# PRAESENSA

Public Address and Voice Alarm System

**en** Open Interface programming instructions

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## DISLAIMER

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## DOCUMENT HISTORY

| Date | Version | Reason |
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| 17-02-2022 | V1.50 | Added RedundantDataPathFault. |

# PART 1 – OPEN INTERFACE PROTOCOL

Part 1 of the Open Interface programming instructions describes the Open Interface protocol of the PRAESENSA system.

# 1. INTRODUCTION

## 1.1 Purpose

This document describes the native communication interface of the PRAESENSA Public Address System.

## 1.2 Scope

This document is intended for persons, who want to integrate PRAESENSA in their applications with the PRAESENSA native communication interface. They must have knowledge about:

- The PRAESENSA system and its installation (see [UG_PRAESENSA])
- The TCP/IP protocol and how to communicate using TCP/IP
- Optionally, the TLS protocol and how to secure communication using TLS (when using a secure connection)

This document does not describe the high-level communication (Application Programming Interfaces, API). Refer to [UM_OPENINF] for information about controlling the PRAESENSA with high-level Windows™ based languages.

It is not possible to derive any rights from this document regarding the programming interface. Extensions and improvements on the Open Interface can be introduced in new versions of the PRAESENSA.

## 1.3 Definitions, Acronyms and Abbreviations

| | |
|---|---|
| SC | PRAESENSA system controller |
| OI | Open Interface |
| PA | Public address |
| OIP | Open Interface Protocol |
| LSB | Least Significant Byte |
| MSB | Most Significant Byte |

## 1.4 References

The reference that must be used for this document is: **UM_OPENINF_PRAESENSA**

| | | |
|---|---|---|
| UG_PRAESENSA | User guide PRAESENSA system | |
| UM_OPENINF | User manual Open Interface control with C# and .NET Framework | GO209101 |

## 1.5 Overview

Chapter 0 is a general introduction to the document.

Chapter 3 describes the protocol used for the communication

Chapter 4 describes the command messages to trigger functionality on the PRAESENSA system.

Chapter 5 describes the response messages to be expected after a command transmission.

Chapter 6 describes the notification messages sent by the PRAESENSA system.

Chapter 7 describes the diagnostic event structures.

Chapter 7.4.71 describes the event originator structures.

Chapter 9 gives an overview of all constants used in the open interface protocol and application messages.

Chapter 10 gives an overview of all error codes that can be sent back in the response messages.

## 1.6 How to read this document

In this document many messages are described which should be transmitted over the TCP connection. The description of each message is divided into several (optional) subsections. The meaning of each section is described below:

- **Purpose:**
  A global description of the purpose of the message. In case a group of messages is described (all using the same message structure), a short description is given for each message.
- **Parameter structure:**
  The parameters related to the message. When the message requires no parameters, no structure is described here.
- **Response message type:**
  In case the message is a command, the system controller returns a response message. In this section the response message type is referenced. Note that the described message is only valid when the response signals that the command succeeded without errors.
  Beside the described response messages it is also possible that the MESSAGETYPE_OIP_ResponseProtocolError is returned in case on protocol level a failure is detected.
- **Update notifications:**
  The notification messages that can be generated during the execution of the remote function. When there are no related notifications, then this part will be omitted.
- **Related messages:**
  The related messages in conjunction with the message described.

## 1.7 Open Interface changes

The following changes were made to the Open Interface that might affect existing implementations of the protocol

As of software release 1.30, the command messages MESSAGETYPE_OIP_GetConfiguredUnits and MESSAGETYPE_OIP_GetConnectedUnits return both the configured unit name and the host name instead of the configured host name (refer to §5.9)

# 2. APPLICATION CONTROL OVERVIEW

## 2.1 Calls

### 2.1.1 Introduction

As PRAESENSA is a public address and emergency sound system, it is used to distribute background music, live speech and evacuation messages. All audio in the system is distributed in the form of calls.

### 2.1.2 Components

A call always consists of the following components:

- Priority (refer to section 2.1.3)
- Call content (refer to section 2.1.4)
- Routing (refer to section 2.1.5)

### 2.1.3 Priority

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

| Priority | Call type |
|---|---|
| 0 to 31 | BGM (Background Music) calls. |
| 32 to 223 | Business calls. |
| 224 to 255 | Emergency calls. |

### 2.1.4 Call content

The content of a BGM call typically consists of an audio signal coming from a BGM source, such as a CD player or a tuner. The content of business calls and emergency calls can consist of:

- A start chime (optional).
- Pre-recorded message(s) (optional)
- Live speech (optional).
- An end chime (optional).

The major difference between business calls and emergency calls is that emergency calls can put the system in the emergency state.

### 2.1.5 Routing

The routing of the call is the set of zones to which the call is intended to be addressed. Whether the call actually is addressed to the selected zones depend on the priority of the call and its partiality (refer to §4.5).

### 2.1.6 Restart call

A call can be configured to be automatically restarted when it is aborted by the system (for example when all zones are removed from the call). If the restart call option is not configured, the system will automatically restart all emergency calls without live-speech.

The restart call option matches the ‘Continue call’ option on the PRAESENSA call macro configuration page.

## 2.2 Diagnostics

As PRAESENSA is an emergency compliant system, it monitors its equipment and signals activity performed on the system.

Systems connected to a PRAESENSA system can subscribe to activity and equipment signals for long term storage and reporting facilities. To receive events from the PRAESENSA system, the connected system must subscribe. The following groups are identified:

- General Events
- Call Events
- Fault Events

After subscription for a group, all events currently present in the storage of the PRAESENSA system are sent. Existing events are signaled with the action-type OIACT_EXISTING. The last existing event is signaled with the action type OIACT_EXISTING_LAST. If the connected system subscribes to receive fault events and there are no fault events in the storage of the PRAESENSA system, the PRAESENSA system responds with a message with the action type OIACT_EXISTING_LAST and an event of type DET_NoFaults (see paragraph 7.4.13). The event itself does not represent an actual system fault and is supposed to be ignored.
Newly created and updated events are notified conform the action described in section 9.2.9.

Fault events can be acknowledged and reset by the connected system. The system can choose to acknowledge all fault or specific faults.

## 2.3 Hardware connection

The communication between PRAESENSA and your system is based on top of a TCP/IP connection (refer to the next figure).


Over the TCP/IP connection, messages can be transmitted between your system and PRAESENSA. To set-up the TCP/IP connection, you must:

- Use the IP address of the system controller.
- Use port number 9401 (non-secure) or 9403 (secure).

# 3. PROTOCOL CONSIDERATIONS

## 3.1 Set-up a connection

After PRAESENSA 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 IP address of the system controller and port 9401 or port 9403. The connection between the PRAESENSA system and your system is based on a stream connection. This implies that messages may be transferred using multiple packets.

Port 9401 is used for non-secure connections and port 9403 is used for secure connections. For secure connections, TLS 1.2 is used. The PRAESENSA system uses a self-signed certificate file and is available for download from the PRAESENSA configuration web page (see [UG_PRAESENSA]). A new certificate is generated for the system each time the system controller is reset to defaults. After the socket connect has been established, the login message (MESSAGETYPE_OIP_Login) is expected before any other message. The login message passes the user name and password to PRAESENSA for verification. If either the user name or the password is incorrect, an error is reported back. In this case, the socket connection is disconnected on demand of the system controller. If the user name and password are correct, all control functions of PRAESENSA become available.

## 3.2 Heartbeat

After the connection between your system and PRAESENSA has been established, the system controller of PRAESENSA starts the heartbeat checks of your system. The system controller checks if a message is received within 15 seconds after the last message. When the time between two messages is more than 15 seconds, the system controller considers the connection to be broken and closes the TCP/IP connection to your system.

It is advised to also run heartbeat checks of PRAESENSA on your system. To signal that the connection is still present, you must transmit a "MESSAGETYPE_OIP_KeepAlive" message (refer to section 3.4.3.3) to the system controller every 5 seconds when no other messages are ready for transmission.

## 3.3 Response times

When your system sends a message to the system controller, a response can be expected within 10 seconds. If your system does not receive a response within 10 seconds, your system can consider the connection to be broken.

## 3.4 Message format

### 3.4.1 Introduction

The communication between your system and PRAESENSA is based on messages. This section describes the structures that are used in the data field of the messages for PRAESENSA.

### 3.4.2 General Message Layout

Each message must have this layout:

| MessageType | Length | Data |
|---|---|---|

Defined in (c-style) structure format:

```
struct {
   DWORD  messageType;   // Message Type
   UINT   length;        // Message Length
   BYTE   data[];        // Message Data (length – 8 bytes)
};
```

***Where:***

| | |
|---|---|
| *messageType* | The “message-type”, which describes the content of the actual data passed. Refer to the various message-type definitions in sections below (§4, §5 and §6) |
| *length* | The total length of the message in number of bytes, including the sizes of the message-type and length. The length must match the actual transmitted size of bytes.<br><br>Since the *MessageType* and the *length* are always present, the minimum size of the message is 8 bytes. The maximum size of a message is 128 Kbytes. |
| *data* | Data corresponding to the description of the message-type. The data represents a structure which format is explained hereafter together with the message-type. |

**NOTE:**
The length of a specific message-type may vary due to the variable data. For example, when a message contains multiple strings, the length also depends on the sum of the sizes of the strings.

### 3.4.3 Conventions

In the sections and chapters below several structures are defined. These structures are defined using standard data types, which have defined sizes and usage. The following data types will be used:

#### 3.4.3.1 Basic data types

| | |
|---|---|
| BOOLEAN: | a 1 byte unsigned value with the values FALSE = 0 and TRUE = 1. |
| CHAR: | a 1 byte type representing an ASCII character. |
| BYTE: | a 1 byte unsigned value with the range 0 ... 255. |
| WORD: | a 2 byte unsigned value with the range 0 ... 65535. |
| SHORT: | a 2 byte signed value with the range -32768 ... 32767. |
| INT: | a 4 bytes signed value with the range $-(2^{31})$ ... $(2^{31}-1)$. |
| UINT: | a 4 byte unsigned value with the range 0 ... $(2^{32}-1)$. |
| LONG: | a 4 bytes signed value with the range $-(2^{31})$ ... $(2^{31}-1)$. |
| DWORD: | a 4 byte unsigned value with the range 0 ... $(2^{32}-1)$. |

**NOTE:**
All numbers are represented in the little-endian[1] format. Between the data-type is no alignment present.

#### 3.4.3.2 Variable length Data types

Beside the basic data type, variable length data types are used within the messages. In this section the variable length data types are described in term of basic data types.

[1] Little endian is a storage mechanism where the least significant byte is stored on the lowest address, followed by the more significant bytes. E.g. a WORD is represented in memory as two consecutive bytes where the LSB is stored on the lowest address and the MSB on the next address. For transmission over TCP, the LSB byte is transmitted first, followed by the MSB bytes

### *String*

A string is used to pass ASCII text within a message. A string is always variable in length.

```
struct {
   UINT    length
   CHAR    chars[Length];
} STRING;
```

***Where:***

| | |
|---|---|
| *length* | String length in bytes (characters). Strings are limited in length to a maximum of 64 Kbytes. Note that the size of the length *parameter* is not included in the length. |
| *chars* | Actual string, not zero terminated. |

### *Time structure*

A time structure represents the date and time. It is generated by the PRAESENSA system. The time is mostly passed along with diagnostic events (see §7) to indicate the actual date and time of creation and other changes.

```
struct {
   DWORD    time;
} TIME;
```

***Where:***

| | |
|---|---|
| *time* | UTC time in seconds since 1 January 1970, 00:00:00 hour. |

### *Complex structure*

Message can refer to structural information. These structures by itself described a complete set of information and will be described in the corresponding sections. The basic format of each structure is as follows:

```
struct {
   DWORD    structureType;   // Type of the structure.
   UINT     length;          // structure Length.
   BYTE     data[]           // structure data (length – 4 bytes)
} structureHeader;
```

***Where:***

| | |
|---|---|
| *structureType* | Defines the “structure Type”, which describes the content of the structure data passed. Refer to the various structure type definitions in the sections below (§7 and §7.4.13). |
| *length* | The total length of the structure in number of bytes, including the sizes of the structure type and length. The length should match the actual transmitted size of bytes. |
| *data* | Data corresponding to the description of the structure-type. The data represents a structure which format is explained with the structure-type. |

#### 3.4.3.3 Comma separated lists

Commands sent to the PRAESENSA system do not accept spaces around the separation commas in lists of strings. However, notifications and results sent from the PRAESENSA system may contain a space after the separation comma.

## 3.5 Heartbeat message MESSAGETYPE_OIP_KeepAlive

***Purpose:***

The heartbeat message is a special message, which can be sent to the PRAESENSA system at any time. In normal circumstances the heartbeat message is transmitted every 5 seconds (when nothing else to transmit). The message is used to notify the PRAESENSA system that your system is still alive. The PRAESENSA system also sends heartbeat messages to indicate that the PRAESENSA system is still operational. You must check if two successive messages are received within 15 seconds.

Note that the heartbeat message is similar to the notification messages.

***Parameter structure:***

```
struct {
   DWORD      messageType;
   UINT       length;
   UINT       reserved1;
   UINT       reserved2;
} OIP_KeepAlive;
```

***Where:***

| | |
|---|---|
| *messageType* | The message type indicator for the heartbeat message. Constant value MESSAGETYPE_OIP_KeepAlive (See Chapter 9). |
| *length* | The total length of the Heartbeat message (16 bytes for this message). |
| *reserved1* | Session sequence number. Currently the *reserved1* is not used and should be set to the value zero (0). |
| *reserved2* | Message sequence number. Currently the *reserved2* is not used and should be set to the value zero (0). |

## 3.6 Protocol fault message MESSAGETYPE_OIP_ResponseProtocolError

***Purpose:***

Any message sent towards the PRAESENSA system is checked against its boundaries (message size, string size, validity of the message-type, not logged in ...). In case a mismatch is detected regarding the size, a universal error response message is returned. Response message as described in section 5 cannot be used, because the received message is not decoded nor processed.

***Parameter structure:***

```
struct {
   DWORD      messageType;
   UINT       length;
   UINT       reserved1;
   UINT       reserved2;
   UINT       errorCode;
   UINT       errorPosition;
} OIP_ResponseProtocolError;
```

***Where:***

| | |
|---|---|
| *messageType* | The message type indicator for the message. Constant value MESSAGETYPE_OIP_ResponseProtocolError (See Chapter 9). |
| *length* | The total length of the Protocol fault message (24 bytes for this message). |
| *reserved1* | Session sequence number. Currently the *reserved1* is not used and should be set to the value zero (0). |
| *reserved2* | Message sequence number. Currently the *reserved2* is not used and should be set to the value zero (0). |
| *errorCode* | The error code of the received message. For the possible error codes see Chapter 10. |
| *errorPosition* | The byte offset in the message stream, where the fault is detected. |

***Related messages:***

Any message received by the PRAESENSA system and is not conform the message guideline as described in 3.4.

## 3.7 Buffer overflow

***Purpose:***

Messages ready for transmission from the PRAESENSA system are queued. In case the receive speed of the connected system is too low, the queue may overflow (dependent on the number of generated events, resource update, etc.). Since the queue consumes internal PRAESENSA system resources, overflow detection is present, which disconnects the communication interface when the queue overflows its limit.

This may result in a loss of received events.

# 4. COMMAND MESSAGES

## 4.1 Introduction

Command messages can be sent to control the PRAESENSA system. Commands always result in a response from the PRAESENSA system. The expected response is referenced with each command or the generic response MESSAGETYPE_OIP_ResponseProtocolError is returned in case the message is corrupted. Each command message starts with a fixed number of fields, which are presented below in structure format.

**NOTE:**
In the time between the transmission of the command message and the reception of the response message, the PRAESENSA system can send notification messages.

```
struct {
   DWORD      messageType;
   UINT       length;
   UINT       reserved1;
   UINT       reserved2;
} COMMANDHEADER;
```

***Where:***

| | |
|---|---|
| *messageType* | The command message type as documented in the sections below. |
| *length* | The total length of the command structure. |
| *reserved1* | Session sequence number. Currently the *reserved1* is not used and should be set to the value zero (0) |
| *reserved2* | Message sequence number. Currently the *reserved2* is not used and should be set to the value zero (0). |

**NOTE:**
The initial two elements (refer to section 3.4.2) are repeated in the structure.

## 4.2 MESSAGETYPE_OIP_Login

***Purpose:***

Logs in on the PRAESENSA system with a user name and password.

***Parameter structure:***

```
struct {
   COMMANDHEADER   header;
   STRING          userName;
   STRING          password;
} OIP_Login;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_Login. |
| *userName* | The user name to logon with. |
| *password* | The password to logon with. |

***Response message type:***

MESSAGETYPE_OIP_Response

## 4.3 MESSAGETYPE_OIP_GetNcoVersion

***Purpose:***

Gets the software release of the PRAESENSA system.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
} OIP_GetNcoVersion;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_GetNcoVersion. |

***Response message type:***

MESSAGETYPE_OIP_ResponseGetNcoVersion

## 4.4 MESSAGETYPE_OIP_GetProtocolVersion

***Purpose:***

Gets the protocol version of the Open Interface of the PRAESENSA system. Should be used to verify that your system is compatible with the PRAESENSA system.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
} OIP_GetProtocolVersion;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_GetProtocolVersion. |

***Response message type:***

MESSAGETYPE_OIP_ResponseGetProtocolVersion

## 4.5 MESSAGETYPE_OIP_CreateCallEx2

***Purpose:***

Creates (but does not start) a call with the given parameters.

***Parameter structure:***

```
struct {
   COMMANDHEADER         header;
   UINT                  priority;
   TOICallOutputHandling outputHandling;
   TOICallStackingMode   stackingMode;
   UINT                  stackingTimeout;
   BOOLEAN               liveSpeech;
   UINT                  repeat;
   STRING                routing;
   STRING                startChime;
   STRING                endChime;
   STRING                audioInput;
   STRING                messages;
   TOICallTiming         callTiming;
   STRING                preMonitorDest;
   UINT                  liveSpeechAttenuation;
   UINT                  startChimeAttenuation;
```

```
    UINT            sendChimeAttenuation;
    UINT            messageAttenuation;
} OIP_CreateCallEx2;
```

***Where:***

*header* — Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_CreateCallEx2.

*priority* — Priority of the call.
Ranges:

- 0 ... 31: BGM call priority. Always partial call, regardless the partial setting.
- 32 ... 223: Normal call priority.
- 224 ... 255: Emergency call priority. Always partial call, regardless the partial setting.

*outputHandling* — Whether the call is partial, non-partial or stacked. There are three possible values: OICOH_PARTIAL, OICOH_NON_PARTIAL and OICOH_STACKED. See §9.2.11 for the value set description. Settings the output handling to anything other than OICOH_PARTIAL will result in ERROR_INVALID_PARAMETERS.

*stackingMode* — Whether a stacked call waits for all zones to become available or a stacked call waits for each zone to become available for replay. There are two possible values: OICSM_WAIT_FOR_ALL and OICSM_WAIT_FOR_EACH. See §9.2.12 for the value set description. This parameter is ignored when outputHandling is set to : OICOH_PARTIAL or OICOH_NON_PARTIAL.

*stackingTimeout* — Amount of minutes for a stacked call to wait for available resources. The time-out countdown is started at the moment the original call has ended. The accepted range is 1 to 255 minutes; the value OICST_INFINITE is used to wait infinitely. This parameter is ignored when outputHandling is set to OICOH_PARTIAL or OICOH_NON_PARTIAL.

*liveSpeech* — Whether or not the call has a live speech phase. TRUE = live speech, FALSE = no live speech.

*repeat* — How many times the messages should be repeated.
Value can be:

- -1: Repeat infinity.
- 0: Play Message once.
- 1 ... 32767: Repeat count.

Note that the value 1 indicates one repeat, so the message is played twice.

*routing* — List of names of zone groups, zones and/or control outputs. The routing is formatted as a comma separated

| | |
|---|---|
| | set of resource names. No spaces are allowed before or after the separation commas in the string. |
| *startChime* | The name of the start chime. May be empty, no leading or trailing spaces are allowed. |
| *endChime* | The name of the end chime. May be empty, no leading or trailing spaces are allowed. |
| *audioInput* | Name of the audio Input (only used when live speech is true). No leading or trailing spaces are allowed. |
| *messages* | List of names of prerecorded messages. The messages parameter is formatted as a comma separated set of message names. May be empty, but no spaces are allowed before or after the separation commas. |
| *callTiming* | Indicates the way the call must be handled. There are three possible values: OICTM_IMMEDIATE, OICTM_TIME_SHIFTED and OICTM_MONITORED. See §9.2.13 for the value set description. Setting the call timing to anything other than OICTM_IMMEDIATE will result in ERROR_INVALID_PARAMETERS. |
| *preMonitorDest* | The destination zone of the pre-monitor phase of a pre-monitored call. When the call is not pre-monitored, this value is ignored. This parameter is ignored when callTiming is set to OICTM_IMMEDIATE or OICTM_TIME_SHIFTED. |
| *liveSpeechAttenuation* | The attenuation to be used for the audio input during the live speech phase. Range: 0..60 dB. |
| *startChimeAttenuation* | The attenuation to be used for the chime generator during the start chime phase. Range: 0..60 dB. |
| *endChimeAttenuation* | The attenuation to be used for the chime generator during the end chime phase. Range: 0..60 dB. |
| *messageAttenuation* | The attenuation to be used for the message generator during the start prerecorded message phase. Range: 0..60 dB. |

***Response message type:***

MESSAGETYPE_OIP_ResponseCallId.

***Related messages:***

MESSAGETYPE_OIP_StartCreatedCall
MESSAGETYPE_OIP_StopCall
MESSAGETYPE_OIP_AbortCall
MESSAGETYPE_OIP_AddToCall
MESSAGETYPE_OIP_RemoveFromCall

## 4.6 MESSAGETYPE_OIP_CreateCallEx3

***Purpose:***

Creates (but does not start) a call with the given parameters.

***Parameter structure:***

```
struct {
   COMMANDHEADER        header;
   UINT                 priority;
   TOICallOutputHandling  outputHandling;
   TOICallStackingMode    stackingMode;
   UINT                 stackingTimeout;
   BOOLEAN                liveSpeech;
   UINT                 repeat;
   STRING                 routing;
   STRING                 startChime;
   STRING                 endChime;
   STRING                 audioInput;
   STRING                 messages;
   TOICallTiming          callTiming;
   STRING                 preMonitorDest;
   UINT                 liveSpeechAttenuation;
   UINT                 startChimeAttenuation;
   UINT                 sendChimeAttenuation;
   UINT                 messageAttenuation;
   BOOLEAN                restartCall;
} OIP_CreateCallEx3;
```

***Where:***

*header* — Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_CreateCallEx2.

*priority* — Priority of the call.
Ranges:

- 0 ... 31: BGM call priority. Always partial call, regardless the partial setting.
- 32 ... 223: Normal call priority.
- 224 ... 255: Emergency call priority. Always partial call, regardless the partial setting.

*outputHandling* — Whether the call is partial, non-partial or stacked. There are three possible values: OICOH_PARTIAL, OICOH_NON_PARTIAL and OICOH_STACKED. See §9.2.11 for the value set description. Settings the output handling to anything other than OICOH_PARTIAL will result in ERROR_INVALID_PARAMETERS.

*stackingMode* — Whether a stacked call waits for all zones to become available or a stacked call waits for each zone to become available for replay. There are two possible values: OICSM_WAIT_FOR_ALL and OICSM_WAIT_FOR_EACH. See §9.2.12 for the value set description. This parameter is ignored when outputHandling is set to : OICOH_PARTIAL or OICOH_NON_PARTIAL.

*stackingTimeout* — Amount of minutes for a stacked call to wait for available resources. The time-out countdown is started at the moment the original call has ended. The accepted range is 1 to 255 minutes; the value OICST_INFINITE is used to wait infinitely. This parameter is ignored when outputHandling is set to OICOH_PARTIAL or OICOH_NON_PARTIAL.

| | |
|---|---|
| *liveSpeech* | Whether or not the call has a live speech phase. TRUE = live speech, FALSE = no live speech. |
| *repeat* | How many times the messages should be repeated. Value can be:<br>-1: Repeat infinity.<br>0: Play Message once.<br>1 ... 32767: Repeat count.<br>Note that the value 1 indicates one repeat, so the message is played twice. |
| *routing* | List of names of zone groups, zones and/or control outputs. The routing is formatted as a comma separated set of resource names. No spaces are allowed before or after the separation commas in the string. |
| *startChime* | The name of the start chime. May be empty, no leading or trailing spaces are allowed. |
| *endChime* | The name of the end chime. May be empty, no leading or trailing spaces are allowed. |
| *audioInput* | Name of the audio Input (only used when live speech is true). No leading or trailing spaces are allowed. |
| *messages* | List of names of prerecorded messages. The messages parameter is formatted as a comma separated set of message names. May be empty, but no spaces are allowed before or after the separation commas. |
| *callTiming* | Indicates the way the call must be handled. There are three possible values: OICTM_IMMEDIATE, OICTM_TIME_SHIFTED and OICTM_MONITORED. See §9.2.13 for the value set description. Setting the call timing to anything other than OICTM_IMMEDIATE will result in ERROR_INVALID_PARAMETERS. |
| *preMonitorDest* | The destination zone of the pre-monitor phase of a pre-monitored call. When the call is not pre-monitored, this value is ignored. This parameter is ignored when callTiming is set to OICTM_IMMEDIATE or OICTM_TIME_SHIFTED. |
| *liveSpeechAttenuation* | The attenuation to be used for the audio input during the live speech phase. Range: 0..60 dB. |
| *startChimeAttenuation* | The attenuation to be used for the chime generator during the start chime phase. Range: 0..60 dB. |
| *endChimeAttenuation* | The attenuation to be used for the chime generator during the end chime phase. Range: 0..60 dB. |
| *messageAttenuation* | The attenuation to be used for the message generator during the start prerecorded message phase. Range: 0..60 dB. |

| | |
|---|---|
| *restartCall* | Indicates if the call should be restarted after an interruption. |

***Response message type:***

MESSAGETYPE_OIP_ResponseCallId.

***Related messages:***

MESSAGETYPE_OIP_StartCreatedCall
MESSAGETYPE_OIP_StopCall
MESSAGETYPE_OIP_AbortCall
MESSAGETYPE_OIP_AddToCall
MESSAGETYPE_OIP_RemoveFromCall

## 4.7 MESSAGETYPE_OIP_StartCreatedCall

***Purpose:***

Starts a previously created call. If the call was started successfully, call state update notification messages are sent.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   TOICallId        callId;
} OIP_StartCreatedCall;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_StartCreatedCall. |
| *callId* | Identification of the call, returned by createCallEx2 (§4.5) and createCallEx3 (§4.6). See §9.2.2 for the value set description. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyCall
MESSAGETYPE_OIP_NotifyResources

***Related messages:***

MESSAGETYPE_OIP_CreateCall
MESSAGETYPE_OIP_StopCall
MESSAGETYPE_OIP_AbortCall
MESSAGETYPE_OIP_AddToCall
MESSAGETYPE_OIP_RemoveFromCall

## 4.8 MESSAGETYPE_OIP_StopCall

***Purpose:***

Stops a previously created or started call.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   TOICallId        callId;
} OIP_StopCall;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_StopCall. |
| *callId* | Identification of the call, returned by createCallEx2 (§4.5) or createCallEx3 (§4.6). See §9.2.2 for the value set description. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyCall
MESSAGETYPE_OIP_NotifyResources

***Related messages:***

MESSAGETYPE_OIP_CreateCallEx2
MESSAGETYPE_OIP_CreateCallEx3
MESSAGETYPE_OIP_StartCreatedCall
MESSAGETYPE_OIP_AbortCall
MESSAGETYPE_OIP_AddToCall
MESSAGETYPE_OIP_RemoveFromCall

## 4.9 MESSAGETYPE_OIP_AbortCall

***Purpose:***

Aborts a previously created or started call.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   TOICallId        callId;
} OIP_AbortCall;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_AbortCall. |
| *callId* | Identification of the call, returned by createCallEx2 (§4.5) or createCallEx3 (§4.6). See §9.2.2 for the value set description. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyCall
MESSAGETYPE_OIP_NotifyResources

***Related messages:***

MESSAGETYPE_OIP_CreateCallEx2
MESSAGETYPE_OIP_CreateCallEx3
MESSAGETYPE_OIP_StartCreatedCall
MESSAGETYPE_OIP_StopCall
MESSAGETYPE_OIP_AddToCall
MESSAGETYPE_OIP_RemoveFromCall

## 4.10 MESSAGETYPE_OIP_AddToCall

***Purpose:***

Adds routing to a previously created or started call.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   TOICallId        callId;
   STRING           routing;
} OIP_AddToCall;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_AddToCall. |
| *callId* | Identification of the call, returned by createCallEx2 (§4.5) or createCallEx3 (§4.6). See §9.2.2 for the value set description. |
| *routing* | List of names of zone groups, zones and/or control outputs to be added to the call. A comma separates each name in the routing list. No spaces are allowed before or after the separation commas in the string. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyResources

***Related messages:***

MESSAGETYPE_OIP_CreateCallEx2
MESSAGETYPE_OIP_CreateCallEx3
MESSAGETYPE_OIP_StartCreatedCall
MESSAGETYPE_OIP_StopCall
MESSAGETYPE_OIP_AbortCall
MESSAGETYPE_OIP_RemoveFromCall

## 4.11 MESSAGETYPE_OIP_RemoveFromCall

***Purpose:***

Removes routing from a previously created or started call.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   TOICallId        callId;
   STRING           routing;
} OIP_RemoveFromCall;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_RemoveFromCall. |
| *callId* | Identification of the call, returned by createCallEx2 (§4.5) or createCallEx3 (§4.6). See §9.2.2 for the value set description. |
| *routing* | List of names of zone groups, zones and/or control outputs to be removed from the call. A comma separates each |

name in the routing list. No spaces are allowed before or after the separation commas in the string.

***Response message type:***
MESSAGETYPE_OIP_Response

***Update notifications:***
MESSAGETYPE_OIP_NotifyResources

***Related messages:***
MESSAGETYPE_OIP_CreateCallEx2
MESSAGETYPE_OIP_CreateCallEx3
MESSAGETYPE_OIP_StartCreatedCall
MESSAGETYPE_OIP_StopCall
MESSAGETYPE_OIP_AbortCall
MESSAGETYPE_OIP_AddToCall

## 4.12 MESSAGETYPE_OIP_CancelAll

***Purpose:***
Cancels all available stacked calls that were started by this connection.

***Parameter structure:***
```
struct {
   COMMANDHEADER    header;
} OIP_CancelAll;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_CancelAll. |

***Response message type:***
MESSAGETYPE_OIP_Response

***Update notifications:***
MESSAGETYPE_OIP_NotifyCall
MESSAGETYPE_OIP_NotifyResources

***Related messages:***
MESSAGETYPE_OIP_CreateCallEx2
MESSAGETYPE_OIP_CreateCallEx3
MESSAGETYPE_OIP_StartCreatedCall
MESSAGETYPE_OIP_CancelLast

## 4.13 MESSAGETYPE_OIP_CancelLast

***Purpose:***
Cancels (if still available) the last stacked call that was started by this connection.

***Parameter structure:***
```
struct {
   COMMANDHEADER    header;
} OIP_CancelLast;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_CancelLast. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyCall
MESSAGETYPE_OIP_NotifyResources

***Related messages:***

MESSAGETYPE_OIP_CreateCallEx2
MESSAGETYPE_OIP_CreateCallEx3
MESSAGETYPE_OIP_StartCreatedCall
MESSAGETYPE_OIP_CancelAll

## 4.14 MESSAGETYPE_OIP_AckAllFaults

***Purpose:***

Acknowledges all fault events. Because the fault alarm depends on the states of all fault events, it also acknowledge the fault alarm. If the start of the fault alarm changes state, it results in the message MESSAGETYPE_OIP_NotifyAlarm (if subscribed, see §6.3).

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
} OIP_AckAllFaults;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_AckAllFaults. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyAlarm (alarm-type equals OIAT_FAULT)
MESSAGETYPE_OIP_NotifyDiagEvent

***Related messages:***

MESSAGETYPE_OIP_ResetAllFaults
MESSAGETYPE_OIP_ReportFault

## 4.15 MESSAGETYPE_OIP_ResetAllFaults

***Purpose:***

Resets all fault events. Because the fault alarm depends on the state of all fault events, this can possibly reset the fault alarm, when the faults are resolved. If the fault alarm changes state, it results in the message MESSAGETYPE_OIP_NotifyAlarm (if subscribed, see §6.3).

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
} OIP_ResetAllFaults;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_ResetAllFaults. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyAlarm (alarm-type equals OIAT_FAULT)
MESSAGETYPE_OIP_NotifyDiagEvent

***Related messages:***

MESSAGETYPE_OIP_AckAllFaults
MESSAGETYPE_OIP_ReportFault

## 4.16 MESSAGETYPE_OIP_ReportFault

***Purpose:***

Reports a general fault diagnostics event in the system. The fault is reported as a User-Injected-Fault, which is notified as diagnostic event DET_UserInjectedFault.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   STRING           description;
} OIP_ReportFault;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_ReportFault. |
| *description* | Textual representation of the fault to be reported. |

***Response message type:***

MESSAGETYPE_OIP_ResponseReportFault

***Update notifications:***

MESSAGETYPE_OIP_NotifyAlarm (alarm-type equals OIAT_FAULT)
MESSAGETYPE_OIP_NotifyDiagEvent

***Related messages:***

MESSAGETYPE_OIP_AckAllFaults
MESSAGETYPE_OIP_ResetAllFaults
MESSAGETYPE_OIP_AckFault
MESSAGETYPE_OIP_ResolveFault
MESSAGETYPE_OIP_ResetFault

## 4.17 MESSAGETYPE_OIP_AckFault

***Purpose:***

Acknowledges a specific diagnostic fault event. Because the fault alarm depends on the states of all fault events, it can possibly acknowledge the state of the fault alarm of the system (in case it was the last non-acknowledged fault). If the state of the fault alarm changes, it results in the message MESSAGETYPE_OIP_NotifyAlarm (if subscribed, see §6.3).

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   TOIEventId       eventId;
} OIP_AckFault;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_AckFault. |

*eventId* Identification of the diagnostic fault event. See §9.2.1 for the value set description.

***Response message type:***
MESSAGETYPE_OIP_Response

***Update notifications:***
MESSAGETYPE_OIP_NotifyAlarm (alarm-type equals OIAT_FAULT)
MESSAGETYPE_OIP_NotifyDiagEvent

***Related messages:***
MESSAGETYPE_OIP_AckAllFaults
MESSAGETYPE_OIP_ResetAllFaults
MESSAGETYPE_OIP_ReportFault
MESSAGETYPE_OIP_ResolveFault
MESSAGETYPE_OIP_ResetFault

## 4.18 MESSAGETYPE_OIP_ResolveFault

***Purpose:***
Resolves the fault injected by with the message MESSAGETYPE_OIP_ReportFault. The received eventId of the reportFault message is the parameter.

***Parameter structure:***
```
struct {
   COMMANDHEADER    header;
   TOIEventId       eventId;
} OIP_ResolveFault;
```

***Where:***

*header* Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_ResolveFault.

*eventId* Identification of the diagnostic fault event, received by the MESSAGETYPE_OIP_ResponseReportFault message. See §9.2.1 for the value set description.

***Response message type:***
MESSAGETYPE_OIP_Response

***Update notifications:***
MESSAGETYPE_OIP_NotifyDiagEvent

***Related messages:***
MESSAGETYPE_OIP_ReportFault
MESSAGETYPE_OIP_AckFault
MESSAGETYPE_OIP_ResetFault

## 4.19 MESSAGETYPE_OIP_ResetFault

***Purpose:***
Resets a specific diagnostic fault event. Because the fault alarm depends on the states of all fault events, it can possibly reset the state of the fault alarm of the system (in case it was the last non-reset fault). If the state of the fault alarm changes, it results in the message MESSAGETYPE_OIP_NotifyAlarm (if subscribed, see §6.3).

***Parameter structure:***
```
struct {
   COMMANDHEADER    header;
```

```
    TOIEventId      eventId;
} OIP_ResetFault;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_ResetFault. |
| *eventId* | Identification of the diagnostic fault event. See §9.2.1 for the value set description. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyAlarm (alarm-type equals OIAT_FAULT)
MESSAGETYPE_OIP_NotifyDiagEvent

***Related messages:***

MESSAGETYPE_OIP_AckAllFaults
MESSAGETYPE_OIP_ResetAllFaults
MESSAGETYPE_OIP_AckFault
MESSAGETYPE_OIP_ReportFault
MESSAGETYPE_OIP_ResolveFault

## 4.20 MESSAGETYPE_OIP_AckEvacAlarm

***Purpose:***

This message acknowledges the emergency alarm. If the state of the emergency alarm changes, it results in the message MESSAGETYPE_OIP_NotifyAlarm (if subscribed, see §4.31).

***Parameter structure:***

```
struct {
    COMMANDHEADER    header;
} OIP_AckEvacAlarm;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_AckEvacAlarm. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyAlarm (alarm-type equals OIAT_EVAC)

***Related messages:***

MESSAGETYPE_OIP_ResetEvacAlarmEx

## 4.21 MESSAGETYPE_OIP_ResetEvacAlarmEx

***Purpose:***

Resets the emergency alarm. Whether or not running evacuation priority calls are aborted can be specified. If the state of the emergency alarm changes, it results in the message MESSAGETYPE_OIP_NotifyAlarm (if subscribed, see §4.31).

***Parameter structure:***

```
struct {
    COMMANDHEADER      header;
```

```
    BOOLEAN          bAbortEvacCalls
} OIP_ResetEvacAlarmEx;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_ResetEvacAlarmEx. |
| *bAbortEvacCalls* | Whether or not currently running evacuation priority calls must be aborted. TRUE = abort running evacuation priority calls, FALSE = do not abort running evacuation priority calls |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyAlarm (alarm-type equals OIAT_EVAC)

***Related messages:***

MESSAGETYPE_OIP_AckEvacAlarm

MESSAGETYPE_OIP_ResetEvacAlarm

## 4.22 MESSAGETYPE_OIP_IncrementBgmVolume

***Purpose:***

Increments the BGM volume of the passed routing with 3 dB.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   STRING           routing;
} OIP_IncrementBgmVolume;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_IncrementBgmVolume. |
| *routing* | List of names of zone groups and/or zones. A comma separates each name in the routing list. No spaces are allowed before or after the separation commas in the string. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Related messages:***

MESSAGETYPE_OIP_DecrementBgmVolume
MESSAGETYPE_OIP_SetBgmVolume

## 4.23 MESSAGETYPE_OIP_IncrementBgmChannelVolume

***Purpose:***

Increments the BGM volume of a channel with 3 dB.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   STRING           channel;
} OIP_IncrementBgmChannelVolume;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_IncrementBgmVolume. |
| *channel* | The BGM channel name as present in the PRAESENSA configuration. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Related messages:***

MESSAGETYPE_OIP_DecrementBgmChannelVolume
MESSAGETYPE_OIP_SetBgmVolume
MESSAGETYPE_OIP_GetBgmChannelNames

## 4.24 MESSAGETYPE_OIP_DecrementBgmVolume

***Purpose:***

Decrements the BGM volume of the passed routing with 3 dB.

***Parameter structure:***

```
Struct {
   COMMANDHEADER    header;
   STRING           routing;
} OIP_DecrementBgmVolume;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_DecrementBgmVolume. |
| *routing* | List of names of zone groups and/or zones. A comma separates each name in the routing list. No spaces are allowed before or after the separation commas in the string. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Related messages:***

MESSAGETYPE_OIP_IncrementBgmVolume
MESSAGETYPE_OIP_SetBgmVolume

## 4.25 MESSAGETYPE_OIP_DecrementBgmChannelVolume

***Purpose:***

Decrements the BGM volume of a channel with 3 dB.

***Parameter structure:***

```
Struct {
   COMMANDHEADER    header;
   STRING           channel;
} OIP_DecrementBgmChannelVolume;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_DecrementBgmChannelVolume. |
| *channel* | The BGM channel name as present in the PRAESENSA configuration. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Related messages:***

MESSAGETYPE_OIP_IncrementBgmChannelVolume
MESSAGETYPE_OIP_SetBgmVolume
MESSAGETYPE_OIP_GetBgmChannelNames

## 4.26 MESSAGETYPE_OIP_SetBgmVolume

***Purpose:***

Sets the BGM volume of the given routing.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   INT              volume;
   STRING           routing;
} OIP_SetBgmVolume;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_SetBgmVolume. |
| *volume* | Volume of the BGM. Value range: 0 ... –96 (dB). Use –96 (dB) to mute the BGM. |
| *routing* | List of names of zone groups and/or zones. A comma separates each name in the routing list. No spaces are allowed before or after the separation commas in the string. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Related messages:***

MESSAGETYPE_OIP_IncrementBgmVolume
MESSAGETYPE_OIP_DecrementBgmVolume

## 4.27 MESSAGETYPE_OIP_AddBgmRouting

***Purpose:***

Adds a routing to a BGM channel. Either all specified routing is added or, in case of an error, no routing at all.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   STRING           channel;
   STRING           routing;
} OIP_AddBgmRouting;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_AddBgmRouting. |
| *channel* | The BGM channel name as present in the PRAESENSA configuration. |
| *routing* | List of names of zone groups and/or zones. A comma separates each name in the routing list. No spaces are |

allowed before or after the separation commas in the string.

***Response message type:***
MESSAGETYPE_OIP_Response

***Update notifications:***
MESSAGETYPE_OIP_NotifyBgmRouting

***Related messages:***
MESSAGETYPE_OIP_RemoveBgmRouting
MESSAGETYPE_OIP_ToggleBgmRouting
MESSAGETYPE_OIP_SetBgmRouting

## 4.28 MESSAGETYPE_OIP_RemoveBgmRouting

***Purpose:***
Removes a routing from a BGM channel. Either all specified routing is removed or, in case of an error, no routing at all.

***Parameter structure:***

```
Struct {
   COMMANDHEADER    header;
   STRING           channel;
   STRING           routing;
} OIP_RemoveBgmRouting;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_RemoveBgmRouting. |
| *channel* | The BGM channel name as present in the PRAESENSA configuration. |
| *routing* | List of names of zone groups and/or zones. A comma separates each name in the routing list. No spaces are allowed before or after the separation commas in the string. |

***Response message type:***
MESSAGETYPE_OIP_Response

***Update notifications:***
MESSAGETYPE_OIP_NotifyBgmRouting

***Related messages:***
MESSAGETYPE_OIP_AddBgmRouting
MESSAGETYPE_OIP_ToggleBgmRouting
MESSAGETYPE_OIP_SetBgmRouting

## 4.29 MESSAGETYPE_OIP_ToggleBgmRouting

***Purpose:***
Toggles a routing in a BGM channel. When none of names in the specified routing are part the BGM channel, all specified routing is added, else all supplied routing is removed or, in case of an error, the current routing of the BGM channel remains unchanged.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   STRING           channel;
   STRING           routing;
} OIP_ToggleBgmRouting;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_ToggleBgmRouting. |
| *channel* | The BGM channel name as present in the PRAESENSA configuration. |
| *routing* | List of names of zone groups and/or zones. A comma separates each name in the routing list. No spaces are allowed before or after the separation commas in the string. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyBgmRouting

***Related messages:***

MESSAGETYPE_OIP_AddBgmRouting
MESSAGETYPE_OIP_RemoveBgmRouting
MESSAGETYPE_OIP_SetBgmRouting

## 4.30 MESSAGETYPE_OIP_SetBgmRouting

***Purpose:***

Sets the routing of a BGM channel. Note that the specified routing replaces the configured routing in the configuration of the PRAESENSA system.

***Parameter structure:***

```
Struct {
   COMMANDHEADER    header;
   STRING           channel;
   STRING           routing;
} OIP_SetBgmRouting;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_SetBgmRouting. |
| *channel* | The BGM channel name as present in the PRAESENSA configuration. |
| *routing* | List of names of zone groups and/or zones. A comma separates each name in the routing list. No spaces are allowed before or after the separation commas in the string. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyBgmRouting

***Related messages:***

MESSAGETYPE_OIP_AddBgmRouting
MESSAGETYPE_OIP_RemoveBgmRouting
MESSAGETYPE_OIP_ToggleBgmRouting

## 4.31 MESSAGETYPE_OIP_SetSubscriptionAlarm

***Purpose:***

Subscribes or unsubscribes to alarm notifications. Depending on the *alarmtype* parameter, it subscribes to faults or emergency alarms. Only when a subscription is set for the faults or emergency alarm, state notifications will be sent. When a subscription is set, the MESSAGETYPE_OIP_NotifyAlarm message is sent with the current state of the alarm.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   TOIAlarmType     alarmType;
   BOOLEAN          subscription;
} OIP_SetSubscriptionAlarm;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_SetSubscriptionAlarm. |
| *alarmType* | The alarm type to subscribe of unsubscribe, see §9.2.3. |
| *subscription* | Whether to subscribe or unsubscribe. TRUE = subscribe, FALSE = unsubscribe |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyAlarm

## 4.32 MESSAGETYPE_OIP_SetSubscriptionResources

***Purpose:***

Subscribes or unsubscribes to resource (read zone groups, zones) state notifications of particular resources. Only when a subscription is set for a resource, resource state notifications are sent for that resource. When a subscription is set for a resource, the MESSAGETYPE_OIP_NotifyResources message is sent with the current state of that resource.

It is not possible to subscribe to control outputs. No updates will be triggered for these resources.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   STRING           resourceNames;
   BOOLEAN          subscription;
} OIP_SetSubscriptionResources;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_SetSubscriptionResources. |

| | |
|---|---|
| *resourceNames* | List of names of zone groups and/or zones. A comma separates each name in the routing list. Resources already having the subscription state are ignored. No spaces are allowed before or after the separation commas in the string. |
| *subscription* | Whether to subscribe or unsubscribe. TRUE = subscribe, FALSE = unsubscribe. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyResources

## 4.33 MESSAGETYPE_OIP_SetSubscriptionResourceFaultState

***Purpose:***

Subscribes or unsubscribes to resource (read zone groups or zones) fault state notifications of particular resources for faults that affect the audio distribution of that zone or zone group. Only when a subscription is set for a resource, resource fault state notifications are sent for that resource. When a subscription is set for a resource, the MESSAGETYPE_OIP_NotifyResourceFaultState message is sent with the current state of that resource.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   STRING           resourceNames;
   BOOLEAN          subscription;
} OIP_SetSubscriptionResourceFaultState;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_SetSubscriptionResourceFaultStat e. |
| *resourceNames* | List of names of zone groups and/or zones. A comma separates each name in the routing list. Resources already having the subscription state are ignored. No spaces are allowed before or after the separation commas in the string. Subscription for control output resources is not allowed. |
| *subscription* | Whether to subscribe or unsubscribe. TRUE = subscribe, FALSE = unsubscribe. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyResourceFaultState

## 4.34 MESSAGETYPE_OIP_SetSubscriptionBgmRouting

***Purpose:***

Subscribes or unsubscribes to BGM routing notifications. Only when a subscription is set for a BGM channel, BGM routing notifications are sent for that BGM channel.

When a subscription is set for a BGM channel, the MESSAGETYPE_OIP_NotifyBgmRouting message is sent with the routing of that BGM channel and with the *addition* parameter set to TRUE.

In case the BGM channel is not active due to a missing audio input in the configuration then no subscription can be set and an ERROR_INTERNAL is returned.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   STRING           channel;
   BOOLEAN          subscription;
} OIP_SetSubscriptionBgmRouting;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_SetSubscriptionBgmRouting. |
| *channel* | The BGM channel name as present in the PRAESENSA configuration. |
| *subscription* | Whether to subscribe or unsubscribe. TRUE = subscribe, FALSE = unsubscribe. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyBgmRouting

## 4.35 MESSAGETYPE_OIP_SetSubscriptionEvents

***Purpose:***

Subscribes or unsubscribes to diagnostic event notifications. Only when a subscription is set for an event group, diagnostic event notifications are sent for that group. When a subscription is set for an event group, the MESSAGETYPE_OIP_NotifyDiagEvent message is sent with the diagnostic event of that group.

***Parameter structure:***

```
struct {
   COMMANDHEADER      header;
   TDiagEventGroup    eventGroup;
   BOOLEAN            subscription;
} OIP_SetSubscriptionEvents;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_SetSubscriptionEvents. |
| *eventGroup* | Group identification of the diagnostic events. The associated event-types for each group is represented in §9.3.2. |
| *subscription* | Whether to subscribe or unsubscribe. TRUE = subscribe, FALSE = unsubscribe. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyDiagEvent

## 4.36 MESSAGETYPE_OIP_SetSubscriptionBgmVolume

***Purpose:***

Subscribes or unsubscribes to BGM volume notifications. Only when a subscription is set for zone, BGM volume notifications are sent for that zone. When a subscription is set for a zone, the MESSAGETYPE_OIP_NotifyBgmVolume message is sent with the current volume of that zone.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   STRING           zones;
   BOOLEAN          subscription;
} OIP_SetSubscriptionBgmVolume;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_SetSubscriptionBgmVolume. |
| *zones* | The zone names as present in the PRAESENSA configuration. |
| *subscription* | Whether to subscribe or unsubscribe. TRUE = subscribe, FALSE = unsubscribe. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyBgmVolume

## 4.37 MESSAGETYPE_OIP_GetZoneNames

***Purpose:***

Retrieve the configured zone names from the PRAESENSA system. When the zone group parameter is empty all zone names are returned otherwise the zone names in that zone group are returned.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   STRING           zonegroup;
} OIP_GetZoneNames;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_GetZoneNames. |
| *zoneGroup* | The zone group to get the names of. |

***Response message type:***

MESSAGETYPE_OIP_ResponseNames

## 4.38 MESSAGETYPE_OIP_GetZoneGroupNames

***Purpose:***

Retrieve the configured zone group names from the PRAESENSA system.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
} OIP_GetZoneGroupNames;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_GetZoneGroupNames. |

***Response message type:***

MESSAGETYPE_OIP_ResponseNames

## 4.39 MESSAGETYPE_OIP_GetMessageNames

***Purpose:***

Retrieve the configured message names from the PRAESENSA system. Note that the chimes on the PRAESENSA system are also messages, so the names of the chimes will be part of the response to the GetMessageNames.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
} OIP_GetMessageNames;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_GetMessageNames. |

***Response message type:***

MESSAGETYPE_OIP_ResponseNames

## 4.40 MESSAGETYPE_OIP_GetChimeNames

***Purpose:***

Retrieve the configured message names from the PRAESENSA system. Note that this is the same list as returned by MESSAGETYPE_OIP_GetMessageNames.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
} OIP_GetChimeNames;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_GetChimeNames. |

***Response message type:***

MESSAGETYPE_OIP_ResponseNames

## 4.41 MESSAGETYPE_OIP_GetAudioInputNames

***Purpose:***

Retrieve the configured audio input names from the PRAESENSA system.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
} OIP_GetAudioInputNames;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_GetAudioInputNames. |

***Response message type:***

MESSAGETYPE_OIP_ResponseNames

## 4.42 MESSAGETYPE_OIP_GetBgmChannelNames

***Purpose:***

Retrieve the configured BGM channel names from the PRAESENSA system.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
} OIP_GetBgmChannelNames;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_GetBgmChannelNames. |

***Response message type:***

MESSAGETYPE_OIP_ResponseNames

## 4.43 MESSAGETYPE_OIP_GetConfigId

***Purpose:***

Retrieve the configuration identifier from the PRAESENSA system. This is a number which is increased each time the configuration is saved.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
} OIP_GetConfigId;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_GetConfigId. |

***Response message type:***

MESSAGETYPE_OIP_ResponseConfigId

## 4.44 MESSAGETYPE_OIP_ActivateVirtualControlInput

***Purpose:***

Activate a control input. If the virtual control input is already active then activating it again will not have any effect.

***Parameter structure:***

```
struct {
   COMMANDHEADER        header;
   STRING               virtualControlInput;
} OIP_ActivateVirtualControlInput;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_ActivateVirtualControlInput. |
| *virtualControlInput* | Name of the virtual control input to activate. |

***Response message type:***

MESSAGETYPE_OIP_Response.

***Related messages:***

MESSAGETYPE_OIP_DeactivateVirtualControlInput

## 4.45 MESSAGETYPE_OIP_DeactivateVirtualControlInput

***Purpose:***

Deactivate a virtual control input. If the virtual control input is already inactive then deactivating it again will not have any effect.

***Parameter structure:***

```
struct {
   COMMANDHEADER                          header;
   STRING                        virtualControlInput;
      TOIVirtualControlInputDeactivation deactivationType
} OIP_DeactivateVirtualControlInput;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_DeactivateVirtualControlInput. |
| *virtualControlInput* | Name of the virtual control input to deactivate. |
| *deactivationType* | Specifier how the associated action should be deactivated (see §9.2.15). |

***Response message type:***

MESSAGETYPE_OIP_Response.

***Related messages:***

MESSAGETYPE_OIP_ActivateVirtualControlInput

## 4.46 MESSAGETYPE_OIP_SetSubscriptionUnitCount

***Purpose:***

Subscribes or unsubscribes to unit count notifications. Only when a subscription is set for the unit count, unit count updates will be sent. When a subscription is set, the MESSAGETYPE_OIP_NotifyUnitCount message is sent with the current number of connected units.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
   BOOLEAN          subscription;
} OIP_SetSubscriptionUnitCount;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_SetSubscriptionUnitCount. |
| *subscription* | Whether to subscribe or unsubscribe. TRUE = subscribe, FALSE = unsubscribe. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyUnitCount

## 4.47 MESSAGETYPE_OIP_SetSubscriptionVirtualControlInputs

***Purpose:***

Subscribes or unsubscribes to virtual control input state notifications. Only when a subscription is set for virtual control inputs, state notifications are sent for virtual control inputs. When a subscription is set, the MESSAGETYPE_OIP_NotifyVirtualControlInputs message is sent with the current state of the virtual control inputs.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
      STRING          virtualControlInputs;
   BOOLEAN         subscription;
} OIP_SetSubscriptionVirtualControlInputs;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_SetSubscriptionVirtualControlInputs . |
| *virtualControlInputs* | List of names of virtual control inputs. A comma separates each name in the routing list. Virtual control inputs already having the subscription state are ignored. No spaces are allowed before or after the separation commas in the string. |
| *subscription* | Whether to subscribe or unsubscribe. TRUE = subscribe, FALSE = unsubscribe. |

***Response message type:***

MESSAGETYPE_OIP_Response

***Update notifications:***

MESSAGETYPE_OIP_NotifyVirtualControlInputs

## 4.48 MESSAGETYPE_OIP_GetVirtualControlInputNames

***Purpose:***

Retrieve the configured virtual control input names from the PRAESENSA system.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
} OIP_GetVirtualControlInputNames;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_GetVirtualControlInputNames. |

***Response message type:***

MESSAGETYPE_OIP_ResponseNames

## 4.49 MESSAGETYPE_OIP_GetConfiguredUnits

***Purpose:***

Retrieve the configured units (along with the host name) from the PRAESENSA system. Only the units that are enabled are returned.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
} OIP_GetConfiguredUnits;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_GetConfiguredUnits. |

***Response message type:***

MESSAGETYPE_OIP_ResponseUnits

## 4.50 MESSAGETYPE_OIP_GetConnectedUnits

***Purpose:***

Retrieve the connected units (along with the host name) from the PRAESENSA system. Only the units that are configured, enabled and connected with the correct firmware version (units that can be controlled) are returned.

***Parameter structure:***

```
struct {
   COMMANDHEADER    header;
} OIP_GetConnectedUnits;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_GetConnectedUnits. |

***Response message type:***

MESSAGETYPE_OIP_ResponseUnits

# 5. RESPONSE MESSAGES

## 5.1 Introduction

The PRAESENSA system returns a response message after a command message has been executed. This section describes the response messages returned in case no protocol failures are detected (see §3.6). Section 5.1 describes the structure of the response messages. In specific cases, the default response structure is extended with additional information.

## 5.2 MESSAGETYPE_OIP_Response

***Purpose:***

Defines the general response of the commands that returned an error code and no additional information. It contains the basic information for all response messages.

***Parameter structure:***

```
struct {
   DWORD        messageType;
   UINT         length;
   UINT         reserved1;
   UINT         reserved2;
   DWORD        errorCode;
} RESPONSEHEADER;
```

***Where:***

| | |
|---|---|
| *messageType* | The response message type, which is equal to MESSAGETYPE_OIP_Response. |
| *length* | The total length of the response structure |
| *reserved1* | Session sequence number. Currently the *reserved1* is not used and should be set to the value zero (0) |
| *reserved2* | Message sequence number. Currently the *reserved2* is not used and should be set to the value zero (0). |
| *errorCode* | The error code of the command this is a response for. For the possible error codes see Chapter 10. |

**NOTE:**

The initial two elements described in section 3.4.1, are repeated in this structure.

***Related messages:***

Any command message not described in the sections §5.

## 5.3 MESSAGETYPE_OIP_ResponseGetNcoVersion

***Purpose:***

Responses to the command message MESSAGETYPE_OIP_GetNcoVersion.

***Parameter structure:***

```
struct {
   RESPONSEHEADER   header;
   STRING           version;
} OIP_ResponseGetNcoVersion;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_ResponseGetNcoVersion. |

*version* Release of the system controller software. The release label has no defined format.

***Related messages:***

MESSAGETYPE_OIP_GetNcoVersion

## 5.4 MESSAGETYPE_OIP_ResponseGetProtocolVersion

***Purpose:***

Responses to the command message MESSAGETYPE_OIP_GetProtocolVersion.

***Parameter structure:***

```
struct {
   RESPONSEHEADER    header;
   STRING            version;
} OIP_ResponseGetProtocolVersion;
```

***Where:***

*header* Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_ResponseGetProtocolVersion.

*version* Version of the Open Interface protocol in the format “M.m”.

**Where:**

M The major version number

m The minor version number

***Related messages:***

MESSAGETYPE_OIP_GetProtocolVersion

## 5.5 MESSAGETYPE_OIP_ResponseCallId

***Purpose:***

Responses to the command message MESSAGETYPE_OIP_CreateCallEx2 and MESSAGETYPE_OIP_CreateCallEx3.

***Parameter structure:***

```
struct {
   RESPONSEHEADER    header;
   UINT              callId;
} OIP_ResponseCallId;
```

***Where:***

*header* Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_ResponseCallId.

*callId* Unique identification of the call, which can be used in the call-handling commands.

***Related messages:***

MESSAGETYPE_OIP_CreateCallEx2
MESSAGETYPE_OIP_CreateCallEx3
MESSAGETYPE_OIP_StartCreatedCall
MESSAGETYPE_OIP_StopCall
MESSAGETYPE_OIP_AbortCall
MESSAGETYPE_OIP_AddToCall
MESSAGETYPE_OIP_RemoveFromCall

## 5.6 MESSAGETYPE_OIP_ResponseReportFault

***Purpose:***

Response to the command message MESSAGETYPE_OIP_ReportFault.

***Parameter structure:***

```
struct {
   RESPONSEHEADER    header;
   TOIEventId        eventId;
} OIP_ResponseReportFault;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_ResponseReportFault. |
| *eventId* | Unique identification of the fault event, which can be used in the event handling commands. |

***Related messages:***

MESSAGETYPE_OIP_ReportFault
MESSAGETYPE_OIP_AckFault
MESSAGETYPE_OIP_ResolveFault
MESSAGETYPE_OIP_ResetFault

## 5.7 MESSAGETYPE_OIP_ResponseNames

***Purpose:***

Responses to the command messages MESSAGETYPE_OIP_GetXXXNames.

***Parameter structure:***

```
struct {
   RESPONSEHEADER    header;
   STRING            names;
} OIP_ResponseNames;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_ResponseNames. |
| *names* | The requested names of the items. A comma separates each name in the list. |

***Related messages:***

MESSAGETYPE_OIP_GetZoneNames
MESSAGETYPE_OIP_GetZoneGroupNames
MESSAGETYPE_OIP_GetMessageNames
MESSAGETYPE_OIP_GetChimeNames
MESSAGETYPE_OIP_GetAudioInputNames
MESSAGETYPE_OIP_GetBgmChannelNames
MESSAGETYPE_OIP_GetVirtualControlInputNames

## 5.8 MESSAGETYPE_OIP_ResponseConfigId

***Purpose:***

Responses to the command message MESSAGETYPE_OIP_GetConfigId.

***Parameter structure:***

```
struct {
   RESPONSEHEADER    header;
   UINT              configId;
} OIP_ResponseGetConfigId;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_GetConfigId. |
| *configId* | Unique identification of the call, which can be used in the call-handling commands. |

***Related messages:***

MESSAGETYPE_OIP_GetConfigId

## 5.9 MESSAGETYPE_OIP_ResponseUnits

***Purpose:***

Responses to the command message MESSAGETYPE_OIP_GetXXXUnits.

***Parameter structure:***

```
struct {
   RESPONSEHEADER   header;
   STRING           units;
} OIP_ResponseUnits;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_ResponseUnits |
| *units* | Comma (,) separated list of unit names with host name,<br>Formatted as name(host name). |

***Related messages:***

MESSAGETYPE_OIP_GetConfiguredUnits
MESSAGETYPE_OIP_GetConnectedUnits

# 6. NOTIFICATION MESSAGES

## 6.1 Introduction

The PRAESENSA system notifies you system about the changes of the states of various resources (e.g. calls, zones). Each notification message starts with a fixed number of fields, which are presented below in structure format.

```
struct {
   DWORD       messageType;
   UINT        length;
   UINT        reserved1;
   UINT        reserved2;
} NOTIFYHEADER;
```

***Where:***

| | |
|---|---|
| *messageType* | The notification message type as documented in the sections below. |
| *length* | The total length of the notification structure. |
| *reserved1* | Session sequence number. Currently the *reserved1* is not used and should be set to the value zero (0) |
| *reserved2* | Message sequence number. Currently the *reserved2* is not used and should be set to the value zero (0). |

**NOTE:**
The initial two elements described in section 3.4.1, are repeated in this structure.

## 6.2 MESSAGETYPE_OIP_NotifyCall

***Purpose:***

Sent when the state of a running call, started by this Open Interface connection changes. Note that this notification does not report state changes for calls started on Call-Stations or other Open Interface connections.

***Parameter structure:***

```
struct {
   NOTIFYHEADER     header;
   UINT             callId;
   TOICallState     callState;
} OIP_NotifyCall;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_NotifyCall. |
| *callId* | Unique identification of the call, which changed its state. |
| *callState* | The new state of the call. See §9.2.6 for the definitions of the call states. |

***Related messages:***

MESSAGETYPE_OIP_StartCreatedCall
MESSAGETYPE_OIP_StopCall
MESSAGETYPE_OIP_AbortCall

## 6.3 MESSAGETYPE_OIP_NotifyAlarm

***Purpose:***

Sent when the state of an alarm changes and there is a subscription to the specific type of alarm.

***Parameter structure:***

```
struct {
   NOTIFYHEADER     header;
   TOIAlarmType     alarmType;
   TOIAlarmState    alarmState;
} OIP_NotifyAlarm;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_NotifyAlarm. |
| *alarmType* | The type of alarm, which changed its state. See §9.2.3 for the different types. |
| *alarmState* | The new state of the alarm. See §9.2.4 for the definitions of the alarm states. |

***Related messages:***

MESSAGETYPE_OIP_SetSubscriptionAlarm

## 6.4 MESSAGETYPE_OIP_NotifyResources

***Purpose:***

Sent when the state of resources (zone groups, zones) change and there is a subscription to notifications of resources.

***Parameter structure:***

```
struct {
   NOTIFYHEADER         header;
   TOIResourceState     resourceState;
   UINT                 priority;
   UINT                 callId;
   STRING               resources;
} OIP_NotifyResources;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_NotifyResources. |
| *resourceState* | The new state of the resource. See §9.2.5 for the definitions of the resource states. |
| *priority* | The priority of the call using the resource when the state is OIRS_INUSE. Not used (no valid) when the resource become free (state OIRS_FREE). |
| *callId* | Identification of the call, which uses the resource. The value is OI_UNDEFINED_CALLID when the resource is freed. |
| *resources* | List of names of zone groups and/or zones. A comma separates each name in the routing list. |

***Related messages:***

MESSAGETYPE_OIP_SetSubscriptionResources

## 6.5 MESSAGETYPE_OIP_NotifyResourceFaultState

***Purpose:***

Sent when the fault state of resources (zone groups, zones) for faults that affect the audio distribution of that zone or zone group changes and there is a subscription to fault notifications of resources.

***Parameter structure:***

```
struct {
   NOTIFYHEADER         header;
   TOIResourceFaultState resourceFaultState;
   STRING               resources;
} OIP_NotifyResourceFaultState;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_NotifyResourceFaultState. |
| *resourceFaultState* | The new state of the resource. See §9.2.6 for the definitions of the resource fault states. |
| *resources* | List of names of zone groups and/or zones. A comma separates each name in the routing list. |

***Related messages:***

MESSAGETYPE_OIP_SetSubscriptionResourceFaultState

## 6.6 MESSAGETYPE_OIP_NotifyBgmRouting

***Purpose:***

Sent when the routing of a BGM channel changes and there is subscription to notifications of BGM channels.

***Parameter structure:***

```
struct {
   NOTIFYHEADER     header;
   BOOL             addition;
   STRING           channel;
   STRING           routing;
} OIP_ NotifyBgmRouting;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_NotifyBgmRouting. |
| *addition* | Whether the routing was added (TRUE) or removed (FALSE). |
| *channel* | The name of the BGM channel, which routing was changed. |
| *routing* | List of names of zone groups and/or zones and/or control outputs that were added or removed. A comma separates each name in the routing list. |

***Related messages:***

MESSAGETYPE_OIP_SetSubscriptionBgmRouting
MESSAGETYPE_OIP_SetBgmRouting
MESSAGETYPE_OIP_AddBgmRouting
MESSAGETYPE_OIP_RemoveBgmRouting

## 6.7 MESSAGETYPE_OIP_NotifyEvent

***Purpose:***

Sent when a diagnostic event is added or updated and there is a subscription to notification of diagnostic events.

***Parameter structure:***

```
struct {
   NOTIFYHEADER     header;
   TOIActionType    action;
   DIAGEVENT        diagnosticEvent;
} OIP_NotifyDiagEvent;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_NotifyDiagEvent. |
| *action* | Indicates what happened with the diagnostic event. See §9.2.8 for the action definitions. |
| *diagnosticEvent* | Diagnostic event information. See chapter 7 for the descriptions of the diagnostic information. |

***Related messages:***

MESSAGETYPE_OIP_SetSubscriptionEvents

## 6.8 MESSAGETYPE_OIP_NotifyBgmVolume

***Purpose:***

Sent when the volume of a BGM zone changes and there is subscription to notifications of BGM zones.

***Parameter structure:***

```
struct {
   NOTIFYHEADER     header;
   STRING           zone;
   INT              volume;
} OIP_ NotifyBgmVolume;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_NotifyBgmRouting. |
| *zone* | The name of the BGM zone, which volume was changed. |
| *volume* | The new volume of the zone. |

***Related messages:***

MESSAGETYPE_OIP_SetSubscriptionBgmVolume
MESSAGETYPE_OIP_IncrementBgmVolume
MESSAGETYPE_OIP_DecrementBgmVolume
MESSAGETYPE_OIP_SetBgmVolume

## 6.9 MESSAGETYPE_OIP_NotifyUnitCount

***Purpose:***

Sent when the number of connected units has changed.

***Parameter structure:***

```
struct {
   NOTIFYHEADER        header;
   UINT                numberConnected;
} OIP_ NotifyUnitCount;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the *messageType* element is equal to MESSAGETYPE_OIP_NotifyUnitCount. |
| *numberConnected* | The number of connected units. |

***Related messages:***

MESSAGETYPE_OIP_SetSubscriptionUnitCount

## 6.10 MESSAGETYPE_OIP_NotifyVirtualControlInputState

***Purpose:***

Sent when the state of one or more virtual control inputs has changed state.

***Parameter structure:***

```
struct {
   NOTIFYHEADER                    header;
   STRING                    virtualControlInputs;
      TOIVirtualControlInputState  state;
} OIP_ NotifyVirtualControlInputState;
```

***Where:***

| | |
|---|---|
| *header* | Header of the message, where the messageType element is equal to MESSAGETYPE_OIP_NotifyVirtualControlInputState. |
| *virtualControlInputs* | List of names of virtual control inputs of which the state has changed. A comma separates each name in the list. |
| *state* | The state of the virtual control inputs. See §9.2.16 for the definitions of the states. |

***Related messages:***

MESSAGETYPE_OIP_SetSubscriptionVirtualControlInputs
MESSAGETYPE_OIP_activateVirtualControlInput
MESSAGETYPE_OIP_deactivateVirtualControlInput

# 7. DIAGNOSTIC EVENTS STRUCTURES

## 7.1 Introduction

The PRAESENSA system uses diagnostic event for reporting signals and faults that are detected within the system. The diagnostic events can be divided into three groups:

- General Events
  Events to signal user action or system changes. All generic events are without state, which means that they just notify the event.
- Call Events
  Signals the activity of calls. Call events are like general events, but they specifically report about calls.
- Fault Events
  Signals problems detected within the PRAESENSA system. Faults have states for the user and the equipment, reporting the fault event. Fault events influences the systems fault mode, reported by the message MESSAGETYPE_OIP_NotifyAlarm.

The diagnostic events are embedded in the MESSAGETYPE_OIP_NotifyEvent message, but since the event is variable in length, follows the complex structure rule as described in §3.4.3.2.

Each diagnostic event structure contains a fixed number of fields, which are described below.

```
struct {
   TDiagEventType     diagMessageType;
   UINT               length;
   TDiagEventGroup    diagEventGroup;
   TOIEventId         diagEventId;
   TDiagEventState    diagEventState;
   TIME               addTimeStamp;
   TIME               acknowledgeTimeStamp;
   TIME               resolveTimeStamp;
   TIME               resetTimeStamp;
   ORIGINATOR         addEventOriginator;
   ORIGINATOR         acknowledgeEventOriginator;
   ORIGINATOR         resolveEventOriginator;
   ORIGINATOR         resetEventOriginator;
} DIAGEVENTHEADER;
```

***Where:***

| | |
|---|---|
| *diagMessageType* | The message type indicator for the diagnostic structure as defined in 9.4. In the sections below the various diagnostic event types are described. |
| *length* | The total length of the diagnostic event information (including the *diagMessageType , length* and the additional information as described for a specific diagnostic event type) |
| *diagEventGroup* | The group to which the event belongs. See §9.3.2 for the diagnostic group definitions. |
| *diagEventId* | The identification of the event as generated by the PRAESENSA system. |

| | |
|---|---|
| *diagEventState* | The state of the event. |
| *addTimeStamp* | Time of creation (add to the system) of the diagnostic event. |
| *acknowledgeTimeStamp* | Time of acknowledgement by a user of the diagnostic event. On creation filled with value zero. |
| *resolveTimeStamp* | Time of resolving the problem by the event-creator of the diagnostic event. On creation filled with value zero. |
| *resetTimeStamp* | Time of reset by a user of the diagnostic event. On creation filled with value zero. |
| *addEventOriginator* | The originator that created (add to the system) the event. |
| *acknowledgeEventOriginator* | The originator that acknowledged the event, filled when acknowledged. On creation filled with value structure OIEOT_NoEventOriginator. |
| *resolveEventOriginator* | The originator that resolved the event, filled when resolved. On creation filled with value structure OIEOT_NoEventOriginator. |
| *resetEventOriginator* | The originator that reset the event, filled when reset. On creation filled with value structure OIEOT_NoEventOriginator. |

Note: the event originator information is described in §7.4.13.

## 7.2 General Diagnostic Events

This section describes the general diagnostic event types. For each diagnostic event is either the structure defined, or a reference to the structure definition.

Since a general diagnostic event is stateless, several elements in the DIAGEVENTHEADER structure have default values:

- The *diagEventState* is always set to the value DES_NEW (See §9.3.1)
- The time stamps for Acknowledge, Resolve and Reset are set to no time (value 0).
- The originators for Acknowledge, Resolve and Reset are set to the type OIEOT_NoEventOriginator

### 7.2.1 DET_EvacAcknowledge

***Purpose:***

This diagnostic event indicates that the system emergency state is acknowledged.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_EvacAcknowledge.

### 7.2.2 DET_EvacReset

***Purpose:***

This diagnostic event indicates that the system emergency state is reset.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_EvacReset.

### 7.2.3 DET_EvacSet

***Purpose:***

This diagnostic event indicates that the system emergency state is set (activated).

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_EvacSet.

### 7.2.4 DET_UnitConnect

***Purpose:***

This diagnostic event indicates that a unit has connected to or disconnected from the PRAESENSA system.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_UnitConnect.

### 7.2.5 DET_SCStartup

***Purpose:***

This diagnostic event indicates that the PRAESENSA system has started.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_SCStartup.

### 7.2.6 DET_OpenInterfaceConnect

***Purpose:***

This diagnostic event indicates that a remote system has connected to the PRAESENSA system using the open interface.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_OpenInterfaceConnect.

### 7.2.7 DET_OpenInterfaceDisconnect

***Purpose:***

This diagnostic event indicates that a remote system has disconnected from the PRAESENSA system using the open interface.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_OpenInterfaceDisconnect.

### 7.2.8 DET_OpenInterfaceConnectFailed

***Purpose:***

This diagnostic event indicates that a remote system has attempted to connect to the PRAESENSA system using the open interface but failed.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_OpenInterfaceConnectFailed.

### 7.2.9 DET_CallLoggingSuspended

***Purpose:***

This diagnostic event indicates that call logging has been suspended because of a logging queue overflow.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_CallLoggingSuspended.

### 7.2.10 DET_CallLoggingResumed

***Purpose:***

This diagnostic event indicates that call logging has been resumed.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_CallLoggingResumed.

### 7.2.11 DET_UserLogIn

***Purpose:***

This diagnostic event Indicates that a user has logged in..

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_UserLogIn.

### 7.2.12 DET_UserLogOut

***Purpose:***

This diagnostic event indicates that a user has logged out..

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_UserLogOut.

### 7.2.13 DET_UserLogInFailed

***Purpose:***

This diagnostic event indicates that a login attempt has failed.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_UserLogInFailed.

### 7.2.14 DET_BackupPowerModeStart

***Purpose:***

This diagnostic event indicates that backup power mode has started.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_BackupPowerModeStart. This event is only generated when backup power mode (in the system settings) has been configured **not** to generate a fault event.

### 7.2.15 DET_BackupPowerModeEnd

***Purpose:***

This diagnostic event indicates that backup power mode has ended.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_BackupPowerModeEnd. This event is only generated when backup power mode (in the system settings) has been configured **not** to generate a fault event.

### 7.2.16 DET_ConfigurationRestored

***Purpose:***

This diagnostic event Indicates that the configuration on the system controller has been restored from a backup.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER    header;
   BOOLEAN            configurationRestored;
   BOOLEAN            securityConfigurationRestored;
   BOOLEAN            messagesRestored;
} ConfigurationRestoredDiagEvent;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_BoosterSpareSwitch. |
| *configurationRestored* | Whether the configuration is restored. |
| *securityConfigurationRestored* | Whether the security configuration is restored. |
| *messagesRestored* | Whether the messages are restored. |

### 7.2.17 DET_DemoteToBackup

***Purpose:***

This diagnostic event indicates that the current duty controller in a redundant system detected a critical fault and demoted itself to backup.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_DemoteToBackup.

### 7.2.18 DET_InControl

***Purpose:***

This diagnostic event indicates that a call station in a group is now in control.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER    header;
   STRING             callStationGroupName;
} InControlDiagEvent;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_InControl. |

## 7.3 Call Diagnostic Events

This section describes the call diagnostic event types. For each diagnostic event either the structure is defined, or a reference to the structure definition.

Since a call diagnostic event is stateless, the same default values are used as described in §7.2.

### 7.3.1 DET_CallStartDiagEventV2

***Purpose:***

This diagnostic event indicates the start of a call in the PRAESENSA system.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER      header;
   UINT                 callId;
   STRING               audioInput;
   STRING               endChime;
   BOOLEAN              liveSpeech;
   STRING               messageNames;
   STRING               outputNames;
   UINT                 priority;
   STRING               startChime;
   UINT                 messageRepeat;
   STRING               macroName;
   UINT                 originalCallId;
   TOICallOutputHandling outputHandling;
   TOICallTiming        callTiming;
   UINT                                reserved;
} CallStartDiagEvent;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_CallStartDiagEventV2. |
| *audioInput* | The names of the audio input used in this call. |
| *endChime* | The names of the end chimes used in this call. |
| *liveSpeech* | Whether or not this call has live speech. |
| *messageNames* | List of names of prerecorded messages used in this call. A comma separates each name in the list. |
| *outputNames* | List of names of zones used in the call. A comma separates each name in the routing list. |

| | |
|---|---|
| *Priority* | The priority of the call. See §4.5 for the value description of the priority. |
| *startChime* | The names of the start chimes used in this call. |
| *messageRepeat* | The repeat count of the messages in the call. See §4.5 for the value description of the repeat count. |
| *callId* | Identification of the call. |
| *macroName* | The name of the macro used in this call. |
| *originalCallId* | Identification of the original call in case of a replay. |
| *outputHandling* | Whether the call is 'partial', 'non-partial' or 'stacked'. Partial calls are calls that proceed even in case not all required zones are available. Stacked calls are calls that extend partial calls with replays to previously unavailable zones. |
| *callTiming* | Whether the call should start 'immediate', 'time-shifted' or 'pre-monitored'. |
| *reserved* | Parameter only used for internal processing. |

### 7.3.2 DET_CallEndDiagEventV2

***Purpose:***

This diagnostic event indicates the end (or abort) of a call in the PRAESENSA system.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_CallStartDiagEventV2.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER     header;
   UINT                callId;
   TOICallState        callStateCompleted;
   BOOLEAN             callAborted;
   TOICallStopReason   callStopReason;
   UINT                reserved;
} CallEndDiagEvent;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_CallChangeResourceDiagEventV2. |
| *callId* | Identification of the call. |
| *callStateCompleted* | The last completed call state the moment the call is stopped or aborted. See §9.2.7for the definitions of the call states. |
| *callAborted* | Whether a call was aborted. TRUE = call is aborted, FALSE = the call is stopped. |
| *callStopReason* | Why the call was stopped or aborted. See §9.2.8 for the definitions of the call stop reasons. |

| | |
|---|---|
| *reserved* | Parameter only used for internal processing. |

### 7.3.3 DET_CallChangeResourceDiagEventV2

***Purpose:***

This diagnostic event indicates a change in routing of a running call. The diagnostic event indicates whether zone groups, zones and/or control outputs are added to the routing or removed from the routing.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER    header;
   UINT               callId;
   STRING             removedResourceNames;
   STRING             addedResourceNames;
} CallChangeResourceDiagEvent;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_CallChangeResourceDiagEvent. |
| *callId* | Identification of the call. |
| *removedResourceNames* | List of names of zones removed from the call. A comma separates each name. |
| *addedResourceNames* | List of names of zones added to the call. A comma separates each name. |

### 7.3.4 DET_CallTimeoutDiagEventV2

***Purpose:***

This diagnostic event indicates that a stacked call has reached its time-out point and implies that the call has been unable to reach all required zones. The diagnostic event provides the unreached zones.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER    header;
   UINT               callId;
   STRING             unreachedResourceNames;
} CallTimeoutDiagEvent;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_CallTimeoutDiagEvent. |
| *callId* | Identification of the call. |
| *unreachedResourcesNames* | List of names of zones that were not reached during the extended call. A comma separates each name. |

### 7.3.5 DET_CallRestartDiagEvent

***Purpose:***

This diagnostic event indicates the restart of a call in the PRAESENSA system. The diagnostic event is only logged when the call was reset earlier (see §7.3.6).

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER      header;
   UINT                 callId;
   STRING               audioInput;
   STRING               endChime;
   BOOLEAN              liveSpeech;
   STRING               messageNames;
   STRING               outputNames;
   UINT                 priority;
   STRING               startChime;
   UINT                 messageRepeat;
   STRING               macroName;
   UINT                 originalCallId;
   TOICallOutputHandling outputHandling;
   TOICallTiming        callTiming;
   UINT                                reserved;
} CallRestartDiagEvent;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_CallRestartDiagEvent. |
| *audioInput* | The names of the audio input used in this call. |
| *endChime* | The names of the end chimes used in this call. |
| *liveSpeech* | Whether or not this call has live speech. |
| *messageNames* | List of names of prerecorded messages used in this call. A comma separates each name in the list. |
| *outputNames* | List of names of zones used in the call. A comma separates each name in the routing list. |
| *Priority* | The priority of the call. See §4.5 for the value description of the priority. |
| *startChime* | The names of the start chimes used in this call. |
| *messageRepeat* | The repeat count of the messages in the call. See §4.5 for the value description of the repeat count. |
| *callId* | Identification of the call. |
| *macroName* | The name of the macro used in this call. |
| *originalCallId* | Identification of the original call in case of a replay. |
| *outputHandling* | Whether the call is ‘partial’, ‘non-partial’ or ‘stacked’. Partial calls are calls that proceed even in case not all required zones are available. Stacked calls are calls that extend partial calls with replays to previously unavailable zones. |
| *callTiming* | Whether the call should start ‘immediate’, ‘time-shifted’ or ‘pre-monitored’. |
| *reserved* | Parameter only used for internal processing. |

### 7.3.6 DET_CallResetDiagEvent

***Purpose:***

This diagnostic event indicates the reset of a call in the PRAESENSA system. A call can only be reset (and restarted) if the 'Continue call' setting in the Call Macro is set to 'After interruption'. If a call is reset, the call state is set to OICS_IDLE (see §9.2.7) and the call will be restarted.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_CallResetDiagEvent.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER     header;
   UINT                callId;
   TOICallState        callStateCompleted;
   TOICallResetReason  callResetReason;
   UINT                reserved;
} CallResetDiagEvent;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_CallResetDiagEvent. |
| *callId* | Identification of the call. |
| *callStateCompleted* | The active call state the moment the call is reset. See §9.2.7 for the definitions of the call states. |
| *callResetReason* | Why the call was reset. See §**Error! Reference s ource not found.**9.2.8 for the definitions of the call reset reason. |
| *reserved* | Parameter only used for internal processing. |

## 7.4 Fault Diagnostic Events

This section describes the fault diagnostic event types. For each diagnostic event either the structure is defined, or a reference to the structure definition.

The creation of a fault within a fault-less system changes the system to the fault mode. This indicates that the PRAESENSA system requires maintenance. The maintenance engineer acknowledges the faults and takes appropriate action to repair the faults. When the system detects that the faults are resolved, the fault-diagnostic events resolve their fault. Finally, the maintenance engineer should reset the fault to bring the system in normal operation mode.

Each fault diagnostic event passes several states, which are all notified. The link between related faults is controlled by the *diagEventId* element in the header of the diagnostic event (see structure in section 7).

### 7.4.1 DET_AudioPathSupervision

***Purpose:***

This diagnostic event indicates that an audio-path failure is detected.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_AudioPathSupervision.

### 7.4.2 DET_MicrophoneSupervision

***Purpose:***

This diagnostic event indicates that a microphone failure is detected. Note that this diagnostic event only applies to a Call Station.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_MicrophoneSupervision

### 7.4.3 DET_SystemInputContact

***Purpose:***

This diagnostic event indicates that a system input contact failure is detected.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_SystemInputContact.

### 7.4.4 DET_CallStationExtension

***Purpose:***

This diagnostic event indicates that a mismatch between the number of configured call station extensions and the number of detected call station extensions

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER    header;
   UINT               numberConfigured;
   UINT               numberDetected;
} CallStationExtensionDiagEvent;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_CallStationExtension. |
| *numberConfigured* | The number of extensions as configured in the PRAESENSA system configuration |
| *numberDetected* | The number of extensions as reported by the call station. |

### 7.4.5 DET_ConfigurationFile

***Purpose:***

This diagnostic event indicates that a missing or corrupt configuration file is detected.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_ConfigurationFile.

### 7.4.6 DET_ConfigurationVersion

***Purpose:***

This diagnostic event indicates that a mismatch between the configuration file version and the required configuration file version is detected. The configuration file requires conversion.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER    header;
   STRING             expected;
   STRING             loaded;
} ConfigurationVersionDiagEvent;
```

***Where:***

| | |
|---|---|
| *Header* | Header of the event, where the *diagMessageType* element is equal to DET_ConfigurationVersion. |
| *expected* | String containing the expected configuration file version |
| *Loaded* | String containing the loaded (opened) configuration file version |

### 7.4.7 DET_IllegalConfiguration

***Purpose:***

This diagnostic event indicates an inconsistency within the active configuration file.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER    header;
   UINT               errorCode;
} IllegalConfigurationDiagEvent;
```

***Where:***

| | |
|---|---|
| *Header* | Header of the event, where the *diagMessageType* element is equal to DET_IllegalConfiguration. |
| *errorCode* | The code of the illegal configuration error. Not used at the moment, currently filled with the value ‘0’. |

### 7.4.8 DET_PrerecordedMessagesNames

***Purpose:***

This diagnostic event indicates that a mismatch is detected between the configured (and used) prerecorded message-names and the detected prerecorded message-names in the PRAESENSA system.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER    header;
   STRING             missingMessages;
} PrerecordedMessagesNamesDiagEvent;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_PrerecordedMessagesNames. |
| *missingMessages* | List of names of prerecorded messages not found in the PRAESENSA system, but used in the |

configuration. A comma separates each name in the list.

### 7.4.9 DET_PrerecordedMessagesCorrupt

***Purpose:***

This diagnostic event indicates that one or more prerecorded messages in the PRAESENSA system is corrupt and cannot be used.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER    header;
   STRING             corruptMessages;
} PrerecordedMessagesCorruptDiagEvent;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_PrerecordedMessagesCorrupt. |
| *corruptMessages* | List of names of corrupt prerecorded messages in the PRAESENSA system. A comma separates each name in the list. |

### 7.4.10 DET_UnitMissing

***Purpose:***

This diagnostic event indicates a missing unit, which was configured in the PRAESENSA system configuration.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_UnitMissing.

### 7.4.11 DET_UnitReset

***Purpose:***

This diagnostic event indicates that a restart of a unit is detected.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER    header;
   STRING             chipType;
} UnitResetDiagEvent;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_UnitReset. |
| *chipType* | The type of the processor that caused is restarted. |

### 7.4.12 DET_UserInjectedFault

***Purpose:***

This diagnostic event indicates that a fault is injected by a user or a remote system. Note that this diagnostic event message can be triggered by the MESSAGETYPE_OIP_ReportFault as well as by a configured control-input of the PRAESENSA system.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER    header;
```

```
    STRING          errorDescription;
} UserInjectedFaultDiagEvent;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_UserInjectedFault. |
| *errorDescription* | A textual description of the error. |

***Related messages:***

MESSAGETYPE_OIP_ReportFault

### 7.4.13 DET_NoFaults

***Purpose:***

A diagnostic event of this type does not represent an actual fault, but is used to indicate that there are no fault events present in the logging of the system controller. This event is always sent in a message with the *TOIActionType* equal to OIACT_EXISTING_LAST (See §9.2.9).

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_NoFaults and the *diagEventId* is equal to zero.

### 7.4.14 DET_ZoneLineFault

***Purpose:***

This diagnostic event indicates that a Zone Line Fault that is injected by a remote system by triggering configured control input.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER    header;
   UINT[]             zoneResourceIds;
   UINT               keySpecResourceId;
   STRING             zoneNames;
   STRING             controlInputName;
} ZoneLineFaultDiagEvent;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_ZoneLineFault. |
| *zoneResourceIds* | Array of internal IDs indicating which zones have a zone line fault. Can be ignored. |
| *keySpecResourceId* | Internal ID indicating which key specification that triggered the zone line fault. Can be ignored. |
| *zoneNames* | Zone names which are configured to the input contact that are reported. A comma separates each name. |
| *controlInputName* | Control input name which is configured for the zone line fault. |

### 7.4.15 DET_NetworkChangeDiagEvent

***Purpose:***

This diagnostic event indicates that there was a change in the network (broken links between devices). This event is only reported if network supervision is enabled (see [UG_PRAESENSA]).

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER    header;
   BYTE               nrNetworkChanges;
   TNetworkChangeData networkChanges[];
} NetworkChangeDiagEvent;
```

Where TNetworkChangeData is defined as:

```
struct {
   STRING      localPortId;
   STRING      localSystemName;
   STRING      remotePortId;
   STRING      remoteSystemName;
} TNetworkChangeData
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_NetworkChangeDiagEvent. |
| *nrNetworkChanges* | The number of changes present in the network changes array element. Only this amount of array elements is transmitted. |
| *networkChanges []* | Array holding the network changes information. The actual length of the array is defined in the *nrNetworkChanges* element. The structure of each array element is described below. |
| *localPortId* | The port ID of the local system. |
| *localSystemName* | The name of the local system as configured in the PRAESENSA system. |
| remotePortId | The port ID of the remote system. |
| remoteSystemName | The name of the remote system as configured in the PRAESENSA system. |

### 7.4.16 DET_IncompatibleFirmware

***Purpose:***

This diagnostic event indicates that a device contains incompatible firmware and cannot be used in the PRAESENSA system.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER    header;
   STRING             current;
   STRING             expected;
} OverheatFault;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_IncompatibleFirmware. |

| | |
|---|---|
| *current* | The current firmware in the device. |
| expected | The expected firmware the device should contain. |

### 7.4.17 DET_Amp48VAFault

***Purpose:***

This diagnostic event indicates the loss of 48V A supply for the amplifier. Severity is high if DET_Amp48VBFault is also reported.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
   UINT              severity;
} Amp48VAFault;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_Amp48VAFault. |
| *severity* | Severity of the fault. LOW = 0, HIGH = 1. |

***Related events:***

DET_Amp48VBFault

### 7.4.18 DET_Amp48VBFault

***Purpose:***

This diagnostic event indicates the loss 48V B supply. Severity is high if DET_Amp48VAFault is also reported.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
   UINT              severity;
} Amp48VAFault;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_Amp48VBFault. |
| *severity* | Severity of the fault. LOW = 0, HIGH = 1. |

***Related events:***

DET_Amp48VAFault

### 7.4.19 DET_AmpChannelFault

***Purpose:***

This diagnostic event indicates a channel fault internally in the amplifier. If not used already, the spare channel takes over the functionality of the channel. Severity is high if the spare channel is already in use.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
   UINT              severity;
} Amp48VAFault;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_AmpChannelFault. |
| *severity* | Severity of the fault. LOW = 0, HIGH = 1. |

### 7.4.20 DET_AmpShortCircuitLineAFault

***Purpose:***

This diagnostic event indicates for the amplifier channel the hardware short detection is triggered or the output voltage is too low due to a short on line A.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
   UINT              severity;
} AmpShortCircuitLineAFault;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_AmpShortCircuitLineAFault. |
| *severity* | Severity of the fault. LOW = 0, HIGH = 1. |

### 7.4.21 DET_AmpShortCircuitLineBFault

***Purpose:***

This diagnostic event indicates for the amplifier channel the hardware short detection is triggered or the output voltage is too low due to a short on line B.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
   UINT              severity;
} AmpShortCircuitLineBFault;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_AmpShortCircuitLineBFault. |
| *severity* | Severity of the fault. LOW = 0, HIGH = 1. |

### 7.4.22 DET_AmpAcc18VFault

***Purpose:***

This diagnostic event indicates failure of the amplifier lifeline power supply. The severity is not used.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
   UINT              severity;
} AmpAcc18VFault;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_AmpAcc18VFault. |
| *severity* | Severity of the fault. LOW = 0, HIGH = 1. |

### 7.4.23 DET_AmpSpareInternalFault

***Purpose:***

This diagnostic event indicates an internal failure in the amplifier spare channel and can no longer be used. Severity is always high.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
   UINT              severity;
} AmpSpareInternalFault;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_AmpSpareInternalFault. |
| *severity* | Severity of the fault. LOW = 0, HIGH = 1. |

### 7.4.24 DET_AmpChannelOverloadFault

***Purpose:***

This diagnostic event indicates for the amplifier channel an output overload has occurred.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
   UINT              severity;
} AmpChannelOverloadFault;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_AmpChannelOverloadFault. |
| *severity* | Severity of the fault. LOW = 0, HIGH = 1. |

### 7.4.25 DET_EolFailureLineAFault

***Purpose:***

This diagnostic event indicates that the end-of-line device for the amplifier channel on line A is disconnected (the end-of-line pilot tone is not present).

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
   UINT              severity;
} EolFailureLineAFault;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_EolFailureLineAFault. |
| *severity* | Severity of the fault. LOW = 0, HIGH = 1. |

### 7.4.26 DET_EolFailureLineBFault

***Purpose:***

This diagnostic event indicates that the end-of-line device for the amplifier channel on line B is disconnected (the end-of-line pilot tone is not present).

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
```

```
  UINT          severity;
} EolFailureLineBFault;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_EolFailureLineBFault. |
| *severity* | Severity of the fault. LOW = 0, HIGH = 1. |

### 7.4.27 DET_GroundShortFault

***Purpose:***

This diagnostic event indicates that a ground fault is signaled by the amplifier hardware.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_GroundShortFault.

### 7.4.28 DET_OverheatFault

***Purpose:***

This diagnostic event indicates that amplifier hardware is overheated. All channels are disabled and severity is always high.

***Parameter structure:***

```
struct {
  DIAGEVENTHEADER   header;
  UINT          severity;
} OverheatFault;
```

***Where:***

| | |
|---|---|
| *header* | Header of the event, where the *diagMessageType* element is equal to DET_OverheatFault |
| *severity* | Severity of the fault. LOW = 0, HIGH = 1. |

### 7.4.29 DET_PowerMainsSupplyFault

***Purpose:***

This diagnostic event indicates the loss of mains power for a Multifunction Power Supply

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_PowerMainsSupplyFault.

### 7.4.30 DET_PowerBackupSupplyFault

***Purpose:***

This diagnostic event indicates the loss of backup power supply for a Multifunction Power Supply

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_PowerBackupSupplyFault.

### 7.4.31 DET_MainsAbsentPSU1Fault

***Purpose:***

This diagnostic event indicates absence of the output 1 mains power. The number matches the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_MainsAbsentPSU1Fault.

### 7.4.32 DET_MainsAbsentPSU2Fault

***Purpose:***

This diagnostic event indicates absence of the output 2 mains power. The number matches the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_MainsAbsentPSU2Fault.

### 7.4.33 DET_MainsAbsentPSU3Fault

***Purpose:***

This diagnostic event indicates absence of the output 3 mains power. The number matches the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_MainsAbsentPSU3Fault.

### 7.4.34 DET_BackupAbsentPSU1Fault

***Purpose:***

This diagnostic event indicates absence of the output 1 12V DC backup power. The number matches the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_BackupAbsentPSU1Fault.

### 7.4.35 DET_BackupAbsentPSU2Fault

***Purpose:***

This diagnostic event indicates absence of the output 2 12V DC backup power. The number matches the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_BackupAbsentPSU2Fault.

### 7.4.36 DET_BackupAbsentPSU3Fault

***Purpose:***

This diagnostic event indicates absence of the output 3 12V DC backup power. The number matches the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_BackupAbsentPSU3Fault.

### 7.4.37 DET_DcOut1PSU1Fault

***Purpose:***

This diagnostic event indicates a missing 48V DC output for output 1A. The numbers match the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_DcOut1PSU1Fault.

### 7.4.38 DET_DcOut2PSU1Fault

***Purpose:***

This diagnostic event indicates a missing 48V DC output for output 1B. The numbers match the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_DcOut2PSU1Fault.

### 7.4.39 DET_DcOut1PSU2Fault

***Purpose:***

This diagnostic event indicates a missing 48V DC output for output 2A. The numbers match the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_DcOut1PSU2Fault.

### 7.4.40 DET_DcOut2PSU2Fault

***Purpose:***

This diagnostic event indicates a missing 48V DC output for output 2B. The numbers match the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_DcOut2PSU2Fault.

### 7.4.41 DET_DcOut1PSU3Fault

***Purpose:***

This diagnostic event indicates a missing 48V DC output for output 3A. The numbers match the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_DcOut1PSU3Fault.

### 7.4.42 DET_DcOut2PSU3Fault

***Purpose:***

This diagnostic event indicates a missing 48V DC output for output 3B. The numbers match the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_DcOut2PSU3Fault.

### 7.4.43 DET_AudioLifelinePSU1Fault

***Purpose:***

This diagnostic event indicates a wiring problem in the ACC connector with the lifeline analog audio signal for output 1. The number matches the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_AudioLifelinePSU1Fault.

### 7.4.44 DET_AudioLifelinePSU2Fault

***Purpose:***

This diagnostic event indicates a wiring problem in the ACC connector with the lifeline analog audio signal for output 2. The number matches the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_AudioLifelinePSU2Fault.

### 7.4.45 DET_AudioLifelinePSU3Fault

***Purpose:***

This diagnostic event indicates a wiring problem in the ACC connector with the lifeline analog audio signal for output 3. The number matches the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_AudioLifelinePSU3Fault.

### 7.4.46 DET_AccSupplyPSU1Fault

***Purpose:***

This diagnostic event indicates a missing 10 to 18V at the ACC connector for output 1. The number matches the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_AccSupplyPSU1Fault.

### 7.4.47 DET_AccSupplyPSU2Fault

***Purpose:***

This diagnostic event indicates a missing 10 to 18V at the ACC connector for output 2. The number matches the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_AccSupplyPSU2Fault.

### 7.4.48 DET_AccSupplyPSU3Fault

***Purpose:***

This diagnostic event indicates a missing 10 to 18V at the ACC connector for output 3. The number matches the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_AccSupplyPSU3Fault.

### 7.4.49 DET_Fan1Fault

***Purpose:***

This diagnostic event indicates that fan 1 in the Multifunction Power Supply is broken.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_Fan1Fault.

### 7.4.50 DET_Fan2Fault

***Purpose:***

This diagnostic event indicates that fan 2 in the Multifunction Power Supply is broken.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_Fan2Fault.

### 7.4.51 DET_DcAux1Fault

***Purpose:***

This diagnostic event indicates the absence of 24V DC aux 1 voltage for the Multifunction Power Supply. The number matches the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_DcAux1Fault.

### 7.4.52 DET_DcAux2Fault

***Purpose:***

This diagnostic event indicates the absence of 24V DC aux 2 voltage for the Multifunction Power Supply. The number matches the screening at the back-panel of the device.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_DcAux2Fault.

### 7.4.53 DET_BatteryShortFault

***Purpose:***

This diagnostic event indicates a short in the external battery for the Multifunction Power Supply.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_BatteryShortFault.

### 7.4.54 DET_BatteryRiFault

***Purpose:***

This diagnostic event indicates a Ri fault for the connected battery of the Multifunction Power Supply. Depending on the configured battery capacity in the PRAESENSA system a fault is reported.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_BatteryRiFault.

### 7.4.55 DET_BatteryOverheatFault

***Purpose:***

This diagnostic event indicates the temperature of the connected battery of the Multifunction Power Supply is not in correct working range

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_BatteryOverheatFault.

### 7.4.56 DET_BatteryFloatChargeFault

***Purpose:***

This diagnostic event indicates that the battery of the Multifunction Power Supply is most likely broken. The charger enters a float state when the State of Charge (SoC) is 100%. In this state a low charge current is expected just to component the self-discharge of the battery. When the charge current is very high the battery is probably broken and therefore the fault is reported. The charger is suspended for safety reasons.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_BatteryFloatChargeFault.

### 7.4.57 DET_MainsAbsentChargerFault

***Purpose:***

This diagnostic event indicates that the mains converter for the charger is defect which prevents charging the battery correctly.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_MainsAbsentChargerFault.

### 7.4.58 DET_PoESupplyFault

***Purpose:***

This diagnostic event indicates that a mismatch is detected the number of Power over Ethernet connections to the call station and the number of expected Power over Ethernet inputs configured in the PRAESENSA system.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_PoESupplyFault.

### 7.4.59 DET_PowerSupplyAFault

***Purpose:***

This diagnostic event indicates that the power supply input A level on the system controller is not within range. The fault is only reported if the power supply input is configured to be supervised in the PRAESENSA system.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_PowerSupplyAFault.

### 7.4.60 DET_PowerSupplyBFault

***Purpose:***

This diagnostic event indicates that the power supply input B level on the system controller is not within range. The fault is only reported if the power supply input is configured to be supervised in the PRAESENSA system.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_PowerSupplyBFault.

### 7.4.61 DET_ExternalPowerFault

***Purpose:***

This diagnostic event indicates that the PRAESENSA system is now in backup power mode. This event is only generated when backup power mode (in the system settings) has been configured to generate a fault event.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_ExternalPowerFault.

### 7.4.62 DET_ChargerSupplyVoltageTooLowFault

***Purpose:***

This diagnostic event indicates that the charger supply voltage is too low which prevents charging the battery correctly.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_ChargerSupplyVoltageTooLowFault.

### 7.4.63 DET_BatteryOvervoltageFault

***Purpose:***

This diagnostic event indicates that the internal charger is defect and is switched off for safety reasons.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_BatteryOvervoltageFault.

### 7.4.64 DET_BatteryUndervoltageFault

***Purpose:***

This diagnostic event indicates that there is an undervoltage situation when mains is absent. The battery is too empty to operate on.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_BatteryUndervoltageFault.

### 7.4.65 DET_MediaClockFault

***Purpose:***

This diagnostic event indicates there are one or more devices that failed to lock to PTP for a longer period of time.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_MediaClockFault.

### 7.4.66 DET_ChargerFault

***Purpose:***

This diagnostics event indicates an internal charger fault which prevents charging the battery correctly.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_ChargerFault.

### 7.4.67 DET_Amp20VFault

***Purpose:***

This diagnostic event indicates the failure of the power convertor for the controller section of the amplifier.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER    header;
   UINT               severity;
} Amp20VFault;
```

***Where:***

| | |
|---|---|
| *Header* | Header of the event, where the *diagMessageType* element is equal to DET_Amp20VFault. |
| *Severity* | Severity of the fault. LOW = 0, HIGH = 1. |

***Related events:***

DET_AmpPsuFault

### 7.4.68 DET_AmpPsuFault

***Purpose:***

This diagnostic event indicates the failure of the power convertor for the audio section of the amplifier.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
   UINT              severity;
} AmpPsuFault;
```

***Where:***

| | |
|---|---|
| *Header* | Header of the event, where the *diagMessageType* element is equal to DET_AmpPsuFault. |
| *Severity* | Severity of the fault. LOW = 0, HIGH = 1. |

***Related events:***

DET_Amp20VFault

### 7.4.69 DET_NetworkLatencyFault

***Purpose:***

This diagnostic event indicates that an audio flow gets interrupted by network delay and network jitter.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
   UINT              severity;
} NetworkLatencyFault;
```

***Where:***

| | |
|---|---|
| *Header* | Header of the event, where the *diagMessageType* element is equal to DET_NetworkLatencyFault. |
| *Severity* | Severity of the fault. LOW = 0, HIGH = 1. |

### 7.4.70 DET_SynchronizationFault

***Purpose:***

This diagnostic event indicates that the synchronization between a standby controller and a duty controller in a redundant system failed..

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_SynchronzationFault.

### 7.4.71 DET_AudioDelayFault

***Purpose:***

This diagnostic event indicates that DDR audio path issues occurred on the amplifier.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
   UINT              severity;
} AudioDelayFault;
```

***Where:***

| | |
|---|---|
| *Header* | Header of the event, where the *diagMessageType* element is equal to DET_AudioDelayFault. |
| *Severity* | Severity of the fault. LOW = 0, HIGH = 1. |

### 7.4.72 DET_InternalPowerFault

***Purpose:***

This diagnostic event indicates that one of the voltages on the powerlines in the MPS are out of bound.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_InternalPowerFault.

### 7.4.73 DET_InternalCommunicationFault

***Purpose:***

This diagnostic event indicates that one or several boards in the MPS are not responding.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
   STRING            board;
} InternalCommunicationFault;
```

***Where:***

| | |
|---|---|
| *Header* | Header of the event, where the *diagMessageType* element is equal to DET_InternalCommunicationFault. |
| *Board* | Space separated list of boards which are faulty. |

### 7.4.74 DET_VoIPFault

***Purpose:***

This diagnostic event indicates that VoIP calls using SIP and the PABX are no longer

possible due to configuration- or connectivity issues.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_VoIPFault.

### 7.4.75 DET_RemoteOutputFault

***Purpose:***

This diagnostic event indicates a fault on a remote audio output, located on a remote system device.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
   UINT              severity;
} RemoteOutputFault;
```

***Where:***

| | |
|---|---|
| *Header* | Header of the event, where the *diagMessageType* element is equal to DET_RemoteOutputFault. |
| *Severity* | Severity of the fault. LOW = 0, HIGH = 1. |

### 7.4.76 DET_RemoteOutputLoopFault

***Purpose:***

This diagnostic event indicates that a loop is detected for a remote audio output. A loop is defined as a remote audio output which is linked to a zone group on a system controller which contains remote audio outputs that are linked back to one or more zone groups located on the originating system controller.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
   STRING            remoteZoneGroupName;
} RemoteOutputLoopFault;
```

***Where:***

| | |
|---|---|
| *Header* | Header of the event, where the *diagMessageType* element is equal to DET_RemoteOutputLoopFault. |
| *remoteZoneGroupName* | Name of the remote zone group |

### 7.4.77 DET_RemoteOutputConfigurationFault

***Purpose:***

This diagnostic event indicates that an invalid remote zone group name is configured for the remote audio output.

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
   STRING            remoteZoneGroupName;
} RemoteOutputConfigurationFault;
```

***Where:***

| | |
|---|---|
| *Header* | Header of the event, where the *diagMessageType* element is equal to DET_RemoteOutputConfigurationFault. |
| *remoteZoneGroupName* | Name of the remote zone group |

### 7.4.78 DET_LicenseFault

***Purpose:***

This diagnostic event indicates that there is insufficient license of a specific license type

***Parameter structure:***

```
struct {
   DIAGEVENTHEADER   header;
   License           licenseType;
} LicenseFault;
```

***Where:***

| | |
|---|---|
| *Header* | Header of the event, where the *diagMessageType* element is equal to DET_LicenseFault. |
| *licenseType* | Insufficient license type |

### 7.4.79 DET_RemoteSystemFault

***Purpose:***

This diagnostic event indicates that a system fault is detected on another remote system controller.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_RemoteSystemFault.

### 7.4.80 DET_RemoteMainPowerFault

***Purpose:***

This diagnostic event indicates that a main power fault is detected on another remote system controller.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_RemoteMainPowerFault.

### 7.4.81 DET_RemoteBackupPowerFault

***Purpose:***

his diagnostic event indicates that a backup power fault is detected on another remote system controller.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_RemoteBackupPowerFault.

### 7.4.82 DET_RemoteGroundFault

***Purpose:***

This diagnostic event indicates that a ground fault is detected on another remote system controller.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_RemoteGroundFault.

### 7.4.83 DET_RemoteFault

***Purpose:***

This diagnostic event indicates that a fault is detected on another remote system controller.

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_RemoteFault.

### 7.4.84 DET_PowerSupplyFault

***Purpose*:**

This diagnostics event indicates a power supply fault is detected on a unit

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_PowerSupplyFault.

### 7.4.85 DET_StackedSwitchMismatchFault

***Purpose*:**

This diagnostics event indicates a mismatch between the detected switches in a stacked switch setup and the configuration

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_StackedSwitchMismatchFault.

### 7.4.86 DET_RedundantDataPathFault

***Purpose:***

This diagnostics event indicates that the interconnection between stacked Cisco IE5000 switches is not redundant

***Parameter structure:***

The Diagnostic Event structure contains only the information as described in the DIAGEVENTHEADER, wherein the *diagMessageType* is equal to DET_RedundantDataPathFault.

# 8. EVENT ORIGINATOR STRUCTURES

## 8.1 Introduction

Each diagnostic event that is sent contains originators to indicate who or which device has triggered the event. The group of originators described the structures for each kind of originator.

Each originator structure contains a fixed number of fields, which are described below.

```
Struct {
   DWORD          originatorType;
   UINT           length;
} ORIGINATORHEADER;
```

***Where:***

| | |
|---|---|
| *originatorType* | The originator type indicator for the originator structure as defined §9.5. In the sections below the various diagnostic event types are described. |
| *length* | The total length of the originator information (including the *originatorType, Length* and the additional information as described for a specific diagnostic event type) |

## 8.2 OIEOT_NoEventOriginator

***Purpose:***

This originator represents no or an unknown originator. There is no information available about the originator. During the creation of a diagnostic event message, only the *addEventOriginater* element is filled with an originator. All other originator elements of the structure are filled with this originator type.

***Parameter structure:***

The Originator structure contains only the information as described in the ORIGINATORHEADER, wherein the *originatorType* is equal to OIEOT_NoEventOriginator.

Note that since this originator type does not add additional information, the length parameter in the ORIGINATORHEADER only holds the length of the ORIGINATORHEADER.

## 8.3 OIEOT_UnitEventOriginator

***Purpose:***

This originator represents a unit connected to the PRAESENSA system.

***Parameter structure:***

```
struct {
   ORIGINATORHEADER    header;
   STRING              unitName;
} UnitOriginator;
```

***Where:***

| | |
|---|---|
| *header* | The originator header, where the *originatorType* element is equal to OIEOT_UnitEventOriginator. |
| *unitName* | The name of the originator unit as configured in the PRAESENSA system configuration. |

## 8.4 OIEOT_OpenInterfaceEventOriginator

***Purpose:***

This originator represents an open interface connection and its connection name.

***Parameter structure:***

```
struct {
   ORIGINATORHEADER    header;
   STRING              tcpIpDeviceName;
   DWORD               ipAddress;
   WORD                portNumber;
   STRING              userName;
} OpenInterfaceOriginator;
```

***Where:***

| | |
|---|---|
| *header* | The originator header, where the *originatorType* element is equal to OIEOT_OpenInterfaceEventOriginator. |
| *tcpIpDeviceName* | The name of the TCP/IP device. Currently this name is not (yet) filled (empty string). |
| *ipAddress* | The IP address of the originator open interface connection. Note that this IP address is transmitted as DWORD (LSB ordering) and not as an IP-address. The ordering of the bytes is different. Only IPv4 is supported in the PRAESENSA system. |
| *portNumber* | The TCP-port number of the open interface connection. |
| *userName* | The login user name of the open interface connection. |

## 8.5 OIEOT_ControlInputEventOriginator

***Purpose:***

This originator represents a binary control input, located on a unit.

***Parameter structure:***

```
struct {
   UnitOriginator      unitHeader;
   STRING              inputContactName;
} ControlInputOriginator;
```

***Where:***

| | |
|---|---|
| *unitHeader* | The unit-originator header (See §8.3), where the *originatorType* element is equal to OIEOT_ControlInputEventOriginator. |
| *inputContactName* | The name of the input contact as configured in the PRAESENSA system configuration. |

## 8.6 OIEOT_AudioOutputEventOriginator

***Purpose:***

This originator represents an audio output, located on a unit.

***Parameter structure:***

```
struct {
   UnitOriginator      unitHeader;
   STRING              audioOutputName;
} AudioOutputEventOriginator;
```

***Where:***

| | |
|---|---|
| *unitHeader* | The unit-originator header (See §8.3), where the *originatorType* element is equal to OIEOT_AudioOutputEventOriginator. |
| *audioOutputName* | The name of the audio output as configured in the PRAESENSA system configuration. |

## 8.7 OIEOT_AudioInputEventOriginator

***Purpose:***

This originator represents an audio input, located on a unit.

***Parameter structure:***

```
struct {
   UnitOriginator     unitHeader;
   STRING             audioInputName;
} AudioInputEventOriginator;
```

***Where:***

| | |
|---|---|
| *unitHeader* | The unit-originator header (See §8.3), where the *originatorType* element is equal to OIEOT_AudioInputEventOriginator. |
| *audioInputName* | The name of the audio input as configured in the PRAESENSA system configuration. |

## 8.8 OIEOT_UserEventOriginator

***Purpose:***

This originator represents user action performed on the system.

***Parameter structure:***

```
struct {
   UnitOriginator     unitHeader;
   STRING             userId;
} UserEventOriginator;
```

***Where:***

| | |
|---|---|
| *unitHeader* | The unit-originator header (See §8.3), where the *originatorType* element is equal to OIEOT_UserEventOriginator. |
| *userId* | The user ID which is logged in. |

## 8.9 OIEOT_NetworkEventOriginator

***Purpose:***

This originator represents network action performed on the system

***Parameter structure:***

```
struct {
   UnitOriginator     unitHeader;
   DWORD              ipAddress;
   DWORD              portNumber;
   STRING             userName;
} NetworkEventOriginator;
```

***Where:***

| | |
|---|---|
| *unitHeader* | The unit-originator header (See §8.3), where the *originatorType* element is equal to OIEOT_NetworkEventOriginator. |
| *ipAddress* | The IP address of the network connection. Note that this IP address is transmitted as DWORD (LSB ordering) and not as an IP-address. The ordering of the bytes is different. Only IPv4 is supported in the PRAESENSA system. |
| *portNumber* | The TCP-port number of the connection |
| *userName* | The user name of the originator network connection |

## 8.10 OIEOT_StackedUnitEventOriginator

***Purpose:***

This originator represents a sub-unit of a composite unit connected to the PRAESENSA system.

***Parameter structure:***

```
struct {
   ORIGINATORHEADER    header;
   STRING              unitName;
   BYTE                stackId;
} StackedUnitOriginator;
```

***Where:***

| | |
|---|---|
| *header* | The originator header, where the *originatorType* element is equal to OIEOT_UnitEventOriginator. |
| *unitName* | The name of the originator unit as configured in the PRAESENSA system configuration. |
| *stackId* | Id of the sub-unit. Used for stacked Cisco switches where the stackId can have the value 1 to 4. |

# 9. OIP CONSTANT VALUES

In this document some constants are used. In this chapter all constants will be connected to their values and to their reference type. Note that these constants are only used within the Open Interface protocol and not in the diagnostic events and event originators.

## 9.1 Protocol Constants

Related to the protocol, there are several constants. This section summary describes the constants to be used to handle the protocol.

| Constant Meaning | Value |
|---|---|
| Port Number for the unsecure connection | 9401 |
| Port Number for the secure connection | 9403 |
| Transmit timeout for transmission heartbeat message | 5 seconds |
| Check timeout to verify whether a message is received (reset after each message reception) | 15 seconds |
| Maximum command response time | 10 seconds |
| Minimum message size (message-type + length) | 8 bytes |
| Maximum message size | 128 Kbytes |
| Maximum string size | 64 Kbytes |

## 9.2 General Constants

### 9.2.1 TOIEventId

The event Identification represents a diagnostic event as generated by the PRAESENSA system. The type is mapped upon a UINT basic type as described in §3.4.3.1. In case the command results in an error, a special value is returned, described in the table below.

| Constant name | Value |
|---|---|
| OI_UNDEFINED_EVENTID | 0xFFFFFFFF |

### 9.2.2 TOICallId

The call Identification represents a running call in the PRAESENSA system and is generated by the PRAESENSA system. The type is mapped upon a UINT basic type as described in §3.4.3.1. In case the command result in an error, a special value is returned, described in the table below.

| Constant name | Value |
|---|---|
| OI_UNDEFINED_CALLID | 0xFFFFFFFF |

### 9.2.3 TOIAlarmType

The system wide alarms as used within the PRAESENSA system are represented by the alarm-type. The type is mapped upon a UINT basic type as described in §3.4.3.1. The valid values used within this type are described in the table below.

| Constant name | Value |
|---|---|
| OIAT_EVAC | 0x00000000 |
| OIAT_FAULT | 0x00000001 |

#### 9.2.4 TOIAlarmState

The alarm states as used within the PRAESENSA system are represented by the Alarm-state type. The type is mapped upon a UINT basic type as described in §3.4.3.1. The valid values used within this type are described in the table below.

| Constant name | Value |
|---|---|
| OIAS_ACTIVE | 0x00000000 |
| OIAS_ACKNOWLEDGED | 0x00000001 |
| OIAS_INACTIVE | 0x00000002 |

#### 9.2.5 TOIResourceState

The resource states as used within the PRAESENSA system are represented by the resource-state type. The type is mapped upon a UINT basic type as described in §3.4.3.1. The valid values used within this type are described in the table below.

| Constant name | value |
|---|---|
| OIRS_FREE | 0x00000000 |
| OIRS_INUSE | 0x00000001 |

#### 9.2.6 TOIResourceFaultState

The resource fault states as used within the PRAESENSA system are represented by the resource fault state type. The type is mapped upon a UINT basic type as described in §3.4.3.1. The valid values used within this type are described in the table below.

| Constant name | value |
|---|---|
| OIRS_OK<br>Indicates that no fault is present for the resource that affects the audio distribution of that resource. | 0x00000000 |
| OIRS_FAULT<br>Indicates that a fault is present for the resource that affects the audio distribution of that resource. | 0x00000001 |

#### 9.2.7 TOICallState

The call states as used within the PRAESENSA system are represented by the Call-state type. The type is mapped upon a UINT basic type as described in §3.4.3.1. The valid values used within this type are described in the table below.

| Constant name | value |
|---|---|
| OICS_START<br>The call is in preparation. | 0x00000000 |

| Constant name | value |
|---|---|
| OICS_STARTCHIME<br>The call is processing the start-chime. | 0x00000001 |
| OICS_MESSAGES<br>The call is processing the prerecorded messages (including repeats). | 0x00000002 |
| OICS_LIVESPEECH<br>The call is in the live speech state. The audio input passed during the start of the call is active. | 0x00000003 |
| OICS_ENDCHIME<br>The call is processing the end-chime. | 0x00000004 |
| OICS_END<br>Final state of the call. The associated call identification is not valid any more. | 0x00000005 |
| OICS_ABORT<br>Final state of the call. The associated call identification is not valid any more. | 0x00000006 |
| OICS_IDLE<br>The call is identified, but the processing needs to be started (no resources are associated with the call yet). | 0x00000007 |
| OICS_REPLAY<br>Indicates that the mentioned call is waiting for available resources or/and replaying a previously recorded call. | 0x00000008 |

#### 9.2.8 TOICallStopReason

The reason for an aborted call to stop as used within the PRAESENSA system is represented by the stopReason type. The type is mapped upon a UINT basic type as described in §3.4.3.1. The valid values used within this type are described in the table below.

| Constant name | value |
|---|---|
| OICSR_ORIGINATOR<br>The call was stopped by the originator. | 0x00000000 |
| OICSR_RESOURCE_LOST<br>The call was stopped due to lost or overruled resources. | 0x00000001 |
| OICSR_SYSTEM<br>The call was stopped by the system. | 0x00000002 |
| OICSR_STOPCOMMAND<br>The call was stopped by a stop command. | 0x00000003 |

| Constant name | value |
|---|---|
| OICSR_UNKNOWN<br>The call was stopped by an undefined reason. | 0x00000004 |

#### 9.2.9 TOICallResetReason

The reason for a call to reset as used within the PRAESENSA system is represented by the resetReason type. The type is mapped upon a UINT basic type as described in §3.4.3.1. The valid values used within this type are described in the table below.

| Constant name | value |
|---|---|
| OICRR_RESOURCE_LOST<br>The call was reset due to lost or overruled resources. | 0x00000000 |
| OICRR_SYSTEM<br>The call was reset by the system. | 0x00000001 |
| OICRR_UNKNOWN<br>The call was reset by an undefined reason. | 0x00000002 |

#### 9.2.10 TOIActionType

The action type describes the action performed on the specified diagnostic event. The type is mapped upon a UINT basic type as described in §3.4.3.1. The valid values used within this type are described in the table below.

| Constant name | Value |
|---|---|
| OIACT_NEW<br>The specified diagnostic event is added to the event storage in the PRAESENSA system. | 0x00000000 |
| OIACT_ACKNOWLEDGED<br>The specified diagnostic (fault) event is acknowledged. | 0x00000001 |
| OIACT_RESOLVED<br>The specified diagnostic (fault) event is resolved. | 0x00000002 |
| OIACT_RESET<br>The specified diagnostic (fault) event is reset. | 0x00000003 |
| OIACT_UPDATED<br>The specified diagnostic (fault) event is updated. This means that additional information is added to the diagnostic event (e.g. The number of WLS2-Boards with failures is extending). | 0x00000004 |
| OIACT_REMOVED<br>The specified diagnostic event is removed from the event storage in the PRAESENSA system. | 0x00000005 |
| OIACT_EXISTING<br>The specified diagnostic event is already present in the storage. This action type is passed for each | 0x00000006 |

| Constant name | Value |
|---|---|
| diagnostic event already in the storage after subscription for the events (See §4.35). | |
| OIACT_EXISTING_LAST<br>The specified diagnostic event is already present in the storage and it is the last present event sent, or there are actually no fault events present in the storage, in which case the specified diagnostic event is of type DET_NoFaults. | 0x00000007 |

#### 9.2.11 TOICallOutputHandling

Describes how calls behave on routing availability. The type is mapped upon a UINT basic type as described in §3.4.3.1.

| Constant name | Value |
|---|---|
| OICOH_PARTIAL<br>Partial calls are calls that proceed even in case not all required zones are available. | 0x00000000 |
| OICOH_NON_PARTIAL<br>Non-partial calls are calls that require the entire routing to be available at the start of the call and during the call. When during the call a part of the routing becomes unavailable, the call is aborted. | 0x00000001 |
| OICOH_STACKED<br>Stacked calls are calls that extend partial calls with replays to previously unavailable zones. | 0x00000002 |

#### 9.2.12 TOICallStackingMode

Describes when recorded calls replay. A stacked call or a stacked call waits for each zone to become available for replay. The type is mapped upon a UINT basic type as described in §3.4.3.1

| Constant name | Value |
|---|---|
| OICSM_WAIT_FOR_ALL<br>Wait with replay for all zones to become available | 0x00000000 |
| OICSM_WAIT_FOR_EACH<br>Start a replay for each zone to become available | 0x00000001 |

#### 9.2.13 TOICallTiming

Indicates the way the call must be handled. The type is mapped upon a UINT basic type as described in §3.4.3.1

| Constant name | Value |
|---|---|
| OICTM_IMMEDIATE<br>Broadcast to the selected zones and zone groups when the call is started. | 0x00000000 |
| OICTM_TIME_SHIFTED<br>Broadcast to the selected zones and zone groups when the original call is finished to prevent audio feedback during live speech. | 0x00000001 |
| OICTM_MONITORED<br>Broadcast when the call is not cancelled within 2 seconds after the monitoring phase has finished. | 0x00000002 |

#### 9.2.14 TOICallStackingTimeout

Defines the limit of time for stacked call broadcasting. The type is mapped upon a UINT basic type as described in §3.4.3.1

| Constant name | Value |
|---|---|
| OICST_INFINITE<br>Wait infinitely for zones to become available for broadcasting. | 0xFFFFFFFF |

#### 9.2.15 TOIVirtualControlInputDeactivation

Defines the behavior of the running action when deactivating a virtual control input. The type is mapped upon a UINT basic type as described in §3.4.3.1

| Constant name | Value |
|---|---|
| OIVCI_STOP<br>Stop the running action gracefully. | 0x00000000 |
| OIVCI_ABORT<br>Abort the running action immediately. | 0x00000001 |

#### 9.2.16 TOIVirtualControlInputState

Defines the values returned when the state of virtual control inputs change. The type is mapped upon a UINT basic type as described in §3.4.3.1

| Constant name | Value |
|---|---|
| OIVCIS_INACTIVE<br>Indicates that the virtual control input is in the inactive state (associated action not running). | 0x00000000 |
| OIVCIS_ACTIVE<br>Indicates that the virtual control input is in the active state (associated action running). | 0x00000001 |

## 9.3 Diagnostic Constant values

### 9.3.1 TDiagEventState

The diagnostic event states as used within the PRAESENSA system are represented by the Diagnostic-Event-state type. The type is mapped upon a UINT basic type as described in §3.4.3.1. The valid values used within this type are described in the table below.

| Constant name | value |
|---|---|
| DES_NEW | 0x00000000 |
| DES_ACKNOWLEDGED | 0x00000001 |
| DES_RESOLVED | 0x00000002 |
| DES_RESET | 0x00000003 |

### 9.3.2 TDiagEventGroup

The diagnostic event groups as used within the PRAESENSA system are represented by the Diagnostic-event-group type. The type is mapped upon a UINT basic type as described in §3.4.3.1. The valid values used within this type are described in the table below.

| Constant name | value |
|---|---|
| DEG_CallEventGroup | 0x00000000 |
| DEG_GeneralEventGroup | 0x00000001 |
| DEG_FaultEventGroup | 0x00000002 |

### 9.3.3 TDiagEventType

The diagnostic event types as used within the PRAESENSA system are represented by the diagnostic-event type. The type is mapped upon a UINT basic type as described in §3.4.3.1. The valid values used within this type are described in the table below. In the event that a value of TDiagEventType is received that is not in this table, a new version of PRAESENSA is probably installed on the system controller.

| Constant name | Value |
|---|---|
| DET_CallChangeResourceV2 | 0x00467105 |
| DET_CallEndV2 | 0x00467106 |
| DET_CallStartV2 | 0x00467107 |
| DET_CallTimeoutV2 | 0x00467108 |
| DET_CallRestart | 0x00467109 |
| DET_CallReset | 0x0046710B |
| DET_EvacAcknowledge | 0x00467204 |
| DET_EvacReset | 0x00467205 |
| DET_EvacSet | 0x00467206 |

| Constant name | Value |
|---|---|
| DET_SCStartup | 0x00467209 |
| DET_OpenInterfaceConnect | 0x0046720A |
| DET_OpenInterfaceDisconnect | 0x0046720B |
| DET_UnitConnect | 0x0046720E |
| DET_CallLoggingSuspended | 0x0046720F |
| DET_CallLoggingResumed | 0x00467210 |
| DET_UserLogIn | 0x00467213 |
| DET_UserLogOut | 0x00467214 |
| DET_UserLogInFailed | 0x00467215 |
| DET_OpenInterfaceConnectFailed | 0x00467216 |
| DET_BackupPowerModeStart | 0x00467217 |
| DET_BackupPowerModeEnd | 0x00467218 |
| DET_ConfigurationRestored | 0x00467219 |
| DET_AudioPathSupervision | 0x00467308 |
| DET_CallStationExtension | 0x0046730A |
| DET_ConfigurationFile | 0x0046730D |
| DET_ConfigurationVersion | 0x0046730E |
| DET_IllegalConfiguration | 0x00467312 |
| DET_MicrophoneSupervision | 0x00467315 |
| DET_PrerecordedMessagesNames | 0x00467319 |
| DET_SystemInputContact | 0x0046731B |
| DET_UnitMissing | 0x0046731C |
| DET_UserInjectedFault | 0x00467320 |
| DET_NoFaults | 0x00467334 |
| DET_ZoneLineFault | 0x00467335 |
| DET_PrerecordedMessagesCorrupt | 0x00467337 |
| DET_NetworkChangeDiagEvent | 0x00467339 |
| DET_DemoteToBackup | 0x0046733A |
| DET_InControl | 0x0046733B |
| DET_Amp48VAFault | 0x00467400 |
| DET_Amp48VBFault | 0x00467401 |

| Constant name | Value |
|---|---|
| DET_AmpChannelFault | 0x00467402 |
| DET_AmpShortCircuitLineAFault | 0x00467405 |
| DET_AmpShortCircuitLineBFault | 0x00467406 |
| DET_EolFailureLineAFault | 0x00467407 |
| DET_EolFailureLineBFault | 0x00467408 |
| DET_Fan1Fault | 0x00467409 |
| DET_Fan2Fault | 0x0046740a |
| DET_GroundShortFault | 0x0046740b |
| DET_OverheatFault | 0x0046740c |
| DET_UnitResetFault | 0x0046740d |
| DET_IncompatibleFirmware | 0x0046740e |
| DET_PoESupplyFault | 0x0046740f |
| DET_PowerSupplyAFault | 0x00467410 |
| DET_PowerSupplyBFault | 0x00467411 |
| DET_ExternalPowerFault | 0x00467412 |
| DET_DcAux1Fault | 0x00467413 |
| DET_DcAux2Fault | 0x00467414 |
| DET_BatteryShortFault | 0x00467415 |
| DET_BatteryRiFault | 0x00467416 |
| DET_BatteryOverheatFault | 0x00467417 |
| DET_BatteryFloatChargeFault | 0x00467418 |
| DET_MainsAbsentChargerFault | 0x00467419 |
| DET_MainsAbsentPSU1Fault | 0x0046741a |
| DET_BackupAbsentPSU1Fault | 0x0046741b |
| DET_DcOut1PSU1Fault | 0x0046741c |
| DET_DcOut2PSU1Fault | 0x0046741d |
| DET_AudioLifelinePSU1Fault | 0x0046741e |
| DET_AccSupplyPSU1Fault | 0x0046741f |
| DET_MainsAbsentPSU2Fault | 0x00467420 |
| DET_BackupAbsentPSU2Fault | 0x00467421 |
| DET_DcOut1PSU2Fault | 0x00467422 |

| Constant name | Value |
|---|---|
| DET_DcOut2PSU2Fault | 0x00467423 |
| DET_AudioLifelinePSU2Fault | 0x00467424 |
| DET_AccSupplyPSU2Fault | 0x00467425 |
| DET_MainsAbsentPSU3Fault | 0x00467426 |
| DET_BackupAbsentPSU3Fault | 0x00467427 |
| DET_DcOut1PSU3Fault | 0x00467428 |
| DET_DcOut2PSU3Fault | 0x00467429 |
| DET_AudioLifelinePSU3Fault | 0x0046742a |
| DET_AccSupplyPSU3Fault | 0x0046742b |
| DET_AmpAcc18VFault | 0x0046742c |
| DET_AmpSpareInternalFault | 0x0046742d |
| DET_AmpChannelOverloadFault | 0x0046742e |
| DET_PowerMainsSupplyFault | 0x0046742f |
| DET_PowerBackupSupplyFault | 0x00467430 |
| DET_ChargerSupplyVoltageTooLowFault | 0x00467431 |
| DET_BatteryOvervoltageFault | 0x00467432 |
| DET_BatteryUndervoltageFault | 0x00467433 |
| DET_MediaClockFault | 0x00467434 |
| DET_ChargerFault | 0x00467435 |
| DET_Amp20VFault | 0x00467436 |
| DET_AmpPsuFault | 0x00467437 |
| DET_NetworkLatencyFault | 0x00467438 |
| DET_SynchronizationFault | 0x00467439 |
| DET_AudioDelayFault | 0x0046743a |
| DET_InternalPowerFault | 0x0046743b |
| DET_InternalCommunicationFault | 0x0046743c |
| DET_VoIPFault | 0x0046743d |
| DET_RemoteOutputFault | 0x0046743e |
| DET_RemoteOutputLoopFault | 0x0046743f |
| DET_RemoteOutputConfigurationFault | 0x00467440 |
| DET_LicenseFault | 0x00467441 |

| Constant name | Value |
|---|---|
| DET_RemoteSystemFault | 0x00467442 |
| DET_RemoteMainPowerFault | 0x00467443 |
| DET_RemoteBackupPowerFault | 0x00467444 |
| DET_RemoteGroundFault | 0x00467445 |
| DET_RemoteFault | 0x00467446 |
| DET_PowerSupplyFault | 0x00467447 |
| DET_StackedSwitchMismatchFault | 0x00467448 |
| DET_RedundantDataPathFault | 0x00467449 |

## 9.4 Message Types

The message types (command, response and notification messages) as used within the PRAESENSA system are represented by the Message type. The type is mapped upon a UINT basic type as described in §3.4.3.1. The valid values used within this type are described in the table below.

| Constant name | Value |
|---|---|
| MESSAGETYPE_OIP_Login | 0x00447002 |
| MESSAGETYPE_OIP_StopCall | 0x00447004 |
| MESSAGETYPE_OIP_AbortCall | 0x00447005 |
| MESSAGETYPE_OIP_AddToCall | 0x00447006 |
| MESSAGETYPE_OIP_RemoveFromCall | 0x00447007 |
| MESSAGETYPE_OIP_AckAllFaults | 0x00447008 |
| MESSAGETYPE_OIP_ResetAllFaults | 0x00447009 |
| MESSAGETYPE_OIP_AckEvacAlarm | 0x0044700a |
| MESSAGETYPE_OIP_SetSubscriptionAlarm | 0x0044700d |
| MESSAGETYPE_OIP_SetSubscriptionResources | 0x0044700e |
| MESSAGETYPE_OIP_GetNcoVersion | 0x0044700f |
| MESSAGETYPE_OIP_IncrementBgmVolume | 0x00447010 |
| MESSAGETYPE_OIP_DecrementBgmVolume | 0x00447011 |
| MESSAGETYPE_OIP_SetBgmVolume | 0x00447012 |
| MESSAGETYPE_OIP_AddBgmRouting | 0x00447013 |
| MESSAGETYPE_OIP_RemoveBgmRouting | 0x00447014 |
| MESSAGETYPE_OIP_SetBgmRouting | 0x00447015 |
| MESSAGETYPE_OIP_SetSubscriptionBgmRouting | 0x00447016 |

| Constant name | Value |
|---|---|
| MESSAGETYPE_OIP_ReportFault | 0x00447017 |
| MESSAGETYPE_OIP_ResolveFault | 0x00447018 |
| MESSAGETYPE_OIP_AckFault | 0x00447019 |
| MESSAGETYPE_OIP_ResetFault | 0x0044701a |
| MESSAGETYPE_OIP_SetSubscriptionEvents | 0x0044701b |
| MESSAGETYPE_OIP_Response | 0x0044701c |
| MESSAGETYPE_OIP_ResponseCallId | 0x0044701d |
| MESSAGETYPE_OIP_ResponseGetNcoVersion | 0x0044701e |
| MESSAGETYPE_OIP_ResponseReportFault | 0x0044701f |
| MESSAGETYPE_OIP_ResponseProtocolError | 0x00447020 |
| MESSAGETYPE_OIP_NotifyAlarm | 0x00447022 |
| MESSAGETYPE_OIP_NotifyCall | 0x00447023 |
| MESSAGETYPE_OIP_NotifyResources | 0x00447024 |
| MESSAGETYPE_OIP_NotifyBgmRouting | 0x00447025 |
| MESSAGETYPE_OIP_NotifyDiagEvent | 0x00447026 |
| MESSAGETYPE_OIP_KeepAlive | 0x00447027 |
| MESSAGETYPE_OIP_StartCreatedCall | 0x00447029 |
| MESSAGETYPE_OIP_GetZoneNames | 0x0044702a |
| MESSAGETYPE_OIP_GetZoneGroupNames | 0x0044702b |
| MESSAGETYPE_OIP_GetMessageNames | 0x0044702c |
| MESSAGETYPE_OIP_GetChimeNames | 0x0044702d |
| MESSAGETYPE_OIP_GetAudioInputNames | 0x0044702e |
| MESSAGETYPE_OIP_GetBgmChannelNames | 0x0044702f |
| MESSAGETYPE_OIP_GetConfigId | 0x00447030 |
| MESSAGETYPE_OIP_SetSubscriptionBgmVolume | 0x00447031 |
| MESSAGETYPE_OIP_ResponseConfigId | 0x00447032 |
| MESSAGETYPE_OIP_ResponseNames | 0x00447033 |
| MESSAGETYPE_OIP_NotifyBgmVolume | 0x00447034 |
| MESSAGETYPE_OIP_IncrementBgmChannelVolume | 0x00447035 |
| MESSAGETYPE_OIP_DecrementBgmChannelVolume | 0x00447036 |
| MESSAGETYPE_OIP_CancelAll | 0x00447038 |

| Constant name | Value |
|---|---|
| MESSAGETYPE_OIP_CancelLast | 0x00447039 |
| MESSAGETYPE_OIP_ToggleBgmRouting | 0x0044703A |
| MESSAGETYPE_OIP_ResetEvacAlarmEx | 0x0044703B |
| MESSAGETYPE_OIP_SetSubscriptionResourceFaultState | 0x0044703C |
| MESSAGETYPE_OIP_NotifyResourceFaultState | 0x0044703D |
| MESSAGETYPE_OIP_CreateCallEx2 | 0x0044703E |
| MESSAGETYPE_OIP_ActivateVirtualControlInput | 0x0044703F |
| MESSAGETYPE_OIP_DeactivateVirtualControlInput | 0x00447040 |
| MESSAGETYPE_OIP_SetSubscriptionUnitCount | 0x00447041 |
| MESSAGETYPE_OIP_SetSubscriptionVirtualControlInputs | 0x00447042 |
| MESSAGETYPE_OIP_GetVirtualControlInputNames | 0x00447043 |
| MESSAGETYPE_OIP_NotifyUnitCount | 0x00447044 |
| MESSAGETYPE_OIP_NotifyVirtualControlInputState | 0x00447045 |
| MESSAGETYPE_OIP_GetConfiguredUnits | 0x00447046 |
| MESSAGETYPE_OIP_GetConnectedUnits | 0x00447047 |
| MESSAGETYPE_OIP_ResponseUnits | 0x00447048 |
| MESSAGETYPE_OIP_CreateCallEx3 | 0x00447049 |
| MESSAGETYPE_OIP_GetProtocolVersion | 0x0044704A |
| MESSAGETYPE_OIP_ResponseGetProtocolVersion | 0x0044704B |

## 9.5 Event originator Message Types

The originator message types as used within the PRAESENSA system are represented by the originator-message type. The type is mapped upon a UINT basic type as described in §3.4.3.1. The valid values used within this type are described in the table below.

| Constant name | value |
|---|---|
| OIEOT_NoEventOriginator | 0x00477002 |
| OIEOT_UnitEventOriginator | 0x00477003 |
| OIEOT_OpenInterfaceEventOriginator | 0x00477004 |
| OIEOT_ControlInputEventOriginator | 0x00477005 |
| OIEOT_AudioOutputEventOriginator | 0x00477006 |
| OIEOT_AudioInputEventOriginator | 0x00477007 |
| OIEOT_UserEventOriginator | 0x00477009 |

| Constant name | value |
|---|---|
| OIEOT_NetworkEventOriginator | 0x0047700A |
| OIEOT_StackedUnitEventOriginator | 0x0047700B |

# 10. ERROR CODES

Responses returned upon a remote function request contain an error field. In this chapter an overview is given of the possible errors and their hexadecimal values.

| Remote Function Services Error code | Value |
|---|---|
| **ERROR_OK**<br>The command message is executed successfully. | 0X00000000 |
| **ERROR_INVALID_PARAMETERS**<br>If one of the parameters is wrong, this error code is returned. | 0X0044E000 |
| **ERROR_INTERNAL**<br>The PRAESENSA system cannot fulfill the command due to an internal error. | 0X0044E001 |
| **ERROR_INVALID_MESSAGE_LENGTH**<br>The overall message length of the data is too small (below 8 bytes) or too large (above 128 Kbytes). | 0X0044E002 |
| **ERROR_UNEXPECTED_COMMAND_TYPE**<br>The message cannot be used, since the message-type is not a known command by the PRAESENSA system. | 0X0044E003 |
| **ERROR_TOO_MUCH_UNMARSHAL_DATA**<br>Parsing of the message was done, but conform the length information, there is still data left in the message. The message length does not match the content. The message is not accepted. | 0X0044E004 |
| **ERROR_MUST_LOGIN_FIRST**<br>Command received before the user is logged in. | 0X0044E005 |
| **ERROR_INVALID_MESSAGETYPE**<br>The message cannot be used, since the message-type is not known by the PRAESENSA system. | 0x0044E006 |
| **ERROR_STRING_TOO_LONG**<br>The length of a string is too long (above 64 Kbytes). Related to a string in a message, but message length within boundaries. | 0X0044E007 |
| **ERROR_UNEXPECTED_END**<br>Parsing of the message goes beyond the end of the message. Sum of the element lengths greater than the message length. | 0X0044E008 |
| **ERROR_CALL_NO_LONGER_EXISTS**<br>The given callId belongs to a call that, even though it was created (but not yet started via the Open Interface), no longer exists. Successive use of this callId will result in ERROR_INVALID_PARAMETERS. | 0X0044E009 |

# PART 2 – OPEN INTERFACE LIBRARY

This part 2 of the Open Interface programming instructions describes the Open Interface Library of the PRAESENSA system.

# 11. INTRODUCTION

## 11.1 Purpose

The purpose of this document is to describe the usage of the PRAESENSA Open Interface protocol version V10.0 based on a C# and .NET Framework implementation.

## 11.2 Scope

This user manual describes the use of the open interface in combination with C# and .NET Framework. To understand this document, knowledge is expected on the following issues:

- The C# programming language and its development environment.
- The PRAESENSA system and its installation.

This document is intended for users, who want to use the PRAESENSA Open Interface into their application.

The user of this document cannot derive any rights from this document regarding the programming interface. Extensions and improvements on the Open Interface can be implemented when new versions of PRAESENSA are introduced.

## 11.3 Definitions, Acronyms and Abbreviations

| | |
|---|---|
| DNS | Domain Name System |
| OI | Open Interface |
| PA | Public address |

## 11.4 References

This reference must be used for this document: **UM_OPENINF**

| | |
|---|---|
| UG_PRAESENSA | User guide PRAESENSA system |
| UG_OPENINF_PRAESENSA | Native communication interface of the PRAESENSA system |

## 11.5 Summary

Chapter 12 describes the principles of controlling the PRAESENSA application using the Open Interface.

Chapter 13 describes the constants, methods and events present on the Open Interface.

Chapter 14 provides a Visual Basic example where most of the functions described are used.

# 12. APPLICATION CONTROL OVERVIEW

## 12.1 Principle

The PRAESENSA system is a public address system to perform calls to various areas in a building. Each area, called a zone, is reached by means of one or more amplifiers and is given a name. Multiple areas (zones) can be groups into a zone-group.

Special calls are identified within the PRAESENSA system as emergency calls. These calls can be triggered by e.g. a fire alarm system. These emergency alarm calls contain mostly repeated pre-recorded messages and put the system into a special (emergency) state. The system remains in this state until an operator acknowledges and resets the emergency state. Beside the normal calls, the PRAESENSA system monitors itself and reports any faults found in the system.

To perform a PA call, the following main information needs to be passed to the PRAESENSA system:

- The routing, a collection of zone names and/or zone Group names.
- The priority of the call.
- [Optional] A starting chime name to trigger the listeners that a call is starting.
- [Optional] A set of pre-recorded messages to be played.
- [Optional] A live speech section, where the operator can do his/her spoken message. The microphone is identified by means of the name of an audio input.
- [Optional] An ending chime to notify the termination of the call.

Note that most of the inputs are optional, but at least one of the optional elements must be defined to trigger a valid call.

Upon subscription for diagnostic events, the system first sent all available events as present in the PRAESENSA system, followed by the new and updated events.

### 12.1.1 Limitations

Some of the type definitions described in section 13.2 are currently not supported and should not be used.

- Only partial calls are supported. Setting the output handling to anything other than OICOH_PARTIAL when creating a call will result in a parameter error.
- Only immediate calls are supported. Setting the call timing to anything other than OICTM_IMMEDIATE when creating a call will result in a parameter error.
- Call stacking is not (yet) supported.

## 12.2 Referencing the library

Before the library can be used within your C# application, you need to add a reference to the library. This can be done in the Visual Studio development environment, using the Project→Add References… menu entry.

In the Add Reference dialog, select Assemblies, Extensions and then select OpenInterfaceNetLibrary (if present). When not present, select the browse button and select the file OpenInterfaceNetLibrary.dll in the installed location.

**NOTE:** The OpenInterfaceNetLibrary DLL targets .NET Framework 4.5.

## 12.3 Library usage in C#

After the reference addition, C# knows the methods and events of the PRAESENSA open interface. The application can call the method on the library and the PRAESENSA system will send events to the application.

Before the library can be used the following directive should be added.

```
using Bosch.PRAESENSA.OpenInterface;
```

To use the library, a client object needs to be constructed.

```
OpenInterfaceNetClient client = new OpenInterfaceNetClient();
```

## 12.4 Catching errors

Problems detected during a call to the PRAESENSA system will be reported by means of TOIErrorCode return codes. If no errors are reported, the functions return TOIErrorCode.OIERROR_OK.

The following code sample shows the use of a TOIErrorCode code to catch failures.

```
string ip = “192.168.53.100”;
string username = “user”;
string password = “password”;

TOIErrorCode ec = client.Connect(ip, username, password);
if (ec == TOIErrorCode.OIERROR_OK)
{
   // Continue as usual
}
else
{
   // Handle and/or report error
}
```

Explanation about error codes can be found in section 13.2.2.

# 13. INTERFACE DEFINITION

## 13.1 Introduction

This chapter describes the various remote methods available on the PRAESENSA open interface.

### 13.1.1 Method and Event explanation

The descriptions of the methods and the events contain a brief function explanation and the declaration of the method/event. Further the following items can be present, depending on the content of the method/event:

- **Parameters:**
  A description of the parameters to be passed to the interface method.
- **Return value:**
  A description of the return value returned by the interface method.
- **Related event types:**
  A list of types, whereby the described function is operational. When called for other type the Open Interface shall generate an exception.
- **Error codes:**
  A list of error codes, which can be thrown during the execution of the interface method. See §13.2.2 for a description of the error codes.

## 13.2 Enumeration type definitions

Within the library various enumeration types and constants are defined to prevent the use of magic (non-explaining) numbers.

### 13.2.1 OpenInterfaceConstants

UNDEFINED_CALLID = UINT_MAX:
: Standard indication for a call identifier to which no call is associated.

### 13.2.2 TIOErrorCode

The TIOErrorCode type represents the error values, which can be returned by the Open Interface functions. The error values have the following meaning:

OIERROR_OK:
: The Open Interface function has successfully executed.

OIERROR_ALREADY_LOGGED_IN:
: The Open Interface is already logged in to a PRAESENSA system. Disconnect from the PRAESENSA system and try again.

OIERROR_BAD_CREDENTIALS:
: The Open Interface could not complete the connection, because the username and/or the password is incorrect.

OIERROR_INTERNAL_ERROR:
: The PRAESENSA system detected an internal error during the processing of the command. Check the PRAESENSA System configuration. If persistent, contact PRAESENSA customer services.

OIERROR_INVALID_PARAMETERS:
: Indications that one or more parameters passed to the method do not match the configured names present in the connected PRAESENSA system or that a passed value is out of range. Strings are considered to be invalid when their length exceeds 15000 characters.

OIERROR_NO_CONNECTION:
The Open Interface connection to the PRAESENSA system is not established.

OIERROR_NOT_REGISTERED:
A command was received via the Open Interface before the user is logged in. Call the Connect method first and try again.

OIERROR_UNABLE_TO_MAKE_CONNECTION:
The Open Interface could not complete the connection, due to problems of the link to the PRAESENSA system.

OIERROR_FUNCTION_NOT_SUPPORTED_BY_SERVER:
The PRAESENSA system controller does not support the function called. In general this means that there is a protocol version mismatch. The added functions to the open interface between the two versions cannot be executed.

OIERROR_CALL_NO_LONGER_EXISTS:

The given callId belongs to a call that, even though it was created (but not yet started via the Open Interface), no longer exists. Successive use of this callId will result in OIERROR_INVALID_PARAMETERS.

OIERROR_NO_RESPONSE_RECEIVED:

No answer was received after 15000 ms. Check the connection and try again.

OIERROR_PROTOCOL_ERROR_UNEXPECTED_END:

Parsing of the response goes beyond the end of the message. Sum of the element lengths is greater than the message length. In general this means that there is a protocol version mismatch.

### 13.2.3 TOIAlarmType

The TOIAlarmType type defines the type of alarm

OIAT_EVAC:
Indicates that the alarm is of type evac.

OIAS_FAULT:
Indicates that the alarm is of type fault.

### 13.2.4 TOIAlarmState

The TOIAlarmState type defines the values returned when an alarm occurs.

OIAS_ACTIVE:
Indicates that the alarm state is active.

OIAS_ACKNOWLEDGED:
Indicates that an alarm situation is present and that the alarm state has been acknowledged

OIAS_INACTIVE:
Indicates that no alarm situation is present.

### 13.2.5 TOICallPriority

The TOICallPriority type gives the various sub-ranges for the call priority. The actual value of the call priority depends whether the call is a background music call, a normal call or an emergency call. For each sub-range the minimum and maximum value is given as constant. Calls with higher priority proceeds / overrules calls with lower priority.

OI_MIN_PRIORITY_BGM = 0:
Represents the minimum background music priority value.

OI_MAX_PRIORITY_BGM = 31:
Represents the maximum background music priority value.

OI_MIN_PRIORITY_CALL = 32:
Represents the minimum normal call priority value.

OI_MAX_PRIORITY_CALL = 223:
Represents the maximum normal call priority value.

OI_MIN_PRIORITY_ALARM = 224:
Represents the minimum emergency call priority value.

OI_MAX_PRIORITY_ALARM = 255:
Represents the maximum emergency call priority value.

### 13.2.6 TOICallState

The TOICallState type defines the values returned when the state of a running call changes. Together with the call states, a callId is passed, which identifies the associated call.

OICS_START:
Indicates that the mentioned call has started.

OICS_STARTCHIME:
Indicates that the mentioned call is busy with its starting chime.

OICS_MESSAGES:
Indicates that the mentioned call is busy playing the specified messages for the call.

OICS_LIVESPEECH:
Indicates that the mentioned call is in the live speech phase. The operator of the call can now speak.

OICS_ENDCHIME:
Indicates that the mentioned call is busy with its ending chime.

OICS_END:
Indicates that the mentioned call has ended. The callId is no longer valid after this notification.

OICS_ABORT:
Indicates that the mentioned call has been aborted by either the user or another call started with a higher priority. The callId is after this notification no longer valid.

OICS_IDLE:
Indicates that the mentioned call is known by the system, but not (yet) operational. Note that a call can become idle when the call loses all his resources (BGM call).

OICS_REPLAY:

Indicates that the mentioned call is waiting for available resources and/or replaying the recorded call

### 13.2.7 TOICallStopReason

The TOICallStopReason type defines possible stop and abort reasons for a stopped call. This type is returned as a property by the StopReason getter supplied in the DET_CallEndDiagEventV2 event type The getter Aborted indicates whether the call is

stopped or an aborted call. When a call ends naturally, the value will be OICSR_ORIGINATOR.

OICSR_ORIGINATOR:
Indicates that the call was ended by the originator.

OICSR_RESOURCE_LOST:

Indicates that resource(s) used by the ended call were lost or overruled.

OICSR_SYSTEM:

Indicates that the ended call was stopped by the system.

OICSR_STOPCOMMAND:

Indicates that the ended call was stopped by a stop command.

OICSR_UNKNOWN:

Indicates that the aborted call was stopped for an undefined reason.

### 13.2.8 TOICallResetReason

The TOICallResetReason type defines possible reasons for a reset call. This type is returned as a property by the ResetReason getter supplied in the DET_CallResetDiagEvent event type

OICRR_RESOURCE_LOST:

Indicates that resource(s) used by the reset call were lost or overruled.

OICRR_SYSTEM:

Indicates that the call was reset by the system.

OICRR_UNKNOWN:

Indicates that the call was reset for an undefined reason.

### 13.2.9 TOIResourceState

The TOIResourceState type defines the values returned when the state of resources (read zone groups, zones or control outputs) present in the PRAESENSA system changes.

OIRS_FREE:
Indicates that the resource is free to be used in a call.

OIRS_INUSE:
Indicates that the resource is in use by a running call.

### 13.2.10 TOIResourceFaultState

The TOIResourceFaultState type defines the values returned for the fault state when the state of resources (read zone groups or zones) present in the PRAESENSA system changes.

OIRS_OK
Indicates that no fault is present for the resource that affects the audio distribution of that resource.

OIRS_FAULT:
Indicates that a fault is present for the resource that affects the audio distribution of that resource.

### 13.2.11 TOIVirtualControlInputDeactivation

The TOIVirtualControlInputDeactivation type defines the behavior of the running action when deactivating a virtual control input.

OIVCI_STOP:
: Stop the running action gracefully.

OIVCI_ABORT:
: Abort the running action immediately.

### 13.2.12 TOIVirtualControlInputState

The TOIVirtualControlInputState type defines the values returned when the state of virtual control inputs change.

OIVCIS_ACTIVE:
: Indicates that the control input is in the active state (associated action running). During the time the action is aborting (gracefully) the control input remains in the active state until the action has completed.

OIVCIS_INACTIVE:
: Indicates that the control input is in the inactive state (associated action not running).

### 13.2.13 TOIDiagEventType

The TOIDiagEventType type defines the type of event passed through the open interface. It identifies the events and the associated members for that event.

Note that newer versions of PRAESENSA will most likely send newer (other) types. The application should check and report this so it can be adapted to the new situation.

#### 13.2.13.1 Call Diagnostic Event-Group Event-types

OIDET_CallStartV2:
: Indicates that the diagnostic event represents the start of a call in the PRAESENSA system.

OIDET_CallEndV2:
: Indicates that the diagnostic event represents the end (or abort) of a call in the PRAESENSA system.

OIDET_CallChangeResourceV2:
: Indicates that the diagnostic event represents a change in routing of a running call. The diagnostic event indicates whether zones are added to the routing or removed from the routing.

OIDET_CallTimeoutV2:
: This diagnostic event indicates that a stacked call has reached its time-out point and implies that the call has been unable to reach all required zones. The diagnostic event provides the unreached zones.

OIDET_CALLRESTART:

: Indicates that the diagnostic events represents the restart of a call in the PRAESENSA system.

OIDET_CALLRESET

: Indicates that the diagnostic events represents a reset of a call in the PRAESENSA system. A reset indicates that the call will be restarted.

#### 13.2.13.2 General Diagnostic Event-Group Event-types

OIDET_EvacAcknowledge:
Indicates that the diagnostic event represents that the system emergency state is acknowledged.

OIDET_EvacReset:
Indicates that the diagnostic event represents that the system emergency state is reset.

OIDET_EvacSet:
Indicates that the diagnostic event represents that the system emergency state is set (activated).

OIDET_UnitConnect:
Indicates that the diagnostic event represents that a unit has connected to or disconnected from the PRAESENSA system.

OIDET_SCStartup:
Indicates that the diagnostic event represents that the PRAESENSA system has started.

OIDET_OpenInterfaceConnect:
Indicates that the diagnostic event represents that a remote system has connected to the PRAESENSA system using the open interface.

OIDET_OpenInterfaceDisconnect:
Indicates that the diagnostic event represents that a remote system has disconnected from the PRAESENSA system using the open interface.

OIDET_OpenInterfaceConnectFailed:
Indicates that the diagnostic event represents that a remote system has attempted to connect to the PRAESENSA system using the open interface but failed.

OIDET_CallLoggingSuspended:
Indicates that call logging has been suspended because of a logging queue overflow.

OIDET_CallLoggingResumed:
Indicates that call logging has been resumed.

OIDET_UserLogIn:
Indicates that the diagnostic event represents that a user has logged in..

OIDET_UserLogOut:
Indicates that the diagnostic event represents that a user has logged out..

OIDET_UserLogInFailed:
Indicates that the diagnostic event represents that a login attempt has failed.

OIDET_BackupPowerModeStart:
Indicates that the backup power mode has started. This event is only generated when backup power mode (in the system settings) has been configured **not** to generate a fault event.

OIDET_BackupPowerModeEnd:
Indicates that the backup power mode has ended. This event is only generated when backup power mode (in the system settings) has been configured **not** to generate a fault event.

OIDET_ConfigurationRestored:
Indicates that the backup has been restored. It also indicates which parts of the configuration are restored (configuration, security settings, messages).

OIDET_DemoteToBackup:
Indicates that the current duty controller in a redundant system detected a critical fault and demoted itself to backup.

OIDET_InControl:
Indicates that a call station in a group is now in control.

#### 13.2.13.3 Fault Diagnostic Event-Group Event-types

Amplifier specific faults contain the Severity property (see chapter §13.5.4 for a description of the fault event classes). The severity can either be high or low. If the severity is high, the fault aggregates to a zone fault in the PRAESENSA system. This indicates that audio routing is not possible for (a part of) that zone.

OIDET_AudioPathSupervision:
Indicates that the diagnostic event represents detection of an audio-path failure.

OIDET_MicrophoneSupervision:
Indicates that the diagnostic event represents detection of microphone failure. Note that this diagnostic event only applies to a call station.

OIDET_SystemInputContact:
Indicates that the diagnostic event represents detection of a system input contact failure.

OIDET_CallStationExtension:
Indicates that the diagnostic event represents a mismatch between the number of configured call station extensions and the number of detected call station extensions.

OIDET_ConfigurationFile:
Indicates that the diagnostic event represents detection of a missing or corrupt configuration file.

OIDET_ConfigurationVersion:
Indicates that the diagnostic event represents a mismatch between the configuration file version and the required configuration file version. The configuration file requires conversion.

OIDET_IllegalConfiguration:
Indicates that the diagnostic event represents an inconsistency within the active configuration file: internal references between configuration items could not be verified.

OIDET_PrerecordedMessagesNames:
Indicates that the diagnostic event represents a mismatch between the configured (and used) prerecorded message-names and the detected prerecorded message-names.

OIDET_PrerecordedMessagesCorrupt:
Indicates that the diagnostic event represents one or more prerecorded messages in the PRAESENSA system is corrupt and cannot be used.

OIDET_UnitMissing:
Indicates that the diagnostic event represents a missing configured unit.

OIDET_UnitReset:
Indicates that the diagnostic event represents detection that a unit has restarted.

OIDET_UserInjectedFault:
Indicates that the diagnostic event represents a fault injected by a user or remote system.

OIDET_NoFaults:
Special event type that does not represent an actual fault, but is used to indicate that there are no existing fault events on the storage of the PRAESENSA system.

OIDET_ZoneLineFault:
Indicates that the diagnostic event represents that a Zone Line Fault that is injected by a remote system by triggering configured control input.

OIDET_NetworkChangeDiagEvent:
Indicates that the diagnostic event represents that there was a change in the network (broken links between devices).

OIDET_IncompatibleFirmware:
Indicates that the diagnostic event represents that a device contains incompatible firmware and cannot be used in the PRAESENSA system.

OIDET_Amp48VAFault:
This diagnostic event indicates the loss of 48V A supply for the amplifier. Severity is high if DET_Amp48VBFault is also reported.

OIDET_Amp48VBFault:
This diagnostic event indicates the loss 48V B supply. Severity is high if DET_Amp48VAFault is also reported.

OIDET_AmpChannelFault:
This diagnostic event indicates a channel fault internally in the amplifier. If not used already, the spare channel takes over the functionality of the channel. Severity is high if the spare channel is already in use.

OIDET_AmpShortCircuitLineAFault:
This diagnostic event indicates for the amplifier channel the hardware short detection is triggered or the output voltage is too low due to a short on line A.

OIDET_AmpShortCircuitLineBFault:
This diagnostic event indicates for the amplifier channel the hardware short detection is triggered or the output voltage is too low due to a short on line B.

OIDET_AmpAcc18VFault:
This diagnostic event indicates failure of the amplifier lifeline power supply. The severity is not used.

OIDET_AmpSpareInternalFault:
This diagnostic event indicates an internal failure in the amplifier spare channel and can no longer be used. Severity is always high.

OIDET_AmpChannelOverloadFault:
This diagnostic event indicates for the amplifier channel an output overload has occurred.

OIDET_AmpEolFailureLineAFault:
This diagnostic event indicates that the end-of-line device for the amplifier channel on line A is disconnected (the end-of-line pilot tone is not present).

OIDET_AmpEolFailureLineBFault:
This diagnostic event indicates that the end-of-line device for the amplifier channel on line B is disconnected (the end-of-line pilot tone is not present).

OIDET_GroundShortFault:
This diagnostic event indicates that a ground fault is signaled by the amplifier hardware.

OIDET_OverheatFault:
This diagnostic event indicates that amplifier hardware is overheated. All channels are disabled and severity is always high.

OIDET_PowerMainsSupply:
Indicates that the diagnostic event represents detection of loss of mains power for a Multifunction Power Supply.

OIDET_PowerBackupSupply:
Indicates that the diagnostic event represents detection of loss of the backup power supply for a Multifunction Power Supply.

OIDET_MainsAbsentPSU1Fault:
This diagnostic event indicates absence of the output 1 mains power. The number matches the screening at the back-panel of the Multifunction Power Supply .

OIDET_MainsAbsentPSU2Fault:
This diagnostic event indicates absence of the output 2 mains power. The number matches the screening at the back-panel of the Multifunction Power Supply .

OIDET_MainsAbsentPSU3Fault:
This diagnostic event indicates absence of the output 3 mains power. The number matches the screening at the back-panel of the Multifunction Power Supply .

OIDET_BackupAbsentPSU1Fault:
This diagnostic event indicates absence of the output 1 12V DC backup power. The number matches the screening at the back-panel of the multifunction power supply.

OIDET_BackupAbsentPSU2Fault:
This diagnostic event indicates absence of the output 2 12V DC backup power. The number matches the screening at the back-panel of the Multifunction power supply.

OIDET_BackupAbsentPSU3Fault:
This diagnostic event indicates absence of the output 3 12V DC backup power. The number matches the screening at the back-panel of the Multifunction Power Supply .

OIDET_DcOut1PSU1Fault:
This diagnostic event indicates a missing 48V DC output for connector 1A. The numbers match the screening at the back-panel of the Multifunction Power Supply .

OIDET_DcOut2PSU1Fault:
This diagnostic event indicates a missing 48V DC output for connector 1B. The numbers match the screening at the back-panel of the Multifunction Power Supply .

OIDET_DcOut1PSU2Fault:
This diagnostic event indicates a missing 48V DC output for connector 2A. The numbers match the screening at the back-panel of the Multifunction Power Supply .

OIDET_DcOut2PSU2Fault:
This diagnostic event indicates a missing 48V DC output for connector 2B. The numbers match the screening at the back-panel of the Multifunction Power Supply .

OIDET_DcOut1PSU3Fault:
This diagnostic event indicates a missing 48V DC output for connector 3A. The numbers match the screening at the back-panel of the Multifunction Power Supply .

OIDET_DcOut2PSU3Fault:
This diagnostic event indicates a missing 48V DC output for connector 3B. The numbers match the screening at the back-panel of the Multifunction Power Supply .

OIDET_AudioLifelinePSU1Fault:
This diagnostic event indicates a wiring problem in the ACC connector with the lifeline analog audio signal for output 1. The number matches the screening at the back-panel of the Multifunction Power Supply .

OIDET_AudioLifelinePSU2Fault:
This diagnostic event indicates a wiring problem in the ACC connector with the lifeline analog audio signal for output 2. The number matches the screening at the back-panel of the Multifunction Power Supply .

OIDET_AudioLifelinePSU3Fault:
This diagnostic event indicates a wiring problem in the ACC connector with the lifeline analog audio signal for output 3. The number matches the screening at the back-panel of the Multifunction Power Supply .

OIDET_AccSupplyPSU1Fault:
This diagnostic event indicates a missing 10 to 18V at the ACC connector for output 1. The number matches the screening at the back-panel of the Multifunction Power Supply .

OIDET_AccSupplyPSU2Fault:
This diagnostic event indicates a missing 10 to 18V at the ACC connector for output 2. The number matches the screening at the back-panel of the Multifunction Power Supply .

OIDET_AccSupplyPSU3Fault:
This diagnostic event indicates a missing 10 to 18V at the ACC connector for output 3. The number matches the screening at the back-panel of the Multifunction Power Supply .

OIDET_Fan1Fault:
This diagnostic event indicates that fan 1 in the Multifunction Power Supply is broken.

OIDET_Fan2Fault:
This diagnostic event indicates that fan 2 in the Multifunction Power Supply is broken.

OIDET_DcAux1Fault:
This diagnostic event indicates the absence of 24V DC aux 1 voltage of the

Multifunction Power Supply. The number matches the screening at the back-panel of the device.

OIDET_DcAux2Fault:
This diagnostic event indicates the absence of 24V DC aux 2 voltage of the Multifunction Power Supply. The number matches the screening at the back-panel of the device.

OIDET_BatteryShortFault:
This diagnostic event indicates a short in the external battery of the Multifunction Power Supply.

OIDET_BatteryRiFault:
This diagnostic event indicates a Ri fault for the connected battery of the Multifunction Power Supply. This fault depends on the configured battery capacity in the PRAESENSA system if a fault is reported.

OIDET_BatteryOverheatFault:
This diagnostic event indicates that the temperature of the connected battery of the Multifunction Power Supply is not in correct working range

OIDET_BatteryFloatChargeFault:
This diagnostic event indicates that the battery of the Multifunction Power Supply is most likely broken. The charger enters a float state when the State of Charge (SoC) is 100%. In this state a low charge current is expected just to compensate the self-discharge of the battery. When the charge current is very high the battery is probably broken and therefore the fault is reported. The charger is suspended for safety reasons.

OIDET_MainsAbsentChargerFault:
This diagnostic event indicates that the mains converter for the charger is defect which prevents charging the battery correctly.

OIDET_PoESupplyFault:
This diagnostic event indicates that a mismatch is detected the number of Power over Ethernet connections to the call station and the number of expected Power Over Ethernet inputs configured in the PRAESENSA system.

OIDET_PowerSupplyAFault:
This diagnostic event indicates that the power supply input A level on the system controller is not within range. The fault is only reported if the power supply input is configured to be supervised in the PRAESENSA system.

OIDET_PowerSupplyBFault:
This diagnostic event indicates that the power supply input B level on the system controller is not within range. The fault is only reported if the power supply input is configured to be supervised in the PRAESENSA system.

OIDET_ExternalPowerFault:
This diagnostic event indicates that the PRAESENSA system is now in backup power mode. This event is only generated when backup power mode (in the system settings) has been configured to generate a fault event.

OIDET_ChargerSupplyVoltageTooLowFault:
This diagnostic event indicates that the charger supply voltage is too low which prevents charging the battery correctly.

OIDET_BatteryOvervoltageFault:
This diagnostic event indicates that the internal charger is defect and is switched off for safety reasons.

OIDET_BatteryUndervoltageFault:

This diagnostic event indicates that there is an undervoltage situation when mains is absent. The battery is too empty to operate on.

OIDET_MediaClockFault:

This diagnostic event indicates there are one or more devices that failed to lock to PTP for a longer period of time.

OIDET_ChargerFault

This diagnostics event indicates an internal charger fault which prevents charging the battery correctly.OIDET_Amp20VFault

This diagnostic event indicates the failure of the power convertor for the controller section of the amplifier.

OIDET_AmpPsuFault

This diagnostic event indicates the failure of the power convertor for the audio section of the amplifier.

OIDET_NetworkLatencyFault

This diagnostic event indicates that an audio flow gets interrupted by network delay and network jitter.

OIDET_SynchronizationFault

This diagnostic event indicates that the configuration synchronization between a standby controller and the duty controller of a redundant system failed.

OIDET_AudioDelayFault

This diagnostic event indicates that DDR audio issues occurred on the amplifier.

OIDET_InternalPowerFault

This diagnostic event indicates that one of the voltages on the powerlines in the MPS are out of bound.

OIDET_InternalCommunicationFault

This diagnostic event indicates that one or several boards in the MPS are not responding.

OIDET_VoIPFault

This diagnostic event indicates that VoIP calls using SIP and the PABX are no longer

possible due to configuration- or connectivity issues.

OIDET_RemoteOutputFault

This diagnostic event indicates there is a remote audio output fault on the remote system device.

OIDET_RemoteOutputLoopFault

This diagnostic event indicates that a loop is detected for a remote audio output. A loop is defined as a remote audio output which is linked to a zone group on a system controller which contains remote audio outputs that are linked back to one or more zone groups located on the originating system controller.

OIDET_RemoteOutputConfigurationFault

This diagnostic event indicates that an invalid remote zone group name is configured for the remote audio output.

OIDET_LicenseFault

This diagnostic event indicates that there is insufficient license of a specific license type.

OIDET_RemoteSystemFault

This diagnostic event indicates that a system fault is detected on another remote system controller.

OIDET_RemoteMainPowerFault

This diagnostic event indicates that a main power fault is detected on another remote system controller.

OIDET_RemoteBackupPowerFault

This diagnostic event indicates that a backup power fault is detected on another remote system controller.

OIDET_RemoteGroundFault

This diagnostic event indicates that a ground fault is detected on another remote system controller.

OIDET_RemoteFault

This diagnostic event indicates that a fault is detected on another remote system controller.

OIDET_PowerSupplyFault

This diagnostics event indicates that is a power fault detected on a device

OIDET_StackedSwitchMismatchFault

This diagnostics event indicates that there is a mismatch between the number of detected switches in a “stacked switch” and number configurated.

OIDET_RedundantDataPathFault

This diagnostics event indicates that the interconnection between the stacked Cisco IE5000 switches is not redundant.

### 13.2.14 TOIDiagEventGroup

The TOIDiagEventGroup type divides each event into groups. Each event belongs to maximum one group. The groups are used to divide the event generation. The group-type is used for subscription of the events. The relation between the groups and the event-types is given in section 13.2.11, presented as sub-sections.

OIDEG_CALLEVENTGROUP:
Indicates that the diagnostic event is related to call events.

OIDEG_GENERALEVENTGROUP:
Indicates that the diagnostic event represents a general event.

OIDEG_FAULTEVENTGROUP:
Indicates that the diagnostic event represents a fault event. Faults have a state and can be acknowledged, resolved or reset.

OIDEG_UNKNOWNDIAGEVENTGROUP = UINT_MAX:
Indicates that the diagnostic event couldn’t be grouped in one of the groups above.

### 13.2.15 TOIEventOriginatorType

The TOIEventOriginatorType type represents the various types of the originators that generated the received event.

OIEOT_NOEVENTORIGINATOR = 0x00477002:
Indicates that the event originator is not known.

OIEOT_UNITEVENTORIGINATOR = 0x00477003:
Indicates that the event originator is a unit.

OIEOT_OPENINTERFACEEVENTORIGINATOR = 0x00477004:
Indicates that the event originator is a system connected to the open interface of the PRAESENSA system.

OIEOT_CONTROLINPUTEVENTORIGINATOR = 0x00477005:
Indicates that the event originator is a control-input.

OIEOT_AUDIOOUTPUTEVENTORIGINATOR = 0x00477006:
Indicates that the event originator is an audio-output.

OIEOT_AUDIOINPUTEVENTORIGINATOR = 0x00477007:
Indicates that the event originator is an audio input.

OIEOT_USEREVENTORIGINATOR = 0x00477009:
Indicates that the event originator is a user.

OIEOT_NETWORKEVENTORIGINATOR = 0x0047700A:
Indicates that the event originator represents a network connection. Used for user login events.

OIEOT_STACKEDUNITEVENTORIGINATOR = 0x0047700B:

Indicates that the event originator is a sub-unit of a composite unit. Used for stacked Cisco switches.

### 13.2.16 TOIDiagEventState

The TOIDiagEventState type represents the state of the fault-group diagnostic events. Other diagnostic event-types always will have the state RESET.

OIDES_NEW:
Indicates that the diagnostic event is added to the system.

OIDES_ACKNOWLEDGED:
Indicates that the diagnostic fault event is acknowledged.

OIDES_RESOLVED:
Indicates that the diagnostic fault event is resolved.

OIDES_RESET:
Indicates that the diagnostic fault event is reset.

### 13.2.17 TOIActionType

The TOIActionType type represents the action done on the Fault-type events. Other diagnostic event-types always received the action type NEW or REMOVED.

OIACT_NEW:
Indicates that the Diagnostic event is added to the system.

OIACT_ACKNOWLEDGED:
Indicates that the Diagnostic event is acknowledged (fault events only).

OIACT_RESOLVED:
Indicates that the Diagnostic event is resolved (fault events only).

OIACT_RESET:
Indicates that the Diagnostic event is reset (fault events only).

OIACT_UPDATED:
Indicates that the Diagnostic event is updated (additional information is added to an existing event)

OIACT_REMOVED:
Indicates that the Diagnostic event is removed from the system.

OIACT_ EXISTING:
The specified diagnostic event is already present in the PRAESENSA System. This action type is passed for each diagnostic event already present on the storage of the PRAESENSA System after subscription for the events.

OIACT_EXISTING_LAST:
The specified diagnostic event is already present on the PRAESENSA System storage and it is the last present event sent, or there are actually no fault events present on the storage of the PRAESENSA System, in which case the specified diagnostic event is of type OIDET_NOFAULTS.

### 13.2.18 TOICallOutputHandling

Describes how calls behave on routing availability.

OICOH_PARTIAL:
Partial calls are calls that proceed even in case not all required zones are available.

OICOH_NON_PARTIAL:
Non-partial calls are calls that require the entire routing to be available at the start of the call and during the call. When during the call a part of the routing becomes unavailable, the call is aborted. Currently not supported in the PRAESENSA system.

OICOH_STACKED:
Stacked calls are calls that extend partial calls with replays to previously unavailable zones. Currently not supported in the PRAESENSA system.

### 13.2.19 TOICallStackingMode

Describes when recorded calls replay. A stacked call or a stacked call waits for each zone to become available for replay.

OICSM_WAIT_FOR_ALL:
Wait with replay for all zones to become available

OICSM_WAIT_FOR_EACH:
Start a replay for each zone to become available

### 13.2.20 TOICallTiming

Indicates the way the call must be handled.

OICTM_IMMEDIATE:
Broadcast to the selected zones and zone groups when the call is started.

OICSM_TIME_SHIFTED:
Broadcast to the selected zones and zone groups when the original call is finished to prevent audio feedback during live speech.

OICSM_MONITORED:
Broadcast when the call is not cancelled within 2 seconds after the monitoring phase has finished.

## 13.3 Methods

### 13.3.1 Connect

Make a connection with a system controller. A connection is required before other methods can be used. The connection is done using the port number 9401 (non-secure) or 9403 (secure).

For secure connections, TLS 1.2 is used. The certificate supplied by the system controller is automatically accepted without validation.

```
TOIErrorCode Connect(string hostnameOrIP, string username, string password, bool
    secure = true)
```

***Parameters:***

| | |
|---|---|
| hostnameOrIP | IP address of the system controller, format “127.0.0.1” or the DNS name of the PRAESENSA system controller. |
| username | Name of the user as defined during the “User Management” configuration of the PRAESENSA system. |
| password | Password of the user. |
| secure | Use a secure connection. True by default. |

***Return value:***
Error code indicating success or failure.

### 13.3.2 Disconnect

Gracefully terminates a connection with the system controller. After a successful call to this function it is no longer possible to use functions of the open interface.

```
TOIErrorCode Disconnect()
```

***Return value:***
Error code indicating success or failure.

### 13.3.3 GetNcoVersion

Retrieves the software release of the system controller.

```
TOIErrorCode GetNcoVersion(out string release)
```

***Parameters:***

| | |
|---|---|
| release | Software release of the system controller |

***Return value:***
Error code indicating success or failure.

### 13.3.4 GetProtocolVersion

Retrieves the protocol version of the Open Interface as major.minor. This is not the software version of the PRAESENSA system.

```
TOIErrorCode GetProtocolVersion(out int major, out int minor)
```

***Parameter***

| | |
|---|---|
| major | Major version number of the Open Interface protocol |
| minor | Minor version number of the Open Interface protocol |

***Error codes:***

Error code indicating success or failure.

### 13.3.5 CreateCallEx2

Create (but do not start) a call with the given parameters.

```
TOIErrorCode CreateCallEx2(List<string> routing, uint priority, TOICallOutputHandling
    outputHandling, TOICallStackingMode stackingMode, uint stackingTimeout,
    string startchime, string endchime, bool livespeech, string audioinput,
    List<string> messages, uint repeat, TOICallTiming callTiming, string
    preMonitorDest, uint liveSpeechAttenuation, uint startChimeAttenuation, uint
    endChimeAttenuation, uint messageAttenuation, out uint callId)
```

***Parameters:***

| | |
|---|---|
| routing | List of names of zone groups, zones and/or control outputs. The routing is formatted as a comma separated set of resource names. |
| priority | The priority of the call. See §13.2.5 for the value range definitions. |
| outputHandling | Whether the call is partial, non-partial or stacked. There are three possible values: OICOH_PARTIAL, OICOH_NON_PARTIAL and OICOH_STACKED.<br><br>Partial calls are calls that proceed even in case not all required zones are available. Non-partial calls are calls that require the entire routing to be available at the start of the call and during the call. When during the call a part of the routing becomes unavailable, the call is aborted. Stacked calls are calls that extend partial calls with replays to previously unavailable zones. Stacked calls are only available within the business call priority range. This means that stacking emergency and BGM priority calls is not possible. |
| stackingMode | Whether a stacked call waits for all zones to become available or a stacked call waits for each zone to become available for replay. There are two possible values: OICSM_WAIT_FOR_ALL and OICSM_WAIT_FOR_EACH. This parameter is |

| | |
|---|---|
| | ignored when outputHandling is set to OICOH_PARTIAL or OICOH_NON_PARTIAL. |
| stackingTimeout | Amount of minutes for a stacked call to wait for available resources. The time-out countdown is started at the moment the original call has ended. The accepted range is 1 to 255 minutes; the value OICST_INFINITE is used to wait infinitely. This parameter is ignored when outputHandling is set to OICOH_PARTIAL or OICOH_NON_PARTIAL. |
| startChime | The name of the start chime. |
| endChime | The name of the end chime. |
| liveSpeech | Whether or not the call has a live speech phase. True = live speech, False = no live speech. |
| audioInput | Name of the audio Input (only used when live speech is true). |
| messages | List of names of prerecorded messages. The messages parameter is formatted as a comma separated set of message names. |
| repeat | How many times the messages should be repeated. If the messages needs to be played only once or forever, then the enumerated values of the TOICallRepeatCount can be used (see §**Error! Reference source not found.**). Otherwise, the following value range can be used: 1 .. 32767. |
| callTiming | Indicates the way the call must be handled. There are three possible values: OICTM_IMMEDIATE, OICTM_TIME_SHIFTED and OICTM_MONITORED. An immediate call will be broadcast to the selected zones and zone groups when the call is started. A time shifted call will be broadcast to the selected zones and zone groups when the original call is finished to prevent audio feedback during live speech. A monitored call will broadcast when it is not cancelled within 2 seconds after the monitoring phase has finished. |
| preMonitorDest | The destination zone of the pre-monitor phase of a pre-monitored call. When the call is not pre-monitored, this value is ignored. This parameter is ignored when callTiming is set to OICTM_IMMEDIATE or OICTM_TIME_SHIFTED. |
| liveSpeechAttenuation | The attenuation to be used for the audio input during the live speech phase. Range: 0..60 dB. |
| startChimeAttenuation | The attenuation to be used for the chime generator during the start chime phase. Range: 0..60 dB. |

| | |
|---|---|
| endChimeAttenuation | The attenuation to be used for the chime generator during the end chime phase. Range: 0..60 dB. |
| messageAttenuation | The attenuation to be used for the message generator during the prerecorded message phase. Range: 0..60 dB. |
| callId | Unique identification of the call (only valid when return value is OIERROR_OK) |

***Return value:***

Error code indicating success or failure.

### 13.3.6 CreateCallEx3

Create (but do not start) a call with the given parameters.

```
TOIErrorCode CreateCallEx3(List<string> routing, uint priority, TOICallOutputHandling
        outputHandling, TOICallStackingMode stackingMode, uint stackingTimeout,
        string startchime, string endchime, bool livespeech, string audioinput,
        List<string> messages, uint repeat, TOICallTiming callTiming, string
        preMonitorDest, uint liveSpeechAttenuation, uint startChimeAttenuation, uint
        endChimeAttenuation, uint messageAttenuation, bool restartCall, out uint callId)
```

***Parameters:***

| | |
|---|---|
| routing | List of names of zone groups, zones and/or control outputs. |
| priority | The priority of the call. See §13.2.5 for the value range definitions. |
| outputHandling | Whether the call is partial, non-partial or stacked. There are three possible values: OICOH_PARTIAL, OICOH_NON_PARTIAL and OICOH_STACKED.<br><br>Partial calls are calls that proceed even in case not all required zones are available. Non-partial calls are calls that require the entire routing to be available at the start of the call and during the call. When during the call a part of the routing becomes unavailable, the call is aborted. Stacked calls are calls that extend partial calls with replays to previously unavailable zones. Stacked calls are only available within the business call priority range. This means that stacking emergency and BGM priority calls is not possible. |
| stackingMode | Whether a stacked call waits for all zones to become available or a stacked call waits for each zone to become available for replay. There are two possible values: OICSM_WAIT_FOR_ALL and OICSM_WAIT_FOR_EACH. This parameter is ignored when outputHandling is set to OICOH_PARTIAL or OICOH_NON_PARTIAL. |

| | |
|---|---|
| stackingTimeout | Amount of minutes for a stacked call to wait for available resources. The time-out countdown is started at the moment the original call has ended. The accepted range is 1 to 255 minutes; the value OICST_INFINITE is used to wait infinitely. This parameter is ignored when outputHandling is set to OICOH_PARTIAL or OICOH_NON_PARTIAL. |
| startChime | The name of the start chime. |
| endChime | The name of the end chime. |
| liveSpeech | Whether or not the call has a live speech phase. True = live speech, False = no live speech. |
| audioInput | Name of the audio Input (only used when live speech is true). |
| messages | List of names of prerecorded messages. The messages parameter is formatted as a comma separated set of message names. |
| repeat | How many times the messages should be repeated. If the messages needs to be played only once or forever, then the enumerated values of the TOICallRepeatCount can be used (see §**Error! Reference source not found.**). Otherwise, the following value range can be used: 1 .. 32767. |
| callTiming | Indicates the way the call must be handled. There are three possible values: OICTM_IMMEDIATE, OICTM_TIME_SHIFTED and OICTM_MONITORED. An immediate call will be broadcast to the selected zones and zone groups when the call is started. A time shifted call will be broadcast to the selected zones and zone groups when the original call is finished to prevent audio feedback during live speech. A monitored call will broadcast when it is not cancelled within 2 seconds after the monitoring phase has finished. |
| preMonitorDest | The destination zone of the pre-monitor phase of a pre-monitored call. When the call is not pre-monitored, this value is ignored. This parameter is ignored when callTiming is set to OICTM_IMMEDIATE or OICTM_TIME_SHIFTED. |
| liveSpeechAttenuation | The attenuation to be used for the audio input during the live speech phase. Range: 0..60 dB. |
| startChimeAttenuation | The attenuation to be used for the chime generator during the start chime phase. Range: 0..60 dB. |
| endChimeAttenuation | The attenuation to be used for the chime generator during the end chime phase. Range: 0..60 dB. |

| | |
|---|---|
| messageAttenuation | The attenuation to be used for the message generator during the prerecorded message phase. Range: 0..60 dB. |
| restartCall | Indication if the call should be restarted after an interruption. |
| callId | Unique identification of the call (only valid when return value is OIERROR_OK). |

***Return value:***
Error code indicating success or failure

### 13.3.7 StartCreatedCall

Start a previously created call. If the call was started successfully, call state update events for this call will be sent via the Open Interface.

```
TOIErrorCode StartCreatedCall(uint callId)
```

***Parameters:***

| | |
|---|---|
| callId | unique identification of the call, returned by CreateCallEx2 or CreateCallEx3. |

***Return value:***
Error code indicating success or failure.

### 13.3.8 StopCall

Stop a previously created or started call.

```
TOIErrorCode StopCall(uint callId)
```

***Parameters:***

| | |
|---|---|
| callId | Unique identification of the call, returned by CreateCallEx2 or CreateCallEx3. |

***Return value:***
Error code indicating success or failure.

### 13.3.9 AbortCall

Abort a previously created or started call.

```
TOIErrorCode AbortCall(uint callId)
```

***Parameters:***

| | |
|---|---|
| callId | Unique identification of the call, returned from CreateCallEx2 or CreateCallEx3. |

***Return value:***
Error code indicating success or failure

### 13.3.10 CancelAll

Cancel all available stacked calls that were started by this connection.

```
TOIErrorCode CancelAll()
```

***Return value:***
Error code indicating success or failure

### 13.3.11 CancelLast

Cancel (if still available) the last stacked call that was started by this connection.

```
TOIErrorCode CancelLast()
```

***Return value:***
Error code indicating success or failure.

### 13.3.12 AddToCall

Add resources to a previously created or started call.

```
TOIErrorCode AddToCall(uint callId, List<string> resources)
```

***Parameters:***

| | |
|---|---|
| callId | Unique identification of the call, returned from CreateCallEx2 or CreateCallEx3. |
| resources | List of names of zone groups, zones and/or control outputs to be added to the call. A comma separates each name in the routing list. |

***Return value:***
Error code indicating success or failure.

### 13.3.13 RemoveFromCall

Removes resources from the running call.

```
TOIErrorCode RemoveFromCall(uint callId, List<string> resources)
```

***Parameters:***

| | |
|---|---|
| callId | Unique identification of the call, returned from CreateCallEx2 or CreateCallEx3. |
| resources | List of names of zone groups, zones and/or control outputs to be removed from the call. A comma separates each name in the routing list. |

***Return value:***
Error code indicating success or failure.

### 13.3.14 ReportFault

Reports a fault diagnostics event in the system. The fault will be reported as a DET_UserInjectedFault.

```
TOIErrorCode ReportFault(string faultname, out uint eventId)
```

***Parameters:***

| | |
|---|---|
| faultname | Textual representation of the fault to be reported. |
| eventId | Identification of the diagnostic fault event reported (only valid when return value is OIERROR_OK). |

***Return value:***

Error code indicating success or failure.

### 13.3.15 ResolveFault

Resolve a specific diagnostic fault event. The received eventId of the ReportFault function or a diagnostic event should be used as parameter.

```
TOIErrorCode ResolveFault(uint eventid)
```

***Parameters:***

| | |
|---|---|
| eventId | Identification of the diagnostic fault event, received by the ReportFault function. |

***Return value:***

Error code indicating success or failure.

### 13.3.16 AckFault

Acknowledge a specific diagnostic fault event. Because the fault alarm depends on the states of all fault events, this function can possibly acknowledge the system fault alarm state (in case it was the last non-acknowledged fault). If the fault alarm changes state, this will indicate an alarm state change using the AlarmUpdate event.

```
TOIErrorCode AckFault(uint eventid)
```

***Parameters:***

| | |
|---|---|
| eventId | Identification of the diagnostic fault event. |

***Return value:***

Error code indicating success or failure.

### 13.3.17 ResetFault

Reset a specific diagnostic fault event. Because the fault alarm depends on the states of all fault events, this function can possibly reset the system fault alarm state (in case it was the last non-reset fault). If the fault alarm changes state, this will indicate an alarm state change using the AlarmUpdate event.

```
TOIErrorCode ResetFault(uint eventid)
```

***Parameters:***

| | |
|---|---|
| eventId | Identification of the diagnostic fault event. |

***Return value:***

Error code indicating success or failure.

### 13.3.18 AckAllFaults

Acknowledges all fault events. Because the fault alarm depends on the states of all fault events, this will also acknowledge the fault alarm. If the fault alarm changes state, this will indicate an alarm state change using the AlarmUpdate event.

```
TOIErrorCode AckAllFaults()
```

***Return value:***

Error code indicating success or failure.

### 13.3.19 ResetAllFaults

Resets all fault events. Because the fault alarm depends on the state of all fault events, this can possibly reset the fault alarm, dependent whether the faults are resolved. If the fault alarm changes state, this will indicate an alarm state change using the AlarmUpdate event.

TOIErrorCode **ResetAllFaults**()

***Return value:***

Error code indicating success or failure.

### 13.3.20 AckEvacAlarm

Acknowledges the emergency alarm. If the emergency alarm changes state, this will indicate an alarm state change using the AlarmUpdate event.

TOIErrorCode **AckEvacAlarm**()

***Return value:***

Error code indicating success or failure.

### 13.3.21 ResetEvacAlarmEx

Resets the emergency alarm. If the emergency alarm changes state, this will indicate an alarm state change using the AlarmUpdate event.

TOIErrorCode **ResetEvacAlarmEx**(bool bAbortEvacCalls)

***Parameters:***

| | |
|---|---|
| bAbortEvacCalls | Whether or not currently running evacuation priority calls must be aborted. true = abort running evacuation priority calls, false = do not abort running evacuation priority calls. |

***Return value:***

Error code indicating success or failure.

### 13.3.22 AckFaultAlarm

Acknowledges the emergency alarm. If the fault alarm changes state, this will indicate an alarm state change using the AlarmUpdate event.

TOIErrorCode **AckFaultAlarm**()

***Return value:***

Error code indicating success or failure.

### 13.3.23 ResetFaultAlarm

Resets the fault alarm. If the fault alarm changes state, this will indicate an alarm state change using the AlarmUpdate event.

TOIErrorCode **ResetFaultAlarm**()

***Return value:***

Error code indicating success or failure.

### 13.3.24 GetAudioInputNames

Retrieve the list of configured audio inputs.

TOIErrorCode **GetAudioInputNames**(out List<string> names)

***Parameters:***

| | |
|---|---|
| names | The list with the names of all configured audio inputs. |

***Return value:***

Error code indicating success or failure.

### 13.3.25 GetBgmChannelNames

Retrieve the list of configured BGM channels.

TOIErrorCode **GetBgmChannelNames**(out List<string> names)

***Parameters:***

| | |
|---|---|
| names | The list with the names of all configured BGM channels. |

***Return value:***

Error code indicating success or failure.

### 13.3.26 GetChimeNames

Retrieves the list of configured chime names. Note that this is the same list as returned by GetMessageNames.

TOIErrorCode **GetChimeNames**(out List<string> names)

***Parameters:***

| | |
|---|---|
| names | Comma (,) separated list of chime names. |

***Return value:***

Error code indicating success or failure.

### 13.3.27 GetMessageNames

Retrieves the list of configured message names. Note that the chimes are also messages and therefore are included in the list of message names.

TOIErrorCode **GetMessageNames**(out List<string> names)

***Parameters:***

| | |
|---|---|
| names | Comma (,) separated list of message names. |

***Return value:***

Error code indicating success or failure.

### 13.3.28 GetZoneGroupNames

Retrieves the list of configured zone group names.

TOIErrorCode **GetZoneGroupNames**(out List<string> names)

***Parameters:***

| | |
|---|---|
| names | List of zone group names. |

***Return value:***
Error code indicating success or failure.

### 13.3.29 GetZoneNames

Retrieve the list of configured zone names. When the zone group parameter is empty all zone names are returned otherwise the zone names in that zone group are returned.

TOIErrorCode **GetZoneNames**(string sZoneGroupName, out List<string> names)

***Parameters:***

| | |
|---|---|
| sZoneGroupName | The zone group to get the names of (empty string for all zones). |
| names | The names of the zones |

***Return value:***
Error code indicating success or failure.

### 13.3.30 GetConfigId

Retrieve the configuration identifier from the PRAESENSA system. This is a number which is increased each time the configuration is saved.

TOIErrorCode **GetConfigId**(out uint configId)

***Parameters:***

| | |
|---|---|
| configId | Configuration identifier. |

***Return value:***
Error code indicating success or failure.

### 13.3.31 SetSubscriptionResources

Subscribe or unsubscribe the Open Interface client to resource (read zone groups or zones) state updates of particular resources. Only when a subscription is set for a resource, resource state updates will be sent for that resource. When a subscription is set for a resource, the ResourceState event will be used with the current state of that resource.

It is not possible to subscribe to control outputs. No updated will be triggered for these resources.

TOIErrorCode **SetSubscriptionResources**(bool bSub, List<string> resources)

***Parameters:***

| | |
|---|---|
| bSub | Whether to subscribe or unsubscribe. true = subscribe, false = unsubscribe. |
| resources | List of names of zone groups and/or zones. A comma separates each name in the routing list. Resources already having the subscription state are ignored. |

***Return value:***

Error code indicating success or failure.

### 13.3.32 SetSubscriptionResourcesFaultState

Subscribes or unsubscribes to resource (read zone groups or zones) fault state notifications of particular resources for faults that affect the audio distribution of that zone or zone group. Only when a subscription is set for a resource, resource fault state notifications are sent for that resource. When a subscription is set for a resource, the ResourceFaultState event will be used with the current state of that resource.

TOIErrorCode **SetSubscriptionResourcesFaultState**(bool bSub, List<string> resources)

***Parameters:***

| | |
|---|---|
| bSub | Whether to subscribe or unsubscribe. true = subscribe, false = unsubscribe. |
| resources | List of names of zone groups and/or zones. A comma separates each name in the routing list. Resources already having the subscription state are ignored. Subscription for control output resources is not allowed. |

***Return value:***

Error code indicating success or failure.

### 13.3.33 SetSubscriptionBgmVolume

Subscribes or unsubscribes the client to BGM volume updates. Only when a subscription is set for a BGM channel, BGM volume updates will be sent for that BGM zone. When a subscription is set for a BGM zone, the BgmVolumeChanged event will be used with the current volume of that BGM channel.

TOIErrorCode **SetSubscriptionBgmVolume**(bool bSub, List<string> resources)

***Parameters:***

| | |
|---|---|
| bSub | Whether to subscribe or unsubscribe. true = subscribe, false = unsubscribe. |
| resources | List of BGM channel names. |

***Return value:***

Error code indicating success or failure.

### 13.3.34 SetSubscriptionBgmRouting

Subscribes or unsubscribes the client to BGM routing updates. Only when a subscription is set for a BGM channel, BGM routing updates will be sent for that BGM channel. When a subscription is set for a BGM channel the BgmRoutingChanged event will be used with the current routing of that BGM channel.

In case the BGM channel is not active due to a missing audio input in the configuration then no subscription can be set and OIERROR_INTERNAL_ERROR is returned.

TOIErrorCode **SetSubscriptionBgmRouting**(bool bSub, string channel)

***Parameters:***

| | |
|---|---|
| bSub | Whether to subscribe or unsubscribe. true = subscribe, false = unsubscribe. |
| channel | name of the BGM channel. |

***Return value:***

Error code indicating success or failure.

### 13.3.35 SetSubscriptionEvents

Subscribe or unsubscribe the Open Interface client to diagnostic event updates. Only when a subscription is set for an event group and there are events, diagnostic event updates will be sent for that group. When a subscription is set for an event group, the DiagEventNotification event will be used with the diagnostic event for that group.

TOIErrorCode **SetSubscriptionEvents**(bool bSubscribe, TOIDiagEventGroup eventGroup)

***Parameters:***

| | |
|---|---|
| bSub | Whether to subscribe or unsubscribe. true = subscribe, false = unsubscribe. |
| eventGroup | Group identification of the diagnostic events. The associated event-types for each group is represented in §13.2.14. |

***Return value:***

Error code indicating success or failure.

### 13.3.36 SetSubscriptionAlarm

Subscribe or unsubscribe the client to fault or evac alarm state updates. Only when a subscription is set for the fault alarm, fault alarm state updates will be sent. When a subscription is set for an alarm type, the AlarmUpdate event will be used with the alarm state for that alarm type.

TOIErrorCode **SetSubscriptionAlarm**(TOIAlarmType alarmType, bool bSub)

***Parameters:***

| | |
|---|---|
| alarmType | Alarm type to subscribe or unsubscribe to. The associated alarm type is represented in §13.2.3. |
| bSub | Whether to subscribe or unsubscribe. true = subscribe, false = unsubscribe. |

***Return value:***

Error code indicating success or failure.

### 13.3.37 SetSubscriptionUnitCount

Subscribe or unsubscribe the Open Interface client to connected unit count updates. Only when a subscription is set for the unit count, unit count updates will be sent. When a subscription is set, the UnitCountChanged event will be used with the current number of connected units.

TOIErrorCode **SetSubscriptionUnitCount**(bool bSub)

***Parameters:***

| | |
|---|---|
| bSub | Whether to subscribe or unsubscribe. true = subscribe, false = unsubscribe. |

***Return value:***

Error code indicating success or failure.

### 13.3.38 IncrementBgmVolume

Increments the BGM volume of routing with 3 dB.

TOIErrorCode **IncrementBgmVolume**(List<string> resources)

***Parameters:***

| | |
|---|---|
| resources | List of names of zone groups and/or zones. |

***Return value:***

Error code indicating success or failure.

### 13.3.39 DecrementBgmVolume

Decrements the BGM volume of routing with 3 dB.

TOIErrorCode **DecrementBgmVolume**(List<string> resources)

***Parameters:***

| | |
|---|---|
| resources | List of names of zone groups and/or zones. |

***Return value:***

Error code indicating success or failure.

### 13.3.40 IncrementBgmChannelVolume

Increments the BGM volume of a channel with 3 dB.

TOIErrorCode **IncrementBgmChannelVolume**(string channelName)

***Parameters:***

| | |
|---|---|
| channelName | BGM channel name |

***Return value:***

Error code indicating success or failure.

### 13.3.41 DecrementBgmChannelVolume

Decrements the BGM volume of a channel with 3 dB.

TOIErrorCode **DecrementBgmChannelVolume**(string channelName)

***Parameters:***

| | |
|---|---|
| channelName | BGM channel name |

***Return value:***
Error code indicating success or failure.

### 13.3.42 SetBgmVolume

Sets the BGM volume of routing.

TOIErrorCode **SetBgmVolume**(int volume, List<string> resources)

***Parameters:***

| | |
|---|---|
| volume | Volume to set. Value range: 0 .. –96 (dB). Use –96 (dB) to mute the BGM. |
| resources | List of names of zone groups and/or zones. |

***Return value:***
Error code indicating success or failure.

### 13.3.43 AddBgmRouting

Adds a routing to a BGM channel. Either all specified routing is added or, in case of an error, no routing at all.

TOIErrorCode **AddBgmRouting**(string channel, List<string> resources)

***Parameters:***

| | |
|---|---|
| channel | Name of the BGM channel. |
| resources | List of names of zone groups and/or zones. |

***Return value:***
Error code indicating success or failure.

### 13.3.44 RemoveBgmRouting

Removes routing from a BGM channel. Either all specified routing is removed or, in case of an error, no routing at all.

TOIErrorCode **RemoveBgmRouting**(string channel, List<string> resources)

***Parameters:***

| | |
|---|---|
| channel | Name of the BGM channel. |
| resources | List of names of zone groups and/or zones. |

***Return value:***
Error code indicating success or failure.

### 13.3.45 ToggleBgmRouting

Toggles routing in a BGM channel. When none of names in the specified routing are part the BGM channel, all specified routing is added, else all supplied routing is removed or, in case of an error, the current routing of the BGM channel remains unchanged.

TOIErrorCode **ToggleBgmRouting**(string channel, List<string> resources)

***Parameters:***

| | |
|---|---|
| channel | Name of the BGM channel. |
| resources | List of names of zone groups and/or zones. |

***Return value:***

Error code indicating success or failure.

### 13.3.46 SetBgmRouting

Sets the routing of a BGM channel. Either replaces the current routing of a BGM channel with all specified routing or, in case of an error, the current routing of the BGM channel remains unchanged.

```
TOIErrorCode SetBgmRouting(string channel, List<string> resources)
```

***Parameters:***

| | |
|---|---|
| channel | Name of the BGM channel. |
| resources | List of names of zone groups and/or zones. |

***Return value:***

Error code indicating success or failure.

### 13.3.47 ActivateVirtualControlInput

Activate a virtual control input. If the virtual control input is already active then activating it again will not have any effect.

```
TOIErrorCode ActivateVirtualControlInput(string virtualControlInput)
```

***Parameters:***

| | |
|---|---|
| virtualControlInput | Name of the virtual control input to activate. |

***Return value:***

Error code indicating success or failure.

### 13.3.48 DeactivateVirtualControlInput

Deactivate a virtual control input. If the virtual control input is already inactive then deactivating it again will not have any effect.

```
TOIErrorCode DeactivateVirtualControlInput(string virtualControlInput,
        TOIVirtualControlInputDeactivation deactivationType)
```

***Parameters:***

| | |
|---|---|
| virtualControlInput | Name of the virtual control input to deactivate. |
| deactivationType | Specifier how the associated action should be deactivated (see §13.2.11). |

***Return value:***

Error code indicating success or failure.

### 13.3.49 SetSubscriptionVirtualControlInputs

Subscribe or unsubscribe the Open Interface client to virtual control input state updates. Only when a subscription is set for the virtual control input state, virtual control input state updates will be sent. When a subscription is set, the VirtualControlInputStateChanged event will be used with the current state of the virtual control inputs.

TOIErrorCode **SetSubscriptionVirtualControlInputs**(bool bSubscription, List<string> virtualControlInputs)

***Parameters:***

| | |
|---|---|
| bSubscription | Whether to subscribe or unsubscribe. true = subscribe, false = unsubscribe. |
| virtualControlInputs | List of names of virtual control inputs. |

***Return value:***

Error code indicating success or failure.

### 13.3.50 GetVirtualControlInputNames

Retrieve the configured virtual control input names.

TOIErrorCode **GetVirtualControlInputNames**(out List<string> names)

***Parameters:***

| | |
|---|---|
| names | List with the names of virtual control input names. |

***Return value:***

Error code indicating success or failure.

### 13.3.51 GetConfiguredUnits

Retrieve the list of configured units (along with the host name) from the PRAESENSA system. Only the units that are enabled are returned.

TOIErrorCode **GetConfiguredUnits**(out List<string> units)

***Parameters:***

| | |
|---|---|
| names | List of unit names. Formatted as name(host name) |

***Return value:***

Error code indicating success or failure.

### 13.3.52 GetConnectedUnits

Retrieve the list of connected units (along with the host name) from the PRAESENSA system. Only the units that are configured, enabled and connected with the correct software release (units that can be controlled) are returned.

TOIErrorCode **GetConnectedUnits**(out List<string> units)

***Parameters:***

| | |
|---|---|
| names | List of unit names. Formatted as name(host name) |

***Return value:***
Error code indicating success or failure.

## 13.4 Events

Apart from enabling the subscription in the system controller by calling to corresponding subscription method, the application needs to attach an event handler to the event. The following example shows how to handle events.

**NOTE:** Make sure to attach the event handler before enabling the subscription as enabling a subscription will trigger an initial fetch of the data from the system controller.

```
static void Main(string[] args)
{
   OpenInterfaceNetClient client = new OpenInterfaceNetClient();

   string ip = "192.168.53.100";
   string username = "user";
   string password = "password";

   TOIErrorCode ec = client.Connect(ip, username, password);
   if (ec != TOIErrorCode.OIERROR_OK)
   {
      return;
   }

   List<string> resources = new List<string>();
   resources.Add("Zone 1");
   resources.Add("Zone 2");

   // Attach the event handler to the event
   client.BgmVolumeChanged += OnBgmVolumeChanged;

   // Set the subscription in the system controller
   client.SetSubscriptionBgmVolume(true /*bSub*/, resources);
}

private static void OnBgmVolumeChanged(object sender,
         OIBgmVolumeChangedEventArgs e)
{
   // Handle the event
}
```

### 13.4.1 ConnectionBroken

Will be called when the connection with the system controller is broken (closed by other means than Disconnect()). When this function is called, it is necessary to make a new connection and set all subscriptions again.

```
event EventHandler ConnectionBroken;
```

Note that this event is also triggered when the PRAESENSA System detects a message transmission buffer overflow due to too slow reception by the application.

### 13.4.2 CallStateChanged

Indicates the state of a call has changed.

event EventHandler<OICallStateChangedEventArgs> **CallStateChanged**

Where the event argument OICallStateChangedEventArgs consists of:

| | |
|---|---|
| CallId | Unique identification of the call. |
| State | State of the call. See §13.2.6 for the definitions of the call states. |

### 13.4.3 ResourceStateChanged

Indication that a resource state has changed.

event EventHandler<OIResourceStateEventArgs> **ResourceStateChanged**

Where the event argument OIResourceStateEventArgs consists of:

| | |
|---|---|
| Resources | List of names of zone groups and/or zones. |
| CallId | Unique identification of the call (when state is activated). |
| Priority | Priority of the call using the resource (when state is activated). See §13.2.5 for the priority value ranges. |
| State | State of the resource. See §13.2.6 for the definitions of the resource states. |

Note that when a zone-group is partial occupied by a call, the state of that zone-group is marked as occupied (OIRS_INUSE). Only when all zones in the zone-group are free, the state of the zone-group is marked free (OIRS_FREE).

### 13.4.4 ResourceFaultStateChanged

Indicates that a resource state has changed.

event EventHandler<OIResourceFaultStateEventArgs> **ResourceFaultStateChanged**

Where the event argument OIResourceFaultStateEventArgs consists of:

| | |
|---|---|
| Resources | List of names of zone groups and/or zones. A comma separates each name in the routing list. |
| FaultState | Fault state for faults that affect the audio distribution of these zone or zone group resources. |

Note that when a zone-group has a fault in one of its zones then that zone group is marked as in fault (OIRS_FAULT).

### 13.4.5 BgmRoutingChanged

Indication that a BGM routing has changed.

event EventHandler<OIBgmRoutingChangedEventArgs> **BgmRoutingChanged**

Where the event argument OIBgmRoutingChangedEventArgs consists of:

| | |
|---|---|
| Channel | Name of the BGM channel. |
| Routing | List of names of zone groups, zones and/or control outputs. |

| | |
|---|---|
| Added | Whether the routing was added (true) or removed (false). |

### 13.4.6 BgmVolumeChanged

Indication that BGM volume has changed.

```
event EventHandler<OIBgmVolumeChangedEventArgs> BgmVolumeChanged
```

Where the event argument OIBgmVolumeChangedEventArgs consists of:

| | |
|---|---|
| Routing | Name of the BGM zone. |
| Volume | The new volume of the zone. |

### 13.4.7 AlarmUpdate

Indication of alarm state change.

```
event EventHandler<OIAlarmStateChangedEventArgs> AlarmUpdate
```

Where the event argument OIAlarmStateChangedEventArgs consists of:

| | |
|---|---|
| State | State of the fault alarm. See §13.2.4 for the definitions of the fault alarm states. |

### 13.4.8 UnitCountChanged

Indication of unit count change

```
event EventHandler<OIUnitCountChangedEventArgs> UnitCountChanged
```

Where the event argument OIUnitCountChangedEventArgs consists of:

| | |
|---|---|
| UnitCount | The number of connected units |

### 13.4.9 DiagEventNotification

Will be called when a diagnostic event is logged inside the system controller. See chapter 4.1 for use of the diagEvent.

```
event EventHandler<OIDiagEventEventArgs> DiagEventNotification
```

Where the event argument OIDiagEventEventArgs consists of:

| | |
|---|---|
| ActionType | Action done on the event. See §13.2.17 for the definitions of the action types. |
| Event | Reference to a DiagEvent object. |

### 13.4.10 VirtualControlInputStateChanged

Will be called when the state of one or more virtual control inputs changes.

```
event EventHandler<OIVirtualControlInputStateChangedEventArgs>
        VirtualControlInputStateChanged
```

Where the event argument OIVirtualControlInputStateChangedEventArgs consists of:

| | |
|---|---|
| VirtualControlInputs | List of names of virtual control inputs that have changed state. A comma separates each name in the list. |

| | |
|---|---|
| State | State of the virtual control inputs. See §13.2.12 for the definitions of the virtual input contact states. |

## 13.5 DiagEvent Classes

The following chapter describes the derived DiagEvent classes and corresponding properties available. The derived DiagEvent classes are annotated with the ClassIdAttribute. This attribute contains the ClassId which corresponds with the TOIDiagEventType described in §13.2.13. The ClassId should be used to cast the DiagEvent base class to the correct derived class, as shown in the example below.

```
private static void OnDiagEventNotification(object sender, OIDiagEventEventArgs e)
{
   DiagEvent diagEvent = e.Event;
   TOIDiagEventType eventType = (TOIDiagEventType)diagEvent.ClassId;

   switch (eventType)
   {
      case TOIDiagEventType.OIDET_UserInjectedFault:
         DET_UserInjectedFault userInjectedFaultDiagEvent =
         (DET_UserInjectedFault)diagEvent;
         string description = userInjectedFaultDiagEvent.ErrorDescription;
         break;
      default:
         break;
   }
}
```

### 13.5.1 DiagEvent

Base class for all DiagEvents.

***Properties:***

| | |
|---|---|
| TOIDiagEventGroup EventGroup | The group this event belongs to. See §13.2.14 for the definitions of the event groups. |
| uint EventId | Unique identification id. |
| DateTime AddTimeStamp | Time the event was created. |
| DateTime AcknowledgeTimeStamp | Time the event was acknowledged. |
| DateTime ResolveTimeStamp | Time the event was resolved. |
| DateTime ResetTimeStamp | Time the event was reset. |
| EventOriginator AddEventOriginator | The originator that added the event. See §13.6 for the class definitions. |
| EventOriginator AcknowledgeEventOriginator | The originator that acknowledged the event. See §13.6 for the class definitions. |
| EventOriginator ResolveEventOriginator | The originator that resolved the event. See §13.6 for the class definitions. |

| | |
|---|---|
| EventOriginator<br>ResetOriginator | The originator that reset the event. See §13.6 for the class definitions. |

### 13.5.2 GeneralEvent

Base class for all general events. Derived from DiagEvent. This class is empty and does not have any properties.

#### 13.5.2.1 DET_EvacAcknowledge

ClassId: TOIDiagEventType.OIDET_EvacAcknowledge.

Derived from GeneralEvent. This class is empty and does not have any properties.

#### 13.5.2.2 DET_EvacReset

ClassId: TOIDiagEventType.OIDET_EvacReset.

Derived from GeneralEvent. This class is empty and does not have any properties.

#### 13.5.2.3 DET_EvacSet

ClassId: TOIDiagEventType.OIDET_EvacSet.

Derived from GeneralEvent. This class is empty and does not have any properties.

#### 13.5.2.4 DET_UnitConnect

ClassId: TOIDiagEventType.OIDET_UnitConnect.

Derived from GeneralEvent. This class is empty and does not have any properties.

#### 13.5.2.5 DET_DemoteToBackup

ClassId: TOIDiagEventType.OIDET_DemoteToBackup.

Derived from GeneralEvent. This class is empty and does not have any properties.

#### 13.5.2.6 DET_SCStartup

ClassId: TOIDiagEventType.OIDET_SCStartup.

Derived from GeneralEvent. This class is empty and does not have any properties.

#### 13.5.2.7 DET_OpenInterfaceConnect

ClassId: TOIDiagEventType.OIDET_OpenInterfaceConnect.

Derived from GeneralEvent. This class is empty and does not have any properties.

#### 13.5.2.8 DET_OpenInterfaceDisconnect

ClassId: TOIDiagEventType.OIDET_OpenInterfaceDisconnect.

Derived from GeneralEvent. This class is empty and does not have any properties.

#### 13.5.2.9 DET_OpenInterfaceConnectFailed

ClassId: TOIDiagEventType.OIDET_OpenInterfaceConnectFailed.

Derived from GeneralEvent. This class is empty and does not have any properties.

#### 13.5.2.10 DET_CallLoggingSuspended

ClassId: TOIDiagEventType.OIDET_CallLoggingSuspended.

Derived from GeneralEvent. This class is empty and does not have any properties.

#### 13.5.2.11 DET_CallLoggingResumed

ClassId: TOIDiagEventType.OIDET_CallLoggingResumed.

Derived from GeneralEvent. This class is empty and does not have any properties.

#### 13.5.2.12 DET_UserLogIn

ClassId: TOIDiagEventType.OIDET_UserLogIn.

Derived from GeneralEvent. This class is empty and does not have any properties.

#### 13.5.2.13 DET_UserLogOut

ClassId: TOIDiagEventType.OIDET_UserLogOut.

Derived from GeneralEvent. This class is empty and does not have any properties.

#### 13.5.2.14 DET_UserLogInFailed

ClassId: TOIDiagEventType.OIDET_UserLogInFailed.

Derived from GeneralEvent. This class is empty and does not have any properties.

#### 13.5.2.15 DET_BackupPowerModeStart

ClassId: TOIDiagEventType.OIDET_BackupPowerModeStart.

Derived from GeneralEvent. This class is empty and does not have any properties.

#### 13.5.2.16 DET_BackupPowerModeEnd

ClassId: TOIDiagEventType.OIDET_BackupPowerModeEnd.

Derived from GeneralEvent. This class is empty and does not have any properties.

#### 13.5.2.17 DET_ConfigurationRestored

ClassId: TOIDiagEventType.OIDET_ConfiguredRestored.

Derived from GeneralEvent.

***Properties:***

| | |
|---|---|
| bool ConfigurationSettingsRestored | Indication if configuration settings are restored |
| bool SecuritySettingsRestored | Indication if security settings are restored. |
| bool MessagesRestored | Indication if messages are restored. Not supported (yet) in the PRAESENSA system. |

#### 13.5.2.18 DET_InControl

ClassId: TOIDiagEventType.OIDET_InControl.

Derived from GeneralEvent.

***Properties:***

| | |
|---|---|
| string CallStationGroupName | Name of the group this call station belongs to. |

### 13.5.3 CallDiagEventV2

Base class for all call events. Derived from DiagEvent.

***Properties:***

| | |
|---|---|
| uint CallId | Id of the call. |

#### 13.5.3.1 DET_CallStartDiagEventV2

ClassId: TOIDiagEventType.OIDET_CallStartV2.

Derived from CallDiagEventV2.

***Properties:***

| | |
|---|---|
| string AudioInput | Audio input of the call. |
| string StartChime | Configured start chime name. |
| string EndChime | Configured end chime name. |
| bool LiveSpeech | Indicates if live speech is used. |
| string MessageNames | Comma separated string of messages. |
| string OutputNames | List of names of zones used in the call. A comma separates each name in the routing list. |
| uint Priority | Call priority. |
| uint MessageRepeat | Number of message repeats configured. |
| uint OriginalCallId | Call id of the original call in case this is a replay. |
| TOICallOutputHandling OutputHandling | Call output handling. See §13.2.18. |
| TOICallTiming CallTiming | Call timing. See §13.2.20. |

#### 13.5.3.2 DET_CallEndDiagEventV2

ClassId: TOIDiagEventType.OIDET_CallEndV2.

Derived from CallComplete.

***Properties:***

| | |
|---|---|
| TOICallState StateCompleted | Call state at which the call has ended. See §13.2.6. |
| bool Aborted | Indicates if the call was aborted. |
| TOICallStopReason StopReason | Reason the call was stopped. See §13.2.7. |

#### 13.5.3.3 DET_CallChangeResourceDiagEventV2

ClassId: TOIDiagEventType.OIDET_CallChangeResourceV2.

Derived from CallDiagEventV2.

***Properties:***

| | |
|---|---|
| string Removed | List of names of zones removed from the call. A comma separates each name in the routing list. |
| string Added | List of names of zones added to the call. A comma separates each name. |

#### 13.5.3.4 DET_CallTimeoutDiagEventV2

ClassId: TOIDiagEventType.OIDET_CallTimeoutV2.

Derived from CallDiagEventV2.

***Properties:***

| | |
|---|---|
| string Unreached | Comma separated string of unreached resources. |

#### 13.5.3.5 DET_CallRestartDiagEvent

ClassId: TOIDiagEventType.OIDET_CallRestart.

Derived from DET_CallStartDiagEventV2.

***Properties:***

| | |
|---|---|
| string Unreached | Comma separated string of unreached resources. |

#### 13.5.3.6 DET_CallResetDiagEvent

ClassId: TOIDiagEventType.OIDET_CallReset.

Derived from CallComplete.

***Properties:***

| | |
|---|---|
| TOICallState StateCompleted | Call state at which the call has ended. See §13.2.6. |
| TOICallResetReason ResetReason | Reason the call is reset. See §13.2.8. |

### 13.5.4 FaultEvent

Base class for all fault events. Derived from DiagEvent. This class is empty and does not have any properties.

#### 13.5.4.1 DET_AudioPathSupervision

ClassId: TOIDiagEventType.OIDET_AudioPathSupervision.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.2 DET_MicrophoneSupervision

ClassId: TOIDiagEventType.OIDET_MicrophoneSupervision.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.3 DET_SystemInputContact

ClassId: TOIDiagEventType.OIDET_SystemInputContact.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.4 DET_CallStationExtension

ClassId: TOIDiagEventType.OIDET_CallStationExtension.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| uint NumberConfigured | Number of configured extensions. |
| uint NumberConnected | Number of connected extensions. |

#### 13.5.4.5 DET_ConfigurationFile

ClassId: TOIDiagEventType.OIDET_ConfigurationFile.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.6 DET_ConfigurationVersion

ClassId: TOIDiagEventType.OIDET_ConfigurationVersion.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| string Expected | Expected configuration version. |
| string Loaded | Loaded configuration version. |

#### 13.5.4.7 DET_IllegalConfiguration

ClassId: TOIDiagEventType.OIDET_IllegalConfiguration.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| uint ErrorCode | Code of the illegal configuration error. Not used at the moment, currently filled with the value ‘0’. |

#### 13.5.4.8 DET_PrerecordedMessagesNames

ClassId: TOIDiagEventType.OIDET_PrerecordedMessagesNames.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| string MissingNames | Comma separated string with the missing messages. |

#### 13.5.4.9 DET_PrerecordedMessagesCorrupt

ClassId: TOIDiagEventType.OIDET_PrerecordedMessagesCorrupt.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| string CorruptNames | Comma separated string with the corrupt messages. |

#### 13.5.4.10 DET_UnitMissing

ClassId: TOIDiagEventType.OIDET_UnitMissing.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.11 DET_UnitReset

ClassId: TOIDiagEventType.OIDET_UnitReset.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| string ChipType | Processor type which caused the unit reset. |

#### 13.5.4.12 DET_UserInjectedFault

ClassId: TOIDiagEventType.OIDET_UserInjectedFault.

***Properties:***

| | |
|---|---|
| string ErrorDescription | User injected error description. |

#### 13.5.4.13 DET_NoFaults

ClassId: TOIDiagEventType.OIDET_NoFaults.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.14 DET_ZoneLineFault

ClassId: TOIDiagEventType.OIDET_ZoneLineFault.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| string ZoneNames | Comma separated string with zone names for which the fault occurred. |
| string ControlInputName | Control input name which is configured for the zone line fault. |

#### 13.5.4.15 DET_NetworkChange

ClassId: TOIDiagEventType.OIDET_NetworkChangeDiagEvent.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| uint NrOfNetworkChanges | Number of network changes. |
| TNetworkChangeData[] NetworkChanges | Detailed information about network changes. |

Where the TNetworkChangeData consists of:

| | |
|---|---|
| string LocalPortId | The port ID of the local device. |
| string LocalSystemName | The name of the local device as configured in the PRAESENSA system. |
| string RemotelPortId | The port ID of the remote device. |
| string RemoteSystemName | The name of the remote device as configured in the PRAESENSA system. |

#### 13.5.4.16 DET_IncompatibleFirmware

ClassId: TOIDiagEventType.OIDET_IncompatibleFirmware.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| string Current | Current firmware in the device. |
| string Expected | Expected firmware the device should contain. |

#### 13.5.4.17 DET_Amp48VAFault

ClassId: TOIDiagEventType.OIDET_Amp48VAFault.

Derived from FaultEvent.

***Properties:***

Severity Severity — Severity of the fault. LOW = 0, HIGH = 1.

#### 13.5.4.18 DET_Amp48VBFault

ClassId: TOIDiagEventType.OIDET_Amp48VBFault.

Derived from FaultEvent.

***Properties:***

Severity Severity — Severity of the fault. LOW = 0, HIGH = 1.

#### 13.5.4.19 DET_AmpChannelFault

ClassId: TOIDiagEventType.OIDET_AmpChannelFault.

Derived from FaultEvent.

***Properties:***

Severity Severity — Severity of the fault. LOW = 0, HIGH = 1.

#### 13.5.4.20 DET_AmpShortCircuitLineAFault

ClassId: TOIDiagEventType.OIDET_AmpShortCircuitLineAFault.

Derived from FaultEvent.

***Properties:***

Severity Severity — Severity of the fault. LOW = 0, HIGH = 1.

#### 13.5.4.21 DET_AmpShortCircuitLineBFault

ClassId: TOIDiagEventType.OIDET_AmpShortCircuitLineBFault.

Derived from FaultEvent.

***Properties:***

Severity Severity — Severity of the fault. LOW = 0, HIGH = 1.

#### 13.5.4.22 DET_AmpAcc18VFault

ClassId: TOIDiagEventType.OIDET_AmpAcc18VFault.

Derived from FaultEvent.

***Properties:***

Severity Severity — Severity of the fault. LOW = 0, HIGH = 1.

#### 13.5.4.23 DET_AmpSpareInternalFault

ClassId: TOIDiagEventType.OIDET_AmpSpareInternalFault.

Derived from FaultEvent.

***Properties:***

Severity Severity — Severity of the fault. LOW = 0, HIGH = 1.

#### 13.5.4.24 DET_AmpChannelOverloadFault

ClassId: TOIDiagEventType.OIDET_AmpChannelOverloadFault.

Derived from FaultEvent.

***Properties:***

Severity Severity Severity of the fault. LOW = 0, HIGH = 1.

#### 13.5.4.25 DET_EolFailureLineAFault

ClassId: TOIDiagEventType.OIDET_EolFailureLineAFault.

Derived from FaultEvent.

***Properties:***

Severity Severity Severity of the fault. LOW = 0, HIGH = 1.

#### 13.5.4.26 DET_EolFailureLineBFault

ClassId: TOIDiagEventType.OIDET_EolFailureLineBFault.

Derived from FaultEvent.

***Properties:***

Severity Severity Severity of the fault. LOW = 0, HIGH = 1.

#### 13.5.4.27 DET_GroundShortFault

ClassId: TOIDiagEventType.OIDET_GroundShortFault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.28 DET_OverheatFault

ClassId: TOIDiagEventType.OIDET_OverheatFault.

Derived from FaultEvent.

***Properties:***

Severity Severity Severity of the fault. LOW = 0, HIGH = 1.

#### 13.5.4.29 DET_PowerMainsSupply

ClassId: TOIDiagEventType.OIDET_PowerMainsSupply.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.30 DET_PowerBackupSupply

ClassId: TOIDiagEventType.OIDET_PowerBackupSupply.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.31 DET_MainsAbsentPSU1Fault

ClassId: TOIDiagEventType.OIDET_MainsAbsentPSU1Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.32 DET_MainsAbsentPSU2Fault

ClassId: TOIDiagEventType.OIDET_MainsAbsentPSU2Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.33 DET_MainsAbsentPSU3Fault

ClassId: TOIDiagEventType.OIDET_MainsAbsentPSU3Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.34 DET_BackupAbsentPSU1Fault

ClassId: TOIDiagEventType.OIDET_BackupAbsentPSU1Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.35 DET_BackupAbsentPSU2Fault

ClassId: TOIDiagEventType.OIDET_BackupAbsentPSU2Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.36 DET_BackupAbsentPSU3Fault

ClassId: TOIDiagEventType.OIDET_BackupAbsentPSU3Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.37 DET_DcOut1PSU1Fault

ClassId: TOIDiagEventType.OIDET_DcOut1PSU1Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.38 DET_DcOut2PSU1Fault

ClassId: TOIDiagEventType.OIDET_DcOut2PSU1Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.39 DET_DcOut1PSU2Fault

ClassId: TOIDiagEventType.OIDET_DcOut1PSU2Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.40 DET_DcOut2PSU2Fault

ClassId: TOIDiagEventType.OIDET_DcOut2PSU2Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.41 DET_DcOut1PSU3Fault

ClassId: TOIDiagEventType.OIDET_DcOut1PSU3Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.42 DET_DcOut2PSU3Fault

ClassId: TOIDiagEventType.OIDET_DcOut2PSU3Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.43 DET_AudioLifelinePSU1Fault

ClassId: TOIDiagEventType.OIDET_AudioLifelinePSU1Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.44 DET_AudioLifelinePSU2Fault

ClassId: TOIDiagEventType.OIDET_AudioLifelinePSU2Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.45 DET_AudioLifelinePSU3Fault

ClassId: TOIDiagEventType.OIDET_AudioLifelinePSU3Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.46 DET_AccSupplyPSU1Fault

ClassId: TOIDiagEventType.OIDET_AccSupplyPSU1Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.47 DET_AccSupplyPSU2Fault

ClassId: TOIDiagEventType.OIDET_AccSupplyPSU2Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.48 DET_AccSupplyPSU3Fault

ClassId: TOIDiagEventType.OIDET_AccSupplyPSU3Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.49 DET_Fan1Fault

ClassId: TOIDiagEventType.OIDET_Fan1Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.50 DET_Fan2Fault

ClassId: TOIDiagEventType.OIDET_Fan2Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.51 DET_DcAux1Fault

ClassId: TOIDiagEventType.OIDET_DcAux1Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.52 DET_DcAux2Fault

ClassId: TOIDiagEventType.OIDET_DcAux2Fault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.53 DET_BatteryShortFault

ClassId: TOIDiagEventType.OIDET_BatteryShortFault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.54 DET_BatteryRiFault

ClassId: TOIDiagEventType.OIDET_BatteryRiFault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.55 DET_BatteryOverheatFault

ClassId: TOIDiagEventType.OIDET_BatteryOverheatFault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.56 DET_BatteryFloatChargeFault

ClassId: TOIDiagEventType.OIDET_BatteryFloatChargeFault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.57 DET_MainsAbsentChargerFault

ClassId: TOIDiagEventType.OIDET_MainsAbsentChargerFault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.58 DET_PoESupplyFault

ClassId: TOIDiagEventType.OIDET_PoESupplyFault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.59 DET_PowerSupplyAFault

ClassId: TOIDiagEventType.OIDET_PowerSupplyAFault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.60 DET_PowerSupplyBFault

ClassId: TOIDiagEventType.OIDET_PowerSupplyBFault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.61 DET_ExternalPowerFault

ClassId: TOIDiagEventType.OIDET_ExternalPowerFault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.62 DET_ChargerSupplyVoltageTooLowFault

ClassId: TOIDiagEventType.OIDET_ChargerSupplyVoltageTooLowFault

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.63 DET_BatteryOvervoltageFault

ClassId: TOIDiagEventType.OIDET_BatteryOvervoltageFault

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.64 DET_BatteryUndervoltageFault

ClassId: TOIDiagEventType.OIDET_BatteryUndervoltageFault

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.65 DET_MediaClockFault

ClassId: TOIDiagEventType.OIDET_MediaClockFault

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.66 DET_ChargerFault

ClassId: TOIDiagEventType.OIDET_ChargerFault

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.67 DET_Amp20VFault

ClassId: TOIDiagEventType.OIDET_Amp20VFault.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| Severity Severity | Severity of the fault. LOW = 0, HIGH = 1. |

#### 13.5.4.68 DET_AmpPsuFault

ClassId: TOIDiagEventType.OIDET_AmpPsuFault.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| Severity Severity | Severity of the fault. LOW = 0, HIGH = 1. |

#### 13.5.4.69 DET_NetworkLatencyFault

ClassId: TOIDiagEventType.OIDET_NetworkLatencyFault.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| Severity Severity | Severity of the fault. LOW = 0, HIGH = 1. |

#### 13.5.4.70 DET_SynchronizationFault

classId: TOIDiagEventType.OIDET_SynchronizationFault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.71 DET_AudioDelayFault

ClassId: TOIDiagEventType.OIDET_AudioDelayFault.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| Severity Severity | Severity of the fault. LOW = 0, HIGH = 1. |

#### 13.5.4.72 DET_InternalPowerFault

classId: TOIDiagEventType.OIDET_InternalPowerFault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.73 DET_InternalCommunicationFault

ClassId: TOIDiagEventType.OIDET_InternalCommunicationFault.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| String Board | String separated list of boards with a fault |

#### 13.5.4.74 DET_VoipFault

ClassId: TOIDiagEventType.OIDET_VoipFault.

Derived from FaultEvent.

#### 13.5.4.75 DET_RemoteOutputFault

ClassId: TOIDiagEventType.OIDET_RemoteOutputFault.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| Severity Severity | Severity of the fault. LOW = 0, HIGH = 1. |

#### 13.5.4.76 DET_RemoteOutputLoopFault

ClassId: TOIDiagEventType.OIDET_RemoteOutputLoopFault.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| String remoteZoneGroupName | Name of the remote zone group |

#### 13.5.4.77 DET_RemoteOutputConfigurationFault

ClassId: TOIDiagEventType.OIDET_RemoteOutputConfigurationFault.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| String remoteZoneGroupName | Name of the remote zone group |

#### 13.5.4.78 DET_LicenseFault

ClassId: TOIDiagEventType.OIDET_LicenseFault.

Derived from FaultEvent.

***Properties:***

| | |
|---|---|
| License LicenseType | Type of the license. Subsystem = 0 |

#### 13.5.4.79 DET_RemoteSystemFault

ClassId: TOIDiagEventType.OIDET_RemoteSystemFault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.80 DET_RemoteMainPowerFault

ClassId: TOIDiagEventType.OIDET_RemoteMainPowerFault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.81 DET_RemoteBackupPowerFault

ClassId: TOIDiagEventType.OIDET_RemoteBackupPowerFault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.82 DET_RemoteGroundFault

ClassId: TOIDiagEventType.OIDET_RemoteGroundFault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.83 DET_RemoteFault

ClassId: TOIDiagEventType.OIDET_RemoteFault.

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.84 DET_PowerSupplyFault

ClassId: TOIDiagEventType.OIDET_PowerSupplyFault

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.85 DET_StackedSwitchMismatchFault

ClassId: TOIDiagEventType.OIDET_StackedSwitchMismatchFault

Derived from FaultEvent. This class is empty and does not have any properties.

#### 13.5.4.86 DET_RedundantDataPathFault

ClassId: TOIDiagEventType.OIDET_RedundantDataPathFault

Derived from FaultEvent. This class is empty and does not have any properties.

## 13.6 EventOriginator classes

The following chapter describes the derived EventOriginator classes and corresponding properties available. The derived DiagEvent classes are annotated with the ClassIdAttribute. This attribute contains the ClassId which corresponds with the TOIEventOriginatorType described in §13.2.15. The ClassId should be used to cast the EventOriginator base class to the correct derived class, as shown in the example below.

```
private static void OnDiagEventNotification(object sender, OIDiagEventEventArgs e)
{
   DiagEvent diagEvent = e.Event;
   EventOriginator addEventOriginator = diagEvent.AddEventOriginator;

   TOIEventOriginatorType originatorType =
         (TOIEventOriginatorType)addEventOriginator.ClassId;
   switch (originatorType)
   {
      case TOIEventOriginatorType.OIEOT_UserEventOriginator:
         UserEventOriginator userEventOriginator =
         (UserEventOriginator)addEventOriginator;
         string unitName = userEventOriginator.UnitName;
         break;
   }
}
```

### 13.6.1 EventOriginator

Base class for all EventOriginators. This class is empty and does not have any properties

#### 13.6.1.1 NoEventOriginator

ClassId: OIEOT_NoEventOriginator. Event originator indicating there is no event originator.

Derived from EventOriginator. This class is empty and does not have any properties.

#### 13.6.1.2 UnitEventOriginator

ClassId: OIEOT_UnitEventOriginator. Event originator indicating the event is originated by a unit.

Derived from EventOriginator.

***Properties:***

| | |
|---|---|
| string UnitName | Name of the unit. |

#### 13.6.1.3 OpenInterfaceEventOriginator

ClassId: OIEOT_OpenInterfaceEventOriginator. Event originator indicating the event is originated by an open interface client.

Derived from EventOriginator.

***Properties:***

| | |
|---|---|
| string TcpIpDeviceName | Device name as configured in the PRAESENSA system. |
| uint IpAddress | IP address of the client, in the form of “127.0.0.1”. |
| ushort PortNumber | TCP-port number of the device on the network. |
| string Username | User name of the client logged into the PRAESENSA system. |

#### 13.6.1.4 ControlInputEventOriginator

ClassId: OIEOT_ControlInputEventOriginator. Event originator indicating the event is originated by a control input on a unit.

Derived from EventOriginator.

***Properties:***

| | |
|---|---|
| string OriginatorName | Name of the control input as configured in the PRAESENSA system. |

#### 13.6.1.5 AudioOutputEventOriginator

ClassId: OIEOT_AudioOutputEventOriginator. Event originator indicating the event is originated by an audio output on a unit.

Derived from EventOriginator. This class is empty and does not have any properties.

#### 13.6.1.6 AudioInputEventOriginator

ClassId: OIEOT_AudioInputEventOriginator. Event originator indicating the event is originated by an audio input on a unit.

Derived from EventOriginator. This class is empty and does not have any properties.

#### 13.6.1.7 UserEventOriginator

ClassId: OIEOT_UserEventOriginator. Event originator indicating a user action performed on the system.

Derived from EventOriginator.

***Properties:***

| | |
|---|---|
| string OriginatorName | Name of the user as configured in the PRAESENSA system. |

#### 13.6.1.8 NetworkEventOriginator

ClassId: OIEOT_NetworkEventOriginator. Event originator indicating the event is originated by a network connection. Used for user login events.

Derived from EventOriginator.

***Properties:***

| | |
|---|---|
| uint IpAddress | IP address of the client, in the form of “127.0.0.1”. |
| ushort PortNumber | TCP-port number of the device on the network. |
| string Username | The user name of the originator network connection. |

#### 13.6.1.9 StackedUnitEventOriginator

ClassId: OIEOT_StackedUnitEventOriginator. Event originator indicating the event is originated by a sub-unit of a composite unit. Used for stacked Cisco switches.

Derived from UnitEventOriginator

***Properties:***

| | |
|---|---|
| byte stackId | Id of the sub-unit, in case of stacked Cisco switches this can be a value from 1 to 4 |

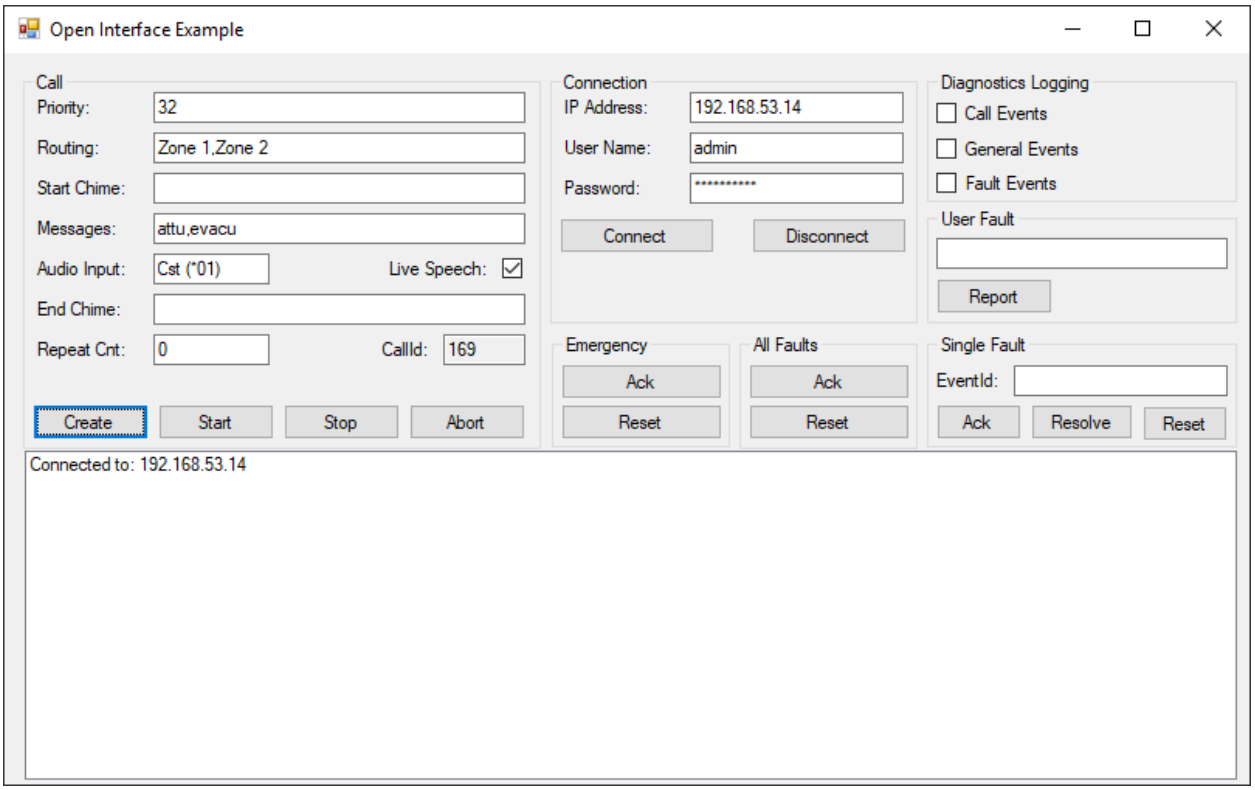
# 14. EXAMPLES

## 14.1 Interface usage

In the example code blow a simple C# .NET application is pre-coded, containing a single form, where a subset of the functions mentioned above or present. This example could help you as a starting point for application development based on the Open Interface .NET library

Most of the fields used in the form have self-explaining names.

### *Form layout*




### *Form Code*

```
using Bosch.PRAESENSA.OpenInterface;
using System;
using System.Collections.Generic;
using System.Linq;
using System.Windows.Forms;

namespace OpenInterfaceNetExample
{
   /// <summary>
   /// This class implements an example with which it is possible
   /// to execute some actions in a PRAESENSA system using the Open Interface.
   /// It also shows how events generated by the system can be monitored.
   /// Only a part of the available functionality is used. Other functionality
   /// can be used in similar ways as shown in this example.
   /// This example uses the PRAESENSA Open Interface .NET library.
   /// There is only limited error checking.
   /// </summary>
   /// <remarks>This is only an example! Do not use it in real systems.</remarks>
   public partial class OILExample : Form
   {
      private OpenInterfaceNetClient m_client;

      public OILExample()
      {
         InitializeComponent();
```

```
    Console.SetOut(new ListBoxWriter(lb_Console));

    // Instantiate the OpenInterfaceNetClient and add the event handlers
    m_client = new OpenInterfaceNetClient();
    m_client.ConnectionBroken += OnConnectionBroken;
    m_client.DiagEventNotification += OnDiagEventNotification;
}

/// <summary>
/// Function that is called when the Open Interface connection between the client
/// and the system controller is broken.
/// </summary>
/// <param name="sender">Indicates who raised the event.</param>
/// <param name="e">Parameters of the event (not used).</param>
private void OnConnectionBroken(object sender, EventArgs e)
{
    Console.WriteLine("Connect broken reported (remote)");
}

/// <summary>
/// Function that is called when a new diagnostic event is logged in the PRAESENSA system.
/// In order for this function to be called the client must be connected to the system controller
/// and subscribed to at least one event group (call, general or fault).
/// </summary>
/// <param name="sender">Indicates who raised the event..</param>
/// <param name="e">Diagnostic event logged in the system.</param>
private void OnDiagEventNotification(object sender, OIDiagEventEventArgs e)
{
    Console.WriteLine("EventId = {0}, action = {1}, event = {2}", e.Event.EventId, e.ActionType, e.Event.ToString());
}

/// <summary>
/// Function that is called when the connect button is clicked.
/// It will connect the client to the system controller using the parameters
/// defined by the user. Only when connected can other functionality be used.
/// </summary>
/// <param name="sender">Indicates who raised the event.</param>
/// <param name="e">Parameters of the event (not used).</param>
private void btn_Connect_Click(object sender, EventArgs e)
{
    TOIErrorCode ec = m_client.Connect(tb_IpAddress.Text, tb_UserName.Text, tb_Password.Text, true
        /*secure*/);
    if (ec == TOIErrorCode.OIERROR_OK)
    {
        Console.WriteLine("Connected to: {0}", tb_IpAddress.Text);
    }
    else
    {
        Console.WriteLine("Failed to connect: {0}", ec);
    }
}

/// <summary>
/// Function that is called when the disconnect button is clicked.
/// It will disconnect the client from the system controller.
/// </summary>
/// <param name="sender">Indicates who raised the event.</param>
/// <param name="e">Parameters of the event (not used).</param>
private void btn_Disconnect_Click(object sender, EventArgs e)
{
    TOIErrorCode ec = m_client.Disconnect();
    if (ec == TOIErrorCode.OIERROR_OK)
    {
        Console.WriteLine("Disconnected");
    }
    else
    {
        Console.WriteLine("Failed to disconnect: {0}", ec);
    }
}

/// <summary>
```

```
/// Function that is called when the call create button is clicked.
/// It will create a call using the parameters defined by the user and
/// the returned call ID is stored.
/// </summary>
/// <param name="sender">Indicates who raised the event.</param>
/// <param name="e">Parameters of the event (not used).</param>
private void btn_CallCreate_Click(object sender, EventArgs e)
{
   uint callId = 0;
   List<string> routing = tb_Routing.Text.Split(new char[] { ',' }).ToList();
   List<string> messages = tb_Messages.Text.Split(new char[] { ',' }).ToList();

   TOIErrorCode ec = m_client.CreateCallEx2(routing,
                                    Convert.ToUInt32(tb_Priority.Text),
                                    TOICallOutputHandling.OICOH_PARTIAL,
                                    TOICallStackingMode.OICSM_WAIT_FOR_ALL,
                                    0,
                                    tb_StartChime.Text,
                                    tb_EndChime.Text,
                                    cb_LiveSpeech.Checked,
                                    tb_AudioInput.Text,
                                    messages,
                                    Convert.ToUInt32(tb_RepeatCnt.Text),
                                    TOICallTiming.OICTM_IMMEDIATE,
                                    "",
                                    0, 0, 0, 0,
                                    out callId);

   if (ec == TOIErrorCode.OIERROR_OK)
   {
      tb_CallId.Text = callId.ToString();
   }
   else
   {
      Console.WriteLine("Failed to create call: {0}", ec);
   }
}

/// <summary>
/// Function that is called when the call start button is clicked.
/// This will start the call that is created earlier.
/// </summary>
/// <param name="sender">Indicates who raised the event.</param>
/// <param name="e">Parameters of the event (not used).</param>
private void btn_CallStart_Click(object sender, EventArgs e)
{
   uint callId = Convert.ToUInt32(tb_CallId.Text);

   TOIErrorCode ec = m_client.StartCreatedCall(callId);
   if (ec != TOIErrorCode.OIERROR_OK)
   {
      Console.WriteLine("Failed to start call: {0}", ec);
   }
}

/// <summary>
/// Function that is called when the call stop button is clicked.
/// This will stop the call that was started earlier.
/// </summary>
/// <param name="sender">Indicates who raised the event.</param>
/// <param name="e">Parameters of the event (not used).</param>
private void btn_CallStop_Click(object sender, EventArgs e)
{
   uint callId = Convert.ToUInt32(tb_CallId.Text);

   TOIErrorCode ec = m_client.StopCall(callId);
   if (ec != TOIErrorCode.OIERROR_OK)
   {
      Console.WriteLine("Failed to stop call: {0}", ec);
   }

   tb_CallId.Text = "";
}
```

```
/// <summary>
/// Function that is called when the call abort button is clicked.
/// This will abort the call that was started earlier.
/// </summary>
/// <param name="sender">Indicates who raised the event.</param>
/// <param name="e">Parameters of the event (not used).</param>
private void btn_CallAbort_Click(object sender, EventArgs e)
{
   uint callId = Convert.ToUInt32(tb_CallId.Text);

   TOIErrorCode ec = m_client.AbortCall(callId);
   if (ec != TOIErrorCode.OIERROR_OK)
   {
      Console.WriteLine("Failed to abort call: {0}", ec);
   }

   tb_CallId.Text = "";
}

/// <summary>
/// Function that is called when the emergency acknowledge button is clicked.
/// This will acknowledge the evac alarm (if present).
/// </summary>
/// <param name="sender">Indicates who raised the event.</param>
/// <param name="e">Parameters of the event (not used).</param>
private void btn_EmergencyAck_Click(object sender, EventArgs e)
{
   TOIErrorCode ec = m_client.AckEvacAlarm();
   if (ec != TOIErrorCode.OIERROR_OK)
   {
      Console.WriteLine("Failed to acknowledge evac alarm: {0}", ec);
   }
}

/// <summary>
/// Function that is called when the emergency reset button is clicked.
/// This will reset the evac alarm and abort all running evac calls.
/// </summary>
/// <param name="sender">Indicates who raised the event.</param>
/// <param name="e">Parameters of the event (not used).</param>
private void btn_EmergencyReset_Click(object sender, EventArgs e)
{
   TOIErrorCode ec = m_client.ResetEvacAlarmEx(true /*bAbortEvacCalls*/);
   if (ec != TOIErrorCode.OIERROR_OK)
   {
      Console.WriteLine("Failed to reset evac alarm: {0}", ec);
   }
}

/// <summary>
/// Function that is called when the all faults acknowledge button is clicked.
/// This will acknowledge all fault events in the system.
/// </summary>
/// <param name="sender">Indicates who raised the event.</param>
/// <param name="e">Parameters of the event (not used).</param>
private void btn_AllFaultsAck_Click(object sender, EventArgs e)
{
   TOIErrorCode ec = m_client.AckAllFaults();
   if (ec != TOIErrorCode.OIERROR_OK)
   {
      Console.WriteLine("Failed to acknowledge all faults: {0}", ec);
   }
}

/// <summary>
/// Function that is called when the all faults reset button is clicked.
/// This will reset all fault events in the system.
/// </summary>
/// <param name="sender">Indicates who raised the event.</param>
/// <param name="e">Parameters of the event (not used).</param>
private void btn_AllFaultsReset_Click(object sender, EventArgs e)
{
```

```
    TOIErrorCode ec = m_client.ResetAllFaults();
    if (ec != TOIErrorCode.OIERROR_OK)
    {
        Console.WriteLine("Failed to reset all faults: {0}", ec);
    }
}

/// <summary>
/// Function that is called when the report fault button is clicked.
/// This will trigger a UserInjectedFault event in the system with the
/// description provided by the user.
/// </summary>
/// <param name="sender">Indicates who raised the event.</param>
/// <param name="e">Parameters of the event (not used).</param>
private void btn_ReportFault_Click(object sender, EventArgs e)
{
    uint eventId = 0;

    TOIErrorCode ec = m_client.ReportFault(tb_UserFault.Text, out eventId);
    if (ec == TOIErrorCode.OIERROR_OK)
    {
        Console.WriteLine("Fault reported, eventId: {0}", eventId);
    }
    else
    {
        Console.WriteLine("Failed to report fault: {0}", ec);
    }
}

/// <summary>
/// Function that is called when the fault acknowledge button is clicked.
/// This will acknowledge a single fault in the system.
/// The user should provide the fault ID.
/// </summary>
/// <param name="sender">Indicates who raised the event.</param>
/// <param name="e">Parameters of the event (not used).</param>
private void btn_FaultAck_Click(object sender, EventArgs e)
{
    TOIErrorCode ec = m_client.AckFault(Convert.ToUInt32(tb_EventId.Text));
    if (ec != TOIErrorCode.OIERROR_OK)
    {
        Console.WriteLine("Failed to acknowledge fault: {0}", ec);
    }
}

/// <summary>
/// Function that is called when the fault resolve button is clicked.
/// This will resolve a single fault in the system.
/// The user should provide the fault ID.
/// </summary>
/// <param name="sender">Indicates who raised the event.</param>
/// <param name="e">Parameters of the event (not used).</param>
private void btn_FaultResolve_Click(object sender, EventArgs e)
{
    TOIErrorCode ec = m_client.ResolveFault(Convert.ToUInt32(tb_EventId.Text));
    if (ec != TOIErrorCode.OIERROR_OK)
    {
        Console.WriteLine("Failed to resolve fault: {0}", ec);
    }
}

/// <summary>
/// Function that is called when the fault reset button is clicked.
/// This will reset a single fault in the system.
/// The user should provide the fault ID.
/// </summary>
/// <param name="sender">Indicates who raised the event.</param>
/// <param name="e">Parameters of the event (not used).</param>
private void btn_FaultReset_Click(object sender, EventArgs e)
{
    TOIErrorCode ec = m_client.ResetFault(Convert.ToUInt32(tb_EventId.Text));
    if (ec != TOIErrorCode.OIERROR_OK)
    {
```

```
            Console.WriteLine("Failed to reset fault: {0}", ec);
        }
    }

    /// <summary>
    /// Function that is called when the call events checkbox is clicked.
    /// This will either subscribe or unsubscribe from call events.
    /// Call events are handled by <see cref="OnDiagEventNotification(object, OIDiagEventEventArgs)"/>.
    /// </summary>
    /// <param name="sender">Indicates who raised the event.</param>
    /// <param name="e">Parameters of the event (not used).</param>
    private void cb_CallEvents_CheckedChanged(object sender, EventArgs e)
    {
        TOIErrorCode ec = m_client.SetSubscriptionEvents(cb_CallEvents.Checked,
            TOIDiagEventGroup.OIDEG_CALLEVENTGROUP);
        if (ec != TOIErrorCode.OIERROR_OK)
        {
            Console.WriteLine("Failed to (un)subscribe to/from call events: {0}", ec);
        }
    }

    /// <summary>
    /// Function that is called when the general events checkbox is clicked.
    /// This will either subscribe or unsubscribe from general events.
    /// General events are handled by <see cref="OnDiagEventNotification(object, OIDiagEventEventArgs)"/>.
    /// </summary>
    /// <param name="sender">Indicates who raised the event.</param>
    /// <param name="e">Parameters of the event (not used).</param>
    private void cb_GeneralEvents_CheckedChanged(object sender, EventArgs e)
    {
        TOIErrorCode ec = m_client.SetSubscriptionEvents(cb_GeneralEvents.Checked,
            TOIDiagEventGroup.OIDEG_GENERALEVENTGROUP);
        if (ec != TOIErrorCode.OIERROR_OK)
        {
            Console.WriteLine("Failed to (un)subscribe to/from general events: {0}", ec);
        }
    }

    /// <summary>
    /// Function that is called when the fault events checkbox is clicked.
    /// This will either subscribe or unsubscribe from fault events.
    /// Fault events are handled by <see cref="OnDiagEventNotification(object, OIDiagEventEventArgs)"/>.
    /// </summary>
    /// <param name="sender">Indicates who raised the event.</param>
    /// <param name="e">Parameters of the event (not used).</param>
    private void cb_FaultEvents_CheckedChanged(object sender, EventArgs e)
    {
        TOIErrorCode ec = m_client.SetSubscriptionEvents(cb_FaultEvents.Checked,
            TOIDiagEventGroup.OIDEG_FAULTEVENTGROUP);
        if (ec != TOIErrorCode.OIERROR_OK)
        {
            Console.WriteLine("Failed to (un)subscribe to/from fault events: {0}", ec);
        }
    }
  }
}
```

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