PM9-SCS System controller, small
Promatrix 9000

DYNACORD

- Full control of PROMATRIX 9000 devices and audio routing

- Built-in supervised storage for messages and tone files

- Support for Dante audio input and output streams

- Open interface to third party applications

- IP-networked on OMNEO for audio and control

The small system controller PM9-SCS is the budget variant in the range of PROMATRIX 9000 system controllers. The small controller has all the features of the large system controller PM9-SCL except for some limitations regarding the size of the system.
The system controller manages all system related functions in a PROMATRIX 9000 Public Address and Voice Alarm system. It routes all audio connections between network-connected PROMATRIX 9000 audio sources and destinations. It supervises and plays back messages and tones, stored on its flash memory, either scheduled or manually started from a call station or PC. It manages the routing of background music streams, along with business calls and emergency calls, all based on priority level and zone occupancy. It collects all status information of connected system devices, manages the event logs and reports faults.
The system controller is network-connected via OMNEO and DC-powered from a multifunction power supply with integrated battery backup, accommodating both centralized and decentralized system topologies. Connections to other devices in the system are made using the built-in 5-port switch, supporting RSTP. The built-in web server allows for system configuration using a browser.

Functions

System control and audio routing

- Capability to control PROMATRIX 9000 systems with a maximum of six amplifiers. In combination with the PM9-AD608 amplifiers, the PM9-SCS is sufficient to control up to 48 zones. Use the PM9-SCL to address more zones or if you need more power.

- The number of dynamic OMNEO channels that can be routed is unlimited, which allows for many simultaneous calls. However, the number of static Dante audio streams to use as interface with 3rd party systems is limited to eight.

- Native support for switched single-subnet networks, with add-on support for routed multi-subnet topologies.

- Dynamic allocation of multiple and simultaneous audio channels to save on network bandwidth; audio connections are created when a call or a message is broadcast, and freed up immediately afterwards.

- Secure interconnections using Advanced Encryption Standard (AES128) for audio data and Transport Layer Security (TLS) for control data.

- Receiver for up to eight Dante or AES67 audio channels from external sources, with dynamic re-routing to secure OMNEO channels.

- SIP/VoIP interface for telephone paging and for audio to PROMATRIX 9000 and control from 3rd party systems.
- Internal storage capacity for messages and tones; up to eight messages can be played back simultaneously.
- Internal real time clock for scheduled events and event time stamping; support for Network Time Protocol (NTP) with automatic adjustment for Daylight Saving Time (DST).
- Internal system event and fault event log.
- Networked control interface for third party applications.
- Built-in webserver for configuration and file management using a browser.
- Dual redundant system controller option for highest system availability in mission-critical applications.
- When equipped with the PRA-LSCRF License call recording and forwarding, eight recorders and players allow for call stacking and time-shifting.

Sound quality
- Audio-over-IP, using OMNEO, the Dynacord high-quality digital audio interface, compatible with Dante and AES67; audio sample rate is 48 kHz with 24-bit sample size.
- Messages and tones are stored as high definition uncompressed wav-files.

Supervision
- Supervision of stored messages and tones.
- Supervision of data integrity of site specific data.
- Internal watchdog timers to detect and recover from processing errors.
- Faults or problems of all system devices are collected, reported and logged.

Fault tolerance
- Eight system controllers can be configured as redundant pairs.
- Five OMNEO network connection ports, supporting RSTP.
- Dual DC-inputs with polarity reversal protection.

Variants of the PROMATRIX 9000 system controller

| Variant	PM9-SCL	PM9-SCS
Dynamic OMNEO audio channels (secure)	1000	1000
Dynamic OMNEO tone/message playback channels (secure)	8	8
Static Dante or AES67 audio channels (secure, input and/or output)	Pool of 8	Pool of 8
Static Dante or AES67 audio channels (open, input)	112	—

Variant	PM9-SCL	PM9-SCS
Maximum number of networked devices	250	250
Number of amplifiers in the system	System setup dependent	6

Connection and functional diagram
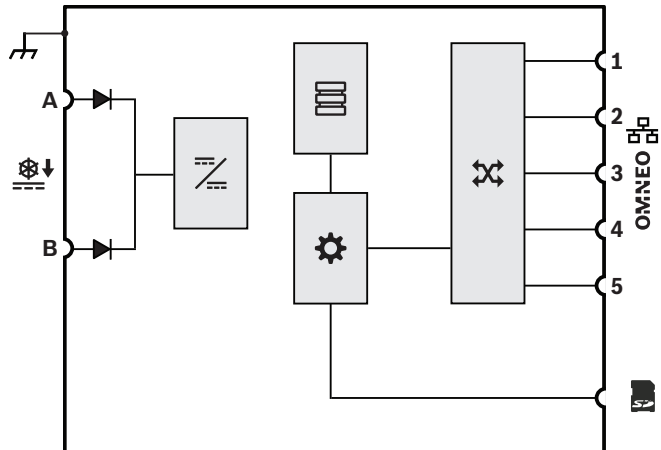
⊳⊢ Diode		⌿ DC to DC converter	
☰ Message and tone storage		⚙ Controller	
⤬ OMNEO network switch			

Front view
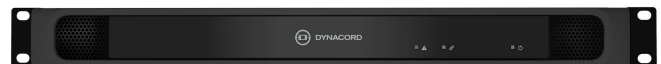
Front panel indicators

⚠	Device fault present	Yellow
🔗	Network link present	Green
	Network link lost	Yellow
	Standby for redundancy	Blue
⏻	Power on	Green

Rear view

Rear panel indicators

品	100 Mbps network	Yellow
	1 Gbps network	Green
⏻	Power on	Green
	Device in identification mode	Green blinking
⚠	Device fault present	Yellow
⊘	SD card busy; do not remove	Green

Rear panel controls

↺	Device reset (to factory default)	Button

Rear panel connections
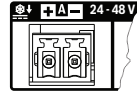
	24 to 48 VDC input A-B	
	Memory card	
OMNEO	Network port 1-5	
	Chassis ground	
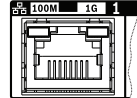
Architects' and engineers' specifications

The IP-networked system controller shall be designed exclusively for use with Dynacord PROMATRIX 9000 systems. The system controller shall dynamically assign network audio channels for audio routing between system devices across multiple subnets. It shall support >100 simultaneous high-resolution audio channels (24-bit, 48 kHz) for music routing and making calls, with encryption and authentication to protect against eavesdropping and hacking. It shall be capable of receiving Dante and AES67 audio streams. A SIP/VoIP telephone interface shall be available. The system controller shall provide an interface for control data and multi-channel digital audio over OMNEO using an integrated 5-port Ethernet switch for redundant network connections, supporting RSTP and loop-through cabling. The system controller shall have dual power supply inputs and power supplies. The system controller shall manage all devices in the system to provide the configured system functions. It shall incorporate a supervised storage for message and tone files with networked playback of up to eight streams simultaneously. It shall keep an internal log of fault events and call events. The system controller shall provide a secure TCP/IP open interface for remote control and diagnostics. The system controller shall provide front-panel LED indications for the status of power supplies and the presence of faults in the system and provide additional software monitoring and fault reporting features. The system controller shall be rack mountable (1U). It shall be possible to connect a backup system controller for dual redundancy with automatic fail-over. The system controller shall be certified for EN 54-16, marked for CE and be compliant with the RoHS directive. Warranty shall be three years minimum. If the system size permits, the system controller shall be a Dynacord PM9-SCS, otherwise a Dynacord PM9-SCL.

Regulatory information

Emergency standard certifications	
Europe	EN 54-16 (0560-CPR-202190028)
Maritime applications	DNV GL Type Approval

Emergency standard compliance	
Europe	EN 50849

Regulatory areas	
Safety	EN/IEC 62368-1
Immunity	EN 55035 EN 50130-4
Emissions	EN 55032 EN 61000-6-3 EN 62479
Environment	EN/IEC 63000
Railway applications	EN 50121-4

Installation/configuration notes

This is a professional product that should be installed, used and maintained by trained professionals only.

Parts included

Quantity	Component
1	System controller
1	Set of 19"-rack mounting brackets (pre-mounted)
1	Set of screw connectors and cables
1	Safety and security information

Technical specifications

Electrical

System

Routing (audio, dynamic): OMNEO channels	Unlimited
Tone/Message playback (dynamic): OMNEO channels	8
Number of inputs (audio, static): Dante or AES67 channels	8
Number of outputs (audio, static): Dante channels	8
Number of events: Logging (internal storage)	6,000
Call events	2,000
Fault events	2,000
General events	2,000
Real time clock synchronization	NTP
Accuracy with NTP	< 1 s/yr off
Accuracy without NTP	< 11 min/yr off

Daylight saving time correction	Automatic
Backup battery type	Lithium
Battery size	CR2032
Tone/Message storage (min) (mono, uncompressed, 48 kHz, 16 bit)	90 min
SD Memory card capacity (GB)	32 GB
System size	
Networked devices (single subnet)	250
Networked amplifiers	6
Number of output zones (with PM9-AD60x amplifiers)	500
Configuration	Web server/browser

Power transfer

Operating voltage (VDC) range	24 VDC – 48 VDC
Operating voltage (VDC) tolerance	20 VDC – 60 VDC
Power consumption (W) duty mode	3.90 W
Power consumption (W) per active port	0.4 W

Supervision

Run fault (watchdog reset)	All processors
Fault report time (s)	< 100 s
Site specific data integrity fault report time (h)	< 1 h
Protection	Watchdog; RSTP

Network interface

Protocols / standards	TCP/IP; OMNEO; Dante; AES70; AES67
Ethernet type	100BASE-TX; 1000BASE-T
Latency (ms)	10 ms
Encryption	TLS
Audio encryption	AES 128
Number of Ethernet ports	5

Reliability

Mean time between failures (MTBF) (h) (extrapolated from calculated MTBF of PM9-AD608)	1,000,000 h

Environmental

Operating temperature (℃)	-5 ℃ – 50 ℃
Operating temperature (℉)	23 ℉ – 122 ℉
Storage temperature (℃)	-30 ℃ – 70 ℃
Storage temperature (℉)	-22 ℉ – 158 ℉

Operating relative humidity, non-condensing (%)	5% – 95%
Air pressure (hPa)	560 hPa – 1,070 hPa
Installation altitude (m)	-500 m – 5,000 m
Operating vibration	
Amplitude (mm)	< 0.07 mm
Acceleration (G)	< 2 G
Bump (transport) (G)	< 10 G (IEC 60068-2-27)

Mechanical

Dimensions (H x W x D) (mm)	44 mm x 483 mm x 400 mm
Rack unit (U)	1 U, 19 in
IP rating	IP30
Material	Steel; Zamac
Color (RAL)	RAL 9017 Traffic black
Weight (kg)	5.80 kg

Ordering information

PM9-SCS System controller, small
Network-connected, DC-powered, system controller and message manager for Public Address and Voice Alarm applications.
Order number **PM9-SCS | F.01U.416.191**

Software Options
PRA-LSPRA License for subsystem PRAESENSA
This software license enables the creation of subsystems connected to a master system controller within the PROMATRIX 9000 system.
Order number **PRA-LSPRA | F.01U.402.624**

PRA-LSCRF License call recording and forwarding
The PRA-LSCRF software license enables the stacking and time-shifting of calls within the PROMATRIX 9000 system. It can be installed in the PM9-SCL or the PM9-SCS.
Order number **PRA-LSCRF | F.01U.425.784**