A MITEL
PRODUCT
GUIDE

Unify OpenScape Alarm Response Economy

OScAR-Eco 100 V5

Service Manual
07/2024

P31003-S1850-S100-01-7620Atos

Mitel

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1 Conventions and Operating Instructions

Note:
This Service Manual is designed to assist all persons who perform the initial installation, the start-up and any configuration of the OScAR Eco 100 system.

Overview

This chapter explains the notations and symbols that are used in this manual. It also offers valuable instructions and provides helpful information on data protection and data security.

Content

The following areas are covered in this chapter:

1.1 Description of the chapters in this document
1.2 Notations and symbols
1.3 Reporting of accidents
1.4 Data protection and data security

Information on the hardware and product designation

- As a rule, the hardware platform is referred to as OScAR Eco 100**.**
- The general product name is OScAR Eco 100.
- The product name when marketed and sold through Unify reads **OScAR-Eco 100** (OScAR = **O**pen **Sc**ape **A**larm **R**esponse).
- The screenshots in this document carry the product-specific hardware designation OScAR Eco 100.

1.1 Description of the chapters in this document

This document also includes the following chapters:

Chapter	Description
Chapter 2, "OScAR Eco 100 Specification"	This chapter gives you an overview of the hardware configuration of OScAR Eco 100.
Chapter 3, "Product Components"	This chapter gives you an overview of the basic technical specification of OScAR Eco 100.
Chapter 4, "Hardware Operations"	This chapter describes the hardware operations and also includes the safety instructions in German, Finnish, Danish and Swedish.
Chapter 5, "Wiring Plans"	This chapter covers the different wiring plans of OScAR Eco 100.
Chapter 6, "PBX Systems and Soft Switches"	This chapter covers in brief the coupling of OScAR Eco 100 to the PBX network or the convergent voice/data networks, as well as the trunk connections. It also refers to the external configuration instructions for the respective interface(s).

Table 1-1 Overview of chapters

1.2 Notations and symbols

Notations

The following definitions are used in this document:

`Text`	All texts from files that are described in this document, and all entries that are added to these files, appear in the monospace font Courier.
The password **123456**...	Details and instructions in the continuous text that are of particular importance or must be heeded are output in bold print. In the same way, buttons and menus also appear in bold print.
The file `global.cfg`	Files and directories are output in the monospace font Courier.
<*Placeholder*>	Entries and outputs, both of which may vary dependent on the individual situation in which they appear, are placed in <angle brackets> and are in italics.
[*beginning of value range ... end of value range; default*] or [*X*]	All default values and all value range details from data fields are placed in squared brackets and appear in italics. The additional [x] after an entry option for a database field indicates that this entry option is also the default value.

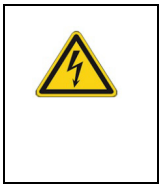
Table 1-2 Notations

Symbols

The following symbols are used in this document:

Note:
The info "i" is used to indicate additional helpful information.

Caution!
The exclamation mark is used to indicate important information which the reader should treat with particular caution.



Warning!
The warning sign is used to alert you to a hazardous or high risk situation. It means that you are currently exposed to a risk situation that may cause a physical injury. Before you start working with any apparatus, please always be aware of the risks that may arise in connection with the device's electric currents and follow the standard practices to avoid accidents.

1.3 Reporting of accidents

- Be careful to report all accidents immediately, also near accidents and any potential safety hazard.
- Report every electrical shock, no matter how small.
- Never allow the storage of easily inflammable substances in the proximity or even in the same room with the communications system.
- Make sure that the work area is always well lit.
- Remember that an untidy work area can lead to accidents.

1.4 Data protection and data security

In order to comply with the legal provisions that apply when providing services - be it service tasks performed at your customers' site or by way of teleservice - we strongly urge you to follow the below-listed rules. This will not only help you protect the interests and concerns of customers and clients, but also avoid unwanted implications for yourself.

Please help ensure complete data protection and data security by being aware of these issues as you work:

- Always make sure that only authorized persons have access to your client and customer data.
- Assign passwords whenever you can. Do not grant unauthorized persons access to any passwords, for example by writing them down.
- Always make sure that no unauthorized persons can process, save, edit, transmit, block, delete or utilize customer data in any way.
- Always make sure that no unauthorized persons have access to data storage media, for example to backup disks or printouts of logfiles or protocols. This applies both to service work provided directly at the customer and to the storage and transport of data carriers.
- Always make sure that every data storage medium that is no longer needed is properly and fully destroyed. Also be careful not to leave behind any papers that could become openly accessible to others.

Note:
We urge all readers to work together closely with the contact persons of your clients. This not only helps to build trust but will also help you reduce your own workload.

2 OScAR Eco 100 Specification

Overview

This chapter gives you an overview of the hardware configuration of OScAR Eco 100.

Content

The following areas are covered in this chapter:

2.1 General
2.2 Certifications
2.3 Characteristics of OScAR Eco 100

2.1 General

OScAR Eco 100 comes as a small tabletop unit in a convenient box size (165mm x 105mm x 30mm), and has the following features:

- Computer core with µClinux™ operating system and anti-virus protection
- Pluggable 2 GB microSD card for the program, data, licenses, protocols and announcements
- LAN interface (10/100-Base-T) for VoIP, service console (VCON), administration and peripheral inter-connectivity
- Feeding either via data switch with support of power-over-ethernet (<6.5 Watts, PoE, Class 2), or via the PoE-Injector looped-in the LAN connection, from 100…240VAC
- Serial asynchronous interface RS232/RS422 (electrically isolated)
- USB service interface for all start-up functions
- 8 + 1 floating contact outputs for system and process reports
- 16 fed contact inputs with short circuit and line break detection
- Optionally pluggable as alternative:
  – TDM/ISDN module with 2x S_0 (IIS-02 module, standard)
  – TDM/ISDN module with 1 x S_{2M} E1 or T1 (IIE-02 module for North America)
  – Module with 2 additional serial asynchronous interfaces

2.2 Certifications

This device is certified in these countries in keeping with UL, FCC, CE and Australia RCM (country codes as in ISO 3166):

- All EU countries:
  AT, BE, BG, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SE, SI, SK
- These countries outside the EU:
  AR, AU, CA, CH, CO, HK, ID, ME, MK, MY, NZ, PA, PH, RS, SG*, TR, US

* Singapore: Available as industrial product only

Fire security and life safety features were not evaluated during the UL test.

Status: June 12th, 2019 − National approvals subject to change.

2.3 Characteristics of OScAR Eco 100

The below table lists the characteristics of OScAR Eco 100:

Description	Value
Dimensions	• height: 30 mm • width: 105 mm • depth: 165 mm
Weight	• 450 g
Power supply	• Power-over-Ethernet (PoE) Class 2 Mode A or Mode B in keeping with IEEE 802.3af • Max. power consumption 6.5 W
Ventilation	• Convective air cooling
Operating conditions	• Temperature: +5 °C .. +35 °C • Relative Humidity: 5 % .. 80 % (non-condensing)
Storage conditions and terms of transport	• Temperature: -20 °C .. +70 °C • Relative Humidity: 5 % .. 80 % (non-condensing)
MTBF	• > 400,000 h (over a 5-year period under report)
Certifications/Declarations of conformity	• EN 55024 • EN 55032 • EN 60950-1 • UL 60950-1 • FCC 47 CFR Part 15 • CE Marking • CB Scheme • RCM Marking

Table 2-1 OScAR Eco 100 characteristics

3 Product Components

Overview

This chapter gives you an overview of the basic technical specification of OScAR Eco 100.

Warning!

All external components that are connected to OScAR Eco must meet and comply with the pertinent legal provisions that are currently in force in the country in which they are operated.

Content

3.1 OScAR Eco 100 components
- 3.1.1 Rear panel of the population option C
- 3.1.3 Front panel of the table top housing - with a COM interface
- 3.1.5 Status indicator

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3.4 microSD card

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- 3.5.2 DTE adaptor
- 3.5.3 CSA converter
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- 3.5.5 Single outlet line jack unit RS422 (unshielded)
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- 3.5.10 Special connector for digital outputs
- 3.5.11 Special connector for audio I/O
- 3.5.12 Rating data for line connections of the digital I/O and audio

3.6 LAN printer
- 3.6.1 Connect the printer to the LAN

3.1 OScAR Eco 100 components

3.1.1 Rear panel of the population option C

The population option C comes with contact I/O (= without audio I/O)

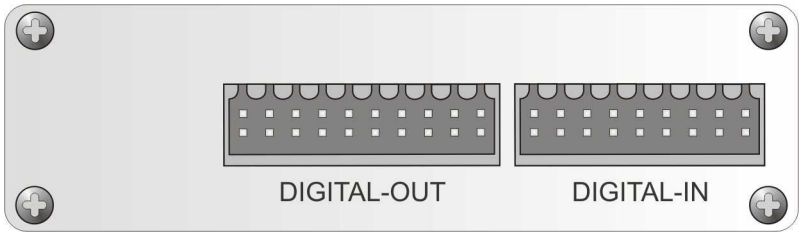


Image 3-1 Rear panel of the population option C

3.1.2 Rear panel of the population option CA

The population option CA comes with contact I/O and audio I/O

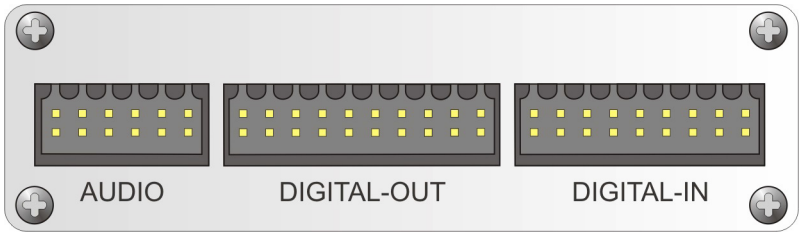


Image 3-2 Rear panel of the population option CA

3.1.3 Front panel of the table top housing - with a COM interface

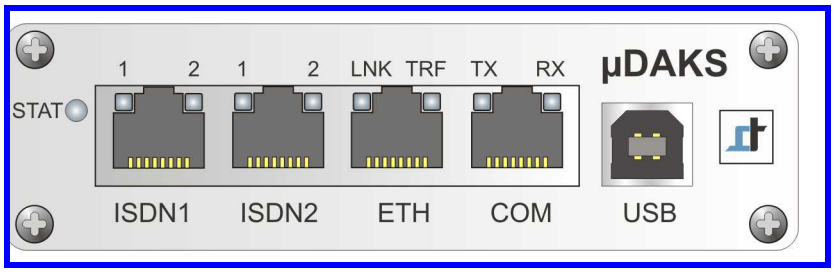


Image 3-3 Front panel of the table top housing - with **one** COM interface

3.1.4 Front panel of the table top housing - with three COM interfaces

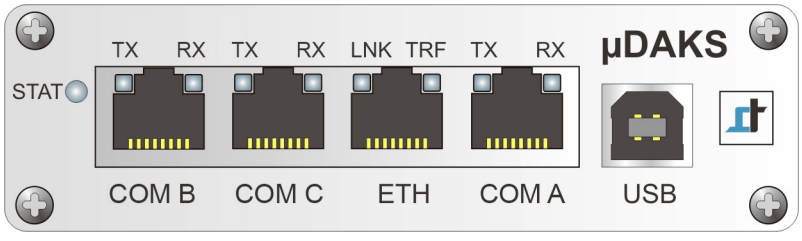


Image 3-4 Front panel of the table top housing - with **three** COM interfaces

3.1.5 Status indicator

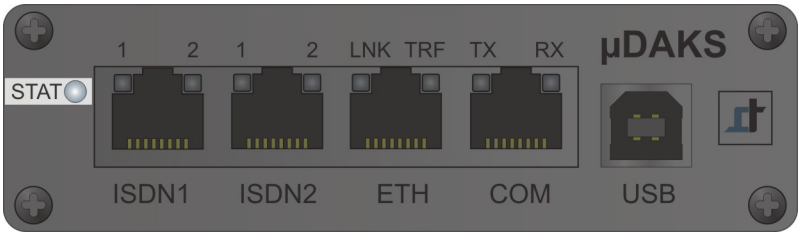


Image 3-5 Status indicator

Element	Description	
Status	Status indicator via LED:	
	• OFF	If the status indicator does not light up, either OScAR Eco 100 is not connected to the power supply, or the servicing switch or PoE injector is not connected or not activated (turned on).
	• red	Reset
	• red blinking	Internal error
	• Yellow	Currently booting
	• yellow blinking	The basic system is ready and the operating system is operating; the application or other software components are not active
	• green-red blinking	OScAR Eco 100 is not enabled
	• green-yellow blinking	Application has started, working data is missing
	• green	Ready to operate
	• green blinking	At least one broadcast or one conference is currently active

Table 3-1 Status indicator

3.2 Interfaces

3.2.1 Ethernet interface

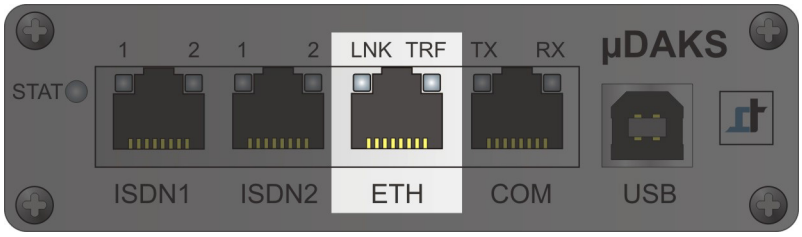


Image 3-6 Ethernet interface

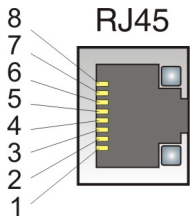
Element	Description
ETH	RJ45 jack for connectivity with the LAN (10-,100-Base-T) and for the power supply via PoE: **Pin assignment:**  Pin 1: Tx+ Pin 2: Tx- Pin 3: Rx+ Pin 4: + PWR Pin 5: + PWR Pin 6: Rx- Pin 7: - PWR Pin 8: - PWR
LED LNK	Physical contact to the LAN (link): • red Reset • green: Link 100 Mbit/s • yellow: Link 10 Mbit/s • OFF: No link
LED TRF	Activity of the Ethernet interface: • red Reset • green: Traffic • OFF: No traffic

Table 3-2 Ethernet interface

3.2.2 COM interfaces

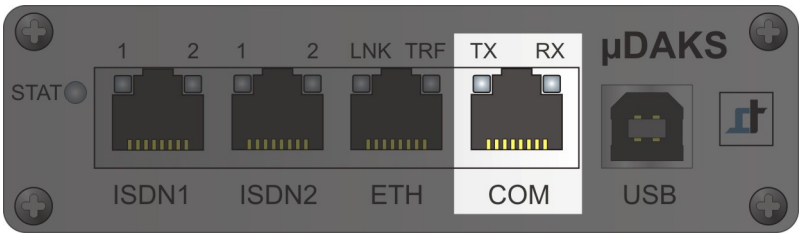


Image 3-7 COM interface

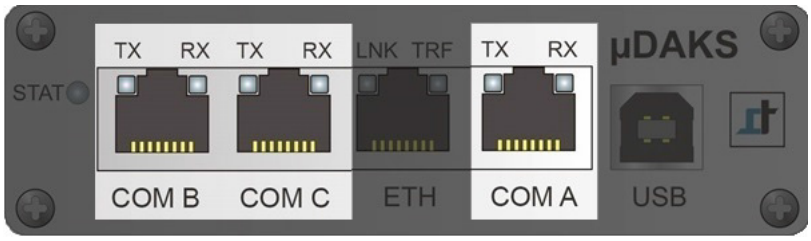


Image 3-8 COM A, B and C interface

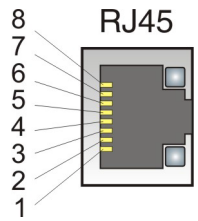
Element	Description
COM COM A, B and C	RJ45 jack for connectivity to external add ons (electrically isolated): • RS232 • RS422 **Pin assignment:**  Pin 1: n. c. / n. c. Pin 2: RTS / Tx+/Y Pin 3: GND / GND Pin 4: TxD / Tx-/Z Pin 5: RxD / Rx+/A Pin 6: n. c. / n. c. Pin 7: CTS / Rx-/B Pin 8: DTR / n. c. (**RS232** / **RS422**)
LED TX	Status indicator: • red: Reset • green: Data traffic
LED RX	Status indicator: • red: Reset • green: Data traffic

Table 3-3 COM interfaces

3.2.3 ISDN interfaces

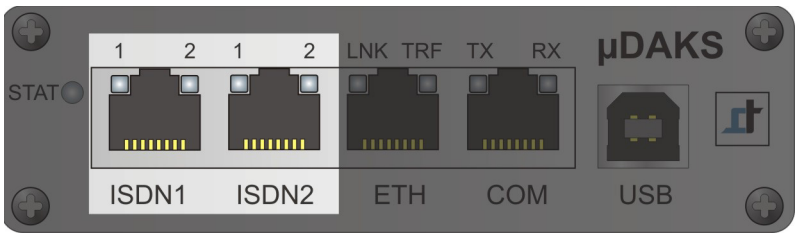


Image 3-9 ISDN interfaces

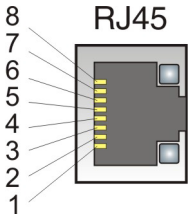
Element	Description
ISDN 1 ISDN 2	RJ45 jack for connectivity to the PBX: • E_1 (S_{2M}) /T_1 • S_0 • U_{K0} **Pin assignment:**  **E_1/T_1 / S_0 / U_{K0}** Pin 1: Rx+ / n.c. / n.c. Pin 2: Rx- / n.c. / n.c. Pin 3: n. c. / Tx+ / n.c. Pin 4: Tx+ / Rx- / a Pin 5: Tx- / Rx+ / b Pin 6: n. c. / Tx- / n.c. Pin 7: n. c. / n.c. / n.c. Pin 8: n. c. / n.c. / n.c. **Input resistance:** • E1 120 Ω • T1 100 Ω • S_0 100 Ω
LED 1	Status indicator Layer 1 and 2: • OFF Layer 1, Layer 2 inactive • red Layer 1 inactive • yellow Layer 1 active, Layer 2 inactive • green Layer 1 and Layer 2 active • green blinking Layer 1 inactive, Layer 2 active
LED 2	Status indicator Layer 3: • OFF Layer 3 inactive • yellow Layer 3 active (all B-channels occupied) • green Layer 3 active (at least 1 B-channel occupied)

Table 3-4 ISDN interfaces

3.2.4 USB interface

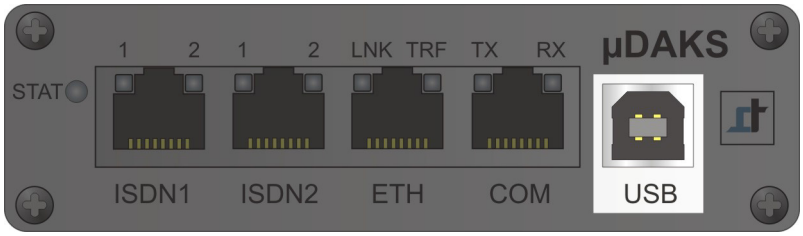


Image 3-10 USB interface

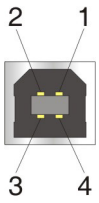
Element	Description
USB	USB plug type B: **Pin assignment:**  Pin 1: V_{Bus} Pin 2: D- Pin 3: D+ Pin 4: GND

Table 3-5 USB interface

3.3 Digital I/O

3.3.1 Digital inputs

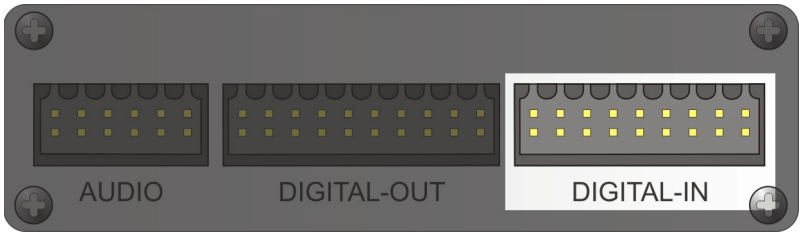


Image 3-11 Digital inputs

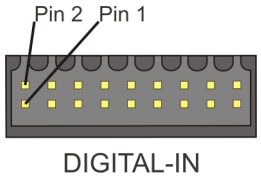
Element	Description
DIGITAL-IN	16 digital inputs: • Internal feeding for direct connectivity of contacts **Pin assignment:**  Pin 1: IN1 Pin 2: IN2 Pin 3: IN3 Pin 4: IN4 Pin 5: IN5 Pin 6: IN6 Pin 7: IN7 Pin 8: IN8 Pin 9: IN9 Pin 10: IN10 Pin 11: IN11 Pin 12: IN12 Pin 13: IN13 Pin 14: IN14 Pin 15: IN15 Pin 16: IN16 Pin 17: INCOM Pin 18: INCOM

Table 3-6 Digital inputs

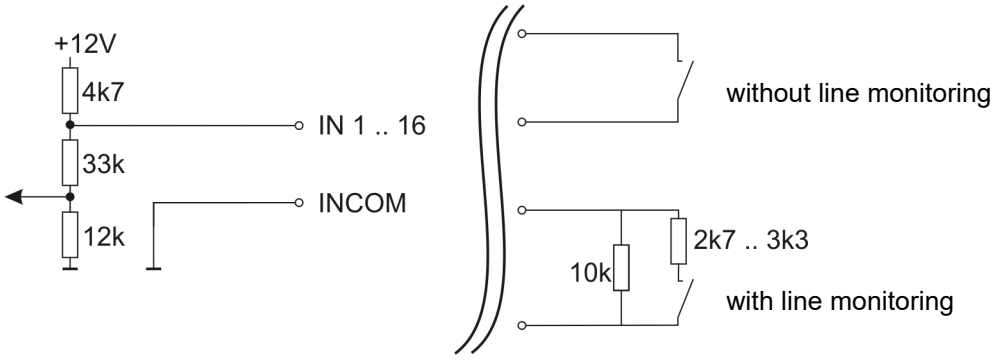


Image 3-12 Wiring of the digital inputs

3.3.2 Digital outputs

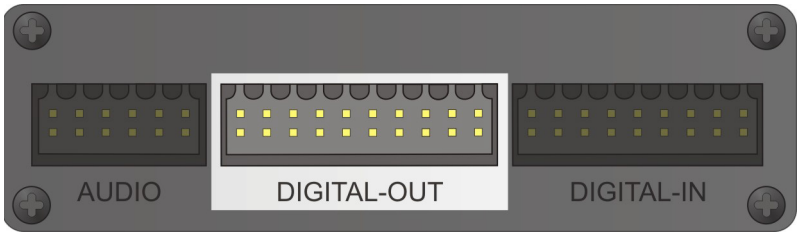


Image 3-13 Digital outputs

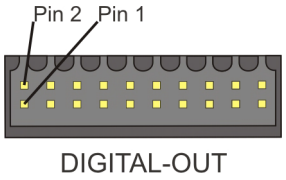
Element	Description
DIGITAL-OUT	8 digital outputs (electrically isolated, also from one another): • Umax 60 V DC • I_{max} 0.1 A • RON 11 Ω 1 Relay output (electrically isolated): • Umax 60 V DC • I_{max} 1 A • P_{max} 30 W **Pin assignment:**  Pin 1: GND Pin 2: REL-NC Pin 3: REL-C Pin 4: REL-NO Pin 5: OUT1A Pin 6: OUT1B Pin 7: OUT2A Pin 8: OUT2B Pin 9: OUT3A Pin 10: OUT3B Pin 11: OUT4A Pin 12: OUT4B Pin 13: OUT5A Pin 14: OUT5B Pin 15: OUT6A Pin 16: OUT6B Pin 17: OUT7A Pin 18: OUT7B Pin 19: OUT8A Pin 20: OUT8B

Table 3-7 Digital outputs

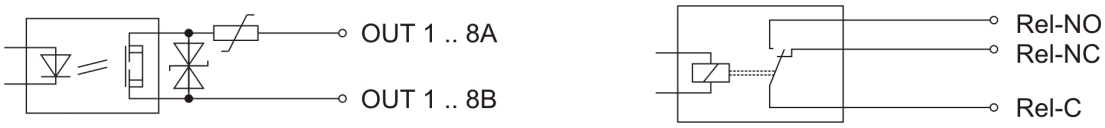


Image 3-14 Wiring of the digital outputs

3.4 microSD card

- **Order number:** TNK:UD-SD-2G
- **Function:** The microSD card is used for mass storage in OScAR Eco 100. It is here that all non-volatile data that is needed to operate OScAR Eco 100 is stored (e.g. operating system, driver, license information, applications, application data, and the protocols).
- **Technical data:** Storage capacity: 2 GB

Caution!
The microSD card TNK:UD-SD-2G cannot be replaced with any commercially available microSD card.

3.5 Add ons

3.5.1 DCE-01 adaptor

- **Order number:** TNK:A-DCE-01
- Function: Adaptor from RJ45 to SUB D-09-F to connect OScAR Eco 100 to a DTE with local handshake, e.g. a PC;
See Chapter 5, "Wiring Plans"

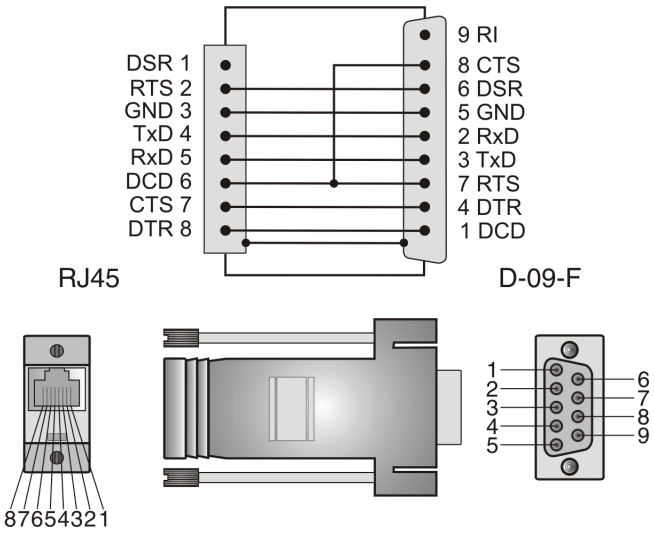


Image 3-15 DCE adaptor with a local handshake

3.5.2 DTE adaptor

- **Order number:** TNK:A-DTE-01
- **Function:** Adaptor from RJ45 to SUB D-09-M to connect OScAR Eco 100 to a DCE, e.g. a modem;
  See Chapter 5, "Wiring Plans"

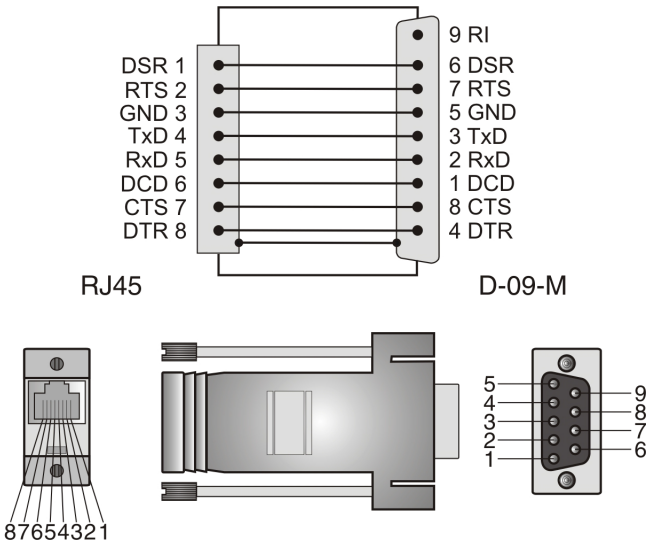


Image 3-16 DTE Adaptor

3.5.3 CSA converter

- **Order number:** TNK:CSA-01
- **Function:** To convert an RS-422 interface into an RS-232 interface
  See Section 5.6, "Line Extension of the COM interfaces"

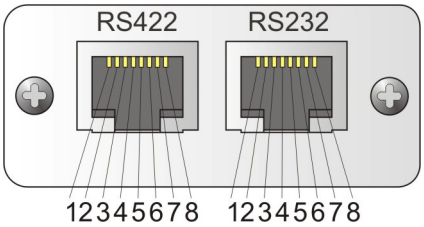


Image 3-17 CSA converter

Pin assignment RS422:

- Pin 1: n.c.
- Pin 2: Rx+/A
- Pin 3: GND
- Pin 4: Rx-/B
- Pin 5: Tx+/Y
- Pin 6: n.c.
- Pin 7: TX-/Z
- Pin 8: n.c.

Pin assignment RS232:

- Pin 1: DSR
- Pin 2: RTS
- Pin 3: GND
- Pin 4: TxD
- Pin 5: RxD
- Pin 6: DCD
- Pin 7: CTS
- Pin 8: DTR

Note:
The CSA converter is powered through the RS232 connection and requires no further electric power supply.

3.5.4 Twin outlet line jack unit S0 (shielded)

- **Order number:** TNK:UAE/8/8AP-S
- **Function:** Connect OScAR Eco 100 to a PBX
  See Section 5.3, "Wiring plan of the ISDN-S0 interface"

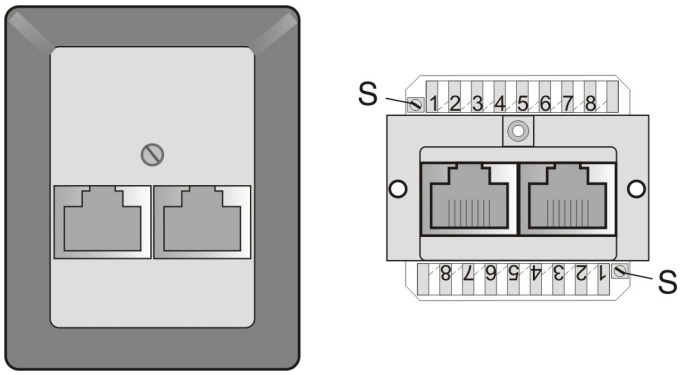


Image 3-18 Twin outlet line jack unit S_0 (shielded)

3.5.5 Single outlet line jack unit RS422 (unshielded)

- **Order number:** TNK:UAE8AP
- **Function:** The single socket is used for line extension via RS422
  see Section 5.5, "Wiring plan of the COM interfaces"

The Pin assignment of the RJ45 socket results from the interface to which it is connected.

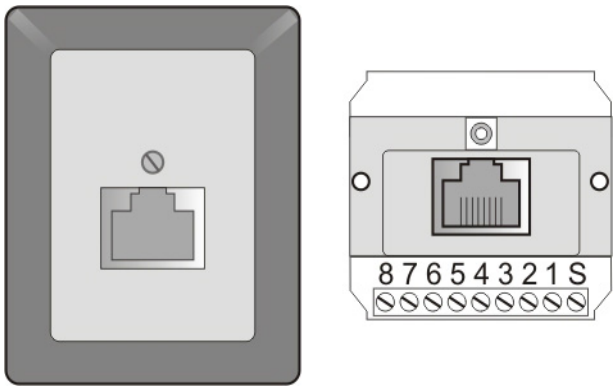


Image 3-19 Single outlet line jack unit RS422 (unshielded)

3.5.6 USB cable cord

- **Order number:** TNK:K-USBAB-0300
- **Function:** To connect OScAR Eco 100 to a Service PC

Technical details:

- Length 3.00 m
- Connection: Plug type A/B

3.5.7 Patch cable cord

- **Order number:** TNK:K-CAT6-0300
- **Function:** Connector cable to link up various interfaces (e.g. LAN, RS232, RS422, S_0, E_1/T_1)

Technical details:

- Length 3.00 m
- Category: CAT6, shielded
- PIN assignment In keeping with EIA/TIA T568A or EIA/TIA T568B, resp.

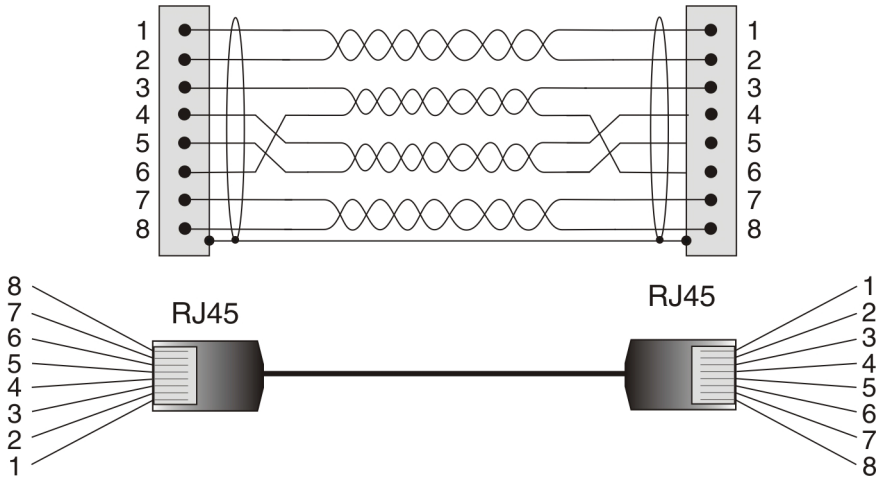


Image 3-20 Patch cable cord

3.5.8 PoE injector

- **Order number:** TNK:POE$_1$
- **Function:** Power supply of OScAR Eco 100 via Power over Ethernet, incl. link-up of OScAR Eco 100 to the LAN in keeping with IEEE 802.3af

Technical details:

- Input voltage: 100 ... 240VAC at 50-60Hz
- max. power consumption: 400 mA
- Output voltage: 48V
- Output current: 320 mA

Image 3-21 PoE injector

Connector specification:

- IN: In keeping with 10-/100-/1000-Base-T
- OUT: In keeping with IEEE 802.3af
- Power: IEC socket to connect the PSU to the power supply

3.5.9 Special connector for digital inputs

- **Order number:** TNK:ST-2L18
- **Function:** 18-pin clamp connector to connect the digital inputs

The below picture illustrates the line connector in the spring-cage system.

The connectors have a straight outlet direction with a 3.5 mm pitch.

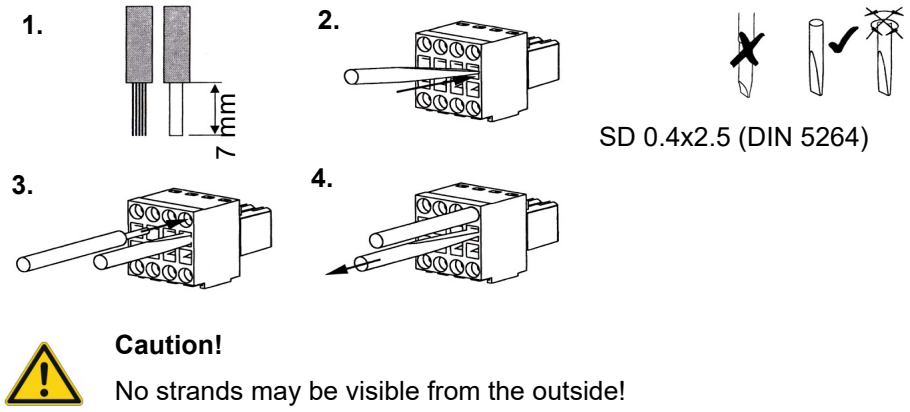


Image 3-22 Special connector for digital inputs

3.5.10 Special connector for digital outputs

- **Order number:** TNK:ST-2L20
- **Function:** 20-pin clamp connector to link up the digital outputs

“Special connector for digital inputs” on page 26 (see above) illustrates the spring-cage system.

The connectors have a straight outlet direction with a 3.5 mm pitch.

3.5.11 Special connector for audio I/O

- **Order number:** TNK:2L12
- **Function:** 11-pin clamp connector to connect the audio I/O

“Special connector for digital inputs” on page 26 illustrates the spring-cage system.

The connectors have a straight outlet direction with a 3.5 mm pitch.

3.5.12 Rating data for line connections of the digital I/O and audio

The line connections of the digital inputs, digital outputs and audio meet the following rating data in keeping with IEC 60664-1 / IEC 61984:

Description	Size	Value
max. clamping range	mm^2	0.08...1
single wire H05(07) V-U	mm^2	0.2...1
fine wire H05(07) V-K	mm^2	0.2...1
fine wire with end splice (German short: AEH)	mm^2	0.13...0.34
End splice (AEH) with plastic collar	mm^2	0.13...0.34
Stripping length	mm	7

Table 3-8 Rating data for line connections digital I/O und audio

3.6 LAN printer

- **Order number:** TNK:OM280LAN
- **Function:** Protocol printer with LAN connectivity

The following components are included in the printer delivery package:

- Dot-matrix printer OKI Microline 280
- LAN Module
- PSU for power supply of the LAN interface

Note:
The documentation on the OKI Microline 280 printer is on the CD that is part of the OKI Microline 280 delivery package.
The documentation on the LAN module is on the CD that is part of the LAN module delivery package.
Bear in mind that an OKI Microline 280 with a serial interface cannot be used as a LAN printer.

Caution!
The USB interface of an OKI Microline 280 may not be connected in parallel, if the printer is used as the protocol printer for OScAR Eco 100!
The IP address of the LAN interface upon delivery reads '192.168.100.100'. To configure the interface, connect the printer to a PC/Laptop with a crossover patch cable cord (not included in the delivery)!
In this process, be careful to follow the setup instructions in the LAN module's documentation.

3.6.1 Connect the printer to the LAN

How to connect the printer to the LAN, step by step:

No.	Step
1.	If needed, switch the printer OFF and pull the power cable from the printer.
2.	Plug the LAN module into the printer's Centronics interface.
3.	To configure the LAN module connect it either directly to the network, or connect it to a PC or laptop with a crossover patch cable (see above).
4.	Connect the LAN module to the PSU.
5.	Plug the power cable into the printer and switch the printer ON.
6.	Configure the LAN module. ? see documentation of the LAN module
7.	If needed, switch the printer emulation 'IBM' to ON (activated by default). ? see OKI Microline 280 documentation
8.	If you have installed the printer through a crossover patch cable connect to the LAN.

Table 3-9 Connect the printer to the LAN

4 Hardware Operations

Overview

This chapter describes the hardware operations and also includes the safety instructions in German, Finnish, Danish and Swedish.

Content

The following areas are covered in this chapter:

4.1 General safety instructions-
- 4.1.1 Safety instructions for Denmark
- 4.1.2 Safety instructions for Finland
- 4.1.3 Safety instructions for Sweden

4.2 Open and close the hardware casing
4.3 Insert and remove the ISDN module
4.4 Insert and remove the COM module
4.5 Insert and remove the microSD card

4.1 General safety instructions-

Note:
Fire security and life safety features were not evaluated during the UL test.

Warning!
Always make sure you read the installation instructions carefully before you connect the system to the electric power source.

Warning!
Please follow the general safety instructions and the recommended measures for ESD protection.

Warning!
OScAR Eco 100 may not be operated in explosion-risk areas or rooms.

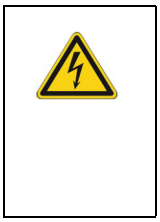
Warning!
OScAR Eco 100 may only be operated on switches with PoE (Power over Ethernet) or PoE injectors. Please follow the safety information and safety instructions of these devices.

Warning!
After disconnecting the Ethernet power cord, make sure that no current-carrying parts of the Ethernet power plug come into contact with metallic objects.

Warning!
During a thunderstorm, do not perform any operations on the system and do not connect or pull any cables or cords.

Warning!
The sockets marked "ETH", "USB", "COM", "DIGITAL OUT", "DIGITAL IN", and "AUDIO" are safety switches with an extra low voltage (Safety Extra Low Voltage, SELV). Always make sure that SELV switches are only connected to other SELV switches.

Warning!
The sockets marked "ISDN 1" and "ISDN 2" are safety switches with TNV-1 circuits.



Warning!
OScAR Eco 100 is designed as a tabletop solution for operation in an EDP or lab environment, and requires a surrounding that is dry, clean, well-ventilated, and air conditioned. OScAR Eco 100 is cooled exclusively by way of convection, i.e. no fans are built into OScAR Eco 100. For more details on the required ambient temperature and the humidity, see Chapter 2, "OScAR Eco 100 Specification".

Warning!
OScAR Eco 100 may only be repaired or serviced by the producer and with the original parts. No components or parts of the boards may be replaced or exchanged by the user.

Warning!
This product may only be disposed in keeping with the pertinent statutory laws and regulations.
Note: OScAR Eco 100 has no batteries!

4.1.1 Safety instructions for Denmark

Vigtigt!
Lederen med grøn/gul isolation må kuntilsluttes en klemme mærket (IEC 417, No. 5019) eller (IEC 417, No. 5017).
For tilslutning af de øvrige ledere, se medfølgende installationsvejledning".

4.1.2 Safety instructions for Finland

Variotus!
Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan.

4.1.3 Safety instructions for Sweden

Varning!
Apparaten skall anslutas till jordat uttag.

4.2 Open and close the hardware casing

Warning!
Before you carry out any servicing work on OScAR Eco 100, always make sure to disconnect the Ethernet interface as the electric power supply, as well as ALL other connections.

How to open and close the casing, step by step:

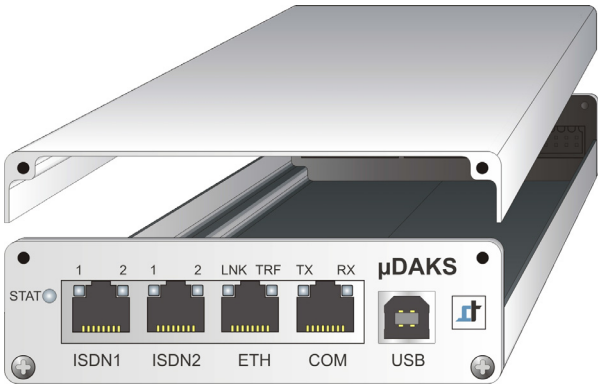
No.	Step
1.	Disconnect the Ethernet connection. Pull all other connections. See Section 4.1, "General safety instructions-"
2.	Now remove the UPPER fastening screws at the face and rear panel of the casing.
3.	Remove the casing top. 
4.	Now close the casing again, in the reverse order of steps. **Caution!** Be mindful of the mounting direction of the casing top and, if needed, make a note of it. The casing top is not symmetrical and must, in the reassembly, be placed back in the same direction as before the disassembly.
5.	Plug in all connections to OScAR Eco 100 with the exception of the Ethernet connection. Plug in the Ethernet connection to OScAR Eco 100. ? see **Warning!**

Table 4-1 How to open and close the casing

4.3 Insert and remove the ISDN module

How to insert and remove the ISDN module, step by step:

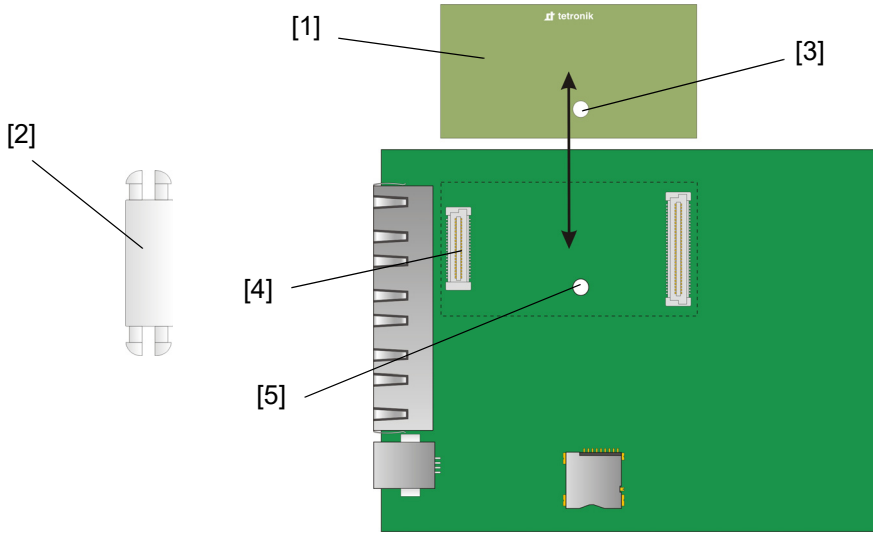
No.	Step
1.	Open the casing. See Section 4.2, "Open and close the hardware casing"
2.	 **Insert and remove the ISDN module [1] of the type IIE-02, IIS-02 or IIU-02:** **To insert:** • Snap and lock into place the plastic clip [2] in the mounting hole [5] on the motherboard. • Plug the ISDN module [1] onto the plug connector [4] and click-to-fasten-into-place the plastic clip in the mounting hole [5] of the motherboard, using the mounting hole of the ISDN module [3]. **To remove:** • Remove the plastic clip [2] by pressing both sides of the clip together at the top. • Lift the ISDN module [1] from the plug connector [4]. • Remove the plastic clip [2] from the mounting hole [5] of the motherboard. **Caution!** The ISDN module [1] of the type IIE-02, IIS-02 or IIU-02 must always be attached and fastened with the plastic clip [2].
3.	Now close the casing again. See Section 4.2, "Open and close the hardware casing"

Table 4-2 Insert and remove the ISDN module

4.4 Insert and remove the COM module

How to insert and remove the COM module, step by step:

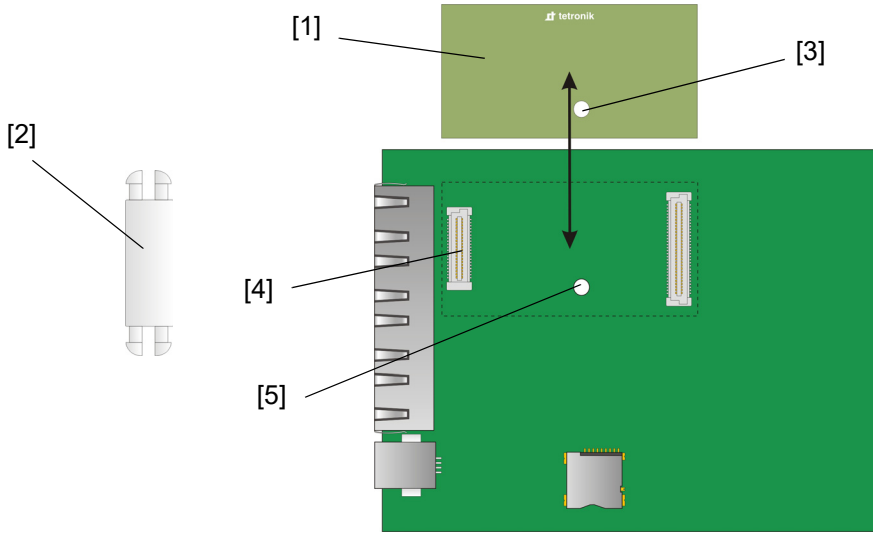
No.	Step
1.	Open the casing. See Section 4.2, "Open and close the hardware casing"
2.	 **Insert and remove the COM module [1] of the type ISX-01.** **To insert:** • Snap and lock into place the plastic clip [2] in the mounting hole [5] on the motherboard. • Plug the COM module [1] onto the plug connector [4] and click-to-fasten-into-place the plastic clip in the mounting hole [5] of the motherboard, using the mounting hole of the COM module [3]. **To remove:** • Remove the plastic clip [2] by pressing both sides of the clip together at the top. • Lift the COM module [1] from the plug connector [4]. • Remove the plastic clip [2] from the mounting hole [5] of the motherboard. **Caution!** The COM module [1] of the type ISX-01 must always be attached and fastened with the plastic clip [2].
3.	Now close the casing again. ? see Section 4.2, "Open and close the hardware casing"

Table 4-3 Insert and remove the COM module

4.5 Insert and remove the microSD card

Caution!
The microSD card does not need to be replaced unless there is a defect on the card itself.

How to insert and remove the microSD card, step by step:

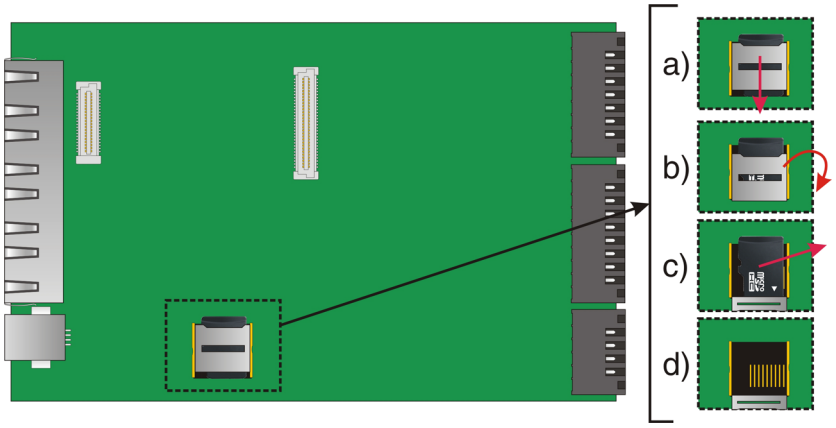
No.	Step
1.	Open the casing. See Section 4.2, "Open and close the hardware casing"
2.	 To remove the microSD card: • a) Slide the metal lid towards the board's edge. • b) Flip the metal lid up. • c) Remove the microSD card. • d) The contacts of the microSD card retainer are now visible.
3.	Insert the microSD card you want to mount in the reverse order of the above-mentioned steps 2a) through 2c). Please bear in mind for the microSD card: • The contacts must be face down. • The groove must point to the left.
4.	Now close the casing again. ? see Section 4.2, "Open and close the hardware casing"

Table 4-4 Insert and remove the microSD card

5 Wiring Plans

Overview

This chapter covers the different wiring plans of OScAR Eco 100.

Content

The following areas are covered in this chapter:

5.1 Wiring plan of the USB interface
5.2 Wiring plan of the Ethernet interface with power supply
5.3 Wiring plan of the ISDN-S0 interface
5.4 Wiring plan of the ISDN-E1/T1 interface
5.5 Wiring plan of the COM interfaces
5.6 Line Extension of the COM interfaces

5.1 Wiring plan of the USB interface

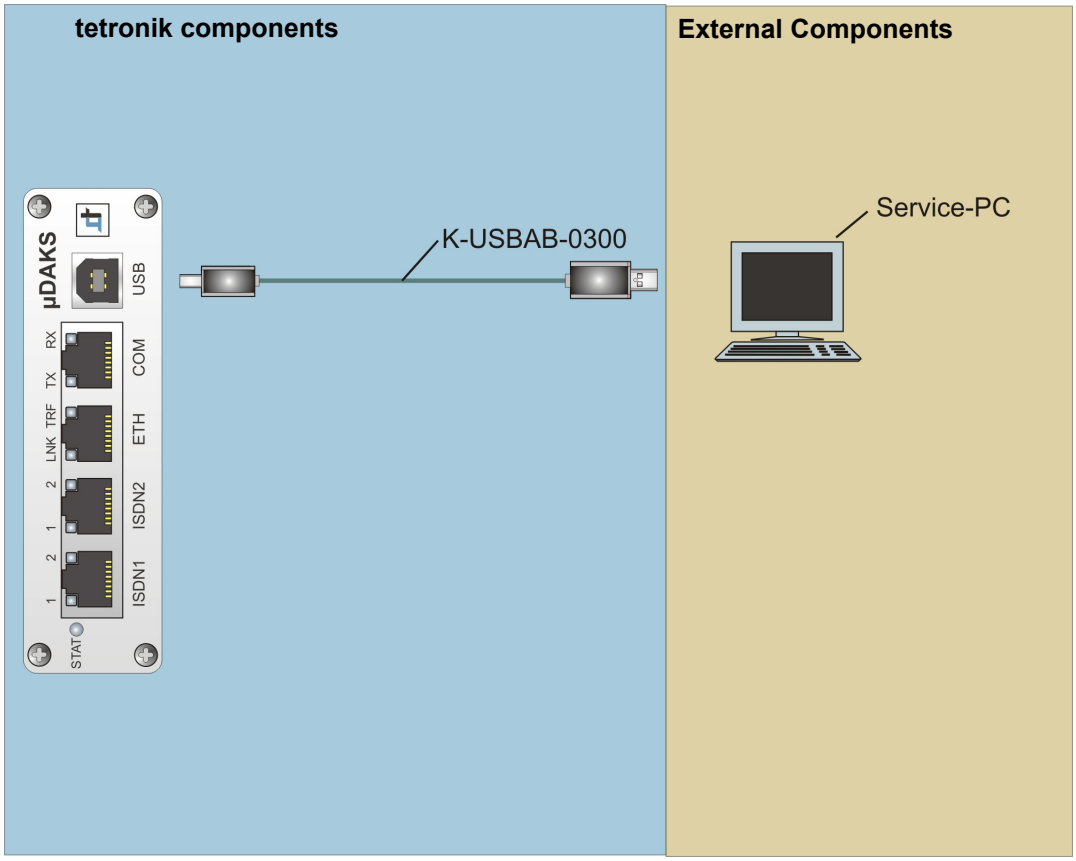


Image 5-1 USB wiring plan

Element	Description
K-USBAB-0300	USB cable cord
Service PC	PC with terminal emulation program

Table 5-1 USB wiring plan

5.2 Wiring plan of the Ethernet interface with power supply

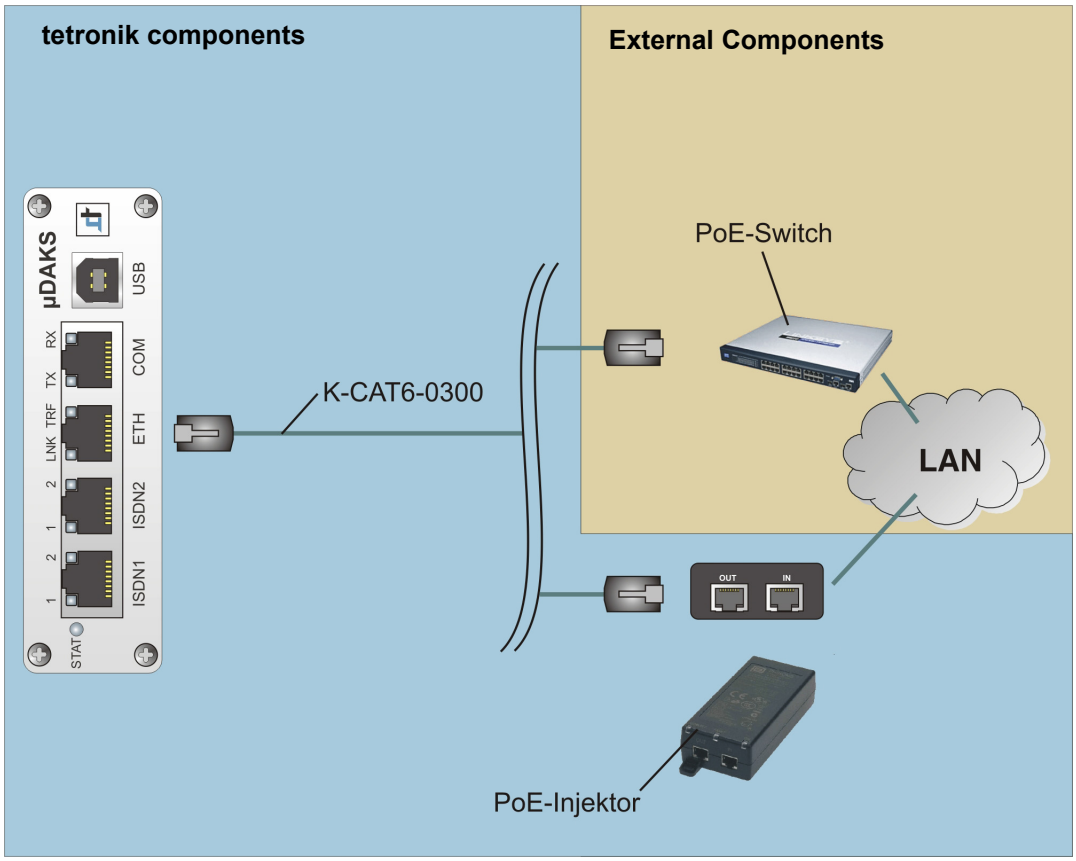


Image 5-2 Ethernet wiring plan

Element	Description
K-CAT6-0300	Standard patch cable
PoE switch	Power supply alternatively from OScAR Eco 100 and link-up to the LAN
PoE injector	

Table 5-2 Ethernet wiring plan

5.3 Wiring plan of the ISDN-S_0 interface

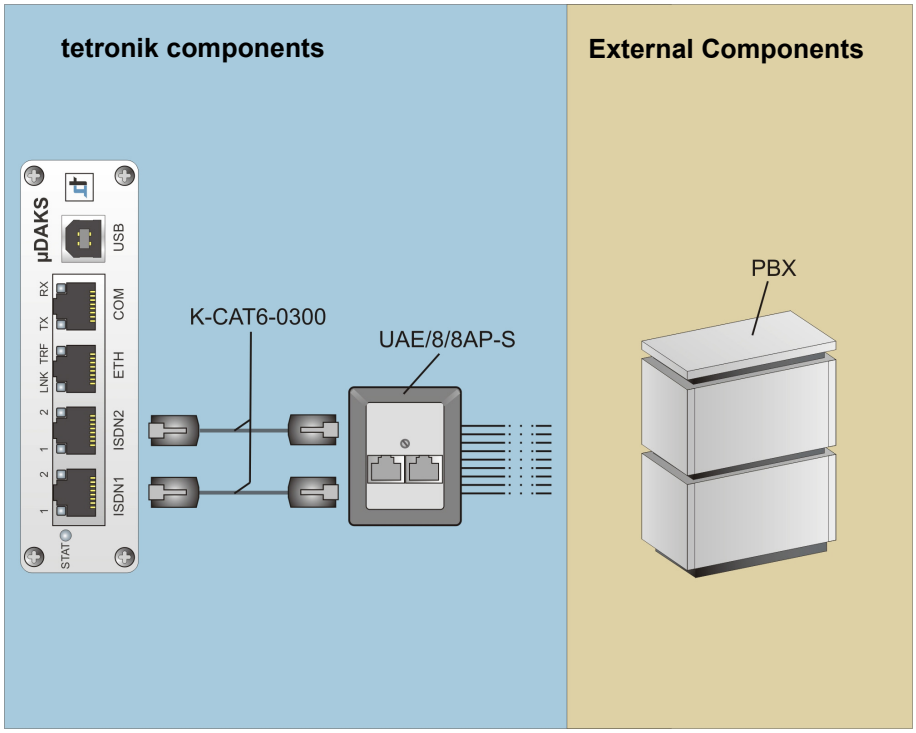
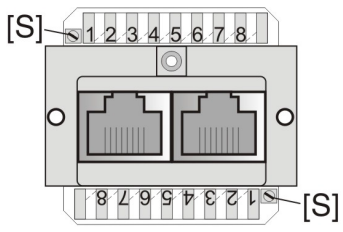


Image 5-3 Wiring plan ISDN S_0 and U_{K0}

Note:
Be careful to connect U_{K0} only at the port ISDN 1.

Warning!
For ISDN connections, please use connection cables with a diameter of at least 0.4 mm (AWG26 or superior).

Element	Description
K-CAT6-0300	Standard patch cable
PBX	Public exchange system
UAE/8/8AP-S	Socket for S_0 to connect OScAR Eco 100 to a PBX.



	S_0	U_{K0}
Pin 1:	n.c.	n.c.
Pin 2:	n.c.	n.c.
Pin 3:	Tx+	n.c.
Pin 4:	Rx-	a
Pin 5:	Rx+	b
Pin 6:	Tx-	n.c.
Pin 7:	n.c.	n.c.
Pin 8:	n.c.	n.c.
[S]	Shield	Shield

Table 5-3 Wiring plan ISDN S_0 and U_{K0}

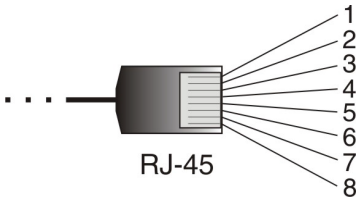
Element	Description
RJ45	Pin assignment of the patch cable plug to connect OScAR Eco 100 to any PBX system.  **S_0** / **U_{K0}** Pin 1: n.c. / n.c. Pin 2: n.c. / n.c. Pin 3: Tx+ / n.c. Pin 4: Rx- / a Pin 5: Rx+ / b Pin 6: Tx- / n.c. Pin 7: n.c. / n.c. Pin 8: n.c. / n.c.

Table 5-3 Wiring plan ISDN S_0 and U_{K0}

5.4 Wiring plan of the ISDN-E_1/T_1 interface

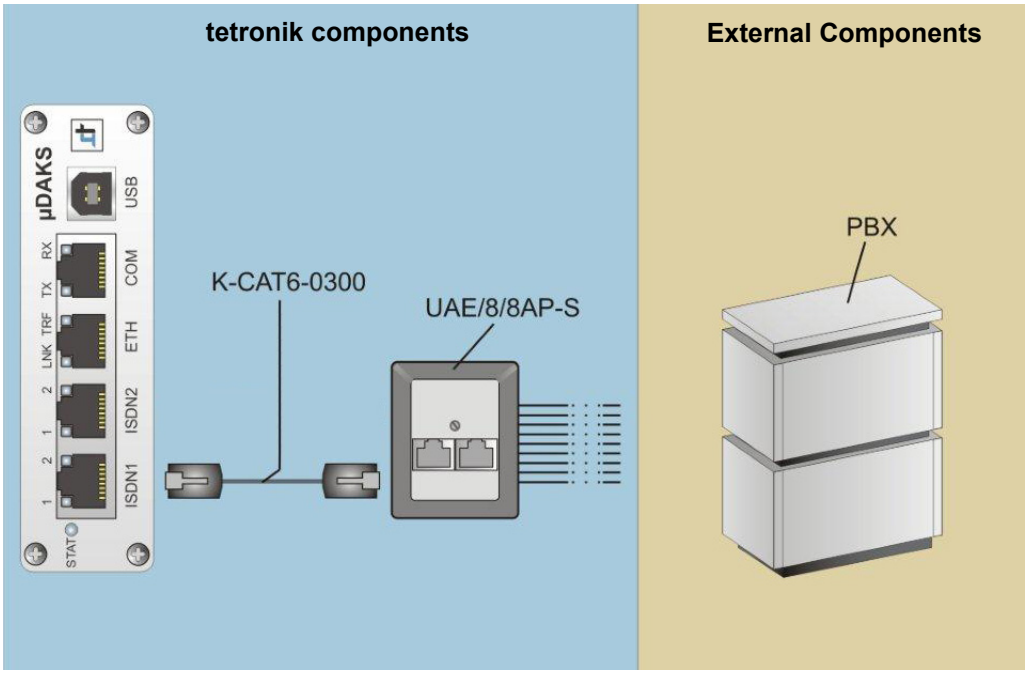


Image 5-4 Wiring plan ISDN E_1/T_1

Note:
Please be sure to connect E_1/T_1 only at the port ISDN1.

Warning!
For ISDN connections only use connection cables with a diameter of at least 0.4 mm (AWG26 or superior).

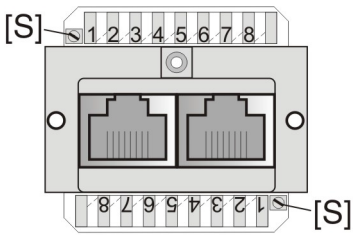
Element	Description
K-CAT6-0300	Standard patch cable
PBX	Public exchange system
UAE/8/8AP-S	Socket for E_1/T_1 to connect OScAR Eco 100 to a PBX.  **E_1/T_1** Pin 1: Rx+ Pin 2: Rx- Pin 3: n.c. Pin 4: Tx+ Pin 5: Tx- Pin 6: n.c. Pin 7: n.c. Pin 8: n.c. [S] Shield

Table 5-4 Wiring plan ISDN E_1/T_1

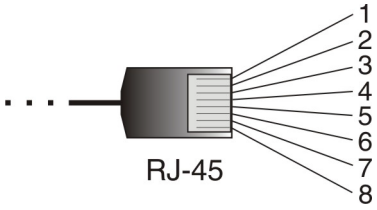
Element	Description
RJ45	Pin assignment of the plug of the patch cable, to connect OScAR Eco 100 to a PBX system with the Pins 4 and 5 being = TX, and the Pins 1 and 2 being = RX  **E_1/T_1** Pin 1: Rx+ Pin 2: Rx- Pin 3: n.c. Pin 4: Tx+ Pin 5: Tx- Pin 6: n.c. Pin 7: n.c. Pin 8: n.c.

Table 5-4 Wiring plan ISDN E_1/T_1

Caution!

When you connect the system to the PBX system, always make sure that the Tx lines of OScAR Eco 100 are connected to the Rx lines of the PBX system, and also that the Rx lines of OScAR Eco 100 are always connected to the Tx lines of the PBX system.

If the PBX connection is not via the patch cable (included in the delivery), via the junction box and via an inhouse connection, but instead linked-up directly via a cable with double-sided RJ-45 connections, you will usually not utilize the included patch cable cord, but a twisted-pair E_1/T_1 cable, instead, (i.e. when on the PBX side the Pins 1 and 2 are = Rx, and the Pins 4 and 5 are = Tx).

5.5 Wiring plan of the COM interfaces

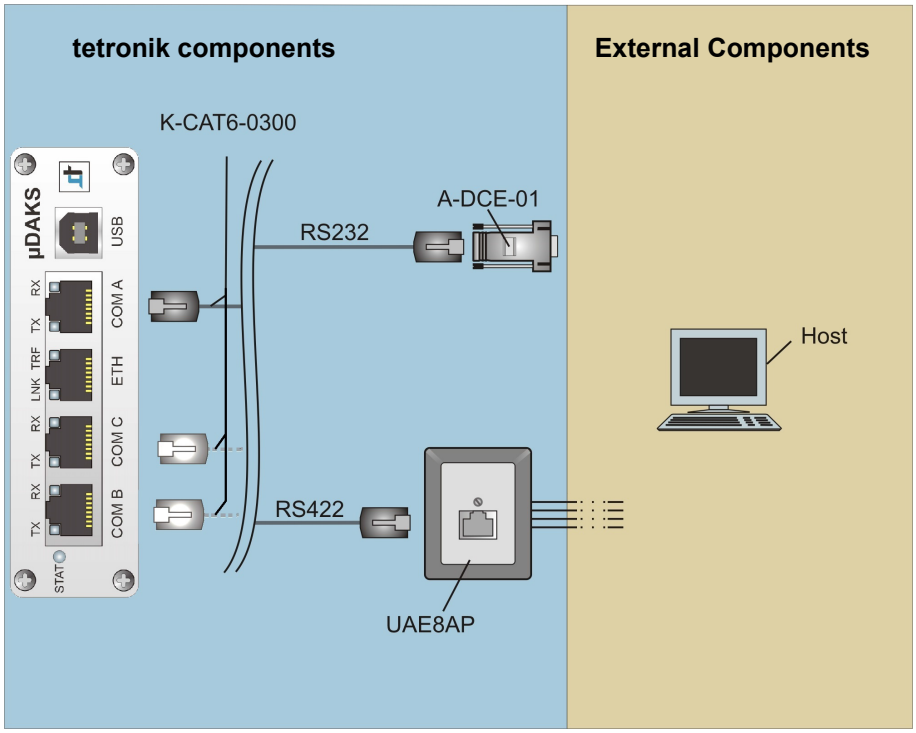


Image 5-5 Wiring plan of the COM interfaces

Warning!
Line lengths exceeding 15 m require a line extension of the serial connections.
? see Section 5.6, "Line Extension of the COM interfaces"

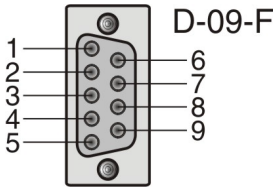
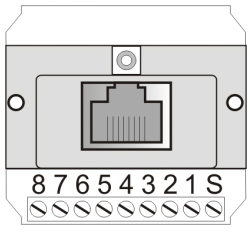
Element	Comment
K-CAT6-0300	Standard patch cable
PC/Host	Data Terminal Equipment (DTE), e.g. a nurse call system, connected either via RS232 or via RS422
A-DCE-01	Adaptor to connect OScAR Eco 100 to a DTE device  Pin 1: DCD Pin 6: DSR Pin 2: RxD Pin 7: RTS Pin 3: TxD Pin 8: CTS Pin 4: DTR Pin 9: RI Pin 5: GND
UAE8AP	Socket for an RS422 interface.  Pin 2: Tx+/Y Pin 3: GND Pin 4: Tx-/Z Pin 5: Rx+/A Pin 7: Rx-/B Pin 1, 6, 8: n. c.

Table 5-5 Wiring plan COM interfaces

5.6 Line Extension of the COM interfaces

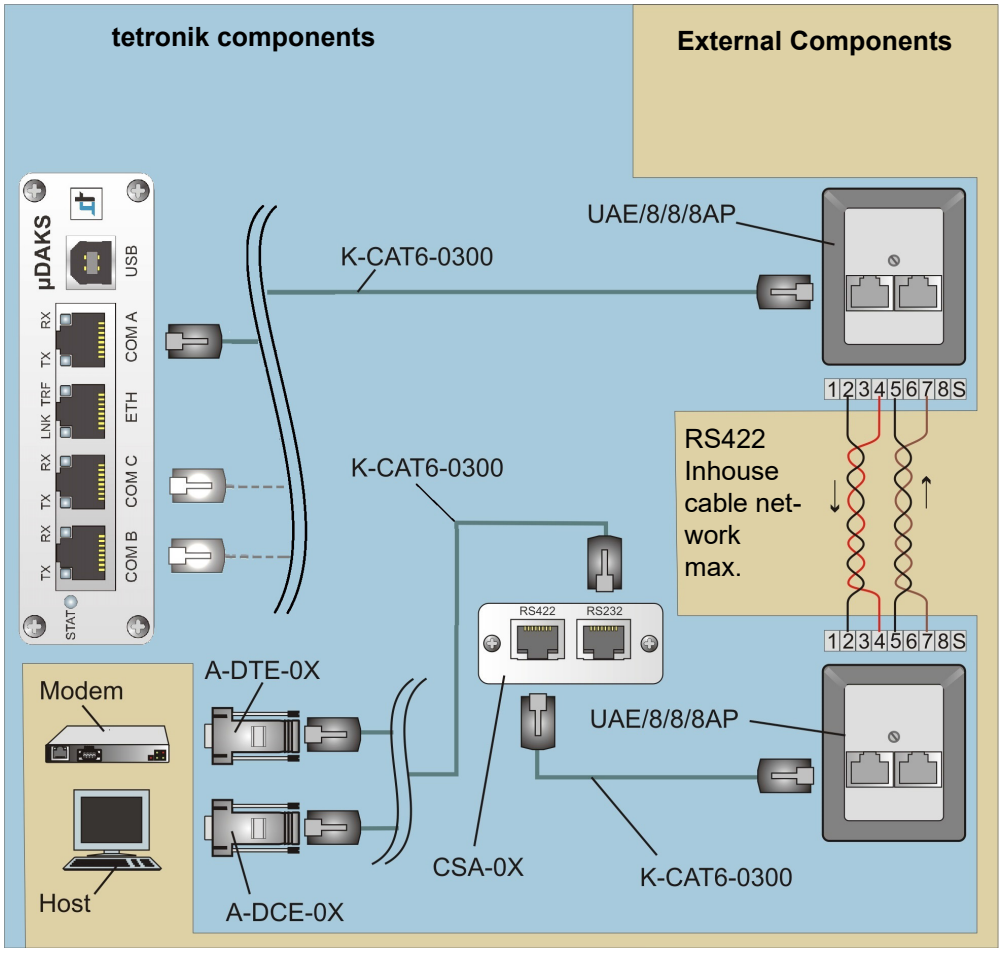


Image 5-6 Wiring plan of the COM interface line extension

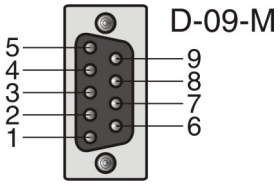
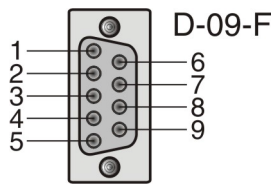
Element	Comment
Modem	Data Communication Equipment (DCE)/Modem, e.g. a GSM radio modem
A-DTE-0X	Adaptor to connect OScAR Eco 100 to a DCE device  D-09-M Pin 1: DCD Pin 6: DSR Pin 2: RxD Pin 7: RTS Pin 3: TxD Pin 8: CTS Pin 4: DTR Pin 9: n. c. Pin 5: GND
PC/Host	Data Terminal Equipment (DTE) e.g. a call system
A-DCE-0X	Adaptor to connect OScAR Eco 100 to a DTE device  D-09-F Pin 1: DCD Pin 6: DSR Pin 2: RxD Pin 7: RTS Pin 3: TxD Pin 8: CTS Pin 4: DTR Pin 9: n. c. Pin 5: GND
K-CAT6-0300	Standard patch cable

Table 5-6 Wiring plan line extension COM interfaces

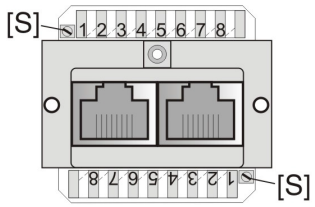
Element	Comment
UAE/8/8/8AP	Socket for an RS422 interface.  Pin 2: Tx+/Y Pin 3: GND Pin 4: Tx-/Z Pin 5: Rx+/A Pin 7: Rx-/B Pin 1, 6, 8: n. c.
CSA-0x	Conversion from RS422 to RS232

Table 5-6 Wiring plan line extension COM interfaces

6 PBX Systems and Soft Switches

Overview

This chapter covers in brief the coupling of OScAR Eco 100 to the PBX network or the convergent voice/data networks, as well as the trunk connections. It also refers to the external configuration instructions for the respective interface(s).

General Details

The coupling between OScAR Eco 100 and the PBX network or the convergent voice/data network is carried out with 4 channels, either:

- via ISDN using 2x S_0 digital trunks (QSIG, CorNet-NQ), or
- via VoIP using the LAN interface (SIP or SIP-Q).

The coupling to the PBX system or to the PBX network is carried out via trunk connection with a code and with direct inward dialing (DDI), enabling OScAR Eco 100 to be seen, from the network's side, like an additional network node, i.e. like a subsystem with its own numbering plan.

This is therefore **not** a CSTA-coupling (such as e.g. ACL or CAP for PBX systems by Unify)!

Note:
Please be aware that the configuration of the interface(s) between OScAR Eco 100 and the different PBX systems or soft switches is not part of this document.
For documentation of the configuration of the PBX interfaces:

- either on the Installation CD under "Documentation"
  Caution! This information may have already become obsolete!

Caution!
To access the Extranet you must be a service technician trained on OScAR, and registered with tetronik (access data that may already be available for FTP-download can be used for this area also).

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