



A MITEL
PRODUCT
GUIDE

Mitel OpenScape Business

OpenScape Business X1/X1W

OpenScape Business V4

Service Documentation

06/2026

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1 History of changes

Changes mentioned in the following list are cumulative.

Changes in V3R3 FR2

Impacted Chapter	Change Description
<ul style="list-style-type: none"> OCCSB on page 31 	Correction on the values of the LEDs table.

Changes in V3R2

Impacted Chapter	Change Description
<ul style="list-style-type: none"> OpenScape Business X1W Boards on page 22 Integrated Cordless Solution on page 52 System restart for OpenScape Business X1 / X1W on page 62 	Support of X1W System

Changes in V3R1

Impacted Chapter	Change Description
<ul style="list-style-type: none"> System restart for OpenScape Business X1 / X1W on page 62 	Reasons for system restart

1.1 History of improvements/fixes

Changes mentioned in this chapter are cumulative.

Changes in V3R2

Service case ID	Date of change	Description of change	Impacted chapters
PRB000066138	12 May 2023	Added information about the OCCSB mainboard.	OCCSB on page 31

Changes in V3R1

Service case ID	Date of change	Description of change	Impacted chapters
PRB000055651	28 Feb 2022	Added info about the silent calls	Troubleshooting on page 60

2 Introduction and Important Notes

This introduction provides you with an overview of the documentation structure. The introduction should assist you in finding information on selected topics faster. Before you begin with the installation and startup of the communication system, make sure that you have carefully read the safety information and warnings as well as the important notes.

INFO: The safety information and requirements inform you about the safety and other requirements to be observed. The important notes contain information on the emergency behavior, the standards and guidelines for the installation, and the radio frequency interference of the communication system. In addition, you will also find details on and the proper disposal and recycling of the communication system here.

2.1 About this Documentation

This documentation provides you with information on the boards and extensions for the OpenScape Business X™ hardware models.

The information contained in this documentation should only be considered a guideline and does not replace any training.

This document is intended for administrators and service technicians.

For more information beyond the contents of this document, please refer to the *OpenScape Business Administrator Documentation* and the *OpenScape Business Installation Guides*.

2.1.1 Documentation and Target Groups

The documentation for OpenScape Business is intended for various target groups.

Sales and Project Planning

The following documentation is intended for sales and project planning.

- Feature Description

This documentation describes all the features. This document is an extract from the Administrator Documentation.

Installation and Service

The following documentation is intended for service technicians.

- OpenScape Business X1, Installation Guide

This document describes the installation of the hardware and the initial installation of OpenScape Business X1.

- OpenScape Business X1, Service Documentation

This documentation describes the hardware of OpenScape Business X1.

Administration

The following documentation is intended for administrators.

- Administrator Documentation
This documentation describes the configuration of features that are set up using the OpenScape Business Assistant (WBM). The Administrator documentation is available in the system as online help.
- Configuration for Customer Administrators, Administrator Documentation
This documentation describes the configuration of features that can be set up using the OpenScape Business Assistant (WBM) with the **Basic** administrator profile.
- Manager E, Administrator Documentation
This documentation describes the configuration of features that are set up using Manager E.

UC Clients / Telephone User Interfaces (TUI)

The following documentation is intended for UC users.

- myPortal for OpenStage, User Guide
This documentation describes the configuration and operation of myPortal for OpenStage.
- UC Smart Telephone User Interface (TUI), Quick Reference Guide
This documentation describes the voicemail phone menu of the UC solution UC Smart.

2.1.2 Types of Topics

The types of topics include concepts and tasks:

Type of topic	Description
Concept	Explains the "What" and provides an overview of context and background information for specific features, etc.
Task (operating instructions)	Describes task-oriented application cases (i.e., the "How") step-by-step and assumes familiarity with the associated concepts. Tasks can be identified by the title How to ...

2.1.3 Display Conventions

This documentation uses a variety of methods to present different types of information.

Type of information	Presentation	Example
User Interface Elements	Bold	Click OK .
Menu sequence	>	File > Exit
Special emphasis	Bold	Do not delete Name.
Cross-reference text	Italics	You will find more information in the topic <i>Network</i> .
Output	Monospace font, e.g., Courier	Command not found.
Input	Monospace font, e.g., Courier	Enter LOCAL as the file name.
Key combination	Monospace font, e.g., Courier	<Ctrl>+<Alt>+<Esc>

2.2 Safety Information and Warnings

Safety information and warnings indicate situations that can result in death, injury, property damage, and/or data loss.

Work on the communication systems and devices should **only** be performed by personnel with proper qualifications.

Within the context of this safety information and these warnings, qualified personnel are people who are authorized to ground and label systems, devices, and trunks and put them into operation in compliance with the applicable safety regulations and standards.

Make sure you have read and noted the following safety information and warnings before installing and starting up the communication system:

Make sure you also read carefully and follow all safety information and warnings printed on the communication system and devices.

Familiarize yourself with emergency numbers.

Types of Safety Information and Warnings

This documentation uses the following levels for the different types of safety information and warning:



DANGER: Indicates an immediately dangerous situation that will cause death or serious injuries.



WARNING: Indicates a universally dangerous situation that can cause death or serious injuries.



CAUTION: Indicates a dangerous situation that can cause injuries.

NOTICE: Indicates situations that can cause property damage and/or data loss.

Additional symbols for specifying the source of danger more exactly

The following symbol is generally not used in this documentation, but may appear on the devices or packaging.



ESD - electrostatically sensitive devices

2.2.1 Warnings: Danger

"Danger" warnings indicate immediately dangerous situations that will cause death or serious injury.



DANGER: Risk of electric shock through contact with live wires

- Note: Voltages over 30 VAC (alternating current) or 60 VDC (direct current) are dangerous.
- Only personnel with proper qualifications or qualified electricians should perform work on the low-voltage network (<1000 VAC), and all work must comply with the national/local requirements for electrical connections.

2.2.2 Warnings: Warning

"Warnings" indicate universal dangerous situations that can cause death or serious injury.



WARNING: Risk of electric shock through contact with live wires

- Only use systems, tools and equipment which are in perfect condition. Do not use equipment with visible damage.
- Replace any damaged safety equipment (covers, labels and ground wires) immediately.
- Replace the power cable immediately if it appears to be damaged.
- The communication systems and servers should only be operated with outlets that have connected ground contacts.
- During a thunderstorm, do not connect or disconnect lines and do not install or remove boards.
- Disconnect all power supply circuits if you do not require power for certain activities (for example, when changing cables).

Before starting any work, make sure that the communication system is de-energized. Never take it for granted that all circuits have reliably been disconnected from the power supply when a fuse or a main switch has been switched off.

- Expect leakage current from the telecommunications network. Disconnect all telecommunication cables from the communication system.
- So long as the power supply is switched on, always observe the greatest caution when performing measurements on powered components and maintenance work on boards and covers.

Metallic surfaces such as mirrors are conductive. If you touch them, there is a risk of electric shocks or short circuits.

2.2.3 Warnings: Caution

"Caution" warnings indicate a dangerous situation that can result in injury.



CAUTION: Risk of explosion caused by the incorrect replacement of batteries

- The lithium battery should only be replaced with an identical battery or one recommended by the manufacturer.
-



CAUTION: Fire hazard

- Only use communication lines with a conductor diameter of 0.4 mm (AWG 26) or more.
-



CAUTION: General risk of injury or accidents in the workplace

- After completing test and maintenance work, make sure that all safety equipment is re-installed in the right place and that all covers and the housing are closed.
 - Install cables in such a way that they do not pose a risk of an accident (tripping), and cannot be damaged.
 - When working on an open communication system or server, make sure that it is never left unattended.
 - Use appropriate tools to lift heavy objects or loads.
 - Check your tools regularly. Only use intact tools.
 - When working on the systems, never wear loose clothing and always tie back long hair.
 - Do not wear jewelry, metal watchbands or clothes with metal ornaments or rivets.
 - Always wear the necessary eye protection whenever appropriate.
 - Always wear a hard hat where there is a risk of injury from falling objects.
 - Make sure that the work area is well lit and tidy.
-

2.2.4 Warnings: Note

"Note" warnings are used to indicate situations that could result in property damage and/or data loss.

The following contains important information on how to avoid property damage and/or data loss:

- Before placing the system into operation, check whether the nominal voltage of the mains power supply corresponds to the nominal voltage of the communication system or server (type plate).
- Follow these ESD measures to protect the electrostatically sensitive devices:
 - Always wear the antistatic wristband in the prescribed manner before performing any work on PC boards and modules.
 - Always place PC boards and modules on a grounded conductive base.
 - Make sure that the components of the communication system (e.g., the boards) are transported and shipped only in the appropriate packaging.
- Use only original accessories. Failure to comply with this safety information may damage the system equipment or violate safety and EMC regulations.
- Sudden changes in temperature can result in condensing humidity. If a communication system or server is transported from a cold environment to warmer areas, for example, this could result in the condensation of humidity. Wait until the communication system or server has adjusted to the ambient temperature and is completely dry before starting it up.
- Connect all cables only to the specified connection points.
- If no emergency backup power supply is available or if no switchover to emergency analog phones is possible in the event of a power failure, then no emergency calls can be made via the communication system following a power failure.
- Before starting wall mounting, check that the wall has sufficient load bearing capacity. Always use suitable installation and mounting materials to mount the communication systems and devices securely.
- Do not allow easily flammable materials to be stored in or near the room where the communication system is installed.

2.2.5 Country-specific Safety Information

Here, you will find information on the specific safety precautions to be observed when installing, starting up and operating the communication systems in certain countries.

2.2.5.1 Safety Information for Australia

The following safety precautions must always be observed when installing, starting up and operating the communication system in Australia:

- The communication system must be installed and serviced only by authorized personnel.
- The communication system must be installed near the mains socket outlet that supplies power to it. The wall socket shall be readily accessible. The integrity of the wall socket must be assured.

Introduction and Important Notes

Important Notes

- The communication system must always be configured to allow emergency calls (for example, 000) to be made at all times.
- If no emergency backup power supply is available or if no switchover to emergency analog phones (trunk failure transfer) is possible in the event of a power failure, then no emergency calls can be made via the communication system following a power failure).
- Music on Hold and paging devices must be connected to the communication system via a Line Isolation Unit approved by the Australian Communications Authority (ACA).

2.3 Important Notes

The important notes inform you about emergency procedures and the proper disposal, recycling, intended use and operating conditions of the communication systems and servers. In addition, they also include details concerning the standards and guidelines for the installation, the radio interference characteristics of the communication systems, and data protection and data security.

2.3.1 Emergencies

This section provides information on how to proceed in an emergency.

What To Do In An Emergency

First Aid

Calling for Help

Reporting Accidents

- In the event of an accident, remain calm and controlled.
- Always switch off the power supply before you touch an accident victim.
- If you are not able to immediately switch off the power supply, only touch the victim with non-conductive materials (such as a wooden broom handle), and first of all try to isolate the victim from the power supply.
- Be familiar with basic first aid procedures for electrical shock. A fundamental knowledge of the various resuscitation methods if the victim has stopped breathing or if the victim's heart is no longer beating, as well as first aid for treating burns, is absolutely necessary in such emergencies.
- If the victim is not breathing, immediately perform mouth-to-mouth or mouth-to-nose resuscitation.
- If you have appropriate training, immediately perform heart massage if the victim's heart is not beating.

Immediately call an ambulance or an emergency physician. Provide the following information in the following sequence:

- Where did the accident happen?
- What happened?
- How many people were injured?

- What type of injuries?
- Wait for questions.
- Immediately report all accidents, near accidents and potential sources of danger to your manager.
- Report all electrical shocks, no matter how small.

2.3.2 Proper Use

The communication systems and servers may only be used as described in this documentation and only in conjunction with add-on devices and components recommended and approved by Unify Software and Solutions GmbH & Co. KG.

The prerequisites for the proper use of the communication systems and servers include proper transportation, storage, installation, startup, operation and maintenance of the system.

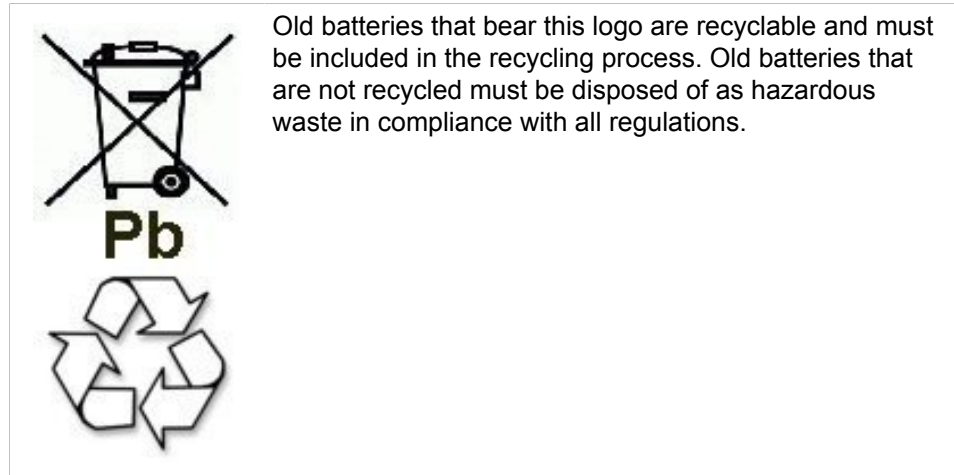
NOTICE: Clean the housing of the communication system and server only with a soft, slightly damp cloth. Do not use any abrasive cleaners or scouring pads.

2.3.3 Correct Disposal and Recycling

Please read the information on the correct disposal and recycling of electrical and electronic equipment and old batteries.



All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities. The correct disposal and separate collection of your old appliance will help prevent potential negative consequences for the environment and human health. It is a precondition for reuse and recycling of used electrical and electronic equipment. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service, the shop where you purchased the product or your sales representative. The statements quoted above are only fully valid for equipment which is installed and sold in the countries of the European Union and is covered by the directive 2012/19/EU. Countries outside the European Union may have other regulations regarding the disposal of electrical and electronic equipment.



2.3.4 Installation Standards and Guidelines

This section provides information on the specifications you must comply with when connecting the communication systems and servers to the power supply circuit and when using shielded cabling for LAN and WAN connectors.

2.3.4.1 Connecting OpenScape Business X to the Power Supply Circuit

The OpenScape Business X communication systems have been approved for connection to TN-S power supply systems. They can also be connected to a TN-C-S power supply system in which the PEN conductor is divided into a ground wire and a neutral wire. TN-S and TN-C-S systems are defined in the IEC 60364-1 and IEC60364-5-51 standard.

Only qualified electricians should perform any work that may be required on the low-voltage network. These installation activities to connect the communication systems must be performed in compliance with IEC 60364-1 and IEC 60364-4-41 or any corresponding legal norms or national regulations.

2.3.4.2 Shielded Cabling for LAN and WAN Connections of OpenScape Business X

Compliance with CE requirements on electromagnetic compatibility in the OpenScape Business X communication systems and their LAN and WAN connections is subject to the following conditions:

- The communication systems should only be operated using shielded connection cables. This means that a shielded Category 5 (CAT.5) cable with a length of at least 3 m should be used between the shielded LAN and WAN sockets of the communication systems and the building installation port or the external active component port. The cable shield must be grounded at the building installation end or the external active component end (connection to the building's potential equalization terminal).
- A shielded Category 5 (CAT.5) cable should also be used for shorter connections with external active components (LAN switch or similar). However, the active component must feature a shielded LAN connection

with a grounded shield connection (connection to the building's potential equalization terminal).

- The shield properties of the cable components should at least satisfy the requirements of the European standard EN 50173-1^{*)} "Information technology - Generic cabling systems" (and all references specified).^{***)}
- Building installations that are fitted with shielded symmetrical copper cables throughout in accordance with the Class-D requirements^{**)} of EN 50173-1 satisfy the above condition.^{***)}

2.3.4.3 Fire Safety Requirements

Fire safety requirements are defined on a country-specific basis in the building regulations. Please follow the valid regulations for your country.

To ensure the legal fire protection and EMC requirements, operate the OpenScape Business X communication systems only when closed. The system may only be opened temporarily for installation and maintenance purposes.

OpenScape Business system cables comply with the requirements of international norm IEC 60332-1 regarding flammability. The following norms contain similar requirements regarding cables:

IEC 60332-1 Note: IEC 60332-1 is equivalent to test method UL VW-1	EN 60332-1-1 and EN 60332-2-1	DIN EN 60332-1-1 (VDE 0482-332-1-1) and DIN EN 60332-2-1 (VDE 0482-332-2-1)
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The division responsible for project planning and service must check whether the IEC 60332-1 norm complies sufficiently with the relevant building regulation and any other applicable regulations.

2.3.4.4 Lightning Protection Requirements

The protection of communication systems against high-energy surges requires a low-impedance ground connection in accordance with the specifications in the *OpenScape Business Installation Guide*.

NOTICE: Fire hazard due to surge voltage

^{*)} The European standard EN 50173-1 is derived from the international standard ISO/IEC 11801.

^{**)} Class-D is reached, for instance, if Category-5 (CAT.5) components (cables, wall outlets, connection cables, etc.) are installed.

^{***)} UTP cables (U.S. standard EIA/TIA 568 A/B) are the most widely used cables on the North American market; this has the following implications for the LAN and WAN connections in communication systems: The systems may only be operated with shielded connection cables. This means that a shielded Category 5 (CAT.5) cable with a length of at least 3 m should be used between the shielded LAN and WAN sockets of the communication systems and the building installation port or the external active component port. The cable shield must be grounded at the building installation end or the external active component end (connection to the building's potential equalization terminal).

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Telecom lines which are over 500m in length or which must leave the building must be conducted through an additional external lightning protection.

Lightning protection of this kind is known as additional primary protection. The additional primary protection is guaranteed by the professional installation of ÜSAGs (surge arresters, gas filled) in the main distribution frame, the patch panel or at the entry point of the pipe in the building. A gas-filled surge arrester with 230 V nominal voltage is switched to ground from each wire that is to be protected.

Without this additional primary protection, lightning could irreparably damage the boards. This can cause the entire communication system to fail or result in components overheating (fire hazard).

NOTICE: Once a communication system has been grounded, check the low-impedance ground connection of the system using the ground conductor of the mains power supply circuit and the low-impedance connection (of the additional permanently-connected protective ground conductor) to the building's potential equalization bus.

2.3.4.5 Markings for OpenScape Business X



The compliance of the equipment according to EU directives is confirmed by the CE mark. This Declaration of Conformity and, where applicable, other existing declarations of conformity as well as further information on regulations that restrict the usage of substances or affect the declaration of substances used in products can be found in the Unify Expert WIKI at <http://wiki.unify.com> under the section "Declarations of Conformity".

2.3.5 Notes on Electromagnetic and Radio Frequency Interference of OpenScape Business X

The OpenScape Business X communication systems are Class B devices in accordance with EN 55032.

2.3.6 Data Protection and Data Security

Please note the details below with respect to protecting data and ensuring privacy.

The communication systems and servers described in this documentation process and use personal data for purposes such as call detail recording, displays, and customer data acquisition.

In Germany, the processing and use of such data is subject to various regulations, including those of the Federal Data Protection Law (Bundesdatenschutzgesetz, BDSG). For other countries, please follow the appropriate national laws.

The aim of data protection is to protect the rights of individuals from being adversely affected by use of their personal data.

In addition, the aim of data protection is to prevent the misuse of data when it is processed and to ensure that one's own interests and the interests of other parties which need to be protected are not affected.

INFO: The customer is responsible for ensuring that the communication systems and servers are installed, operated and maintained in accordance with all applicable labor laws and regulations and all laws and regulations relating to data protection, privacy and safe labor environment.

Employees of Unify Software and Solutions GmbH & Co. KG are bound to safeguard trade secrets and personal data under the terms of the company's work rules.

In order to ensure that the statutory requirements are consistently met during service – whether on-site or remote – you should always observe the following rules. You will not only protect the interests of your and our customers, you will also avoid personal consequences.

A conscientious and responsible approach helps protect data and ensure privacy:

- Ensure that only authorized persons have access to customer data.
- Take full advantage of password assignment options; never give passwords to an unauthorized person orally or in writing.
- Ensure that no unauthorized person is able to process (store, modify, transmit, disable, delete) or use customer data in any way.
- Prevent unauthorized persons from gaining access to storage media such as backup CDs and DVDs or log printouts. This applies to service calls as well as to storage and transport.
- Ensure that storage media which are no longer required are completely destroyed. Ensure that no sensitive documents are left unprotected.
- Work closely with your customer contact; this promotes trust and reduces your workload.

2.3.7 Technical Regulations and Conformity of OpenScape Business X

Details on how the OpenScape Business X communication systems meet conformity requirements can be found here.

2.3.7.1 CE Conformity

The CE certification is based on: 2014/35/EU - Low Voltage Directive (LVD); (Official Journal of the EU L96, 29.03.2014, p. 357-374) 2014/30/EU - Electromagnetic Compatibility Directive (EMC); (Official Journal of the EU L96, 29.03.2014, p. 79-106) 2011/65/EU - Restriction of the use of certain Hazardous Substances Directive (RoHS); (Official Journal of the EU L174, 01.07.2011, p. 88–110)

	Standards reference
Safety	EN 62368-1
Electromagnetic Compatibility EMC	EN55032 (EMC Emission) EN55024 (EMC Immunity Residential)

2.3.7.2 Conformity with International Standards

	Standards reference
Safety	IEC 60950-1 and IEC 62368-1
EMC Emission	CISPR 32

2.3.8 Operating Conditions

Note the environmental and mechanical conditions for operating OpenScape Business X1.

Environmental Operating Conditions

Operating limits:

- Room temperature: + 5 to + 40 °C (41 to 104 °F)
- Absolute humidity: 1 to 25 g H₂O/m³
- Relative humidity: 5 to 80%

Ventilation of the communication system is by convection only.

NOTICE: Damage caused by local temperature increases

Avoid exposing the communication systems to direct sunlight and other sources of heat.

NOTICE: Damage caused by condensation due to humidity

Avoid any condensation of humidity on or in the communication systems before or during operation under all circumstances.

A communication system must be completely dry before you put it into service.

Mechanical Operating Conditions

The communication systems are intended for stationary use.

3 OpenScape Business X1

OpenScape Business X1 is a communication system which can be wall mounted.



Figure 1: OpenScape Business X1

Telephones, trunks, etc. are directly connected to the mainboard.



The power supply unit (PSU) is integrated in the housing on the right. No further components are required for permanent AC power supply operation.

Construction data

- Dimensions (height x width x depth): approx. 470 mm x 370 mm x 80 mm
- Weight: 2.8 kg

Ringer Equivalence Number (Type Plate)

- 0.7 A / 100 - 240 VAC
- 50 - 60 Hz

4 Boards

The HW contains the mainboard (X1: OCCS) plus optional modules.

4.1 Overview of Modules

All boards that are either built in into the base box of a OpenScape Business communication systems or that can be ordered as an expansion are listed below by their function.

Boards within the current portfolio

These boards can actually be ordered separately or only in combination with a system box.

A distinction between the types of boards according to the explanation above is made:

- Central boards
- Peripheral boards
- Options

Boards and Devices Being Phased Out

These boards and devices can no longer be ordered. However, they can still be used in the communication systems of the OpenScape Business communication platform.

Non-Supported Boards

These boards cannot be used in the communication systems of the OpenScape Business communication platform for technical reasons. These boards must be removed when migrating from HiPath 3000 / 500 to OpenScape Business. If required, the respective follow-up board can be used instead.

Refer to the topic Migration in the OpenScape Business Administrator Documentation for detailed information on the boards that are not supported.

Central Boards

All central boards that can be ordered for the communication systems, either separately or in combination with the system box, of the OpenScape Business communication platform are listed below.

NOTICE: Only the power supply units listed in the table below and those listed under Boards being phased out (see OpenScape Business, Administrator Documentation, Migration) ensure the safe operation of all communication systems of the OpenScape Business communication platform. Any power supply units not listed there must be replaced.

Table 1: Central Boards and Modules

Board	Part Number	Used in	Function
OCCS	S30810-Q2958-X	X1	Mainboard (central control board) with one WAN and one LAN interface, 8 UP0/E and 4 a/b subscriber line interfaces and 2 S0 trunk/subscriber line interfaces
CMAe	S30807-Q6957-X	X1	Provisioning of ADPCM conversion and echo cancellation for DECT Light (integrated cordless solution)

Peripheral boards

No peripheral boards exist for OpenScape Business X1. All devices are directly connected to the mainboard. Trunks are also directly connected to the mainboard.

Options

All options that can be ordered for OpenScape Business X1 are listed below.

Table 2: Options

Option	Part Number	Used in	Function
MUSIC plugin module	S30122-K7275-T	X1	Module that provides MOH (Music On Hold)
ET-S	S30122-K7696-T313	X1	Adapter box with amplifier for connecting an entrance telephone

4.2 OCCS

OCCS (Open Core Controller Small) is the central control board (mainboard) of the OpenScape Business X1 communication system.

The SD card slot contains the SDHC (Secure Digital High Capacity) card with the current software of the communication system.

NOTICE: The SDHC card must never be removed or inserted while the communication system is up and running. Otherwise, there may be damage to the file system and thus result in the failure of the communication system.

Boards

Board Variants and their Use

Board	Part Number	Used in		Maximum number
		Communication system	Country	
OCCS	S30810-Q2958-X	OpenScape Business X1	CE and South Africa	1

Figures

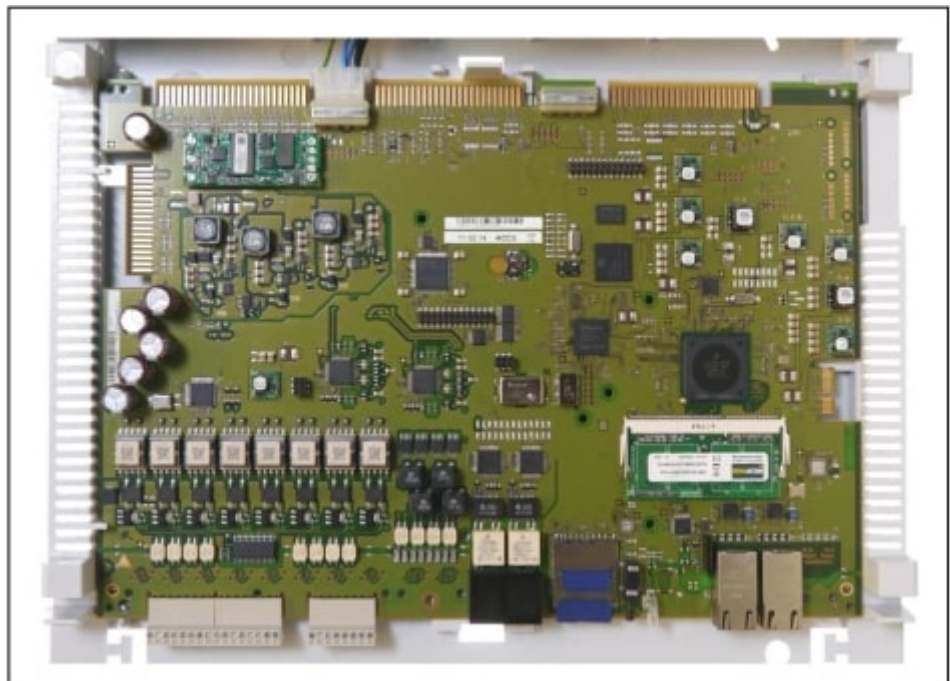


Figure 2: OCCS

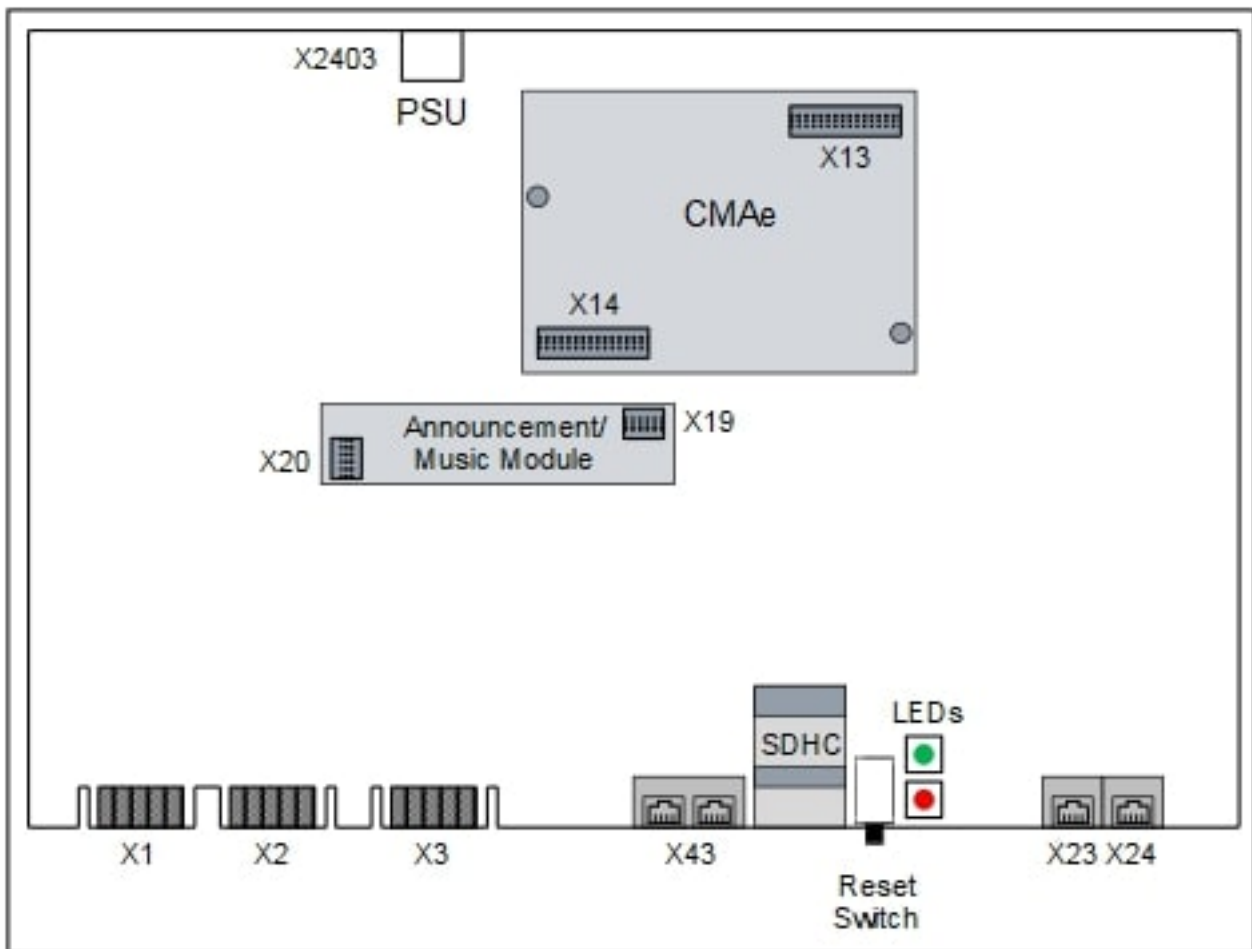


Figure 3: OCCS - Connections

Temperature Monitoring

The temperature of the system is monitored. At temperatures higher than 61 degrees Celsius, a notification is sent to a system telephone with a display, by e-mail or through signaling via an SNMP trap. Entries are made in the event log and event viewer (client trace) only if the system exceeds or falls below the critical temperatures. Logging occurs in the message log so long as the value is less than or equal to 58° Celsius.

At temperatures above 66 °C, the message "Alarm: critical system temperature!" is displayed on the home page of the OpenScape Business Assistant (WBM). The system must be restarted to clear the alarm.

Connectors

NOTICE:

Fire hazard due to surge voltage

Only for the $U_{P0/E}$, a/b and S_0 interfaces used for the station connection: In the case of line lengths exceeding 500 m and where the lines exit the building, the OCCS board must be protected by external lightning protection.

Lightning protection of this kind is known as additional primary protection. The additional primary protection is guaranteed by installing ÜSAGs (surge arresters, gas filled) in the patch panel or at the entry point of the pipe in the building. A gas-filled surge arrester with 230 V nominal voltage is switched to ground from each wire that is to be protected.

- X1, X2 = 8 U_{P0/E} interfaces (edge connectors)

U_{P0/E} interface for

- U_{P0/E} phones (e.g., OpenStage T) and
- DECT base stations for DECT Light (integrated cordless solution).

To connect the base stations, the U_{P0/E} interfaces 2 through 8 must be used.

For further information, see *Administrator Documentation, Integrated Cordless Solution*.

- X3 = 4 a/b interfaces (edge connectors)

a/b interface for analog devices such as fax, modem, etc.

The interfaces supply a ring voltage of approx. 65 V_{eff}.

Calling name identification presentation (CLIP) is supported.

The connection of external extensions is not possible.

- X43 = 2 S₀ interfaces (RJ45 jacks)

The S₀ interfaces can be used for the ISDN trunk connection (ISDN trunk) or the ISDN station connections (ISDN phones, Fax Group 4, etc.).

The RJ45 jacks are wired for the direct connection of ISDN trunk lines. A twisted ISDN patch cable must be used for the station connection or the Receive and Transmit wires of the ISDN cables must be reversed.

The ISDN phones to be connected must have a separate power source, e.g., via a power adapter. It is not possible to obtain power via the S₀ ports of the central control board.

- X23, X24 = 2 Ethernet (10/100/1000 BaseT) ports (RJ45 jacks)

Two LEDs indicate the current status of each Ethernet interface.

Table 3: OCCS - LEDs for Indicating the Ethernet Interface Status

Left LED (Speed)	Right LED (Link/Activity)	Meaning
off	–	10 Mbps connection
steady green light	–	100 Mbps connection
steady yellow light	–	1,000-Mbps connection
–	flashing green light	Activity

Left LED (Speed)	Right LED (Link/Activity)	Meaning
–	off	No connection/activity

- X23 = WAN connection

To connect to an ITSP, for example, using DSL (PPPOE or PPTP protocol). The WAN can be connected to the DSL modem either directly or via a router.

- X24 = LAN connection

For linking into the LAN infrastructure of the customer (e.g., for connection to a LAN switch), for connecting an Internet router, a WLAN Access Point or the direct connection of an IP phone or PC client.

Subboards

NOTICE: Place the mainboard on a flat surface before inserting a subboard. Otherwise you may damage the mainboard.

The spacing bolts supplied guarantee the correct positioning of a subboard, so you should always mount them.

The following optional subboards can be used depending on the application:

- CMAe (Clock Module with ADPCM enhanced)

CMAe is used in combination with DECT Light (integrated cordless solution). It provides the functions for ADPCM conversion and echo cancellation.

The subboard is plugged into the X13 and X14 connector strips on the OCCS board. The DECT base stations must be connected to the U_{P0/E} interfaces 2 through 8 of the mainboard.

If no CMAe is installed, a maximum of two calls can be conducted per base station. In this case, ADPCM conversion is performed directly by the DECT base station, but echo cancellation is not directly supported. In case that echo cancellation is required a CMAe subboard is needed.

- Announcement and Music Modules

The following modules are available:

- EXMR

The subboard enables the connection of an external music source and thus the provisioning of announcements and music on hold (MOH).

- MUSIC plugin module

The subboard provides music on hold (MOH).

The announcement and music module is plugged into the socket terminal strips X19 and X20 on the OCCS.

Power Supply Unit

The power is supplied via an integrated power supply unit (additional PSU module) in the housing with a power cord (2 m). The connection cable of the power supply is plugged into the X2403 socket of the mainboard and secured with two "PSU pins" (expanding rivets made of plastic).

Reset Switch

The board includes a reset switch with the following functions.

Table 4: OCCS - Functions of the Reset Switch

Reset switch is pressed	Result	Red LED
< 5 s	The communication system performs a controlled restart (similar to pressing the Reset button on a PC). The communication system will be operational again after the startup.	on
> 5 s and < 10 s	A controlled shutdown of the communication system is performed.	off
> 10 s	A reload is initiated on the communication system. The communication system reverts to the initial (default) state following startup. All country and customer-specific settings are lost (system country code = Germany). Country- and customer-specific data backups can be reloaded once the basic settings have been configured.	on

Immediately after releasing the reset switch, the selected function (restart, shutdown or reload) is executed.

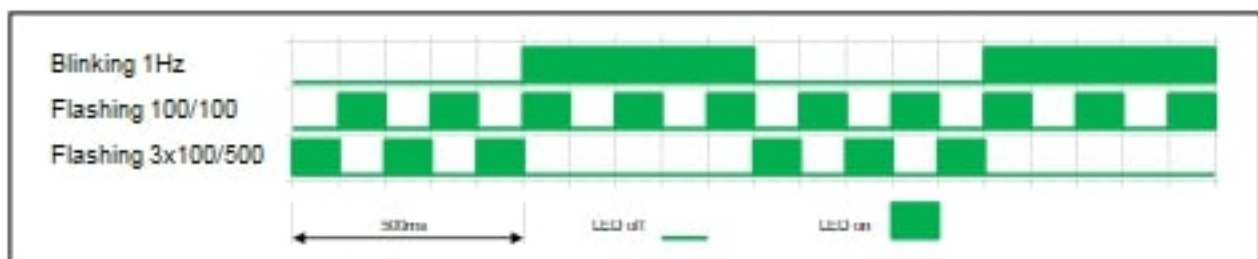
LEDs

The board features two LEDs that indicate the operating states.

Table 5: OCCS - LED Statuses and their Meanings

Green LED	Red LED	Meaning
off	on	Default state after the communication system is connected to the power supply (< 1 s)
flickering 2500/ 250	flickering 250/ 2500	The SDHC card must not be inserted.
on	off	UBOOT (Universal Boot Loader) startup. The LED states do not change until the UBOOT startup has been completed.
on	flashing	Only if a SW update is available: UBOOT: FW update process is running. The system must be disconnected from the mains. After the startup is completed, a restart is automatically performed.

Green LED	Red LED	Meaning
off	on	The UBOOT startup was stopped. A system error has occurred (e.g., the write protection of the SDHC card is enabled). The Linux startup is not possible. The system error can be read via a console on a PC that is connected to the USB control interface.
off	off	The UBOOT startup has completed.
on	off	Linux startup
on	on	The Linux startup has completed. The system is starting.
flickering 3x100/ 500	on	Feature Process Startup Procedure starting.
flickering 3x100/ 500	off	LAN Device Handler Startup Procedure starting.
flashing	off	Normal operating state (1 Hz)
flashing	on	The reset switch was pressed during normal operation. The assigned function (Restart/Shutdown/Reload) is executed as soon as the button is pressed, and the Green LED stops flashing.
	off	
	on	
off	on	The system shutdown has been completed. The system must be disconnected from the power supply. This status is shown after system shutdown. It must not be confused with the system error status Green LED: off - Red LED: on , which is shown during UBOOT startup, in order to indicate that "UBOOT startup was stopped".
off	off	No power



Pin Assignments

Table 6: OCCS - Pin Assignments of the X1 and X2 Edge Connectors (U_{P0/E} Interfaces)

X1			X2		
Pin	Signal	Description	Pin	Signal	Description
1	1b	U _{P0/E} interface 1	1	5b	U _{P0/E} interface 5
2	1a		2	5a	
3	2b	U _{P0/E} interface 2	3	6b	U _{P0/E} interface 6
4	2a		4	6a	
5	3b	U _{P0/E} interface 3	5	7b	U _{P0/E} interface 7
6	3a		6	7a	
7	4b	U _{P0/E} interface 4	7	8b	U _{P0/E} interface 8
8	4a		8	8a	

Table 7: OCCS - Pin Assignments of the X3 Edge Connector (a/b Interfaces)

Pin	Signal	Description
1	1a	a/b interface 1
2	1b	
3	2a	a/b interface 2
4	2b	
5	3a	a/b interface 3
6	3b	
7	4a	a/b interface 4
8	4b	

Table 8: OCCS - Pin Assignments of the X43 RJ45 Jacks (S₀ Interfaces)

X13		
Pin	Signal	Description
1	–	Not used
2	–	Not used
3	Ta	Transmit +
4	Ra	Receive +
5	Rb	Receive –
6	Tb	Transmit –
7	–	Not used
8	–	Not used

Table 9: OCCS - Pin Assignments of the X23 and X24 RJ45 Connectors (Ethernet Interfaces), Depending on the Connection

Pin	10/100BaseT		1000BaseT	
	Signal	Description	Signal	Description
1	Tx +	Transmit +	Tx A +	Pair A: Transmit +
2	Tx –	Transmit –	Tx A –	Pair A: Transmit -
3	Rx +	Receive +	Tx B +	Pair B: Transmit +
4	–	Not used	Tx C +	Pair C: Transmit +
5	–	Not used	Tx C –	Pair C: Transmit -
6	Rx –	Receive –	Tx B –	Pair B: Transmit -
7	–	Not used	Tx D +	Pair D: Transmit +
8	–	Not used	Tx D –	Pair D: Transmit -

4.3 OCCSB

OCCSB (Open Core Controller Small Basic) is the central control board (mainboard) of the OpenScape Business X1W communication system.

The OCCSB requires M.2 SATA SSD (SATA Solid State Drive) containing the current system SW. SW version V3R1 or higher is required for operation.

NOTICE: The M.2 SATA SSD module can only be plugged or removed if the mainboard is not inserted in the system. In case of a system in operation, the system needs to be turned off.

Board Variants and their Use

Board	Part Number	Used in		Maximum number
		Communication system	Country	
OCCSB	S30810-K2965-S	OpenScape Business X1W	CE and South Africa	1

Figures

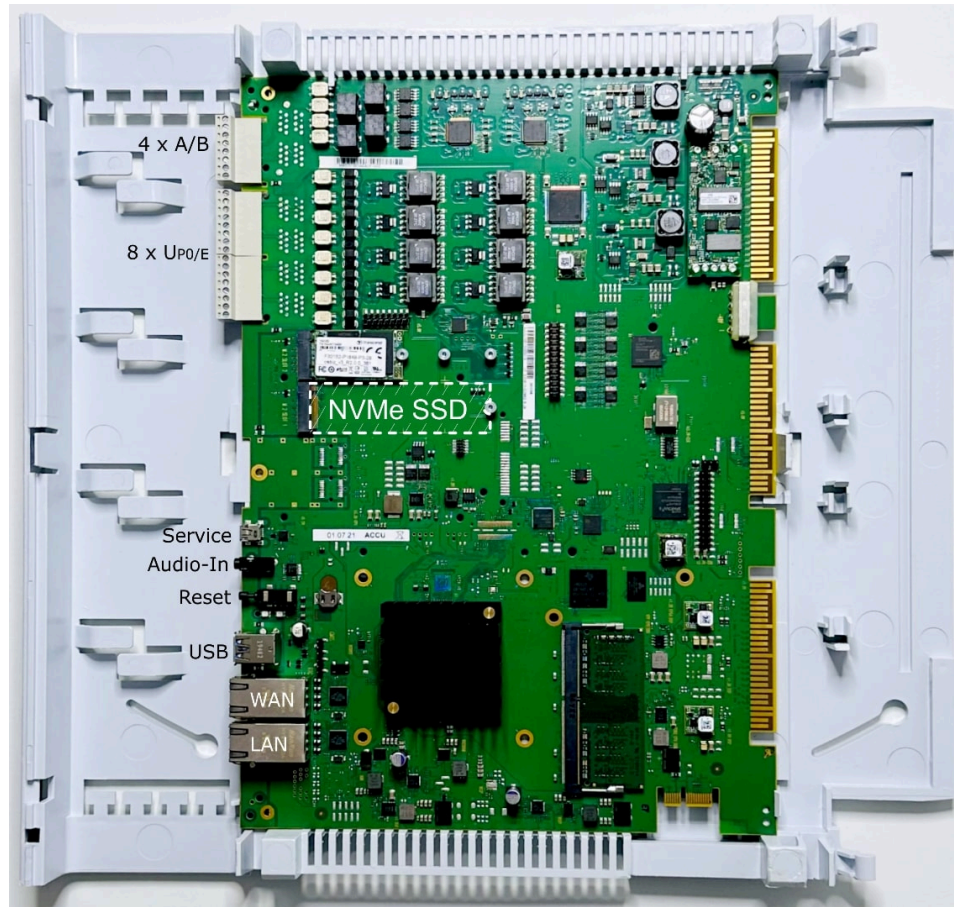


Figure 4: OCCSB

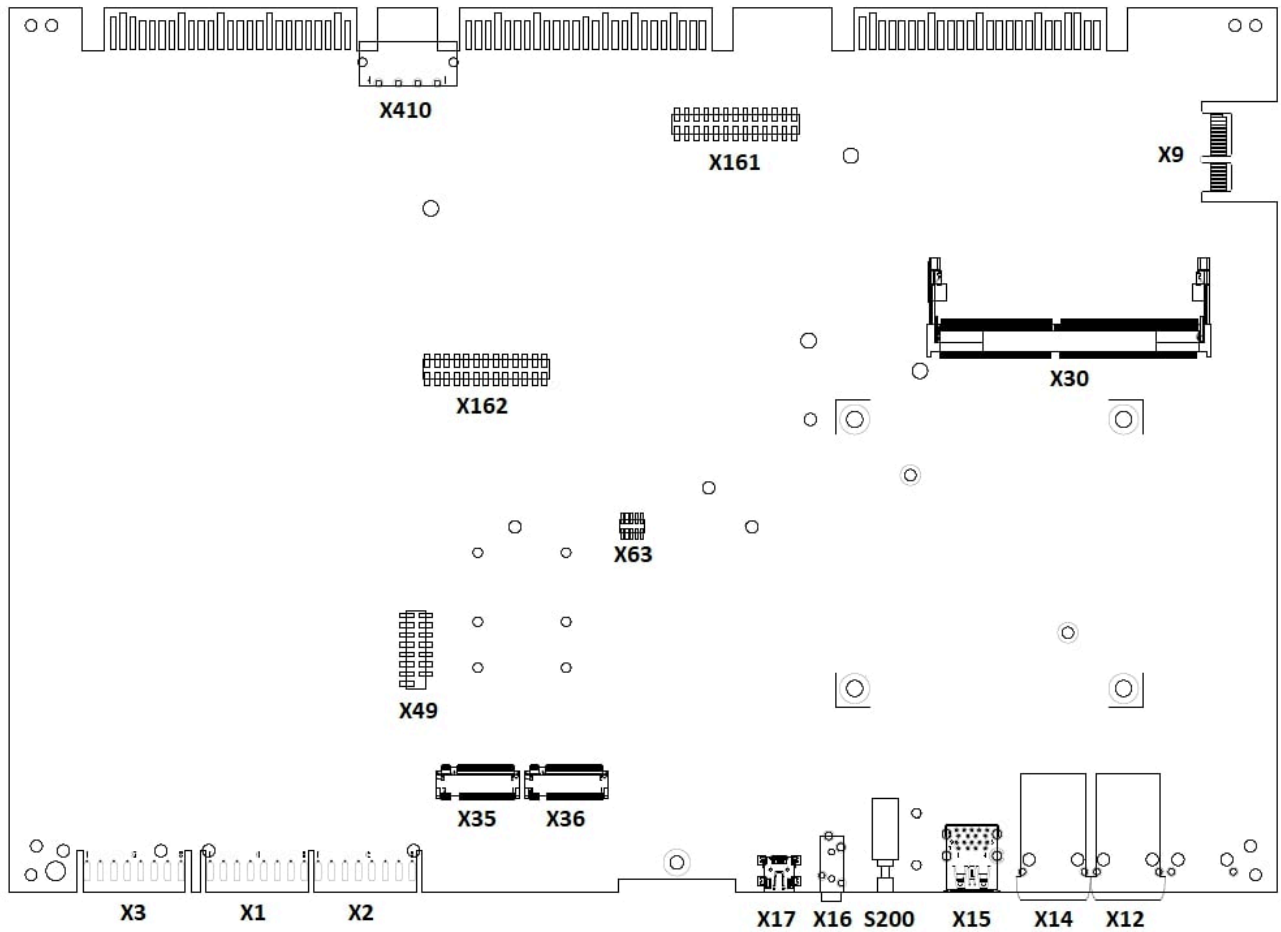


Figure 5: OCCSB - Connections

Temperature Monitoring

The temperature of the system is monitored by two sensors on the OCCSB mainboard. The first sensor monitors the system temperature. The second sensor is built in the CPU and monitors the CPU core temperature. System SW handles both sensors as a logical "OR" connection. In case that certain thresholds are exceeded, the system SW reacts as follows:

Boards

System temperature	CPU temperature	System Status	SW reaction	Notification via
Above 60°C	Above 83°C	Warning	In case that the temperature exceeds 60°C/83°C a “Warning” notification can be sent to up to three system telephones, by e-mail or through signaling via an SNMP trap (FP_EVT_ADM_019). No Entries are made in the event log and event viewer (client trace) in case of a warning.	<ul style="list-style-type: none"> • Telephone display • e-mail • SNMP Trap
Above 65°C	Above 88°C	Critical	If the temperature exceeds 65°C/88°C the message <code>Alarm: critical system temperature!</code> is displayed on the Home Page of the OpenScope Business Assistant (WBM). Entries are made in the event log and event viewer (client trace) if the system exceeds or falls below the critical temperature threshold. Logging occurs in the message log so long as the value is less than or equal to 59° Celsius.	<ul style="list-style-type: none"> Event log viewer Event log file WBM Homepage Message log file
Below 59°C	Below 82°C	Normal	Alarms are cleared Logging in the message log is stopped	

NOTICE: When the CPU reaches the **critical temperature**, it automatically starts to reduce all cores frequencies to the minimum, to reduce the heat emission.

Connectors

Fire hazard due to surge voltage.

Only for the U_{P0/E} and a/b interfaces used for the station connection: In the case of line lengths exceeding 500 m and where the lines exit the building, the OCCSB board must be protected by external lightning protection.

Lightning protection of this kind is known as additional primary protection. The additional primary protection is guaranteed by installing USAGs (surge arresters, gas filled) in the main distribution frame, the patch panel or at the entry point of the pipe in the building. A gas-filled surge arrester with 230 V nominal voltage is switched to ground from each wire that is to be protected.

- X1, X2 = 8 UP0/E interfaces (edge connectors)

The following can be connected

- UP0/E phones (e.g., OpenScape Desk Phone CP T) and
- DECT base stations for DECT Light (integrated cordless solution).

To connect the base stations, the UP0/E interfaces 2 through 8 must be used.

- X3 = 4 a/b interfaces (edge connectors)

Analog phones and devices (fax, modem, etc.) can be connected.

The a/b interfaces supply a ring voltage of approx. 65 Vrms.

Calling name identification presentation (CLIP) is supported.

The connection of external extensions is not possible.

- X 17, Service = USB device port, Mini B jack (USB 1.1, up to 2 Mbit/s)

To connect a PC for service and diagnostic purposes.

- X16, Audio In = Analog audio in port, 3.5 mm audio jack

To connect an external audio device for Music on Hold.

- X15 USB = 2x USB host ports, Standard A jacks for connecting an external hard disk or USB stick for backups and software upgrades or recovery installations.

- OCCSB: 2x USB 3.0

- X12, X14 = 2 Ethernet (10/100/1000 BaseT) ports (RJ45 jacks)

Two LEDs indicate the current status of each Ethernet interface.

INFO: It is recommended to operate X14 and X12 interface with 100 Mbps at least to ensure the transmission quality of VoIP traffic.

Table 10: OCCSB – LEDs for Indicating the Ethernet Interface Status

Left LED	Right LED	Description
off	Blink green light	Activity 1000 Mbps
Blink orange light	Blink green light	Activity 100 Mbps
Blink orange light	off	Activity 10 Mbps
off	off	No link, no activity
off	Solid green light	Link 1000 Mbps
Solid orange light	Solid green light	Link 100 Mbps
Solid orange light	off	Link 10 Mbps

- X12, LAN= Ethernet port, RJ45 jack (10/100/1000 BaseT) ports
For linking into the LAN infrastructure of the customer, for connecting a WLAN Access Point, an additional LAN switch of the direct connection of an IP phone or PC client.
- X14 WAN = Ethernet port, RJ45 jack (10/100/1000 BaseT)
To connect to an ITSP, for example, using DSL (PPOE or PPTP protocol). The WAN can be connected to the DSL modem either directly or via a router.

NOTICE: All Ethernet ports support only Full Duplex mode.

- X49 Connection to STRB module
- X55 = Clear RTC - 3 pin connector strip to reset the real time clock (RTC).
Jumper must be set on pins 1-2 for normal operation (factory delivery default). Settings jumper on pins 2-3 for 10 seconds clears the RTC.

NOTICE: After an RTC reset of a mainboard which is operated in a customer system, the system time needs to be actualized afterwards using the OpenScape Business Assistant (WBM). Otherwise problems may occur with the system licensing.

- X56 = Clear CMOS - 3 pin connector strip to reset the CMOS memory of the board.
Jumper must be set on pins 1-2 for normal operation (factory delivery default). Setting jumper on pins 2-3 for 10 seconds clears the CMOS memory.

Storage Cards

The following storage cards and connectors are used depending on the application.

NOTICE: When mounting the SSD storage cards on the mainboard, make sure that the mounting screw is only slightly tightened (max. 0.25 Nm) to avoid damaging the printed circuit board.

- 1) M.2 SATA SSD containing the system SW must be inserted in connector X35. This SSD is mandatory for the operation of the OCCMB board/ system..
- 2) M.2 NVMe SSD for storing the multimedia data of the embedded applications. This SSD is optional. Its usage depends on the embedded applications that are operated within the system. The NVMe SSD must be inserted in connector X36. The minimum storage capacity is 120GB.

Subboards

The following optional subboards can be used depending on the application.

NOTICE: Place the mainboard on a flat surface before inserting a subboard. Otherwise you may damage the mainboard.

The spacing bolts supplied guarantee the correct positioning of a subboard, so you should always mount them.

1) CMAe (Clock Module with ADPCM enhanced)

CMAe is used in combination with DECT Light (integrated cordless solution). It provides the functions for ADPCM conversion and echo cancellation. If no CMAe is installed no echo cancellation is supported and ADPCM is performed directly by the base station.

The subboard is plugged into the X161 and X162 connector strips on the OCCSB board. The DECT base stations must be connected to the U_{P0/E} interfaces 2 through 8 of the mainboard.

2) OCCBL (Open Core Channel Booster)

Connections between IP and TDM phone or trunks connection requires DSP (Digital Signal Processor) channel. If the number of DSPs provided on the central control board is insufficient, an OCCBL subboard can be used. OCCBL provides up to 40 additional DSP channels.

The OCCBL subboard has a PCI-E jack which is plugged into the edge connector X9 of the mainboard.

Audio In Jacks

The 3.5 mm Audio In jack (X16) at the front panel offers the connection to external audio devices for Music on Hold or announcements. Connection is done by a 3.5 mm mono or stereo plug.

- Maximum input level: 3Vpp
- Input Impedance: 60 kOhm

Power Supply Unit

The power is supplied via an integrated power supply unit (additional PSU module) in the housing with a power cord (2 m). The connection cable of the power supply is plugged into the X410 socket of the mainboard and secured with two "PSU pins" (expanding rivets made of plastic).

Reset Switch

The board includes a reset switch with the following functions.

Table 11: OCCSB - Functions of the Reset Switch

Reset switch is pressed	Result	Red LED
< 5 s	The communication system performs a controlled restart (similar to pressing the Reset button on a PC). The communication system will be operational again after the startup.	on
> 5 s and < 10 s	A controlled shutdown of the communication system is performed.	off



















Reset switch is pressed	Result	Red LED
> 10 s	A reload is initiated on the communication system. The communication system reverts to the initial (default) state following startup. All country and customer-specific settings are lost (system country code = Germany). Country- and customerspecific data backups can be reloaded once the basic settings have been configured.	on





























Immediately after releasing the reset switch, the selected function (restart, shutdown or reload) is executed.

LEDs

The board features two LEDs that indicate the operating states.

Table 12: OCCSB - LED Statuses and their Meanings

RUN LED	INFO LED	Description
 Off	 Off	System powered off
 Off	 Red	Default after power on (typically < 1 second)
 Blue flashing 1Hz	 Red	Battery and CMOS checking
 Off	 Blue flashing 1Hz	BIOS update
 Blue	 off	BIOS running
 Blue	 Blue flashing 1Hz	RAM initialization
 Blue	 Red	RAM not detected 
 Blue	 Red flashing 8Hz	BIOS critical error 

RUN LED	INFO LED	Description
 Blue flashing 8Hz	 Off	Boot device missing 
 Green	 Off	BIOS boot completed/ Linux startup continues
 Green	 Red	Linux startup not possible 
 Green	 Blue flashing 8Hz	FPGA update in progress
 Green	 Green	Linux startup has completed/ System starts
 Green	 Blue	DSP initialization
 Green flashing 3 x 100/500ms	 Green	Telephony starts
 Green flashing 3 x 100/500ms	 Off	Telephony is synchronized
 Green flashing 1 Hz	 Off	System running in normal operating state
 Not relevant	 Purple flashing 1Hz	System restart requested
 Not relevant	 Purple	System reload requested
 Not relevant	 Orange flashing 1Hz	System shutdown requested
 off	 Red	System shutdown has been completed. System can be disconnected from the power supply.

Pin Assignments

Table 13: OCCSB - Pin Assignments of the X1 and X2 Edge Connectors (U_{P0/E} Interfaces)

X1			X2		
Pin	Signal	Description	Pin	Signal	Description
1	1b	U _{P0/E} interface 1	1	5b	U _{P0/E} interface 5
2	1a		2	5a	
3	2b	U _{P0/E} interface 2	3	6b	U _{P0/E} interface 6
4	2a		4	6a	
5	3b	U _{P0/E} interface 3	5	7b	U _{P0/E} interface 7
6	3a		6	7a	
7	4b	U _{P0/E} interface 4	7	8b	U _{P0/E} interface 8
8	4a		8	8a	

Table 14: OCCSB - Pin Assignments of the X3 Edge Connector (a/b Interfaces)

Pin	Signal	Description
1	1a	a/b interface 1
2	1b	
3	2a	a/b interface 2
4	2b	
5	3a	a/b interface 3
6	3b	
7	4a	a/b interface 4
8	4b	

Table 15: OCCSB - Pin Assignments of the X14 (WAN) and X12 (LAN) RJ45 Connectors, Depending on the Connection

Pin	10/100BaseT		1000BaseT	
	Signal	Description	Signal	Description
1	Tx +	Transmit +	Tx A +	Pair A: Transmit +
2	Tx -	Transmit -	Tx A -	Pair A: Transmit -
3	Rx +	Receive +	Tx B +	Pair B: Transmit +
4	-	Not used	Tx C +	Pair C: Transmit +
5	-	Not used	Tx C -	Pair C: Transmit -
6	Rx -	Receive -	Tx B -	Pair B: Transmit -
7	-	Not used	Tx D +	Pair D: Transmit +
8	-	Not used	Tx D -	Pair D: Transmit -

4.4 CMAe

CMAe (Clock Module with ADPCM enhanced) are optional subboards for the central control boards OCCM, OCCMBm, OCCMA (OpenScape Business X3W, OpenScape Business X5W) and OCCMR, OCCMBR, OCCMAR (OpenScape Business X3R, OpenScape Business X5R).

CMAe are used in combination with DECT Light (integrated cordless solution). The subboard provides the functions for ADPCM conversion and echo cancellation (48 channels for CMAe). Up to four calls can be conducted per DECT base station. Up to seven DECT base stations can be connected to the U_{P0/E} interfaces of the central control boards.

INFO:

If no CMAe is installed, a maximum of two calls can be conducted per base station. In this case, ADPCM conversion is performed directly by the DECT base station, but echo cancellation is not directly supported. In case that echo cancellation is required a CMAe subboard is needed.

Board Variants and their Use

Board	Part Number	Used in		Maximum number
		Communication system	Country	
CMAe	S30807-Q6957-X	OpenScape Business X1	ROW	1

CMAe is plugged into the following connector strips on the mainboards:

- OCCS: connector strips X13 and X14.
- OCCSB: connector strips X161 and X162.

NOTICE:

Place the mainboard on a flat, grounded and conducting surface before inserting the CMAe subboard. Otherwise you may damage the mainboard.

In the default factory state, the CMAe subboard has two spacing bolts inserted to ensure the correct positioning of the subboard on the mainboard.

Figure



Figure 6: CMAe subboard

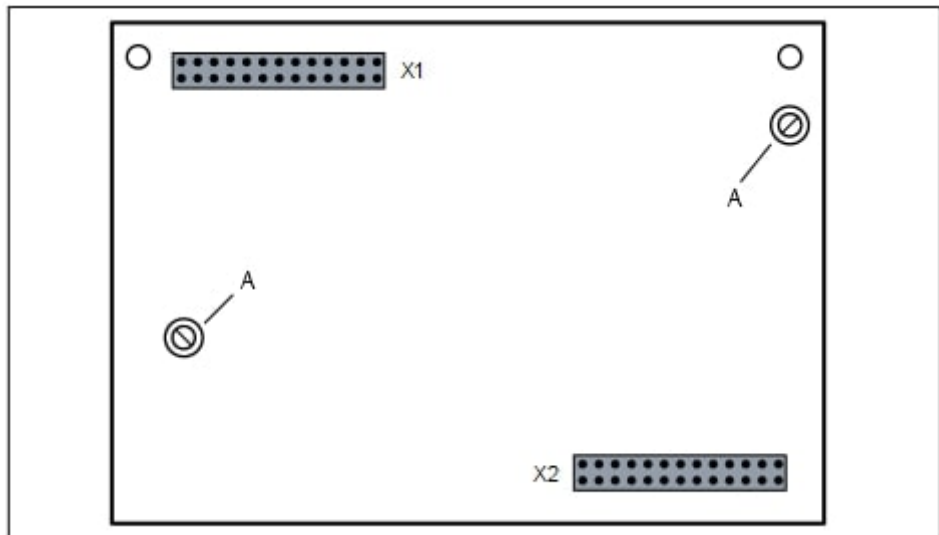


Figure 7: CMAe - Component side with inserted spacing bolts (A)

4.4.1 How to Install CMAe on OCCS or OCCSB



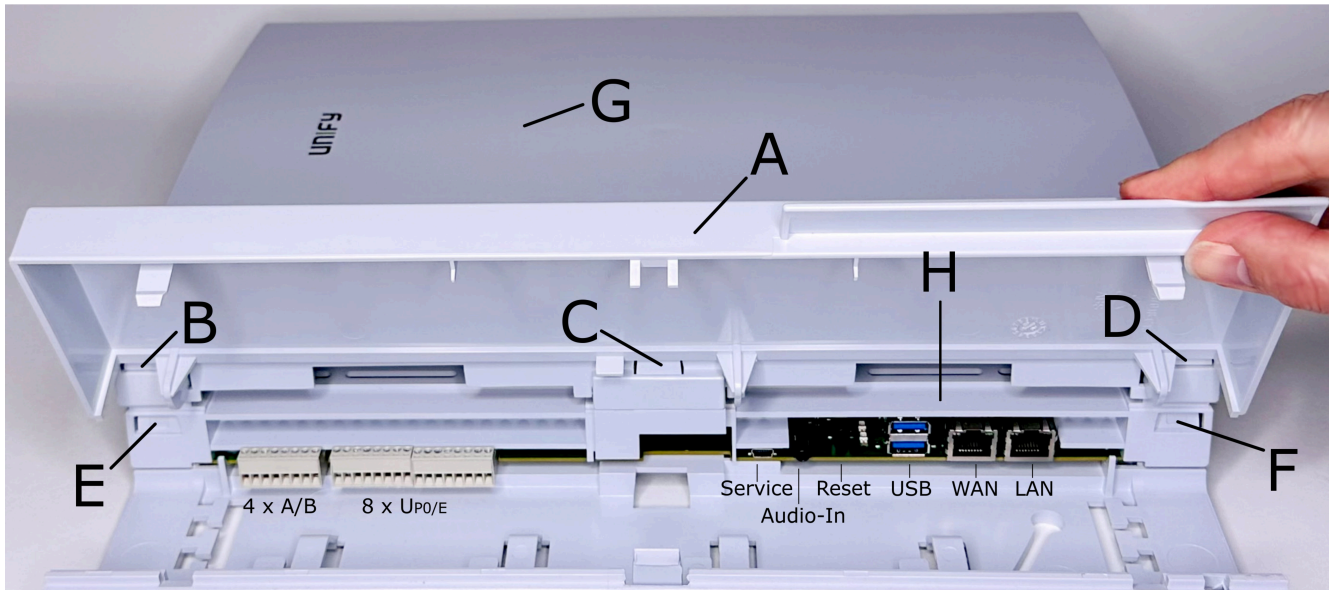
DANGER:

Risk of electric shock through contact with live wires
Make sure that the communication system is de-energized.

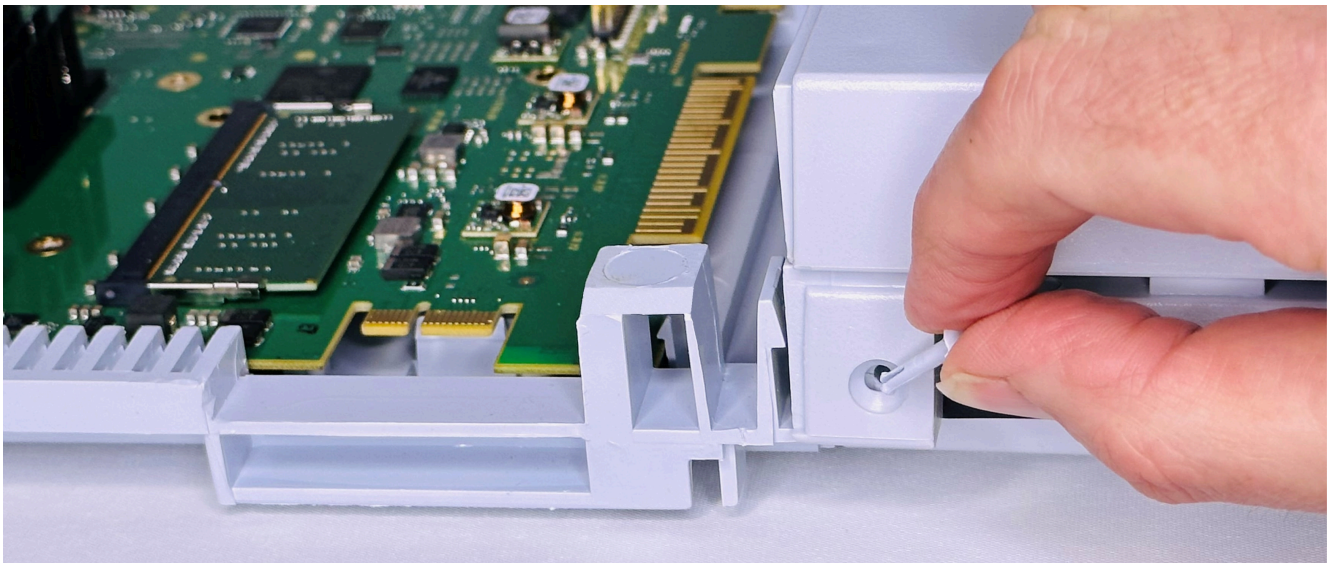
Step by Step

- 1) Disconnect the power plug of the communication system.

- 2) Lift open the left housing cover (A) and remove it.



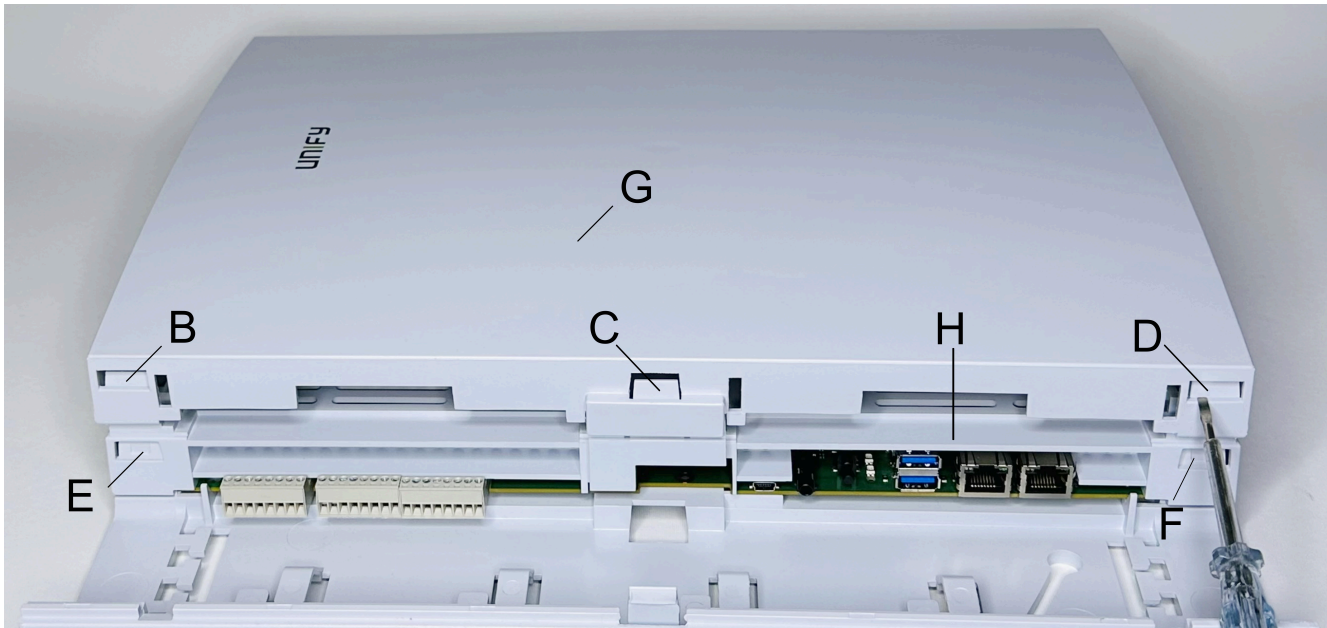
- 3) Pull out the two retaining pins at the top and bottom of the right housing cover (includes power supply) and slide the right housing cover slightly to one side.



Boards

OCCB1 and OCCBL

- 4) Use a small slotted screwdriver to press the 3 latches (B, C and D) of the middle housing cover (G) inward and remove the middle cover (G).



- 5) Use a small slotted screwdriver to press the two front latches (E and F) of the middle frame (H) inward. Then press the three rear latches of the middle frame (H) inward and remove the middle frame.
- 6) Plug the CMAe subboard (with component side facing downwards) into the following connector strips on the mainboards. Make sure that the two spacing bolts are plugged into the appropriate holes on the mainboard.
 - OCCS: connector strips X13 and X14.
 - OCCSB: connector strips X161 and X162.

INFO: In the default factory state, the CMAe subboard already has the spacing bolts inserted.

- 7) Lock the middle frame back into its brackets.
- 8) Slide the right housing cover back and insert the two retaining pins at the top and bottom in the right housing cover.
- 9) Lock the middle housing cover in its brackets.
- 10) Place back the left housing cover and close it.
- 11) Place the communication system back into operation.

4.5 OCCB1 and OCCBL

The UC Voice Channel Booster Cards OCCB modules optional subboards for the central control boards

If the number of signal digital processors processor (DSP) channels provided by the mainboard of the system is insufficient, additional DSP channels can be provided by inserting an OCCB subboard

- OCCB1 or OCCBL

Provides up to 40 additional DSP channels (gateway channels).

INFO: OCCBL is the successor board of OCCB1. System SW version V3 or higher is required for their operation.

Board Variants and their Use

Board	Part Number	Used in			Maximum number
		Communication system	Mainboard	Country	
OCCBL	S30807-Q6956-X1	OpenScape Business X1W	OCCSB	ROW	1

The OCCBL subboard has a PCI-E jack that is plugged in the same way into the associated edge connector of the mainboard:

- OCCSB: edge connector X9, see [How to Install OCCBL on OCCSB](#) on page 46

INFO: Place the mainboard on a flat, grounded and conducting surface before inserting the subboard. Otherwise you may damage the mainboard.

In the default factory state, the subboard has two spacing bolts inserted to ensure the correct positioning of the subboard on the mainboard.

Figure

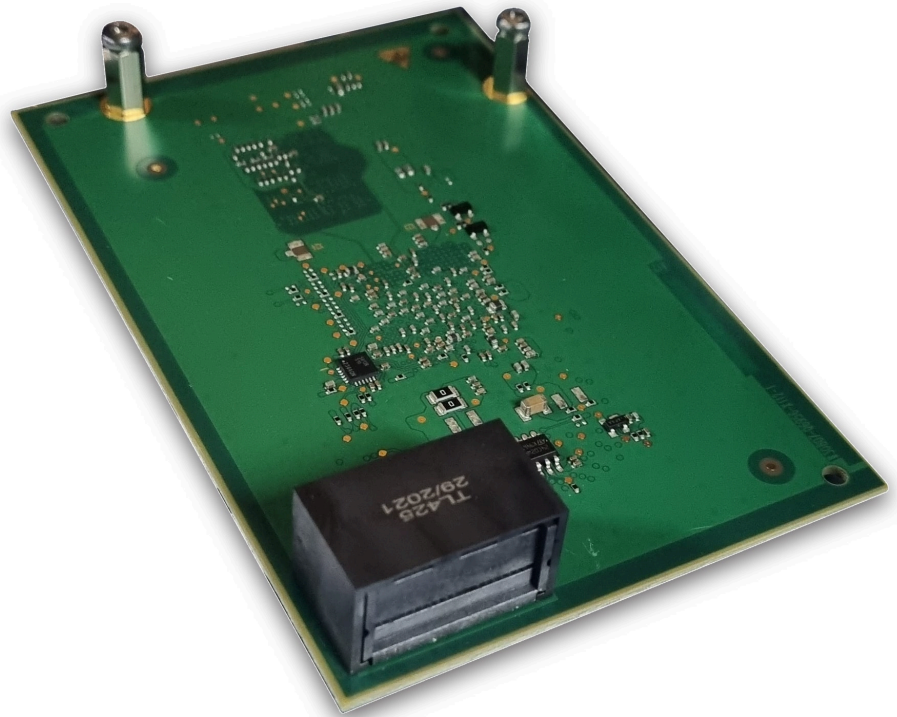


Figure 8: Example OCCBL- Rear side with inserted spacing bolts

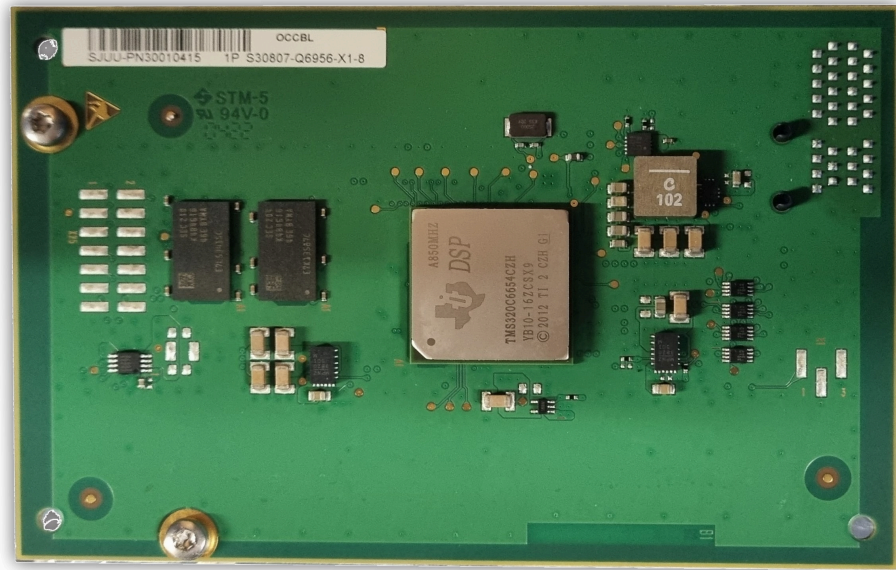


Figure 9: Example OCCBL- Rear side

4.5.1 How to Install OCCBL on OCCSB



DANGER:

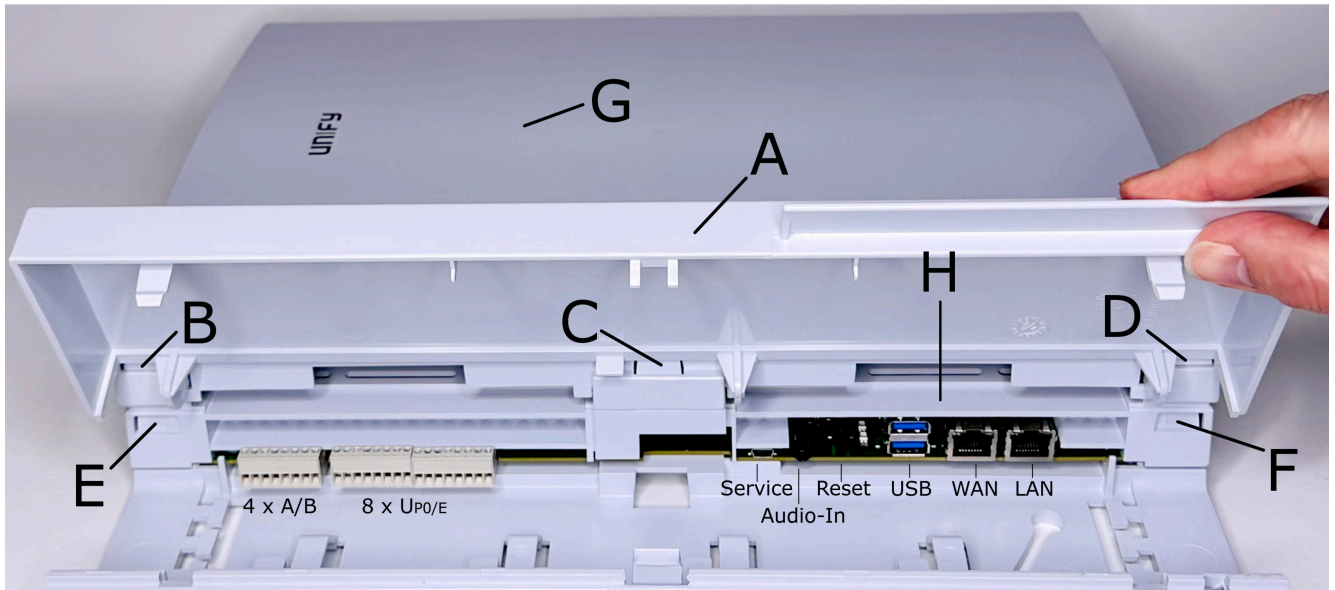
Risk of electric shock through contact with live wires

Disconnect the power plug of the X1W communication system before opening the housing.

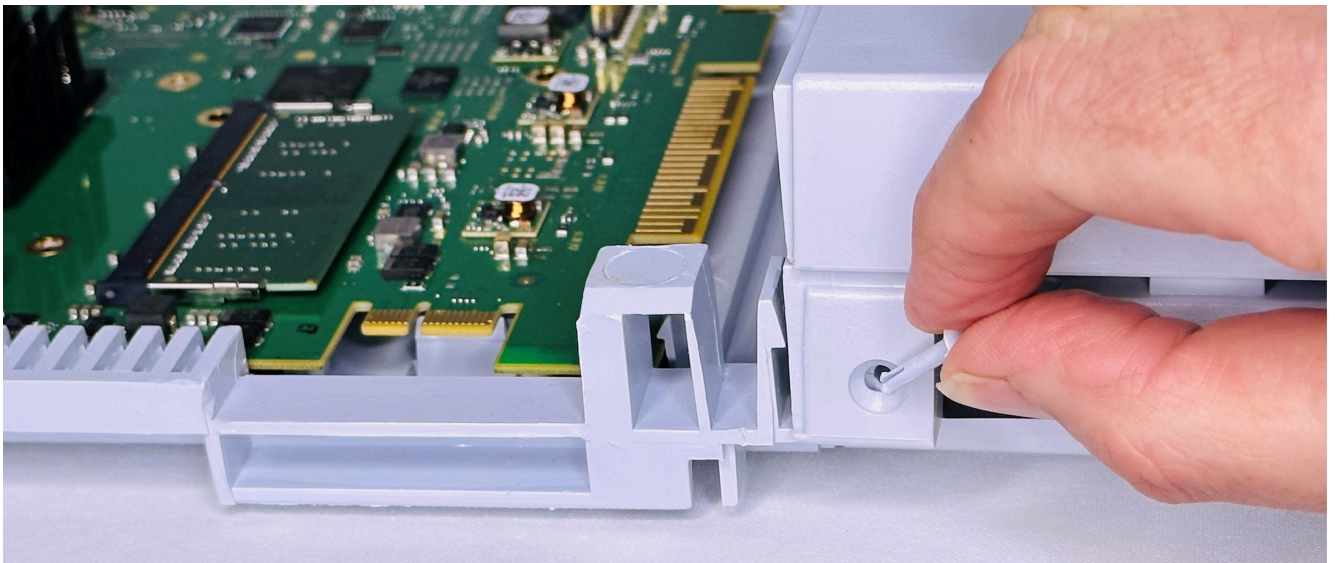
Step by Step

- 1) Disconnect the power plug of the communication system.

- 2) Lift open the left housing cover (A) and remove it.

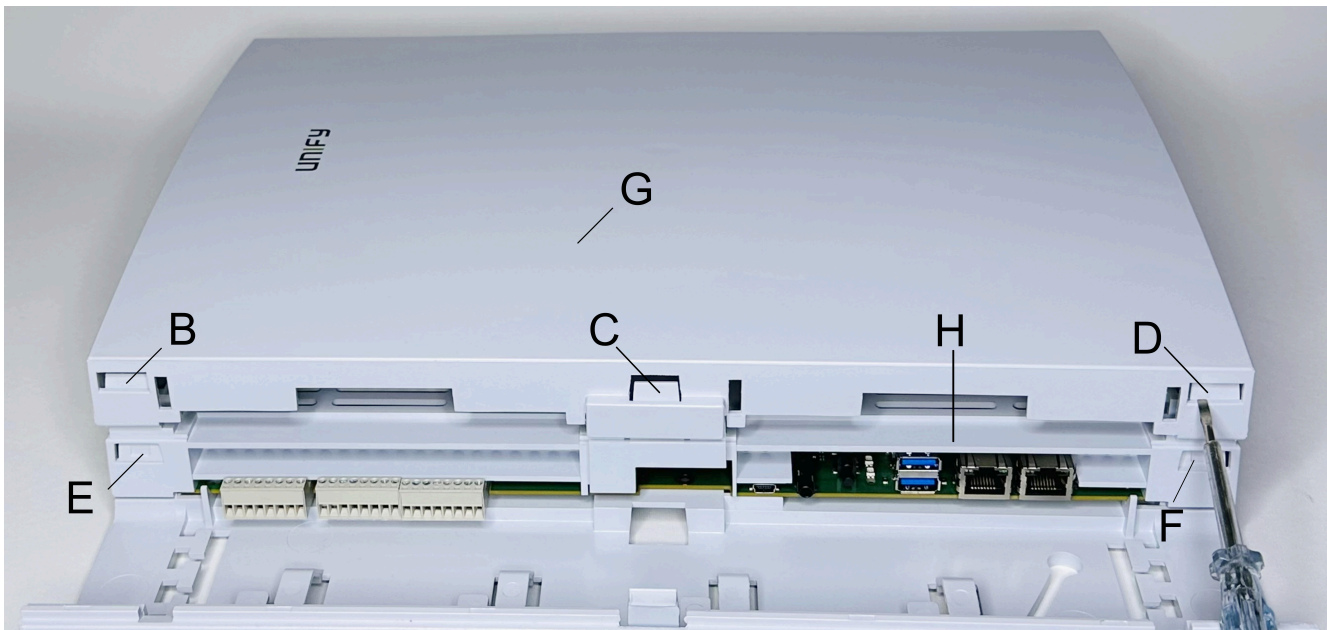


- 3) Pull out the two retaining pins at the top and bottom of the right housing cover (includes power supply) and slide the right housing cover slightly to one side.



Boards

- 4) Use a small slotted screwdriver to press the 3 latches (B, C and D) of the middle housing cover (G) inward and remove the middle cover (G).



- 5) Use a small slotted screwdriver to press the two front latches (E and F) of the middle frame (H) inward. Then press the three rear latches of the middle frame (H) inward and remove the middle frame.

- 6) Insert the PCI-E connector X22 of the OCCBL subboard (rear side down) onto the X9 edge connector of the OCCSB mainboard. Make sure that the two spacing bolts are plugged into the appropriate holes on the mainboard.

INFO: In the default factory state, the OCCBL subboard already has the spacing bolts inserted.

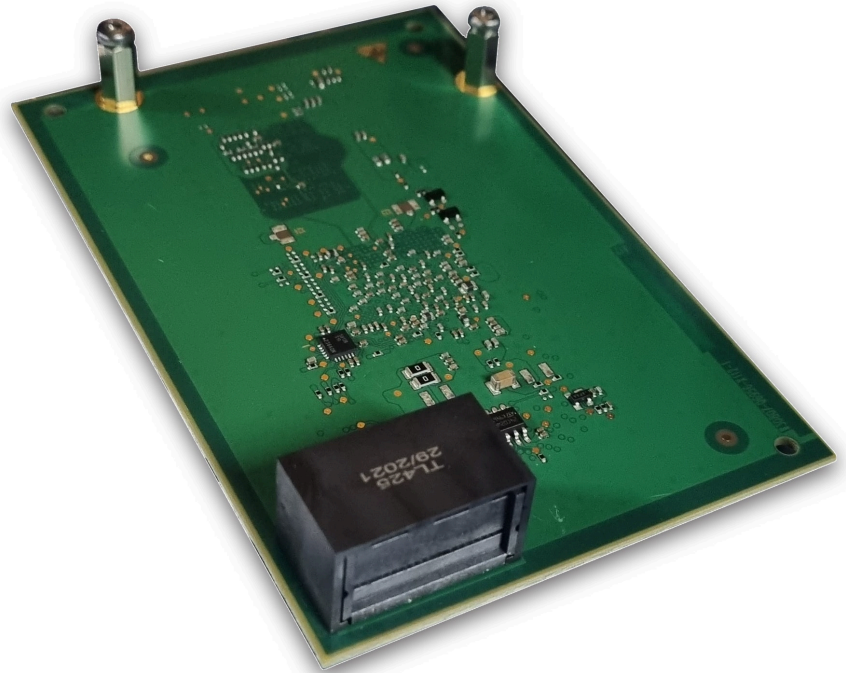


Figure 10: Example OCCBL – Rear side with inserted spacing bolts

- 7) Lock the middle frame back into its brackets.
- 8) Slide the right housing cover back and insert the two retaining pins at the top and bottom in the right housing cover.
- 9) Lock the middle housing cover in its brackets.
- 10) Place back the left housing cover and close it.
- 11) Place the communication system back into operation.

4.6 MUSIC plugin module

The MUSIC plug-in module is an optional submodule for the OCCS mainboard (OpenScape Business X1).

The submodule provides music on hold (MOH).

INFO: Before loading music files, make sure that you do not infringe on any copyrights.

Board Variants and their Use

Board	Part Number	Maximum number	Used in
MUSIC plugin module	S30122-K7275-T	1	1

The MUSIC plugin module is plugged into the X19 and X20 socket terminal strips on the mainboard.

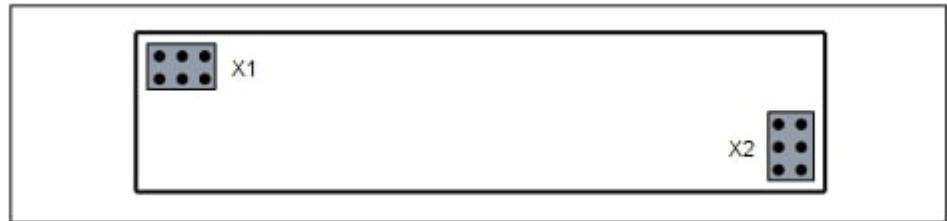


Figure 11: MUSIC plugin module

4.7 ET-S

The ET-S adapter (entrance telephone with amplifier) enables the connection of a to an entrance telephone/door opener.

The connection to the communication system is established via an a/b subscriber line interface.

Board Variants and their Use

Board	Part Number	Maximum number	Used in
ET-S	S30122-K7696-T313	4	1

NOTICE: The safety and installation instructions supplied with ET-S adapter must be observed!

Pin Assignments

Table 16: ET-S – Pin Assignments

Connection	a/b interfaces 1 – 4
a1 / b1	a/b subscriber line interfaces of the communication system
TO1 / TO2	Switching contact for door opener (normally open contact, max. 24 V / 2 A)
KL1 / KL2	Connection for floating doorbell button
a2 / b2	a/b interface for the entrance telephone
TS1 / TS2	Switching contact for entrance telephone amplifier
UB1 / UB2	Power supply ET-S adapter (7 - 19 VAC / 50 Hz or 10 - 24 VDC)

4.8 Phased Out Boards and Devices (not supported anymore)

Some boards and devices are being discontinued and can no longer be ordered.

Whenever you encounter errors in conjunction with one of the boards and devices being discontinued, the follow-up board or device should be used.

Board/Device	Part Number	Function	Notes / Successor
CMA	S30807-Q6931-X	Submodule for DECT Light	S30807-Q6931-X1

5 Integrated Cordless Solution

OpenScape Business Cordless is integrated cordless solution for the operation of cordless telephones (DECT phones) via the communication system. With the connected DECT phones, the HFA features of OpenScape Business can be used.

5.1 System Overview

The integrated Cordless solution enables the direct connection (DECT Light) of base stations to the communication system.

In the integrated cordless solution, the DECT phones are internal, system-specific stations as opposed to separate DECT systems, which are connected via standard interfaces.

The connection of OpenScape Business base stations for the operation of DECT phones can be implemented via:

- Direct connection to the $U_{P0/E}$ interfaces of the OCCS/ OCCSB central control board of OpenScape Business X1.

The Cordless radio technology corresponds to the DECT (Digital Enhanced Cordless Telecommunications) Standard. The entire radio area administered by the system is made up of base stations, which together form either a complete network of overlapping radio cells or individual radio "islands". The size of a radio cell is dependent on the local/structural factors.

The integrated Cordless solution supports GAP-enabled mobile telephones from third-party manufacturers. The full scope of HFA services can, however, only be used with approved DECT phones.

NOTICE: OpenScape Business X1 does not support multi-SLC.

NOTICE: The description of the configuration can be found in the OpenScape Business Administrator Documentation (*Administrator Documentation, Configuring the Integrated Cordless Solution*), and the description of the boards and base stations can be found in the OpenScape Business Service Documentation, *Installing OpenScape Business X3/X5/X8 (Integrated Cordless Solution)*.

CMAe Option

By using the CMAe subboard on the mainboards the ADPCM conversion and echo cancellation functions (48 channels for CMAe) are made available. Up to four calls can be conducted per base station. Up to seven base stations can be connected to the $U_{P0/E}$ interfaces of the mainboards OCCS, OCCSB.

If no CMA is installed, a maximum of two calls can be conducted per base station. In this case, the ADPCM conversion is performed directly by the DECT base station.

NOTICE: In case no CMAe is installed, no echo handling functions are available.

5.1.1 System Configuration

Up to 7 base stations can be connected, and up to 16 DECT phones can be used.

The following table shows the maximum possible system configuration of the integrated Cordless solution.



WARNING: Risk of electric shock through contact with live wires. Use separate ground wires to provide protective grounding for the system boxes of your communication system as well as all main distribution frames and patch panels before connecting the base stations.

NOTICE: The base stations BS4 (S30807-U5491-X), BS3/1 (S30807-H5482-X), BS3/3 (S30807-H5485-X) and BS3/S (X30807-X5482-X100) are being phased out and can no longer be ordered. However, they can still be connected to OpenScape Business X1.

In the event of a failure, the current base stations should be used.

OpenScape Business	Maximum number of simultaneous calls per base station, depending on the U _{P0/E} connection				Clock Module	Max. number of BaseStation BS when connected via 1xU _{P0}	Ports/ Simultaneous calls per BS	Max. number of registred devices	Max. number of simultaneous calls
	SLC16N	SLCN	SLUN	SLMC					
X1	-	-	-	-	-	7	1/2	16	14
	-	-	-	-	CMA	7	1/4	16	16
	-	-	-	-	CMAe	7	1/4	16	16

5.1.2 Traffic capacity

The traffic capacity inside different radio cells (for example, in offices, warehouses or garage areas) varies according to the subscribers.

The following tables provide reference values for the traffic capacity of individual base stations. These values apply to a single radio cell not having overlapping ranges with other radio cells (without overload handling).

A distinction is made here, depending on whether the connection of the base station occurs via one U_{P0/E} interface (= four simultaneously available voice channels), two U_{P0/E} interfaces (= eight simultaneously available voice channels) or three U_{P0/E} interfaces (= 12 simultaneously available voice channels) of a Cordless board.

Table 17: Traffic capacity of single base stations with 50 mErl per subscriber

	Connecting the base station					
	1 x U _{P0/E}		2 x U _{P0/E}		3 x U _{P0/E}	
Grade Of Service (GOS)	0.1 %	1 %	0.1 %	1 %	0.1 %	1 %
Number of stations per base station	11	16	42	62	84	118
Traffic capacity	0.55 erlangs	0.8 erlangs	2.1 erlangs	3.1 erlangs	4.2 erlangs	5.9 erlangs

Table 18: Traffic capacity of single base stations with 100 mErl per subscriber

	Connecting the base station					
	1 x U _{P0/E}		2 x U _{P0/E}		3 x U _{P0/E}	
Grade Of Service (GOS)	0.1 %	1 %	0,1 %	1 %	0,1 %	1 %
Number of stations per base station	7	8	21	31	42	59
Traffic capacity	0.7 erlangs	0.8 erlangs	2.1 erlangs	3.1 erlangs	4.2 erlangs	5.9 erlangs

Table 19: Traffic capacity of single base stations with 200 mErl per subscriber

	Connecting the base station					
	1 x U _{P0/E}		2 x U _{P0/E}		3 x U _{P0/E}	
Grade Of Service (GOS)	0.1 %	1 %	0.1 %	1 %	0.1 %	1 %
Number of stations per base station	4	5	10	15	21	29
Traffic capacity	(0.8 erlangs)	1 erlangs	2.1 erlangs	3.1 erlangs	4.2 erlangs	5.9 erlangs

5.1.3 Grade Of Service (GOS)

The Grade of Service indicates the availability (i.e., successful setup) and loss (i.e., the termination) of call connections in cordless solutions.

To calculate the capacity limits, the following assumptions are made: 1 % GOS per radio interface and 0.1 % on the PCM highway of the communication system and on the networking connections. A GOS of 1 % for availability means that an average of one call out of 100 cannot be made. For a call from handset

to handset, 1 % GoS per radio interface means that an average of two calls out of 100 (2 %) cannot be made.

Radio field quality and the number of available channels are crucial elements for setting up a call and for call breakdowns in cordless connections. Poor radio field quality results in high breakdown rates, low availability, and poor voice quality. This may occur if the physical structure of buildings (a lot of metal, machinery, tin, etc.) causes inhomogeneous fields and reflections. In such cases, a GOS of 1% or 2% cannot be achieved. The interference described can also occur when using other DECT devices (such as cordless headsets or cordless phones).

5.1.4 Single-Cell Mode

Single-cell mode allows up to 8 DECT telephones that are registered together to a base station and are in one call group to ring simultaneously. Only one B channel is occupied in the process. The DECT phone that answers the call uses this B channel. The single-cell mode is only supported for DECT Light. Only one base station (BS3/S, BS4 or BS5) may be connected to a U_{P0/E} interface of the OCCM/OCCMR mainboard.

By contrast, in the multi-cell mode (when more than one base station is connected), the number of DECT phones that can ring simultaneously is equal to the number of free B-channels. This restriction does not apply in single-cell mode (when only one base station is connected), since only one B-channel is used.

NOTICE: The system automatically switches from single-cell mode to multi-cell mode if an additional BS5 base station is connected or if a BS4 or BS3/S base station is replaced with a BS5 base station and more BS5 base stations are additionally connected. In these cases, the first BS5 base station automatically restarts and switches to multi-cell mode.

The switch from multi-cell mode back to single-cell mode requires a manually initiated system restart after the additional base stations have been removed.

5.2 Testing a Cordless Solution

To ensure trouble-free operation of a cordless solution, a number of different tests must be conducted after the initial startup. The test results must be documented in the building/site plan.

5.2.1 Checking the Base Stations and the Radio Coverage

After the initial startup of a cordless solution, a test of the base stations and the radio coverage (area coverage) must be conducted.

NOTICE: The following information refers to measurements performed with DECT phones. The resulting measurement values are not very precise and thus represent only a rough estimate. In addition, different values may be recorded on each DECT phone even though the ambient conditions are identical.

If greater accuracy is required, the measurements should be performed with a special service tool for cordless systems (such as the HCS Locator Pro, for example).

Base Station Test

The purpose of this test is to check the functions of all base stations.

- Test the radio link (synchronicity) between the DECT phone and the base station
- Measure the following values:

- RSSI (Received Signal Strength Indication)

Field strength of the radio signals received from a base station, normalized to a maximum of 100.

If the RSSI value is < 50 , the radio connection to the base station is no longer guaranteed. An acceptable RSSI value is > 50 (> -60 dBm).

- FRAQ (Frame Quality)

Transmission quality in %

Values of 95 % to 100 % are satisfactory (for short periods, values of 90 % to 94 % are non-critical). Sustained values below 95% result in transmission errors.

Test the radio coverage (are coverage)

The purpose of this test is to check whether the necessary field strength and the transmission quality is attained throughout the entire radio network.

Using a DECT phone (with the measuring mode enabled), move around the radio coverage area and check whether an RSSI value > 50 (> -60 dBm) and a FRAQ value $> 95\%$ are achieved throughout the area. Areas in building corners or behind metal structures, in particular, should be checked carefully (by verifying the RSSI values several times).

Activating the range warning feature is useful in this context. Exceeding the range limit (border zone of the radio range) is then signaled by a warning tone.

In these border zones of the radio range, the radio connection to the base station may be lost.

Presentation of the Measurement Results

The following value is an example of the display of a measurement result on a DECT phone of type OpenStage SL4 Professional (Gigaset SL4 Professional):

087-7-02-20-100

- 087 = Field strength (RSSI) of the radio signals received from the base station (maximum value = 100)
- 7 = Frequency (value range 0 to 9)
- 02 = Time slot of the receiving channel on which the measurement was performed (value range 0 to 11).
- 20 = Identification of the base station via the Radio Fixed Part Identity RFPI as a hexadecimal number (20 corresponds to decimal 32)
- 100 = Transmission quality (FRAQ) in %

5.2.1.1 Testing Base Stations

NOTICE: The following information refers to the operation of a DECT phone of the type OpenStage SL4 Professional (Gigaset SL4 Professional).

The default language for measuring mode is English.

Step by Step

- 1) Move with the DECT phone close to a base station to be tested.
- 2) Holding the DECT phone directly below, beside or above the base station to be tested, turn it off and on again.
 - If a radio link (synchronicity) with the base station exists, this will be indicated in the display as *Station 1*, for example.

Continue with step 3.

 - If there is no radio link (synchronicity) with the base station, this will be indicated by a flashing display (for example, *Station 1* will be shown flashing).

Repeat step 2 with another DECT telephone. If no radio link can be established with this DECT phone as well, replace the base station.

- 3) Turn off the DECT phone.
- 4) Press the keys **1**, **4** and **7** simultaneously together with **Hang up** key in order to activate the service mode.

Service appears on the display.
- 5) Enter the code **76200** to bring up the service menu.
- 6) In the service menu, navigate to the item **Measuring mode** and confirm the selection with the **OK** key.

This enables the measuring mode.
- 7) In the service menu, navigate to the item **Measuring time** and confirm the selection with the **OK** key.
- 8) Set the desired measuring time using the control keys (< = to reduce the measuring time, and > = to increase the measuring time).

The displayed value range for the measuring time is between 06 and 16. This corresponds to a measuring cycle between 1 and 2.5 seconds.

The recommended value of 16, which corresponds to a measuring cycle of 2.5 seconds.
- 9) Confirm the set values by pressing the **Save** key.

- 10) Turn off the DECT phone.
- 11) Turn on the DECT phone again.

After switching on the DECT phone, the measurement values are shown on the display and updated on the basis of the set measuring cycle.

For example: 087-7-02-20-100 (see [Checking the Base Stations and the Radio Coverage](#))

- If the required measurement values (RSSI value > 50 (> - 60 dBm), FRAQ > 95%) are achieved, continue with step 12.
- If the required measurement values (RSSI value > 50 (> - 60 dBm), FRAQ > 95%) are not achieved, repeat steps 3 through 11 with another DECT phone.

If this DECT phone does not reach the required measurement values either, replace the base station.

- 12) Repeat the testing for all other base stations.

5.2.1.2 Check the Radio Coverage

NOTICE: The following information refers to the operation of a DECT phone of the type OpenStage SL4 Professional (Gigaset SL4 Professional).

The default language for the measuring mode is English.

Step by Step

- 1) Turn off the DECT phone.
- 2) Press the keys **1**, **4** and **7** simultaneously together with **Hang up** key in order to activate the service mode.

Service appears on the display.

- 3) Enter the code **76200** to bring up the service menu.
- 4) In the service menu, navigate to the item **Measuring mode** and confirm the selection with the **OK** key.

This enables the measuring mode.

- 5) In the service menu, navigate to the item **Measuring time** and confirm the selection with the **OK** key.
- 6) Set the desired measuring time using the control keys (< = to reduce the measuring time, and > = to increase the measuring time).

The displayed value range for the measuring time is between 06 and 16. This corresponds to a measuring cycle between 1 and 2.5 seconds.

The recommended value of 16, which corresponds to a measuring cycle of 2.5 seconds.

- 7) Confirm the set values by pressing the **Save** key.
- 8) Turn off the DECT phone.

- 9) Turn on the DECT phone again.

After switching on the DECT phone, the measurement values are shown on the display and updated on the basis of the set measuring cycle.

Example: 087-7-02-20-100

- 10) With a DECT phone, move around the area in question and determine whether an RSSI value > 50 (> -60 dBm) and a FRAQ value > 95 % are reached throughout the area.

Pay particular attention to areas in building corners and behind metal structures (by measuring the RSSI values several times).

INFO: Enable the "Range warning" feature (Tones menu). Exceeding the range limit (border zone of the radio range) is then signaled by a warning tone.

In these radio area border zones, the radio connection to the base station may be lost.

- 11) Draw the coverage area with an RSSI value > 50 in the building/site plan.

5.2.2 Documentation of the Test Results

The test results of the radio coverage (area coverage) must be entered or marked in the building/site plan.

The following data should be documented:

- Installation locations of the base stations and their Radio Fixed Part Identity RFPI
- Radio range with an RSSI value > 50

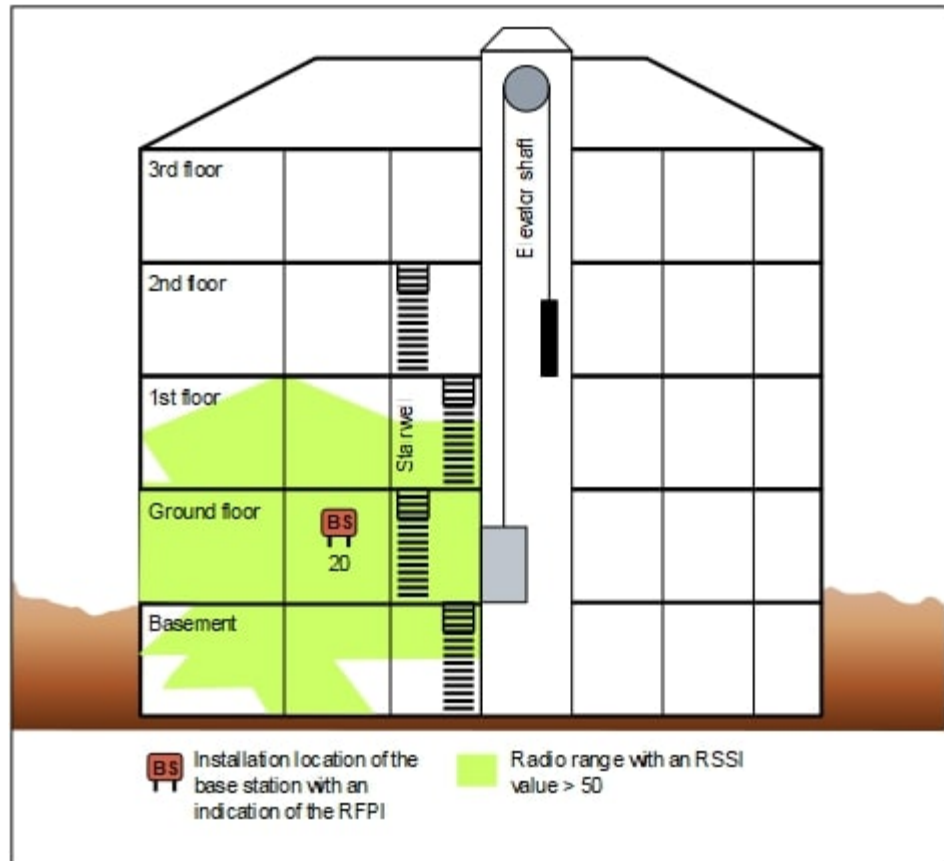


Figure 12: Example for the Documentation of Test Results in a Building Plan

5.3 Troubleshooting

Here you will learn how to troubleshoot and correct potential disruptions and errors.

Synchronization symbol on the display of DECT phones

- No synchronization to base station: Flashing display of Station XY
 - DECT phone not logged on?
Remedy: Log in the DECT phone.
 - If the DECT phone is logged into multiple systems, is it switched to the correct system? Is automatic system selection activated?
Remedy: Check the registration of the DECT phone. If necessary, log in the DECT phone again.
 - Base station defective?
Remedy: [Check base stations.](#)

- Synchronization to the base station: Steady display of `Station XY`, but no action is possible.
 - An error tone can be heard when the line key is pressed: Temporary overload status (all the base station speech paths are busy).
Remedy: Wait, and try again.
 - DECT phone has not completed the location request (contact of the DECT phone to the communication system) successfully.
Remedy: Repeat location request by switching off the DECT phone and then switching it on again.
 - DECT phone is no longer registered.
Remedy: Log in the DECT phone again.

DECT telephone

- Problems when logging in:
 - Are the "home cordless board" and at least one base station (within range of the DECT phone) as well as the Cordless board to which this base station is connected operational (is the green LED lit on the Cordless board?)
 - If the DECT phone is to be registered via a "current-location cordless board", the extension connections must be operational.

A connection to the extension connection port must be tested by using a corded phone. If the call succeeds, the connection is OK. Otherwise, an error has occurred, and the configuration of the extension connection must be checked.
 - Is a sufficiently accurate clock pulse supply ensured by the communication system?

If the station display on a registered DECT phone is not permanently active, this could indicate a bad clock pulse supply. For example, if `Base Search` occasionally appears in the idle state.
- No visual user prompts:
 - When logging in the DECT phone, was the line key pressed before the "Silent Call" arrived?

Remedy: Log in the DECT phone again and wait for Silent Call. If the error persists, the phone involved is an unauthorized DECT phone.

Silent Call means a short automatic call (on some devices this is like 2 rings). If you are registering an inactive call number (which has not been used before, it looks black at WBM and gray in KDS) then the registration is completed with one silent call. If you are registering an active call number that has been used before (looks green at WBM and KDS) then the registration is completed with two silent calls.

6 Reasons for System Restart

6.1 System restart for OpenScape Business X1 / X1W

OpenScape Business system may restart for the following reasons:

Reset Actions via Reset Button and Service Center

Action Reset Button	Event Log Entry	Customer Trace - Event Viewer
Reset	Reset button restart action	System restarts because of RESET BUTTON RESTART action.
Power off	Reset button shutdown action	System restarts because of RESET BUTTON SHUTDOWN action.
Reload	Reset button reload action	System restarts because of RESET BUTTON RELOAD action.

Action Admin Portal	Event Log Entry	Customer Trace - Event Viewer
Reset	Admin/Portal restart	System restarts because of ADMIN/PORTAL RESTART.
Power off	Admin/Portal shutdown	System restarts because of ADMIN/PORTAL SHUTDOWN.
Reload	Admin/Portal reload	System restarts because of ADMIN/PORTAL RELOAD.

Software Update and Configuration Restarts

Action	Event Log Entry	Customer Trace - Event Viewer
Software Upgrade Success	Software update Admin/Portal – Restart ¹	System restart because of SOFTWARE UPDATE. System restart because of ADMIN/PORTAL RESTART. ¹

Action	Event Log Entry	Customer Trace - Event Viewer
Software Upgrade Failure Switchback Reset	Software switchback	System restart because of SOFTWARE UPDATE. System restart because of ADMIN/PORTAL RESTART.
Software Configuration and Administration restarts	Admin/Software Delayed Restart	System restart because of ADMIN or SOFTWARE RESET.

Application and system failure restarts

Action	Event Log Entry	Customer Trace - Event Viewer
Application Failures Reset By Observer	Process Failure	System restart because of PROCESS FAILURE
System and OS Failures Power failure Linux Kernel Failure	Power down or watch dog or kernel oops	System restart because of POWER DOWN or WATCH DOG or KERNEL OOPS

Error Reasons

Action	Event Log Entry	Customer Trace - Event Viewer
Undefined Entry ²	Error! no reason available!	System restart because of < Error Missing Entry >
Unknown Reason ³	Unknown reason	System restart because of < Unknown Reason >

¹ Software update initiates two system restarts, second restart triggered automatically by admin/portal.

² System reset and power off initiated by console commands (requires root access).

³ The reason of restart is available, but it's undefined. Error should be reported.

7 Appendix

The appendix contains reference information such as hardware capacity limits, the interface ranges for subscriber lines, the maximum cable lengths for trunk connections and direct CorNet NQ/QSIG wiring and the country-specific ring frequencies for analog subscriber line modules. In addition, it also includes information on the power requirements of the boards and connectable telephones, key modules, adapters and base stations.

7.1 Interface Ranges for Subscriber Lines

The following table lists the maximum possible interface ranges for subscriber lines when using cables of type J-Y (ST) 2x2x0.6 (0.6 mm conductor diameter).

Table 20: Interface Ranges for Subscriber Lines (for J-Y (ST) 2x2x0.6, (0.6 mm conductor diameter)

Interface	Range	Loop resistance
S ₀ : point-to-point connection ⁴	< 600 m	156 ohms
S ₀ : extended bus connection ⁴	< 400 m	104 ohms
S ₀ : bus connection ⁴	< 60 m, for the STMD3 board (S30810-Q2217-X10)	21 ohms
	< 120 m, for all other S ₀ boards	21 ohms
S ₀ : line jack unit for the phone ⁴	< 10 m	–
a/b	< 2000 m	520 ohms
U _{P0/E} : master	< 1000 m	230 ohms
U _{P0/E} : master-slave configuration	< 100 m	23 ohms

7.2 Cable Lengths for Trunk Connections and CorNet NQ/QSIG Direct Networking

The table below provides the maximum cable lengths for trunk connections and direct CorNet NQ/QSIG wiring.

The values apply to ideal conditions, which means there can be no joints, etc. The real conditions must be measured on-site.

⁴ Only for OpenScape Business X1

Table 21: Cable Lengths for Trunk Connections and CorNet NQ/QSIG Direct Networking

Interface	Cable	Conductor diameter	Attenuation per km	Max. Cable Length
S ₀ ⁵	ICCS cable J-2Y(ST)Y4x2x0,51 LG ICCS Data5	0.51 mm	7.5 dB at 96 kHz	800 m
	Installation cable J-2Y(ST)Y >= 10x2x0.6 ST III BD	0.6 mm	6.0 dB at 96 kHz	1000 m
S _{2M}	AA-2Y0F(L)2Y >= 10x2x0.6 (full PE insulation, filled)	0.6 mm	17 dB at 1 MHz	350 m

⁵ Only for OpenScape Business X1

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