DYNACORD

PROMATRIX 9000

Public Address and Voice Alarm System

en   Configuration manual

DYNACORD

Table of contents

1   General information

This manual provides all required information needed for the configuration of the Dynacord PROMATRIX 9000 system. It is a systematic guide for new users and serves as a reference for experienced users.

–   Unless required for the configuration of the products, this manual does not describe hardware installation instructions. Refer to *Related documentation, page 8*.
–   This manual is available at www.dynacord.com in the PROMATRIX 9000 product section.

1.1   Intended audience

This configuration manual is intended for everyone who is authorized to do the configuration of PROMATRIX 9000 and related products.

1.2   How to use this manual

It is advised to follow the manual from start to finish if you're new to PROMATRIX 9000 or starting the configuration of a new PROMATRIX 9000 system.

Manual content

Refer to the following sections before and during the configuration of your system:

–   *General information, page 7*: describes how to use this manual and provides a high-level introduction description of the PROMATRIX 9000 Public Address and Voice Alarm System, among other general content.
–   *Product overview, page 14*: gives an overview of the PROMATRIX 9000 products.
–   *Getting started, page 22*: describes software installation instructions and important procedures that you must take into account before and during the configuration.
–   *Logon the application, page 46*: describes how to logon the PROMATRIX 9000 webserver webpages and important procedures that must take into account before and during the configuration logon.
–   *Configure the system, page 48*: describes the configuration of a PROMATRIX 9000 system.
–   *Diagnose, page 133*: describes diagnostics for, for example, the configuration, the amplifier loads, and the battery impedance.
–   *Security, page 143*: describes how to change security credentials, reconnect lost and disconnected devices, and Open Interface client certificate connections.
–   *Print configuration, page 146*: describes how to print the configuration settings of the devices and the system.
–   *About, page 147*: describes how to view certificates and Open Source Software licenses.
–   *Introduction to make an announcement, page 148*: describes what is and how to setup an announcement with content, priority and routing.
–   The next chapters describe how to use different applications with PROMATRIX 9000:
    –   *Optional: Using the Logging Server, page 150*
    –   *Optional: Using the Logging Viewer, page 155*
    –   *Optional: Using OMNEO Control, page 159*
    –   *Optional: Using (OMNEO) Network Docent, page 160*
    –   *Optional: Using Dante Controller, page 161*
    –   *Optional: Using the Open Interface, page 162*
–   *Troubleshooting, page 164*: describes PROMATRIX 9000 troubleshooting options.
–   *Tones, page 166*: gives information on tones to be used with PROMATRIX 9000.
–   Support and academy: provides high-level technical support and training information.

1.3   Related documentation

The Dynacord PROMATRIX 9000 technical documentation is set up in a modular way addressing different stakeholders.

	Installer	System integrator	Operator
Installation manual. Detailed system and product descriptions and installation instructions.	X	X	-
Configuration manual. Detailed instructions for configuration, diagnosis and operation.	X	X	X

> **Notice!**
> Retain all documentation supplied with the products for future reference.
> Visit www.dynacord.com > PROMATRIX 9000 product section.

1.3.1   Other related documentation

– Commercial brochures
– Datasheets
– Architects' & Engineers' specifications, also included in the product datasheet
– Release notes
– Application notes, including the DNV Type Approval
– Other PROMATRIX 9000 hardware and software related documentation.

Visit www.dynacord.com > PROMATRIX 9000 product section > System controller > Downloads > Literature.

1.4   Training

Participation in the Dynacord PROMATRIX 9000 product and system training is highly recommended before installing and configuring a PROMATRIX 9000 system. The Dynacord Security Academy offers classroom training sessions as well as online tutorials on www.dynacord.com > Support > Training.

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Dynacord reserves the right to make changes to features and specifications at any time without prior notification in the interest of ongoing product development and improvement.

1.8 Software and tool release history

Use latest software

Before operating the device for the first time, make sure that you install the latest applicable release of your software version. For consistent functionality, compatibility, performance, and security, regularly update the software throughout the operational life of the device. Follow the instructions in the product documentation regarding software updates.

The following links provide more information:

– General information: https://dynacord.com/support/product-security/
– Security advisories, that is a list of identified vulnerabilities and proposed solutions: https://www.boschsecurity.com/xc/en/support/product-security/security-advisories.html

Dynacord assumes no liability whatsoever for any damage caused by operating its products with outdated software components.

PROMATRIX 9000 Software Package x.xx.zip

Release date	Version	Reason
2020-12	1.20	Official release.
2021-06	1.40	Official release.
2021-10	1.41	Official release.
2021-12	1.42	Official release.
2022-05	1.50	Official release.
2022-08	1.60	Internal release.
2022-11	1.61	Official release.
2022-12	1.70	Official release.
2023-04	1.80	Internal release.
2023-04	1.81	Official release.
2023-07	1.90	Internal release.
2023-08	1.91	Official release.
2024-05	2.00	Official release.
2024-07	2.10	Official release.
2024-12	2.20	Official release.

Release date	Version	Reason
2025-03	2.30	Official release.

FWUT

Visit https://products.dynacord.com/emea/de/software for the latest FWUT. The version is indicated as *Vyyyy.mmdd.cccc*.

1.9 System introduction

For a detailed product and system description/specification, refer to the PROMATRIX 9000 product datasheets and installation manual. See *Related documentation, page 8*

Introduction to PROMATRIX 9000

With PROMATRIX 9000, Dynacord has set a new standard in Public Address and Voice Alarm systems. With all system elements being IP-connected and using state-of-the-art technologies, this system combines cost efficiency and audio quality with ease of installation, integration and use. IP-connectivity and amplifier power partitioning enable new levels of scalability and adaptability, and combined with local backup power facilities this makes PROMATRIX 9000 equally suited to both centralized and decentralized topologies. PROMATRIX 9000 uses only a few different but very flexible system devices, each with unique capabilities, to create sound systems of all sizes for an extremely wide range of applications. PROMATRIX 9000 fits to an office with background music in the reception area and some occasional calls, as well as to an international airport with many simultaneous (automated) announcements for flight information, and carefully selected music programs in lounges, restaurants and bars. In all cases, it can be installed to operate also as a certified voice alarm system for mass notification and evacuation. System functions are defined and configured in software and system capabilities can be enhanced via software upgrades. PROMATRIX 9000: one system, endless options.

Introduction to OMNEO

PROMATRIX 9000 uses OMNEO network technology. OMNEO is an architectural approach to connecting devices that need to exchange information such as audio content or device control. Built upon multiple technologies, including IP and open public standards, OMNEO supports the technologies of today such as Audinate's Dante while adopting the standards of tomorrow, such as AES67 and AES70. OMNEO offers a professional-grade media networking solution that provides interoperability, unique features for easier installation, better performance and greater scalability than any other IP offering on the market. Using standard Ethernet networking, media products that integrate OMNEO can be assembled into small, medium and large networks that exchange studio-quality synchronized multichannel audio and share common control systems. OMNEO's media transport technology is based on Audinate's Dante, a high performance standards-based, routable IP-media transport system. OMNEO's system control technology is AES70, also known as Open Control Architecture (OCA), an open public standard for control and monitoring of professional media network environments. OMNEO devices are fully compatible with AES67 and AES70, without losing any functionality.

1.10 Security precautions

PROMATRIX 9000 is an IP-connected, networked Public Address and Voice Alarm system. To make sure that the intended functions of the system are not compromised, special attention and measures are required during installation and operation. The PROMATRIX 9000

configuration manual and installation manual provide many security measures related to the products and the activities described. This section provides an overview of precautions related to network security and access to the system.

– Follow the installation instructions with respect to the location of equipment and the permitted access levels. Refer to the chapter *Location of racks and enclosures* in the PROMATRIX 9000 installation manual for more information. Make sure to restrict access to call stations that address very large areas and to operator panels configured for alarm functions. To do so, mount them in an enclosure with a lockable door or configure user authentication on the device.

– It is highly recommended to operate PROMATRIX 9000 on its own dedicated network. Do not mix the system with equipment with other purposes. The extra equipment can be accessible by unauthorized people, causing a security risk. This is especially true if the network is connected to the Internet.

– It is highly recommended to lock or disable unused ports on network switches to avoid the possibility that connected equipment can compromise the system. This is also the case for PROMATRIX 9000 call stations connected through a single network cable. Make sure the connector cover of the device is in place and fixed to avoid access by a second network socket. Install other PROMATRIX 9000 equipment in an area that is only accessible by authorized people to avoid tampering.

– Use an Intrusion Protection System (IPS) with port security where possible to monitor the network for malicious activity or policy violations.

– PROMATRIX 9000 uses secure OMNEO for its network connections. All control and audio data exchange use encryption and authentication. But the system controller allows the configuration of unsecure Dante or AES67 audio connections as an extension of the system, both as inputs and as outputs. These Dante/AES67 connections are not authenticated and not encrypted. This forms a security risk, as no precautions are taken against malicious or accidental attacks through their network interfaces. For highest security, these Dante/AES67 devices should not be used as part of the PROMATRIX 9000 system. If you need such inputs or outputs, use unicast connections.

– The following switches report their power faults and network connection status directly to the PROMATRIX 9000 system controller through SNMP:
  – From PROMATRIX 9000 software version 1.50 onwards, the PRA-ES8P2S switch and the Cisco IE-5000-12S12P-10G switch/router.
  – From PROMATRIX 9000 software version 2.30 onwards, the Cisco IE-9320-22S4X-A switch/router.
  – The switches can be daisy-chained without an OMNEO device between them for connection supervision. The PRA-ES8P2S is preconfigured for this purpose from custom firmware version 1.01.05 onwards.

– For security reasons, the PRA-ES8P2S Ethernet switch is not accessible from the Internet by default. When the default (special link-local) IP-address is changed to an address outside the link-local range (169.254.x.x/16), the default (published) password must be changed. Even for applications on a closed local network, for highest security, the password must still be changed. Refer to the *Ethernet switch* chapter in the PROMATRIX 9000 installation manual for more information.

– To enable SNMP, for example to use the Dynacord analysis tool Network Docent, use SNMPv3. SNMPv3 provides much better security with authentication and privacy. Select the authentication level SHA and encryption via AES. Refer to the *Ethernet switch* chapter in the PROMATRIX 9000 installation manual for more information.

- The system controller webserver uses secure HTTPS with SSL. The web server in the system controller uses a self-signed security certificate. When you access the server via https, you will see a Secure Connection Failed error or warning dialog indicating that the certificate was signed by an unknown authority. This is expected and to avoid this message in the future you have to create an exception in the browser.
- Make sure that new user accounts for system configuration access use sufficiently long and complex passwords. The user name must have a minimum of five characters and a maximum of 16 characters. The password must contain the characters as defined in the *System settings, page 81*.
- The PROMATRIX 9000 system controller provides an Open Interface for external control. Access through this interface requires the same user accounts as for the system configuration access. In addition, the system controller generates a certificate to setup the TLS secure connection between the system controller and the Open Interface client. Download the certificate and open/install/save the crt-file. Activate the certificate on the client PC. Refer to *System security, page 143*.
- System access to the devices of this system is secured via the OMNEO security user name and passphrase of the system. The system uses a self-generated user name and long passphrase. This can be changed in the configuration. The user name must have between 5 and 32 characters and the passphrase must have 8 to 64 characters. To update the firmware of the devices, the firmware upload tool requires this security user name and passphrase to get access.
- In case a PC for event logs is used (PROMATRIX 9000 logging server and viewer), make sure that the PC is not accessible by unauthorized persons.
- Use secure VoIP protocols (SIPs) whenever possible, including verification through VoIP server certificate. Only use non-secure protocols when the SIP server (PBX) does not support secure VoIP. Only use VoIP audio in the protected sections of the network, because the VoIP audio is not encrypted.
- Anyone with the ability to dial one of the extensions of the system controller can make an announcement in the PROMATRIX 9000 system. Do not allow external numbers to dial the system controller extensions.

Find all documentation and software related at www.dynacord.com in the **Downloads** section of the PROMATRIX 9000 products.

Whenever you think you have identified a vulnerability or any other security issue related to a Bosch product or service, contact the Bosch Product Security Incident Response Team (PSIRT): https://psirt.bosch.com.

1.11   Use of latest software

Before operating the device for the first time, make sure that you install the latest applicable release of your software version. For consistent functionality, compatibility, performance, and security, regularly update the software throughout the operational life of the device. Follow the instructions in the product documentation regarding software updates.
The following links provide more information:
- General information: https://dynacord.com/support/product-security/

–   Security advisories, that is a list of identified vulnerabilities and proposed solutions:
https://www.boschsecurity.com/xc/en/support/product-security/security-advisories.html

Dynacord assumes no liability whatsoever for any damage caused by operating its products with outdated software components.

2   Product overview

For a detailed product and system description/specification, refer to the PROMATRIX 9000 product datasheets and installation manual. See *Related documentation, page 8*
The PROMATRIX 9000 product family consists of the following products.

Order number	Product view	Product name
PM9-SCL PM9-SCS		System controller, large System controller, small
PRA-LSPRA		*License for subsystem PRAESENSA (LSPRA), page 16*
PRA-LSCRF		*License call recording and forwarding (LSCRF), page 17*
PM9-AD604		Amplifier, 600W 4-channel
PM9-AD608		Amplifier, 600W 8-channel
PM9-EOL		End-of-line device
PM9-MPS3		Multifunction power supply, large
PRA-ANS		Ambient noise sensor
PRA-IM16C8		Control interface module

Order number	Product view	Product name
PRA-IM2A2		Audio interface module
PM9-CSLD		Desktop LCD call station
PM9-CSLW		Wallmount LCD call station
PM9-CSE		Call station extension
PRA-CSBK		Call station kit, basic
PRA-CSEK		Call station extension kit
WPN1-EU WPN1-US		Wall panel controller networked, EU Wall panel controller networked, US

Order number	Product view	Product name
PRA-ES8P2S		Ethernet switch, 8xPoE, 2xSFP
PRA-SFPSX PRA-SFPLX		Fiber transceiver, single mode Fiber transceiver, multimode
PRA-APAS		Advanced public address server
PRA-APAL		*Advanced public address license (APAL),* *page 18*
PRA-PSM24 PRA-PSM48		Power supply module 24V Power supply module 48V

Refer to the PROMATRIX 9000 Installation manual for details on the hardware products.

2.1 License for subsystem PRAESENSA (LSPRA)

The PRA-LSPRA software license creates a PROMATRIX 9000 multi-system architecture with higher scalability in comparison to a single system. A system with master and subsystem controllers improves the overall performance by extending the number of devices and zones. A master system controller is a standard PROMATRIX 9000 system controller with an active PRA-LSPRA license per subsystem. The same amount of licenses is required for an optional redundant master controller. Subsystem controllers do not require licenses.
With a master controller and a maximum of 20 subsystems, PROMATRIX 9000 can support 3000 devices and 10,000 zones.

Configure the PRA-LSPRA license with the *Optional: PRAESENSA License Management, page 37*.

2.1.1 Functions
- Allows a master controller to manage multiple subsystem controllers.
- Makes it possible to configure an EN 54-16 certified Firemen's microphone to perform system wide:

- – Live announcements with evacuation priority
- – Start / stop emergency messages
- – Zone status indication
- – Fault reporting
- – Emergency status acknowledgement / reset.
- – Allows acknowledgement / reset of system wide faults.
- – Enables system wide business calls and start / stop business messages.
- – The BGM sources are available across the system, while the volume is controlled in each system individually.

2.1.2　Specifications

Maximum of subsystems per master controller	20
Maximum of subsystems per redundant master controller	20

The easy and flexible interaction concept of several networked systems is based on corresponding names for remote zone groups. Therefore, it is possible to perform multiple calls from a master controller to several subsystems at the same time. One zone group can have a combination of several zones that belong to different subsystems. For these use cases, the audio between the systems is always synchronized.

> **Notice!**
> Contact Bosch if you want to design a system with multiple controllers.

2.2　License call recording and forwarding (LSCRF)

One PRA-LSCRF software license can be installed per system controller to allow for the stacking and time-shifting of calls within the PROMATRIX 9000 system.
Call stacking records the live speech within time-shifted calls, stacked calls, and time-shifted stacked calls. The live speech recorded can then be replayed. The playback of a call can start while the message is still being recorded. You can store up to 30 minutes of live speech.
Time-shifting calls prevents audio feedback when the call station and the loudspeakers are located in the same zone.
Time-shifting also makes it possible to avoid wrong or misspoken announcements. After the announcement, a user has two seconds to cancel the broadcast of the call before it is played. You can configure an extension key in a call station to cancel the last started broadcast (Cancel Last) or cancel all broadcast replays (Cancel All) of time-shifted calls, stacked calls and time-shifted stacked calls.
Configure the PRA-LSPRA license with the *Optional: PRAESENSA License Management, page 37*.

2.2.1　Functions

- – Record the live speech of time-shifted calls, stacked calls and time-shifted stacked calls.

–   Wait until all zones are free to deliver the call, or play the call as soon as each zone
becomes available.
–   Record a maximum of 30 minutes of live speech.
–   Avoid the possibility of getting audio feedback when time-shifting calls.
–   Within two seconds after stopping the call, cancel the broadcast of a wrong or
misspoken announcement of a time-shifted call or time-shifted stacked call before it is
played.
–   Cancel a call during the broadcast.

2.2.2   Specifications

Supporting devices	PM9-SCL / PM9-SCS
Number of licenses needed per duty controller	1
Number of licenses needed per standby controller	1
Number of recorders available per controller	8
Number of players available per controller	8
Maximum duration of a recorded call	1200 seconds (20 minutes)
Maximum duration of recording	30 minutes
Time to cancel a time-shifted call to avoid broadcast replay	2 seconds after the original call ends
Time to cancel a broadcast replay	Anytime during broadcast

2.3   Advanced public address license (APAL)

The PRA-APAL is a license code for an operator device to access the advanced public
address server PRA-APAS for PROMATRIX 9000. It adds advanced business related public
address functions to the function set provided by the system controller. A PC or wireless
tablet, connected to the local IP-network, functions as operator device with an intuitive
graphical user interface, controlled by mouse or touch screen. A headset, connected via USB
or Bluetooth to the operator device, may be used for voice announcements and audio
monitoring. The integrated web server of the PRA-APAS keeps the operator device platform
independent. Each operator device uses its own web browser as operator interface.

Refer to the PRA-APAS Configuration manual for details on the configuration of the license.

2.3.1   Functions

Advanced public address license
–   License for an operator device to connect to the PRA-APAS advanced public address
server.
–   Multiple operator devices may access the advanced public address server
simultaneously, each using its own PRA-APAL license.
–   Each license of an operator device may have multiple, different, operator profiles on
that device, with tailored functionalities for each user group.

Operator functions
–   Easy zone selection with picture representation of zones.

- Control of background music sources and volume levels in selected zones. Music can be streamed from internal memory, but also from Internet music portals and Internet radio.
- Live call recording of announcements with pre-monitoring and playback to selected zones.
- Live and scheduled playback of stored messages.
- Playback of text based announcements with automatic (multi-lingual) on-line text-to-speech conversion.

Public address server
- Industrial PC with pre-installed and licensed software, acting as server to one or more operator control devices, and as interface between these devices and one PROMATRIX 9000 system.
- For security reasons the server has two ports to connect to two different local area networks. One port is connected to the secure PROMATRIX 9000 network, the other port to the corporate network with access to operator devices and (Firewall protected) access to the Internet.
- License management of operator devices. Each operator device needs a PRA-APAL license for access to the advanced public address server.
- Integrated web server to keep operator devices platform independent. Each operator device uses its own web browser as operator interface.
- Storage of messages and music in internal memory, multiple audio formats supported.

Connection to PROMATRIX 9000
- The server connects to the PROMATRIX 9000 system controller, using the PROMATRIX 9000 Open Interface for control of business related functions. Higher priority, emergency related functions are always handled by the system controller and will overrule PRA-APAS activities.
- The server can stream up to 10 high quality audio channels to the system controller, using the AES67 protocol. The system controller converts the static AES67 audio streams into dynamic OMNEO streams.

2.3.2   Specifications

Operation

Control device	
License format	Code sent via e-mail
License requirement	One per active operator device
Maximum number of operator devices	Virtually unlimited
Supported connections	IP (wired or Wi-Fi)
Supported browsers	Chrome, Firefox, Microsoft Edge
Graphic user interface	Optimized for use with a 10" touch screen
Supported headsets	Determined by operator device

System integration

Browsers	
Firefox	From version 78 onwards

Browsers	
Microsoft Edge	From version 88 onwards
Google Chrome	From version 91 onwards

2.4   GUI Languages

The PROMATRIX 9000 system has the following GUI languages:

Languages	Configuration software	Call station GUI	Network configurator	Logging application
Chinese, simplified	•	•	•	•
Chinese, traditional	•	•	•	•
Czech	•	•	•	•
Danish	•	•	•	•
Dutch	•	•	•	•
English	•	•	•	•
Estonian		•		
Finnish		•	•	•
French	•	•	•	•
German	•	•	•	•
Greek		•	•	•
Hungarian		•	•	•
Italian	•	•	•	•
Korean	•	•	•	•
Latvian		•		
Lithuanian		•		
Norwegian		•	•	•
Polish	•	•	•	•
Portuguese BR	•	•	•	•
Russian	•	•	•	•
Slovak	•	•	•	•
Spanish	•	•	•	•
Swedish		•	•	•
Turkish	•	•	•	•

2.5   Compatibility and certification overview

The tables show:
–   The hardware and software products that can be part of a PROMATRIX 9000 system,
–   The minimum required software version of PROMATRIX 9000 for each of the products, and
–   For which emergency sound standards the products are certified.

Due to ongoing certification activities, the tables are subject to change.

For the latest information, check the certificates in the download section of these products in the online product catalog available at www.dynacord.com

PROMATRIX 9000 hardware products

Product	SW version	EN 54	ISO 7240	DNV-GL
PRA-PSM24	—			
PRA-PSM48	—			✓
PRA-ES8P2S PRA-SFPLX PRA-SFPSX	—	✓		
PM9-SCL PM9-AD608 PM9-EOL PM9-MPS3 PM9-CSLD PM9-CSLW PM9-CSE	1.00	✓		
PM9-AD604	1.10	✓		
PRA-ANS	1.40	✓		—
PRA-CSBK PRA-CSEK	1.41	—		
OMN-ARNIE OMN-ARNIS IE-5000-12S12P-10G	1.50	✓		—
PRA-IM16C8 PM9-SCS	1.91	✓		—
PRA-WCP-EU PRA-WCP-US	2.00	—		
PRA-IM2A2	2.20	✓		–

PROMATRIX 9000 software licenses

License	SW version	EN 54	DNV-GL
PRA-LSPRA	1.50	✓	–
PRA-LSCRF	2.10	✓	–

3　Getting started

Configuration of PROMATRIX 9000 will be done by the graphical user interface (GUI) which is provided by the webserver of the system controller and can be accessed via a web browser.

– You should have a working knowledge of your computer operating system and (PROMATRIX 9000) Ethernet network.

Before starting configuration and operating of the PROMATRIX 9000 system, it is advised to do the following:

1. *Check the hardware, page 22*
2. *Install the system software, page 22*
3. *Check network and web browser settings, page 41*
4. *Configuration do's and don'ts, page 44*
5. *Logon the application, page 46*

3.1　Check the hardware

Make sure that:

1. You have the **hostnames and MAC-addresses** of the 19" devices (see the product label) before mounting them in a 19"-rack. For configuration, you need to know the hostnames:
   – After mounting, access to the product labels with this information might be difficult, especially for devices that have their labels on the side.
2. The **products** are mechanical correctly installed and connections are done as specified in the PROMATRIX 9000 installation manual.
3. An **Ethernet connection** between the PROMATRIX 9000 system and the building Ethernet network is **disconnected**. It is not recommended to connect the PROMATRIX 9000 system (controller) permanently to an Ethernet network that is also used for other purposes, like a computer network:
   – This to avoid that **non** PROMATRIX 9000 system related network devices become visible in the PROMATRIX 9000 configuration web browser pages. And an excess of data on the network (e.g. a so-called data storm of multicast messages) might overload the system.
   – Notice that setup of the building Ethernet network is not part of this manual. If needed, contact your local IT representative in case of connecting PROMATRIX 9000 to the building Ethernet network.
4. An **Ethernet network connection** cable (shielded CAT5e or better) between the configuration computer / (Wi-Fi) router and the PROMATRIX 9000 system (controller) is **established**:
   – Although any port can be used, it is advised to use port 5 for the connection to a PC for configuration, especially if this connection is permanent. This port can also be connected to a Wi-Fi router to enable configuration and system setup from a mobile device, using its browser. In this way, zone volume and equalizer settings can be configured conveniently in the zone itself by immediate audible monitoring. This requires Wi-Fi coverage in the zones.

3.2　Install the system software

The PROMATRIX 9000 system software installation procedure consists of the following steps:

1. Check if the computer fulfills the minimum requirements to install and run the PROMATRIX 9000 (related) software. See *PC requirements, page 23*.
2. Installation of the (mandatory) software package on the configuration computer. See *Mandatory software, page 24*.
3. Installation of the firmware on the system controller and other PROMATRIX 9000 network devices. See *Check/Upload the devices firmware, page 27*.
4. *Check network and web browser settings, page 41*.
5. *Optional: Logging Server, page 29*
6. *Optional: Logging Viewer, page 30*
7. *Optional: OMNEO Control, page 31*
8. *Optional: OMNEO Network Docent, page 33*
9. *Optional: Dante Controller, page 34*
10. *Optional: Open Interface, page 36*
11. *Optional: PRAESENSA License Management, page 37*
12. *Optional: PRAESENSA Network Configurator, page 39*
13. *Logon the application, page 46*

Refer to
– *Optional: PRAESENSA License Management, page 37*
– *Optional: PRAESENSA Network Configurator, page 39*
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– *Optional: Open Interface, page 36*
– *Optional: OMNEO Network Docent, page 33*
– *Optional: OMNEO Control, page 31*
– *Check network and web browser settings, page 41*

3.2.1   PC requirements

The PROMATRIX 9000 software and applications can run on any PC that meets the following minimum requirements:

Item	Minimum requirement
Operating system	Microsoft® Windows 10 Professional; 32-bit or 64-bit. – Keep the PC updated with the latest Windows updates. This makes sure that the PC contains the most recent version and service packs of the Microsoft® Jet 4.0 database, which is used by the *Logging Server*. See also http://support.microsoft.com/common/international.aspx
Processor	X86 or X64. Dual core 2.4 GHz
Network connection	Ethernet 100 base-T
Maximum Transmission Unit (MTU)	Set to 1500 bytes
Internal memory (RAM)	4 GB

Item	Minimum requirement
Free disk space	Depends on the amount of events that must be stored, but it is recommended to have at least 10 GB of free disk space.
Screen resolution	1366 × 768 pixels. 16-bit or 32-bit color depth

3.2.2   Mandatory software

The following software is essential to configure and operate PROMATRIX 9000 and **must be installed** on the computer which will be used to configure and operate the PROMATRIX 9000 system. It is made online available as follows:

In the www.dynacord.com page, in the PROMATRIX 9000 product section, under a device, for example the system controller, find the .zip file named:

PROMATRIX 9000 Installation Package x.xx.zip, where x.xx is the release version that changes with the updates.

The installers' directory of the .zip includes the following files:

– redist
– Dynacord PROMATRIX 9000 Firmware.exe
– *: Dynacord PROMATRIX 9000 Logging Server.exe
– *: Dynacord PROMATRIX 9000 Logging Viewer.exe
– *: Dynacord-OpenInterface-Net-installer.exe

From https://products.dynacord.com/emea/de/software, download the Firmware upload tool Vx.xx, where x.xx is the release version that changes with the updates. It includes:

– The SetupOMNEOFirmwareUploadToolBundle(64).exe (two versions 32-bit and 64-bit): Use the Firmware Upload Tool (FWUT) to upload the device firmware and Domain Name System Service Discovery (DNS-SD). Install the FWUT on the PC used to configure the PROMATRIX 9000 system. Automatically, the Dynacord DNS-SD Service is also installed. This service allows to access the PROMATRIX 9000 devices through their hostname instead of their IP-address.

(i) **Notice!**
The files above with the * character are part of the .zip file, but their installation is optional.

Optional software

– *Tones, page 166*
    – PROMATRIX 9000 pre-defined tones (.wav). Go to www.dynacord.com > PROMATRIX 9000 product section > system controller > Downloads.
– *:*Optional: Open Interface, page 36*:
    – For 3th party applications the Open Interface needs to be installed on your PROMATRIX 9000 configuration computer.
– **: *Optional: OMNEO Control, page 31*:
    – The OMNEO Control software enables users to configure audio devices, and to route audio all over the network.
– **: *Optional: OMNEO Network Docent, page 33*:
    – The software scans and visualizes the network environment, giving insight into all devices and cable-connections. Docent is able to identify and provide guidance on solving common and simple network errors.
– **: *Optional: Dante Controller, page 34*:

- Dante Controller is a software application provided by Audinate, which allows users to configure and route audio around Dante networks.

Notice!

The files above with the * character are part of the PROMATRIX 9000 Installation Package x.xx.zip, but their installation is optional.

The optional software files indicated above with the ** characters are NOT part of the PROMATRIX 9000 Installation Package x.xx.zip file. These software files can be downloaded as indicated within their installation chapters.

Install the software

All PROMATRIX 9000 software is only made available online. Here you could find also updates and new releases. Please read the online PROMATRIX 9000 release notes before you download, or update, software. Release notes contain last minute changes and remarks. See *Related documentation, page 8*, if required.

If the software will be installed for the first time, proceed as follows:

1. If not already done, **turn-on the power** of the PROMATRIX 9000 system:
   – All network devices boot and the 19"-devices show the (yellow *device fault*) LED on.
   – A call stations shows *connecting* on the display.
   – See also *Device options, page 54*
2. **Ensure** you are logged on to your computer as an administrator.
   – **You need** (Windows) administrator rights to install/save.
   – **Check** if you use a Windows 32-bit or 64-bit operating system. Notice that some (optional) software could be possible only made available for a 64-bit operating system.
3. **Go to** www.dynacord.com > *Product Catalog* > Choose your region and country:
   – **Type** PROMATRIX 9000 in the *search* text box >
   – **Select and click** the PROMATRIX 9000 product page of the System controller >
   – **Select and click** *Downloads > Software* on the product page >
   – **Select** PROMATRIX 9000 Installation Package x.xx.zip and and other (optional) files, if required.
   – **Save** PROMATRIX 9000 Installation Package x.xx.zip files to a safe location on your computer's hard drive.
4. **Go to** https://products.dynacord.com/emea/de/software and **download** the Firmware upload tool Vx.xx (where x.xx is the version release number and will be changed at updates) to a safe location on your computer's hard drive. It includes:
   – SetupOMNEOFirmwareUploadToolBundle(64).exe (two versions 32-bit and 64-bit).
5. **Browse to**, **and unzip**, the PROMATRIX 9000 Installation Package x.xx.zip file on your computer's hard drive.
6. **Browse to** the other (optional) files on your computer's hard drive, if required.
7. **Browse to**, **and run**, **all .exe** (without * character in front) of the unzipped PROMATRIX 9000 Installation Package x.xx.zip file including SetupOMNEOFirmwareUploadToolBundle(64).exe (32 or 64-bit *.exe version) and run other (optional) files, if required:
   – Follow the onscreen instructions.
   – If the installation does not start automatically, check/run also the .exe files of the **redist** directory of the Installation Package x.xx.
8. In the following order, see also:
   – *Check/Upload the devices firmware, page 27*
   – *Optional: Logging Server, page 29*
   – *Optional: Logging Viewer, page 30*
   – *Logon the application, page 46*

Update the software

Important is to check the PROMATRIX 9000 Installation Package x.xx.zip and Firmware upload tool Vx.xx for new releases on a regular base. To do so:

1. **Go to** www.dynacord.com > *Product Catalog* > Choose your region and country:
    –   **Type** PROMATRIX 9000 in the *search* text box >
    –   **Select and click** the PROMATRIX 9000 product page of the System controller >
    –   **Select and click** *Downloads > Literature* on the product page >
    –   **Select** the latest available *Release notes*. **Follow** the *release note* guideline on how to proceed.
2. **Select and click** the PROMATRIX 9000 product page of the System controller >
    –   **Select and click** *Download > Software* on the product page > **Check** the release version (x.xx) and date of:
        PROMATRIX 9000 Installation Package x.xx.zip and other (optional) files, if required.
3. **Go to** https://products.dynacord.com/emea/de/software and check the Firmware upload tool Vx.xx (where x.xx is the version release number). It includes:
    –   SetupOMNEOFirmwareUploadToolBundle(64).exe (two versions 32-bit and 64-bit).
4. **If** the online PROMATRIX 9000 Installation Package x.xx.zip and/or the Firmware upload tool Vx.xx release version is of a **higher/newer version** than the one installed on your computer; **install** (overwrite) the newly released version(s).
    –   To install, see the previous topic: *Install the software*

> **(i) Notice!**
> Do not use a configuration created with a newer software version on an older software version. Always store and keep a backup of the current configuration version before upgrades.

3.2.3   Check/Upload the devices firmware

All PROMATRIX 9000 network devices are delivered with basic firmware. Upgrade them to the latest available version with the FWUT.

Find the firmware in the .zip file as described in *Mandatory software, page 24*.

Follow the procedure to install updates of the network device firmware. See the online PROMATRIX 9000 release notes for details on the latest release. Refer to *Related documentation, page 8*.

> **(i) Notice!**
> Connect the configuration PC to a port of any other device on the same network, such as the (Advantech) PRA-ES8P2S Ethernet switch or any other Ethernet switch.

You have two firmware upload possibilities:

1. **First time firmware upload** with the default settings:
    –   Only valid for the initial firmware upload.
    –   No configuration web pages present yet.
2. **Secure firmware upload** with the settings configured in the PROMATRIX 9000 software:
    –   Only possible after the initial firmware upload and the 1st time configuration logon.
    –   The configuration web pages are available.

1. First time firmware upload

The first time you use PROMATRIX 9000, upload the devices firmware. Otherwise, you will not have access to the configuration web pages.

To do the first time upload:

1. Download the latest available software version release.
    –   See *Mandatory software, page 24*.
2. On the PC you are using to configure the PROMATRIX 9000 system, browse to, and run, the **SetupOMNEOFirmware UploadToolBundle**.
    –   Select either the 32-bit or 64-bit version.
    –   Follow the onscreen instructions.
3. Click the **Yes** button or the **NO** button if you do not want to proceed.
    –   If you click **Yes**, the screen where all connected network device types are visible opens. You can see the selection tabs on the top of the screen.
    –   The Firmware Upload Tool (FWUT) addresses the devices through their device hostname. See *Logon the application, page 46*.
4. In a tab, select one or more device rows and click the **Upload** button.
    –   To select all the rows on the screen, click Windows and ctrl A on the keyboard.
    –   The screen **Select Firmware for upload** appears.
    –   The commercial type numbers of the selected device type appear.
5. Select the latest firmware version to upload.
6. Click the **Start** button or the **Cancel** button if you do not want to proceed.
    –   If you click **Start**, the firmware upload process continues.
    –   The **State** column shows **active** or **finish**.
    –   The **Progress** column show the upload progress in a green color bar.
    –   The error LED on the 19" device front panel is on as long the upload process of the device runs.
    –   The call station display shows the upload process as long the upload process of the device runs.
7. Repeat the previous steps for all connected network devices:
    –   The firmware upload is successfully if no fault messages are generated.
8. Continue with *Logon the application, page 46*.

2. Secure firmware upload

A secure firmware upload means that the data communication and connection between the firmware upload tool and the PROMATRIX 9000 system controller configuration is secured against visibility and using of the firmware by unauthorized people and devices:

To do the secure firmware upload:

1. Download the latest available software version release.
    –   See *Mandatory software, page 24*.
2. On the PC you are using to configure the PROMATRIX 9000 system, browse to, and run, the **SetupOMNEOFirmware UploadToolBundle**.
    –   Select either the 32-bit or 64-bit version.
    –   Follow the onscreen instructions.
3. Click the **Yes** button or the **NO** button if you do not want to proceed.
    –   If you click **Yes**, the screen where all connected network device types are visible opens. You can see the selection tabs on the top of the screen.

- – The Firmware Upload Tool (FWUT) addresses the devices through their device hostname. See *Logon the application, page 46*.
4. Select and click **File** > **Options**
   - – The screen **Firmware Upload Tool Options** appears
5. Enable the checkbox **Use secure connection**.
6. Select a **User name** from the dropdown list or enter a new user name
   - – To enter a new user name, click **Manage security user** > **Add.**
   - – The screen **Security user** appears.
7. Enter the OMNEO **User name**, **Passphrase** and **Confirm Passphrase** in the appropriate fields.
8. Click **OK**.
   - – **IMPORTANT**: Retrieve your OMNEO **Security username** and **Passphrase** from the PROMATRIX 9000 configuration. See *Logon the application, page 46* and *System security, page 143*.
   - – **IMPORTANT:** The **Security username** and **Passphrase** are automatically generated during the configuration logon process. They are only available after the initial firmware upload.
   - – Now the firmware upload process uses a secure data connection with the PROMATRIX 9000 configuration.
9. In a tab, select one or more device rows and click the **Upload** button.
   - – To select all the rows on the screen, click Windows and ctrl A on the keyboard.
   - – The screen **Select Firmware for upload** appears.
   - – The commercial type numbers of the selected device type appear.
10. Select the latest firmware version to upload.
11. Click the **Start** button or the **Cancel** button if you do not want to proceed.
    - – If you click **Start**, the firmware upload process continues.
    - – The **State** column shows **active** or **finish**.
    - – The **Progress** column show the upload progress in a green color bar.
    - – The error LED on the 19" device front panel is on as long the upload process of the device runs.
    - – The call station display shows the upload process as long the upload process of the device runs.
12. Repeat the previous steps for all connected network devices:
    - – The firmware upload is successfully if no fault messages are generated.
13. Continue with *Logon the application, page 46*.

3.2.4 Optional: Logging Server

The PROMATRIX 9000 *Logging server* application software is part of the PROMATRIX 9000 (mandatory) software package (*.zip). If you want to view the events logged, it needs to be installed on your computer. It is not required to install the *Logging server* on the same computer which will be used for configuration of PROMATRIX 9000. See also *PC requirements, page 23*, if required.

With the PROMATRIX 9000 *Logging server*, the events generated by a system can be logged. Typically, the *Logging server* runs on a computer that is connected to all systems of which the events are logged. The *Logging server* stores the events in a database.

To install, proceed as follows:

1. **Browse to, and click**, the file named Dynacord PROMATRIX 9000 Logging Server.exe to start the setup program of the *Logging server*:

–   **IMPORTANT**: Only install and use the PROMATRIX 9000 *Logging server* when connected to PROMATRIX 9000 systems. E.g. the PRAESIDEO *Logging server* does not work with PROMATRIX 9000.
–   Follow the on screen instructions.
2.   The interface for the *Logging server* is available in different languages. During installation a number of language file folders have been installed in:
    –   *Program Files (x86)*\Dynacord\PROMATRIX 9000 *Logging Server*. **Check** this folder to see if your language is available:
    –   The language file folders have names according to the international 2-letter language code (ISO 639), for example; 'en' for English, 'ru' for Russian.
    –   If a language folder exists for the language of the installed Windows operating system, then that is the language of the *Logging server*. If a different language is needed and a language folder exists for that language, proceed as follows:
3.   **Add** a language parameter to the logging server program. The parameter is the 2-letter language abbreviation, e.g. " fi", i.e. a space followed by the language code.
    –   For the *Logging server*, go to the startup folder to add the parameter: *ProgramData > Microsoft > Windows> Start Menu > Programs > Startup >* PROMATRIX 9000 *Logging Server*.
4.   **Right click** on the *Logging server*, select properties and select the tab shortcut.
5.   **Add** the " fi" parameter to the target description that ends with .exe", so after the double quote.
6.   If the *Logging server* has not been installed for automatic startup and is not in the startup folder, then **create** a shortcut for the program file, **right click** on the shortcut (can be on the desktop too), click properties and select the tab shortcut.
7.   **Add** the " fi" parameter to the target description that ends with .exe", so after the double quote. Use the shortcut to start up the program. Of course, replace " fi" with the language abbreviation of your choice.
8.   A **notification** is displayed when the installation is finished.
9.   **Continue** with: *Optional: Logging Viewer, page 30*:
    –   **IMPORTANT**: Go to *Optional: Using the Logging Server, page 150* after the installation process of both the *Logging server* and *Logging viewer*.

3.2.5   Optional: Logging Viewer

The *Logging Viewer* application software is part of the PROMATRIX 9000 (mandatory) software (*.zip). If you want to *view* the events logged, it needs to be installed on your computer. It is not required to install the *Logging viewer* on the same computer which will be used for configuration of PROMATRIX 9000.

With the *Logging Viewer*, the events logged by the *Logging Server* in a database, can be viewed. Typically, the *Logging Viewer* runs on a computer that is connected to the computer on which the *Logging Server* runs. The database is located at the same computer as the *Logging Server*.

To install, proceed as follows:

1.   **Browse to, and click**, the file Dynacord PROMATRIX 9000 Logging Viewer.exe to start the setup program of the *Logging viewer*.
    –   **IMPORTANT**: Only install and use the PROMATRIX 9000 *Logging viewer* when connected to PROMATRIX 9000 systems. E.g. the PRAESIDEO *Logging viewer* does not work with PROMATRIX 9000.
    –   Follow the onscreen instructions:

2. The *Logging Viewer* is able to show its user interface and the logging events in different languages. During installation of the *Logging Viewer* a number of language file folders have been installed in:
   – *\Program Files (x86)*\Dynacord\PROMATRIX 9000 *Logging Viewer*
   – The language file folders have names according to the international 2-letter language code (ISO 639), e.g. 'en' for English, 'ru' for Russian. Check this folder to see if your language is available.
   – If a language folder exists for the language of the installed Windows operating system, then the *Logging Viewer* is in that language.
   – If a different language is needed and a language folder exists for that language, proceed as follows:
3. **Add** a language parameter to the *Logging Viewer* program. The parameter is the 2-letter language abbreviation, e.g. " fi", i.e. a space followed by the language code.
4. For the Logging Viewer **create** a shortcut for the program file, then **right click** on the short cut (can be on the desktop too), **click** properties and **select** the tab short cut.
5. **Add** the " fi" parameter to the target description that ended with .exe", so after the double quote.
   – Use the short cut to start up the program. Of course, replace " fi" with the language abbreviation of your choice.
6. A notification is displayed when the installation is finished.
7. **Go to** *Optional: Using the Logging Viewer, page 155* after the installation process of both the *Logging Server* and *Logging Viewer*.
8. **Continue** with: *Logon the application, page 46*

3.2.6   Optional: OMNEO Control

The OMNEO Control software enables users to configure audio devices, and to route audio all over the network. With a single mouse click, users can create and remove audio connections between all OMNEO devices in a single- or multi-subnet network.

Dante Controller and OMNEO Control

As an alternative to Dante Controller, OMNEO Control could also be used to set up these audio connection paths. But OMNEO Control creates dynamic audio connections that are not automatically re-established by the devices themselves after a reset or power down. OMNEO Control can restore these connections instead, but only when the PC running OMNEO Control remains connected. For that reason it is preferred to use Dante Controller to set up connections to Dante or AES67 devices.

Although OMNEO Control and Dante Controller may be used simultaneously in the same network, this is not recommended as it may lead to confusion. An audio connection made in Dante Controller becomes also visible in OMNEO Control, where it shows up as a Dante connection. OMNEO Control can remove Dante connections and replace them for OMNEO connections. But to set them back to Dante connections, Dante Controller must be used.

See also: *Optional: Using OMNEO Control, page 159*

Key features of OMNEO Control
– Detection and display of OMNEO and Dante devices.
– Controlling audio connections on a PC.
– Support for single- and multi subnets.
– Automatic selection of unicast and multicast.
– Store and reload scenario presets.
– Device configuration for OMNEO devices.

OMNEO Control supports OMNEO and Dante devices. OMNEO couples Audinate's Dante Audio Transport Protocol with OCA, a proven system control protocol for unprecedented reliability and dependability in digital audio. OCA was developed by the OCA Alliance and has been standardized by the AES (Audio Engineering Society) as AES70.

Notice!

This notice states an important difference between OMNEO Control and Dante Controller and persistence. Persistence implicates that connections are automatically restored after a power failure. Unicast and multicast connections made with OMNEO Control are persistent only if OMNEO Control is set in Lock mode. Unicast and multicast connections made with Dante Controller are persistent, even after the Dante Controller application is closed.

OMNEO Control software installation

⚠	**Caution!** OMNEO control is an application for use with OMNEO channels only. It is not compatible with AES67 and Dante. OMNEO control will automatically clean up the AES67 connections every 30 seconds.

The OMNEO Control software is optional PROMATRIX 9000 software. See *Mandatory software, page 24*. It can be downloaded from the Dynacord download area: https://products.dynacord.com/emea/de/software. It is named as OMNEO control Vx.xx (where x.xx is the version release and will be changed at updates and new releases).

The OMNEO Control software is available for the Windows operating system.

–   **Download** the software file as follows:
   –   The installation process is described in a separate manual, called: OMNEO Control Software. See the Dynacord download area: https://products.dynacord.com/emea/de/downloads.
1.   **Go to** https://products.dynacord.com/emea/de/software > OMNEO control Vx.xx and be sure to **select** and **click** the right version for your system (the 32-bit or 64-bit software version).
   –   Pressing the hotkey Windows+Pause will open a window with information about your system.
   –   The download is a .zip file archive. Zip file archives have a .zip file name extension.
2.   **Save** the .zip file to a folder on your Windows computer.
3.   Windows will **unpack** the downloaded .zip file archive when you right click on the file name and select **Extract**.
   –   Follow the onscreen instructions.
4.   **Regularly check** the OMNEO control Vx.xx software for updates and new releases.

Refer to
–   *Related documentation, page 8*

3.2.7   Optional: OMNEO Network Docent

Network Docent is developed to help AV operators in their daily job. The software scans and visualizes the network environment, giving insight into all devices and cable-connections of a network-based AV system. Network Docent is able to identify and provide guidance on solving common and simple network errors that cause disruption or improper operation of the AV system. As a result, Network Docent will reduce time and effort, when installing or operating a network-based AV system.

Features
–   Detection and visualization of OMNEO devices connected to the (PROMATRIX 9000) local network.
–   Detection and visualization of Ethernet switches with LLDP (Link-Layer Discovery Protocol).
–   SNMP (Simple Network Management Protocol) support.
–   Configuration and communication error detection.
–   Error and event log.
–   Troubleshooting knowledge base.
–   List of connected endpoints and alerts.

Installation

The Network Docent software is PROMATRIX 9000 optional software. See *Mandatory software, page 24*. It can be downloaded from the Dynacord download area: https://products.dynacord.com/emea/de/software. It is named as Network Docent Vx.xx (where x.xx is the version release and will be changed at updates and new releases).

– The installation process is described in a separate manual, called:
    – Network Docent. It can be downloaded from the Dynacord download area: https://products.dynacord.com/emea/de/downloads.

1. **Go to** https://products.dynacord.com/emea/de/software > Network Docent Vx.xx and be sure to **select** and **click** the right version for your system (the 32-bit or 64-bit software version).
    – Pressing the hotkey Windows+Pause will open a window with information about your system.
    – The download is a .zip file archive. Zip file archives have a .zip file name extension.

2. **Save** the .zip file to a folder on your Windows computer.

3. Windows will **unpack** the downloaded .zip file archive when you right click on the file name and select **Extract**.
    – Follow the onscreen instructions.

4. **Regularly check** the Network Docent Vx.xx software for updates and new releases.

Refer to

– *Related documentation, page 8*

3.2.8   Optional: Dante Controller

Dante Controller is a software application provided by Audinate which allows users to configure and route audio around Dante networks. It is available for Windows and OS X. The PROMATRIX 9000 system controller is able to receive multiple Dante or AES67 audio streams from other devices, such as for background music from a music server. Dante and AES67 use static audio connections between devices, while PROMATRIX 9000 devices use more efficient dynamic OMNEO channels to be able to switch dynamically between multiple audio streams. For that reason, Dante or AES67 streams must be converted into dynamic OMNEO streams that are under control of the system controller. This conversion is done by the system controller, including encryption to secure the first eight channels.

Dante Controller is used to set up these static audio channels to the system controller. These audio channels must be permanent because the PROMATRIX 9000 system controller cannot control unknown Dante devices, or re-establish lost connections to such devices. Dante Controller can set up permanent (static) label-based connections, but only between devices that are in the **same subnet**. This means that the audio connection paths may include Ethernet switches, but no routers. Because Dante/AES67 connections are permanent, the PC with Dante Controller can be removed after configuration.

> **(i)   Notice!**
> The multicast address selection for Dante audio (239.255.x.x) between Dante and system controllers can potentially cause disruption in the audio. To avoid unexpected behavior, make sure that **only unicast** connections will be used.

	Notice! Some Dante devices do not automatically re-establish their connection with the PROMATRIX 9000 system controller after a reboot of the system controller. Re-establish the connection via Dante controller or use a Dante device that supports automatic reconnection.

Dante Controller and OMNEO Control

As an alternative to Dante Controller, OMNEO Control could also be used to set up these audio connection paths. But OMNEO Control creates dynamic audio connections that are not automatically re-established by the devices themselves after a reset or power down. OMNEO Control can restore these connections instead, but only when the PC running OMNEO Control remains connected. For that reason it is preferred to use Dante Controller to set up connections to Dante or AES67 devices.

Although OMNEO Control and Dante Controller may be used simultaneously in the same network, this is not recommended as it may lead to confusion. An audio connection made in Dante Controller becomes also visible in OMNEO Control, where it shows up as a Dante connection. OMNEO Control can remove Dante connections and replace them for OMNEO connections. But to set them back to Dante connections, Dante Controller must be used.

See also: *Optional: Using Dante Controller, page 161*.

Dante Controller features

Once you install Dante Controller on your PC or Mac and connect it to a network, you can use Dante Controller to:

– View all Dante-enabled audio devices and their channels on the network.
– View Dante-enabled device clock and network settings.
– Route audio on these devices, and view the state of existing audio routes.
– Change the labels of audio channels from numbers to names that suit you.
– Customize the receive latency (latency before play out).
– Save audio routing presets.
– Apply previously saved presets.
– Edit presets offline, and apply as configurations for new network deployments.
– View and set per device configuration options.
– View network status information, including multicast bandwidth across the network and transmit and receive bandwidth for each device.
– View device performance information, including latency statistics and packet errors.
– View clock status information for each device, including frequency offset history and clock event logs.

Installing or updating Dante Controller

Go to www.Audinate.com > Dante Controller, where the latest version of the Dante Controller can be downloaded. For compliancy to the Audinate license agreement the Dante Controller program itself is not online on www.dynacord.com. This program is used for configuration and routing of the OMNEO and/or Dante audio channels.

Installation

To install Dante Controller you will need to be logged on with administrator privileges. You do not need to uninstall a previous version before installing an update. For device discovery by Dante Controller for Windows, the Audinate 'Dante Discovery' service is used. Dante Discovery is installed automatically with Dante Controller for Windows.

To install Dante Controller:

1. **Ensure** you are logged on to your computer as an administrator.
2. **Navigate to and double-click** the downloaded *Dante Controller installer file*.
3. **Read** the license agreement:
   – If you agree to the terms, select the 'I agree' checkbox and click *Install*.
   – If you do not agree to the terms, click *Close*.
4. **Confirm / acknowledge** any Windows security prompts that are displayed.
5. **After installation** the computer (PC) needs to reboot.
   – A notification is displayed when the installation is finished.
6. **See**: *Optional: Using Dante Controller, page 161*
   – **IMPORTANT**: Go to *Optional: Using Dante Controller, page 161* after the PROMATRIX 9000 configuration process has been finalized or when the configuration process is asking for it.
7. **Continue** with: *Logon the application, page 46*

3.2.9   Optional: Open Interface

The *Open Interface* application software is part of the PROMATRIX 9000 optional software. See *Mandatory software, page 24* (*.zip). If you want to use the *Open Interface* with third party applications, it needs to be installed on your PROMATRIX 9000 configuration computer.

To install, proceed as follows:

1. **Browse to, and run**, the file named: Dynacord.OpenInterface-Net-installer.exe

–   The setup program *Open Interface* starts.
–   Follow the onscreen instructions.
2.   A notification is displayed when the installation is finished.
3.   **Go to** Open interface and *Optional: Using the Open Interface, page 162*
4.   **Continue** with: *Logon the application, page 46*

3.2.10   Optional: PRAESENSA License Management

The PROMATRIX 9000 License Management allows you to add licenses to the system controller, which enable new functionalities in your PROMATRIX 9000 system. This tool is part of a system controller's web interface. After you order a license and receive it through email, use the tool to add the license to a PROMATRIX 9000 system controller and to return licenses when they are no longer required.

The PROMATRIX 9000 License Management allows you to add the following licenses:
–   *License for subsystem PRAESENSA (LSPRA), page 16*: Configure a system with a remote controller or multiple remote controllers.
–   *License call recording and forwarding (LSCRF), page 17*: Enable the stacking and time-shifting of calls in your system.

To access the management tool
1.   Open the PROMATRIX 9000 License Management website of your master controller by entering, for example, https://prascl-0b4xxx-ctrl.local/licensing in your browser.
2.   Enter the same **User name** and **Password** used for the PROMATRIX 9000 system.
3.   Choose a **Language** from the drop-down list.
4.   Click **Login**.
     The **License overview** window appears.

In the **License overview** window, you can see information about the licenses currently in the system:
–   **Quantity**: the number of licenses in the system.
–   **License name**: the names of the licenses in the system.
–   **Activation date**: the date of when those licenses were activated.

To see an overview of the licenses your system had in the past but is currently missing:
1.   Click **Print configuration** in the PROMATRIX 9000 software.
2.   Scroll down to the last table in **Print other settings**.
Refer to *Print configuration, page 146*.

To add a license
1.   Open the PROMATRIX 9000 License Management website of your master controller by entering, for example, https://prascl-0b4xxx-ctrl.local/licensing in your browser.
2.   Enter the same **User name** and **Password** used for the PROMATRIX 9000 system.
3.   Click **Add license**.
     The **New license** window appears.
4.   Enter the **Customer information**.
5.   Enter the **Activation ID** you received through e-mail.
6.   Click **Add**.
7.   Click **Activate**.

The download of the file **request.bin** starts. Once the download is completed, a **Notice** window opens.

8. Click **Close** in the **Notice** pop-up.
9. Save the file **request.bin** in your project documentation folder.
10. In your browser, open https://licensing.boschsecurity.com.
    The **System Activation Site** opens.
    Make sure you have an Internet connection.
11. Click **Login**.
    The **Login** window appears.
12. Enter your username and your password.
13. Click **Login**.
14. Select the tab **Manage license**.
15. Click **Browse**.
16. Browse your computer to select the file **request.bin**.
17. Click **Open**.
    The file **request.bin** is transferred to the website.
18. Click **Process**.
    The download of the file **request.bin** starts.
19. Once the download is completed, click **Save to file**.
20. Save the file **ResponseRequest.bin** in your project documentation folder.
21. Browse your computer to select the file **ResponseRequest.bin**.
22. Click **Open**.
    The file **ResponseRequest.bin** is transferred to the master system controller.
23. Click **Restart now** to restart the system controller in order to activate the license.

To return a license
1. In your browser, open https://licensing.boschsecurity.com.
    Make sure you have an Internet connection.
2. Click **Login**.
    The **Login** window appears.
3. Enter your username and password.
4. Click **Login**.
5. Search for your order using the **Activation ID** or **Sales order** fields.
6. Click **Search**.
7. Under **Location**, click the license you want to return.
8. Click **Return Licenses**.
    The download of the file **ReturnRequest.bin** starts.
9. Save the file **ResponseRequest.bin** in your project documentation folder.
10. Open the PROMATRIX 9000 License Management website of your master controller by entering, for example, https://prascl-0b4xxx-ctrl.local/licensing in your browser.
11. Enter the same **User name** and **Password** used for the PROMATRIX 9000 system.
12. Click **Login**.
13. Click **Process response file**.
    The **Return** file window appears.
14. Click **Save Return file**.
15. Save the file **return.bin** in your project documentation folder.
    A **Restart** window opens.
16. Click **Restart now** to restart the system controller in order to deactivate the license.
17. Return to https://licensing.boschsecurity.com.

The **System Activation Site** opens.

18. Click **Login**.

    The **Login** window appears.

    Make sure you have an Internet connection.

19. Enter your username and password.

20. Click **Login**.

21. Select the **Manage License** tab.

22. Click **Browse**.

23. Browse your computer to select the file **return.bin**.

24. Click **Open**.

    The file **return.bin** is transferred to the website.

25. Click **Process**.

    The license has been returned successfully.

3.2.11 Optional: PRAESENSA Network Configurator

Use the PRAESENSA Network Configurator to change the IP-address mode of the devices in the system. You can change from DHCP-assigned to static IP-addresses and conversely.

1. Start the PRAESENSA Network Configurator.
   – **Note:** A popup window appears if you have an ARNI and multiple network adapters in combination with a Dynacord domain.
2. Click **Manage**.
3. Click **Network settings**.
   – The **Network settings** window appears.
4. Select the **Network adapter** from the drop-down list.
5. Select connection type of the devices for which you want to change the IP-address mode.
   – Select **Unsecure** if the devices are unsecure.
   – Select **Secure (default PSK)** if the secure devices use the default PSK identity and passphrase.
   – Select **Secure with PSK identity and passphrase** if the secure devices have a PSK identity and passphrase defined in *System security, page 143*.
6. If you selected **Secure with PSK identity and passphrase**, enter your **PSK Identity** and **Passphrase** in the respective fields exactly as they appear in the PROMATRIX 9000 software.
7. Click **Change**.
   – The devices that correspond to the type of connection chosen will appear in the screen.
   – The number of IP-addresses for the system controllers varies based on whether you have glitch-free enabled. Call stations always have two IP-addresses.

Notice!

A firmware upload of the PM9-CSLx Call stations and PRA-ANS Ambient noise sensors produced with firmware prior to V1.61 will fail if the devices are set to static IP

For every firmware upload of these devices, you must:

a) Change the static IP-addresses of the device to a DHCP- or link-local address.

b) Update the devices to the new software version.

⇨ You can now change the DHCP-addresses to static IP-addresses.

---

8. Double-click the device for which you want to change the IP-address mode.

- The **Set network parameters for device** window pops-up.
9. If you want to change from a static IP-address to a DHCP-assigned IP-address, select **Obtain an IP address automatically**.
10. If you want to change from a DHCP-assigned IP-address to a static IP-address, select **Use the following addressing**.
    - Assign an IP-address in the same range as the IP-address of your PC.
11. Enter the **IP address**, the **Subnet size**, the **Default gateway**, the **DNS server** and the **Domain Name** in the respective fields.
12. Click **Save and Restart**.
    - The changed settings are updated.
    - When changing from a DHCP-address to a static IP-address, the changed device grays out. Rescan the system for the device settings to be editable again.

After the device reboots, you can see the updated settings.

> **Caution!**
>
> **Device with static IP does not recover from a failed upload**
>
> ✓ If a device with a static IP fails to upload the firmware and does not recover from fail-safe mode, you must:
> a) Connect the PC with the FWUT directly to the device in fail-safe mode.
> b) Change the network settings of the PC from static IP to DHCP.
> ⇨ You can now upgrade the device.

Two error messages can popup when you click **Save and Restart**. Both will stop the IP-address of the device from being updated.
- **Failure to update network parameters: [name of the device]**: The device is unreachable. The line of the device you were trying to change turns to gray.
- A parameter you entered is incorrect. For example, you entered an incorrect IP-address. Enter the correct settings.

You can edit the shortcut of the PRAESENSA Network Configurator to make sure the **Network Settings** are filled automatically and remembered.
1. Create a shortcut of the PRAESENSA Network Configurator application.
2. Right-click the shortcut.
3. Click **Properties**.
    - You can now edit the **Target** of the shortcut.
4. Add to the **Target** of the shortcut:
    - **-s** to select the **Secure with PSK identity and passphrase** option. Windows remembers this selection even if you do not enter the next items.
    - **-u** <your PSK identity>. Enter your PSK identity exactly as it appears in the PROMATRIX 9000 software.
    - **-p** <your passphrase>. Enter your passphrase exactly as it appears in the PROMATRIX 9000 software.
    - **-ni** <the number of the adapter you want to select>. You do not need to enter this item if you only have one adapter.
    - **Note:** If you add the PSK identity but not the passphrase, an error window will popup when you try to open the PRAESENSA Network Configurator.
5. Click **OK**.

3.3   Check network and web browser settings

In order to make sure that the network connection is successfully between the PROMATRIX 9000 system controller and the configuration PC, the settings described in the following chapters must be checked/done.

3.3.1   Ethernet adapter settings

If PROMATRIX 9000 is being used as a standalone system, it uses the so-called dynamic link-local addresses. This means that the TCP/IPv4 setting of the configuration computer need to be set to "*Obtain an IP address automatically*". Normally, these settings are default and therefore do not require PC network configuration settings.

IMPORTANT: Without this setting, your PROMATRIX 9000 configuration computer has not automatically assigned an IP-address and hence is not able to operate in the PROMATRIX 9000 network. To check/set (Windows 10):

1. **Right click** the *Windows Start* button and **click** *Network connections.* A new screen appears:
2. **Click** > *Change adapter options* > **Select** > *Ethernet* > **click** *Properties*. A new screen appears:
3. **Click** *Internet Protocol Version 4 (TCP/IPv4)* > **click** *Propertie*s. A new screen appears:
4. **Enable** (checkmark) > *Obtain an IP-address automatically*, and **enable** (checkmark) > *Obtain DNS-server address automatically*, and then **click** > *OK*.

In case more functionally is required, for example, internet access, the dynamic link-local addresses cannot be used. In this case PROMATRIX 9000 devices and PCs need to be connected to a DHCP-server and gateway to provide internet access.

– If the PROMATRIX 9000 system will become part of a locally present network, **contact your local IT department** for how to set up the network:
   – The DHCP-server has to comply with RFC 4676 and must be able to handle 500 requests per 30 seconds. A consumer grade DHCP-server as is used in most home router/wireless access points is not able to comply with this requirement and will cause unexpected and unrequested behavior.
   – The DHCP-server functionality of Windows server 2012 R2 and Windows server 2016 server does comply with these requirements.
   – The PROMATRIX 9000 system service uses ports **9401** (used for non-secure connections) and **9403** (used for secure connections) with the **Open Interface** and port **19451** with the PROMATRIX 9000 **Logging Server** applications for communication. When using the PROMATRIX 9000 **Logging Server**, please make sure that port **19451** is not used by any other application, otherwise it will not start.

Notice!

When a DHCP-server is *added* to an existing PROMATRIX 9000 network in which the devices already have a Link-Local IP-address, then these devices will query a new IP-address from the DHCP-server and get a new address assigned. This results in temporary network disconnects.

When a DHCP-server is *removed* from an existing PROMATRIX 9000 network, initially all devices will continue to work with their assigned IP-addresses. However, when the lease time expires, they will revert back to a Link-Local IP-address. Since every device will do this at a different moment, this will lead to system instability for a prolonged time. It is better to switch off the power to the system, remove the DHCP-server and switch the system on again.

Caution!

When part of a PROMATRIX 9000 system is powered down, including the DHCP-server, while the rest of the system remains in operation, then, upon restart of the DHCP-server, some DHCP-servers may assign an IP-address to a restarting PROMATRIX 9000 device that is already in use by one of the devices in operation. This will result in unexpected behavior of the system and requires a power cycle of the whole system, to renew all IP-addresses. Also the DHCP-server function of the PRA-ES8P2S switch is suffering from this behavior; therefore this function is disabled by default and it is advised not to enable and use it.

Rapid Spanning Tree Protocol (RSTP) support

The PROMATRIX 9000 system supports redundant network cabling when Rapid Spanning Tree Protocol (RSTP) is **enabled**. **By default** RSTP is **enabled** because a PROMATRIX 9000 system is, for emergency standards compliance, mandatory installed in a redundant network. **IMPORTANT:** When having RSTP **disabled**, and a redundant network installed, **the system will not function**. See the PROMATRIX 9000 installation manual.

Notice!

How to set up PROMATRIX 9000 in an Ethernet network is outside the scope of this manual. To prevent network failures in both PROMATRIX 9000 and in a Ethernet network where RSTP is not supported or allowed, contact your local IT representative in case PROMATRIX 9000 needs to be part of the external/building Ethernet network.

3.3.2   LAN settings

The Local Area Network (LAN) settings can influence the ability to fully access the PROMATRIX 9000 system. Because of security considerations PROMATRIX 9000 only accepts one connection at the same time.

To do so:

1.   If not already done, **Run** the "SetupOMNEOFirmwareUploadToolBundle(64).exe" software which will install the Domain Name System Service Discovery (DNS-SD) service automatically on the configuration PC.
     –   See *Mandatory software, page 24*.
2.   **Before** the DNS-SD is activated, make sure that the LAN-setting of the configuration PC is set to "Automatically detect settings". To do so:
     –   **Windows** version **< 10**. *Windows Start > Control Panel > Internet Options > Connections > LAN Settings >* check "Automatically detect settings".
     –   **Windows** version **10**: *Windows Start > Control Panel > Network and Internet > Internet Options > Connections > LAN Settings >* check "Automatically detect settings".

3.3.3   Web browser settings

The configuration of the PROMATRIX 9000 system controller can be accessed via a web browser. The system controller webserver is compatible with, and optimized for, the latest version of the following web browsers:
–   Firefox (from version 52 onwards).
–   Edge (from version 40 onwards).
–   Chrome (from version 78 onwards).

Proxy settings

To use a web browser with PROMATRIX 9000, make sure that **NO** proxy is used. To disable proxy e.g. at Firefox:
1.   **Open** the (Firefox) web browser on the configuration PC.
2.   **Select** > *Tools* from the menu > **click** > *Options*.
3.   **Select** > *Network Settings* > **click** > *Settings*.
4.   **Select** > *No proxy* in "Configure Proxy Access to the Internet" > **click** *OK*.
5.   **Close** > *Tools* menu.

Security settings

Several web browser settings are relevant to the proper functioning of the configuration web pages of the PROMATRIX 9000 system. The most important one is *security* settings.
–   Note that these kind of settings can also be modified or limited by the network administrator, who is responsible for the network and/or computer that is used for the configuration of the PROMATRIX 9000 system.

Security settings can prevent, for example, the execution of the Scalable Vector Graphics (SVG) viewer in Internet Explorer, which is needed to display the equalizer response on the web page. The preferable solution is to add the PROMATRIX 9000 system to the list of the trusted sites, by entering the *control hostname* of its system controller. As an example the PM9-SCL system controller *control hostname*: PRASCL-xxxxxx-ctrl.local. See for more details the product label and *Logon the application, page 46*.
–   **In Windows** (Here, you can also lower the protection level for these trusted sites. The protection level for non-listed sites is not affected.), this list can be found via:
      –   **Windows** version **< 10**: *Windows Start > Control Panel > Internet Options > Security > Trusted sites > Sites >* Enter the *control hostname*.
      –   **Windows** version **10**: *Windows Start > Control Panel > Network and Internet > Internet Options > Security > Trusted sites > Sites >* Enter the *control hostname*.
–   **Other** possible sources of problems are virus checkers, popup blockers, anti-spyware software and firewalls:
      –   Configure it in such a way that it accepts the PROMATRIX 9000 system as a **trusted site**.

3.4   Configuration do's and don'ts

The do's and don'ts described within this section are general valid for the PROMATRIX 9000 system configuration.

3.4.1   Use of characters

All **Unicode** characters can be used when entering names for devices, inputs, outputs, zones, zone groups, etc.

3.4.2   Use unique names

When entering names for devices, inputs, outputs, messages, zones, zone groups, etc., make sure that:
– All entered names are unique. It is not allowed to use a name for more than one item.
– The name must not only be unique within a group of items (e.g. device names), but also within the complete system configuration (e.g. zone groups must have different names than zones).

IMPORTANT: Names that are not unique cause inconsistencies in the configuration database. In turn, these inconsistencies can result in unpredictable system behavior.

Refer to
– *Call definitions, page 96*

3.4.3   Initial values

<None>: When the value of a parameter of a configuration item is <None>, the parameter has no value yet. For example, when the *Action definition* page of a *Call definition* is opened for the first time, the value in the *Call definition* field is <None>.
<Unknown>: When the value of a parameter of a configuration item is <Unknown>, the correct parameter has to be selected before it is set. For example, when a device is added to the system composition, the value in the *Hostname* is <Unknown>.
<Default>: When the value of a parameter of a configuration item is <Default>, the parameter is set to its default value. For example, if the audio input of a *Call definition* is <Default>, the configured audio input is the microphone of the call station that started the *Call definition*.

3.4.4   Enable/Disable items (checkbox)

Configuration items can be enabled or disabled by using a checkbox.
– **Enable**: If a configuration item is enabled (checkmark/on), the system is for example able to generate a fault event when a fault occurs.
– **Disable**: If a configuration item is disabled (unchecked/off), the system cannot for example generate a fault event when a fault occurs.

The webserver puts disabled configuration items between ( ) in selection lists. For example, the disabled configuration item AudioIn01 is displayed as (AudioIn01) in selection lists.

3.4.5   Undo changes

Most pages of the *Configure* section contain a *Cancel* button. By clicking the *Cancel* button, any changes made on the pages are cancelled and not stored.

3.4.6   Deleting items

When a configuration item is deleted, all configuration items that are related to the deleted configuration item are also deleted.

     – For example, when an amplifier is deleted from the *System composition*:
        – All audio outputs of the amplifier are also no longer part of the configuration.

3.4.7 Audio inputs and outputs

It is not allowed to use audio inputs and audio outputs for more than one purpose, since this can cause inconsistencies in the configuration database. In turn, these inconsistencies can result in unpredictable system behavior. For example:

– If an audio input is already part of a *Call definition*, it is not allowed to use the audio input in a background music (BGM) channel.
– Audio outputs of amplifiers cannot be assigned to more than one (loudspeaker) zone.

3.4.8 Use the submit button

Most of the web browser pages in the *Configure* section of the webserver contains a *Submit* button. Always click this button after making changes, otherwise the changes are lost. Clicking the *Submit* button, however, does not mean that the changes are saved. See *Save configuration, page 130*.

4 Logon the application

After the (mandatory) software has been installed on the configuration computer, it must establish a secured data connection with the PROMATRIX 9000 system (controller) to be able to transfer system data to and from the system (controller) and other network devices in the PROMATRIX 9000 system.

> **(i)** **Notice!**
> The logon and configuration time-out is about 10 minutes. Submit your changes before the time-out exceeds, otherwise your changes are lost.

Proceed as follows:

1. If not already done, **turn-on the power** of the PROMATRIX 9000 system:
   – All network devices boot and the 19"-devices show the yellow *device fault* LED on.
   – LCD Call stations show a *fault status message* on the display.
2. Find the two MAC-addresses and two hostnames indicated on a product label of the system controller:
   – The device hostname is unique for each PROMATRIX 9000 network device and is used to identify the device within system. For example, the device hostname of a system controller becomes visible as: PRASCx-yyyyyy. The device hostname is derived from its commercial type number (CTN) and MAC-address: PRASCx-yyyyyy, with PRASC being the commercial type number (without a dash between PRA and SCx), x being the system controller version type and yyyyyy being the last 6 hexadecimal digits of the device MAC-address.
   – The controller hostname is also unique and is used to get access to the webserver of the system controller. The controller hostname is derived from the device hostname with a postfix -ctrl (not from the MAC-address!). The address (PRASCx-yyyyyy-ctrl.local) is used as the **URL** (Uniform Resource Locator) to logon PROMATRIX 9000.
   – **Notice**: The controller hostname is also used to address the Open Interface.
   – **Remark**: The configuration web browser pages show *device hostnames* without .local domain extension. It does not show *control hostnames*, neither the one of its own webserver, nor from other system controllers.
3. **Open** the web browser on your computer and **enter** the appropriate *control hostname* URL (Uniform Resource Locator): *https://PRASCx-yyyyyy-ctrl.local* in the address bar.
   – **IMPORTANT:** PROMATRIX 9000 uses default a secured data connection (https with SSL self-signed security certificate) which could result in blocking the logon process including a warning message similar to the following: *Continue to this website (not recommended), despite it is not recommended*. To continue the logon process, with a secured data connection, the address can be best added first to the secure/trusted websites of your used web browser. If required, see also *Check network and web browser settings, page 41*.
4. An *Initial (administrator) setup* logon screen appears with the device **Hostname** and **Device name** of the system controller requesting a **(New) administrator username** and **Password**.
   – **Notice:** The *Initial (administrator) setup* login screen is only visible:
     - During the first time logon in the system as an *administrator*,
     - When the saved configuration file of the system controller is erased,
     - After a reset to factory default.

- The new **Administrator username** can have a minimum of five and a maximum of 64 characters.
- The requirements for the **Password** are:
  - The new password created for the first time logon must have a minimum of eight and a maximum of 64 characters.
  - After a reset to factory default, the Password must follow the requirements configured in the **Password policy** in *System settings, page 81*

5. Enter the **Administrator username** and **Password**.
   - An initial user account automatically gets the secured configuration *administrator* rights.
6. **Only at 1st / initial logon** > a OMNEO *security username* and OMNEO *passphrase* is **automatically generated** by the system controller:
   - You need this *security username* and *passphrase* for a *secure firmware upload* and for the Network configurator.
   - PROMATRIX 9000 is default set for using a **secured connection** between the system controller and other network devices.
   - If required, see *Change user name and passphrase, page 143*.
7. **Click** the *Create* button > A web browser page appears, **showing** the following elements:
   - **On top** of the web browser page, from left to right: the *name of the device* (system controller), **your** *username* and the *software release* number. See *Mandatory software, page 24*).
   - **The name of**, and link to, **the system controller**.
   - **Configure** - A button that opens the *configuration* items selection.
   - **Diagnose** - A button that opens the *diagnostics* items selection.
   - **Security** - A button that opens the system *Security* and *Open Interface* item selection (e.g. download certificate).
   - **Print configuration** - A button that opens the configuration printing utility.
   - **About** - A button that opens the *Open source licenses*.
   - **Main frame** - A frame that displays the selected PROMATRIX 9000 web browser page.
   - **Home** - A button that returns to the *Home* web browser page where you could select:
     - The (new) *language* and the *continue* button.
   - **Logout** - A button which returns you to the *logon* webpage. You have to logon the configuration again, if required.
8. **Click** the *Home* button to select/change a *language* for the webserver GUI and web browser pages and **click** the *continue* button to access the web browser pages in the selected language.
   - **Notice**: English (UL2572) language selection is specific used for mass notification UL2572.
9. **Select and click** the *system controller* name/link:
   - **On default** the system controller *device hostname* is selected and fixed. If not, **select** the system controller *device hostname* from the *Host name* dropdown list.
10. **Click** the *Submit* button:
    - Notice that the changes are not permanent until the configuration is saved. See *Save configuration, page 130*.
11. **Proceed** with: *Configure the system, page 48*.

5   Configure the system

Using the *Configure* section, the PROMATRIX 9000 devices / system functionality can be
defined.

IMPORTANT: Only PROMATRIX 9000 administrator and installer user accounts have access
to the *Configure* section. See *User accounts, page 48*.

–   The order of the *configure* menu items in this section, which is opened when the
     Configure button is clicked, represents the recommended workflow for the
     configuration of a PROMATRIX 9000 system.
–   See also: *Configuration do's and don'ts, page 44*

Configure (menu items)		
1	*User accounts, page 48*	The user accounts that provide access to the PROMATRIX 9000 webserver can be managed.
2	*System composition, page 51*	The network devices of which the system must consists can be added or removed.
3	*Device options, page 54*	Each network device that has been added using the *System composition* pages can be defined.
4	*System options, page 78*	A number of general system settings can be defined.
5	*Zone definitions, page 88*	The routing of zones, zone group, BGM, audio inputs and audio outputs of the amplifiers can be defined.
6	*Call definitions, page 96*	The announcement options (call definitions) can be defined.
7	*Action definitions, page 100*	The buttons of the call station (extension) and the control inputs can be defined.
8	*Audio processing, page 118*	The audio processing parameters (equalizer + volume) of the call station audio inputs and the amplifier audio outputs that can be set.
9	*Save configuration, page 130*	The current configuration can be saved.
10	*Backup and restore, page 131*	A saved configuration can be backup and/or restored.

Notice!

The logon and configuration time-out is about 10 minutes. Submit your changes before the
time-out exceeds, otherwise your changes are lost.

5.1   User accounts

To access the configuration web pages of the webserver, Open Interface and Logging server,
an account is needed. An account consists of a *username*, a *password* and an *authorization*
level. The *authorization* level defines to which part of the webserver access is granted.
Notice: Initially you have already created an *Administrator user account*. See *Logon the
application, page 46*.
The webserver provides the following authorization levels:

– **Administrators**: Administrators have access to all parts of the webserver including the *User accounts* part, *Logging Server*, *Logging Viewer* and *Open Interface*.
– **Installers**: With the exception of the *User accounts* and *Backup and restore* parts, installers have access to all parts of the webserver, *Logging Server, Logging Viewer* and *Open Interface.*
– **Operators**: Operators have access to the *Diagnose > version* and *About* sections of the webserver, *Logging Server, Logging Viewer and Open Interface.*

Using the *User accounts* pages, it is possible to:
– *Add a user account, page 49*
– *Delete a user account, page 50*

Refer to
– *Logon the application, page 46*

5.1.1   Add a user account

Only **Administrators** can create new user accounts.
1. Click the **Add** button.
2. Enter the username for the new user in the **UserID** text field.
   – It is mandatory to use a minimum of five and maximum of 64 characters.
3. Select the authorization level / function of the user account for the new user in the **Group** column.
   – The authorization level defines to which part of the PROMATRIX 9000 configuration software access is granted.
4. Enter the password for the new user in the **Password** text field.
   – The **Password** must follow the requirements configured in the **Password policy** in *System settings, page 81*.
   – Make sure your password is not easy to guess, since it safeguards unauthorized access to the system that could result in an unsafe system configuration.
5. Click the **Add** button to activate the new user account.
   – The new user account appears in the overview.

5.1.2   Delete a user account

For security reasons, it is advisable to create first a new *Administrator* account and then delete the initial PROMATRIX 9000 *Administrator* account.

–   Only *Administrators* can delete existing accounts.
–   A logged in account cannot be deleted.

Proceed as follows to *delete* a *user account*:

1.   **Select** the row of the *user account* that must be deleted.
      –   The selected row will be highlighted.
2.   **Click** the *Delete* button to delete the *user account* **or** the *Cancel* button to keep the *user account*.
      –   A *deleting* row will appear.
3.   **Click** the *Delete* button:
      –   The selected *user account* is removed from the *user account* overview.

5.2   Access control users

You can now lock a call station against unauthorized users. To authenticate yourself and get access to the call station, you need to create an account.

1.   Click **Add**.
2.   Enter a **User number** with a minimum of one digit and a maximum of 10.
3.   Enter a **PIN code** with a minimum of four digits and a maximum of 10.
4.   Enter a **User name** with a maximum of 32 characters.
      –   The username is used in the Logging Viewer, not in the call station.
5.   Click **Add**.
6.   Click **Submit**.
      –   Notice that you always have to Save the configuration. See *Save configuration, page 130*.

Refer to the section Access control in *Call station, page 64* to add your account as a user of the call station.

Call station lockout time

After adding a user account to the call station, you will need to enter the User number and respective Pin code to access it. If you fail to log in, the call station will lock out for a few seconds. The lock out period will increase the more times you fail to log in:

Failed logins	Call station screen locked out (sec)
1	3
2	3
3	3
4	10
5	20
6	40
7	80
8	160

9	320
+10	640 (around 10 minutes)

After failing to log in over 10 times, the lock out period will no longer increase.

5.3   System composition

On the *System composition* page you will add (or remove) network devices one by one. This is a mandatory configuration step.

All network devices will be listed on the *system composition* page as soon they are connected, discovered and added to the PROMATRIX 9000 Ethernet network. In this way you have a complete overview of the total used network devices within the system.

Initially, only the first added network device (most likely; the system controller) is listed on the *system composition* page automatically. See *Logon the application, page 46*.

> **Notice!**
>
> The PRA-APAS (Advanced public address server) configuration is described in a separate PRA-APAS configuration manual. See www.dynacord.com > PRA-APAS.

Using the *System composition* page, it is possible to *(Re)discover*, *Add and Delete* network devices and change network device credentials as described following:

Name	The free chosen name of the network device.
Device type	The commercial type number (CTN) name of the connected network device. The *Device type* (e.g. PM9-AD608 is part of the *Amplifier* category.) is fixed and cannot be changed.
Host name	The unique network *device hostname*. Each *device hostname* is fixed and cannot be changed. It uniquely identifies each network device in the system. See *Logon the application, page 46*.
Location	Free text. E.g. the name of the physical location of the network device.
Show identification	Visualize identification of the selected network device.

Proceed with:
– *Rediscover devices, page 51* and
– *Add a device, page 53*.

5.3.1   Rediscover devices

Using the (re)discover function, the connected system controller finds all new and/or removed connected network devices and (un)list them. This rediscover process is an internal system controller process and not visible. Meaning that you have to add, select or change each (new) found network device to the *system composition* manually.

To do so:
1. **Click** the *Rediscover* button to find (new) network connected devices, or to view (changed) network device credentials.

–   All (connected and removed) network devices will be discovered by the system
     controller.
2.   **Proceed** with: *Add a device, page 53*

5.3.2   **Add a device**

With the exception of the initial added network device (system controller), no other connected network devices are listed on the *system composition* page after using the *rediscover* function. This means that you have to add and set each network device to the *system composition* first. Only then the network device could be recognized, listed and configured in the system. See *Logon the application, page 46*, if required.

To do so:

1. Click the **Add** button.
    –   An **Adding** row appears.
2. Enter the device **Name** in the text box.
    –   The name may consist of up to 32 characters.
3. Select the **Device type** from the dropdown list.
    –   The **Device type** name (e.g. PM9-AD608 is part of the *Amplifier* category) is fixed and cannot be changed by the user.

> **(i)**   **Notice!**
> When working with a PM9-SCS, you can only add six amplifiers. If you try to add more, the error message **Maximum of 6 amplifiers is reached** appears.

> **(i)**   **Notice!**
> You can create a configuration for a PM9-SCS application with a PM9-SCL as long as:
> - You configure only a maximum of six amplifiers.
> - You do not configure any unencrypted virtual audio inputs (Dante/AES67).

---

4. Click the **Add** button below the row, or click the **Cancel** button to return.
    –   By using the **Add** button, the device, including the unique **Device hostname**, will be added to the **System composition**.
5. Select an unused device hostname from the **Host name** dropdown list.
    –   The *device hostname* consists of an extraction of the commercial type number name and the last 6-digits of the MAC-address. The *device hostname* is fixed and cannot be changed by the user. Refer to the label on the device. See *Logon the application, page 46*, if required.
    –   When adding a **System client** device or a **Network switch** device, you will need to enter the IP-address.
    –   When you select an already used *device hostname*, a prompted message will ask you to select another (unused) one, as soon you click the **Submit** button.
    –   When you select **<unknown>** no device (type) will be linked because the correct *hostname* is not selected.
    –   If not already done, select the *device hostname* of the initially added network device (system controller) from the **Host name** dropdown list.
6. Optionally, enter the **Location** (free text) name in the text box.
    –   This could be e.g. the name of the physical location of the network device.
7. Click the **Submit** button.
    –   The changes are not permanent until the configuration is saved. See *Save configuration, page 130*.
8. Only after *Save configuration and restart system*, the function of **Show identification** checkbox can be activated. Enable (checkmark/on) the checkbox or disable (off) the **Show identification** checkbox if you (not) want to visualize identification of the selected network device:

–   By enabling, the LEDs of the network device front/top (and rear) panel will be immediately switching intermittent on and off as long **Show identification** is enabled.

–   Disable the checkbox to stop the network device (LED) identification.

> **Notice!**
>
> If an added device is disconnected from the PROMATRIX 9000 network afterwards, the *Hostname* will be colored "light grey" only after using the *Rediscover* function and upon entering the web page. Besides that a lost device fault event messages is generated.

> **Notice!**
>
> When working with a master controller with a License for subsystem PROMATRIX 9000, the option to add subsystems appears as **Subsystem**. Otherwise, only the **Master system** option is available in the drop-down menu. Refer to *Optional: PRAESENSA License Management, page 37* on how to install a license.

Refer to

5.3.3   Delete a device

By using the *Delete* button, the network device, including the unique *device hostname*, will be deleted from the *system composition* and will also be removed from the configuration pages everywhere it is used.

To do so:

1.   **Click** the row to select the network device to be deleted:
     –   The row will be highlighted.
2.   **Click** the *Delete* button:
     –   A *Deleting* row appears.
3.   **Click** the *Delete* button below the row, or **click** the *Cancel* button to return:
     –   Using *Delete*, the selected network device is permanently deleted from the system.
4.   **Click** the *Submit* button:
     –   Notice that the changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

5.4   Device options

Each network device that has been added to the *System composition* can be functional configured by using its own *Device options* page. A connected network device is automatically recognized by its *device hostname* and added to the *Device type* category where it belongs to (e.g. Amplifier). The *Device type* category is manufacturer pre-defined and cannot be changed.

The following *Device type* categories are pre-defined. **Click** on a link below to go to *Device options* of the:

- *Wall control panel, page 74*
- *Telephone interface, page 74*
- *Audio routed network interface, page 75*
- *System client, page 75*
- *Network switch, page 75*
- *Remote system, page 77*

5.4.1 System controller

1. **Below** *Device options*, **click** *System controller*:
   - A new screen appears listed the connected system controller(s).
   - Notice that a *system controller* is only listed when it is added to the *System composition*.
   - See also *Logon the application, page 46*, if required.
2. **Select and click** the *System controller* name to configure.
   - A new screen appears to configure *General*, *Virtual control inputs*, *Virtual audio inputs/outputs (Dante/AES67) and Unencrypted virtual audio inputs (Dante/AES67)* functionality:

General

1. **Select and click** the + of the *General* category row:
2. **Select**, **enable** or **disable** each of the following items:

Item	Value	Description
Supervision		
Power supply input A Power supply input B	Enable / Disable	**Enable:** 24-48 Vdc power supply A and B input. Power supply faults and/or power losses will be indicated on the system controller front/rear panel (see indicators tables at the end of this section), *Diagnose, page 133* and *Optional: Using the Logging Viewer, page 155*. **Disable:** results in a system that does not detect power supply input failures of the system controller of the disabled input.
Network redundancy The network cabling supports a closed loop, which allows redundancy to be achieved.		
Single network (ports 1-5)	Selection	**Select** this option if only PROMATRIX 9000 network devices are used and the network is star and/or redundant (daisy-chain) topology connected. The system controller supports Rapid Spanning Tree Protocol (RSTP) to enable the use of multiple connections simultaneously for cable redundancy, e.g. to daisy-chain devices in a loop, with a maximum of 20 devices in a loop. RSTP can be disabled in case a (corporate) network does not allow this. See *System settings,*

Item	Value	Description
		page 81 Ports 1-5 could be each daisy-chain connected to network devices in the system.
Dual network (primary: ports 1-4 / secondary: port 5)	Selection	**Select** this option for Voice Alarm systems using ports 1-4 for (redundant) connections to the Voice Alarm network part, including all other PROMATRIX 9000 devices. Use port 5 for auxiliary connections, not related to the Voice Alarm function, like to a background music server. PROMATRIX 9000 can be set up to work on two completely separate networks simultaneously for fail-over redundancy, supporting **glitch-free*** audio switching between both networks for continuous and uninterrupted audio distribution in case of a network failure of one of the networks. In this mode, use ports 1-4 for the primary network (with RSTP) and port 5 for the secondary network. **Notice** that **port 5** is possible already dedicated used for connection of the configuration computer.
Emergency relevant	Enable (default) / Disable	By default, *Emergency relevant* is **enabled** and cannot be disabled at the System controller. *Emergency relevant* troubles (faults) are troubles (faults) that affect the emergency capability of the system. To differentiate between Mass Notification System (MNS) troubles (faults) and other troubles (faults) it is needed to assign (or not) *Emergency relevant*. Troubles (faults) that occur on devices that have assigned *Emergency relevant* will reported as MNS faults. Only when *Emergency relevant* is enabled, it shall trigger the general trouble (fault) alarm visual/audible trouble (fault) indicators when a trouble (fault) is reported. AC power supply trouble (Mains supply fault) / backup power fault / ground fault indicators will show on First responder panel (Emergency/MNS call station) if the originator is *Emergency relevant*.

Item	Value	Description
Submit	Button	**Click** the *Submit* button to store the settings: Notice that you always have to *Save* the configuration. See *Save configuration, page 130*

– 	* A glitch is in this case a short-lived audio fault in the systems network audio path, such as very short audio disturbance, distortion, drops. **By selecting** this option a possible glitch could be avoided, reduced and/or not noticed **only** when the network is physical redundant connected to port 5.

– 	* External (non) PROMATRIX 9000 network devices must support glitch free and it must be enabled in their configuration.

Virtual control inputs

Virtual control inputs (VCI's) are *control inputs* that can be activated from the *Open Interfa*ce, to accommodate external applications via a simple interface. These *Virtual control inputs* do not exist as hardware inputs, but behave in a similar way. They can be activated and deactivated by *Open Interface* messages, causing the associated *call definition* to be started and stopped. In this way the external application does not need to be configured for all parameters of an announcement because the configuration has already been done as part of the *call definition*.

– A *virtual control input* (VCI) can **added** (or **deleted**) here.
  – To do so:

1. **Enter** a VCI name in the *Add* text field:
   – Its name can be freely chosen with a minimum of 1 and a maximum of 32 characters, but must be unique within the set of VCIs.
2. **Click** the *Add* button:
   – The number of *virtual control inputs* that can be assigned to a system controller is more than 100, but values more than 100 are not recommended because it slows down the performance of the configuration web pages.
   – A VCI is enabled by default.
3. **Enable** (checkmark) or **disable** the *Add* checkbox.
   – Enable makes the VCI available to be used in the system.
4. **Select** the *Function*:
   – **Make announcement:** which activates and deactivates an announcement, or select:
   – **Make phased announcement** (an announcement): With this behavior several VCIs can use the same *call definition* to contribute (add/remove) *zones* to an existing announcement, not restricted by the maximum number of simultaneous announcements.
5. **Repeat** the previous steps to *add* a new VCI.
6. **To delete** a VCI, click the *Delete* button:
   – A warning message will appear > **Click** the *OK* or *Cancel* button.
7. **Click** the *Submit* button to store the settings:
   – Notice that you always have to *Save* the configuration. See *Save configuration, page 130*

Introduction to virtual audio inputs/outputs (Dante/AES67)

– In total 128 audio channels can be routed by the PROMATRIX 9000 system controller:
  – The audio channels *01 up to 08* are for PROMATRIX 9000 internal use only.
  – The audio channels *09 up to16* are encrypted and switchable between *audio input* or *audio output* for e.g. Dante/AES67.
  – The audio channels *17 up to 128* are unencrypted audio inputs for e.g. Dante/AES67.
– The inputs *09-128* can be mapped on Dante/AES67 audio channels. In this way you can, for example, use a 3rd party Dante/AES67 audio source device (e.g. BGM) as input for the PROMATRIX 9000 system.
– Dante/AES67 audio channels are default not connected to the PROMATRIX 9000 network, have a static routing, are not encrypted but can route on the same PROMATRIX 9000 OMNEO network.
– The audio channel mapping can be done by using i.e. Dante Controller. See *Optional: Dante Controller, page 34*.

The following two sectionsdescribe the mapping of the Virtual audio inputs/outputs (Dante/AES67) and Unencrypted virtual audio inputs (Dante/AES67).

Virtual audio inputs/outputs (Dante/AES67)

Valid for audio channels *09 up to 16*.

See also *Optional: Dante Controller, page 34*.

–   As soon a *virtual audio input* or *output (Dante/AES67)* 09-16 is mapped, it can be configured to route encrypted analog audio to or from the PROMATRIX 9000 system.

–   To do so:

1. **Select and click** the + of the *Virtual audio input/output (Dante/AES67)* category row:
    –   The *system controller* audio channels (*09) up to (*16) become visible.
2. **Select** *input* or *output* from the *Audio* dropdown list:
    –   If *input* (or *output*) is selected, it cannot be used as *output* (or *input*) anymore.
3. **Enable** (checkmark) **or disable** the *system controller (*nn)* checkbox.
    –   This makes the audio channel (un)available to be used in the PROMATRIX 9000 system.
4. **Repeat** the previous steps to connect / disconnect each of the *encrypted* audio channels.
5. **Click** the *Submit* button to store the settings:
    –   Notice that you always have to *Save* the configuration. See *Save configuration, page 130*

Unencrypted virtual audio inputs (Dante/AES67)

Valid for unencrypted audio channels 17 up to 128.

See also *Optional: Dante Controller, page 34*.

As soon a **Unencrypted virtual audio input (Dante/AES67)** 17-128 is mapped, it can be configured to route unencrypted analog audio to the PROMATRIX 9000 system.

> **(i)**   **Notice!**
> This section is not available when you are working with a PM9-SCS.

To do so:

1. Click the **+** of the **Unencrypted virtual audio inputs (Dante/AES67)** category row:
    –   The system controller unencrypted audio input channels (*17) up to (*128) become visible.
2. Enable or disable the system controller *(*nn-*nnn)* checkbox.
    –   This makes the audio input channel (un)available to be used in the PROMATRIX 9000 system.
3. Repeat the previous steps to connect / disconnect each of the unencrypted audio input channels.
4. Click the **Submit** button to store the settings:
    –   Notice that you always have to save the configuration. See *Save configuration, page 130*

5.4.2   Amplifier

1. **Below** *Device options*, **clic**k *Amplifier*:
    –   A new screen appears listed the connected amplifier(s).
    –   Notice that an *amplifier* is only listed when it is added to the *System composition*.
2. **Select and click** the amplifier *name* to configure:
    –   A new screen appears to configure *General* and *Audio outputs* functionality.

General configuration
1. **Select and click** the + of the *General* category row:
2. **Select**, **enable** or **disable** each of the following items:

Item	Value	Description
Supervision (per amplifier) Supervision of the amplifier power supply, ground connection and lifeline**.**		
Power supply	Enable / Disable	**Enable:** 48 Vdc amplifier power supply (1-3) input. The amplifier front/rear panel indicator will indicate faults and/or power loss (see indicators tables at the end of this section), *Diagnose, page 133* and *Optional: Using the Logging Viewer, page 155* **Disable:** (unchecked), results in a system that does not detect *Power supply input* failures of the amplifier disabled input.
Ground leakage	Enable / Disable	**Enable:** ground shorts will be indicated by the amplifier front/rear panel indicator(s) (see indicator tables following), *Diagnose, page 133* and *Optional: Using the Logging Viewer, page 155* **Disable** (unchecked), results in a system that does not detect *Ground Leakage* failures of the amplifier.
Lifeline supply input	Enable / Disable	**Enable:** lifeline power supply loss will be reported. See *Diagnose, page 133* and *Optional: Using the Logging Viewer, page 155*
Emergency relevant	Enable (default) / Disable	By default, *Emergency relevant* is **enabled** and can be **disabled.** *Emergency relevant* troubles (faults) are troubles (faults) that affect the emergency capability of the system. To differentiate between Mass Notification System (MNS) troubles (faults) and other troubles (faults) it is needed to assign (or not) *Emergency relevant*. Troubles (faults) that occur on devices that have assigned *Emergency relevant* will reported as MNS faults. Only when *Emergency relevant* is enabled, it shall trigger the general trouble (fault) alarm visual/audible trouble (fault) indicators when a trouble (fault) is reported. AC power supply trouble (Mains supply fault) / backup power fault / ground fault indicators will show on First responder panel (Emergency/MNS call station) if the originator is *Emergency relevant*.

Item	Value	Description
Submit	Button	**Click** the *Submit* button to store the settings. Notice that you always have to *Save* the configuration. See *Save configuration, page 130*

Audio outputs

1. **Click** the + of the *Audio outputs* category row:
   – All available amplifier audio outputs are listed.
2. **Select**, **enable** or **disable** each of the following items:

Item	Value	Description
Amplifier [#01-#nn]	Enable / Disable	**Unique name** for each audio output channel. Each output can be enabled or disabled using the checkbox. **Disable** results in no audio routing via the disabled output channel.
Supervision (per amplifier channel) Supervision of the *amplifier channel, loudspeaker line and overload*.		
Amplifier channel	Enable / Disable	**Enable:** amplifier channel faults and output signal losses will be indicated by the amplifier front/rear panel indicator(s) (see indicator tables at the end of this section), *Diagnose, page 133* and *Optional: Using the Logging Viewer, page 155*
Loudspeaker line	Enable / Disable	**Enabled** plus an EOL device (PM9-EOL) connected, a disconnection of the loudspeaker line (including loudspeaker and connections) will be indicated by the amplifier front/rear panel indicator(s) (see indicator tables at the end of this section), *Diagnose, page 133* and *Optional: Using the Logging Viewer, page 155*
Overload	Enable / Disable	**Enable:** an amplifier output channel overload will be indicated by the amplifier front/rear panel indicator(s) (see indicator tables at the end of this section), *Diagnose, page 133* and *Optional: Using the Logging Viewer, page 155*
Load connection	Selection (by default Single)	Enable **Loudspeaker line** to select Dual or Loop. **Single (A only)**: Select when only output A is connected with loudspeaker load. **Dual (A and B)**: Select when both output A and B are connected with loudspeaker load

Item	Value	Description
		(A/B wiring). When supervision is enabled the first fault on output A or B will be detected. Secondary faults will be ignored. **Loop (A to B)**: Select when output A and B are redundant connected with loudspeaker load. In this case a loudspeaker will be fed from the other side when e.g. a cable is broken (Class-A). When supervision is enabled the first fault on output A or B will be detected. Secondary faults will be ignored **General**: for End-of-Line (connection); refer to the PROMATRIX 9000 installation manual.
Submit	Button	**Click** the *Submit* button to store the settings. Notice that you always have to *Save* the configuration. See *Save configuration, page 130*

5.4.3 Multifunction power supply

The PM9-MPS3 Multifunction power supply combines multiple support functions to power and serve other PROMATRIX 9000 system devices.

1. Below **Device options**, click **Multifunction power supply**.
   A new screen appears listing the configured devices.
   A device is only listed when it was added in the **System composition** page.
2. Click the device you want to configure.

General configuration
1. Click the **+** sign of the **General** category row.
2. In the group **Supervision**, you can enable **Mains power** / **AC power** (UL 2572) for the system to indicate mains failures. If a battery is connected, when the mains power is lost, the system reports a **Mains power fault** on the Logging Viewer and on the **Fault log** of the call stations. The multifunction power supply indicates a mains power failure through a LED indication.
3. In the group **Supervision**, enable **Battery** for the front panel indicators to show if the battery is disconnected.
   – Battery protection is always active when a battery is connected. When supervision of the battery is disabled, the following faults are not reported:
   Battery fault: battery disconnected
   Battery fault: impedance too high
   Battery power converter fault
   – The diagnostics page **Battery impedance** is only available when **Battery** supervision is enabled.
4. In **Battery capacity [Ah]**, enter the connected battery capacity value between 100 and 250 Ah. This value is used for the impedance measurement. The front indicator is orange when the battery impedance is above the threshold level shown in the

Diagnostics page. The system reports the corresponding battery fault.
Note: The supervision status influences the impedance measurement. Impedance measurement is not carried out if the mains power is not available.

5. **Amplifier 48 V power supply (1, 2, 3)** is enabled by default. The front or rear panel indicators show related faults. Disabling this setting stops the 48 VDC supply to the respective amplifier. The faults are not reported.

6. **Amplifier lifeline audio supervision (1, 2, 3)** is enabled by default. The front or rear panel indicators show related faults. If disabled, the system does not log analog lifeline failures.

7. **Emergency relevant** is enabled by default. Disable it if needed.
    –   Emergency relevant troubles (or faults) are troubles that affect the emergency capability of the system. To differentiate between MNS troubles and non-MNS faults, you need to select **Emergency relevant**. Troubles that occur on devices that have **Emergency relevant** selected are reported as MNS faults.
    –   The visual or audible trouble indicators are triggered when a trouble is reported only if **Emergency relevant** is enabled.
    –   The **AC power supply trouble** (Mains supply fault), **Backup power fault**, and **Ground fault** indicators appear on the first responder panel if the originator is selected as **Emergency relevant**.
    –   A reported **AC power supply trouble: External** (Mains supply fault: External), which is triggered by a control input, is always emergency relevant, regardless of the configuration.

8. Click the **Submit** button.
    –   The changes are not permanent until the configuration is saved. Refer to *Save configuration, page 130*.

Control inputs configuration
Control inputs receive signals from third party equipment that cause actions in the PROMATRIX 9000 system.
It is also possible to supervise the connected cables for short-circuits or open connections.

1. Click the **+** sign of the **Control inputs** category row.
2. Select the input you want to configure.
3. Choose the **Function** of the input from the dropdown list. For a detailed description of the functions, refer to *Input functions description, page 104*.
4. Choose how the **Activation** happens:
    –   On **Contact make**: The action starts or stops when the contact is closed.
    –   On **Contact break**: The action starts or stops when the contact is opened.
5. Choose the number of **Actions** from 1 to 5 for the functions:
    –   **Make announcement**
    –   **Start phased announcement**
    –   **Stop phased announcement**.
6. Select for which inputs you want to enable **Supervision**.
7. Click the **Submit** button.
    –   The changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

Control outputs configuration

Control outputs send signals to third party equipment to trigger actions. Each control output connection has three pins.

1. Click the **+** sign of the **Control outputs** category row.
2. Select the output you want to configure.
3. Choose the **Function** of the output from the dropdown list. For a detailed description of the functions, refer to *Output functions description, page 109*.
4. Click the **Submit** button.
   – The changes are not permanent until the configuration is saved. Refer to *Save configuration, page 130*.

5.4.4   Call station

The PM9-CSLD and PM9-CSLW call stations are easy to install and intuitive to operate. The touch screen LCD provides clear user feedback about setting up a call and monitoring its progress, or controlling background music.

The PRA-CSBK basic call station kit is an open-frame call station to create dedicated custom operator panels for PROMATRIX 9000. It has the same functionalities as the PM9-CSLW without the LCD user interface to facilitate the mounting in operator desks or in wall-mounted fireman's panel enclosures.

The PM9-CSE keypad extension is used in combination with the PROMATRIX 9000 call stations to make selections for business and alarm calls. The PRA-CSEK extension kit is an open-frame call station extension that can replace two PM9-CSE in connection with the PRA-CSBK.

The configuration of the devices is the same for:
– The PM9-CSLD, PM9-CSLW and PRA-CSBK.
– The PM9-CSE and The PRA-CSEK.

– Below **Device options**, click **Call station**.
   – A dropdown menu appears with the options **Settings**, **Emergency group** and **Access control**.

Settings page
1. Click **Settings**.
   – A new screen appears listing the network connected call stations and fire response panels.
   – A device is only listed when it was added in the **System composition** page.
2. Click the device you want to configure.
3. A new screen appears with the following functionalities to configure:
   – **General**
   – **Functions**: Only available for call stations of **Class: Normal**
   – **Audio inputs**
   – **Extension**: By default, this section is not visible, unless you select **1-4** in the **General** section
   – **Recorded messages**: Only available for call stations of **Class: Normal**
   – **Alert messages**: Only available for call stations of **Class: Normal**.

General configuration
1. Click the **+** sign of the **General** category row.

2.   Select **Class** of the call station from the dropdown list:
  –   Select **Normal** when the call station is used for commercial purposes. This gives
      you access to the **Functions** menu, which you can also control through the LCD.
      The **Functions** available for the operator can be selected in the configuration
      interface. See *Assigning a function, page 102*.
      Class: **Normal** call stations also have access to the sections **Recorded messages**
      and **Alert messages**.
  –   Select **Emergency** when the call station acts as an emergency call station. The call
      station LCD shows the **Fault log** button. You cannot select any menu item or
      functionality in the configuration interface.
  –   Select **Mass notification** when the first responder panel acts as a Mass Notification
      System (MNS) panel. The LCD shows the **Trouble log** and the **Control location**.
  –   **IMPORTANT**: As an emergency call station, the internal call station loudspeaker
      generates a tone that can be stopped through a button or a control input with the
      Acknowledgement and/or reset function.
3.   Select the number of call stations **Extensions** connected to the selected call station
     from the dropdown list. Any deviation from the hardware triggers a fault.
  –   **IMPORTANT:** Assigning zones to a standalone call station is not possible. You need
      at least one extension connected and selected.
4.   Select the call station network connections using Power over Ethernet from the
     dropdown list in the **Expected PoE inputs** field. Any deviation from the hardware
     triggers a fault.
5.   **Emergency relevant** is enabled by fault. Disable it if needed.
  –   Emergency relevant troubles (or faults) are troubles that affect the emergency
      capability of the system. To differentiate between MNS troubles and non-MNS
      faults, you need to select **Emergency relevant**. Troubles that occur on devices that
      have **Emergency relevant** selected are reported as MNS faults.
  –   The visual or audible trouble indicators are triggered when a trouble is reported
      only if **Emergency relevant** is enabled.
  –   The **AC power supply trouble** (Mains supply fault), **Backup power fault**, and
      Ground fault indicators appear on the first responder panel if the originator is
      selected as **Emergency relevant**.
6.   For **Class**: **Normal** call stations only, enable or disable **Access control** as needed.
7.   Select the **Automatic logout** timer of the call station from the dropdown list.
  –   The **Automatic logout** defines how long the user remains logged in when no action
      is performed in the call station. Note that only display presses are actions, not
      scrolling.
8.   Click the **Submit** button.
  –   The changes are not permanent until the configuration is saved. Refer to *Save
      configuration, page 130*.

Functions configuration
This section is only available for call stations of **Class: Normal**.

1.   Click the **+** sign of the **Functions** category row.

2.   The function **Voice** is enabled by default. The Voice tile appear in the call station display. The call station operator presses the **Voice** tile to start the process of making announcements with live speech to the selected areas. For area and zone selection, the call station must have at least one call station extension connected and configured. Refer also to *Call definitions, page 96*.

3.   Enable the function **Music** to make the **Music** tile appear in the call station display. The call station operator presses the **Music** tile to control the music in the selected areas. For area and zone selection, the call station must have at least one call station extension connected and configured. For music control, a zone must be configured for BGM channel selection. Refer also to *Call definitions, page 96*.
    –   This tile is most likely selected only for a call station used by a system administrator or by specific authorized users.

4.   Enable the function **Recorded messages** to make the **Message** tile appear in the call station display. The call station operator presses the **Message** tile to start the process of sending recorded messages to the selected areas. For area and zone selection, the call station must have at least one call station extension connected and configured. Each area or zone can have its individual set of available messages. Refer also the *Recorded messages* section.
    –   This tile is most likely selected only for a call station used by a system administrator or by specific authorized users.

5.   Enable the function **Alert messages** to make the **Alert** tile appear in the call station display. The call station operator presses the **Alert** tile to start the process of sending evacuation messages to the selected areas. These messages must be preconfigured and specifically assigned to areas or zones, as the operator is not a first responder, and is not authorized to decide which messages go to which areas. Refer also the *Alert messages* section.
    –   This tile is most likely selected only for a call station used by a system administrator or by specific authorized users.

6.   Enable the function **Fault log**, or **Trouble log** for UL, to make the **Fault log / Trouble log** tile appear in the call station display. The call station operator presses the **Alert** tile to see an overview of the logged device and system faults / troubles.
    –   This tile is most likely selected only for a call station used by a system administrator or by specific authorized users.

7.   Enable the function **Local volume** to make the **Volume** tile appear behind the **Settings** tile in the call station display. The call station operator presses the **Volume** tile to adjust and set the audio output level of the call station monitor loudspeaker.
    –   This tile is most likely selected only for a call station used by a system administrator or by specific authorized users.

8.   Enable the function **Information** to make the **Information** tile appear behind the **Settings** tile in the call station display. The call station operator presses the **Information** tile to, for example, check the hardware and software versions of the connected call station extensions. Use this information when contacting technical support.

9.   Click the **Submit** button.
    –   The changes are not permanent until the configuration is saved. Refer to *Save configuration, page 130*.

Audio inputs configuration
1.   Click the **+** sign of the **Audio inputs** category row.

2. While **Microphone** is enabled by default, you can enable **Line** to select the line audio input in the *Call definitions, page 96*.
3. Enable **Supervision** if you want to supervise the microphone, including the capsule and wiring.
4. Select the **Input gain** of the microphone input between -10 to 10 dB. The default is 0 dB.
5. Click the **Submit** button.
   - The changes are not permanent until the configuration is saved. Refer to *Save configuration, page 130*.

Extension configuration

To communicate with the PROMATRIX 9000 system, the call station extension is always connected to a PROMATRIX 9000 call station.

1. Click the **+** sign of the **Extension 1** category row to configure the functionality of the buttons of the individual call station extension.
2. Select the button you want to configure.
3. Choose the **Function** of the button from the dropdown list. For a detailed description of the functions, refer to *Input functions description, page 104*.
   - **Note**: The function **Transfer of control** is only available when the call station **Class** is **Mass Notification** and when an **Emergency group** is set.
4. Choose the number of **Actions** from 1 to 5 for the functions:
   - **Make announcement**
   - **Start phased announcement**
   - **Stop phased announcement**.
5. Click the **Submit** button.
   - The changes are not permanent until the configuration is saved. Refer to *Save configuration, page 130*.
6. Repeat the previous steps for each extension as needed.

Recorded messages / Alert messages configuration

These sections are only available for call stations of **Class: Normal**. Follow the next steps to rename the tiles shown in the display of the selected call station.

1. Click the **+** sign of the **Recorded messages / Alert messages** category row.
2. Enter a name for the tile in the text box. The name can have a maximum of 16 characters.
3. Enable the checkbox and click the **Add** button.
   - The name is added to the category.

   - To delete a name, click the **Delete** button and confirm with **Yes**.

Emergency group page

Emergency group is a set of functionalities for Mass Notification Systems (MNS). These functionalities allow multiple first responders (fire fighters) to control the evacuation of a building from multiple locations where one or more first responder panels (FRPs) are in use.

These FRPs form a group. To continue actions on another FRP in a different location, the user interface (LCD) of each device must be the same. The result of the actions done on one FRP is also shown on the other first FRPs of the group.

To avoid confusion among the first responders, actions are only possible on one FRP at the time. That FRP is the one in control. It is also possible to force the in-control state from one FRP to the other.

A FRP call station is only selectable in the **Emergency group** page when the **Class** is set to **Mass notification** in the **Settings** page.

Note: In the case of UL-certified systems, make sure that the call station operator language is set to English (UL) in *System settings, page 81*.

Add a mass notification FRP
1.   Click the **+** sign of the **Emergency group** category row.
     –   A list of the call stations configure with **Class: Mass notification** appears under **Emergency call station**.
2.   Use the **>** and **<** buttons or double-click a FRP from the **Emergency call station** list to move it to the **Group** list.
     –   The configuration of the FRP is not affected. The FRPs can have different configurations.
3.   Use the **>** and **<** buttons or double-click a FRP from the **Emergency call station** list to move it to the **Overrule control request** lists.
     –   The **Overrule control request** list shows which FRPs can request the in-control status from the default in-control panel. These FRPs overrule others in the same **Group**.
     –   When not in control, the FRP cannot be used, and the display and buttons are blocked. The FRP not in control have the same behavior as the in-control FRP.
4.   In the **Group name** field, enter a name for the **Group** created. The group name is automatically added to all FRPs part of it.
5.   In the **Default in control** field, select the FRP that is, by default, the one in control.
     –   The FRP that by is default in control can always overrule other FRP listed in the **Overrule control request**.
     –   Only one FRP can be in control at the same time. If the FRP is configured as **Default in control** but not part of the **Group**, the default is set to <None>.
     –   The FRP in control can deny or grant a request. Refer to **Transfer of control** in *Input functions description, page 104* for more details.
6.   In the **Grant control timeout** field, select the time the FRP has to respond to a request of control. If the FRP does not answer within the select period, it automatically loses the in-control status. The default is **30 seconds**.
7.   Click the **Submit** button.
     –   The changes are not permanent until the configuration is saved. Refer to *Save configuration, page 130*.

Rename a mass notification FRP
To rename a FRP, refer to the *System composition, page 51* and the **Group name** in this section.

Remove a mass notification FRP
To remove a FRP, change its **Class** from **Mass notification** to **Normal** or **Emergency**.

Access control page
This section is only available for call stations of **Class: Normal**.

- Below **Device options**, click **Call station**.
  - A dropdown menu appears with the options **Settings**, **Emergency group** and **Access control**.
1. Click **Access control**.
   A new screen appears listing the users created in *Access control users, page 50*.
2. From the dropdown list next to **Name**, select the call station you want to protect with login.
3. Double-click or use the arrows to move the **Access control users** from left to right.
4. Click the **Submit** button.
   - The changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

Refer to
- *System settings, page 81*
- *System composition, page 51*
- *Input functions description, page 104*

5.4.5 Control interface module

The PRA-IM16C8 Control interface module adds sixteen configurable and supervised control inputs, eight voltage-free control outputs, and two supervised trigger outputs to the PROMATRIX 9000 system. These contact inputs and outputs provide the easy logic connectivity of a PROMATRIX 9000 system to auxiliary equipment such as:
- Fire alarm systems
- Indicators
- Strobes
- Speaker relays.

1. Below **Device options**, click **Control interface module**.
   A new screen appears listing the configured devices.
   A device is only listed when it was added in the **System composition** page.
2. Click the device you want to configure.

General configuration
1. Click the **+** sign of the **General** category row.
2. Select the **Expected PoE inputs** from the dropdown list.
   You can connect a maximum of two PoE inputs.
3. Select if you want to enable the **Supervision** of a **Ground leakage**.
4. **Emergency relevant** is enabled by default. Disable it if needed.
   - Emergency relevant troubles (or faults) are troubles that affect the emergency capability of the system. To differentiate between MNS troubles and non-MNS faults, you need to select **Emergency relevant**. Troubles that occur on devices that have **Emergency relevant** selected are reported as MNS faults.

–   The visual or audible trouble indicators are triggered when a trouble is reported
      only if **Emergency relevant** is enabled.
–   The **AC power supply trouble** (Mains supply fault), **Backup power fault**, and
      Ground fault indicators appear on the first responder panel if the originator is
      selected as **Emergency relevant**.
–   A reported **AC power supply trouble: External** (Mains supply fault: External),
      which is triggered by a control input, is always emergency relevant, regardless of
      the configuration.
5. Click the **Submit** button.
      –   The changes are not permanent until the configuration is saved. See *Save
            configuration, page 130*.

Control inputs configuration

Control inputs receive signals from third party equipment that cause actions in the
PROMATRIX 9000 system.
It is also possible to supervise the connected cables for short-circuits, open connections,
and ground faults.

1. Click the **+** sign of the **Control inputs** category row.
2. Select the input you want to configure.
3. Choose the **Function** of the input from the dropdown list. For a detailed description of
    the functions, refer to *Input functions description, page 104*.
4. Choose how the **Activation** happens:
      –   On **Contact make**: The action starts or stops when the contact is closed.
      –   On **Contact break**: The action starts or stops when the contact is opened.
5. Choose the number of **Actions** from 1 to 5 for the functions:
      –   **Make announcement**
      –   **Start phased announcement**
      –   **Stop phased announcement**.
6. Select for which inputs you want to enable **Supervision**.
7. Click the **Submit** button.
      –   The changes are not permanent until the configuration is saved. See *Save
            configuration, page 130*.

Control outputs configuration

Control outputs send signals to third party equipment to trigger actions. Each control
output connection has three pins. The trigger outputs A and B have two pins and are
supervised.

1. Click the **+** sign of the **Control outputs** category row.
2. Select the output you want to configure.
3. Choose the **Function** of the output from the dropdown list. For a detailed description
    of the functions, refer to *Output functions description, page 109*.
      –   For the trigger outputs A and B, you can only select the functions **Zone activity** and
            Switch output.
4. For the trigger outputs A and B, select if you want **Supervision**.
5. Click the **Submit** button.
      –   The changes are not permanent until the configuration is saved. See *Save
            configuration, page 130*.

To configure further the selected functions, refer to *Control interface module, page 116*.

5.4.6   Audio interface module

The PRA-IM2A2 Audio interface module adds to the PROMATRIX 9000 system:

–   Two analog, configurable and supervised audio inputs, balanced for microphone and line with optional phantom power.
–   Two analog, balanced audio outputs.
–   Two configurable and supervised control inputs.
–   Two voltage-free control outputs.

1. Below **Device options**, click **Audio interface module**.
    A new screen appears listing the configured devices.
    A device is only listed when it was added in the **System composition** page.
2. Click the device you want to configure.

General configuration

1. Click the **+** sign of the **General** category row.
2. Select the **Expected PoE inputs** from the dropdown list.
    You can connect a maximum of two PoE inputs.
3. Select the **Audio mode** from the dropdown list:
–   Select **Analog** if you are using the audio input and outputs of the device.
–   Select **Digital** if you are using Dante to route your audio channels.
    –   When you choose **Digital**, after submitting, the section **Virtual audio inputs/ outputs (Dante)** replaces the sections **Audio inputs** and **Audio outputs**.
4. **Emergency relevant** is enabled by default. Disable it if needed.
    –   Emergency relevant troubles (or faults) are troubles that affect the emergency capability of the system. To differentiate between MNS troubles and non-MNS faults, you need to select **Emergency relevant**. Troubles that occur on devices that have **Emergency relevant** selected are reported as MNS faults.
    –   The visual or audible trouble indicators are triggered when a trouble is reported only if **Emergency relevant** is enabled.
    –   The **AC power supply trouble** (Mains supply fault), **Backup power fault**, and **Ground fault** indicators appear on the first responder panel if the originator is selected as **Emergency relevant**.
    –   A reported **AC power supply trouble: External** (Mains supply fault: External), which is triggered by a control input, is always emergency relevant, regardless of the configuration.
5. Click the **Submit** button.
    –   The changes are not permanent until the configuration is saved. Refer to *Save configuration, page 130*.

Audio inputs configuration

The analog audio inputs provide audio connectivity to third party systems, microphones or BGM sources.

1. Click the **+** sign of the **Audio Inputs** category row.
2. Enable the audio inputs you want to use.

3. Enable **Phantom power** if you use an external microphone that requires it, such as a condenser microphone.
4. Select the **Input sensitivity** from the dropdown list. The default is 18 dBu, which corresponds to an analog gain of 0 dB.
5. Enable **Pilot tone detection** to be warned if the audio input does not receive the pilot tone.
    –   If you enable **Pilot tone detection**, the following fields become editable:
6. Select the **Threshold** from the dropdown list. The default is -20 dBFS.
7. Select the **Frequency** from the dropdown list. The default is 20 kHz.
8. Click the **Submit** button.
    –   The changes are not permanent until the configuration is saved. Refer to *Save configuration, page 130*.

Configure audio outputs

The analog audio outputs provide connectivity to third party systems, amplifiers and recorders.

1. Click the **+** sign of the **Audio Outputs** category row.
2. Enable the audio outputs you want to use.
3. Select the **Output level** from the dropdown list. The default is 0 dBu.
4. Enable **Pilot tone generation** for the output to send a pilot tone.
    –   If you enable **Pilot tone generation**, the following fields become editable:
5. Select the **Threshold** from the dropdown list. The default is -20 dBFS.
6. Select the **Frequency** from the dropdown list. The default is 20 kHz.
7. Click the **Submit** button.
    –   The changes are not permanent until the configuration is saved. Refer to *Save configuration, page 130*.

Configure virtual audio inputs/outputs (Dante)

Virtual audio inputs and outputs do not exist as hardware, but behave in a similar way. As such, you can use virtual audio inputs in call definitions or as a source for background music, and use audio outputs in a zone. You can also activate them from the Open interface client.
You can either use the analog inputs and outputs, or the virtual inputs and outputs.

1. Click the **+** sign of the **Virtual audio inputs/outputs (Dante)** category row.
2. Enable the audio inputs/outputs you want to use.
3. In the field **Audio**, select **Input** or **Output** from the dropdown list.

If you select **Input**, the number of the input appears as ***01** or ***02**. You can edit the following fields:
1. Enable **Pilot tone detection** to be warned if the audio input does not receive the pilot tone.
    –   If you enable **Pilot tone detection**, the following fields become editable:
2. Select the **Threshold** from the dropdown list. The default is -20 dBFS.
3. Select the **Frequency** from the dropdown list. The default is 20 kHz.

If you select **Output**, the number of the input appears as **#01** or **#02**. You can edit the following fields:

1. Enable **Pilot tone generation** for the output to send a pilot tone.
    –   If you enable **Pilot tone generation**, the following fields become editable:
2. Select the **Threshold** from the dropdown list. The default is -20 dBFS.
3. Select the **Frequency** from the dropdown list. The default is 20 kHz.

To configure further the selected functions of the audio inputs and outputs, refer to *Audio interface module, page 125*.

Configure control inputs

Control inputs receive signals from third party equipment that cause actions in the PROMATRIX 9000 system.
It is also possible to supervise the connected cables for short-circuits and open connections.

1. Click the **+** sign of the **Control inputs** category row.
2. Select the input you want to configure.
3. Choose the **Function** of the input from the dropdown list. For a detailed description of the functions, refer to *Input functions description, page 104*.
4. Choose how the **Activation** happens:
    –   On **Contact make**: The action starts or stops when the contact is closed.
    –   On **Contact break**: The action starts or stops when the contact is opened.
5. Choose the number of **Actions** from 1 to 5 for the functions:
    –   **Make announcement**
    –   **Start phased announcement**
    –   **Stop phased announcement**.
6. Select for which inputs you want to enable **Supervision**.
7. Click the **Submit** button.
    –   The changes are not permanent until the configuration is saved. Refer to *Save configuration, page 130*.

Control outputs configuration

Control outputs send signals to third party equipment to trigger actions. Each control output connection has three pins.

1. Click the **+** sign of the **Control outputs** category row.
2. Select the output you want to configure.
3. Choose the **Function** of the output from the dropdown list. For a detailed description of the functions, refer to *Output functions description, page 109*.
4. Click the **Submit** button.
    –   The changes are not permanent until the configuration is saved. Refer to *Save configuration, page 130*.

To configure further the selected functions of the control inputs and outputs, refer to *Audio interface module, page 117*.

5.4.7   Wall control panel

The wall control panel provides convenient local control of background music in one zone covered by a PROMATRIX 9000 sound system. For the wall control panel, you can configure the selection of music sources and the volume control range . Control is quick and intuitive. With the single rotary/push button, you can:

– Rotate the knob to scroll through the menu.
– Press the knob to make selections.

The color LCD provides clear user feedback. To restrict operation to authorized people, it is possible to control user access with a PIN code.

1. Below **Device options**, click **Wall control panel**.
    A new screen appears listing the configured devices.
    A device is only listed when it was added in the **System composition** page.
2. Click the device you want to configure.
3. Click the **+** sign of the **General** category row.
4. Enable **Access control with PIN code** as needed.
    – If you restrict the access to the wall control panel, the user needs to enter the PIN code before the BGM volume be changed or a different BGM channel can be selected.
5. If you enabled **Access control with PIN code**, fill the **Pin code** field.
    – The PIN code can only be four digits long.
    – Only use digits from 0-9.
6. The **Music off function** is automatically enabled. Disable it if needed.
    – This function adds an entry to the list of BGM channels shown in the wall control panel. It allows the user to switch off the BGM in the assigned zone.
7. When the **Music off function** is enabled, you can customize the text that appears in the wall control panel in the **Show music off as** field. Use a minimum of 1 and a maximum of 32 characters.
    – The default text, **Music off**, always appears in the first language selected for the configuration software. Even when you change the language of the configuration software, the default text remains. If you change the **Music off** text to customized text, the customized text also remains in its original language.
    – It is not possible to enable **Emergency relevant**.
8. Click the **Submit** button.

5.4.8   Telephone interface

The Telephone interface feature allows for a regular phone solution to make calls to PROMATRIX 9000.

1. Below **Device options**, click **Telephone interface**.
    – A new screen appears listing the connected devices.
    – A device is only listed when it was added in the **System composition** page.
2. Click the device you want to configure.
3. Click the **+** sign of the **General** category row.
4. Enter the **SIP domain (proxy server)**, the **SIP backup domain (proxy server)** and the **Jitterbuffer in ms**.
5. Select the **Input gain** from the drop-down list.
6. Click **Add** to add a **SIP server certificate** and a **SIP client certificate** files.

- The certificates are optional to make sure the system exchanges information with the right Private Automatic Branch Exchange (PABX).
7. **Emergency relevant** cannot be selected for Telephone interface.
8. Click the **+** sign of the **SIP accounts** category row.
9. Enter a **Username** and a **Password** for your extension.
   - For the **Username**, use all digits and letters, as well as dots, hyphens and underscores. The maximum amount of characters allowed is 16.
   - For the **Password**, use all characters to a maximum of 16.
10. Click **Add**.
11. Repeat the previous steps for as many SIP accounts as you need.
12. Click the **Submit** button.
    - The changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

Refer to *Telephone interface, page 118* to configure the zones for the SIP accounts.

Refer to
- *Telephone interface, page 118*

5.4.9 Audio routed network interface

Use the OMN-ARNIE / OMN-ARNIS to support up to 20 subnets in the PROMATRIX 9000 system.

1. Below **Device options**, click **Audio routed network interface**.
   - A new screen appears listing the connected devices.
   - A device is only listed when it was added in the **System composition** page.
2. Click the device you want to configure.
   - A new screen appears to check the **General** settings.
3. Click the **+** sign of the **General** category row.

Emergency relevant appears pre-selected. The audio routed network interface is an essential part of an emergency system and, as such, cannot be unselected.

5.4.10 System client

1. **Below** *Device options*, **Click** *System client*:
   - A new screen appears with a *General* category tab.
   - Notice that a *System client* is only listed when it is added to the *System composition, page 51*.
2. **Select and click** the + of the *General* category tab to configure the general settings of the *System client*:
3. **Enable** (checkmark) the *supervision* checkbox:
   - The connection with the IP-address will be supervised. A fault for the missing system client will be reported after a grace timeout of 10 minutes.
4. **Click** the *Submit* button to store the settings:
   - Notice that the changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

5.4.11 Network switch

You can connect the following types of switch to the PROMATRIX 9000 system:

- The PRA-ES8P2S
- The Cisco IE-5000-12S12P-10G
- The Cisco IE-9320-22S4X-A

Initially, for security reasons, the web server in PRA-ES8P2S switches with software version 1.01.06 cannot be accessed for configuration.

To access the PRA-ES8P2S web browser

1. Connect a USB 2.0 to serial converter to the console port of the switch.
2. Plug the USB into the PC.
3. Start a terminal program such as uCon.
4. Locate the communication port of the converter.
5. Setup a connection with the following settings:
   - **Bits per second (BAUD)**: 115,200.
   - **Number of bits**: 8.
   - **Parity**: None.
   - **Stop bits**: 1.
6. Click **Enter**.
7. Log in with the default credentials: Bosch, mLqAMhQ0GU5NGUK.
   - A prompt appears with **switch#**.
8. In the prompt, type **conf**.
9. Click **Enter**.
   - The prompt shows **switch(config)#**.
10. In the prompt, type **ip https**.
11. Click **Enter**.
    - The prompt shows **switch(config)#**.
12. In the prompt, type **exit**
13. Click **Enter**.
    - The prompt shows **switch#**.
14. In the prompt, type **save**.
15. Click **Enter**.
    - The terminal shows a line without prompt and the word **Success**. On the next line the prompt, **switch#** appears.
16. In the prompt, type **reboot**
17. Click **Enter**.
    - The switch reboots.
18. Set your PC network to a DHCP-assigned address or to a fixed link-local address with subnet 255.255.0.0.
19. Enter https://169.254.255.1/ in the web browser of the interface.
20. Click **Enter**.
21. Log in with the default credentials: Bosch, mLqAMhQ0GU5NGUK.
    - A prompt appears with **switch#**.

> ⚠ **Caution!**
>
> To prevent security breaks, disable the web browser when you no longer need it for configuration purposes.
>
> After an upgrade of the PRA-ES8P2S device to version 1.01.06, the web server will remain active and prone to attacks. To disable the web server, follow the previous procedure, but replace **ip https** by **no ip https** in the relevant steps.

To configure the network switches in the PROMATRIX 9000 software

1. Under **Device options**, click **Network switch**.
    –   A new screen appears listing the connected devices.
    –   A device is only listed when it was added in the **System composition** page.
2. Click the device you want to configure.
3. Click the **+** sign of the **General** category row.
4. Choose the **Model** from the dropdown list.
    –   If you choose a Cisco switch, the section **Stacked switches** appears. For more information on how to configure Cisco switches, refer to the PROMATRIX 9000 Multisubnet Blueprint at www.dynacord.com.
5. The default settings **Power supervision** and **Emergency relevant** are pre-selected. Unselected them as needed.
6. Click the **+** sign of the **SNMP** (Simple Network Management Protocol) category row. **Note:** Only SNMPv3 is supported. Configure the SNMPv3 settings in the switch.
7. In the configuration software of the switch, find the following settings:
–   Enter the **User name**, **Authentication passphrase**, and **Privacy passphrase** exactly as the settings of the switch.
–   Select from the drop-down lists the **Authentication** and the **Privacy passphrase** exactly as the settings of the switch.
8. If you selected a Cisco switch**,** click the **+** sign of the **Stacked switches** category row.
    –   **Note:** Stacked switches need to be supervised by all system controllers in the system.
9. Select between **1** and **2** in the drop-down list for the **Number of stacked switches** and the **Expected power supplies**. You can find this information in the software of the switch.
10. Click the **Submit** button.
    –   The changes are not permanent until the configuration is saved. Refer to *Save configuration, page 130*.

5.4.12   Remote system

One active license on the master controller is required to network one subsystem with the master controller. The activation of one subsystem license on a PM9-SCL or a PM9-SCS turns a standard system controller into a master controller. Up to 20 subsystem licenses can be activated on a system controller. Each system controller can support up to 150 devices and 500 zones. With 20 system controllers connected in a network, a system with multiple controllers can support up to 3000 devices and 10,000 zones.

When the controller of the subsystem has a redundant system controller, you only need one license in the master controller. However, a redundant master controller must have exactly the same amount of active licenses as the primary master controller.

1. Below **Device options**, click **Remote system**.
    –   A new screen appears listing the connected devices.
    –   A device is only listed when it was added in the **System composition** page.
2. Click the device you want to see.
3. Click the **+** sign of the **General** category row.
4. Select or deselect **Emergency relevant** as necessary.
5. Click the **+** sign of the **Remote audio outputs** category row.
6. Enter a name in the **Audio output name** field.

7.   Click the **Add** button.
8.   Enter a name in the **Remote zone group name** field.
       –   The names for the remote zone groups have to be exactly the same in the master system and in the subsystem to allow for the systems to recognize each other.
       –   The audio outputs are enabled by default. Disable them as needed.
       –   To delete an **Audio output name**, click **Delete** in the row to be removed.
9.   Click the **Submit** button.
       –   The changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

To have a usable logging, all subsystems need to synchronize their time with an NTP server. Refer to *Time settings, page 87*.

ⓘ   **Notice!**
Make sure to record the remote zone group names between the subsystems and the master systems. This will guarantee they remain exactly the same.

While the master system and subsystems are connected, a variety of features only work within the same system:
–   The start / stop phased announcements for zones / group zones. Refer to *Input functions description, page 104*, section Start phased announcement.
–   The volume control for and muting of the BGM. Refer to *BGM routing, page 94*.
–   The backup power mode. Refer to *System settings, page 81*.
–   The Virtual Host ID (VHID). Refer to *System settings, page 81*.
–   The AVC. Refer to *Zone options, page 88*, section Volume settings.
–   The transference of control between First responder panels / call stations. Refer to *Input functions description, page 104*, section Transfer of control.
–   The switch between control outputs. Refer to *Input functions description, page 104*, section Switch control output.
–   The zone activity function. Refer to *Multifunction power supply, page 112*.
–   Telephone interface calls. Refer to *Telephone interface, page 118*.

Refer to
–   *Telephone interface, page 118*
–   *Input functions description, page 104*
–   *BGM routing, page 94*
–   *System settings, page 81*
–   *Zone options, page 88*
–   *Multifunction power supply, page 112*

5.5   System options

On the *System options* pages, a number of general, system wide settings can be configured, such as:
–   *Recorded messages, page 79*
–   *System settings, page 81*
–   *Time settings, page 87*
–   *Network supervision, page 87*

5.5.1   Recorded messages

On the **Recorded messages** page, you can manage the audio files used with announcements. These files are uploaded to the internal memory of the system controller. A recorded message can be an audio tone (e.g. attention, alarm, and test audio signal) and pre-recorded (spoken) message.

WAV	Specification
Recording format	48 kHz / 16 bit or 48 kHz / 24 bit > mono
Maximum file size	100 MB
Minimum length	500 ms for repeating messages
Message/tone storage capacity	90 min
Announcement	With tone, eight .WAV files played at the same time

For specification of custom made messages/tones, see also the PROMATRIX 9000 installation manual > System composition > Amplifier power and crest factor.

Add a recorded message

Refer to *Tones, page 166* for pre-defined PROMATRIX 9000 tones.

1.   Below **System options**, click **Recorded messages**.
     –   The **Recorded messages** page appears showing following items:
          The total size of the recorded messages at the top after **Stored recorded messages**
          The **Name**, **File name** and individual **File size**.
2.   Click the **Add** button.
     –   An import file screen appears.
3.   On your computer, browse to the .WAV file to be uploaded to the internal memory of the system controller.
     –   As of release 2.20, you can upload multiple files at the same time as long as their total size does not exceed 100 MB.
     –   If one of the selected messages does not comply with the specifications, the upload operation stops. All messages up to but not including the incorrect messages are uploaded. The resulting popup lets the user know what is the incorrect message.
4.   Select the file and click the **Open** button.
     –   The imported file appears in the **Recorded messages** table, including the **File name**.
5.   Enter or change the name of the file in the **Name** text field.
     –   **Notice**: To avoid mistakes, it is advised to name it exactly the same as the name of the .WAV file, including upper- and lowercase characters. The character "**,**" is not allowed.
     –   The name may consist of up to 64 characters maximum.
6.   Click the **Submit** button.
     –   The changes are not permanent until the configuration is saved. Refer to *Save configuration, page 130*.

Delete a recorded message

1.   **Select** the row (.WAV) to be deleted:
     –   The row will by highlighted.
     –   The *Delete* button appears.

2. **Click** the *Delete* button:
    –   A deleting row appears.
3. **Click** the *Deleted* button **or** *Cancel* button to cancel the delete action:
    –   The *file* will be deleted from the system and *Recorded messages* page.
    –   **Notice** that only the .WAV file will be removed from the system configuration after restarting the system controller.
4. Click the **Submit** button.
    –   The changes are not permanent until the configuration is saved. Refer to *Save configuration, page 130*.

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i	**Notice!** **Backup of recorded messages** To include the recorded messages in the backup file, the maximum total size of the recorded messages must not exceed the 240 MB. You can check the total size of the recorded messages and the individual size of each message in the **Recorded messages** page.

Refer to
–   *Save configuration, page 130*

5.5.2   **System settings**

1. **Below** the *System options* page, **click** *System settings*:
    –   A number of general, system wide parameters can be defined using the *System settings* page.
2. **Select and set** each of the following items:

Item	Value	Description
Rapid Spanning Tree Protocol (RSTP)	Enable / Disable	Specifies whether the network allows a redundant ring (Enable) or not (Disable). When enabled, RSTP reroutes the network if a cable connection breaks by finding another path. By default, RSTP is enabled. See also *Ethernet adapter settings, page 41*, if required.
Multicast address range	Selection (IP-address)	Select the IP-address range from the dropdown list. Use this field when you want to share networks with other equipment that uses multicast. Or when you want to choose, for a 2nd PROMATRIX 9000 system, a non-conflicting IP-address range. **Note:** In networks with subsystems, configure the multicast address ranges differently per subsystem. Otherwise, multiple subsystems can allocate the same multicast addresses and interfere with each other's audio.
Call station display timeout	Time selection (1-10 minutes)	Select the time after which the call station LCD goes to black. The selection that was made is automatically canceled if the selection is not executed. Press any button to activate the LCD. Only the PTT button is activated with the first button press. All other functions are ignored. **IMPORTANT**: If a call station is not yet configured, the LCD goes to black after 10 minutes.
Call station operator language	Language selection	Specifies the user language of the call station display for all LCD call stations used in the system.
Amplifier output voltage	Selection (70 V / 100 V)	Specifies the amplifier output channel voltage (70 V or 100 V) of all PROMATRIX 9000 amplifier outputs used in the system. **IMPORTANT**: After you change the output voltage, save the configuration and restart the system before doing a load measurement on the amplifier outputs. The

Item	Value	Description
		results of previous measurements are wrong when the output voltage selection is changed. See also *Amplifier loads, page 136*.
UL amplifier mode	Enable / Disable	When enabled, the amplifiers comply with the requirements of UL with regards to temperature limitations. When disabled, the amplifiers run in the normal (EN 54) mode. **IMPORTANT**: When **UL amplifier mode** is enabled, the amplifier fan is always blowing at 100 %. This also means that there is no temperature control of the amplifier fan
Wall control panel brand	Selection (Bosch / Dynacord)	Select which brand must appear in the display of the wall control panels used in your system. This setting applies to all control panels connected. The default is **Bosch**.
Emergency mode: **Disable calls below priority level**	Selection (prio. 0-224)	If the system is in the emergency mode, announcements with a priority lower than the selected priority are: - Aborted when running - Not started when started. The system is automatically set to emergency mode when an emergency announcement is started.
Backup power mode: **Disable calls below priority level**	Selection (prio. 0-255)	If the system is in the backup power mode, BGM and announcements with a priority lower than the selected priority are: - Aborted when running - Not started when started. Use the backup power mode action to put the complete system in the backup power mode. Individual amplifiers go to backup power mode if the power supply of that device disappears. In that case, BGM and announcements with a priority lower than the specified priority are only routed to amplifiers (zones) that are not in backup power mode. **Note:** You need to configure the same settings for each master and subsystem controllers.
Mains supply fault:	Selection (Off / 1-8 h(hr)) (by default Off)	The purpose of the grace time is to suspend a warning to i.e. a 3rd party management system that informs service technicians on a remote location for i.e. systems in areas

Item	Value	Description
Grace time to report mains fault on control outputs		where short mains failures frequently happen. If the mains fault is only temporary present, the fault is not reported before the configured grace time ends. The function Fault alarm indicator acts immediately on the occurrence of a mains power fault, or that activation is suspended and will only happen if the mains power fault is still present after the configured grace time. All other faults will result in an immediate activation of this Fault alarm indicator. The Fault alarm buzzer is not delayed in order to give a local warning immediately. See *Multifunction power supply, page 62* and *Multifunction power supply, page 112 >* Control outputs **IMPORTANT**: The system backup power supply should at least be able to provide power during the configured grace time.
Alarm buzzer: **Reactivate silenced fault and emergency alarm buzzer**	Selection Off / 1-24 h (hr) (by default Off)	The buzzer is reactivated after the configured time has passed.
Fault mode: **Reactivate silenced fault alarm buzzer**	Selection Off / 1h-24 h (hr) (by default 4 h (hr))	Set a timeout period after which a fault alarm buzzer is reactivated when the faults have been acknowledged but not yet resolved and reset.
Open Interface		
Allow access by non-configured system clients	Enable / Disable	Specifies whether defined system clients that are part of the **System composition** can access the system (Enable) or not (Disable).
TLS version	Selection (TLS1.2 - TLS1.3 / TLS1.3))	Select the TLS version for the Open Interface. The default is **TLS1.2 - TLS1.3**.
Disable emergency control	Enable / Disable	Enable this setting to prevent the Open Interface client from: - Triggering emergency calls - Acknowledging the emergency state - Reset the emergency state. This options is disabled by default.

Item	Value	Description
Password policy **IMPORTANT**: User accounts configured before release 2.20 can still be used.		Users with Administrator or Installer of authorization level have access to the **Password policy** section. The **Password policy** rules applies to: - The user accounts. - The backup of the configuration. - The Security passphrase (OMNEO PSK). - The initial administrator password after a reset to factory default.
Minimum length	Selection (5-64)	Select the minimum number of characters the password must have. The default is **12**.
Minimum digits (0-9)	Selection (0-32)	Select the minimum number of digits the password must have. The default is **2**.
Minimum special characters (example: !, ?, #, &)	Selection (0-32)	Select the minimum number of special characters the password must have. All of the ASCII special characters are accepted except for the comma. The default is **0**.
System controller redundancy (* see description in this section)		
Group name	Enter text	Enter free text (between 1 and 32 characters) to name the redundant pair of system controllers. By using the exact name, including .local, the group name can also be used to logon the configuration.
Virtual Host ID (CARP VHID)	Selection	Common Address Redundancy Protocol (CARP) allows multiple hosts to share the same IP-address and Virtual Host ID (VHID). 50 is selected by default and is linked with the duty system controller. Unless another system controller will act as the duty one, do not select a number other than 50. **Note:** In case of redundancy in remote systems, every subsystem needs to have a different VHID.
IP-address	Fixed	This is the IP-address of the duty system controller. The IP-address is fixed, and cannot be changed here.
Netmask	Default	This is the Netmask of the duty system controller. The Netmask is fixed, and cannot be changed here.
Group IP-address	Enter address	The group IP-address is used to link the pair of system controllers. The first part of the IP-address is of the IP-address (range) of the duty system controller. It is fixed, and cannot be changed

Item	Value	Description
		here. The second part of the IP-address is free to enter but must be available, and within the same IP-address range of the primary system controller.
Configuration software: **Automatic logout after inactivity of**	Selection 5-30 min (by default 10 min)	If no configuration activity is detected by the system, the logged in user will be automatically logged out after the selected time.
Submit	Button	Click the **Submit** button to store the settings: Notice that you always have to save the configuration. See *Save configuration, page 130*.

* System controller redundancy
You can have a duty and up to 10 standby system controllers in a single system. All system controllers can connect to the network through dual redundant connections. The dual redundant connections avoid that a PROMATRIX 9000 system becomes non-functional when a system controller fails. If only the connection between the controllers fails, the system controllers will continue to operate as self-sufficient separate systems. By default, on startup, the primary system controller will become the duty system controller, while the secondary controllers will be the standby system controllers. During operation, the duty system controller will copy all required configuration settings, messages, event logs and device status information into the standby system controllers. The synchronization of the duty and the standby system controllers might take several minutes.

> **Notice!**
> Always use the same type of system controller for redundancy. Never use, for example, a PM9-SCS for redundancy with a PM9-SCL.

> **Warning!**
> Each standby system controller can take up to 5 minutes to synchronize with the duty controller. The synchronization happens in sequences, one standby system controller after the other. Five minutes is the maximum time per standby system controller when the recorded message storage of the duty controller is at full capacity. The synchronization happens much faster with an average set of standard messages.
> Do not disturb the network during synchronization. Make sure the duty controller stays operational until the synchronization of all standby controllers is finished. If local conditions allow, check the Link LEDs of all standby controllers. Yellow means that the standby controller is not yet synchronized. Blue means that the synchronization is over and the controller is ready.

	Caution!
⚠	Be aware that when start configuring redundancy, the standby system controller is "reset to factory default" first. Refer *System controller, page 55* > Rear panel indicators and controls. This avoids that a standby system controller refuses to be configured.

	Notice!
ⓘ	The duty and all standby system controllers must be in the same subnet.

	Notice!
ⓘ	For time synchronization of the duty system controller and the standby system controller, it is necessary to configure an NTP server. See *Time settings, page 87*.

| 5.5.3 | **Time settings** |

A number of general, system wide parameters can be set using the *System options* page.

1. **Below** the *System options* page, **click** *Time settings*:
2. **Select**, **enable**, **disable** or **enter** the values of each of the following items:

Item	Value	Description
Location	Selection	Select the local time zone from the drop-down list. The daylight saving time will be taken into account.
Set time automatically (NTP)	Enable / Disable	**Enable**: Network Time Protocol (NTP) for automatically clock synchronization of PROMATRIX 9000 with your connected computer (network).
NTP server (Status synced)	Enter text	Enter the URL of the NTP server.
Set Date Time	Enter number	Enter current time and date manually. If *set time automatically* is enabled, it is taking the time from the NTP server.
Submit	Button	Click the *Submit* button to store the settings: Notice that you always have to *Save* the configuration. See *Save configuration, page 130*

Refer to

–   *Save configuration, page 130*

| 5.5.4 | **Network supervision** |

Set a number of system wide network supervision parameters with the **Network supervision** page.

1. Below **System options**, click **Network supervision**.
    –   A new screen appears listing the network supervision options.
2. Enable or disable **Network supervision** as required.
    –   When enabled, the system reports a fault when it detects a change in the network, for example, a cable break or the removal or addition of a new network device.
    –   Refer to *Diagnose, page 133* and *Optional: Using the Logging Viewer, page 155* for more information.
3. Disable **Network supervision** and click **Create network snapshot** to capture a snapshot of the current network connections. The date of the snapshot is registered.
    –   If the last captured snapshot is from before software release 2.00, the **Network snapshot created at** field appears empty.
4. Click **Download network snapshot** to download the last captured snapshot.
    –   The snapshot appears as a .txt file.
5. Enable **Network supervision** again, if required.
6. Click the **Submit** button.
    –   Notice that you always have to **Save the configuration**. Refer to *Save configuration, page 130*.

Network snapshot file

The downloaded file is divided in two sections:

– **Detected Network Connections**: Shows every single connection found on the network.
 Note that only devices configured in the system controller are queried for the network
 snapshot.

– **Supervised Network Connections**: Shows only the supervised network connections.

Note: Devices with **Name: <unknown>** are not configured in the *System composition, page 51.*

(i)

Notice!

After changes in the System composition, a restart is required for the changes to take effect
on the network snapshot.

After changes in the hardware, wait at least two minutes to take a network snapshot, then
restart the system.

5.6   Zone definitions

On the *Zone definitions* pages, the amplifier output channels and zone routing can be
defined. It is possible to configure:

– *Zone options, page 88*
– *Zone grouping, page 92*
– *BGM routing, page 94*

5.6.1   Zone options

On the **Zone options** page, zones can be created. A zone is an audio output or a group of
audio outputs that, for example, go to the same geographical area.

Configuration example

As an example, amplifiers that are part of a PROMATRIX 9000 system on an airport:

– Audio outputs of amplifier 1 and amplifier 2 go to departure hall 1.
– Audio outputs of amplifier 1 and amplifier 2 go to departure hall 2

Then, a *zone* can be created called Departure 1 to group the loudspeaker lines that go to
departure hall 1 and a *zone* called Departure 2 to group the loudspeaker lines that go to
departure hall 2.

– **Notice** that an *audio output* cannot be part of more than one *zone*. After an *audio output*
 has been assigned to a *zone*, it is not allowed to assign the *audio output* to another *zone*.

Zone options page

1.   **Below** *Zone definitions*, **click** *Zone options*:
2.   **Select**, **enable** or **disable** each of the following items:

Item	Value	Description
Audio outputs	Selection	**Shows** the available audio outputs to select.
> and <	Buttons	**Using** the > and < buttons, selected outputs can be added (>) to, or removed (<) from, assigned outputs

Item	Value	Description
Name	Selection	**Shows** the name of the *zone* by a dropdown list selection. See *Add a zone* topic in this section. When using a multifunction power supply *Lifeline* is default available to select.
Ambient noise sensor	Selection	**Shows** the available Ambient noise sensors (ANS) to select.
> and <	Buttons	**Using** the > and < buttons, selected ANSs can be added (>) to, or removed (<) from, an assigned zone. **IMPORTANT**: A maximum of four ANS may added to a zone. An ANS may not added to more than one zone. See also the *Volume settings > AVC* in this section.
Volume settings	Selection	**Opens** the *Volume setting* category to configure the volume settings of the zone. See the *Volume settings* topic in this section.
Add	Button	**A new** *zone* can be *added* to the system configuration. See *Add a zone* topic in this section.
Rename	Button	**An existing** *zone* can be *renamed*. Automatically this name is replaced everywhere in the configuration this *zone* is used.
Delete	Button	**An existing** *zone* can be *deleted* from the system configuration. See *Delete a zone* topic in this section.
Submit	Button	**Click** the *Submit* button to store the settings: Notice that you always have to *Save* the configuration. See *Save configuration, page 130*

Add a zone

Proceed as follows to create a new *zone*:

1. **Click** the *Add* button and **ente**r a *name* for the new *zone* in the *Name* text field:
   – For example: Departure 2
   – It may consist of up to 16 characters, maximum.
2. **Click** the *Add* button or *Cancel* button if you want to cancel:
   – The new *zone* is added to the *Name* selection menu.
3. (Multiple) **Select** each *Audio output* (left box area) that must be added to the *zone*.
4. **Double click** the selected *Audio output* or **click** the > button to add the output to the *zone* area (right box area).
5. **Repeat** the previous steps 1-4 to add a new *zone*.
6. **Click** the +*Volume settings* category to set the *announcement* and *background music (BGM)* volume:
   – **See** the *Volume settings* topic in this section.
7. **Click** the *Submit* button:
   – Note that the changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

Delete a zone

Proceed as follows to *delete* a *zone*:

1. **From** the *Name* dropdown list > **selec**t the *zone* that must be deleted.
2. **Click** the *Delete* button to delete the zone:
   – A pop-up window asks to **confirm** this choice (OK / Cancel).
3. **To delete** the zone, **click** the *OK* button to confirm.
   – The deleted *zone* is no longer available in the *Name* dropdown list. It will also be removed from all occasions where it is used in the configuration.
4. **Click** the *Submit* button:
   – Note that the changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

Rename a zone

Proceed as follows to rename a *zone*:
1. **From** the *Name* dropdown list > **select** the *zone* that must be renamed.
2. **Click** the *Rename* button to rename that *zone*.
   – A new row appears.
3. **Change** the *name* in the text box:
   – The *name* may consist of up to 16 characters, maximum.
   – The *name* of the *zone* will be changed on all occasions where it is used in the configuration.
4. **Click** the *Rename* button.
5. **Click** the *Submit* button:
   – Note that the changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

Volume settings

Configure the volume levels of announcements and background music (BGM) in the **Volume settings** section.

1. Select the **+** sign of the **Volume settings** category row.
2. Select the **Maximum BGM volume** between 0 dB and -96 dB.
   – It is not possible to adjust the BGM volume to a higher level than the maximum BGM volume setting.
3. Select the **Minimum BGM volume** between 0 dB and -96 dB.
   – It is not possible to adjust the BGM volume to a lower level than the minimum BGM volume setting, but it is possible to mute the BGM through the call station or the Open interface client.
4. Select the **Initial BGM volume** between 0 dB and -96 dB. The volume must be between the **Maximum BGM volume** and the **Minimum BGM volume**. Otherwise, the **Initial BGM volume** is corrected automatically.
5. Enable **Scheduled BGM volume adjustment (1)** and **(2)** to decrease automatically the BGM volume during certain periods, for example, in the evening. During the periods of time that both functions are active, the attenuations add-up.
6. Enter the starting time and the ending time for the BGM volume adjustments.
7. Select the volume output level for the **Scheduled BGM volume adjustment** between 0 dB and -96 dB.
8. Enable **Scheduled call volume adjustment** to decrease automatically the announcement volume level during a certain period, for example, in the evening.
9. Enter the starting time and the ending time for the call volume adjustment.
10. Select the volume output level for the **Scheduled BGM volume adjustment** between 0 dB and -96 dB.

11. Click the **Submit** button.
    – The changes are not permanent until the configuration is saved. Refer to *Save configuration, page 130*.

Enable **Automatic volume control** (AVC) in the selected zones to use the Ambient noise sensor (ANS). AVC improves the intelligibility of calls and the audibility of BGM in noisy environments. It adjust the call volume in a zone to compensate for the ambient noise. In the PROMATRIX 9000 system, AVC can adjust the volume of the audio outputs of the amplifiers and of the audio interface module.

Note: AVC only works in zones of the same master and subsystem. It does not work in remote zones.

This configuration section is disabled if no ANS is assigned to a zone.

1. Select the **Ambient noise threshold** between 50 dB SPL and 90 dB SPL.
    – The call level is reduced below this threshold to prevent the sound from becoming uncomfortable while maintaining intelligibility.
2. Select the **Attenuation range** between 4 dB and 18 dB. This is the maximum attenuation applied to the volume.
3. Select the **Adaptation slope**.
    – The **Adaptation slope** is the ratio between the volume change, as a result of the ambient noise level change. For example, if the slope is 0.5 dB/dB, for every dB noise reduction, the call level will only be 0.5 dB reduced.
4. Select the **Adaptation speed**.
    – The **Adaptation speed** is the speed with which the attenuation of the call changes because of the changes in the noise level. It applies to the attack and the release time. The available speeds are:
      Slow: 0.2 dB/s
      Medium: 1 dB/s
      Fast: 5 dB/s
5. Enable or disabled **Control of BGM** as needed to set the AVC for the background music. Note that the attenuation can change with BGM because of changes in noise level.
    – **IMPORTANT**: When the AVC is enabled for the BGM, make sure that the ANS is not near the loudspeakers. If the ANS is near the loudspeakers, the ANS considers the BGM as ambient noise and the volume level of the BGM increases to the maximum volume level.
6. Enable or disabled **Control of business calls** as needed to set the AVC for the business calls. At the start of a business call, the attenuation is set according to the noise level. The attenuation does not change due to changes in the noise level during business calls.
    – **NOTE**: The ambient noise level used to adjust the volume of the call is the measured momentary level just before the start of the call.
7. Click the **Submit** button.
    – The changes are not permanent until the configuration is saved. Refer to *Save configuration, page 130*.
Refer also to *Ambient noise sensor, page 123* and *Ambient noise sensor, page 140*.

5.6.2 Zone grouping

On the *Zone grouping* page, zone groups can be created. A zone group is a group of zones that, for example, go to the same geographical area.

> **Notice!**
> Ambient noise sensors cannot added to *Zone group(s)*.

Configuration example

A small airport with four *zones*: Departure 1, Departure 2, Arrival 1 and Arrival 2:
–   The *zones* Departure 1 and Departure 2 contain loudspeaker lines that go to departure hall 1 and departure hall 2 respectively.
–   The *zones* Arrival 1 and Arrival 2 contain loudspeaker lines that go to arrival hall 1 and arrival hall 2 respectively.

Then, a *zone group* can be created called "Departure Halls" to group the *zones* that go to the departure halls and a *zone group* called "Arrival Halls" to group the *zones* that go to the arrival halls.

Zone grouping configuration page

Below *Zone definitions*, **click** *Zone grouping*:
    –   A screen appears listed the following items:
1.   **Select** each of the following items:

Item	Value	Description
Zones	Selection	**Shows** the available audio *zones* (left box area). *Zones* can be created in *Zone options, page 88*
Name	Selection	**Shows** the name of the *zone group* (dropdown list selection). See *Add a zone group* topic in this section.
> and <	Buttons	**Using** the > and < buttons, selected *zones* can be added to, or removed from, *zone groups*.
Zone group	Selection	**Shows** the *zones* that have been assigned to the *zone group* (right box area). See *Add a zone group* topic in this section.
Add	Button	**A new** *zone group* can be added. See *Add a zone group* topic in this section.
Rename	Button	**An existing** *zone group* can be renamed. Automatically this name is replaced everywhere in the configuration where this *zone group* is used. See *Rename a zone group* topic in this section.

Item	Value	Description
Delete	Button	**An existing** *zone group* can be deleted from the system configuration. Automatically this *zone group* is deleted everywhere in the configuration where this *zone group* is used. See *Delete a zone group* topic in this section.
Submit	Button	**Click** the *Submit* button to store the settings: Notice that you always have to *Save* the configuration. See *Save configuration, page 130*

Add a zone group

> **Notice!**
> It is not possible to add PRA-ANS devices to zone groups.

1. **Enter** a *name* for the *zone group* in the *Name* text box.
2. **Click** the *Add* button. The procedure for creating a *zone group* is **similar** to the procedure for *Add a zone*. See *Zone options, page 88*.

Rename a zone group

The procedure for renaming a *zone group* is **simila**r to the procedure for *Rename a zone*. See *Zone options, page 88*.

Delete a zone group

The procedure for deleting a *zone group* is **similar** to the procedure for *Delete a zone*. See *Zone options, page 88*.

5.6.3   BGM routing

At the *BGM routing* page, background music (BGM) routing can be defined. A BGM routing refers to an *audio input* in the system. Optionally, default *zones* and or default *zone groups* can be connected to the routing. When the system is switched on, then the specified BGM is routed to the connected *zones* and *zone groups*.

BGM routing configuration page

1.   **Below** the *Zone definitions* page, **click** *BGM routing*:
     –   A screen appears listed the following items:
2.   **Select**, **enabl**e or **disable** each of the following items:

Item	Value	Description
Name	Selection	**Shows** the name of the *BGM routing* (dropdown list selection). See *Add BGM routing* topic in this section.
Type	Selection	**Selection** between *zones* and *zone groups* as available routing.
Zones / Zone groups	Selection	The left box area **shows** the available *zones* and *zone groups*. *Zones* (groups) are created in *Zone options, page 88* and *Zone grouping, page 92*
> and <	Buttons	**Using** the > and < buttons, selected *zones* and *zone groups* can be added to, or removed from, *Routing* (the right area box).
Audio input	Selection	**Select** the *Audio input* that provides the background music. **Notice** that the inputs 9 up to 16 are **secured** (Dante/OMNEO channels) to the amplifier. The same *Audio input* may not be assigned to different *BGM routing*. Each *BGM routing* must have a **unique** *audio input*.
Limit routing	Enable / Disable	**Enable:** The center box area shows the *zones* and *zone groups* that are allowed to receive the *BGM routing*. This center box area is not visible if the *Limit routing* checkbox is disabled. **Using** the > and < buttons, selected *zones* and *zone groups* (left area box) can be added to, or removed from *Limit Routing* (the middle area box). **See** also the *Limit routing* topic in this chapter.
Routing	Selection	The right box area **shows** the *zones* and *zone groups* that are assigned to the selected *BGM routing* at system start-up. **Using** the > and < buttons, selected *zones* and *zone groups* (the left or middle area box) can be added to, or removed from *Routing* (right area box).

Item	Value	Description
Add	Button	**A new** *BGM routing* can be added. See *Add BGM routing* topic in this section.
Rename	Button	**An existing** *BGM routing* can be renamed. Automatically this name is replaced everywhere in the configuration this *BGM routing* is used. See *Rename BGM routing* topic in this section.
Delete	Button	**An existing** *BGM routing* can be deleted. Automatically this *BGM routing* will be removed everywhere in the configuration this *BGM routing* is used. See *Delete BGM routing* topic in this section.
Submit	Button	**Click** the *Submit* button to store the settings: Notice that you always have to *Save* the configuration. See *Save configuration, page 130*

Add BGM routing

1. **Enter** a *name* for the *BGM* in the *Name* text box.
2. **Click** the *Add* button. The procedure for *Add BGM routing* is **similar** to the procedure for *Add a zone*. See *Zone options, page 88*.

> **Notice!**
> While you can route the BGM to a remote zone from one system to another, neither volume control nor muting work in remote zones.

Rename BGM routing

The procedure for renaming *BGM routing* is **similar** to the procedure for *Rename a zone*. See *Zone options, page 88*.

Delete BGM routing

The procedure for delete *BGM routing* is **simila**r to the procedure for *Delete a zone*. See *Zone options, page 88*.

Limit BGM routing

You can specify a routing limit to *BGM routing*. To do so:

1. **If** the *Limit routing* checkbox is *disabled*, all available *zones* or *zone groups* can be made part of the default routing for the *BGM routing*.
2. **With** *Limit routing* checkbox *enabled*, you can make a sub-set of available *zones* and *zone groups* and the *BGM routing* cannot be used outside this sub-set:
    –   This function can be used for routing of e.g. a licensed *BGM routing* to specific subscribers. In this case the default *zones* for this *BGM routing* at power on is again a sub-set of the specified routing limit.
    –   Also, *zones* and *zone groups* that are not part of the routing limit cannot be added to the *BGM routing* selection via *call station extension* buttons.
3. **Click** the *Submit* button to store the settings:

–   Note that the changes are not permanent until the configuration is saved. See *Save configuration, page 130.*

Refer to
–   *Save configuration, page 130*
–   *Zone options, page 88*
–   *Zone grouping, page 92*

5.7   Call definitions

Using the *Call definition* page, *call definitions* can be defined.

Call definitions are used to make announcements, are custom made, and could contain several characteristics as shown in the table following. To do so:

1. **Click** the *Call definitions* page:
   –   A *call definition* screen appears with the items as listed in the following table.
2. **Select**, **enable**, **disable** or **enter** (text in) each of the following items of the *call definition*:

Item	Value	Description
Name	Selection	Shows the name of the available call definitions. To select a call definition, first create one with the **Add** button.
Priority	Selection (32-255)	Select the call/announcement priority of the call definition from the list. Refer to *Priority and announcement type, page 148*, if required.
Maximum call duration	Selection (10-1200 s / Unlimited)	Select a **Maximum call duration** to avoid blocking zones with a high priority call or announcement that starts but does not stop, either by accident or because it contains, for example, infinitely looping messages. **Notices!** - When you select **Routing scheme: Stacked** or **Timing scheme: Time shift,** it is not possible to select **Unlimited**. The **Maximum call duration** is automatically changed from the default **Unlimited** to **120 s**. - Change the call duration from the default **Unlimited** when using SIP accounts.
Routing scheme	Selection (Partial / Stacked)	**Partial** is the default option. It starts the call to the available zones at the start of the call. The call is not recorded. Select **Stacked** to record and replay a call when a zone becomes available. You can store a maximum of 30 minutes of time-shifted calls, stacked calls and time-shifted stacked calls.

Item	Value	Description
		Notices! - You need to install the PRA-LSCRF license to select the **Stacked** function. - When the **Priority** is > 223, you can only select the **Routing scheme: Partial**.
Time out	Selection (1-30 min / Infinite)	This function appears when you select the **Routing Scheme: Stacked**. Select the maximum time the call remains in the memory for later broadcast. After this time, the call is deleted. The default is **5** minutes.
Forward on release of	Selection (Each zone / All zones)	This function appears when you select the **Routing Scheme: Stacked**. The default is **All zones**, which forwards the call only when all zones are available. Select **Each zone** to forward the call as soon as the individual zone is available.
Alarm	Selection (None / Emergency)	From priority setting 224 onwards, the **Alarm** section becomes visible. The default is **Emergency** to trigger the alarm independent of the call priority so that it can test the settings without triggering an alarm.
Start tone	Selection	If the call/announcement must use a start tone, select a tone from the **Start tone** dropdown list. Refer to *Recorded messages, page 79* and *Tones, page 166* for an overview of the predefined .WAV audio files.
Attenuation	Selection (0 dB-20 dB)	Adjust the attenuation to set the volume level of the **Start tone**.
Messages	Selection	If the announcement must contain a specific named message, select it in the left area box and click the **>** button to add it to the **Messages** box of the call definition. You can also select this message name on the call station display, if you configure this message function. Refer to *Call station, page 64* > Recorded/Alert Messages.
Attenuation	Selection (0 dB-20 dB)	Adjust the attenuation to set the volume level of the selected **Messages**.
Repetitions	Selection (0-10 / Infinite)	Use the **Repetitions** box to specify how many times the selected messages must be repeated. Be aware that: 0 = play once, 1 = repeat once (play message twice).

Item	Value	Description
Live speech	Selection (Yes / No)	If the announcement must contain live speech, set the **Live speech** option to **Yes**. If the announcement does not contain live speech, set it to **No**. If **No** is selected, the option to select a **Schedule** announcement is enabled.
Attenuation	Selection (0 dB-20 dB)	Adjust the attenuation to set the volume level of the **Live speech**.
End tone	Selection	If the announcement must use an end tone, select a tone from the **End tone** dropdown list. Refer to *Recorded messages, page 79* and *Tones, page 166* for an overview of the predefined .WAV audio files.
Attenuation	Selection (0 dB-20 dB)	Adjust the attenuation to set the volume level of the **End tone**.
Continue call	Selection (No / After interruption)	**No** stops the announcement immediately when it is overruled by another announcement. **After interruption** continues or restarts the announcement when it is overruled by another announcement or not completed. This function also continues the announcement after a restart or after a switch over from a backup to a duty system controller. **Notices!** - From software release 1.10 onwards, **Continue call** is set to **No** when **Live speech** is set to **Yes** and **Priority** is set to a priority higher than **223** (i.e. an evacuation announcement/call). - **Continue call** is not available when you select **Routing scheme: Stacked**.
Audio input	Selection (<Default> / input)	If **Live speech** is set to **Yes**, use the **Audio input** list to specify which input to use. Notice that the inputs 9 up to 16 are secured (Dante/AES67) channels to the amplifier. Select **<Default >** if the **Live speech** originates from a call station microphone.
Timing scheme	Selection (Immediate / Time shift)	The default is **Immediate**, which broadcasts the call immediately. Select **Time shift** to broadcast the call only when any ongoing call is finished or to avoid

Item	Value	Description
		acoustic feedback from loudspeakers. When **Time shift** is selected, the broadcast starts 2 seconds after the original call stops. **Notices**! - You need to install the PRA-LSCRF license to select the **Time shift** function. - When **Live speech** if set to **No**, it is not possible to select **Time shift**. The **Timing scheme** is automatically set to **Immediate**.
Schedule	Selection (Enable / Disable)	If **Live speech** is set to **No**, you can set the schedule. Select **Enable** to enable announcement scheduling and remove the **Maximum call duration**. Enter the start time of the first announcement in the **Start time** box.
Start time	Enter (hh/mm / Enable/Disable day)	Enter the time to start the **Schedule** announcement. **Enable** the days on which the announcement **Schedule** is active.
End time	Enter (hh/mm)	Enter the time to end the **Schedule** announcement on the enabled days. After the **End time**, the announcement is not repeated.
Interval	Enter (hh/mm)	Enter the interval between the **Schedule** announcements.
Add	Button	Click to add a new call definition.
Rename	Button	Click to rename an existing call definition. Automatically this name is replaced everywhere in the configuration where this call definition is used.
Delete	Button	Click to delete a call definition from the system configuration.
Submit	Button	Click the **Submit** button to store the settings: Notice that you always have to **Save the configuration**. Refer to *Save configuration, page 130*.

Add (create) a call definition
1. **Click** the *Add* button to add/create a new *call definition*.
2. **Enter** the name of the new *call definition* in the *Name* text box:
   – It may consist of up to 16 characters, maximum.
3. **Click** the *OK* button to *add* the *call definition* to the list of *call definitions* in the system.

4. **Select**, **enable** or **disable** each of the items (see previous table) to define the *call definition*:
5. **Click** the *Submit* button to store the changes:
   – Note that the changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

Delete a call definition

Proceed as follows to *delete* a *call definition*:
1. **Select** the *call definition* that has to be deleted from the *Name* dropdown list.
2. **Click** the *Delete* button to delete the *call definition*.
   – A pop-up window asks to confirm this choice.
3. **Click** the *OK* button to confirm that the *call definition* must be deleted:
   – The deleted *call definition* is no longer available from the *Name* dropdown list.
4. **Click** the *Submit* button to store the changes:
   – Note that the changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

Refer to

5.8 Action definitions

On the **Action definitions** pages, you can configure specific device functionalities. For an overview of the functionalities available through all the devices in the PROMATRIX 9000 system refer to:
The process of configuring an action to a button or to an input consists of two steps:
See the following sections to configure the actions per device type category:

5.8.1 Assigning an operation

The *operation* specifies how the *control input* deals with incoming signals or how the *button* reacts when it is pressed and released. An *operation* is always linked to a *function* (see *Assigning a function, page 102*).

Type of operations

The available type of *operations* are represented in the following table:

Operation type	Description
Momentary - abort on release	**The action** coupled to the *control input* or *button* is active during the time the external contact is closed. When the external contact is opened, the action is immediately aborted.
Momentary - finish on release	**The action** coupled to the *control input* or *button* is active during the time the external contact is closed. When the external contact is opened, the action is stopped after the completion of the current phase.
	When the external contact is closed again while the action is still running, the action is immediately aborted.
Toggle - abort on switch off	**The action** coupled to the *control input* or *button* is started when the external contact closes and immediately aborted when the external contact closes again.
Toggle - finish on switch off	**The action** coupled to the *control input* or *button* is started when the external contact closes. When the external contact closes again, the action is stopped after the completion of the current phase.
	When the external is closed a third time while the action is still running, the action is immediately aborted.
Do once	**The action** is started when the external contact closes. **The action** can be stopped with an *Abort phased announcement* or *Finish phased announcement.* **Usually**, the Abort/*Finish phased announcement* operation is used for triggering events (for example, to cancel a selection) and actions with a significant duration (for example, an announcement).
Abort phased announcement	**The action** is stopped when the external contact closes. This type of **operation** is used for stopping actions that were started with a *Do once* operation.
Finish phased announcement	**The action** is stopped when the external contact closes. This type of **operation** is used for stopping actions that were started with a *Do once* operation.
Make phased announcement	**The action** coupled to a *virtual control input* of the *system controller* is started/stopped/aborted depending of the trigger by the Open Interface.
Toggle	**The action** coupled to the *button* is started when the contact closes and stopped when the contact closes again.

Refer to

5.8.2 Assigning a function

The **Function** field determines which function is triggered if the control input or button becomes active. The operation that can be assigned to a *control input or button* depends on the function. A function is always linked to an operation. Refer to *Assigning an operation, page 100*.

You can configure the **Functions** with the listed devices, as described through their abbreviations in the table below.

– The call station -> **CS**
– The call station extension -> **CSE**
– The system controller (virtual control inputs) -> **SC (VCI)**
– The multifunction power supply -> **MPS**
– The control interface module -> **IM16C8**
– The audio interface module -> **IM2A2**

Functions and operations

The numbers in the following two tables refer to the operations availability in relation with the functions. For the control inputs, each function is activated through the options **Contact make** or **Contact break**.

Operation number	Operation description
1	Momentary: abort on release
2	Momentary: finish on release
3	Toggle: abort on switch off
4	Toggle: finish on switch off
5	Do once
6	Abort phased announcement
7	Finish phased announcement
8	Toggle

Function Used with device	Input I=Input option		Operation number D=Default | O=Optional | -=Not applicable							
	CSE Button	Control input	1	2	3	4	5	6	7	8
Press-to-Talk (PTT) button CS	-	-	-	D	-	O	-	-	-	-
Make announcement CSE, SC (VCI), MPS, IM16C8, IM2A2	I	I	D	O	O	O	O	-	-	-

Function Used with device	Input I=Input option		Operation number D=Default | O=Optional | -=Not applicable							
	CSE Button	Control input	1	2	3	4	5	6	7	8
Make announcement with zone selection CSE	I	-	-	-	D	O	-	-	-	-
Select zone(s) CSE	I	-	-	-	-	-	-	-	-	D
Start phased announcement CSE, MPS, IM16C8, IM2A2	I	I	D	-	O	-	O	-	-	-
Stop phased announcement CSE, MPS, IM16C8, IM2A2	I	I	-	-	-	-	-	D	O	-
Silence zone(s) CSE, IM16C8, IM2A2	I	-	D	-	O	-	-	-	-	-
Acknowledge and/ or reset CSE, MPS, IM16C8, IM2A2	I	I	-	-	-	-	D	-	-	-
Indicator test CSE	I	-	D	-	-	-	-	-	-	-
External fault MPS, IM16C8, IM2A2	-	I	D	-	O	-	-	-	-	-
External zone fault UL: **Zone trouble** MPS, IM16C8, IM2A2	-	I	D	-	O	-	-	-	-	-
Mains supply fault: External UL: **AC power supply trouble: External** MPS, IM16C8, IM2A2	-	I	D	-	O	-	-	-	-	-

Function Used with device	Input I=Input option		Operation number D=Default | O=Optional | -=Not applicable							
	CSE Button	**Control input**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Power save mode MPS, IM16C8, IM2A2	-	I	D	-	O	-	-	-	-	-
Switch control output CSE, MPS, IM16C8, IM2A2	I	I	D	-	O	-	-	-	-	-
Local BGM source MPS, IM16C8, IM2A2	-	I	D	-	O	-	-	-	-	-
Local BGM on/off MPS, IM16C8, IM2A2	-	I	D	-	O	-	-	-	-	-
Local BGM volume control MPS, IM16C8, IM2A2	-	I	D	-	O	-	-	-	-	-
Local brightness control CSE	I	-	-	-	-	-	D	-	-	-
Transfer of control (for UL) CSE	I	-	-	-	-	-	D	-	-	-

The meaning and functionality of the functions are described in *Input functions description, page 104*. The various operations are described in *Assigning an operation, page 100*.

5.8.3   Input functions description

The functions described next are activated through a button or a contact input. Besides the operation, and depending on the chosen function, you can select or enter other configuration settings. For the control inputs, each function is activated through the options **Contact make** or **Contact break**.

Refer also to:
–   *Assigning an operation, page 100* for a description of the type of operations available to a control input.
–   *Assigning a function, page 102* for an explanation on the product abbreviations.

Press-to-Talk (PTT) > (CS)
This *function* can be assigned to PTT *buttons*.

Using the *Press-to-Talk* (PTT) *function*, an announcement with a predefined priority based on a *call definition* can be started in one or more **selected** *zones* or *zone groups*. When the activator of a *PTT function* is released, the announcement is stopped after completion of the running phase of the announcement.
– Configuring a *PTT function* is similar to configuring a *Make announcement* function. The PTT button of call stations is linked to the status LCD and LEDs.
– **Select**: Operation.

Make announcement > CSE, SC (VCI), MPS, IM16C8, IM2A2
Assign this function to buttons and/or (virtual) control inputs.
Use the **Make announcement** function to start an announcement with a predefined priority based on a call definition in one or more selected zones or zone groups. When the activator of a **Make announcemen**t function is released, the announcement is aborted or stopped depending on the selected operation.
– If you configure more than one action (up to a maximum of 5) for this function, you can also configure multiple sets of call definitions, priorities and zones.
– **Select**: Operation, Call definition, Priority, Zone/Zone groups.
– **Add / remove** (**>** / **<**): Zone(s) / Zone groups.
    – Zones are selected through two table boxes: the left one shows the available zones, the right one shows the selected zones.

Make announcement with zone selection > (CSE)
This *function* can be assigned to *buttons* and is similar to the *Make announcement* function but without pre-configured *zone / zone groups* selection. Using the *Make announcement with zone selection* function, a pre-recorded message, based on a *call definition*, can be started/ aborted/stopped in one or more manual selected *zones / zone groups*.
– Select first one or more *zones / zone groups* to start a *Make announcement with zone selection*.
– A running *call definition* can abort/stop (depending on the configured operation) by pressing the *Make announcement with zone selection* button again.
– Removing *zones / zone groups* during a running *call definition* is not possible.
– Add a zone / zone groups to a running call definition by selecting a zone / zone group and then pressing the **Make announcement with zone selection** button again:
    – If no zones selected, and a call definition was already running, the call definition is stopped/aborted.
– The **Make announcement with zone selection** button loudspeaker LED is:
    – White while the call definition is ongoing.
    – Blue for business announcements and calls.
    – Red for emergency and mass notification announcements and calls as long as the call definition is ongoing.
– **Select**: Operation and Call definition.

Notice!
The zones and/or zone groups assigned to the PTT button are always added to the calls started with the **Make announcement with zone selection** function.

Select zone(s) > (CSE)

This *function* can be assigned to *buttons*. The *button* is used to activate and route audio to the selected *Zone(s)/Zone groups*.

Using a *Zone selection* button, one or more *zones* and/or one or more *zone groups* can be selected.

– **Select**: Operation, Call definition, Zone/Zone groups.
– **Add/remove** (><): Zone(s) / Zone groups.
  – Zone selection is done via two table boxes, the left one showing the *available zones*, the right one the *selected zones*.
– **Enable/disable** BGM channel selection. Selects which BGM channel could be selected to run on this zone/zone group selected via the call station display BGM tile.

Start phased announcement > CSE, MPS, IM16C8, IM2A2

Assign this function to buttons and/or (virtual) control inputs.

Use the **Start phased announcement** function to make emergency announcements for a phased evacuation. The **Start phased announcement** function starts an announcement, based on a call definition, in a pre-defined zone or zone group. The priority of the announcement is the same as the priority of the call definition and cannot be changed.

– If you configure more than one action (up to a maximum of 5) for this function, you can also configure multiple sets of call definitions and of zones.
– Typically, multiple **Start phased announcement** functions are configured with the same call definition, but address other zones or zone groups. In case of a phased evacuation, the different **Start phased announcement** functions can be used to expand the area in which the announcement is running.
– Depending of the operation selected: When the activator of a **Start phased announcement** function is released, the running announcement is stopped in the zones or zone groups that are associated to the function. In the case of a phased evacuation, releasing the different **Start phased announcement** functions can reduce the area where the announcement is running.
– **Select**: Operation, Call definition, Zone/Zone groups.
– **Add / remove** (**>** / **<**): Zone(s) / Zone groups.
  – Zones are selected through two table boxes: the left one shows the available zones, the right one shows the selected zones.

Warning!

You can only start and stop phased announcements in zone(s) / zone groups that belong to the same master or subsystem. This function does not work remotely in between systems.

Stop phased announcement > CSE, MPS, IM16C8, IM2A2

Assign this function to buttons and/or (virtual) control inputs.

Use the **Stop phased announcement** function to abort emergency announcements for phased evacuation. The **Stop phased announcement** function aborts all announcements that are based on the defined call definition.

– If you configure more than one action (up to a maximum of 5) for this function, you can also configure multiple call definitions.
– **Select**: Operation and Call definition.

Silence zone(s) > CSE, SC (VCI), MPS, IM16C8, IM2A2

Assign this function to buttons.

With a silence button, the function **Silence zone(s)** mutes the selected zones when activated.
–   **Select**: Operation.

Acknowledge and/or reset > CSE, MPS, IM16C8, IM2A2
Assign this function to buttons and/or (virtual) control inputs.
Use the **Acknowledge and/or reset** function to acknowledge and reset faults or emergency states. It is possible to select fault or emergency status for this function. You can also select whether the function should acknowledge, reset, or simultaneously acknowledge and reset (Ack/reset) this status.
–   **Select**: Operation, Type (Fault or Emergency) and Ack/reset.
In the case of **Fault selection**, the following settings are available:
–   **Acknowledge**: The indicator functions as fault buzzer.
–   **Reset**: The indicator functions as fault indicator.
In the case of **Emergency selection**, an additional setting becomes available: **Reset aborts active emergency calls**. For this setting, you can choose:
–   **No**: The emergency state cannot be reset as long as emergency announcements are still ongoing. This is the preferred way of operation, as it is mandatory for EN 54-16 and other standards.
–   **Yes**: This setting is used by engineers in technical rooms to force a reset after an evacuation, when the system must be silenced.
–   **Acknowledge**: The indicator functions as emergency buzzer.
–   **Reset**: The indicator functions as emergency indicator.

Indicator test > CSE
Assign this function to buttons and/or (virtual) control inputs.
When the **Indicator test function** is configured:
–   The sounder is active.
–   All indicators on the call station and all its connected call station extensions switch intermittently to visually check the condition of the indicators.
–   Bi-color indicators alternates between colors.
–   LCD alternates between colors.

External fault > MPS, IM16C8, IM2A2
Assign this function to control inputs.
Use the **External fault** function to log a customized message that changes the system to the fault state.
–   **Select**: Operation.
–   **Enter**: A free chosen text/name. The text/name appears on the Logging Viewer pages.

External zone fault / Zone trouble (UL2572) > MPS, IM16C8, IM2A2
Assign this function to control inputs.
The **External zone fault / Zone trouble** function generates an external line fault/trouble. This fault/trouble is similar to a failure in an amplifier loudspeaker line, which the amplifier itself detects.
–   Give the control input for this function a proper name, such as the name of the zone-loop that is supervised.

– In the configuration, you can couple multiple zone names to the **External zone fault /
Zone trouble** function. This allows combining multiple fault contacts for different loops
on a single control input. These zone names will show up in the fault/trouble log in the
case of a fault/trouble.
– Configure only a single zone for each **External zone fault / Zone trouble** control input.
– **Select**: Operation.
– **Add / remove** (**>** / **<**): Zone(s) / Zone groups.
    – Zones are selected through two table boxes: the left one shows the available
    zones, the right one shows the selected zones.

Mains supply fault: External / AC power supply trouble: External > MPS, IM16C8, IM2A2
Assign this function to control inputs.
The **Mains supply fault: External** / **AC power supply trouble: External** function changes the
system to the backup power mode in case the 48 VDC of an amplifier is low or
disconnected. You can see this state on the LED of the amplifier, which turns blue. In this
mode, all the calls and announcements below a specified priority are aborted.
– **Select**: Operation.

Power save mode > MPS, IM16C8, IM2A2
Assign this function to control inputs.
The **Power save mode** function changes the system to the backup power mode. A fault /
trouble is not reported.
– **Select**: Operation.

Switch control output > CSE, MPS, IM16C8, IM2A2
The **Switch control output** function activates the control outputs and the call station
extensions buttons. In the case of the call station extension, the button itself is not used by
this function. Only the indicator / output attached to the button is activated.
– **Select**: Operation and Priority.
– **Add** / **remove** (**>** / **<**): Control outputs (1-8).

Notice!
The **Switch control output** function only works on control outputs that belong to the same
master system or subsystem.

Local BGM > MPS, IM16C8, IM2A2
Assign this function to control inputs.
The **Local BGM** function steps through all available BGM sources in the assigned zone
(groups), including an inserted Local BGM off position.
– **Select**: Operation.

Local BGM on/off > MPS, IM16C8, IM2A2
Assign this function to control inputs.
The **Local BGM on/off** function turns background music on or off in predefined zone
(groups).
– **Select**: Operation.

Local BGM volume control > MPS, IM16C8, IM2A2
Assign this function to control inputs.
The **Local BGM volume control** function controls the volume of the BGM in the assigned zone (groups). It can be changed in steps of 3 dB between -96 dB and 0 dB.
– **Select**: Operation.

Local brightness control > (CSE)
This *function* can be assigned to call station extension *buttons*.
The *Local brightness control* function is used to control the brightness of a call station display, LEDs and the connected call station extension LED's. Changing the *brightness up* and *brightness down* in steps by using the call station extension buttons. This function can be set to each individual call station and its connected call station extensions.
Select: Operation and Brightness (Brightness up or down).

Transfer of control > (CSE)
The *Transfer of control* function can **only** be assigned to extension *buttons* when the connected First responder panel / call station (button) is selected and set in *Call station, page 64 > Settings > Class: Mass notification* and *Emergency group > Group.*
The *Transfer of control* function is used to set the *Function* of a button to:
– **Control indicator**:
    – White button ring lit: The First responder panel / call station is 'in control'.
    – White button ring off: The First responder panel / call station is NOT 'in control'.
– **Request control**: Used to request the 'in control' First responder panel / call station to take over the 'in control' function. The request is granted or denied by the current 'in control' First responder panel / call station.
    – Pressing the **Request control** button continuously on a First responder panel / call station that is configured in the 'Overrule control request' immediately transfers control to that First responder panel / call station.
– **Grant:** Used by the 'in control' First responder panel / call station to *Grant* an *Overrule control request* of another First responder panel / call station in the *Overrule control request section.*
– **Deny:** Used by the 'in control' First responder panel / call station to *Deny* an *Overrule control request* of another First responder panel / call station in the *Overrule control request* section.
The *function* can be set to each individual button.
Select: Operation and Function.

Notice!
The transfer of control functions only work within the same master and subsystem.

5.8.4 Output functions description
The functions described next are activated through a contact output. Depending on the chosen function, you can select or enter other configuration settings.

Refer also to:
– *Assigning an operation, page 100* for a description of the type of operations available to a control input.

– *Assigning a function, page 102* for an explanation on the product abbreviations.

Switch output > MPS, IM16C8, IM2A2
Selected by default. The control output is activated by a button or control input configured with the **Switch control output** function.

Zone activity > MPS, IM16C8, IM2A2
Select **Zone activity** to activate the control output when there is an active announcement in the associated zone activated by a control input and/or call station button.
– **Select**: Priority and Zone.

Fault alarm buzzer / Trouble sounder (UL 2572) > MPS, IM16C8, IM2A2
Select **Fault alarm buzzer** / **Trouble sounder** for the control output to activate, for example, a connected buzzer/ sounder each time a fault is detected in the system.
This function can only be deactivated by acknowledging all faults/troubles through a call station button.
Note:
– Fault: relay contact open.
– No fault: relay contact closed.

Fault alarm indicator / Trouble indicator (UL 2572) > MPS, IM16C8, IM2A2
You can only use this function when **Mains supply fault: Grace time to report mains fault on control outputs** is selected instead of Off in the *System settings, page 81*.
Select **Fault alarm indicator / Trouble indicator** for the control output to activate a visual indicator, for example, a LED or lamp, each time a fault/trouble is detected in the system. This function can only be deactivated by resetting all faults/troubles through a call station button.
– **Enable**: Indicate mains power fault after grace time.
Note:
– Fault: relay contact open.
– No fault: relay contact closed.

Emergency alarm buzzer / Alarm sounder (UL 2572) > MPS, IM16C8, IM2A2
Select **Emergency alarm buzzer / Alarm sound** for the control output to activate for example, a connected buzzer/ sounder each time a call with priority 223 or higher is started, such as an emergency announcement.
This function can only be deactivated by acknowledging the emergency state through a call station button.
Note:
– Fault: relay contact open.
– No fault: relay contact closed.

Emergency alarm indicator / Alarm indicator (UL 2572) > MPS, IM16C8, IM2A2
Select Emergency alarm indicator / Alarm indicator for the control output to activate a visual indicator, for example, a LED or lamp, each time an announcement with priority 223 or higher is started, such as an emergency announcement..
This functions can only be deactivated by resetting the emergency state through a call station button.

Note:
–   Fault: relay contact open.
–   No fault: relay contact closed.

System fault indicator / System trouble indicator (UL 2572) > MPS, IM16C8, IM2A2
Select **System fault indicator / System trouble indicator** for the control output to activate a
visual indicator, for example, a LED or lamp, each time a system fault/trouble is detected in
the system.
System faults/troubles are a subset of all possible faults/troubles. See also the Events
manual.
Note:
–   Fault: relay contact open.
–   No fault: relay contact closed.

Power fault indicator > MPS, IM16C8, IM2A2
Select **Power fault indicator** for the control output to activate the control output relay each
time a Mains power fault or a Battery backup fault is detected in the system. The fault can
be shown through a connected LED or lamp, for example.
–   **Select**: Mains power fault or Battery backup fault.
Note:
–   Fault: relay contact open.
–   No fault: relay contact closed.

Audio activated output > IM2A2
When **Audio activated output** is selected, the control output is activated when the audio
level on the corresponding audio output exceeds the configured priority. The control output
is always paired with the same audio output, for example, control output #2 with audio
output #2.
–   **Select**: Priority range.

Notice!

With the functions:
- Switch output
- Zone activity
The relay is activated when the output is triggered or if there is activity in the configured
zone. Otherwise, the relay is deactivated.

However, for the functions:
- Fault alarm buzzer
- Fault alarm indicator
- Emergency alarm buzzer
- Emergency alarm indicator
- System fault indicator
- Power fault indicator
The relay is activated when there is no fault or emergency. If there is a fault or emergency,
the relay is deactivated.

5.8.5 System controller

On the *Action definitions* page of the *system controller*, the *virtual control inputs* could be defined, which could be used by the Open Interface.

1. **Below** the *Action definitions* configuration page, **click** *system controller*:
   – A screen appears with an overview of the connected *system controller(s)*.
2. **Select and click** the *name* of the *system controller* to be configured.
   – A row called *virtual control inputs* appears.
3. **Click** the + of the *virtual control* inputs row:
   – A screen appears listed the VCIs each with the following items:

Item	Value	Description
VCI (n)	Static text	**Shows** the name of *virtual control input* which is **entered** in section *System controller, page 55* > VCI paragraph.
Function name	Static text	**Shows** the name of the *Function* which is **selected** in section *System controller, page 55* > VCI paragraph.
Call definition	Selection	**Select** the *call definition* which is **created** in section *Call definitions, page 96*
Zone / Zone groups	Selection	**Select** the *zone* or *zone group* which is **created** in section *Zone definitions, page 88*
> and <	Buttons	**Using** the > and < buttons, a **selected** *zone* or *zone group* (left area box) can be **added** to, or **removed** from the assigned *zone* or *zone groups* (right area box).
Submit	Button	**Click** the *Submit* button to store the settings: Notice that you always have to *Save* the configuration. See *Save configuration, page 130*

Configure a virtual control input action

See *Assigning a function, page 102* for *Function (action)* and *Assigning an operation, page 100* for *operations* available for the *system controller*.

Each created *virtual control input* (VCI) for the *system controller* is listed and can be individual selected and configured. To do so:

1. **Select** the *call definition* from the dropdown list.
2. **Select** *zone* or *zone groups* from the dropdown list.
3. **Select and move** the *zone* or *zone groups* from the left area box to the right area box by using the > button.
   – Removing a *zone* and *zone groups* will be done in the reversed order by using the < button.
4. **Click** the *Submit* button to store the settings. See also *Save configuration, page 130*.

5.8.6 Multifunction power supply

On the **Action definitions** page of the **Multifunction power supply** you can configure the functions you selected in *Multifunction power supply, page 62*.

1. Below **Action definitions**, click **Multifunction power supply**.
   – A new screen appears listing the configured devices.
2. Click the device you want to configure.

Control inputs configuration

1. Click the **+** sign of the **Control inputs** category row.
    The control inputs appear. When **Disabled** appears as the name of the function, the control input is disabled.
2. For each enabled control input, choose an **Operation** from the dropdown list. For a detailed description of the operations, refer to *Assigning an operation, page 100*.
3. For each enabled input configured with a call related function, choose a **Call definition** from the dropdown list. For a detailed description of the call definitions, refer to *Call definitions, page 96*.
4. Move the **Zone** or **Zone groups** from left to right to configure the zones related to your enabled inputs.
5. Click the **Submit** button.
    –   The changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

Control outputs configuration

1. Click the **+** sign of the **Control outputs** category row.
    –   The control outputs appear. When **Disabled** appears as the name of the function, the control output is disabled.
    –   The name and the function of the control outputs are static and can only be changed in the *Device options, page 54* page of the device. The exceptions are the functions **Zone activity**, **Power fault indicator** and **Fault alarm indicator** / **Trouble indicator** (UL2572).
2. For the outputs with the **Zone activity** function, select the **Priority range** and the **Zone**.
    –   **Note**: The **Zone activity** function only works within the system where it is configured.
3. For the outputs with the **Power fault indicator** function, choose between **Mains power fault** and **Battery backup fault** from the dropdown list.
4. For the outputs with the **Fault alarm indicator** / **Trouble indicator** (UL 2572) function, enable **Indicate mains power fault after grace time** if necessary.
5. Click the **Submit** button.
    –   The changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

Refer to

–   *Save configuration, page 130*

5.8.7   Call station

On the *Action definitions* page of the *call station*, *call station* and *call station extension* actions could be defined.

Functions and operations

See *Assigning a function, page 102* for *functions* and *Assigning an operation, page 100* for *operations* (behaviors) available for the *call station and call station extension*.

Configure a call station action

In the *General* section, the properties of the press-to-talk (PTT) button of the *call station* can be defined. This button has default the PTT action. To do so:

1. **Below** the *Action definitions* configuration page, **click** *call station*:
    –   A screen appears with an overview of the connected call station(s).

2. **Select and click** the *name* of the *call station* to be configured:
   – A *General* section row and, if one or more *call station extension(s)* connected, *call station extension* section rows appearing.
   – A *Submit* button appears.
3. **Click** the + of the *General* row:
   – A screen appears listed the following items:
4. **Select** the following items to configure the actions of the *Call station Press to talk* button.

Item	Value	Description
Press to talk	Static text	**Shows** the name *Press to talk* (PTT) of the PTT button of the *call station* **selected** and cannot be changed.
Operation	Selection	**Selec**t the *operation* of the *function* to be **used** from the dropdown list. See *Assigning an operation, page 100*.
Call definition	Selection	**Select** the *Call definition* to be **used** from the dropdown list. See *Call definitions, page 96*
Zone / zone groups	Selection	**Select** the *Zone* or *Zone groups* to be **used** from the dropdown list. See *Zone definitions, page 88*. **NOTE**: The selected *Zone(s)* and/or *Zone group(s)* will be used when (only) the PTT button is pressed. A call station extension (zone selection button) can still be added, but is not required.
> and <	Buttons	**Using** the > and < buttons, selected *Zone* or *Zone groups* can be added (>) to, or removed (<) from, the PTT button.
Depending of the selected Function, different parameters could be selected, entered, added/removed. See *Assigning a function, page 102* **for descriptions.**		
Submit	Button	**Click** the *Submit* button to store the changes. Note that the changes are not permanent and active until the configuration is saved. See *Save configuration, page 130*.

Configure call station extension button action

In the *Call station extension* section, the properties of the *buttons* of the *call station extension* can be defined. To do so:

1. **Click** the + of the (*call station*) *Extension* row:
    –   A screen appears listed the following items.
2. **Select** the items to configure the actions of the *Call station extension*

Item	Value	Description
1 xxx [#01]	Static text	**Shows** the number and name of each of the buttons of the *call station extension* selected and cannot be changed.
Operation	Selection	**Select** the *Operation* of the *Function* which is **selected** in section *Call station, page 64*. See also *Assigning an operation, page 100*.
BGM channel selection	Enable / Disable	BGM channel selection is **only available** when the *Function Select zone(s)* is selected. **Enable**: Selection of the BGM channel(s) which is/are created in the section *BGM routing, page 94*. The configured BGM routing can be used on the call station *Music* screen for these specific selected Zone(s). A maximum of four music sources can be assigned to one Zone and will be shown in the display.
> and <	Buttons	**Using** the > and < buttons, a *BGM routing* channel can be selected (left area box) and added to, or removed from, the assigned *BGM routing* channel (right area box).
Depending of the selected Function, different parameters could be selected, entered, added/removed. See *Assigning a function, page 102* for descriptions.		
Submit	Button	**Click** the *Submit* button to store the changes. Note that the changes are not permanent and active until the configuration is saved. See *Save configuration, page 130*.

Configure buttons

See *Assigning a function, page 102* for *functions* and *Assigning an operation, page 100* for *operations* available for the *call station (extension) buttons*.

Each of the *buttons* listed and can be individual configured. To do so:

1. **Select** the *Operation* from the dropdown list.
2. **Select**, **enter** and/or **add/remove** the parameters belonging to the selected *Function*.
3. **Click** the *Submit* button to store the settings. See also *Save configuration, page 130*.

Recorded messages

Recorded messages selection is only visible/possible if this **function** is enabled in *Call station, page 64*.

1. **Click** the + of the Recorded messages row.
2. **Select** the *call definition*:
    –   **Note**: Do not select *call definition* with *Live speech* set to "**Yes**".
3. **Click** the *Submit* button to store the settings. See also *Save configuration, page 130*.

Alert messages

Alert messages selection is only visible/possible if this **function** is enabled in *Call station, page 64*.

1. **Click** the + of the Alert messages row.
2. **Select** the *call definition*:
   - **Note**: Do not select *call definition* with *Live speech* set to "**Yes**".
3. **Select** (add/remove) the *zone/zone group* with the > < buttons.
4. **Click** the *Submit* button to store the settings. See also *Save configuration, page 130*.

Refer to

– *Action definitions, page 100*

5.8.8 Control interface module

In the **Action definitions** page of the **Control interface module**, you can configure the functions you selected in *Control interface module, page 69*.

– Below **Action definitions**, click **Control interface module**.

Control inputs configuration

1. Click the **+** sign of the **Control inputs** category row.
   The control inputs appear. When **Disabled** appears as the name of the function, the control input is disabled.
2. For each enabled control input, choose an **Operation** from the dropdown list. For a detailed description of the operations, refer to *Assigning an operation, page 100*.
3. For each enabled input configured with a call related function, choose a **Call definition** from the dropdown list. For a detailed description of the call definitions, refer to *Call definitions, page 96*.
4. Move the **Zone** or **Zone groups** from left to right to configure the zones related to your enabled inputs.
5. Click the **Submit** button.
   - The changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

Control outputs configuration

1. Click the **+** sign of the **Control outputs** category row.
   - The control outputs appear. When **Disabled** appears as the name of the function, the control output is disabled.
   - The name and the function of the control outputs are static and can only be changed in the *Device options, page 54* page of the device. The exceptions are the functions **Zone activity**, **Power fault indicator** and **Fault alarm indicator** / **Trouble indicator** (UL2572).
2. For the outputs with the **Zone activity** function, select the **Priority range** and the **Zone**.
   - **Note**: The **Zone activity** function only works within the system where it is configured.
3. For the outputs with the **Power fault indicator** function, choose between **Mains power fault** and **Battery backup fault** from the dropdown list.
4. For the outputs with the **Fault alarm indicator** / **Trouble indicator** (UL 2572) function, enable **Indicate mains power fault after grace time** if necessary.
5. Click the **Submit** button.

　　　　　– 　The changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

5.8.9　　Audio interface module

In the **Action definitions** page of the **Audio interface module**, you can configure the functions you selected in *Audio interface module, page 71*.

–　Below **Action definitions**, click **Audio interface module**.

Control inputs configuration
1. Click the **+** sign of the **Control inputs** category row.
   The control inputs appear. When **Disabled** appears as the name of the function, the control input is disabled.
2. For each enabled control input, choose an **Operation** from the dropdown list. For a detailed description of the operations, refer to *Assigning an operation, page 100*.
3. For each enabled input configured with a call related function, choose a **Call definition** from the dropdown list. For a detailed description of the call definitions, refer to *Call definitions, page 96*.
4. Move the **Zone** or **Zone groups** from left to right to configure the zones related to your enabled inputs.
5. Click the **Submit** button.
   – 　The changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

Control outputs configuration
1. Click the **+** sign of the **Control outputs** category row.
   – 　The control outputs appear. When **Disabled** appears as the name of the function, the control output is disabled.
   – 　The name and the function of the control outputs are static and can only be changed in the *Device options, page 54* page of the device. The exceptions are the functions **Zone activity**, **Power fault indicator**, **Fault alarm indicator** / **Trouble indicator** (UL 2572) and **Audio activated output**.
2. For the outputs with the **Zone activity** function, select the **Priority range** and the **Zone**.
   – 　**Note**: The **Zone activity** function only works within the system where it is configured.
3. For the outputs with the **Power fault indicator** function, choose between **Mains power fault** and **Battery backup fault** from the dropdown list.
4. For the outputs with the **Fault alarm indicator** / **Trouble indicator** (UL 2572) function, enable **Indicate mains power fault after grace time** if necessary.
5. For the outputs with the **Audio activated output** function, select the minimum and maximum **Priority range** between 0 and 255.
   – 　This function is available only for outputs #01 and #02.
6. Click the **Submit** button.
   – 　The changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

5.8.10　　Wall control panel

In the **Action definitions** page of a **Wall control panel**, you can configure the zone and the BGM channels.

Zone

– Use the drop-down menu to assign a zone to the wall control panel.
  – Zone groups and the lifeline zone are not available, as they cannot be configured.
  – You can assign multiple wall control panels to the same zone.

Select BGM channels

– Use the **>** and **<** buttons or double-click an item to move it between the lists on the left and on the right.
  – You can select up to 15 BGM channels.
  – In the display of the wall control panel, the BGM channels appear in the order they are added.
  – You can select different BGM channels for multiple wall control panels assigned to the same zone. For example, Zone 1 is assigned to:
    WCP-A with BGM1 and BGM2 configured, and
    WCP-B with BGM2 and BGM3 configured.

5.8.11 Telephone interface

You can define actions for each SIP account in the **Action definitions** page for the **Telephone Interface**.

1. Below **Action definitions**, click **Telephone interface**.
2. Click the **+** sign of the **SIP accounts** category row.
   – You can now see an overview of the SIP accounts you added
3. For each SIP account, choose a **Call definition** from the drop-down list.
4. Move the **Zone** or **Zone groups** from left to right to configure the zones of your extensions.
5. Click the **Submit** button.

(i)

Notice!
In a multi-controller setup, you can only program a telephone interface either in the master or in a subsystem. However, when the telephone interface is configured in the master system, a telephone interface call can be assigned to multiple subsystems.

The following settings defined in *Call definitions, page 96* will be ignored when a telephone interface call is ongoing:

– Messages
– Live speech
– Continue call.

5.9 Audio processing

On the *Audio processing* pages, the audio processing parameters of an *audio input* of a call station, ambient noise sensor and/or *audio outputs* of an amplifier in the PROMATRIX 9000 system can be set: See:

– *Amplifier, page 119*
– *Call station, page 121*
– *Audio interface module, page 125*

– *Ambient noise sensor, page 123*

The DSP audio equalizers have an internal headroom of 18 dB. Do not use audio equalizer settings with an accumulated gain of more than 18 dB at any frequency, as this will cause audio clipping for full scale input signals. It is good practice to do most of the frequency response corrections by attenuation of prominent frequency bands.
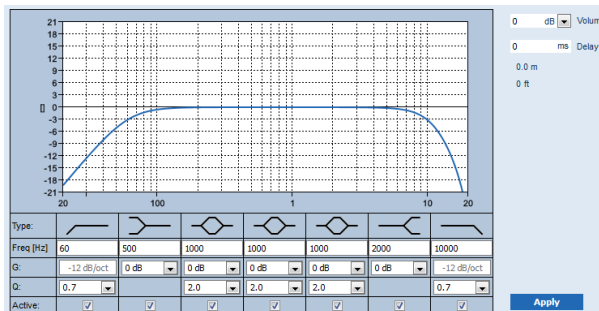
Refer to
– *Audio interface module, page 125*
– *Ambient noise sensor, page 123*
– *Amplifier, page 119*
– *Call station, page 121*

5.9.1   **Amplifier**
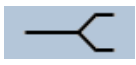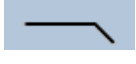
On the *Audio processing* page of the *Amplifier*, the audio processing parameters of the selected amplifier *outputs* can be set.

– For each *audio output* of the amplifier, a *parametric equalizer*, an *audio delay* option and a *volume* level selection button is available to set the *audio output* signal.

1. **Below** the *Audio processing* page, **click** *Amplifier*:
   – A new screen appears listed the connected Amplifier(s).
2. **Select and click** the *Amplifier* name to configure.
   – A new screen appears listed the *Amplifier outputs*.
3. **Select and click** the + of the *Amplifier output* category row:
   – The audio processing / parametric equalizer overview appears.
4. **Select** each of the following items, if required.

F: Frequency, **G:** Gain, **Q:** Quality factor

Item	Filter	Value	Description
High-pass filter		Enter F Select Q	**Default:** Frequency 60 Hz, Quality factor 0.7 (selectable 0.2 - 2.0). **Fixed**: Gain -12 dB/oct.
Shelving filter (for low frequencies)		Enter F Select G	**Default:** Frequency 500 Hz, Gain 0 dB (selectable: -infinite - +12 dB).
Full parametric sections (3)		Enter F Select Q, G	**Default:** Frequency 1000 Hz, Quality factor 20.0 (selectable 0.4 - 20.0), Gains 0 dB (selectable: -infinite - +12 dB)

Item	Filter	Value	Description
Shelving filter (for high frequencies)		Enter F Select G	**Default:** Frequency 2000 Hz, Gain 0 dB (selectable: -infinite - +12 dB).
Low-pass filter		Enter F Select Q	**Default:** Frequency 10000 Hz, Quality factor 0.7 (selectable 0.2 - 2.0). **Fixed**: Gain -12 dB/oct.

Set a filter and output

Proceeds as follows to set the filters of each output separately:

1. Make sure that all loudspeakers are:
   - Connected to each amplifier output.
   - Set at the correct power level.
   - If necessary, aimed.
   - Working.
2. The frequencies, gain and quality factors of each output are already set to the default values as indicated in the previous table.
   - **IMPORTANT**: The correct output setting depends on the environment to where the audio output signal is routed to. As such, adjust it in the zones locally if needed.
3. Enable the **Active** checkbox of each filter for each output to activate it in the system.
4. Select the output volume level from the **Volume** dropdown list. The default is 0 dB.
5. Adjust the nominal output level of the audio output in the zone to guarantee the correct speech intelligibility at the maximum ambient noise level. It ranges from 0 dB to -60 dB in steps of 1 dB and Mute.
6. If required, enter the delay time in milliseconds in the **Delay** field. The default is 0 ms.
   - Make sure that the audio delay setting of each applicable amplifier output is set to the correct value.
   - By entering the delay time, the distance is calculated and displayed.
7. Click the **Apply** button.
   - Be aware that the changes are immediately applied to the audio output and can cause unexpected high-level audio output in the loudspeaker zones.
8. Click the **Submit** button to submit the changes.
   - Notice that the audio processing parameters are changed immediately when you click **Submit**. Although the changes are audible, they are not automatically saved. If the changes are not saved, they are lost when the system controller resets. See *Save configuration, page 130*.

Spare amplifier output channel

The integrated spare amplifier audio output channel automatically replaces a failing *audio output* channel, with due regard of the actual sound processing settings. Meaning that the spare amplifier *audio output* channel does not provide volume and equalizer settings for the *audio output* channel. These settings are automatically set to the same position as the failing *audio output* channel that is replaced by the spare *audio output* channel. **No** separate *audio options* settings for the spare amplifier output channel are required. Refer to the PROMATRIX 9000 installation manual (amplifier chapters) for a detailed description of the *spare amplifier output channel* function.

Lifeline audio input

Each amplifier incorporate a (backup) **analog** *lifeline audio input* driving the spare amplifier *audio output* channel to serve all connected loudspeaker *zone*s in case the network connections, or the amplifier network interface, would fail. The *lifeline* is automatically added as a *zone* when adding a multifunction power supply (mps) in *System composition, page 51* and *Zone definitions, page 88*. **No** separate *audio options* settings for the *lifeline* are available and required. Refer to the PROMATRIX 9000 installation manual (amplifier chapters) for a detailed description of the *lifeline* function.

5.9.2 Call station

On the *Audio processing* page of the *call station*, the audio processing parameters of the selected *call station input* can be set.

– For the *microphone* of the *call station*, a *parametric equalizer* is available to set the *audio output* signal. The correct setting depends on the environment to where the signal is routed to, and possible needs to be adjusted:

– It is advised to **adjust** the microphone characteristics in the room where the *call station* is located.

1. **Below** the *Audio processing* page, **click** *Call station*:
   – A new screen appears listed the connected call station(s).
2. **Select and click** the *Call station name* to configure.
   – A new screen appears listed the *Call station input*.
3. **Select and click** the + of the *Call station input* category row:
   – The audio processing / parametric equalizer overview appears.
4. **Select** each of the following items, if required:
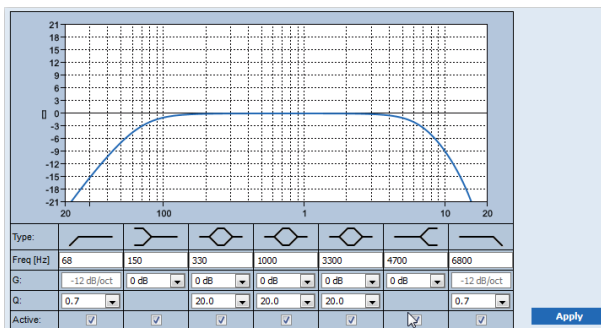
F: Frequency, **G:** Gain, **Q:** Quality factor

Item	Filter	Value	Description
High-pass filter		Enter F Select Q	**Default:** Frequency 50 Hz, Quality factor 0.7 (selectable 0.2 - 2.0). **Fixed**: Gain -12 dB/oct.
Shelving filter (for low frequencies)		Enter F Select G	**Default:** Frequency 500 Hz , Gain 0 dB (selectable:-20 dB - +12 dB).
Full parametric sections (3)		Enter F Select Q, G	**Default:** Frequency 1000 Hz, Quality factor 20.0 (selectable 0.4 - 20.0), Gains 0 dB (selectable: -infinite - +12 dB).

Item	Filter	Value	Description
Shelving filter (for high frequencies)		Enter F Select G	**Default:** Frequency 2000 Hz , Gain 0 dB (selectable: -infinite - +12 dB).
Low-pass filter		Enter F Select Q	**Default:** Frequency 10000 Hz, Quality factor 0.7 (selectable 0.2 - 2.0). **Fixed**: Gain -12 dB/oct.

Set a filter and output

Proceeds as follows to set the *filter*s of **each** *output* separately.

1. **Make sure** that all loudspeakers are connected to each amplifier output, set at the correct power level, are aimed (if necessary) and are working.
2. The frequencies, gain and quality factors of each output are already set to the default values as indicated in the previous table:
   - **IMPORTANT**: The correct output setting depends on the environment to where the audio output signal is routed to, and possible needs to be adjusted in the zone(s) locally.
3. **Enable** (checkmark) the *Active* box of each filter for each output to enable it and to make it active in the system.
4. **Click** the *Apply* button:
   - **Be aware** that the changes are immediately applied to the *audio output* and could cause unexpected high-level audio output in the loudspeaker zone(s).
5. Click the *Submit* button to submit the changes.
   - **Notice** that audio processing parameters are changed immediately when also the *Submit* button is clicked. Although the changes are audible, it is important to realize that they are not automatically saved. If the changes are not saved they will be lost when the system controller resets. See *Save configuration, page 130*.
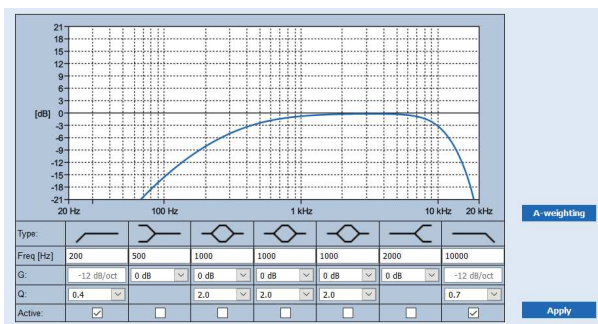
5.9.3 Ambient noise sensor

On the *Audio processing* page of the *Ambient noise sensor* (ANS), the audio processing parameters of the selected *Ambient noise sensor (microphone)* can be set.
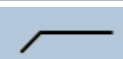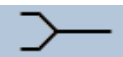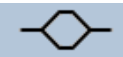
- For the *microphone* of the *ANS*, a *parametric equalizer* is available to set the *audio output* signal. The correct setting depends on to which noise frequencies the ANS should be sensitive, or insensitive, at the location where the ANS is installed.
  - The default EQ setting for an ANS is the A-weighting curve (low-cut at 200 Hz with Q = 0.4 and high-cut at 10 kHz with Q = 0.7).
  - To set the EQ back-to-default (A-weighting) curve, click the *A-weighting* button.

To do so:

1. **Below** the *Audio processing* page, **click** *Ambient noise sensor*:
   - A new screen appears, listed the connected *Ambient noise sensor(s)*.
2. **Select and click** the *Ambient noise sensor name* to configure.
   - A new screen appears listed the *Microphone(s)*
3. **Select and click** the + of the *Microphone* category row:
   - The audio processing / parametric equalizer overview appears.
4. **Select** each of the following items, if required:

F: Frequency, **G:** Gain, **Q:** Quality factor

Item	Filter	Value	Description
High-pass filter		Enter F Select Q	**Default:** Frequency 200 Hz, Quality factor 0.4 (selectable 0.2 - 2.0). **Fixed**: Gain -12 dB/oct.
Shelving filter (for low frequencies)		Enter F Select G	**Default:** Frequency 500 Hz , Gain 0 dB (selectable:-20 dB - +12 dB).
Full parametric sections (3)		Enter F Select Q, G	**Default:** Frequency 1000 Hz, Quality factor 2.0 (selectable 0.4 - 20.0), Gains 0 dB (selectable: -infinite - +12 dB).
Shelving filter (for high frequencies)		Enter F Select G	**Default:** Frequency 2000 Hz , Gain 0 dB (selectable:-20 dB - +12 dB).
Low-pass filter		Enter F Select Q	**Default:** Frequency 10000 Hz, Quality factor 0.7 (selectable 0.2 - 2.0). **Fixed**: Gain -12 dB/oct.

Equalizer settings

When automatic volume control (AVC) is enabled in a zone, an ambient noise sensor (ANS) continuously measures the ambient noise. PROMATRIX 9000 uses an averaging filter to derive the average ambient noise level from the signal of the ANS (microphone).

Proceeds as follows to **set** and **activate** the *filter*s of **each** *ambient noise sensor* (*ANS*), individually.

1. **Make sure** that the ANS is correctly connected to the system and zone.
   – See *System composition, page 51* and *Zone options, page 88*.
2. **Make sure** that all loudspeakers (zones) are connected to each amplifier output, set at the correct power level, are aimed (if necessary) and are working.
3. Note that all filters are already set to the default values as indicated in the previous table. If required, adjust the frequencies, gain and quality factors of each filter.
4. **Enable** (checkmark) the *Active* box of each (required) filter to make it active in the system.
   – The high-pass and low-pass filters are the most valuable ones, and are default already activated.
5. **Click** the *Apply* button.
6. **Click** the *Submit* button to apply the changes.
   – **Notice** that audio processing parameters are changed immediately when **also** the *Submit* button is clicked. Although the changes are audible, it is important to realize that they are not automatically saved. If the changes are not saved they will be lost when the system controller resets. See *Save configuration, page 130*.
7. Continue with *Ambient noise sensor, page 140*.

Refer to
– *Save configuration, page 130*

- *System composition, page 51*
- *Ambient noise sensor, page 140*
- *Zone options, page 88*

5.9.4   **Audio interface module**

On the **Audio processing** page of the Audio interface module, you can set the audio processing parameters of the selected audio module inputs and outputs.

1. Below the Audio processing page, click **Audio interface module**.
   - A new screen appears with the connected devices.
2. Click the audio interface module you want to configure.
   - A new screen appears with the category rows **Audio inputs** and **Audio outputs**.
   - If you do not have any audio inputs or outputs configured, only an error message appears.
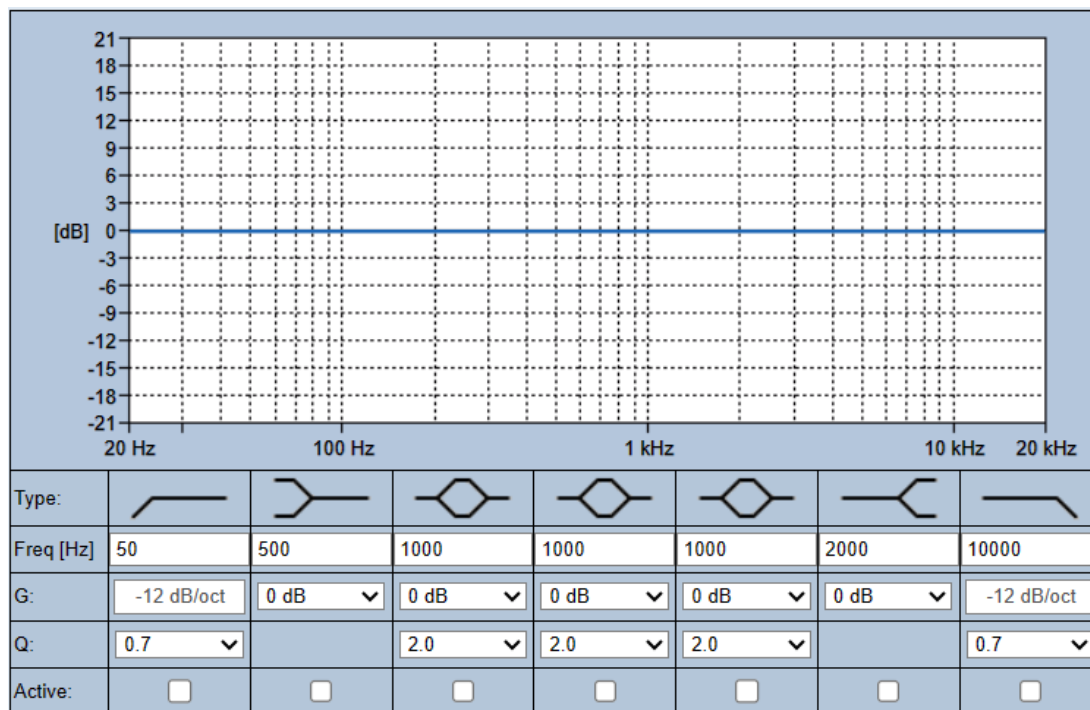
At the top of the page, you can see the **Audio mode** you selected in **Device options**: **Analog** or **Digital**.
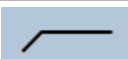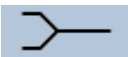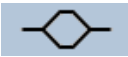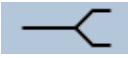
Audio inputs

For each audio input of the audio interface module, you can configure the input signal through a parametric equalizer, a compressor, and volume gain selection. These options are available for both analog and digital audio inputs.

1. Select and click the **+** sign of the **Audio input** category row:
- The parametric equalizer overview and the compressor graphic appear.

For the **parametric equalizer**, select each of the following items, if required.

Type:	╱	⟩	◇	◇	◇	⟨	╲
Freq [Hz]	50	500	1000	1000	1000	2000	10000
G:	-12 dB/oct	0 dB	0 dB	0 dB	0 dB	0 dB	-12 dB/oct
Q:	0.7		2.0	2.0	2.0		0.7
Active:	☐	☐	☐	☐	☐	☐	☐

Note: F: Frequency, **G:** Gain, **Q:** Quality factor

Item	Filter	Value	Description
High-pass filter		Enter F Select Q	**Default:** Frequency 60 Hz, Quality factor 0.7 (selectable 0.2 - 2.0). **Fixed**: Gain -12 dB/oct.
Shelving filter (for low frequencies)		Enter F Select G	**Default:** Frequency 500 Hz, Gain 0 dB (selectable: -infinite - +12 dB).
Full parametric sections (3)		Enter F Select Q, G	**Default:** Frequency 1000 Hz, Quality factor 20.0 (selectable 0.4 - 20.0), Gains 0 dB (selectable: -infinite - +12 dB)
Shelving filter (for high frequencies)		Enter F Select G	**Default:** Frequency 2000 Hz, Gain 0 dB (selectable: -infinite - +12 dB).
Low-pass filter		Enter F Select Q	**Default:** Frequency 10000 Hz, Quality factor 0.7 (selectable 0.2 - 2.0). **Fixed**: Gain -12 dB/oct.

Set a filter and output

Proceeds as follows to set the filters of each output separately.

1. Make sure that all loudspeakers are:
   - Connected to an output.
   - Set at the correct power level.
   - Aimed, if necessary, and
   - Working.
2. The frequencies, gain and quality factors of each output are already set to the default values as indicated in the previous table.
   - **IMPORTANT**: The correct output setting depends on the environment to where the audio output signal is routed. It might need to be adjusted in the zone(s) locally.
3. Checkmark the **Active** box of each filter for each output to enable it and to make it active in the system.

Use the **audio compressor** to decrease the dynamic range of the audio signal, reducing the difference in the level between the highest and lowest parts.
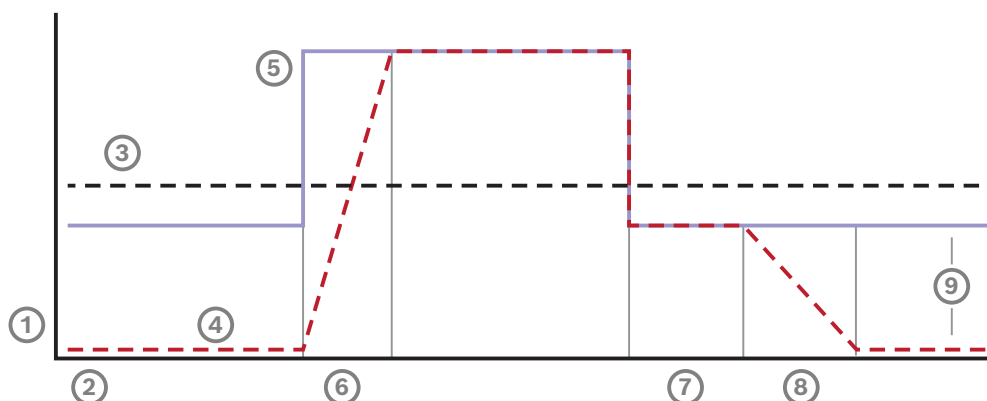
1	Level	4	Output level	7	Hold
2	Time	5	Input level	8	Release
3	Threshold	6	Attack	9	Range

| Item	Action	Description
Attack	Select from the drown-down list.	Defines how quickly the gain decreases if the input level of the control block goes above the compressor threshold. The default is **5 ms**.
Hold	Select from the drown-down list.	Defines how quickly the gain increases if the input level of the control block drops below the compressor threshold. The default is **50 ms**.
Release	Select from the drown-down list.	Defines how long the gain is sustained after the input signal drops below the compressor threshold. The default is **1 ms**.
Active	Checkmark.	Checkmark to activate the compressor options.
Threshold	Select from the drown-down list.	Value at which the signal starts being compressed. The default is **-20 dBFS**. In this case, audio below -20 dBFS remains unaffected.
Ratio	Select from the drown-down list.	Determines the amount of compression applied. The default is **2:1**, which means that for every 2 dBFS of input, the output level increases 1 dBFS.
Knee	Select from the drown-down list.	Controls how smooth is the transition of the signal at the threshold point where the compression starts. The default is the **Medium** knee (10 dB), with optional **Hard** knee (0 dB) and **Soft** knee (20 dB).
Gain (greyed-out)	No action.	This value shows the makeup gain used to amplify the output signal. It is calculated automatically depending on the other values.

Item	Action	Description
Gain (to the right)	Select from the drown-down list.	The volume gain amplifies the audio signal in order to adjust the sensitivity. The default is **0 dB**. **Note:** The range options change depending on the mode of your inputs. For analog inputs, you can choose between -6 dB and 6 Db. For digital inputs, you can choose between -18 and 18 dB.

1. Click the **Apply** button.
    – The changes are immediately applied to the audio output. This cause unexpected high-level audio output in the loudspeaker zone(s).
2. Click the **Submit** button to submit the changes.
    – Notice that the audio processing parameters change immediately when you click **Submit**. Although the changes are audible, they are not automatically saved. Save the changes to keep them after the system controller resets. See *Save configuration, page 130*.
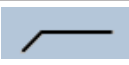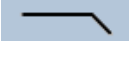
Audio outputs

For each audio output of the audio interface module, you can configure the audio output signal through a parametric equalizer, an audio delay option, and a dropdown list for the volume level selection. The function **Audio activated output** adds two configurable items.

1. Select and click the **+** sign of the **Audio output** category row:
    – The audio parametric equalizer overview appears.
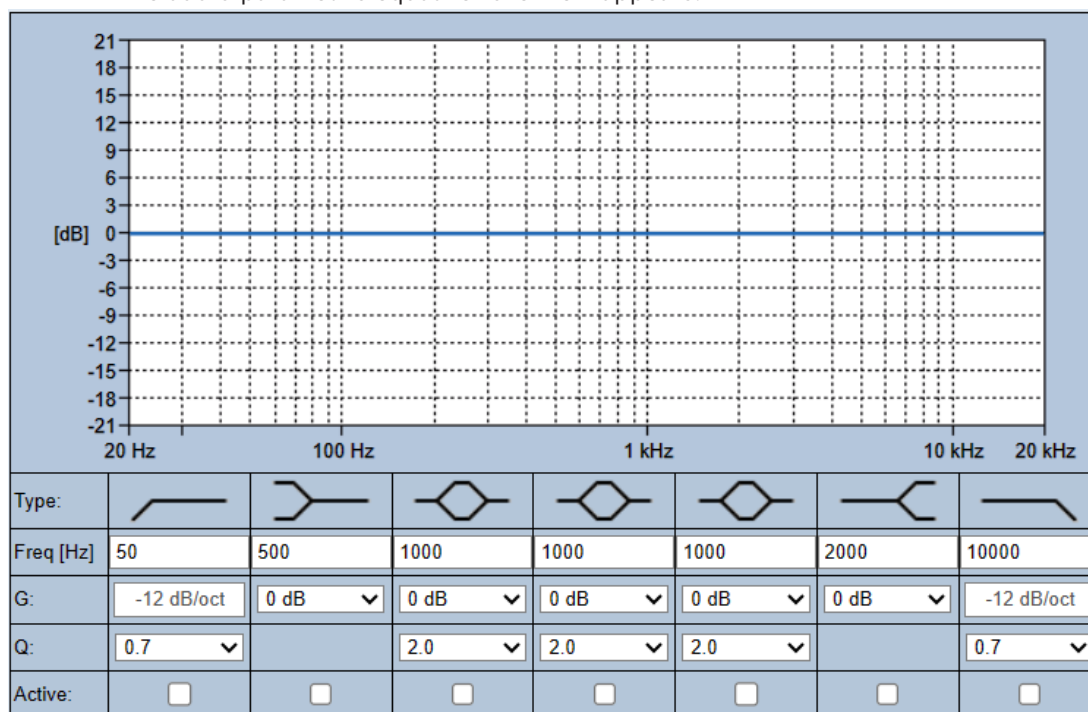
1. Select each of the following items, if required.
    – **Note: F:** Frequency, **G:** Gain, **Q:** Quality factor

Item	Filter	Value	Description
High-pass filter		Enter F Select Q	**Default:** Frequency 60 Hz, Quality factor 0.7 (selectable 0.2 - 2.0). **Fixed**: Gain -12 dB/oct.
Shelving filter (for low frequencies)		Enter F Select G	**Default:** Frequency 500 Hz, Gain 0 dB (selectable: -infinite - +12 dB).
Full parametric sections (3)		Enter F Select Q, G	**Default:** Frequency 1000 Hz, Quality factor 20.0 (selectable 0.4 - 20.0), Gains 0 dB (selectable: -infinite - +12 dB)
Shelving filter (for high frequencies)		Enter F Select G	**Default:** Frequency 2000 Hz, Gain 0 dB (selectable: -infinite - +12 dB).
Low-pass filter		Enter F Select Q	**Default:** Frequency 10000 Hz, Quality factor 0.7 (selectable 0.2 - 2.0). **Fixed**: Gain -12 dB/oct.

2. For the **Audio activated output** function, select the **Threshold** between -40 dB and 0 dB. The default is -20 dB.
   – The **Threshold** is the minimum sound level that triggers the output.
3. For the **Audio activated output** function, select the **Hold time** between 10 milliseconds and 2000 milliseconds. The default is 10 milliseconds.
   – The **Hold time** is the amount of time it takes to release the contact after the audio level is below the defined threshold.

Set a filter and output

Proceeds as follows to set the filters of each output separately.
1. Make sure that all loudspeakers are:
   – Connected to an output.
   – Set at the correct power level.
   – Aimed, if necessary, and
   – Working.
2. The frequencies, gain and quality factors of each output are already set to the default values as indicated in the previous table.
   – **IMPORTANT**: The correct output setting depends on the environment to where the audio output signal is routed. It might need to be adjusted in the zone(s) locally.
3. Checkmark the **Active** box of each filter for each output to enable it and to make it active in the system.
4. Select the output volume level from the **Volume** dropdown list. The default id 0 dB.
   – Adjust the nominal output level of the audio output in the zone to the level required to have the correct speech intelligibility at maximum ambient noise level. It ranges from 0 dB to -60 dB in steps of 1 dB and Mute.
5. Click the **Apply** button.
   – The changes are immediately applied to the audio output. This cause unexpected high-level audio output in the loudspeaker zone(s).

6.   Click the **Submit** button to submit the changes.
     –   Notice that the audio processing parameters change immediately when you click
         Submit. Although the changes are audible, they are not automatically saved. Save
         the changes to keep them after the system controller resets. See *Save
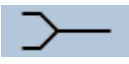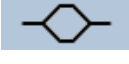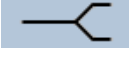   configuration, page 130*.

5.10   Save configuration

Most of the pages in the *Configure* section of the webserver contains a *Submit* button.
Always click this button after making changes, otherwise the changes are lost. Click the
Submit button, however, does not mean that the changes are saved. Therefore, you always
have to save the configuration on the system controller.
To do so:
1.   **Click** the *Save configuration* page *button*:
     –   A (limited) confidence check on the configuration is executed automatically. When
         your computer is connected to the system (controller), and there are no issues
         found, the configuration is correctly done, and the following three buttons and one
         checkbox are displayed to enable you to:
         1 - **Save configuration** (button)
         2 - **Restart system** (button)
         3 - Save configuration and restart system (button)
         Clear event logging on restart (checkbox)
2.   When there are issues found, a message is displayed indicating there are configuration
     issues to be resolved first. Still it is possible to ignore the errors and save the
     configuration anyway to continue the configuration at a later time.
     –   Only one button is displayed: *Ignore errors and save configuration*.
3.   **Click** the *Ignore errors and save configuration* button:
     –   The errors will be ignored and the configuration will be saved.

1 - Save configuration
By clicking the *Save configuration* button, and no issues (errors) are found, the configuration
file is *saved* on the *system controller*. To reload and activate the saved configuration, restart
the system controller.

2 - Restart system
Click the *Restart system* button to restart the system (controller) **without** saving the current
configuration. In this case the existing, and already saved, configuration file will be
reloaded. Notice that possible changes in the current configuration will be overwritten at
reloading.

3 - Save configuration and restart system
By clicking the *Save configuration and restart system* button, and no issues (errors) are found,
the configuration file is *saved* on the *system controller*, and the system (controller) will be
restarted and reloading, plus activating, the just saved configuration.

Clear event logging on restart
By enabling (checkmark) the *Clear event logging on restart* checkbox, all events logged on
the system controller will be erased after the system has been restarted.
–   Note that the events are still visible in the Logging Viewer. See *Optional: Using the
    Logging Viewer, page 155*.

Refer to
–   *Logon the application, page 46*

5.11   Backup and restore

On the *Backup and Restore* pages, the configuration parameters could be backup/restored on a externally (PC) location you prefer. To do so, see:

5.11.1   Backup

To be sure that your *configuration* is not lost if it becomes e.g. corrupt, or when your *system controller* is replaced, it is advisable to make a *backup* so it can be restored afterwards.

Backup your configuration file
See *Logon the application, page 46*.
1.   Below **Backup and restore**, click **Backup**.
     –   At least one of the following items needs to be selected to be backed up to a location on your connected configuration computer.
2.   Enable the **Configuration settings** checkbox.
3.   Enable the **Recorded messages** checkbox.

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Notice!
Backup of recorded messages
To include the recorded messages in the backup file, the maximum total size of the recorded messages must not exceed the 240 MB. You can check the total size of the recorded messages and the individual size of each message in *Recorded messages, page 79*.

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4.   Enable **User credentials and certificates**.
5.   Enter your new **Password** in the text field.
     –   Notice that the password used for the backup can be different from the one used for logon the configuration.
     –   The **Password** must follow the requirements configured in the **Password policy** in *System settings, page 81*.
6.   Click the **Create** button:
     –   A .zip backup file is created.
     –   Depending on the web browser type, a save/open file selection screen appears.
7.   Depending on the web browser type, browse to the file location where you want to store the backup file:
     –   The configuration and credentials selected are stored on the location you selected.
8.   If required, see *Restore, page 131*.

5.11.2   Restore

If the configuration file on your system controller becomes e.g. corrupt or configuration items are lost or changed by accident, and/or when your system controller is replaced, it can be restored **only** when you have made a *backup*. See *Backup, page 131*.

Restore your configuration file
1.   Below **Backup and restore**, click **Restore**.
2.   Click the **Browse** button.
     –   Depending on the web browser type, a file selection screen appears.
3.   Browse to, and select, the .zip file to be restored.

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4. Enter the **Password** you used for the backup in the text field below **Provide password when backup contains user credential and certificates**.
5. Click the **Restore** button.
    –   The selected configuration and credentials file restores your system configuration.
6. Upload/Activate the certificate(s), if required. See Open interface.
    –   **IMPORTANT**: Do this in case the system controller is reset to default or replaced.

6   Diagnose

On the *Diagnose* pages of the webserver, the system (installation) can be diagnosed.
IMPORTANT: With the exception of **Version**, only PROMATRIX 9000 administrator and
installer user accounts have full access to the **Diagnose** section. See *User accounts, page 48*.
IMPORTANT: When adding, or removing, devices in configuration, it requires a *Save
configuration and restart system*, before the changes become effective and responsive on
Diagnose web pages. See *Save configuration, page 130*.

–   Click **Diagnose** to see the following diagnose menu items:

Diagnose (menu items)		
1	*Configuration, page 134*	Can be used to check the system (controller) configuration for inconsistencies.
2	*Version, page 135*	Can be used to check the hardware version of the connected network devices, their firmware version and other relevant information.
3	*Amplifier loads, page 136*	Can be used to calculate the amplifier load (in Watt) per amplifier output channel.
4	*Amplifier spare channel, page 138*	Can be used to generate a fault in an amplifier channel to force spare switching.
5	*Battery impedance, page 139*	Can be used to check the condition of the connected 12 VDC (back-up) battery to the Multifunction power supply (Mps).
6	*Ambient noise sensor, page 140*	Can be used to monitor (changing) ambient noise levels for automatic adjustment of announcement or background music levels (AVC - Automatic Volume Control).
7	*Telephone interface, page 142*	Can be used to check the status of the SIP accounts created.

Refer to

6.1 Configuration

The *Configuration* page in the *Diagnose* section is used to check the system (controller) configuration for inconsistencies. Inconsistencies can cause strange or unexpected system behavior. See also *Save configuration, page 130*.

The webserver of the system controller prevents most inconsistencies from occurring by refusing to accept incorrect user data during configuration, but some inconsistencies can still occur.

– **Important**: The *Configuration* page will display but not solve any remaining inconsistencies. The user should modify the configuration manually to solve.

Configuration diagnostics

By clicking the button *Configuration*, a configuration confidence check is executed automatically. When no errors found, the configuration is correctly done and the message "*No consistency errors found in configurati*on" appears and stays visible as long no error occurs.

Configuration error messages

The *Configuration* page could **show** the following errors:

– Outputs assigned to more than one *zone*.
– Inputs assigned to multiple *BGM routings*.
– *Zones* and *zone groups* assigned to multiple *BGM routings*.
– *Control outputs*, other than configured as *switch control outputs*, assigned to a *PTT* input, *Make announcement* input or a *Start phased announcement* input.
– *Control outputs*, other than configured as *Zone activity* outputs, assigned to a *zone*.

6.2   **Version**

The *Version* page in the *Diagnose* section is used to check the *hardware version* of the connected network devices, their *firmware version* and other *relevant information.*
For devices with a LCD (e.g. a Call station), most of this information is also available from the LCD, but for devices without LCD this *Version* page provides the relevant information.

–   The following information is presented on the *Version* overview page:

Item	Description
Name	**Shows** the *name* of the device. See *System composition, page 51*
Device type	The *device type* name (i.e. Amplifier) description is fixed and cannot be changed. See *System composition, page 51*.
Hostname	**The unique** *hostname* of the device. The *hostname* consists of the commercial type number (CTN) and a part of the MAC address. See the product label on the device and *System composition, page 51*.
Serial number	**The unique** *serial number* of the device. See the product label on the device. The serial number is fixed and cannot be changed.
Hardware	**The unique** *hardware version* of the device. See the product label on the device. The hardware version description is fixed and cannot be changed. **Click** *Details* to see more detailed information of the *hardware* used, e.g PCB type/revision version number.
Firmware	**The unique** *firmware version* of the device. With the **exception** of uploading other firmware, the firmware version description is fixed and cannot be changed. **Click** *Details* to see more detailed information of the *firmware* used, e.g. processor version numbers.
Print	**Click** the *Print* button to produce and save a PDF file of the version overview page. Notice that you need a PDF printer installed to generate a PDF document.

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Notice!
Have the version info available when contact technical support.

6.3 Amplifier loads

The *Amplifier loads* page in the *Diagnose* section is used to measure the amplifier load (in Watt) per amplifier output channel. An amplifier load uses an amount of Watt, whereas an amplifier provides a number of Watts.

> **ⓘ** **Notice!**
> It is an essential step in the system configuration to do a load measurement to check whether the amplifier channels and the amplifier are not overloaded. Without this check, the amplifier channel volume is automatically set to -12 dB to protect the amplifier from unexpected overload conditions in case of an alarm situation.

> **ⓘ** **Notice!**
> When it is needed to change the output voltage; save the configuration and restart the system before doing a load measurement on the amplifier outputs. Results of previous measurements are wrong when the output voltage selection has changed. See also *System settings, page 81*.

The following information is presented on the *Amplifier loads* page:

Item	Description
Measure	**For each** *amplifier* a *Start* button is presented to start the load measuring of the *amplifier* selected.
Name	**Shows** the *name* of the amplifier and each amplifier *output channel*. See *Add a device, page 53*.
Topology (@ 70 / 100 V)	**Select and click** *Channels* below *Topology* to see which output (A and/or B) is selected/connected. See *Amplifier, page 59*.
Overload	**Select and click** *Channels* **below** *Topology* to see the amplifier *Output* overload xxxW@yyyHz, if any. Where xxx is the measured overload in Watt at yyy frequency in Hz. The measured result is visible after using the *Start* button or if another measurement was done before. See the "Start measuring output load" section in this chapter. **Notice** that no (overload) message is shown if the load is equal or less than the total amount of load +20% (Watt) provided by the amplifier. An overload will be shown as follows at: Channel 1: > 720 W (100 V) of 600 W. > 510 W (70 V) of 425 W. Channels 2-4/8 > 360 W of 300 W.
Protection	**Shows** -12 dB (decreased output level) in case the amplifier is in amplifier protection state at an overload or if another measurement was done before. The column field is empty in case of no overload is measured (before). **Notice** that the result is visible after using the *Start* button and when another measurement is done before. See the "Start measuring output load" topic in this chapter.
Status	**A status** message will show the overall measuring result of both the amplifier and channels. When no error is noticed, the text will show; OK. See the status messages table following.

Item	Description
	The status is only visible after using the *Start* button See the "Start measuring output load" topic in this chapter. See also *Troubleshooting, page 164*.

Status messages				
Amplifier overload	NO	YES	NO	YES
Channel overload	NO	NO	YES	YES
Amplifier status	OK	Amplifier overload	Channel overload on A + B	Amplifier overload
Channel status	OK	-	Channel overload	Channel overload on A + B
Amplifier protection	-	-12 dB	-	-12 dB

> **Caution!**
> If the amplifier detects a temperature higher than +90 °C, the output level is attenuated by -3 dB in order to counteract this. The -3 dB attenuation is removed after the fault is acknowledged and reset. Before the fault can be cleared, the temperature needs to drop below +80 °C.

Start measuring output load
1. **Click** the *Start* button of the selected *amplifier*:
   – **IMPORTANT**: The test signal is audible in all amplifier output channels/zones of the amplifier selected. Possible you have to schedule this test after working hours, when less/no people are in the test environment.
   – As soon the *Start* button is **clicked**, the system generates an audio signal to measure the load connected to each amplifier output channel.
2. **Click** *Channels* (**below** Topology) as soon the measurement has been finished:
   – Only the overload power (in Watt) connected to the A and/or B output is indicated in the *Overload* column. See *Amplifier, page 59*.

> **Caution!**
> When a load measurement is done with one of the loudspeaker lines shorted, the webpage will indicate; "**not measured**". Resolve the short and start the load measurement again to resolve this.

Refer to
– *Amplifier, page 59*
– *System settings, page 81*
– *Add a device, page 53*
– *Troubleshooting, page 164*

6.4   Amplifier spare channel

The *Amplifier spare channel* page in the *Diagnose* section is used to generate a fault in an amplifier output channel to force it to the spare output channel of the selected amplifier. This function can be used to test the sparing and faults behavior in an installation (e.g. during commissioning and/or certification of an installation).

The following information is presented on the *Amplifier spare channel* page:

Item	Description
Name	**Shows** the *name* of each amplifier added to the system. See *Add a device, page 53*.
Faulty channel	**Click and select** the (faulty) amplifier channel which need to be forced routed via the spare amplifier channel. See *Amplifier, page 59*.
Apply	**Click** the **Apply** button to set and activate the forced spare channel switching of the selected amplifier (channel) in the system. See *Amplifier, page 59* > Front and rear panel indicators.

(i)

Notice!

To deactivate the spare channel switching: select "None" below *Faulty channel*, click the corresponding *Apply* button, and *acknowledge and reset* the fault (See *Assigning a function, page 102* > *acknowledge and/or reset*).

Refer to
– *Add a device, page 53*
– *Amplifier, page 59*
– *Troubleshooting, page 164*

6.5   **Battery impedance**

The *Battery impedance* page in the *Diagnose* section can be used to check the condition of the connected 12 Vdc (back-up) battery. See also *Multifunction power supply, page 62*.
The following information is presented on the *Battery impedance* page:

Item	Description
Measure	A *Start* **button** is presented to start the battery impedance calculation of the connected battery.
Name	**Shows** the name of the Mps to where the battery is connected. See *Multifunction power supply, page 62*.
Capacity [Ah]	**Shows** the configured capacity (in Ah) of the connected battery. See *Multifunction power supply, page 62*.
Fault threshold [mOhm]	Result of the measurement and depends on the connected battery capacity.
Impedance [mOhm]	Result of the measurement and depends on the connected battery capacity. **IMPORTANT**: The diagnostics page battery impedance is only available when battery supervision is enabled. See *Multifunction power supply, page 62*.
Result	One of the following measurement results will be shown (No error messages will be shown): – **Busy:** the measurement is currently in progress. – **Unknown:** possible no battery connected and/or no measurement was/is started. – **Preliminary:** measurement results known but measured while the battery was not fully loaded. – **Stable:** measurement results known while the battery was fully loaded.
Fault warning	Battery related fault messages will be shown here. See Multifunction power supply (MPS) and/or *Troubleshooting, page 164*

Notice that the system continuously do measurements on the background and report the results. On the diagnostics (Battery impedance) page, the measurements can be started manually.

Start measuring battery impedance
1. **Check** the battery connections and settings as defined in *Multifunction power supply, page 62*.
    – When OK:
2. **Click** the *Start* button:
    – As soon the *Start* button is **clicked**, the system will measure the connected battery capacity and will generate the results for each item as described in the previous table.

6.6   Ambient noise sensor

The *Ambient noise sensor* page in the *Diagnose* section is used to calibrate the automatic volume control (AVC).

The following information is presented on the *Ambient noise sensor* (ANS) page:

Item	Description
Measure	**For each** connected ANS a *Start /Stop* button is presented, to start / stop the measurement of the ANS selected. This starts / stops the live reading of the noise level the ANS is sensing and how this is changing the volume in the assigned zone by means of the attenuation level.
Zone	The selected *Zone name* to where the selected ANS is added. See *Zone options, page 88* > Ambient noise sensor.
Name > Sensors	The *Sensors* section can be expanded or collapsed per zone. By default, the *Sensors* section is collapsed. **To show** the *name(s)* of the ANS(s) selected for the zone, select and click *Sensors*. See *Add a device, page 53*.
Sensor level	When the *Start* button is pressed, actual data (dBSPL) is measured by the ANS. – Sensor level is shown as "Unknown" if the ANS is: – Configured but not connected. – Sensor level is out of range (min. level ANS is 10 dB and max. level is 130 dB). – Initially when the page is just opened and/or left and re-opened. – When *Stop* is pressed (values are frozen and shown until the page is left).
Offset	The *Offset* value is added to the *Sensor level* and creates the *Noise level* that is taken into account when determining the level for the whole *zone*. Range: -20 dB to 20 dB in steps of 1 dB. **Default** is 0 dB. The changed *Offset* value is applied immediately, when the *Apply* button is pressed. **NOTE**: The *Offset* selection is disabled (grayed-out) when the following is done before *Save & Restart* the system: – A *zone* is removed, so that the *Offset* selection of all ANS devices assigned to the *zone* is disabled. – An ANS is removed from a *zone* and/or *system composition* page. See *System composition, page 51* and/or *Zone options, page 88*
Apply	To set and activate the *Offset* of the selected ANS in the system, click the *Apply* button.
Noise level	Indicates the measured level after adding up the *Offset* value for the *zone*, and indicates individual measurement results of the ANSs. The *Noise level* of the *zone* is equal to the maximum of the *Noise levels* of the individual ANSs in the *zone*.

Item	Description
	NOTE: Shows "Unknown" when at least one of the ANSs of the whole *zone* shows "Unknown" for its *Sensor level*. In addition, the *Sensor level* and the *Noise level* of that ANS will show "Unknown".
Volume control	The actual attenuation of the *zone*. The value is continuously updated (when *Start* button is pressed). – When one of the *Sensor levels* is "Unknown", it shows 0 dB. – When initially page is just loaded, it shows "Unknown". – When AVC is NOT enabled for the corresponding *zone*, *zone* and *Volume control* will be displayed within brackets e.g. (<ZoneName>) and (<VolumeControlValue>)". See *Zone options, page 88*.
Submit	**Click** the *Submit* button to store the changes. Note that the changes are not permanent until the configuration is saved. See *Save configuration, page 130*.

(i) **Notice!**

Use a test tone to measure the noise sensor. Inform the people in the affected zones of the test beforehand to make sure that the test tone is not misjudged as an alarm tone.

Start measurement/calibration

1. In the *Diagnose* section, select *Ambient noise sensor*
   – An ANS overview page appears.
2. Below *Name*, click *Sensors* to select the ANS *name*.
3. Of the ANS to measure/calibrate, select the required *Offset* value from the dropdown list, and click the *Apply* button to confirm.
   – Default: 0 dB
4. To start the measurement of (each of) the selected *ANS* in the *zone*, click the *Start* button:
   – When pressing multiple *Start* buttons, *Sensor levels* of multiple *Zones* are updated at the same time.
   – Live measurement results are visible below *Sensor level*.
   – The *Offset* value can be changed, and applied, during the measurement.
   – The maximum *Noise level* of all ANSs in a *Zone* is showing, and is calculated from the *Sensor level + Offset*.
   – The actual attenuation of the *Zone* is showing below *Volume control*. Attenuation can only be 0, or a negative value. The negative value never exceeds the attenuation range as configured in *Zone options*. The attenuation is fixed during a *Normal* call, but updated during a BGM call. See *Zone options, page 88*.
5. To save the *Offset* values, click the *Submit* button.
   – If *Submit* is not used when leaving the *Diagnostics* page, a reminder message appears.
   – Note that the changes are not permanent until the configuration is saved. See *Save configuration, page 130*.
6. To stop the ambient noise measurement/calibration, click the *Stop* button.
   – Updating of the specific *Zone* stops.

– Last measured/calibrated and set values stay visible.

6.7 Telephone interface

The Telephone interface page in the Diagnose section is used to check the status of your SIP accounts.

7 Security

Below the *Security* page, secured system connections can be viewed and/or defined.
IMPORTANT: Only PROMATRIX 9000 administrator and installer user accounts have access to the *Security* section. See *User accounts, page 48*.

To do so:
Click *Security* to see the following *security* menu items:

Security (menu items)		
1	*System security, page 143*	Is used to create a secured configuration connection between the configuration computer and the PROMATRIX 9000 network devices.
2	Open interface	Is used to download the PROMATRIX 9000 Open Interface certificate.

7.1 System security

1. **Below** the *Security* page, **click** *System security*:
   – A new screen OMNEO *system security* appears where the:
   – OMNEO *security username*, and the
   – OMNEO *passphrase* can be viewed. These are both automatically created at 1st time / initial *Logon the application, page 46*.
2. **Both credentials** are used to create a secure connection between the PROMATRIX 9000 system controller, the other network devices, PC and during upgrade of the PROMATRIX 9000 network devices firmware.
3. See *Change user name and passphrase, page 143* if you want to change the credentials.
4. See 1st time / initial *Logon the application, page 46* for the automatically generated secured credentials.
5. See *Check/Upload the devices firmware, page 27* for a secured device firmware upload connection.
6. See *Backup and restore, page 131* for a (secured) *backup* and *restore* of your configuration file.

ⓘ **Notice!**
When working with a master system and subsystems, make sure that the master controller and all its subsystems controllers have the same passphrases.

7.1.1 Change user name and passphrase

The security user name and passphrase are automatically generated and created at the initial logon. Refer to *Logon the application, page 46* for more details.

To change the user name and passphrase
Note: For security reasons, you cannot change just the user name or just the passphrase. Both need to be changed.

1. Below **System security**, click the **+** of the **Change user name and passphrase** category row.
   – Make sure that all configured network devices are connected. Refer also to *Show disconnected devices, page 144*.

2. Click the **Generate (recommended)** button to generate automatically a new **User name** and **Passphrase**.
   – The automatically generated **Password** follows the requirements configured in the **Password policy** in *System settings, page 81*.
3. If you prefer, you can also enter a new **User name** and **Passphrase**.
   – The User name must have a minimum of 5 and a maximum of 32 characters.
   – The **Password** must follow the requirements configured in the **Password policy** in *System settings, page 81*.
4. Click the **Change** button:
   – **IMPORTANT**: The devices that get disconnected during the change process still receive the changes upon **reconnection within one hour**. After one hour, you must first reset the remaining devices to factory default, and then reconnected. Refer to *Reconnect factory default devices, page 144*.

Refer to
– *Logon the application, page 46*
– *Show disconnected devices, page 144*
– *Reconnect factory default devices, page 144*

7.1.2 Reconnect factory default devices

Use this function if you want to securely reconnect one or more factory default devices. Notice that reconnect a network device only works when it was already added in *System composition, page 51*.

To do so:
1. Reset the disconnected device(s) to default by using the *reset* to default button:
   – For location of the reset to default button of the individual devices, see *Device options, page 54* > <device name> > Rear panel indicators and controls and/or the PROMATRIX 9000 installation manual.
2. **Below** the *System security* page, **click** the + of the *Reconnect factory default devices* category row:
   – Make sure that all network devices to be reconnected are reset to default and correctly (wired) connected. See also *Show disconnected devices, page 144*.
3. **Click** the *Reconnect* button:
   – Reconnected devices will be connected again.
4. **Check** if all **reconnected** devices are connected now. See *Show disconnected devices, page 144*:
   – If reconnected devices are still listed in *Show disconnected devices*, visual check and reconnect the devices, again and repeat previous steps.
   – See also *System composition, page 51*.

7.1.3 Show disconnected devices

Use this function if you want to check/see if devices need to be reconnected. Notice that reconnecting and visibility of a network device only works when it was already added and visible in *System composition, page 51*.

To do so:
1. **Below** the *System security* page, **click** the + of the *Show disconnected devices* category row:
   – Make sure all network devices are correctly (wired) connected. See also *Reconnect factory default devices, page 144*.

2.   Click the *Refresh* button:
     –   Disconnected devices will be listed by *Name*, *Hostname* and location (if entered).
     –   See *Reconnect factory default devices, page 144* and/or *System composition, page 51*.

7.2   Open interface

At startup, the PROMATRIX 9000 system controller generates a number of certificates. One
certificate is used to setup the TLS secure connection. An open interface client makes sure
that the connection communicates with the right system controller.
From release 2.30 onwards, you can also use an external certificate instead of one of the
certificates generated by PROMATRIX 9000.

–   Below **Security**, click **Open interface**.

Internal certificate for the TLS connection through the open interface client
1.   Click the **Download certificate** button.
2.   Follow the onscreen instructions.
3.   Activate the certificate on your PC and follow the onscreen instructions.
4.   Refer to *Optional: Using the Open Interface, page 162*

Upload of an external certificate
1.   Click the **Browse** button in the **Certificate file** field. This file must be in PEM format.
2.   Click the **Browse** button in the **Private key file** field. This file must be in .key format.
     –   The .key file must not be password protected.
3.   Click the **Upload certificate** button.

IMPORTANT: Each time the PROMATRIX 9000 system controller is reset to default, the
system controller generates new certificates. In this case, you must do one of the following:
–   Download the internal certificate again.
–   Upload the external certificate again.

8   Print configuration

The PROMATRIX 9000 (mandatory) software installs automatically the configuration printing utility. This utility can read information from configuration files. The configuration printing utility shows the information on screen in a formatted way to check and/or archive the configuration on PDF/paper.

IMPORTANT: Only PROMATRIX 9000 administrator and installer user accounts have access to the *Print configuration* section.

To do so:

1. **Click** *Print configuration* to make available the following menu items:

Print configuration (menu items)		
1	**Print device settings**	Can be used for printing the configuration file settings of all connected devices or each device type category separately (e.g. System controller, Amplifier, etc.).
2	**Print other settings**	Can be used for printing all general configuration file settings, such as; messages, system settings, time settings, network supervision, Lifeline, zone(s), BGM channel and call definition.

2. **Select and click** the required print device/other settings item, which opens a new screen.
3. **Click** the *Print* button to produce and print/save a PDF file:
    –   **Notice** that you need a PDF printer installed on your PC to generate, print and/or save a PDF document.

9   About

Below the *About* page, licenses can be download. It is not required to have PROMATRIX 9000 *administrator* or *installer* logon user account rights to view and/or download items in the *About* section.

To do so:

Click *About* to make available the following menu item:

About (menu item)		
1	*Open source licenses, page 147*	Is used to view and download the PROMATRIX 9000 open source licenses.

9.1   Open source licenses

An up to date listing of open source licensed software which may accompany a PROMATRIX 9000 device is stored inside the device and can be downloaded as a zip-file. This list is also available from www.boschsecurity.com/xc/en/oss/.

The license texts are also installed when installing the firmware in the location where the firmware files are installed. Windows 10: ("c: \ProgramData\Dynacord\OMNEO\Firmware\xxx" with xxx the PROMATRIX 9000 software release).

From the configuration page **only** the licenses of the system controller open source software can be downloaded.

To do so:

1. **Below** *About*, **click** *Open source licenses*:
2. **Click** the *download button*:
    –   A file screen appears with a .zip file.
3. **Open** and/or **save** the .zip file on your computer:

Each of the components listed may be redistributed under the terms of their respective open source licenses. Notwithstanding any of the terms in the license agreement you may have with Dynacord, the terms of such open source license(s) may be applicable to your use of the listed software.

10 Introduction to make an announcement

As PROMATRIX 9000 is a Public Address and Voice Alarm System, it is used to distribute data, live speech, background music and (evacuation) messages. All data and audio in the system is distributed in the form of announcements/calls.

An announcement/call always consists of the following attributes (click the link):

– *Announcement content, page 148*
– *Priority and announcement type, page 148*
– *Routing, page 149*

Using the call station (extension)

The functionality of a *call station*, including the appearance of the items of the graphical user interface LCD, and *call station extension* (buttons), are configured in: *Call station, page 64*.

10.1 Announcement content

The content of a background music (BGM) announcement typically consists of an (mono/stereo) line level audio signal coming from a BGM source, such as a music player, tablet, mobile phone etc.

The content of *normal* announcements and *emergency* announcements is defined by a *Call definition*, which can consist of:

– A start tone (message).
– Pre-recorded message(s).
– Live speech.
– An end tone (message).

See *Call definitions, page 96*.

10.2 Priority and announcement type

To each announcement, a *priority* is assigned. When two or more announcements are addressed to the same *zone*, *zone group* or need shared resources (e.g. a message player), the system only starts the announcement with the highest *priority*. The range of priorities that is available for an announcement depends on the *announcement type*:

Priority	Announcement type
0 to 31	Background music (BGM)
32 to 223	Normal
224 to 255	Emergency

Announcements with the same priority operate on first in first serve basis, except in the case of priority 255: announcements with the same priority 255 overrule each other, so the latest becomes active. This assures that high priority announcements (microphones) that are left behind in an active state will never block the system.

BGM announcements

Background music (BGM) announcements are typically used to distribute (background) music. Their content consists of an audio signal from a BGM source. If a *zone* or *zone group* is already in use by another announcement with the same priority or higher, the *BGM announcement* will not be routed to that *zone* or *zone group* until it has been released by the other announcement.

Normal announcements

Normal announcements typically contain live speech and optionally tones and pre-recorded messages. The content of normal announcements is defined by a *call definition*. See *Call definitions, page 96*.

Normal announcement is set in *Call station, page 64 > Class > Normal*.

Emergency announcements

Emergency announcements are similar to normal announcements. The major difference is that emergency announcements put the system in the emergency state, if configured. In the emergency state, PROMATRIX 9000 stops all *BGM announcements* and *normal announcements*, if configured.

How the system acts could be set in the configuration > *System settings, page 81 >* Emergency mode. Emergency announcement is set in *Call station, page 64 > Class > Emergency*.

10.3 Routing

The routing of the announcement is the set of *zones* and/or *zone group* to which the announcement is intended to be addressed. Whether the announcement actually is addressed to the selected *zone*s and/or *zone group* depends on the *priority* of the announcement.

11 Optional: Using the Logging Server

The *Logging Server* application software is part of the PROMATRIX 9000 installation software package (**.zip*). To use it, firstly the software needs to be installed on your configuration computer. See *Optional: Logging Server, page 29*.

– **IMPORTANT**: Only use the PROMATRIX 9000 *Logging server* when connected to PROMATRIX 9000 systems. E.g. the PRAESIDEO *Logging server* does not work with PROMATRIX 9000.

11.1 Start

The PC automatically starts the *Logging Server* when the user logs in. To indicate that the *Logging Server* has been started and operates correctly, an icon appears in the system tray of the taskbar of Windows.

When the *Logging Server* has been started and faults have occurred in the communication between PROMATRIX 9000 and the logging system, the following icon appears:

Start manually

When the PC does not automatically start the *Logging Server*, proceed as follows to start it manually:

1. In **Windows**:
    – version **< 10**: *Start > Programs >* Dynacord > PROMATRIX 9000 Logging Server.
    – version **10**: *Windows (right mouse click) > File Explorer > c:\ProgramData*\Dynacord\PROMATRIX 9000 Logging Server.
2. Click *Logging Server*:
    – A new icon appears in the system tray of the taskbar of Windows.

11.2 Main window

Proceed as follows:

1. Double click on the *Logging Server* icon.
2. When *server authentication* is enabled, the *Logging Server* asks for a *user name* and *password*.

Status messages

The *main window* displays the *status* of the *Logging Server* by means of messages:

Message: *The Logging Server is OK.*   **Description**:   *The Logging Server operates correctly.*   **Recommended action**:   ----

Message:

Logging Server has no connection with <system>

Description:

There is no connection with the specified system.

Recommended action:

Make sure that the specified system is running and that the specified system has an Ethernet connection with the Logging Server.

Message:

System controller <system> refused connection due to incorrect user name or password.

Description:

It is not possible to connect to the specified system, because the system controller authentication failed.

Recommended action:

Make sure the specified system knows the user name and password of the PROMATRIX 9000 *configuration and Logging Server.*

Message:

The Logging Server options are changed. Restart the Logging Server to use the changed settings.

Description:

The configuration settings of the Logging Server were changed. The changed settings are not used until the Logging Server is restarted.

Recommended action:

Restart the Logging Server to use the new settings.

Message:

The Logging Server database has reached its critical size. Please decrease the logging expiration periods.

Description:

The database has reached its critical size.

Recommended action:

Enable and decrease the logging expiration periods to move events to the overflow files or flush the database.

Message:

The Logging Server overflow files have reached their critical size. Please clear or delete the overflow files.

Description:

One or more overflow files have reached the critical size.

Recommended action:

The overflow files are comma separated value (.csv) files. They can be opened in an editor (e.g. Windows Wordpad, Microsoft® Excel). When an overflow file reaches its critical size, use an editor to delete data from the overflow file and decrease its size.*

Stop
Proceed as follows:
1. Open the main window
2. Go to > *File > Exit*.
    –   The *cross* in the upper right hand corner of the main window does not stop the *Logging Server*.

Configuration
1. Open the main window.
2. Go to > *File > Options*.
3. Go to the *Connections* tab to define the connections to the systems of which the events must be logged.
4. Go to the *Database* tab to define the properties of the logging database.
5. Go to the *Logging Expiration* tab to specify the expiration periods of the logged events.
6. Go to the *Security* tab to change the security settings of the logging server.

11.3 Connections

The *Logging Server* can log the events generated by up to 64 systems. The connections to the systems must be defined on the *Connections* tab.

Add a system
Proceed as follows:
1. Click in the *Enabled* field of the row that is marked with an asterisk (*).
    –   A new row is added to the list of systems.
2. Click the *System Name* field and enter the name of the system to which the *Logging Server* must connect.
    –   The name may consist of up to 16 characters. For example, System 4.
3. Click the *System Name* or *IP-Address* field and enter the IP-address or the name (PRASCx-yyyyyy-ctrl.local) of the *system controller* of the system to which the *Logging Server* must connect. For example: 192.168.0.18

Disable event logging for a system
To disable the event logging for a system, remove the check mark from its *Enabled* check box.

Delete a system
Proceed as follows:
1. Click the field in front of the row that contains the system.
    –   For example, System 4.
2. On the keyboard of the PC on which the *Logging Server* is running, press the *Del* key.
    –   The system is removed from the list.

11.4 Logging expiration

On the *Logging Expiration* tab, the expiration periods of the logged events can be defined.

Expiration periods

When expired events must automatically be moved to an overflow file, put a check mark in the *Move expired* events to overflow file field. Use the controls in the event logging period rows to define the logging periods. All fault that are older than the logging period are moved to an overflow file.

Overflow file

The overflow files contain the expired events. Use the controls in the *Overflow File block* to define:
– The location of the overflow files.
  – This can either be entered in the *Folder* field or selected from the file system with the *Brows*e button.
– The critical size of the overflow files in the *Critical size* field.
  – When the critical size is reached, the *Logging Server* displays a message: *The Logging Server overflow files have reached their critical size. Please clear or delete the overflow fil*es.
  – When the overflow files have been deleted or reduced in size, the *Logging Server* must be restarted to remove this message.
  – Notice: The overflow files are comma separated value files (*.csv).

11.5   Database

On the *Database* tab, the properties of the *logging database* can be defined.

Recent events

Use the *Recent events block* to define the number of recent events that is displayed in the *Logging Viewer*.

Database file

Use the controls in the *Database file block* to define:
1. The location of the logging database. This can be entered in the upper text box.
  – Notice: For experts only: the logging database is a Microsoft® Access file, which also can be opened with Microsoft® Access. If for any reason the database becomes corrupted and the *Logging Server* is not able to access the database, the database can be repaired with Microsoft® Access.
2. The critical size of the logging database. When the critical size is reached, the *Logging Server* displays the following message:
  – *The Logging Server database has reached its critical size. Please decrease the logging expiration periods*.
3. It is possible to make a back-up of the *logging database* (even if the *Logging Serve*r is running). When a back-up is made of a running *Logging Server*, it is advised to wait for a moment at which a low number of events is expected (i.e. when there are almost no running calls). Events that occur while the back-up is made will not be copied to the logging database.

Flush events

Use the controls in the **Flush events block** to flush events from the logging database. Proceed as follows:
1. To flush the fault events from the logging database, checkmark the **Fault events** checkbox.
2. To flush the general events from the logging database, checkmark the **General events** checkbox.

3. To flush the call events from the logging database, checkmark the **Call events** checkbox.
4. Click the **Flush now** button to flush the selected type of events from the logging database.
   – If you checkmark the **Move expired events to overflow file** checkbox of the selected type of events in the **Logging Expiration** tab, the selected type of events are flushed to an overflow file.
   – If you do not checkmark the **Move expired events to overflow file** checkbox of the selected type of events in the **Logging Expiration** tab, the selected type of events are deleted from the database.
   – **Note**: When the database is flushed and the Logging Server is started again, the database is filled with the events that are retrieved from the enabled system controllers. Each enabled system controller keeps an internal list of up to 2000 events per category.

11.6 Security

On the *Security* tab, the security settings can be defined.

Server authentication

Use the controls in the *Server authentication block* to:
– Enable and disable server authentication with the *Use authentication box*. When server authentication is enabled, a *user name* and *password* must be entered to get access to the main window.
– Set the *password* and *user name* to get access to the *Logging Server* with the *Change User Name/Password* button. A password and user name can only be set when server authentication is enabled. The *password* must have at least five (5) characters. The *user name* must have at least four (4) characters.

Viewer/Network controller authentication

Use the controls in the *Viewer/System controller authentication block* to set the *password* and *user name* that:
– Gives a *Logging Viewer* access to the *Logging Server*.
– Gives the *Logging Server* access to all connected system controllers.
Note: Make sure that all systems have an account that contains the *user name* and *password* in the *Viewer/System controller block*. Otherwise, the *Logging Server* cannot connect to the systems.

12   Optional: Using the Logging Viewer

The *logging viewer* application software is part of the PROMATRIX 9000 installation software package (*.zip). To use it, firstly the software needs to be installed on your configuration computer. See *Optional: Logging Viewer, page 30*.

–   **IMPORTANT**: Only use the PROMATRIX 9000 *Logging viewer* when connected to PROMATRIX 9000 systems. E.g. the PRAESIDEO *Logging server* does not work with PROMATRIX 9000.

12.1   Start

Proceed as follows:

1. In **Windows**:
    –   version **< 10**: *Start > Programs* > Dynacord > PROMATRIX 9000 Logging Viewer.
    –   version **10**: *Windows (right mouse click) > File Explorer > c:\ProgramData*\Dynacord\PROMATRIX 9000 Logging Viewer.
    –   Click *Logging Viewer*:
    –   When the *Logging Viewer* has been started and faults have occurred, its icon shows the fault condition.

Notice!

In Windows the taskbar buttons should be configured to 'Never combine' similar taskbar buttons. Otherwise the fault condition will not be shown in the taskbar

12.2   Configuration

To configure the **Logging Viewer**:

1. Click **File** > **Options**.
    The **Options** window opens.
2. In the field **Server name of IP address**, enter the IP-address of the PC where the Logging Server to which the Logging Viewer must connect is installed.
    –   A server host name can be used instead of an IP-address if a DNS server automatically provides the IP-address.
    –   If the Logging Viewer is installed on the same PC as the Logging Server, you can use **Localhost** as the server name in the **Options** window.

12.3   Operation

The Logging Viewer main page shows:
- The menu bar that provides access to the menus of the Logging Viewer.
- The **Show active** button, which allows to select between showing all fault events, irrespective of status, or just the active fault events that have not been reset. This button is only available in the **Fault Events** tab.
- The **Block** buttons to select the next and previous blocks of events.
- The **Logging Status** button, which opens a window that shows the status of the Logging Viewer. When the Logging Server or the Logging Viewer does not operate correctly, this button is red.
- The tabs show the different type of events. For information about events, refer to the Application note Events manual.

12.3.1   Menu bar

The menu bar contains the following:
- The *File* menu.
- The *View* menu.
- The *Systems* menu.
- The *Action* menu.
- The *Help* menu.

File

The items in the *File* menu are used to export and print events and to configure the *Logging Viewer*. It contains the following items:
- *Options :*Opens the *Options* window that is used to configure the *Logging Viewer*.
- *Export:* Exports all events in the current event view to a comma separated values file (*.csv*). This file can be opened with, for example, Microsoft® Excel.
- *Print:* Prints all events in the current event view or prints a selected block of successive events. (To select a block of events: click the first event and then hold the <Shift> key and click the last event.)
- *Exit:* Closes the *Logging Viewer*.

View

The items in the *View* menu are used to set the event viewing options. It contains the following items:
- *Recent :*Shows all recent events. The number of displayed recent events is defined by the *Logging Server* window.
- *Historical:* Shows historical events. These are retrieved from the logging database. When this item is selected, a calendar appears in which a start date (*Start Date*) and an end date (*End Date*) can be selected. When the number of historical events is more than 10000, the *Logging Server* delivers the events in blocks to the *Logging Viewer*. Use the *NextBlock* and *Prev. Block* buttons to scroll through the blocks.
- *Refresh:* Refreshes the list of events.

(i) **Notice!**
New events are only shown in the *Recent* view. The *Historical* view does not show new events.

Systems

The items in the *System* menu are used to select the system from which the events are displayed. The list of available systems is generated by the *Logging Server* to which the *Logging Viewer* is connected. When *All* is selected, the events from all systems are displayed, including events from disabled systems and events from non-configured systems. Events generated by the *Logging Server* itself can be selected separately.

Action

The items in the *Action* menu are used to acknowledge and reset fault events. It contains the following items:

–   *Acknowledge All Fault Events:* Acknowledges all new fault events in all systems that are connected to the *Logging Server*. The user must log on to the *Logging Server* to acknowledge fault events.
–   *Reset All Fault Events:* Resets all acknowledged fault events in all systems that are connected to the *Logging Server*. The user must log on to the *Logging Server* to reset fault events.
–   *Log Off:* Logs the user off from the *Logging Server*.

Help

The item in the *Help* menu provides version information about the *Logging Viewer*.

12.3.2 Logging status button

The *Logging Status* window displays the status of the *Logging Viewer*. The following messages could be displayed:

Message:
The Logging Server and Viewer are OK.
Description:
The *Logging Server* and *Logging Viewer* operate correctly.
Recommended action:

Message:
Logging Server has no connection with <system>.
Description:
There is no connection with the specified system.
Recommended action:
Make sure that the specified system is running and that the specified system has an Ethernet connection with the Logging Server.

Message:
The Logging Viewer has lost contact with the Logging Server.
Description:
There is no connection with the Logging Server.
Recommended action:
Make sure that the Logging Server is running and that the Logging Server has an Ethernet connection with the Logging Viewer.

> **Message**:
> *The Logging Server options are changed. Restart the Logging Server to use the changed settings.*
> **Description**:
> *The configuration settings of the Logging Server were changed. The changed settings are not used until the Logging Server is restarted.*
> **Recommended action**:
> *Restart the Logging Server to use the new settings.*

> **Message**:
> *The Logging Server database has reached its critical size. Please decrease the logging expiration periods.*
> **Description**:
> *The database has reached its critical size.*
> **Recommended action**:
> *Enable and decrease the logging expiration periods to move events to the overflow files or flush the database.*

> **Message**:
> *The Logging Server overflow files have reached their critical size. Please clear or delete the overflow files.*
> **Description**:
> *One or more overflow files have reached the critical size.*
> **Recommended action**:
> *The overflow files are comma separated value (*.csv) files. They can be opened in an editor (e.g. Windows Wordpad, Microsoft® Excel). When an overflow file reaches its critical size, use an editor to delete data from the overflow file and decrease its size.*

12.3.3   Blocks

When the current view is the *Historical* view and the number of historical events is more than 10000, the *Logging Server* delivers the events in blocks to the *Logging Viewer*.

– If a next block is available, the *Next Block* button is enabled. The next block contains events that are newer than the events that are currently displayed.
– If a previous block is available, the *Prev. Block* button is enabled. The previous block contains events that are older than the events that are currently displayed.

13 Optional: Using OMNEO Control

How to use/operate OMNEO Control is described in a separate manual, called:
– OMNEO Control Software
    – **Download** the manual (.pdf) from the Dynacord download area: https://products.dynacord.com/emea/de/downloads > OMNEO control Vx.xx > Manual. See also *Related documentation, page 8*.

> **Caution!**
> OMNEO control is an application for use with OMNEO channels only. It is not compatible with AES67 and Dante. OMNEO control will automatically clean up the AES67 connections every 30 seconds.

> **Notice!**
> OMNEO control shows only device hostnames, not e.g. the control hostname of a PROMATRIX 9000 system controller.

14 Optional: Using (OMNEO) Network Docent

How to use/operate Network Docent is described in a separate manual, called:

– Network Docent:
    – **Download** the manual (.pdf) from the Dynacord download area: https://
      products.dynacord.com/emea/de/downloads > Network Docent Vx.xx > Manual.
      See also *Related documentation, page 8*.

15 Optional: Using Dante Controller

This section acts as a quick guide to Dante Controller. More detailed information can be found in the Dante Controller user documentation.

– It can be downloaded from www.audinate.com > Dante Controller. See also *Related documentation, page 8*.

Network view and routing

1. Startup Dante Controller:
   – Dante Controller will show all connected Dante devices in the network, including the unsecure PROMATRIX 9000 OMNEO network devices (mainly the system controller with maximum 120 inputs).
   – The *Routing* tab of the Dante Controller Network View shows the connected devices with all inputs and outputs.
2. By clicking on cross-point the connections are set up.
3. The tab *Device* Info shows details of the connected devices.
4. The tab *Clock Status* shows the clock status and which device is the Master.
5. The tab *Network Status* shows for each device:
   – *Network speed*, occupied *Transmit* and *Receive* bandwidth, selected *Latency Setting*, and more.
6. The tab *Events* shows recent changes to connected devices.
7. By double-clicking on a device in the *Routing* overview, or clicking *Device* from the menu and selecting a device, the *Device View* opens:
   – In tab *Device Config* the *Latency* can be optimized to the network topology and speed. Make sure that CAT5e or CAT6 network cables are used in case of a Gbps-network. On 100 Mbps networks also CAT5 can be used.
   – The sample rate is always 48 kHz. Other options in this view are not yet supported.

⚠ **Warning!**
Do not set a PIN code in Dante Controller.

If you set a PIN code in the Dante Controller, you need to unlock the Dante device:

1. Press **Ctrl + D** or **Command + D** to open the locked device in **Device View**.
2. Click the red padlock icon.
3. Enter the PIN you set in the **Unlock Device** window.
4. Click **Unlock**.
   The padlock icon changes to blue. Your device is unlocked.

For more information, refer to the chapter *Device Lock* in the Dante Controller User Guide at www.audinate.com.

16   Optional: Using the Open Interface

TCP/IP devices can access the system through the *Open Interface*. A **maximum** of **twenty** (20) TCP/IP devices with *Open Interface* access can be used. This includes connection to Logging Servers (see *Optional: Logging Server, page 29*). The configuration web browser uses a different port (port 80 forwarded to HTTPS 443) for the connection and is not part of this limitation.

The PROMATRIX 9000 *Open Interface* is based on a C# implementation and on .NET framework technology, as described by Microsoft.

Many programming languages recognize .NET, which makes development of user interfaces (e.g. PC call stations) by third parties easier.

The PROMATRIX 9000 *Open Interface* is described in the PROMATRIX 9000 *Open Interface programming instructions* manual:

– Open Interface programming instructions.pdf
– Download the manual from www.dynacord.com > PROMATRIX 9000 product document section (e.g. the system controller). See also *Related documentation, page 8*.
– It is not possible to derive any rights from this PROMATRIX 9000 *Open Interface programming instructions manual* regarding the programming interface.
– Extensions and improvements on the *Open Interface* can be implemented when new versions of PROMATRIX 9000 are introduced. See *Mandatory software, page 24*.
– Since the *Open Interface programming instructions manual* is intended for programmers, it is only available in English.

TCP/IP connection and ports

After PROMATRIX 9000 has been started, the system controller listens to port **9401** and **9403**. The set-up of the TCP/IP connection must originate from your system using the **control hostname** address of the PROMATRIX 9000 system controller (see *Logon the application, page 46*) and port **9401** or port **9403**. The connection between the PROMATRIX 9000 system and your system is based on a stream connection. This implies that messages may be transferred using multiple packets.

IMPORTANT: Port **9401** is used for non-secure connections and port **9403** is used for secure connections. For secure connections, TLS 1.2 is used.

(i) **Notice!**
Connect Open interface applications to each individual master and subsystem.

Safety precautions:

The *Open interface* connection (i.e. an Internet connection) is regarded as an open connection that requires extra safety precautions. For example, a firewall to prevent unauthorized persons using the PROMATRIX 9000 system. Therefore install and run the PROMATRIX 9000 *Open Interface* certificate. Also the application connecting to the *Open Interface* needs to validate the certificate. See Open interface.

– PROMATRIX 9000 can also limit the access of TCP/IP devices. See *System settings, page 81*
– Use of the *Open Interface* can lead to situations in which PROMATRIX 9000 does not comply anymore to the evacuation standards.

Scope

As mentioned before, the PROMATRIX 9000 *Open Interface Programming Instructions manual* describes how to use the PROMATRIX 9000 *Open Interface* in combination with C# and .NET. To understand this manual, knowledge in the following fields is necessary:

– The C# programming language and its development environment.
– The principle of .NET.
– PROMATRIX 9000 and its installation and functionality. See *Related documentation, page 8.*

Refer to

– *Related documentation, page 8*

17 Troubleshooting

If a network device and/or the configuration indicates a fault/error, you have a few troubleshoot options to find the fault/error:

– See *Configuration, page 134* in the Diagnose section.
– See *Optional: Using the Logging Viewer, page 155*.
– Refer to the application note *Events manual*.
– See the *Troubleshooting* section of the PROMATRIX 9000 installation manual.

If a fault cannot be resolved, please contact your supplier or system integrator, or go directly to your Dynacord representative.

IMPORTANT

From our experience, and based on data from our repair shops, we know that problems on site are often related to the application (cabling, settings, etc.) and not to the performance of the device(s) individually. It is therefore important that the available product related documentation (i.e. manuals), including the release notes, are read. This will save your time and helps us deploying the quality of Dynacord products. See *Related documentation, page 8*.

Tip: Be informed about the latest released (configuration) software version and devices firmware version of an PROMATRIX 9000 system installation. Make sure you have the correct (configuration) software and/or product firmware installed. See the *Mandatory software, page 24*

17.1 Device upgrade fails

The upgrade was not successfully completed if the **State** column in the Firmware Upload Tool (FWUT) indicates **Failed** with a red color bar.

In this case:

– Check whether the network device is compatible with the firmware. Refer to *Version, page 135*, to *Compatibility and certification overview, page 21* and check the Release notes.
– Start the upgrading process again.

If the upgrade still fails after a retry, do the following:

– Close and restart the FWUT. Try the upgrade again.
– If the upgrade still fails, power cycle the device that did not process the firmware upload. Try the upgrade again.
– If the upgrade still fails, set the device to bootloader mode.

How to set the device to bootloader mode:

1. Disconnect the power to turn off the device.
2. Press and hold the **Reset to factory default** button.
3. Power the device and keep the button pressed for at least another second.
4. Follow the **First time firmware upload** procedure described in *Check/Upload the devices firmware, page 27*.

Notice!

If, after the successful upgrade to the new firmware, the **Version** column in the FWUT still shows the previous firmware version, upgrade to the new firmware once more.

If you still cannot upgrade the devices, contact your Dynacord service representative.

18 Tones

Each tone and/or pre-recorded (spoken) message used in the PROMATRIX 9000 system must have the .wav audio file format. See *Recorded messages, page 79*.

The following .wav files (tones) are PROMATRIX 9000 predefined, are mono and have a 16-bit sample depth and 48 kHz sample rate. Be noticed that tones could be updated and new tones could be added. Previous means that possible tones are not all/different listed in this document version. See *Mandatory software, page 24* > Tones, for the latest version available.

Requests for other tones can be directed to Bosch Security Systems, Eindhoven, The Netherlands.

18.1 Alarm tones

Alarm tones are mainly used as announcements for emergency and evacuation purposes.

Tone characteristics
– Mono, sample rate 48 kHz, 16-bit sample depth.
– Peak level: < -1.3 dBFS (full scale square wave = 0 dBFS).
– RMS level: < -9 dBFS (full scale sine wave = -3 dBFS).
– Glitch-free and gapless repeat.
– MS = Multi-sine, TS = Triple-sine, SW = Sine wave, B = Bell.
– Filename format: Alarm_MS_<frequency (range)>_<duty cycle>_<duration>.wav.

Alarm_B_100p_1s
– Bell sound, 1 s
– Duty cycle 100%
– Offshore "Abandon platform"

Alarm_B_100p_2.5s
– Bell sound with release, 2.5 s
– Duty cycle 100%
– Offshore "FG"

Alarm_MS_300-1200Hz_100p_1s.wav
– Sweep 300 Hz - 1200 Hz, up in 1 s
– Duty cycle 100%
– "General purpose"

Alarm_MS_350-500Hz_100p_1s.wav
– Sweep 350 Hz - 500 Hz, up in 1 s
– Duty cycle 100%

Alarm_MS_400Hz_100p_1s.wav
– Continuous 400 Hz, 1 s
– Duty cycle 100%

Alarm_MS_420Hz_48p_(0.60+0.65)s.wav
– Intermittent 420 Hz, 0.60 s on, 0.65 s off
– Duty cycle 48%
– Australia, AS 2220 "Alert" (extended spectrum)

Alarm _MS_420Hz_50p_(0.6+0.6)s.wav

- Intermittent 420 Hz, 0.6 s on, 0.6 s off
- Duty cycle 50%
- Australia, AS 1670.4, ISO 7731 "Alert" (extended spectrum)

Alarm_MS_422-775Hz_46p_(0.85+1.00)s.wav

- Sweep 422 Hz - 775 Hz, up in 0.85 s, 1.0 s off
- Duty cycle 46%
- USA, "NFPA Whoop"

Alarm_MS_500-1200-500Hz_100p_(1.5+1.5)s.wav

- Sweep 500 Hz - 1200 Hz, up in 1.5 s, down in 1.5 s
- Duty cycle 100%
- "Siren"

Alarm_MS_500-1200Hz_94p_(3.75+0.25)s.wav

- Sweep 500 Hz - 1200 Hz, up in 3.75 s, 0.25 s off
- Duty cycle 94%
- Australia, AS 2220 -1978 "Action"

Alarm_MS_500-1200Hz_88p_(3.5+0.5)s.wav

- Sweep 500 Hz - 1200 Hz, up in 3.5 s, 0.5 s off
- Duty cycle 88%
- Netherlands, NEN 2575 "Evacuation"

Alarm_MS_500Hz_20p_(0.15+0.60)s.wav

- Intermittent 500 Hz, 0.15 s on, 0.6 s off
- Duty cycle 20%
- Sweden, SS 03 17 11 "Local Warning"

Alarm_MS_500Hz_60p_4x(0.15+0.10)s.wav

- Intermittent 500 Hz, 0.15 s on, 0.1 s off, 4 repetitions
- Duty cycle 60%
- Sweden, SS 03 17 11 "Imminent Danger"

Alarm_MS_500Hz_100p_1s.wav

- Continuous 500 Hz, 1 s
- Duty cycle 100%
- Sweden, SS 03 17 11 "All clear"; Germany, KTA3901 "All clear"

Alarm_MS_520Hz_13p_(0.5+3.5)s.wav

- Intermittent 520 Hz, 0.5 s on, 3.5 s off
- Duty cycle 13%
- Australia, AS 4428.16 "Alert" (extended spectrum)

Alarm_MS_520Hz_38p_3x(0.5+0.5)s+1s.wav

- Intermittent 520 Hz, 0.5 s on, 0.5 s off, 0.5 s on, 0.5 s off, 0.5 s on, 1.5 s off
- Duty cycle 38%
- Australia, AS 4428.16, ISO 8201 "Evacuation" (extended spectrum)

Alarm_MS_550+440Hz_100p_(1+1)s.wav

- Alternating 550 Hz, 1 s and 440 Hz, 1 s
- Duty cycle 100%
- Sweden "Turn Out"

Alarm_MS_560+440Hz_100p_2x(0.1+0.4)s.wav

- Alternating 560 Hz, 0.1 s and 440 Hz, 0.4 s, 2 repetitions
- Duty cycle 100%
- France, NF S 32-001 "Fire"

Alarm_MS_660Hz_33p_(6.5+13)s.wav

– Intermittent 660 Hz, 6.5 s on, 13 s off
– Duty cycle 33%
– Sweden "Pre-mess"

Alarm_MS_660Hz_50p_(1.8+1.8)s.wav

– Intermittent 660 Hz, 1.8 s on, 1.8 s off
– Duty cycle 50%
– Sweden "Local warning"

Alarm_MS_660Hz_50p_4x(0.15+0.15)s.wav

– Intermittent 660 Hz, 0.15 s on, 0.15 s off, 4 repetitions
– Duty cycle 50%
– Sweden "Air raid"

Alarm_MS_660Hz_100p_1s.wav

– Continuous 660 Hz, 1 s
– Duty cycle 100 %
– Sweden "All clear"

Alarm_MS_720Hz_70p_(0.7+0.3)s.wav

– Intermittent 720Hz, 0.7 s on, 0.3 s off
– Duty cycle 70%
– Germany "Industrial alarm"

Alarm_MS_800+970Hz_100p_2x(0.25+0.25)s.wav

– Alternating 800 Hz, 0.25 s and 970 Hz, 0.25 s, 2 repetitions
– Duty cycle 100%
– UK, BS 5839-1 "Fire", EN 54-3

Alarm_MS_800-970Hz_38p_3x(0.5+0.5)s+1s.wav

– Sweep 800 Hz - 970 Hz, up in 0.5 s, 0.5 s off, up in 0.5 s, 0.5 s off, up in 0.5 s, 1.5 s off
– Duty cycle 38%
– ISO 8201

Alarm_MS_800-970Hz_100p_1s.wav

– Sweep 800 Hz - 970 Hz, up in 1 s
– Duty cycle 100%
– UK, BS 5839-1 "Fire"

Alarm_MS_800-970Hz_100p_7x0.14s.wav

– Sweep 800 Hz - 970 Hz, up in 0.14 s, 7 repetitions
– Duty cycle 100%
– UK, BS 5839-1 "Fire"

Alarm_MS_970+630Hz_100p_(0.5+0.5)s.wav

– Alternating 970 Hz, 0.5 s and 630 Hz, 0.5 s
– Duty cycle 100%
– UK, BS 5839-1

Alarm_MS_970Hz_20p_(0.25+1.00)s.wav

– Intermittent 970 Hz, 0.25 s on, 1 s off
– Duty cycle 20%
– "General purpose"

Alarm_MS_970Hz_38p_3x(0.5+0.5)s+1s.wav

– Intermittent 970 Hz, 0.5 s on, 0.5 s off, 0.5 s on, 0.5 s off, 0.5 s on, 1.5 s off
– Duty cycle 38%
– ISO 8201 "Emergency evacuation"

Alarm_MS_970Hz_40p_5x(1+1)s+(3+7)s.wav

– Intermittent 970 Hz, 1 s on, 1 s off, 5 repetitions, 3 s on, 7 s off

- Duty cycle 40%
- Maritime

Alarm_MS_970Hz_50p_(1+1)s.wav
- Intermittent 970 Hz, 1 s on, 1 s off
- Duty cycle 50%
- UK, BS 5839-1 "Alert", PFEER "Alert", Maritime

Alarm_MS_970Hz_50p_(12+12)s.wav
- Intermittent 970 Hz, 12 s on, 12 s off
- Duty cycle 50%
- Maritime

Alarm_MS_970Hz_52p_7x(1+1)s+(5+4)s.wav
- Intermittent 970 Hz, 1 s on, 1 s off, 7 repetitions, 5 s on, 4 s off
- Duty cycle 52%
- Maritime "General emergency alarm"

Alarm_MS_970Hz_56p_7x(1+1)s+(7+4)s.wav
- Intermittent 970 Hz, 1 s on, 1 s off, 7 repetitions, 7 s on, 4 s off
- Duty cycle 56%
- Maritime "General emergency alarm"

Alarm_MS_970Hz_64p_7x(1+1)s+(7+1)s.wav
- Intermittent 970 Hz, 1 s on, 1 s off, 7 repetitions, 7 s on, 1 s off
- Duty cycle 64%
- Maritime "General emergency alarm"

Alarm_MS_970Hz_65p_(5+1)s+(1+1)s+(5+4)s.wav
- Intermittent 970 Hz, 5 s on, 1 s off, 1 s on, 1 s off, 5 s on, 4 s off
- Duty cycle 65%
- Maritime

Alarm_MS_970Hz_67p_(1+1)s+(3+1)s.wav
- Intermittent 970 Hz, 1 s on, 1 s off, 3 s on, 1 s off
- Duty cycle 67%
- Maritime IMO "Leave ship"

Alarm_MS_970Hz_72p_3x(7+2)s+2s.wav
- Intermittent 970 Hz, 7 s on, 2 s off, 3 repetitions, 2 s off
- Duty cycle 72%
- Maritime "Man overboard"

Alarm_MS_970Hz_74p_4x(5+1)s+3s.wav
- Intermittent 970 Hz, 5 s on, 1 s off, 4 repetitions, 3 s off
- Duty cycle 74%
- Maritime

Alarm_MS_970Hz_80p_(12+3)s.wav
- Intermittent 970 Hz, 12 s on, 3 s off
- Duty cycle 80%
- Maritime

Alarm_MS_970Hz_100p_1s.wav
- Continuous 970 Hz, 1 s
- Duty cycle 100%
- UK, BS 5839-1 "Evacuate", PFEER "Toxic gas", Maritime "Fire", EN 54-3

Alarm_MS_1000+2000Hz_100p_(0.5+0.5)s.wav
- Alternating 1000 Hz, 0.5 s and 2000 Hz, 0.5 s
- Duty cycle 100%

- Singapore

Alarm_MS_1200-500Hz_100p_1s.wav
- Sweep 1200 Hz - 500 Hz, down in 1 s
- Duty cycle 100%
- Germany, DIN 33404 Part 3, PFEER "Prepare for evacuation", EN 54-3

Alarm_MS_1400-1600-1400Hz_100p_(1.0+0.5)s.wav
- Sweep 1400 Hz - 1600 Hz, up in 1.0 s, down in 0.5 s
- Duty cycle 100%
- France, NFC 48-265

Alarm_MS_2850Hz_25p_3x(0.5+0.5)s+1s.wav
- Intermittent 2850 Hz, 0.5 s on, 0.5 s off, 0.5 s on, 0.5 s off, 0.5 s on, 1.5 s off
- Duty cycle 25%
- USA, ISO 8201 "High tone"

Alarm_SW_650-1100-650Hz_50p_4x(0.125+0.125)s.wav
- Sweep 650 Hz - 1100 Hz, up and down in 0.125 s, 0.125 s off, 4 repetitions
- Duty cycle 50%
- Offshore "H2S alarm"

Alarm _TS_420Hz_50p_(0.6+0.6)s.wav
- Intermittent 420 Hz, 0.6 s on, 0.6 s off
- Duty cycle 50%
- Australia, AS 1670.4, ISO 7731 "Alert" (standard spectrum)

Alarm_TS_520Hz_13p_(0.5+3.5)s.wav
- Intermittent 520 Hz, 0.5 s on, 3.5 s off
- Duty cycle 13%
- Australia, AS 4428.16 "Alert" (standard spectrum)

Alarm_TS_520Hz_38p_3x(0.5+0.5)s+1s.wav
- Intermittent 520 Hz, 0.5 s on, 0.5 s off, 0.5 s on, 0.5 s off, 0.5 s on, 1.5 s off
- Duty cycle 38%
- Australia, AS 4428.16, ISO 8201 "Evacuation" (standard spectrum)

18.2 Attention tones

Attention tones are mainly used as a start and/or end tone for an announcement.

Tone characteristics
- Mono, sample rate 48 kHz, 16-bit sample depth.
- Filename format: Attention_<sequence number>_<number of tones>_<duration>.wav

Attention_A_1T_1.5s.wav
- Single tone chime
- Marimba and Vibraphone, A4
- Peak level -6 dBFS, RMS level < -10 dBFS, 1.5 s

Attention_B_1T_1.5s.wav
- Single tone chime
- Marimba and Vibraphone, C#5
- Peak level -6 dBFS, RMS level < -10 dBFS, 1.5 s

Attention_C_1T_1.5s.wav
- Single tone chime
- Marimba and Vibraphone, E5
- Peak level -6 dBFS, RMS level < -10 dBFS, 1.5 s

Attention_D_1T_1.5s.wav
– Single tone chime
– Marimba and Vibraphone, G5
– Peak level -6 dBFS, RMS level < -10 dBFS, 1.5 s

Attention_E1_2T_2s.wav
– Two tone pre-chime
– Marimba and Vibraphone, A4/C#5
– Peak level -6 dBFS, RMS level < -10 dBFS, 2 s

Attention_E2_2T_2s.wav
– Two tone post-chime
– Marimba and Vibraphone, C#5/A4
– Peak level -6 dBFS, RMS level < -10 dBFS, 2 s

Attention_F1_3T_2s.wav
– Three tone pre-chime
– Marimba and Vibraphone, G4/C5/E5
– Peak level -6 dBFS, RMS level < -10 dBFS, 2 s

Attention_F2_3T_2s.wav
– Three tone post-chime
– Marimba and Vibraphone, E5/C5/G4
– Peak level -6 dBFS, RMS level < -10 dBFS, 2 s

Attention_G1_3T_2.5s.wav
– Three tone pre-chime
– Marimba and Vibraphone, A#4/D5/F5
– Peak level -6 dBFS, RMS level < -10 dBFS, 2.5 s

Attention_G2_3T_2.5s.wav
– Three tone post-chime
– Marimba and Vibraphone, F5/D5/A#4
– Peak level -6 dBFS, RMS level < -10 dBFS, 2.5 s

Attention_H1_4T_3s.wav
– Four tone pre-chime
– Marimba and Vibraphone, E5/C5/D5/E4
– Peak level -6 dBFS, RMS level < -10 dBFS, 3 s

Attention_H2_4T_3s.wav
– Four tone post-chime
– Marimba and Vibraphone, G4/D5/E5/C5
– Peak level -6 dBFS, RMS level < -10 dBFS, 3 s

Attention_J1_4T_3s.wav
– Four tone pre-chime
– Marimba and Vibraphone, G4/C5/E5/G5
– Peak level -6 dBFS, RMS level < -10 dBFS, 3 s

Attention_J2_4T_3s.wav
– Four tone post-chime
– Marimba and Vibraphone, G5/E5/C5/G4
– Peak level -6 dBFS, RMS level < -10 dBFS, 3 s

Attention_K1_4T_2.5s.wav
– Four tone pre-chime
– Marimba and Vibraphone, G4/C5/E5/G5
– Peak level -6 dBFS, RMS level < -10 dBFS, 2.5 s

Attention_K2_4T_2.5s.wav

– Four tone post-chime
– Marimba and Vibraphone, G5/E5/C5/G4
– Peak level -6 dBFS, RMS level < -10 dBFS, 2.5 s

Attention_L1_4T_3s.wav
– Four tone pre-chime
– Marimba and Vibraphone, C5/E5/G5/A5
– Peak level -6 dBFS, RMS level < -10 dBFS, 3 s

Attention_L2_4T_3s.wav
– Four tone post-chime
– Marimba and Vibraphone, A5/G5/E5/C5
– Peak level -6 dBFS, RMS level < -10 dBFS, 3 s

Attention_M1_6T_2s.wav
– Six tone pre-chime
– Marimba and Vibraphone, G4/C5/E5/G4/C5/E5
– Peak level -6 dBFS, RMS level < -10 dBFS, 2 s

Attention_M2_4T_2s.wav
– Four tone post-chime
– Marimba and Vibraphone, C5/E5/C5/G4
– Peak level -6 dBFS, RMS level < -10 dBFS, 2 s

Attention_N1_7T_2s.wav
– Seven tone pre-chime
– Marimba and Vibraphone, E5/F4/C5/G4/E6/C6/G5
– Peak level -6 dBFS, RMS level < -10 dBFS, 2 s

Attention_N2_4T_2s.wav
– Four tone post-chime
– Marimba and Vibraphone, C6/E5/C5/G4
– Peak level -6 dBFS, RMS level < -10 dBFS, 2 s

Attention_O1_6T_3s.wav
– Six tone pre-chime
– Marimba and Vibraphone, F5/C5/C5/G5/(A4+C6)/(F4+A5)
– Peak level -6 dBFS, RMS level < -10 dBFS, 3 s

Attention_O2_5T_2.5s.wav
– Five tone post-chime
– Marimba and Vibraphone, A#5/A#5/A5/A5/(F4+F5)
– Peak level -6 dBFS, RMS level < -10 dBFS, 2.5 s

Attention_P1_8T_4s.wav
– Eight tone pre-chime
– Marimba and Vibraphone, A4/A4/A4/C5/D5/D5/D5/(D4+A4)
– Peak level -6 dBFS, RMS level < -10 dBFS, 4 s

Attention_P2_4T_2.5s.wav
– Four tone post-chime
– Marimba and Vibraphone, (A4+D5)/A4/D5/(A4+D5)
– Peak level -6 dBFS, RMS level < -10 dBFS, 2.5 s

Attention_Q1_3T_3.5s.wav
– Three tone pre-chime
– Celesta, G4/C5/E5
– Peak level -6 dBFS, RMS level < -10 dBFS, 3.5 s

Attention_Q2_3T_3.5s.wav
– Three tone post-chime

- Celesta, E5/C5/G4
- Peak level -6 dBFS, RMS level < -10 dBFS, 3.5 s

Attention_R_6T_2.5s.wav
- Six tone chime
- Guitar, F4/C5/F5/F4/C5/F5
- Peak level -6 dBFS, RMS level < -10 dBFS, 2.5 s

Attention_S_3T_2s.wav
- Three tone chime
- Vibraphone, C4/D4/D#4
- Peak level -3 dBFS, RMS level < -10 dBFS, 2 s

Attention_T_3T_3s.wav
- Three tone chime
- Vibraphone, D5/C4/D4
- Peak level -4 dBFS, RMS level < -10 dBFS, 3 s

Attention_U_3T_3.5s.wav
- Three tone chime
- Vibraphone, C#6/E5/C5
- Peak level -5 dBFS, RMS level < -10 dBFS, 3.5 s

18.3 Silence tones

Silence tones are mainly used to create a silence before, between and/or after a message/tone.

Tone characteristics
- Mono, sample rate 48 kHz, 16-bit sample depth.
- Filename format: Silence_<duration>.wav

Silence_1s.wav
- Silence period, 1 s

Silence_2s.wav
- Silence period, 2 s

Silence_4s.wav
- Silence period, 4 s

Silence_8s.wav
- Silence period, 8 s

Silence_16s.wav
- Silence period, 16 s

18.4 Test tones

Test tones are mainly used to test the audio output and loudspeaker zones, for example to adjust the audio signal (filter) levels.

Tone characteristics
- Mono, sample rate 48 kHz, 16-bit sample depth.
- Filename format: Test_<purpose>_<duration>.wav

Test_Loudspeaker_AB_20kHz_10s.wav
- Sine wave 20 kHz, peak level -20 dBFS, RMS level -23 dBFS, 10 s.

–   Inaudible signal to drive the A-group loudspeakers and check the connectivity of the A-
    and B-loudspeakers simultaneously while the building is occupied. The B-loudspeakers
    get a 22 kHz signal.
–   The A-loudspeakers are connected to their own zone amplifier channel. This zone gets
    the 20 kHz signal.
–   Keep a smartphone in front of the loudspeaker. A smartphone spectrum analyzer
    detects both the 20 kHz and the 22 kHz simultaneously.

Test_Loudspeaker_AB_22kHz_10s.wav

–   Sine wave 22 kHz, peak level -20 dBFS, RMS level -23 dBFS, 10 s.
–   Inaudible signal to drive the B-group loudspeakers and check connectivity of the A- and
    B-loudspeakers simultaneously while the building is occupied. The A-loudspeakers get a
    20 kHz signal.
–   The B-loudspeakers are temporarily connected to another amplifier channel, for another
    zone; this zone gets the 22 kHz signal.
–   Keep a smartphone in front of the loudspeaker. A smartphone spectrum analyzer
    detects both the 20 kHz and the 22 kHz simultaneously.

Test_LoudspeakerPolarity_10s.wav

–   Filtered sawtooth 50 Hz, peak level -12 dBFS, RMS level -20 dBFS, 10 s.
–   Audible signal to detect proper polarity of connected loudspeakers.
–   A smartphone oscilloscope detects a positive or negative sharp peak that should be in
    the same direction for all loudspeakers.

Test_PinkNoise_30s .wav

–   Pink noise signal 20 Hz - 20 kHz, peak level -3 dBFS, RMS level -16 dBFS, 30 s.
–   Audible signal for acoustic measurements.

Test_STIPA_BedrockAudio_100s.wav

–   STIPA test signal, peak level - 4.2 dBFS, RMS level -11 dBFS, 100 s.
–   Test signal to measure the speech intelligibility through the Speech Transmission Index.
–   Copyright Bedrock Audio BV (http://bedrock-audio.com/), used with permission.
–   Compatible with all STIPA meters compliant to IEC 60268-16 Ed. 4 (Bedrock Audio, NTi
    Audio, Audio Precision).
–   The signal can be looped. A 440 Hz beep signal of -12 dBFS, duration 1 s, marks the
    beginning of the 100 s test signal. Start the measurement after this beep, so the
    measurement will not be disturbed by a gap between the end and the restart.
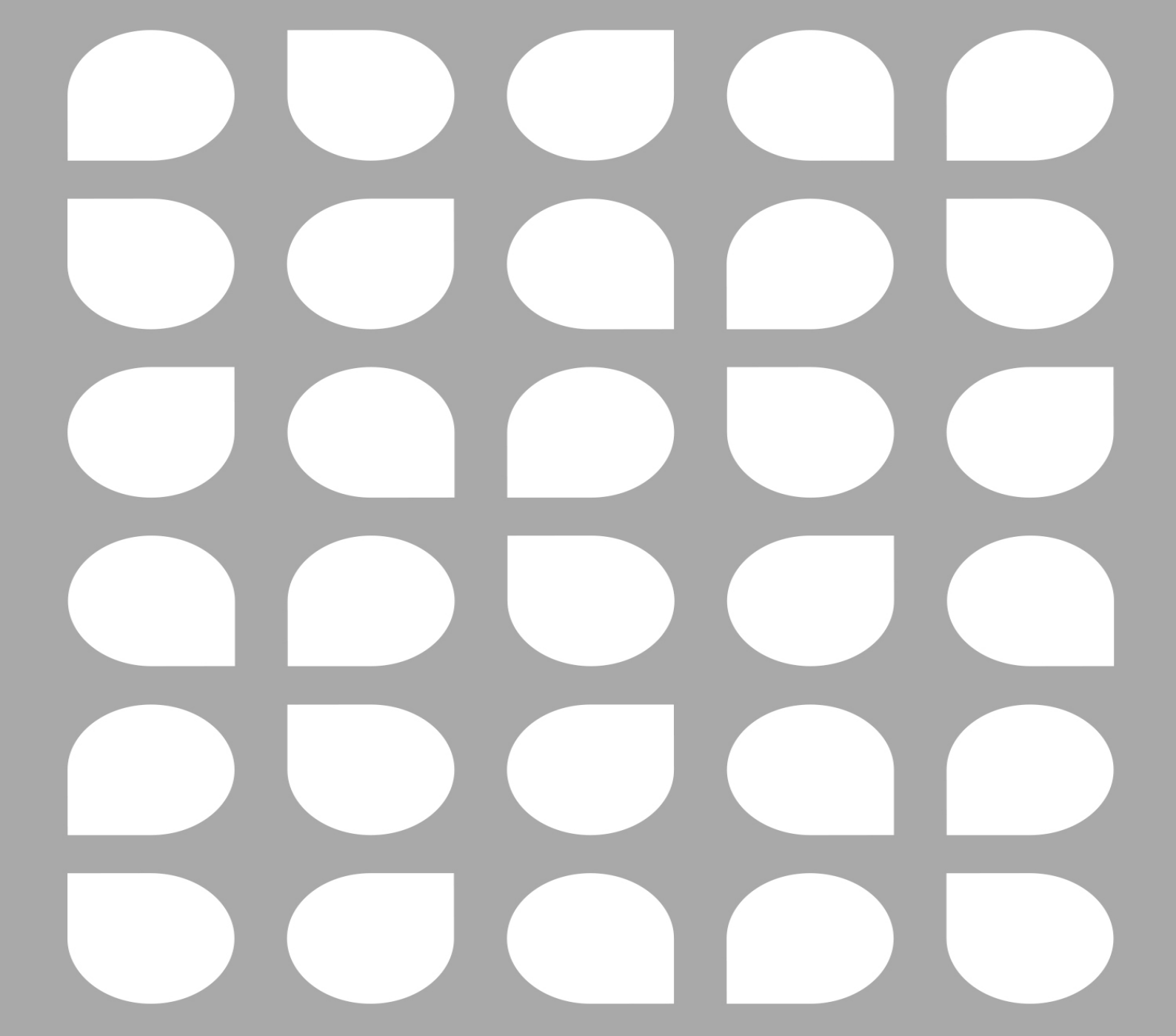–   A measurement cycle takes a minimum of 15 s.

Test_TickTone_1800Hz_5x(0.5+2)s.wav

–   Intermittent 1800 Hz sinewave, 0.5 s on, 2 s off, 4 repetitions.
–   Duty cycle 20%.
–   Route the tick tone to a zone to deliver an audible bleep from each speaker in that
    zone. The loss of the tick tone along the line allows the engineer to identify the position
    of the line discontinuity.

Test_Reference_440Hz_10s.wav

–   Continuous 440 Hz sinewave, 10s.
–   Duty cycle 100%.

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