Service Manual

Digital Alarm and Communication Server

'DAKS Release 6'
=
'HiPath DAKS V2.1'

Classic Applications

Software Versions 6.3x

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This Service Manual describes the overall functionalities of DAKS.
Please note that the functionalities may vary depending on the individual applications and features purchased with the DAKS system, but also as a result of restrictions that may apply to certain regions.

Please also be informed that the below items and corresponding cables are not included ex-works in deliveries to North America (USA, Canada, Mexico, and Puerto Rico):

- additional enclosure of subracks for module frames
- APS-01 board (connection to 115/230 V AC via additional external power supply unit)
- S0 interface board XRS-02- (SC-) BRI
- AIO-11 board (LF-interface board)
- standalone contact inputs (Profibus interface and components)
- DCF-77 receiver
- inhouse-modem (E-LINK-IV)
- line extensions (DAKS <-> PC/host, or DAKS <-> printer)
- CV422-1 RS232/RS422 converter (e.g. to connect SIGMASYS to DAKS)
- remote maintenance modem

1 Introduction

The central component of every DAKS system is the DAKS server. It is this server that carries out all the switching and transmission processes.

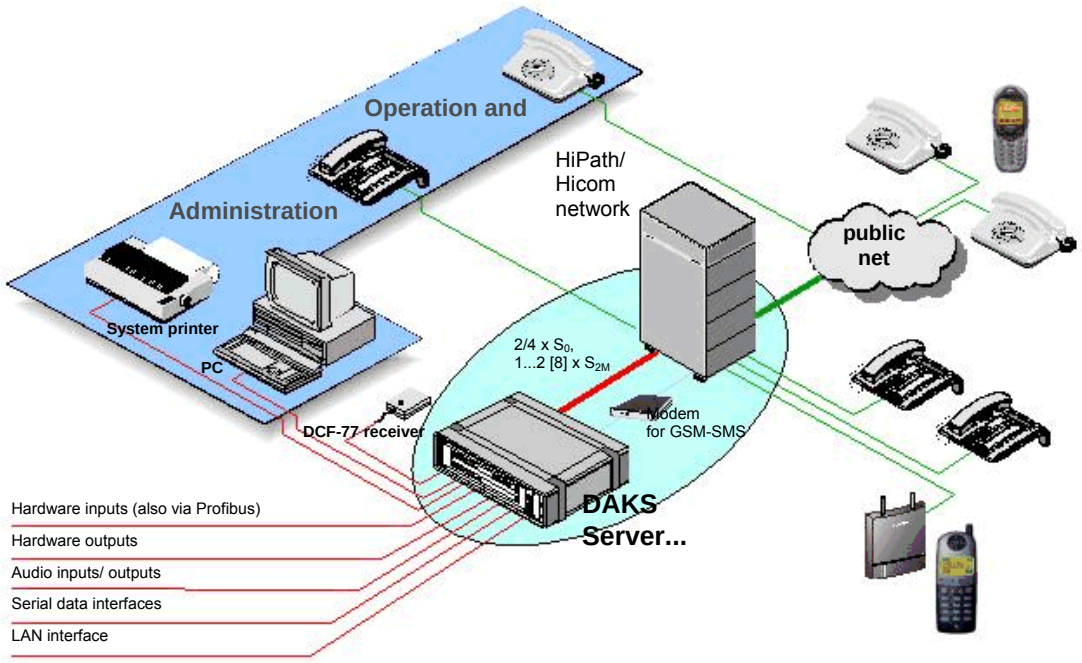
The DAKS server is connected to one or several PABX unit(s) or network analogous to an additional node, i.e. similar to a subsystem, with its own numbering plan (!! consequently not connected to ACL or CAP):

- 4- or 8-channel server via 2 or 4 digital trunks (S_0)
- 23- to 184-channel server via 1 to 8 digital T1 trunks
- 30- to 240-channel server via 1 to 8 digital trunks (E1-S_{2M})
- B-channel: 64 kbit/s A-law or µ-Law

In combination with HiPath/Hicom, the Siemens network protocol CorNet-NQ is used as D-channel protocol. This enables DAKS, especially with Hicom 300 / HiPath 4000, to utilize all of the HiPath/Hicom features that are already available in the network, e.g. alarm calls, emergency release and display control.
Optionally available protocols include: CorNet-N, QSIG, NI2, or DSS1 (with limited features).

The server is supplied with power either by a 48V telephone battery or a 115/230 V AC source.

DAKS requires at least one PC (not included in the delivery!) with the DAKS-TT software component ‘DAKS-TT-Server’, the ‘Admin-Tool’ and the ‘Operator Tool’ (for further details please see the 'User Manual DAKS Release 6 = HiPath DAKS V2.1, Classic Applications').



DAKS can be equipped with the following add-ons:

- Audio frequency interface for feeding in and out of analog audio signals (8xIN, 8xOUT).
- Detachable DCF receiver for synchronization to the DCF 77 standard time.
- (2x) 16 integrated input optocouplers and/or up to 704 hardware input contacts connected by means of Profibus DP technology (including decentralized hardware input contacts).
- (2x) 8 optocoupler outputs and an optional additional relay output.
- Non-volatile additional memory for the SMS retrieval service
- Serial interfaces to external systems or to a modem for GSM-SMS
- LAN interface

You can connect a printer to output system and process messages (the printing is carried out by an internal 64 K spooler via RS232).

Both the printer and the PC can be installed at a remote location and detached from the server via modem or DCI. In addition, the DAKS system supports dial-up modem connections between PC(s) and server(s).

2 Hardware components delivered

2.1 DAKS server components

2.1.1 Sub-rack with power supply in the case

- Shielded sub-rack in 19" format with VMEbus board:
  - either 3HE without PCM highway
  - or 6HE with PCM highway (internal DAKS interface between the ISDN interface and speech memory modules and to audio in/ outputs)
- Power supplied by either:
  - DC/DC converter, 36...60 V ⎓ 1.2-0.5A
  - Connection to 115/230 V AC via an additional, external power supply unit

- Where applicable, housed in plastic case: W x H x D around 540 x 180 x 300 mm (3 HE)
  or around 510 x 310 x 300 mm (6 HE)

2.1.2 ISDN interface and speech memory board XRS-02

- replaceable ISDN line module:
  - either 2x S_{2M} interface PRI-02-60
  - or 4x S_0 interface BRI-02-08
- variable D-channel protocol (in connection with HiPath 4000/Hicom 300: CorNet-NQ)
- pluggable SmartMediaCard with:
  - 60-min. speech memory for standard announcements (can be extended to 120 min.)
  - 3-min. speech memory for ad-hoc announcements (6 x 30 s)
- VMEbus interface to the controller board
- DTMF receiver per channel
- Interface to the PCM highway (SCbus) [add-on]
- debugging interface, asynchronous, serial RS232 (9600 baud)
- cascadable (up to 4 modules per server)

2.1.3 SBC-32 controller board (applies to posterior software upgrades only)

- 1.024 K flash EPROM (16 bit) with BIOS as well as start-up and DAKS software
- 1.024 K flash EPROM (16 bit) for customized data
- 3.072 K CMOS RAM (16 bit)
- Optional 1,024 K NV RAM add-on memory (for special expansions only)
- Real-time clock with battery
- VMEbus interface to the ISDN interface and speech memory board
- Chip card with stored software supply (encrypted)
- 2-wire interface for connecting a DCF77 receiver
- Spooled asynchronous serial RS232 interface (9600 baud):
  - for connecting a system printer, service terminal (usually a PC or notebook with terminal emulation) or modems
  - with ability to load debugging tools and software from a remote location
  - with ability to program chip cards
- Asynchronous serial RS232 protocol interface (usually 9600 baud, with 38400 baud also available) to the Administration and operation PC
- Asynchronous serial protocol interface (variable baud rate) to an external system, GSM-SMS modem or e-mail service:
  - plug-in interface module, including a jumper for the RS232 connection
  - in conjunction with a data interface to an external system [add-on]:
    plug-in interface card for the alternate, electrically isolated RS422 connection
- Slot for M-module

2.1.4 SBC–33 controller board

- 2.048 KByte Flash-EPROM (16 bit) with BIOS, Start Up- and DAKS software
- 2.048 KByte Flash-EPROM (16 bit) for customized data
- 6.144 KByte RAM (16 bit)
- 2.048 KByte NV-RAM additional memory (capacitor buffered memory)

- Real-time clock with battery
- VMEbus interface for the ISDN interface- and voice memory board
- Chipcard with encrypted software features
- IOD module (if necessary) with 2-wire port to connect DCF77 receiver
- Spooled, asynchronous serial RS232 port (9600 bd):
  - to connect a system printer, a service terminal (normally PC or notebook with terminal emulation) or a modem
  - with debugging features and option for remote software-download
  - with Chipcard programming option
- asynchronous serial RS232 protocol interface to connect DAKS-TT Server (normally 9600 bd, optionally 38.400 bd)
- one port for an asynchronous, serial protocol interface (variable baud rate) to an external system, a GSM-SMS modem, or the E-Mail Service:
  - with pluggable interface module + wired bridge for RS232 connection
  - in combination with the appropriate data interface to an external system [expansion] : additionally with pluggable interface module for the alternative RS422 connection (electrically isolated)
- M -module slot
- Slot for TCP/IP LAN Chip (10/100-Base-T) to connect DAKS-TT Server, TR-500-Service and/or xLink-100-Service

2.1.5 Contact input/output module for M-module slot on SBC-3x or ACM-01 [add-on]

- 16 optocoupler inputs (U_{in} 19...60 VDC / R_{in} = 20 kOhm)
- 8 opto-relay outputs (U_{max} = 60V at I_{max} < 0.05 A / I_{max} = 100 mA with R_{on} < 15 Ohm)
- 1 relay output (U_{max} = 100V, I_{max} = 3 A, P_{max} = 30 W, contact protection required)

2.1.6 LAN interface module for M-module slot on SBC-3x or ACM-01 [add-on]

- M module for TCP/IP LAN connection (MIP-01: 10-Base-T, MIP-02: 10-Base-T and 100-Base-T)
- Connection of DAKS-TT Server, TR-500-Service and/or xLink-100-Service

2.1.7 Profibus DP interface board [add-on], applies to subsequent software upgrades only

- Profibus-DP interface (93.75 kbit/s)
- VMWbus interface to controller board
- Debug interface, asynchronous serial RS232 (9600 bd)

2.1.8 Profibus DB M-module slot on SBC-33 or ACM-01 [add-on]

- M-module for Profibus-DP interface (93.75 kbit/s)
- Profibus-DP interface (93.75 kbps)

2.1.9 Audio input and output board [add-on]

- Interface to the PCM highway
- 8 audio frequency inputs and outputs:
  - input/output no. 1 also has a telephone handset port with automatic switchover via the 4P4C Western jack
  - inputs: up to -6 dBm (vol. control), 7 kOhm, electrically isolated from the rest of the system
  - outputs: 0 dBm, 600 Ohm, electrically isolated from the rest of the system

- 1 input and 1 output are each located together on one mini-DIN jack

2.1.10 2-channel serial interface board ACM-01 [add-on]

- VMEbus interface to the controller board
- 2 ports for asynchronous serial protocol interfaces (variable baud rate) to an external system, GSM-SMS modem or e-mail service:
  - plug-in interface module, including a jumper for the RS232 connection
  - in conjunction with a data interface to an external system [add-on]:
    plug-in interface card for the alternate, electrically isolated RS422 connection
- 2 slots for M-modules

2.2 Peripherals

- System printer [add-on]
- Receiver head for DCF 77 standard time with 2-wire interface [add-on]
- Profibus contact modules [add-on], each with a Profibus bridge, power supply and 1...4 basic modules with input modules, for a total of up to 704 hardware inputs (see position 10)
- Normally remote maintenance modem

2.3 Cables, connectors, adapters, jacks

- Null modem data cable with D-9-F connectors at both ends (3 m long) with hardware handshake
- Power supply cable:
  - Either a DC power cable with fast-on connectors (6 m long)
  - Or an AC power cable with a protective contact plug (2.50 m long)
- For system printer add-on only:
  - Null modem data cable with D-9-F connectors at both ends (3 m long)
  - Adapter for system printer: D-25-M -> D-9-M
- For 'DCF-77 standard time' add-on only:
  - Cable set for connection to the DCF jack (3 m long)
  - Two jacks (receiver and server sides)
- In conjunction with the contact input/output module for the SBC-32 or ACM-01 only:
  open-ended connecting cable (6 m long)
- For 8-channel systems only:
  - 2 jacks for S_0 connections
  - 4 cable sets for connection to the S_0 jacks, 3 m long
- For 'Decentralized contact inputs' add-on only: Profibus cable, 3 m long
- For 'Analog audio frequency input and output channels' add-on only, 8 mini-DIN connectors
- In conjunction with a data interface:
  - Shielded null modem data cable for connections without handshake
  - Shielded RS422 data cable
- Optional RS232/RS422 converter CV422-1 (e.g. to connect SIGMASYS to DAKS)
  - Alternative solution instead of connection with line extensions, for external systems, which cannot supply the line extensions with power from their handshake lines
  - Electrically isolated
  - Power supply either with delivered power supply unit 230VAC or directly from an external power supply 12...24 V AC/DC
  - DAKS server connection via RS422 interface module IFM-11
  - Delivery includes cables for RS232 and RS422 connection (each with open end, length 5m)
- Only in conjunction with the LAN interface module:
  - Service cable for debugging/downloading (length 0.5m)
  - Optional DSL Router (e.g. on high network traffic)
    configured IP filter for up to 4 DAKS server, includes power supply unit 230VAC and LAN cable (CAT 5, length 3m)

2.4 CD-ROM

- Installation software:
  - PC software DAKS
  - server program modules
  - update software
  - tools
- Documentation:
  - Service Manual
  - User Manual
  - additional documentations (if needed)

3 External provisioning

3.1 Required only to connect to HiPath 4000/Hicom 300(E/H)

- Prepared system(s) with:
  - either STMD board(s) with 4 unused S_0 ports
  - or DIU-S2 board(s) with termination module S30807-K5415-X and one Siemens cable, S30267-Z88-Axxx (xxx = length in dm, default length = 100dm), for each S_{2M} connection
  - or DIU-N2/DIU-N4 board(s) with configured system cable(s) S30267-Z167-Axxx (xxx = length in dm, default length = 100dm)

3.2 Required only for connection to HiPath 3000/Hicom 150E

- Prepared Hicom system(s) with:
  - either STMD board(s) with 2/4 unused S_0 ports
  - or TMS2M board(s) with special cables (open ends)

3.3 Necessary PC equipment

- Up-to-date PC for the DAKS-TT software:
  - for the operating system Windows 2000, Windows XP or Windows 2003
  - with a CD-Rom drive
  - with a free serial port with free interrupt or LAN interface for DAKS connection

3.4 Required only in special situations or for certain add-ons

- Modems, DCIs or TTY connections for long distances (> 15 m) between the DAKS server and peripherals
- External contacts, key-switches, load relays, lamps, audio sources, recording equipment, possibly with special cables for connection to DAKS
- PC(s) with Gateway software only for special connection(s) via LAN

4 Setting up a Hicom 300 (E/H) or HiPath 4000 network for DAKS

	Hicom 300	Hicom 300E	Hicom 300H	HiPath 4000
Versions:	**V3.5**	**V1.0E**	**---**	**---**
	V3.6	**V2.0E**	**---**	**---**
	---	**V3.0E**	**---**	**---**
	---	**V3.0E.07**	**V1.0IM**	**---**
	---	**---**	**---**	**V1.0**
	---	**---**	**---**	**V2.0**
	---	**---**	**---**	**V2.1**

4.1 General information

CorNet-NQ is the standard D-channel protocol used between Hicom/HiPath and DAKS.

To obtain a better overview, we recommend you assign identical numbers to the following items:

- TGRP Trunk group number, see positions 4.8, 4.12.1, 4.13, 4.15.1, 4.15.2 and 4.19
- DNNO Destination node number
- DESTNO Destination number
- ORNDNO Originating node number (fictitious)
- COP, COT Class of parameter and class of trunk

Please note that in the text below, whenever we specify *for all nodes* or *for all connection paths*, we will be referring to all Hicom/HiPath nodes (or connection paths to these nodes) to which subscribers are connected who need to call DAKS themselves or be called by DAKS.

For route optimization there should be no overflow to the public exchange (restricted signaling).

Also, for route optimization subscribers and tie lines should be administered in the dial plans of all nodes (not via the code point NETZ).

For the purposes of the route optimization example (see pos. 4.19) we will be using the following abbreviations in the AMO description:

[b] = number of the trunk group of the respective networking interfaces
[c] = number of the interface of the assigned class of trunk
[e] = number of the LCR outdial rules
[k] = code of your own node (unique in the network)
[l] = LCR route number
[z] = code of another node in the network

4.2 AMO DIMSU (feature sets)

Check the feature sets for all nodes; if changes are needed, consult the 2nd level support when in doubt.

To display, use: DISPLAY-DIMSU: CC; Hicom 300 (E/H)
or DISPLAY-DIMSU: ALL; HiPath 4000

For example parameter 'COMCPB' on Hicom 300 (E/H) or 'AP' on HiPath 4000:
Select a sufficient number of common call processing buffers for calls with participation of more than 2 devices (e.g. intrusion, three-party conference, etc.).

4.3 AMO ZAND (central system data, admin. of SWU)

4.3.1 Range ALLDATA

For all nodes: (NODECD = ***[k]***):

OVRMST	==>	YES	Override calls in multiple states
OVRHUNT	==>	YES	Override hunt or merged group
ROUTOPTP	==>	NO	Route optimization only using primary route
ROUTOPTD	==>	NO	Disable route optimization

4.3.2 Range ALLDATA2

For all nodes (from SW vres. SP300E-V3):

INDNADIS	==>	YES	Display name independent of suppressed no.
DISPTGNA	==>	NO	Display name of trunk group of extension when calling number is unknown

4.4 AMO FEASU (features switching unit)

For all nodes:

EMOVR	==>	Enable	Network-wide emergency override (disable if using MLPP, CorNet-NQ only)
EMRLS	==>	Enable	Network-wide emergency release (disable if using MLPP, CorNet-NQ only)
RNG	==>	Enable	Distinctive ringing, enable 'External' & 'Alarm' call signals

4.5 AMO COSSU (classes of service)

The connection paths to the relevant nodes must be configured in a way that DAKS can reach telephone users in the network.

The following applies to nodes with connection to DAKS:

4.5.1 Classes of service to and from DAKS

LCOSV	==>	LCR class of service for voice: Enable required classes of service (!! enabling all classes of service may produce continuous loops in the network)	
LCOSD	==>	LCR class of service for data: Enable required classes of service (enabling all classes of service may produce continuous loops in the network)	
COS	==>	TA	auth. for unrestricted long-distance service, no toll/code restriction
	==>	TNOTCR	Tie trunk without toll code restriction
	==>	MB	Mailbox (auth. to 'read' mail)

4.5.2 Classes of service of the Hicom or HiPath systems in the network

To enable DAKS to reach subscribers in the network, you need to enable the connection paths to the respective nodes (LCOSV and LCOSD).

4.5.3 Classes of service for the subscribers

The following parameters must be administered, some of them in the **AMO SDAT** (Administration of subscriber-specific features and general, device-independent subscriber data):

RKNOVR	==>	not set	'Reject camp-on/override' (RKNOVR would avoid intrusion and camp-on)
DAS	==>	not set	'Camp-on/intrusion protection absolute' (DAS would avoid emergency intrusion)
VC	==>	set	'Voice calling' If direct call protection is set to **OFF** via DA-key on the open listening/handsfree speaking terminal, DAKS can activate the loudspeaker.

4.6 AMO COT (class of trunk)

4.6.1 Classes of trunk to DAKS

Only parameters to be set for the connection between DAKS and Hicom/HiPath:

ANS	==>	Answer from line
AEOD	==>	Line with advance end-of-dialing transmission
CBBN	==>	Automatic callback on busy network-wide
CBFN	==>	Automatic callback on free network-wide
COTN	==>	Regenerated CO dial tone on outgoing seizure
NTON	==>	No tone
LWNC	==>	Line without node code
NLCR	==>	Incoming circuit from system without LCR
XFER	==>	Trunk call transfer
KNOR	==>	Override or knocking possible
CEBC	==>	Call extension for busy, ringing or call state
PROV	==>	Priority override/release via S_0/S_2 line
USD	==>	Unrestricted suffix dialing possible
TSCS	==>	TSC signaling for network-wide features in digital networks (e. g. mailbox messages)
NLRD	==>	Incoming circuit from system without LCR (data)
DFNN	==>	Use default node number of line
ROPT	==>	Line leads to nodes with route optimization (to be set only for route optimization)
LINO	==>	Line with implicit call numbers (as of Hicom 300H or HiPath)
NOFT	==>	No Flag Trace (HiPath)
NQNP	==>	CorNet-NQ Network-wide Pick-up not supported (HiPath)
NQPI	==>	CorNet-NQ Pickup-Info not supported (HiPath)
CTLN	==>	Controlled trunk and line selection not allowed (HiPath)

Following parameter may **ONLY be set with CorNet-N, NOT with CorNet-NQ** for the connection between DAKS and HiPath:

NOSD	==>	No simple dialog (HiPath)

Following parameter **may <u>NOT</u> be set** for the connection between DAKS and HiPath:

CONS	==>	consultation over the same line

4.6.2 Classes of trunk for connection paths between Hicom / HiPath nodes

Parameters to be set for all connection paths between Hicom / HiPath nodes (COTNU = ***[c]***):

ROPT	==>	Line leads to nodes with route optimization
ANS	==>	Answer from line
AEOD	==>	Line with advance end-of-dialing transmission
KNOR	==>	Override or knocking possible
CEBC	==>	Call extension for busy, ringing or call state
PROV	==>	Priority override/release via S_0/S_2 line
USD	==>	Unrestricted suffix dialing possible

4.7 AMO COP (class of parameters for trunks) to DAKS

L3AR	==>	Registration of ISDN layer 3 advisory messages

4.8 AMO BUEND (trunk group access) to DAKS

TGRP	==>	Trunk group number
NAME	==>	e. g. DAKS
NO	==>	Depending on configuration, normally = 30 x no. of S_2 links or 2 x no. of S_0 links to DAKS within the relevant node

4.9 AMO WABE (dialing plans, feature access codes)

4.9.1 Digit analysis to DAKS

CD	==>	….	Code for accessing DAKS; if possible, only 2 digits long; same as LCR digit pattern in AMO LDPLN, see pos. 4.16.1
DAR	==>	TIE	Digit analysis result = internal calls to TIE or sat. PABX

4.9.2 Dial code interpretation for route optimization in every node

Own code

CD	==>	***[k]***	
DAR	==>	OWNNODE	Phone number for own node

Networking

CD	==>	***[k]***	
DAR	==>	TIE	Internal traffic to satellite PABX

4.10 AMO LWPAR (loadware parameter block) for DIU-S2/DIU-N2/DIU-N4 to DAKS

LNTYPE	==>	COPPER	Parameter for line type
QUAL	==>	ON	Activate CRC4 method
QUAL1	=>	10 sec	Default value
QUAL2	=>	10 min	Default value
MASTER	==>	YES	Layer 2: Hicom/HiPath is Master, DAKS is Slave
PATTERN	==>	D5H	Idle bit pattern for B-channels on the link
SMD	==>	YES	Layer 1: All assigned trunks listed in REF_TAKT_TBL have priority 0 (AMO REFTA)

4.11 AMO PRODE (protocol descriptor for networking)

Using "DISP-PRODE:DB,VARTAB;" check field PROTVAR:

CORNV33 must be present for CorNet-N.

ECMAV2 must be present for CorNet-NQ.

Get from PDNORM the number of the protocol descriptor PDxx;.
Using "DISP-PRODE:DB,PDLONG,PDxx,TIMER;" check and do not modify the default timer values.

4.12 AMO TDCSU (trunk configuration SWU)

4.12.1 General data

COTNO	==>		Reference to class of trunk as defined in position 4.6.1
COPNO	==>		Reference to class of parameter as defined in pos. 4.7
COS	==>		Reference to COS-class according to position 4.5.1 (without COS, problems may arise by seizure of exchange lines)
LCOSV	==>		Reference to LCR authorization as defined in pos. 4.5.1
LCOSD	==>		Reference to LCR authorization as defined in pos. 4.5.1
CCT	==>		e.g. 'TO DAKS'
DESTNO	==>	0	Destination number; see also position 4.13 (*Hint*: With DESTNO > 0 DAKS cannot place a calls to itself)
PROTVAR	==>	ECMAV2 CONV33	for CorNet-NQ for CorNet-N
SEGMENT	==>	8 1	CorNet-NQ only CorNet-N only
FWDX	==>	5	the default value 1 doesn't function reliably
BCNEG	==>	YES	
ORNDNO	==>	> 0	Fictitious originating node number for lines without a node code **(must be > 0 and unique within the network)**
TGRP	==>		Trunk group number
ISDNCC	==>		must be blank
ISDNAC	==>		must be blank
ISDNLC	==>		must be blank

4.12.2 Data exclusively for connections to **STMD**

DEV	==>	S0CONN	Device type: Digital connecting trunk for S_0 interface with 2 B-channels
MASTER	==>	YES	Layer 2: Hicom/HiPath is Master, DAKS is Slave
SMD	==>	YES	Layer 1: All assigned trunks listed in REF_TAKT_TBL have priority 0 (AMO REFTA)

4.12.3 Data exclusively for connections to **DIU-S2/DIU-N2/DIU-N4**

DEV	==>	S2CONN	Device type: Digital connecting trunk for S_2 interface with 30 B-channels
BCHAN	==>	1&&30	B-channels to be configured for S_2 trunks
BCGR	==>	1	Assign all B-channels in a group
LWPAR	==>	xx	Number of the selected loadware parameter block (see position 4.10)

4.13 AMO RICHT (special routing for trunks via access codes)

MODE	==>	LRTENEW	Configuration of a new LCR route (open numbering)
LRTE	==>		LCR route number; same as LROUTE of positions 4.15.1 and 4.16.1
LSVC	==>	ALL	LCR service: display all types of routes; see pos. 4.15.1
NAME	==>		e. g. DAKS
TGRP	==>		Trunk group number
DNNO	==>	> 0	Fictitious destination node number for lines without a node code **(must be > 0 and unique within the network)**
ROUTOPT	==>	YES	Route optimization is possible (with route optimization only, otherwise: NO)
REROUT	==>	NO	Set rerouting code
DTMFCNV	==>	WITHOUT	Code indicating whether and how DTMF conversion takes place
DTMFDISP	==>	WITHOUT	Indicates display mode for DTMF conversion
DTMFTEXT	==>		Text for displaying DTMF conversion on a DIGITE display
PLB	==>	NO	Prevention of line booking
FWDBL	==>	NO	Forward blocking
DESTNO	==>	0	Destination number; see position 4.12.1

4.14 AMO LODR (LCR outdial rules)

4.14.1 LCR outdial rules to DAKS

ODR	==>	LCR outdial rule number, see position 4.15.1	
CMD	==>		
Section 1	=>	ECHO 2	LCR outdial rule element
Section 2	=>	END	
NPI	==>	Unknown	
TON	==>	Unknown	

4.14.2 LCR outdial rules for route optimization

ODR	==>	***[e]***	
CMDL	==>		
Section 1	=>	ECHOALL	LCR outdial rule element
Section 2	=>	END	

4.15 AMO LDAT (LCR routes)

4.15.1 LCR routes to DAKS

LROUTE	==>		LCR route number; see positions 4.13 (LRTE) and 4.16.1
LSVC	==>	ALL	LCR service: Display all types of routes, see pos. 4.13
TGRP	==>		Trunk group number
ODR	==>		LCR outdial rule number; see position 4.14.1
LAUTH	==>		LCR authorization required as defined by AMO COSSU: 'LCOSV'; see position 4.16.1
LATTR	==>	WCHREG	LCR attribute: Activate call detail recording

4.15.2 LCR routes for route optimization

LROUTE	==>	***[l]***	
LVAL	==>	1	LCR significance
TGRP	==>	***[b]***	
ODR	==>	***[e]***	
LAUTH	==>	1	Necessary LCR author. acc. to AMO-COSSU: 'LCOSS'

4.16 AMO LDPLN (LCR dialing plan)

4.16.1 LCR dial plan to DAKS

LDP	==>		LCR digit pattern; see also position 4.9.1 (e. g.: WABE: CD=70 -> 70-X)
DPLN	==>		Dial plan group as defined in position 4.9
LROUTE	==>		LCR route number; see positions 4.13 (LRTE) and 4.15.1
LAUTH	==>		LCR authorization as defined by AMO-COSSU: 'LCOSV'; see position 4.15.1

4.16.2 LDP for any digits in case of route optimization

LDP	==>	***[z]***-XXX	LCR dial plan (***[z]*** =code of the node leading to this trunk)
LROUTE	==>	***[l]***	
LAUTH	==>	1	LCR authorization according to AMO-COSSU: 'LCOSS'

4.16.3 LDP for time-out in case of route optimization

LDP	==>	***[z]***-T	LCR dial plan (***[z]*** =code of the node leading to this trunk)
LROUTE	==>	***[l]***	
LAUTH	==>	1	LCR authorization according to AMO-COSSU: 'LCOSS'

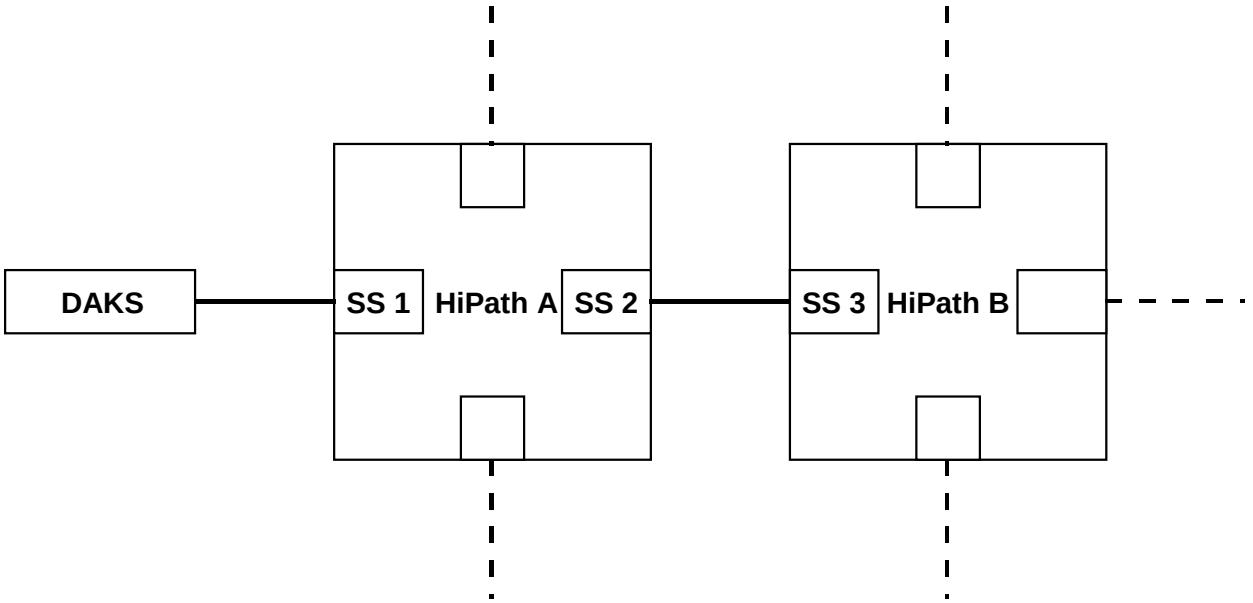
4.17 AMO REFTA (reference clock tables for digital circuits)

PRI	==>	0	Priority of trunk for reference clock selection

4.18 AMO KNMAT (node connection matrix)

Check settings of the node connection matrix via AMO KNMAT.

4.19 Example for route optimization



AMO	Parameter		Device A, SS 2	Device B, SS 3
AMO-ZAND	NODECD	*[k]*	18	19
	ROUTOPTD		NO	NO
	ROUTOPTP		NO	NO
AMO-RICHT	LRTE	*[l]*	180	190
	LSVC		ALL	ALL
	NAME			
	TGRP	*[b]*	8	9
	DNNO	*[l]*	180	190
	ROUTOPT		YES	YES
AMO-LODR	ODR	*[e]*	5	6
	CMD		ECHOALL + END	ECHOALL + END
AMO-LDAT	LROUTE	*[l]*	180	190
	LVAL		1	1
	TGRP	*[b]*	8	9
	ODR	*[e]*	5	6
	LAUTH		1	1
AMO-LDPLN	LDP	*[z]*	19-XXX + 19-T	18-XXX + 18-T
	LROUTE	*[l]*	180	190
	LAUTH		1	1
AMO-COT	COTNO	*[c]*	30	40
	COTPAR		ROPT	ROPT
AMO-WABE	OWNNODE	*[k]*	18	19
	TIE	*[z]*	19	18

5 Additional HiPath 4000 network settings when using MLPP

MLPP (via CorNet-NQ) enables different levels of telephone calls and the disconnection of ongoing telephone calls by calls with a higher priority.

5.1 AMO FEASU (features switching unit)

For all nodes with MLPP:

EMOVR	==>	Disable	Network-wide emergency connection override
EMRLS	==>	Disable	Network-wide emergency connection release
MLPP	==>	Enable	Multi level precedence and preemption

Attention:
Network-wide emergency connection override and netwok-wide emergency connection release may not be used in combination with MLPP.

5.2 AMO ZAND (central system data, admin. of SWU)

5.2.1 Area MLPP

MAUTO ==> Activation of automatic forwarding of precedence calls (party C) to the desired station
NO => Pick up of precedence calls by on-hook (NATO standard)

MCAMP ==> Activation of camp-on on a busy destination, if the destination is busy with a call at the same level
NO => The caller gets busy tone (NATO standard)

MTONE ==> Activation of disconnection tone applies for separating caller (Bemilcom)
NO => Separating caller gets the ringback tone (NATO standard). The separated parties gets disconnection tone independent of this parameter

MLPPDISP ==> Display information for MLPP calls (10 characters, 2 characters per level):
FOFLIMPRRO
== >> MLPP level: routine
== >> MLPP level: priority
== >> MLPP level: immediate
== >> MLPP level: flash
== >> MLPP level: flash override

MLPPDOM ==> MLPP Service Domain.The configured value is only used, if MLPP call setup for DSS1 connections (like ITU-T Q.955) is done and no according value is delivered by the A-Party (e.g: optiset is originator) For incoming calls this value is not checked against the configured value.
(not relevant with current HiPath version !!!)
0-0-0-0-0

5.2.2 Area reserve

126 ==> YES Drop to NAVAR of the attendant console
- after CTIME1 = RWEITER Zeit
- NAVAR subscriber has to be an MLPP subscriber !!!
(chg-zand:reserve,126=YES;)

5.3 AMO COT (class of trunk)

5.3.1 Classes of trunk for connection paths to nodes that support MLPP

MLPR ==> Trunk can be used for MLPP preemption

5.3.2 Classes of trunk for connection paths to nodes that do not support MLPP

NMLT ==> Suppression of MLPP information incoming/outgoing

5.3.3 Classes of trunk to DAKS

Do **not** set MLPR

Do **not** set NMLT

5.4 AMO WABE (dialing plans, feature access codes)

5.4.1 MLPP-Level = Flash Override

CD	==>	##00	(e.g.)
DAR	==>	FLASHOV	MLPP level flash override call (high level)

5.4.2 MLPP-Level = Flash

CD	==>	##01	(e.g.)
DAR	==>	FLAS	MLPP level flash call

5.4.3 MLPP-Level = Immediate

CD	==>	##02	(e.g.)
DAR	==>	IMMED	MLPP level immediate call

5.4.4 MLPP-Level = Priority

CD	==>	##03	(e.g.)
DAR	==>	PRTY	MLPP level priority call (low level)

5.4.5 MLPP Protection

CD	==>	##09	(e.g.)
DAR	==>	PROT	protected against override

5.5 AMO SDAT, Administration of individual subscriber attributes and general subscriber data

Do **not** set EOVR	emergency override/forced hold
ROUTINE or PRTY or IMMED or FLASH or FLASHOV	max. MLPP level that subscriber is allowed to set
PROT or MLPPS	dynamic or static protection against MLPP disconnection

5.6 AMO PTIME, Timers for Peripheral Processing

Change call sequence for MLPP calls according to US standard:

TYPE	==>	SLMA	Subscriber line module analog
RNGON61	==>	1640 MS	
RNGOFF61	==>	360 MS	
RNGON62	==>	1640 MS	
RNGOFF62	==>	360 MS	
RNGON63	==>	1640 MS	
RNGOFF63	==>	360 MS	

6 Setting up a Hicom 300H V1.0 US (9006.6) network for operation with DAKS

The connection between Hicom 300H V1.0 US (9006.6) and DAKS is made via a T1 link with NI-2 Protocol. Hicom represents the network side and DAKS is the user side.

Note: Do not use fractional channels.

To obtain a better overview, identical numbers should be assigned to trunk group number (TGRP) and class of trunk (COT).

In the discussion below, when we specify *for all nodes* or *for all connection paths*, we are referring to all Hicom nodes (or connection paths to these nodes) to which subscribers are connected, who are either to reach DAKS or are to be called by DAKS.

6.1 AMO COS (classes of service)

The connection paths to the relevant nodes must be configured in a way that DAKS can reach telephone users in the network.

The following applies to nodes with connection to DAKS:

6.1.1 Classes of service to and from DAKS

TTT	==>	set	Trunk to trunk connection/transfer

6.1.2 Classes of service for the subscribers

The following parameters must be administered, some of them in the AMO SDAT (Administration of subscriber-specific features and general, device-independent subscriber data):

TTT	==>	set	Trunk to trunk connection/transfer
VC	==>	set	Voice calling
VCE	==>	set	Service module access

6.2 AMO LCOS (least cost routing classes of service)

The connection paths to the relevant nodes must be configured in a way that DAKS can reach telephone users in the network.

The following applies to nodes with connection to DAKS:

6.2.1 Classes of service to and from DAKS

LCRCOSD	==>	LCR class of service for data: Enable required classes of service (enabling all classes of service may produce continuous loops in the network)
LCRCOSV	==>	LCR class of service for voice: Enable required classes of service (enabling all classes of service may produce continuous loops in the network

6.2.2 Classes of service of the Hicom systems in the network

To enable DAKS to reach subscribers in the network, the connection paths to the respective nodes have to be enabled (LCRCOSD and LCRCOSV).

6.3 AMO COT (class of trunk)

6.3.1 Classes of trunk to DAKS

Only parameters to be set for the connection between DAKS and Hicom:

MDR	==>	Message detail recording (optional)

6.4 AMO COP (class of parameters for trunks) to DAKS

no Parameter is required

6.5 AMO TGACC (trunk group access) to DAKS

TGRP	==>	Trunk group number
NAME	==>	e.g. "DAKS “
NO	==>	Depending on configuration, normally = 23 x number of T1 links to DAKS within the relevant node
SATOPS	==>	Satellite hops, set to none

6.6 AMO DPLN (dialing plans, feature access codes)

6.6.1 Digit analysis to DAKS

DGTS	==>	….	Code for accessing DAKS; if possible, only 2 digits long; same as LCR digit pattern in AMO LDPLN
DAR	==>	TIE	Digit analysis result = internal calls to TIE or sat. PABX

6.7 AMO BCSU (board configuration and loadware parameter) for TMDN to DAKS

BOARD	==>	TMD	
LTG	==>	1	
LTU	==>	1	
SLOT	==>	103	
PARTNO	==>	"Q2474-X "	
FCTID	==>	2	
LWVAR	==>	"K"	
CABTYP	==>	1	Type of cable for tmd span only Cable length 0...133 ft. supported by DAKS
TIMTYP	==>	SYST	
OESDISTH	==>	30	Out of frame errored seconds disqualification threshold
OESREQTH	==>	4000	Out of frame errored seconds requalification threshold
SESDISTH	==>	10	Severely errored tenth of seconds disqualification threshold

SESREQTH	==>	10	Severely errored tenth of seconds requalification threshold
SIGTYP	==>	MOS	
NETUSR	==>	NETWK	User will emulate network end of the digital span DAKS is user side
ACKTIM	==>	1000	Acknowledgement Timer
DLVTIM	==>	5000	Data link verification timer
OCTMAX	==>	260	Maximum number of octets in an information field
RETMAX	==>	3	Maximum number of retransmissions
WINDOW	==>	7	Maximum number of outstanding information(I) frames
GN	==>	2	
IID	==>	2	
FRAME	==>	ESF	Extended framing
TABS	==>	NO	Digital link switch enable tabs switched off
BI8SUB	==>	YES	Bipolar 8 substitution
BIVDET	==>	YES	Bipolar violation detection

6.8 AMO TCSU (trunk configuration SWU)

6.8.1 Device for all 23 B-Channels

PEN	==>	1-1-xxx-nn	nn = 01...23
NO	==>		
COTNO	==>		Reference to class of trunk
COPNO	==>		Reference to class of parameter
DPLN	==>		
ITR	==>		
TGRP	==>		Trunk group number
ACDATA	==>		
CCT	==>		e.g. “DAKS “
ACT	==>	Y	
DITIDX	==>	0	
TRKID	==>		
TCCID	==>	""	
DEV	==>	PRIB	
SRTIDX	==>		
ATNTYP	==>	CO	
LCRCOSV	==>		Reference to LCR authorization
LCRCOSD	==>		Reference to LCR authorization
COSNO	==>		
DEDSVC	==>	NONE	
SIDANI	==>	N	
TRTBL	==>	DIDCR	

6.8.2 Device for the D-Channel

PEN	==>	1-1-xxx-24	D-channel
COTNO	==>		Reference to class of trunk
COPNO	==>		Reference to class of parameter
DPLN	==>		
ITR	==>	0	

ACDATA	==>	0	
CCT	==>		e.g. “DAKS “
TCCID	==>	""	
DEV	==>	PRID	
PROTOCOL	==>	NI2	
TMR301	==>	300	
TMR303	==>	4	
TMR305	==>	30	
TMR308	==>	4	
TMR309	==>	90	
TMR310	==>	30	
TMR313	==>	4	
TMR316	==>	30	
TMR322	==>	4	
TDELAY	==>	3000	
BEARER	==>	ONE	
NCT	==>	N	

6.9 AMO LODR (LCR outdial rules)

6.9.1 LCR outdial rules to DAKS

ODR	==>	LCR outdial rule number	
CMD	==>		
Section 1	=>	ECHO 2	LCR outdial rule element
Section 2	=>	END	

6.10 AMO LROUT (LCR routes)

6.10.1 LCR routes to DAKS

TGRP	==>	1	Trunk group number
ROUTSERV	==>	N	
BEARER	==>	ONE	
BANDWDTH	==>	1	
SCHD	==>	A	
AUTH	==>		LCR authorization required as defined by AMO TCSU: 'LCRCOSV'
ONHKQ	==>	N	
OFFHKQ	==>	N	
ODR	==>		LCR outdial rule number
APPLTYP	==>	V&F&D	
TRKSIG	==>	PRI	
ITCPRI	==>	S&U&KHZ31&V	
SVCVCE	==>	NON	
SVCNVCE	==>	NON	

6.11 AMO LDPLN (LCR dialing plan)

6.11.1 LCR dial plan to DAKS

DGTS	==>	"30"&"2"&"XX"
AUTH	==>	1
ACFIELD	==>	0
OCFIELD	==>	0
NWNUMTYP	==>	UNK
NWPLANID	==>	UNK

6.12 AMO REFTA (reference clock tables for digital circuits)

PRI	==>	**0**	Priority of trunk for reference clock selection

6.12.1 Example for Hicom 300H V1.0 US (9006.6) setting

R6.6_NI2_NETWK.txt

7 Configuring the Hicom 150E system for operation with DAKS

7.1 Object: Customer & System

7.1.1 Scope of supply

- Enter the boards needed
  - For 4-/8-channel connection:
    1x board LTG network, CorNet-N S_0 per 2 B-channels R600-A180
  - For 30-channel connection:
    1x board LTG network, CorNet-N S_{2M}, 30 B-channels R600-A190
  - For 60-channel connection:
    2x board LTG network, CorNet-N S_{2M}, 30 B-channels R600-A190
- Enter the number of interfaces used:
  - For 04-channel connection via S_0 2 interfaces
  - For 08-channel connection via S_0 4 interfaces
  - For 30-channel connection via S_{2M} 1 interface
  - For 60-channel connection via S_{2M} 2 interfaces

7.2 Object: Boards

- Assign appropriate 'BOX' entries.
- Card data:
  - either DEF_STMD
  - or DEF_TMS2M

7.3 Object: COS

7.3.1 Create new COS

Create a new COS group with name, e.g.: '**DAKS COS**'

7.3.2 Features

– Available:	**All**	
– Enable:	**LMOVM**	Features in the basic configuration
– Version of feature:	**DUWA**	Authorized for direct inward dialing
	LWLOVKZ	Routing without accounting code
	LWLWEIT	Routing - with route forwarding

7.3.3 SYSLM functions

– Enable:	**AUFTON**	Intrusion tone before intrusion
	AUFVERB	Intrusion with immediate connection after going off-hook
	LWL	Routing
	SATZSATZ	Allow trunk-to-trunk connections

7.4 Object: Trunks

7.4.1 Trunk groups

- available: **all**
- Create new trunk group with name, e.g.: **'DAKS trunk group'**
- Trunk type: S0CORNETN or S2CORNETN
- Mode of operation: **ISDN tie**
- Overflow trunk group: None
- Code: business calls: E. g. **'80'**
  Code: personal calls: --
- Assign ACCESS to trunks in trunk group
- Options -> Trunk seizure: Cyclical

7.4.2 Voice + data + other ISDN

- Name: See Trunks/Trunk groups
- Access: See Trunks/Trunk groups
- COS: See COS
- Conn. grp: **Tie trunk**
- Net. approv.: All networks
- Port data: **DEF_CORNT**

7.4.3 B-channel assignment

- Access type: S0CORNETN or S2CORNETN
- Direction (for all channels) Both directions
- Trunk name See Trunks/Trunk groups
- Other -> access with S_0
  - Access: **Special**
  - B-channel assignment: **From top to bottom**
  - Direction priority: **Outgoing**
  - Layer 1+2 protocol: **L2HDLCCMD**
    L1OPRMOD
- Other -> access with S_{2M}
  - Access: **CorNet master**
  - B-channel assignment: **Default = from top to bottom**
  - Direction priority: **Default = outgoing**
  - Layer 1+2 protocol: **Default = L2HDLCCMD**
    Default = L1CRCHK
    Default = L1CRCREP

7.5 Routing

7.5.1 Outdial rules

- Rule name e.g.: '**TO DAKS**'
- Parameter: **E2A**

7.5.2 Routes

- Set up new route group, e.g.: '**DAKS routes**'
- Trunk group: See Trunks/Trunk groups
- Rule name: See Routing/Outdial rules
- Network name: **Private network**
- Time plan **A** (= always)

7.5.3 Dial plan

- Code type: **Network ID**
- Code: See Trunks/Trunk groups
- Digits: ...-Z (e.g. for code '80' => '80-Z')
- Route group: See Routing/Routes

7.6 Numbering plan

- Code must be entered under:
  (Name = network ID) **All**
- Expand code in numbering plan:
  (Name = see Trunks/Trunk groups) **Internal**
  rect inward dialing
  network

8 Setting up a HiPath 3000 system for operation with DAKS

8.1 General info

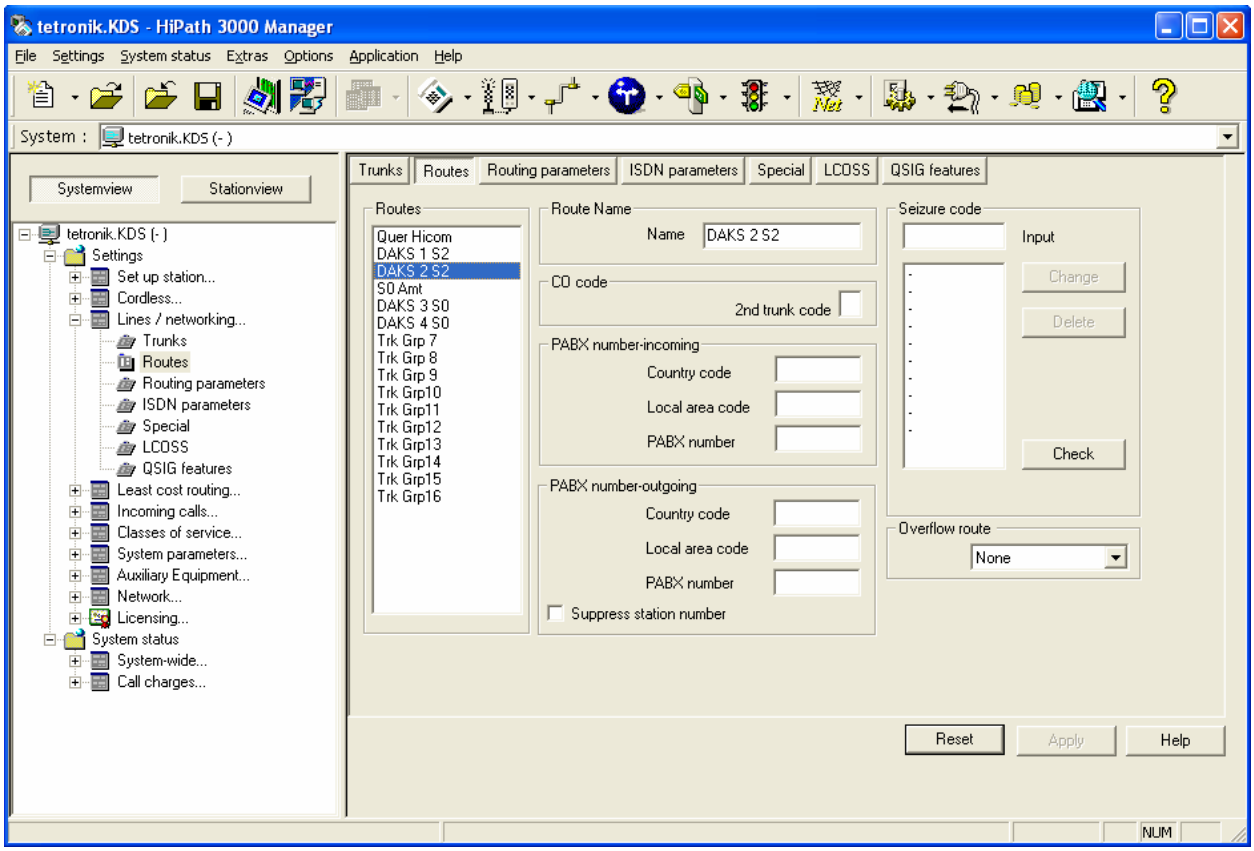
In principle, the DAKS server also works in combination with HiPath 3000 systems. Due to the fact that the connection here is made through the ISO-QSIG protocol, however, some of the CorNet features used in combination with HiPath 4000 are not supported by HiPath 3000.

Details:

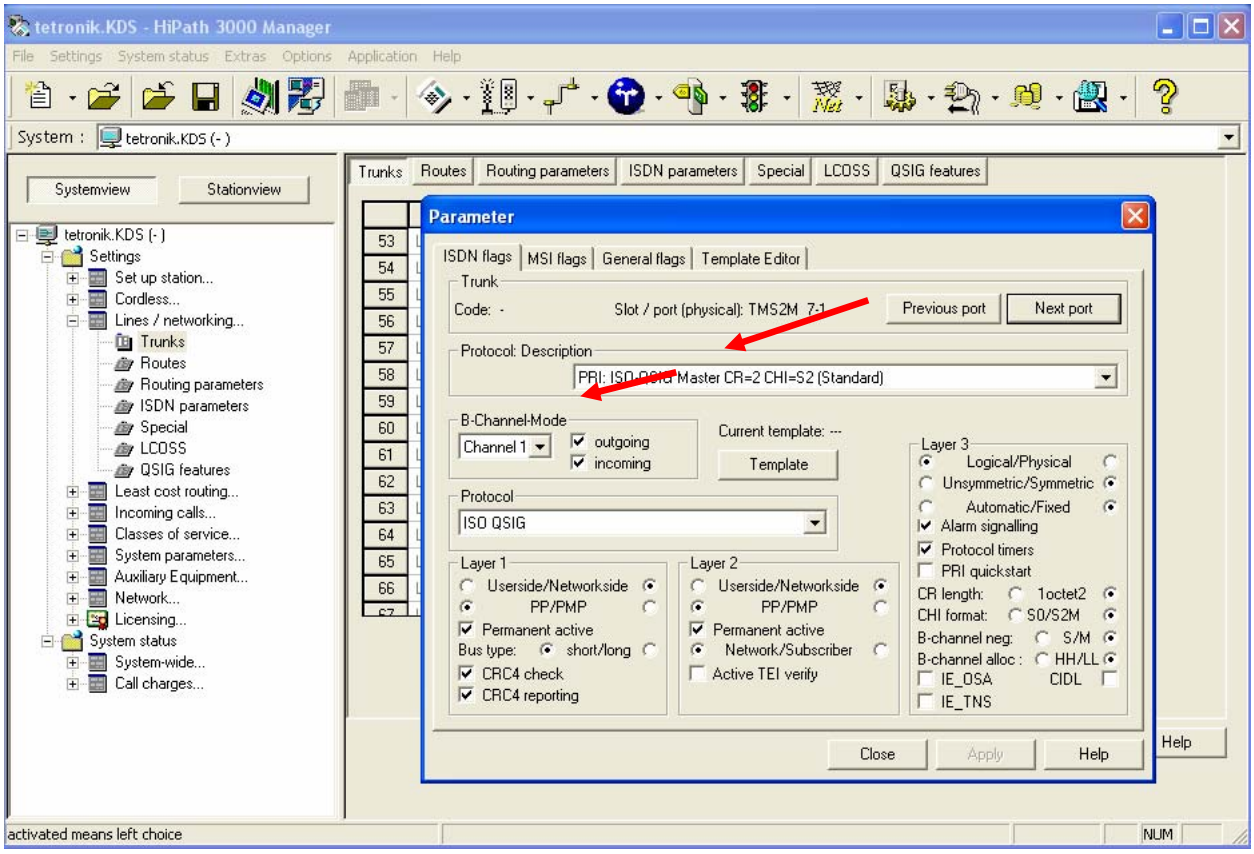
- Options when a subscriber or line is busy:
  - support of intrusion
  - no support of camp-on, forced-release, or emergency intrusion
- Options for call signaling
  - support of internal call signaling
  - support of external call signaling excluding the following features:
    - output of texts or display of calling or connected name
    - alternate output of the caller's telephone numbers
    - intrusion to busy subscribers
  - no support of alarm call signaling
- No support of these functions: call forwarding/call diversion, direct access to executives in Executive/PA (personal assistant or secretary) configurations, and monitoring subscriber status.
- HiPath 3000 does not offer keypad function on tie lines. However, keypad entries can be made via DTMF.
- Support of 1-line display notifications from DAKS only; no support of 2-line display notifications.
- No support of these functions: path replacement, ignore call-pickup groups, speaker-phone-control (voice calling), and override of the do-not-disturb function.

8.2 Setting up the interface(s) to DAKS

- Open the tab **'Routes'** and use the area 'Route name' to assign a name to the routes you find listed on the left, e.g. the name DAKS. Be careful to leave the 'Seizure code' **empty**.

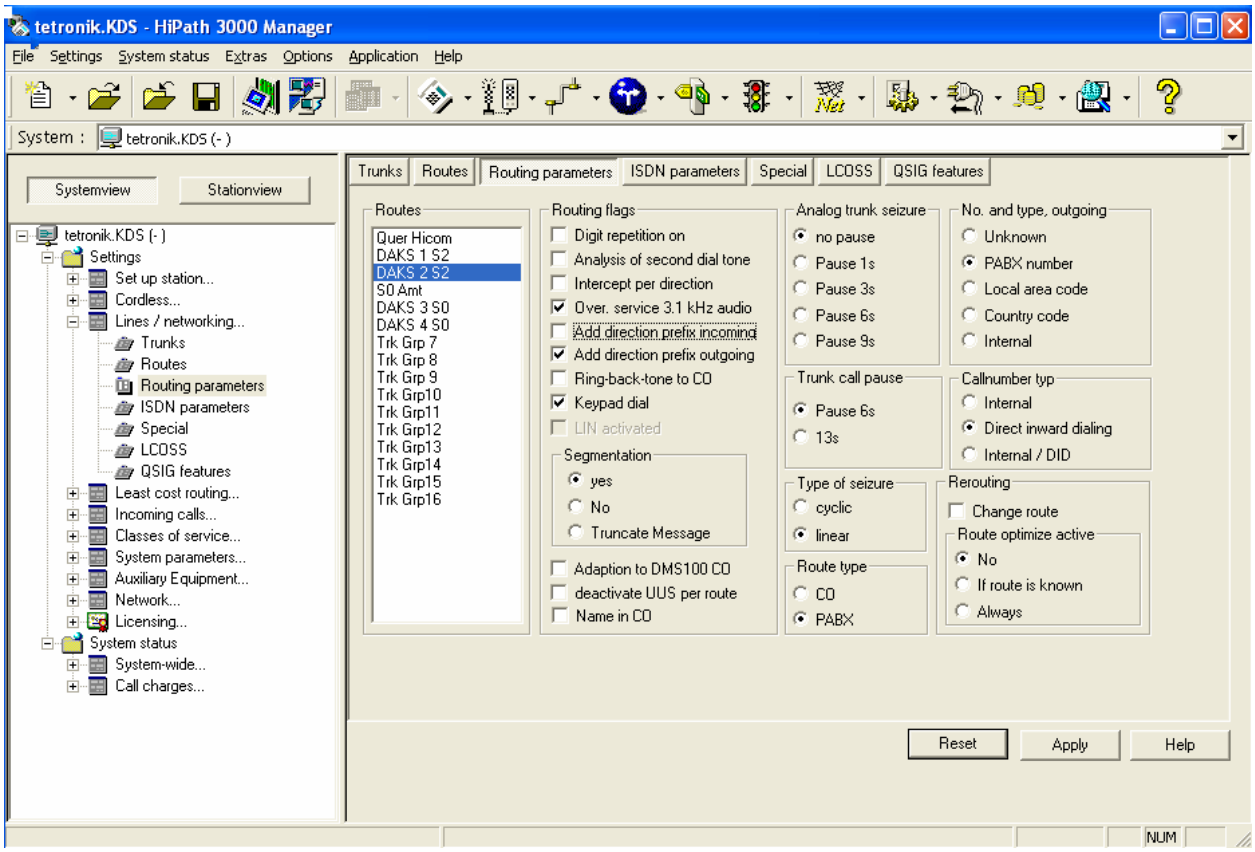


- Open the tab '**Trunks**' and assign to the trunks the defined routes. Then doubleclick on the cooresponding field in the column 'Param' to open the below window:



- Under 'Protocol' select '...ISO-QSIG Master CR=2, CHI=S2' and tick both 'outgoing' **and** 'incoming' for all B-channels for the 'B-Channel-Mode'.

- Open the tab **'Routing parameters'** and set the flags as shown in the below picture. In the area 'Routing flags' and adjacent, be especially careful to follow the below instructions:
  - Do **not** activate 'Add direction prefix incoming'.
  - Tick both 'Add direction prefix outgoing' and "Keypad dial'.
  - For 'Type of seizure' select 'linear'.
  - For 'Routing type' select 'PABX'.
  - For 'No. and type, outgoing' select 'PABX number'.
  - For 'Callnumber type' select 'Direct inward dialing'.
  - Set 'Route optimize active' to 'No'.



- Now open the tab '**Special**' and select for the area 'Switch': 'COLP' and 'Notify send'.

8.3 Other setups

8.3.1 Setup of 'Least cost routing'

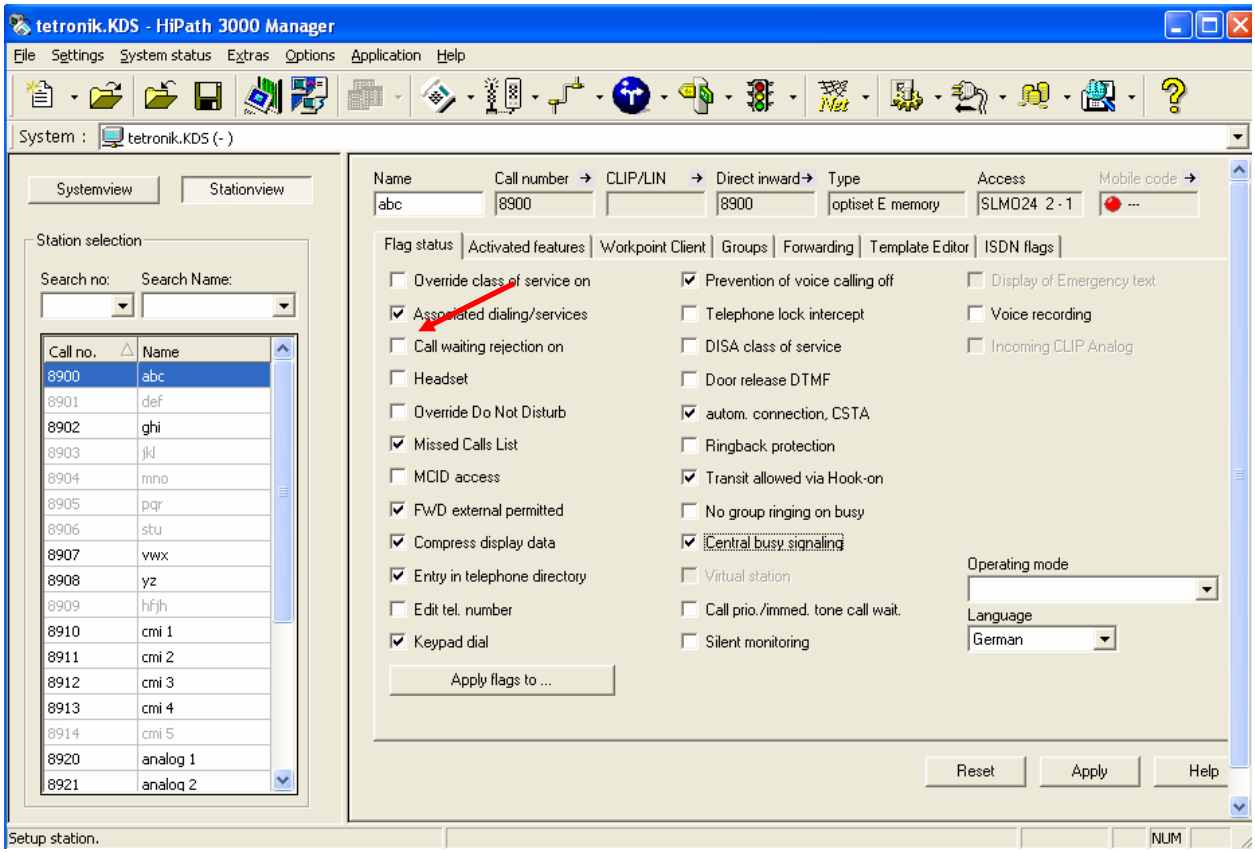
- Open the tab **'Dial plan'** to enter a number in the 'Route table' and assign a name under 'Name'. In 'Dialed digits' enter the digits to be dialed for the tie line zu DAKS in the format '–Z', e.g. 123-Z. Select "Yes" in the column 'Acc. Code'.
- Now open the 'Dial rule wizard' and enter "DAKS" for "Edited dial rule' and "Corporate network" for 'Network provider's method". Finally, select the format "A" for the 'Dial rule format'.

8.3.2 Setup of 'System parameters'

- Open the tab '**Flags**' and activate 'DTMF automatic'.
- Now open the tab '**Display**' and tick 'Name (if availabel)' for 'Display name / call number'.

8.3.3 Setup of subscribers

- If you want to enable the function 'Intrusion', be careful **not** to activate the subscriber flag 'Call waiting rejection on'.



9 Setting up the DAKS server

(see position 22)

⇒ DAKS should be placed into operation by service technicians with DAKS training.

⇒ Please observe the general safety instructions and the ESD protection measures.

⇒ DAKS should never be installed in rooms where there is danger of explosions.

⇒ Protect DAKS against moisture, heavy dust, aggressive liquids and steam.

⇒ Always operate DAKS at an ambient temperature between +5°C and +35°C.

⇒ **Note!!** This is a class A product. In a domestic environment, it can cause radio interference. If this should happen you may be required to take adequate measures.

⇒ The following requirements must be observed when installing the DAKS server into a server rack or server cabinet:

- The enclosure must be fire-proof to provide adequate protection against fire hazards.
- The mechanical fixtures of the rack must firmly support a weight of 5 kg (11 lbs.) when using a 3 HU (height unit) module frame or 8 kg (18 lbs.) when using a 6 HU (height unit) module frame
- The ventilation openings of adjacent devices may not be obstructed.
- The temperature inside the rack or enclosure may not exceed 35° Celsius.
- There are no special measures required for grounding the equipment.

9.1 General set-up instructions

Prerequisite: HiPath/Hicom must be set up in keeping with the instructions in position 4 or 5

- Position the DAKS server:
  - either by installing it in the case supplied
  - or by installing it in a 19” cabinet without the case
- Only for S_{2M} connections to HiPath/Hicom:
  Lay a standard Siemens cable, S30267-Z88-A100 between the PABX and the DAKS server.
- Only for S_{2M} connections to HiPath 3000/Hicom 150E:
  Lay a special cable for connecting the TMS2M boards to the DAKS server and solder on the S_{2M} connector supplied with the unit (D-15-M).
- Only for S_0 connections to HiPath/Hicom:
  - Attach S_0 jacks and connect them to the main distribution frame,
  - Lay 4 S_0 interface cables between the jacks and the DAKS server.
- Lay a power supply cable and connect it to the power supply:
  For 48 V, via a 2 - 2.5 A **time-lag** fuse.
  Note: A false polarization does not destroy the DAKS server, but the server will fail to work.
- Use the null modem data cable to connect the PC with terminal program (e.g. the one that comes with Windows) to the printer port (serial port 1 of the DAKS controller, labeled SBC-32) and adjust the data transmission parameters in the terminal program: 9600 baud, 8 data bits, 1 stop bit, no parity, hardware handshake
- Connect the power supply cable to the DAKS server and turn on the DAKS server.
  ==> Power-on message in plain text in English on the printer or PC (see position 11.1)
- Only for S_{2M} connections:
  Connect the S_{2M} cable to the DAKS server
  - Interface A is for the first 30 channels
  - Interface B is for the second 30 channels (if available)

  ==> Layer 1 and layer 2 messages from the interface(s)

- After you see the message(s) '... Layer 2 established', the S_2 interface(s) to HiPath/Hicom is/are ready for operation. **Do not continue the start-up procedure until you receive these messages!**
- If a DCF receiver is available, connect it to the DCF jack in the DAKS server via two jacks and a 2-wire cable of approx. 1,000 m (if necessary through-connected within the regular in-house wiring).

  Note *Flashing of the red LED in the receiver head in 1-second intervals indicates, that DCF reception is OK.*

- Only if contact input/output modules MIO-11 are available:
  - Connect the switching voltages needed for the inputs to a distributor, keeping the following input parameters in mind:
    > Input parameter U_{in} = 19...60 VDC, R_{in} = 20 kOhm
    > The inputs 9...12 and 13...16 respectively have common return leads.
  - Check the function of the pushbuttons or the automatic signal generator, using a voltmeter.
  - Connect the contact input wires of the connecting cable set to the corresponding positions on the distributor; connect the connector to the server (see position 22.1 and 23.18).
  - For the normal outputs, connect the devices to be activated to the distributor, keeping the following output parameters in mind:
    U_{max} = 60 V at I_{max} < 0,05 A, I_{max} = 100 mA for R_{on} = 15 Ohm
  - Output parameters of the special relay with idle contact, e.g. for failure signaling:
    U_{max} = 100 V, I_{max} = 3 A, P_{max} = 30 W, contact protection required
  - Connect the contact output wires of the connecting cable set to the corresponding positions on the distributor.
  - Configure the outputs in the software (see 'DAKS User Manual').
- Only if LAN interface module (MIP-01 or MIP-02) is present: set up module as per item 19.5.
- If available, install the contact inputs, using the Profibus DP technology (see position 10).
- Only if the 'Analog audio frequency input and output channels' add-on is available:
  - If necessary, connect the recording equipment to the audio frequency output channels, taking the following output parameters into account:
    0 dBm, 600 Ohm, electrically isolated from the rest of the system.
  - If necessary, connect the audio signals to the audio frequency input channels, taking the following input parameters into account:
    max. -6 dBm (vol. control), 7 kOhm, electrically isolated from the rest of the system.
  - For instructions on configuring the software, please refer to the 'DAKS User Manual'.
- Only if remote maintenance modem is available, configure it according to position 11.3.
- If desired, configure serial interfaces (see position 13) for interface application (such as SPS, ESPA).
- If desired, configure an interface (see position 19.8) to the GSM-SMS modem.

9.2 PC and PC-server-connection set-up

- Make sure you have installed operating system (Windows '95/ '98/ 2000 or Windows NT).
- Connect the DAKS server as described in the 'DAKS User Manual' under position 7.2.1 or 7.2.2.
- Install the DAKS-TT Server component as described in the ‘DAKS User Manual’.
- The PcDaksDog2 starts DAKS-TT Server automatically.
- Start the Admin-Tool, set up test groups and test the overall functionality (external calls, intrusion, forced release, alarm call, ignoring of call forwarding, display outputs, printer outputs etc.).
- Save DAKS server settings (see position 19.3) in a text file and store this file in the database directory (to have it available in case of a hardware defect of the DAKS server).

9.2.1 Connecting DAKS server and PC in case of serial connection

- Even if you plan to install the PC remotely later on, e.g. via a modem, first check the functionality by means of a direct connection (to make sure there are no problems on the data link).
- Using the null modem data cable, connect the PC to serial port 2 of the DAKS controller board (SBC-32), which is preconfigured for the Administration PC connection with 9600 bd (see pos. 19.3).
- Set up the server link within DAKS-TT Server as described in the 'DAKS User Manual' and be careful to select the proper COM port and transmission speed.

9.2.2 Connecting DAKS server and PC in case of a LAN connection

- Set up the DAKS server's LAN module as described under position 19.5.
- Connect the DAKS server to the LAN.
- Connect the PC to the LAN.
- Verify the IP configurations of PC and server with "PING", if possible from a third LAN device.
- Set up the server link within DAKS-TT Server as described in the 'DAKS User Manual'.
- If you have set up the ‘Connection to DAKS-TT Server via LAN’ you can additionally create a serial connection via interface 2 (see section 7.2.1). For this option you will have to adjust the connection parameters to the DAKS server within DAKS-TT Server accordingly.

9.3 System printer connection (if available)

- Check the DIL switch settings (see position 21.8).
- Position the printer and load continuous-feed paper (if possible **from below)**.
- Set the switch to the right of the paper roll to the 'continuous feed' setting.
- Using an adapter and null modem data cable, connect the printer to serial port 1 of the DAKS controller.

10 Contact inputs based on Profibus DP technology

For the wiring plans and cable descriptions, please refer to positions 22.7 and **23.14**.
Instructions on setting up the software can be found in the 'DAKS User Manual' .

The use of Profibus technology (process field bus) can be advantageous whenever decentralized actuators or sensors (such as input contacts) are connected to one or more central locations or are to be activated from these locations.

A two-wire data cable (shielded and twisted) is all that is needed for connecting the individual Profibus components.

For use in conjunction with DAKS (Profibus baud rate = 93.75 kbps), the Profibus cable should not be more than 1,200 meters long (without repeaters).

DAKS uses this technology for starting broadcasts and conferences as well as to select info telephone profiles.

Up to 22 decentralized line trunk units with altogether up to 704 inputs can be connected to the DAKS server:

- either via contacts (electrically isolated from each other or with common return leads)
- or via power sources (24V DC) with a common ground.

A single line trunk unit can support 32, 64, 96 or 128 inputs.

The order items are available for DAKS:

- Standalone contact inputs: basic package (without input modules) for the connection of max. 22 x 32 contacts
- Standalone contact inputs: unit for up to 4 modules with 32 contact inputs each
- Standalone contact inputs: input module with 32 inputs

The Profibus basic unit includes:

- Software for the Administration and control of Profibus modules, including advance provisioning for up to 704 contact inputs
- The PBI-01 interface board with VMEbus connection in the DAKS server
- A cable set (3 meters long as standard)

A complete line trunk unit with 32, 64, 96 or 128 contact inputs includes:

- Software for the Administration and control of 32 contact inputs
- 1 *WIN*bloc PROFIBUS bridge (type: DP BK Bridge) for connecting input/output modules to the bus power
- 1...4 basic modules with 2 plus rails (type: ZSB 1.5/16 S/S/+/+)
- 1...4 electronic modules with 2x16 digital inputs, plus-switching (type: DP 32DI P 2x16)
- a switching controller 230 V AC/24 V DC, 2 A (type: PULS)
- a top-hat rail (long) with 2 module end panels (type: WEW 35/2) for holding the bridge, switching controller and modules

The following are needed for the expansion of the connection unit by 32 inputs:

- software for the Administration and control of 32 contact inputs
- a basic module with 2 plus rails (type: ZSB 1.5/16 S/S/+/+)
- an electronic module with 2x16 digital inputs, plus-switching (type: DP 32DI P 2x16)

11 Maintenance and troubleshooting, level 1

(also see position 20)

11.1 LEDs, buttons

The LEDs on the controller board (SBC-3x) and the interface and voice memory board (XRS-02) indicate the operating status (activity) of the DAKS server.

Always consult Level 2 or Level 3 Support before pressing the Reset button.

11.1.1 Bicolor LED on the SBC-3x controller board

- The LED turns green and lights up when the controller is working; this means that it should always be green and continuously lit during operation.
- The LED turns red and lights up briefly when the controller is reset:
  - at power-on
  - when the RESET button is pressed
  - when an error causing the program to crash is detected
  - when the supply voltage is too low

11.1.2 Yellow LED 'L1' and red LED 'L2' on the SBC-3x controller board

- These two LEDs light up briefly during a controller reset and are otherwise controlled by the DAKS software.
- If there is **no** useful data in the flash EPROM of the DAKS server the LEDs 'L1' and 'L2' will flash rapidly in turn.
- **With** useful data available in the flash EPROM of the DAKS server:
  - the yellow LED 'L1' will light up when the Administration and operation PC logs on, i.e. when there is a data connection between the DAKS server and the PC.
  - the red LED 'L2' will light up while a new message is being erased or recorded
  - the red LED 'L2' will flash during broadcasts or when at least one conference is active

11.1.3 LED ‘TRF’ and green/orange LED ‘LNK’ on the controller board SBC-33

- The green/orange LED will light up green or orange when there is a 10BaseT connection or 100BaseT LAN connection (‘Link’).
- The bicolor LED ‘TRF’ lights up red to signal ‘Traffic’ on the LAN connection.

11.1.4 LEDs on the ISDN interface and the voice memory controller board XRS-02

- Bicolor LED:
  - this LED will light up green when the controller accesses this board, i. e.: in normal operation, the LED should flash green at least once every 120s
  - this LED will light up red in Reset:
    - > at power-on
    - > when the Reset button is pressed
    - > when the SBC-3x controller board is in Reset
- 2 or 4 green LEDs on the S_{2M} or S_0 interfaces
  - 1x flash: layer 1 OK
  - 2x flash: layer 2 OK
  - 3x flash: at least one channel is occupied
  - 4x flash: all channels are occupied
  - continuous flashing: interface is not ready for operation
- 4 yellow LEDs on the S_0 interfaces
  - off (standard operation): interface is configured as LT-T

- on: special configuration

11.1.5 Green LEDs 'L1' and 'L2' on the ACM-01 board

- The LEDs will light up at interface activity (sending or receiving of data):
  - L1 for interface 1
  - L2 for interface 2

11.1.6 LEDs on LAN interface module MIP-01/MIP-02

- The green/orange LED (LNK) will light up green or orange with a 10BaseT/100BaseT LAN link.
- The red LED (TRF) signals 'Traffic' on the LAN link.

11.1.7 Red 'Reset' LED, 'R_T' switch, and button on the PBI-01 board

- The LED will light up while the module is being reset:
  - at power-on
  - initiated by the control computer (whenever the control computer is reset)
  - when the module's reset button is pressed
  - when a fault is detected in the module
- The LED should never light up during operation.
- Always consult Level 2 or Level 3 Support before pressing the button.
- The 'R_T' switch as termination:
  - 'Off' = no bus termination, i. e. MPB-01 at the end of the Profibus
  - 'On' = bus termination, i. e. MPB-01 in the middle of the Profibus

11.1.8 LED 'ACT' and 'R_T' switch on the controller board MPB-01

- The LED will light up red when the controller board is reset:
  - at power-on
  - initiated by the controller board (whenever the controller board is reset)
  - when a fault is detected in the module
- The LED will flash green after every scan cycle of all contacts.
- The 'R_T' switch as termination:
  - 'Off' = no bus termination, i. e. MPB-01 at the end of the Profibus
  - 'On' = with bus termination, i. e. MPB-01 in the middle of the Profibus

11.2 Serial ports on the DAKS server

The DAKS server has several serial ports which can be used for localizing and correcting faults:

- Printer port (serial port 1 on the DAKS SBC-3x controller board)
- PC port (serial port 2 on the DAKS SBC-3x controller board)
- A further serial port (3) to an external system
- Test port on the XRS-02 board (ISDN interface and speech memory board)
- Test port on the PBI-01 board (Profibus DP interface debugging interface)

You can connect the system printer, a terminal or a PC with terminal program (e.g. Windows Hyperterminal) directly to the printer port or to the test ports via the null modem data cable supplied with the unit (generally 9600 Bd, 8 data bits, 1 stop bit, no parity, hardware-handshake).

You receive the most important information via the printer port.
This interface is normally used to output all relevant information in plain text
in English:

- Power-on message, including the serial numbers, capacity stages, etc.
- Relevant system states and errors detected
- States of the S_{2M} and S_0 connections to the PABX(s) (layer 1 and layer 2 messages)

Typical power-on message with explanatory notes (can be modified)

B I O S Motorola 68XXX Family Version 07.30 CPU : CPU32 2016 K-Byte contig. Memory Hardware ----------------- SBC-32 Serial-No = 0015507216 Software ----------------- SBCS 5.01 from 30.01.2002 17:53 Restart at ---------------- 04.03.2002 10:45:53 Reset Cause --------------- Powerup Driver Flash-Memory ------- FLSH 5.01 Program Memory ------------ 1 * Macronix MX29F800B at $800000 Add. Memory Bank #1 ------- 2 * Atmel AT29C040A at $300000 Add. Memory Bank #2 ------- no Flash detected User Ram ------------------ from $008008 to $2EDFD0 MC68332 Speed ------------- 20.97 MHz M-Module ------------------ M151 installed, Serial-No = MIP2... Chip-Card ----------------- ok, Serial-No = 90520033 Debug Code for Test ------- ????	BIOS-version and hardware equipment Debug option for 3rd-Level-Support
name and version DKSS 5.05 date compiled Tue Feb 12 2002 10:55:30 copyright (c) 1994-2002 by tetronik	Process software
total free ram $00279E80 Bytes program section from $00840000 to $008A8B77 data section from $00008100 to $00016255 varib section from $00016256 to $00064477 start up program SBCS 510 restart time 25.03.2003 10:46:04 controller serial no 0015507216	RAM-allocation Startup-software and serial-no. of the controller
flash eprom from $0200000 to $03FFFFF data section (flash) from $0300000 to $03445CF data section (ram) from $0295E18 to $02E1E9F	Program- and data memory
Chip-Card serial no 90520033 system DAKS generation 5 date and name 990825MH infotext RXXXXX14100111CE flash eprom data valid and copied into ram	Chipcard-information
SMS-memory present from 00300000 to 003fffff valid max. size per message 160 max. messages 661	SMS-memory
Waiting for S-Boards ... 1 Boards found XRS-0X Nr:1 SN0023619565 60 channels switching+conferencing SC-Bus Controller present main cpu XRSM 518 Reset : powerup Layer 2 Version L213 Layer 3 Version CN54 voice cpu TEXT V60 Reset : external SmartMediaCard 32 MB eeprom banks 1 eeprom 250 Blocks * 15 sec ad hoc 6 Blocks * 30 sec no. of tones 19 Board 1 initialized Board 1 present, configuration ok.	Start-up messages of ISDN interface and speech memory boards

MIP-02 module on SBC serial no MIP215N00000096 Dhcp use 0 Dhcp status 0 Internet Addr 172.162.0.81 Subnet Mask 255.255.255.0 Gateway Addr 172.162.0.254 Bios Version 1.00 IPC Serialno 3c7f Mipdrv Version 4.00 MAC ADRR 00-30-56-f0-3c-7f ACM-01 Board at $00f0f800 not present ACM-01 Board at $00f0fc00 not present 04.03.2002 10:46:07 SYS:PC-DAKS on device SB2 OK 04.03.2002 10:46:07 SYS:PC-DAKS initialized listening on port 2001 04.03.2002 10:46:13 SYS: System ready for operation 04.03.2002 10:46:13 SYS:XRS-0X Nr:1 Line A Layer 2 established 04.03.2002 10:46:19 SYS:Optocouplerinputs activated 04.03.2002 10:46:19 SYS:XRS-0X Nr:1 Line B Layer 2 released	Start-up message of the LAN-interface module 1 S_{2M}-Interface active (Line A)

The messages from the interface board are the most important messages after power-on.
They provide information about the status of the connections to the PABX(s).

- Layer 1 messages signal the status of the physical connection to the PABX.
- Layer 2 messages signal the status of the logical connection to the PABX.

The connections have been established when the following appears as the last message:

- ***... Layer 2: established***

11.3 Teleservice

Teleservice operates with the assistance of a Hayes-compatible analog modem via controller interface **1** (printer-interface) of the DAKS-server.

The modem has first to be set up via a PC with terminal software, e. g. 'Hyperterminal'.

This set-up **must** specify 9600 baud, no parity bit, 8 data bits and 1 stop bit; the modem retains this setting subsequently after reconnection to the DAKS server.

To be entered via terminal:

- first AT&F
- next AT&D0Q1S0=1
- last AT&W0

The entries have the following functions respectively:

- &F Reset modem to original state (factory configuration)
- &D0 DTR of the connected unit is not evaluated (even after resetting or reconnection the modem connection is maintained)
- Q1 No connection messages to the connected unit in case of an incoming call, i.e. if the modem was called
- S0=1 Modem reacts to first call signal
- &W0 Store settings as default profile

For further information regarding modem set-up please refer to the documentation of the specific modem.

12 Serial data interfaces - Overview and level 1

12.1 General information

DAKS supports serial protocol interfaces to external systems, e. g. to:

- nursecall systems,
- fire alarm systems
- programmable logic controls (PLC) or
- to a deployment control computer.

Layer 1: *)
DAKS supports (configurable on-site) point-to-point connections acc. to:

- **RS422** (with galvanic separation) and
- **RS232** (without galvanic separation).

Layer 2: *)
Following protocols are used as data transfer protocols:

- **ESPA 4.4.4** (acc. to publication ESPA no. 4.4.4, publication Nov. 1984)
- **DUST 3964R**
- the two simple protocols **VIT1** and **FTI1**

Layer 3:
DAKS supports 3 different interfaces:

- **PLC interface**: Only contact information is transferred, i. e. the activation of DAKS contact inputs is simulated.
- **Nursecall interface** (= Paging interface): The groups to be activated are transmitted incl. the (current) display message and additional functions are possible, e.g. in the health care sector: callbacks to patients.
- **Host interface** (*not* documented here): The functionality spans the activation of prepared groups to the complete remote control of the DAKS-server by circumvention of DAKS-internal data Administration from a deployment control computer.

The nursecall interface with ESPA protocol occupies the most space in this documentation.

The PLC interface with ESPA protocol is only utilized, when the external system supports the ESPA protocol, but the display- and, if applicable, also the language outputs are to be administrated by DAKS, e. g.:

- in connection with older nursecall systems that are difficult to administrate, or
- if terminal units with HiPath/Hicom-specific display functions are to be alerted with various announcements or,
- in connection with building management systems that behave like a PLC.

The nursecall interface with the simple protocols is always utilized, when the adapted system logically requires the nursecall interface but the implementation of DUST or ESPA would be too cumbersome.

Specifically, the SPS interface with DUST protocol is used in connection with Simatic S5.

*) Deliverable for alternative connection of the external application:
- a DUST-/ESPA driver (OCX for WINDOWS-based external systems)
- a connection external system/DAKS server via TCP/IP-LAN (only DUST 3964R)

12.2 Layer 1, independent of the type of interface selected

DAKS transmits and receives via RS232 or RS422 (see position 12.1) with variable baud rate (1200, 2400, 4800 or 9600 Bd), 7 or 8 data bits, variable parity bit, and with 1 or 2 stop bits.

The character set IBM 2 is used, at 7 data bits it corresponds to US-ASCII.

Towards digital HiPath/Hicom telephones only output of US-ASCII-characters is possible (also no umlauts, no ß).

DAKS supports point-to-point data transmissions (can be configured on-site) according to:

- RS422: with electrical isolation
- RS232: DTE with PIN assignment, like the COM port on a PC and without electrical isolation (!! Electrical isolation must be provided either in the external system or via a modem link or similar arrangement !!)

The following are included in DAKS data interface delivery package:

- pluggable interface module for the RS422 connection as an alternative to RS232
- shielded null-modem data cable for connections without handshake, length 3 m
- shielded RS422 data cable, length 5 m

13 Serial interfaces - Nursecall interface with ESPA protocol

Interface set-up in DAKS server:
Protocol ESPA, function NUC or NUC+ (the latter, when callbacks are also needed)

13.1 Commentary re. ESPA specification

13.1.1 Section 2.4 of the ESPA specification: 'Transmission control prefixes'

- When transmitting messages from an external system to DAKS, the DAKS device address must be sent before <ENQ>.
- DAKS may send the following <NAK> responses
  - '1' <NAK> transmission error
  - '2' <NAK> busy, queue full
  - '3' <NAK> invalid message
- If DAKS responds with ...<NAK>, the received message is discarded.
- If DAKS responds to a message with <NAK> or '1' <NAK>, the message is repeated two more times (making a total of 3 attempts), followed by a detailed error output.
- If DAKS responds to a message with '2' <NAK>, '3' <NAK>, a different reply or nothing at all, the message is not repeated and a detailed error output follows immediately.

13.1.2 Section 3.1 of the ESPA specification: 'Polling'

- The DAKS device address can be set to a number between '0' and '9'.
- DAKS is not the 'control station'.

13.1.3 Re. Pos. 4.2 and 4.3

- Supported headers and records are different for nursecall and PLC interfaces and are described in detail in separate chapters.

13.1.4 Re. Pos. 5 of the ESPA specification: 'Hardware specification'

- With ESPA, operation should be conducted acc. to protocol: with 7 data bits, even parity and 2 stop bits.
- For further information see position 12.2.

13.2 Functionality

DAKS supports up to 3 (4) serial ports for nursecall interfaces.

The nursecall interface is downward-compatible with the nursecall interface of Release 3E.

The nursecall interface enables calls to single participants and groups:

- with variable text output
- with evaluation of the record type 'Priority'
- with evaluation of the record type 'Call-Type' for the support of the Call Type 'Page' and to distinguish whether - and if yes, which callbacks (usually to the patient) are possible:
  - Callback by bed to the patient telephone (connected to the PABX) or to the patient's intercom (connected to the nursecall system)
  - Callback by room to the room loudspeaker (connected to the nursecall system)
- with deletion of calls initiated from the nursecall system incl. restart synchronization
- with Expanded reports (= status-information)

Status information are transmitted either upon selective enquiry or automatically, insofar changes have occurred:

- Call being processed
- Callback initiated
- Call successfully/unsuccessfully terminated (detailed)
- Call terminated after conversation with patient with (where applicable) processing information (remember call or delete call)

For callbacks towards the nursecall system, DAKS supports the following interfaces:

- Analog or digital
- With or without dial-thru capability
- One- or multichannel per care unit
- Where applicable with DTMF receiver:
  - For receiving the information about the loudspeaker or intercom to be addressed (from the nursecall system) and
  - for signaling between nurse and patient during the conversation
    (here DAKS takes over the transfer of keypad from the nurse telephone into DTMF)

To accommodate this functionality, the ESPA specification has been expanded a. o. by:

- additional record types ('Call-ID' and 'Nursecall interface') as well as
- additional data in record types that acc. to ESPA have already been defined.

13.3 Behavior of DAKS in detail

13.3.1 General information

Within DAKS, broadcast groups are to be administrated; a group can be comprised of a single or of many participants.

The relevant group is addressed or selected via its identifier (= Call address, see position 13.7).

DAKS:

- Accepts commands for executing broadcasts via the serial interface,
- First places the broadcast requests in an internal queue,
- Executes the broadcasts and
- Reports the status or result.

Note:
In case the external system requires instant feedback, e. g. because otherwise it can't start another broadcast, DAKS can send back a positive result into the internal queue immediately after the initiation/acceptance of the broadcast request (see position 19.4.2).
In this case reports regarding progress info./result of the broadcast are, of course, omitted.

The queue can hold a maximum of 50 broadcast requests.;
if needed, the queue can also be made smaller (see position 19.4.2).

Up to 10 broadcasts can run simultaneously.

Depending on how the broadcasts are set up within DAKS, they are executed:

- with parallel and/or sequential dialing of subscribers
- with or without called party identification by PIN
- with or without confirmation (during the call in progress or by a callback)
- usually with up-to-date (display) text from the external system
- with broadcast message(s) and advisory messages relating to operation and confirmation
- where applicable with callback option to the initiator (= patient)

For more information on executing broadcasts, see the 'DAKS User Manual'

A broadcast request is removed from the queue:

- immediately after a status request that was answered with an end result (see position 13.7)
- 2 minutes after the end of the broadcast
- 2 minutes after a broadcast is cancelled (e.g. by the operator or a high-priority activity)
- 2 minutes after failure to execute a broadcast to be started,
  e.g. if the telephone connection to the telecommunication network was interrupted
- when DAKS no longer registers the external system (nursecall system) as active;
  this is the case if, for 10 minutes, DAKS neither is polled nor receives a valid data record.

13.3.2 Automatic callback to the initiator (patient)

Callbacks are only possible in conjunction with order position:
'Expansion of the data interface: additional function callback for nursecall interface (ESPA)'

Callbacks are initiated:

- When only one callback target is possible (to the HiPath/Hicom telephone or into the nursecall system),
  by pressing '5' or '6'
- When two callback targets are possible (to the HiPath/Hicom telephone or into the nursecall system), by pressing '5' to the HiPath/Hicom telephone and by pressing 6' into the nursecall system

Callbacks can take place only with the following group-specific DAKS settings:

- 'Number of clients /participants to be reached must be set to 1' (dialing is sequential or parallel)
- With parallel dialing the flag 'terminate/end when target reached' must be set.
- Negative confirmation must be possible.
- The client/participant has to acknowledge by pressing key within the connection.

If the callback wasn't possible, because the callback target was busy or not reachable, didn't accept the call, wasn't permitted to be called again or no more channels where at DAKS' disposal:

- the called party hears 5 short tones
- He/she subsequently hears once again: broadcast message + prompting message
- and can, during this process again choose between 0, 1, 5 and/or 6.

After a callback connection has been established, the called party (the nurse), if applicable, has different signaling options, e. g. to decide:

- 'Delete call' or
- 'Remember call'.

For this on the DAKS side it is possible to select, which special signalings within a callback conversation are evaluated by DAKS: none, only '#', only '1', '1' and '#', and which of these automatically terminate the call (see position 19.4.3)

If the nurse terminates the call by hanging up or by pressing a corresponding key (adjustable, see below), the connection to the patient is also disconnected.

If the conversation is ended by the patient hanging up or by nursecall interfaces, the connection to the nurse remains established for another 8s, and is subsequently disconnected. During these 8 s the nurse can, where applicable, still signal with # or 1.

In parallel dialing of participants simultaneous calls are interrupted exactly then, when the telephone interface accepts the call, i. e. when the callback conversation starts.

In a nursecall interface with DTMF receiver (typical for 'Total Walther medicall 800') in a callback situation DAKS enables a transparent dialog between the nurse and the nursecall interface incl. processing of pressed keys transferred as keypad information from the digital HiPath/Hicom-telephone into DTMF towards the nursecall interface.

In combination with a nursecall interface without DTMF receiver or with callbacks towards the HiPath/Hicom telephone, however, the nurse signals towards DAKS by pressing key, and subsequently a corresponding message is issued through the nursecall interface.

In combination with 'Total Walther medicall 800' signaling currently operates as follows:

- Key '1' means 'Call processed' and no automatic termination occurs
- Key '#' means 'End' with automatic hanging-up by the telephone interface
  (quicker than busy tone recognition; no busy tone via loudspeaker)

13.4 Activation of DAKS calls

13.4.1 General information, Header

Calls are activated by Header 'Call to pager' ('1').

The data identifiers/record types described in following can be sent in any order.

If the exact same call activation with identical record type data is transmitted again while it is still located in the DAKS-Queue, then this data set is received with <ACK>, but not processed further (therefore, discarded).

13.4.2 Record type 'Call address', data identifier '1'

The call address must be sent, otherwise DAKS responds with '3' <NAK>.

The call address must have 1 to 4 numeric digits, otherwise DAKS responds with '3' <NAK>.

The call address must correspond with the group identifier of a broadcast group set up within DAKS, otherwise DAKS responds to the data record with <ACK>, however, doesn't add it to the queue of calls to be processed.

13.4.3 Record type 'Display message', data identifier '2'

If no display message is transmitted, the relevant text message stored in DAKS is output.

If a display message is transmitted, this message may contain 0...160 characters
(acc. to ESPA protocol actually only 128 would be allowed).

A display messages that is too long will be cut off.

What a called participant sees on the display, and whether or not he/she can initiate a callback by redial or by single key function, depends on the following factors:

- structure of the 'Display Message'
- specific parameters of the DAKS broadcast group
- ESPA record type 'Call type' (see position 13.4.5) = callback conversations enabled
- the nurse's terminal unit

In order to perform callbacks to the patient by redial:

- The telephone must support this function,
- the 'display message' must begin with the calling number of the patient + <Space> and
- in the group-specific DAKS parameter 'Display', as 'Number for other participants' you have to enter 'Cost center' *)

For callbacks to a telephone by single key function via DAKS:

- These types of callbacks must be enabled via ESPA (see position 13.4.5),
- again, the display message has to begin with the calling number of the patient + <Space>,
- and, it must be already entered within DAKS that:
  - the broadcast will be ended, as soon as a single participant is reached
  - a negative report is possible and
  - that, within the connection, the reached participant may confirm by pressing key.

*) Background:
Only if the 'Display message' begins with up to 6 numerical digits + <Space> , the digit sequence will become the 'Cost center', the space will be discarded, while the rest (after the space) becomes the initiator-specific text information; Otherwise the complete 'Display Message' will be treated by the

broadcast as the initiator-specific text. information (treated like a contact name/description, a 'Calling name' or a subscriber-specific text), and the 'standard cost center' will be used as 'cost center'.

13.4.4 Record type 'Beep coding', data identifier '3'

'Beep coding':

- does not need to be sent,
- is responded by DAKS with '3' <NAK>, if sent without or with invalid data,
- may be sent with data '0'...'9', and is evaluated as follows:
  - '0'...'5', '8' or '9'
    no effect
  - '6'
    alarm call signaling, if the broadcast group parameters require alarm call signaling for the respective subscriber, otherwise external call signaling
  - '7'
    generally alarm call signaling

13.4.5 Record types 'Call type', data identifier '4'

'Call type':

- Does not need to be sent.
- If not sent, it means 'Standard call' (see below).
- Is responded by DAKS with '3' <NAK>, if sent without or with invalid data.

'Call type' is evaluated as follows:

Data	Meaning acc. to ESPA	Effect
'0'	reserved	like 'Standard call'
'3'	Standard call	no callback conversation possible
'1'	Reset (cancel) Call	call deletion (separate chapter, see position 13.5.1)
'11'	Reset all Calls	delete all calls from queue (for restart) (separate chapter, see position 13.5.2)
'2'	Speech call *)	depending on whether or not a 'nursecall interface' is specified: - if not, it has the same effect as '21' - if yes, it has the same effect as '22'
'21'	DAKS specific *)	callback conversation possible via telephone; prerequisites: - callback conversations enabled within the DAKS system - callback number specified in 'Display message'
'22'	DAKS specific *)	callback conversation possible via nursecall system; prerequisites: - callback conversations enabled within the DAKS system - 'nursecall interface' specified
'23'	DAKS specific *)	callback conversation possible via telephone and via nursecall system; prerequisites: - for callback via telephone see data '21' - for callback via nursecall system see data '22'
'4'	Page (DAKS specific)	like 'Standard call', but with following specialty: The call is not stored in the ESPA interface so there is no polling possible (no status information back to host or nursecall system)

*) Like Standard call, if callback conversations are not enabled.

13.4.6 Record type 'Number of transmissions', data identifier '5'

'No. of transmissions':

- does not need to be sent.
- can be sent with data '0'...'9'.
- is responded by DAKS with '3' <NAK>, if sent without or with invalid data,
- is not evaluated.

13.4.7 Record type 'Priority', data identifier '6'

'Priority':

- does not need to be sent,
- can be sent with data '0'...'3',
- is responded by DAKS with '3' <NAK>, if sent without or with invalid data.

In case priority '1' (=alarm, emergency) is sent, DAKS in any case activates the 'special dial options', i. e. emergency call, forced release in case of busy lines etc., even if the relevant flag is not set within the group Administration.

In case priority '2' (= high) is sent and within the group Administration the 'special dial options' have **not** been activated, DAKS, if appropriate, uses the camp-on or the intrusion feature in case of busy lines.

- DAKS intrudes:
  - if within the connection type of the subscriber the intrusion feature is generally enabled and
  - if an broadcast intrusion message is assigned and accessible.
- DAKS camps-on:
  - if intrusion is not possible and
  - if within the connection type of the subscriber the camp-on feature is generally enabled.

Therefore, for example, you only need to administer one single group, if you want to call the same subscribers through normal calls, through calls with higher priority and through emergency calls, because the differentiation of how DAKS calls the subscribers, can be set differently - according to the incident - by the nursecall system, using the 'priority' parameter.

13.4.8 Record type 'Nursecall Interface'

For callbacks into the nursecall system you have to specify the interface.

The data identifier to specify the nursecall interface is **'E'** ($45).

Following 'Nursecall Interface' data have to be transmitted:

- connection type 3 ASCII characters
  (must correspond with a connection type administered within the DAKS server)
- separator where appropriate, alternatively: comma, colon or <Space> (only if callback no. follows)
- where appropriate callback no. to be evaluated within the nursecall system,
  up to 10x: digits 0...9, * or #

13.4.9 Record type 'Call-ID'

The 'Call-ID'

- simplifies the identification of a call within dialogs between DAKS and the nursecall system,
- enables commands (e. g. deletion) that are relevant for several calls,
- is essential for the transfer of certain status information,
- is so to speak specifies an 'Event',
- itself needs not to be unique, i. e. several calls can use the same Call-ID,
- together with the 'Call Address' must be unique.

If the nursecall system sends a call request once more with the same 'Call ID' and the same 'Call Address' as a call, which still finds itself in the DAKS queue (still waiting or already active), the command will be accepted by <ACK>, but subsequently the call will not be processed.

The 'Call ID' has the data identifier **'I'** ($49),
the 'Call ID's' data (so to speak the event number) are 4 ASCII coded digits ('0000' … '9999').

13.5 Deletion of DAKS broadcast calls

13.5.1 Reset call

It is possible to delete single or several subscriber or group calls, i. e.:

- not to start them, when they are still in the DAKS internal waiting queue,
- or to interrupt them, when they are active (this includes a corresponding announcement for subscribers who are connected to DAKS).

This command immediately deletes the calls out of the queue; after that no status requests (see below) are possible anymore.

An ongoing callback conversation can still be ended normally, it will not be interrupted; in this case there is no more status information either.

This functionality is particularly interesting, if a call is cancelled independent from the alerting via telephone (e. g. directly in the patient's room), but a call request towards DAKS has taken place before.

If a 'Call ID' is used and you want to delete all calls with a specific 'Call ID', the deletion command looks like this:

- Header = Call to pager ('1')
- Record type 'Call type' ('4') = Reset (cancel) call ('1')
- Record type 'Call ID' ('I') = Event number

If a 'Call ID' is used and you want to delete a single subscriber call or group call, the deletion command looks like this:

- Header = Call to pager ('1')
- Record type 'Call type' ('4') = Reset (cancel) call ('1')
- Record type 'Call ID' ('I') = Event number
- Record type 'Call address' = Group identifier

If a 'Call ID' is not used and you want to delete a single subscriber call or group call,
the deletion command looks like this:

- Header = Call to pager ('1')
- Record type 'Call type' ('4') = Reset (cancel) call ('1')

- Other Record types and their entries:
  - They have to be identical to those of an existing call, so that within DAKS the assignment to the relevant call can be found.
  - They can be sent in any order.

13.5.2 Reset all calls

This command is used to synchronize the host system and DAKS e. g. after a restart of the data interface from the host or nursecall system.

Active calls will be continued, calls within the queue, that have not been started yet, will be started, but without any feedback messages, i. e. there won't be any more status information about those calls towards host or nursecall system.

Independent of whether or not a 'Call ID' is used, this overall deletion command looks like this:

- Header = Call to pager ('1')
- Record type 'Call type' ('4') = Reset all calls ('11')

13.6 Status request

13.6.1 Without 'Call ID'

If a 'Call ID' is not used, you can only retrieve the status of one single call.

The command consists of:

- Header = Status request ('3')
- Record types and their entries:
  - They have to be identical to those of an existing call, so that within DAKS the assignment to the relevant call can be found.
  - They can be sent in any order.

13.6.2 With 'Call ID'

If a 'Call ID' is used the external system:

- either can retrieve the status of a single subscriber or group call,
- or can ask DAKS to send one or more status information messages re. calls with changed statuses.

In order to retrieve a single subscriber or group call, following command is required:

- Header = Status request ('3')
- Record type 'Call ID' ('I') = Event number
- Record type 'Call address' = Group identifier

In order to ask DAKS to send one or more status information of calls with changed statuses:

- either a command, which only consists out of Header = Status request ('1')
  (= general 'Status request'),
- or, the nursecall system simply has to poll DAKS without a 'Status request' command in advance.

13.7 Status information

'Status information' messages take place:

- either dedicated for a single call after appropriate 'Status request'
- or for up to 5 calls with changed statuses simultaneously, either after appropriate 'Status request' or simply by polling DAKS.

After a 'Status request' **without** 'Call ID' which refers to a certain call, DAKS sends following 'Status information':

- Header = Status information ('2')
- following Record types with their data (in the following order):
  - Call address ('1')
  - Display message ('2') | only if specified by ...
  - Beep coding ('3') | ... leading ...
  - Priority ('6') | ... Status request
  - Call status ('7')

After a 'Status request' **with** 'Call ID' which refers to a certain call, DAKS sends following 'Status information':

- Header = Status information ('2')
- following Record types with their data (in the following order):
  - Call ID ('I')
  - Call address ('1')
  - Call status ('7')

After a general 'Status request' or when DAKS is polled without leading 'Status-Request',
DAKS sends up to 5 'Status information' messages in which any information can be:

- either a result, as with a 'Status request' with 'Call ID' that refers to a certain call (see above)
- or an information about an active callback (see below)
- finally EOT

Information about active callback calls are only sent in combination with nursecall interfaces with neither dial-thru capability nor a DTMF receiver, i. e. those without specified callback number in record type 'Nursecall interface'.

As the timing of these information messages is critical, they have a higher priority than other events.

An information message about an active callback is not sent before the 'Alerting' state (it is ringing) has been reached.

A callback information consists out of:

- Header = Status information ('2')
- following Record types and their data (in this order):
  - Nursecall interface ('E')
  - Call ID ('I')
  - Call address ('1')

DAKS uses the following 'call status data':

- '2' (in queue):
  Broadcast has either not yet started or is currently active; no final result is yet available.
- '3' (paged) *) Broadcast has ended; result is positive
  - a broadcast without exact number of specified subscribers has ended
  - a broadcast with an exact number of specified subscribers has reached a sufficient number of subscribers
- '5' (Call terminated) *) Broadcast has ended; result is negative:
  - a broadcast with an exact number of specified subscribers has reached an insufficient number of subscribers
- '8' (Fault indications):
  - requested record was not found in the DAKS queue, e.g. it was already deleted (see above)
  - broadcast was cancelled *) *[1])
  - broadcast could not be started *) *[1])

Additionally more detailed status information (can be switched off) is possible for those broadcasts, which are ended, as soon as one single subscriber has been reached:

'9N' (negative) *)	Call ended, negative result, either no subscriber was reached, or no positive confirmation from subscriber
'9P' (positive) *)	Call ended, positive result, subscriber reached, no callback conversation
'9K' (key) *)	Call ended, positive result, subscriber has at least confirmed by pressing a key, no callback conversation
'9S' (speech) *)	Call ended, callback conversation has taken place, no particular signaling during conversation
'91' (speech + 1) *)	Call ended, callback conversation has taken place, notified subscriber pushed key '1' during conversation *[2])
'9#' (speech + #) *)	Call ended, callback conversation has taken place, notified subscriber pushed key '#' during conversation *[2])

*) These 'Status information' values immediately delete the data record (the call request) from queue.

*[1]) In case of these 2 events DAKS Release 3E sent 'Call terminated'.

*[2]) The evaluation or keystrokes '1' and '#' is individually adjustable (see below);
a signaling is still possible, even when the patient or the nursecall system has disconnected the line already (time-out = 8 s);
in case '1' and '#' was pressed and both are evaluated, '91' is sent.

Within DAKS the following are adjustable (see position 19.4.3):

Parameter/ monitor output	possible values	Meaning
Extended Status	0/1	1 enables the sending of the 9x status values. With 0 DAKS sends call status '3' even after a callback conversation (in order to be able to adapt external systems, that do not support the status values '9', '91' and '9#')
Keypad Echo	0/1	1 enables that all keypad information (from the nurse) is changed into DTMF and sent towards telephone interface as DTMF digits.
'1' Evaluation	0/1	1 enables the evaluation of keystroke '1' (from the nurse) within a callback conversation.
'1' Disconnects	0/1	1 enables the immediate disconnection of the callback conversation after keystroke '1' (only in combination with '1' evaluation = 1)
'#' Evaluation	0/1	1 enables the evaluation of keystroke '#' (from the nurse) within a callback conversation.
'#' Disconnects	0/1	1 enables the immediate disconnection of the callback conversation after keystroke '#' (only in combination with '1' evaluation = #)

13.8 Specialties of the 'Tunstall NewLine C201' coupling with callback

Within the DAKS server per nursecall system a dial-thru code is administered working as callback waiting position.

In case of a patient's call this waiting position is called from the telephone interfaces of the Tunstall nursecall system to prepare a callback.

A DAKS server supports up to 3 of those waiting positions for 3 separate nursecall systems.

The Tunstall telephone interfaces dial:

- <DAKS phone number>
- <dial-thru code of the relevant callback waiting position> (1 to 4 digits)
- <station no.> (generally 2 digits)
- <group no. of the broadcast group> (1 to 4 digits)

DAKS accepts the call without announcement injection and waits for a corresponding ESPA data record "Call to Pager" with following special treatments:

- Only one call is possible **per station**; a second simultaneous call with the same station number will receive a busy signal.
- The number of simultaneous calls to callback waiting positions per nursecall system is adjustable within DAKS (= parameter "Number of waiting pos."); exceeding calls get busy signaling. Independent of this number DAKS does not allow more than half of the number of the currently available telephone channels to work as waiting positions; exceeding calls get busy signaling.
- After a call DAKS waits up to 10 minutes for a corresponding ESPA data record; if this is not sent within this security timeout, DAKS disconnects.
- If the specified <group no. of the broadcast group> does not exist or no group data is sent, DAKS will signal busy.

When DAKS receives via the ESPA interface a "Call to Pager" with <station no.> *) and <group no. of the broadcast group> (sent as "Call-Address") corresponding to an existing waiting position connection, the following happens:

- The DAKS call will be interrupted, if the Tunstall telephone interface disconnects (not with security timeout).
- If the nurse presses "5" to initiate a callback:
  - her/his connection is switched through to the telephone interface and
  - from now on all keypad information from the nurse's phone (the just pressed "5" included) are transmitted to the telephone interface as DTMF tones.

*) The station no. is part of the "display message", transmitted as follows:

- 1. and 2. character of the "display message": <station no.>
- 3. character of the "display message": | (= separator: hex 7C)

  If the "display message" begins with 2 digits and the separator | , these 3 characters are not sent to the display of called nurses.

13.9 Parameterization of the nursecall interface with callback for certified nursecall systems

In combination with certified nursecall systems (Siemens 'HiCall', Ackermann 'clinocom 21', TotalWalther 'medicall 800' and Tunstall 'NewLine C201') the interface can be installed with callback calls.

This required certain settings of the relevant port (SB3 or SIx) using the 'serial' command as follows (see also pos. 19.4):

- function of the interface: NUC+ (nursecall with callback)
- interface parameters: **`1200,E,7,2;4,1,2,0,50`**
  - 1200 baud
  - even parity
  - 7 data bits
  - 2 stop bits
  - ESPA protocol (identifier = 4)
  - ESPA address of the nursecall system = 1
  - ESPA address of the DAKS server = 2
  - no immediate positive response
  - length of process queue e. g. 50
- Configure additional behaviors of the ESPA interface as follows:

	Siemens HiCall	Ackermann clinocom 21	TotalWalther Medicall 800	Tunstall NewLine C201
extended status	1	1	1	0
keypad echo	0	0	1	1
'1' evaluation	1	1	1	0
'1' disconnects	0	0	0	0
'#' evaluation	1	1	1	0
'#' disconnects	1	1	1	0

Switch off DAKS server, take out the board with the nursecall interface and double-check, that the correct layer 1 interface module is mounted (see also pos. 21.1):

- chip and jumper in case of RS 232
- module 'IFM-11' in case of RS 422

Plug in the board and switch on the DAKS server again.

Connect nursecall system and DAKS server using the appropriate connecting cable:

- K-10204 in case of RS232 link
- K-10224 in case of RS422 link

14 Serial data interfaces - PLC interface with ESPA protocol

Interface configuration in DAKS server: protocol ESPA, function PLC

14.1 General information about broadcasts started via SPS interface

- The comments of pos. 13.1 'Commentary re. ESPA specification' are valid here too.
- When using the 'SPS interface' with ESPA protocol single contact activations are transmitted to the DAKS server where they are evaluated like contact inputs.
- Within DAKS there is an input contact Administration, that can assign individual functions or activities to each input, mostly to activate a prepared broadcast with or without individual announcement and/or display information (numeric and alphanumeric).
- Up to 10 broadcasts can be active simultaneously.
- In case of more requests than are possible to process in parallel, these are stored temporarily and processed sequentially, nothing gets lost.
- For further information concerning the broadcast processes see 'DAKS User Manual'.

14.2 Re. pos. 4.2 of the ESPA specification: 'Headers'

- The DAKS SPS interface only supports Header '1' = Call to pager (from the external system).
- DAKS responds with '3' <NAK> when receiving a message with a non-supported Header.

14.3 Re. pos. 4.3 of the ESPA specification: 'Records' - Header '1', 'Call to pager'

The data received from the ESPA interface are checked the same way as within the nursecall interface, but only the 'Call address' is relevant.

- Data identifier '1' = Record type 'Call address':
  - the call address must be sent; otherwise DAKS responds with '3' <NAK>.
  - the call addr. must be a 1- to 4-digit number with or without leading zeros,
    i.e.: '1' = '01' = '001' = '0001'
  - in case of missing or syntactically wrong 'Call address' DAKS responds with '3' <NAK>.
  - the call address must correspond to the number of a contact input set up in DAKS,
    CallAddr '1' -> Profibus input 1
    CallAddr '2' -> Profibus input 2
    etc.
    otherwise DAKS sends <ACK> in response to the record, but no action will follow.
- Data identifier '2' = Record type 'Display message':
  - a display message doesn't have to be sent.
  - If a display message is sent, it can be from 0 to 160 characters long (the ESPA protocol actually allows only 128).
  - a display message that is too long produces the response '3' <NAK>.
  - the SPS interface does not evaluate the display message.
- Data identifier '3' = Record type 'Beep coding':
  - beep coding doesn't need to be sent.
  - beep coding can be sent with the data '0' to '9'.
  - beep coding with no data or only invalid data produces the response '3' <NAK>.
  - beep coding is not evaluated at the present time.

- Data identifier '4' = Record type 'Call type':
  - call type doesn't need to be sent.
  - call type can be sent with the data '0' to '3'.
  - call type with no data or only invalid data produces the response '3' <NAK>.
  - call type is not evaluated at the present time.
- Data identifier '5' = Record type 'Number of transmissions':
  - no. of transmissions doesn't need to be sent.
  - no. of transmissions can be sent with the data '0' to '9'.
  - no. of transmissions with no data or only invalid data produces the response '3' <NAK>.
  - no. of transmissions is not evaluated at the present time.
- Data identifier '6' = Record type 'Priority':
  - priority doesn't need to be sent.
  - priority can be sent with the data '0' to '3'.
  - priority with no data or only invalid data produces the response '3' <NAK>.
  - priority is not evaluated at the present time.
- The data identifier and record types can be in any order.
- If the very same contact input is activated again, before the broadcast that is assigned to that input is started or while this broadcast is still active, this record is accepted with <ACK>, but is not processed any further (and is therefore discarded).

15 Serial data interfaces - nursecall interface with FTI1 or VIT1 protocol

Interface configuration in DAKS server: protocol FTI1 or VIT1, function NUC

15.1 General information

The DAKS behavior is on the whole identical to the nursecall interface with protocol ESPA:

- Here too, broadcast groups have to be administered, that consist of a single or several subscribers.
- Here too, the relevant group is selected by it's identifier.
- Here too, a variable output text can be transmitted.

But there is no feedback about the success/failure of the alerting via telephone, there is only a confirmation that the command has been accepted.

This protocol can be realized using a simple printer output (of the external system).

15.2 DAKS behavior in detail

- DAKS:
  - DAKS accepts commands that trigger broadcasts via it's serial interface,
  - writes those requests into an internal queue,
  - carries out the relevant broadcasts and
  - reports the status/result.
- Within queue (i. e. in process) there can be up to 50 requests for broadcasts;
  if necessary, the queue size can be reduced (see position 19.4.2).
- Up to 10 broadcasts can be active simultaneously.
- Depending on how the broadcasts are administered within DAKS, they are carried out:
  - with parallel and/or sequential access of subscribers
  - with or without identification request to the called party via PIN
  - with or without confirmation (within connection or via callback)
  - normally with current (display) text from the external system
  - with broadcast announcement(s) and where app. guiding announcements for operation/ confirmation

15.3 Data transfer using 'FTI1' mode = fixed number of characters, text before identifier

- The following must be transmitted in the following sequence:
  - first exactly n digits (n = 0...160), that are not evaluated (information not relevant for DAKS)
  - then exactly m characters (m = 0...160) of display message
  - then identifier of a prepared group (exactly 4 digits, where app. filled up with null characters or spaces)
  - then (only with the 'Expanded FTI1 mode') additional k characters (k = 0…160), that are not evaluated (!! m+k < 164 !!)
  - then, where appr., 1 check character (can be switched off), either (Motorola) checksum or Block-check-character = EXOR over the data, whereby the evaluation takes place including all data, i. e. over the not relevant data, the display message and the identifier w/o fill characters
  - next: <cr> <lf>
- DAKS starts the evaluation after reception of <cr> + <lf>.
- The time-out within a data record, i. e. the maximum time between 2 characters, is 2 seconds. When DAKS does not receive any character for 2 s, all other characters, that DAKS has received before, are discarded.
- Via the DAKS service menu the protocol-specific parameters n, m, confirmation y/n and check character can be adjusted (see position 19.3).

15.4 Data transfer using 'VIT1' mode = variable number of characters, identifier before text

- The following must be transmitted in the following sequence:
  - first a specific adjustable trigger character, e. g. '<' or <STX> ***)**
  - then the identifier of a prepared group (1...4 digits)
  - then a separator, alternatively slash (/), minus character (-) or space
  - then the display message with 0...160 characters ***)**
  - then a specific adjustable end character, e. g. '>' or <ETX> ***)**
  - then, where app., 1 check character (can be switched off), either (Motorola) checksum or Block-check-character = EXOR over the data, whereby the evaluation takes place including all data between the trigger character and the end character.
- DAKS waits for the trigger character and accepts character until the end character is received; then the evaluation occurs. ***)**
- The time-out within a data record, i. e. the maximum time between 2 characters, is 2 seconds. When DAKS does not receive any character for 2 s, all other characters, that DAKS has received before, are discarded.
- Via the DAKS service menu the protocol specific parameters n, m, confirmation y/n and check character can be adjusted (see position 19.3).

***)** Neither trigger nor end character may be characters of the message !!

15.5 Confirmation of data record reception or after time-out

- The confirmation occurs as within the ESPA protocol and can be switched off.
- Upon correct reception of a data record DAKS confirms with <ACK> (also, if the selected group is not administered or cannot be started)
- Upon incorrect reception DAKS answers as follows:
  - '1' <NAK> in case of transmission error
  - '2' <NAK> in case of full queue
  - '3' <NAK> in case of syntax error or time-out during reception

16 Serial data interfaces - PLC interface with DUST protocol

16.1 Broadcasts started via the PLC interface

When using the 'PLC interface', up to 704 contact states are transmitted to the DAKS server in the form of bit information and evaluated there just like contact inputs.

Only 2 records are exchanged between the programmable controller and DAKS for this purpose:

- Information on current contact states to DAKS
- Reply information on the correct receipt of the record to the programmable controller (PLC)

DAKS performs the usual contact input Administration functions, allowing a function or activity to be assigned individually to each data bit:

- either a prepared broadcast to be activated with optional individual message and/or display information (numeric and alphanumeric)
- or a conference to be activated with optional individual display information (numeric and alphanumeric)
- or a switching function (info telephone profile or hot standby)

If the number of pending activity requests exceeds the number that can be processed at one time, the requests are buffered and processed sequentially so that nothing is lost.

Active/Inactive:

- After the first record is received, DAKS considers the interface to be 'active'.
- If no data is send for 120 seconds, the interface is considered to be 'inactive'.
- The 'active' and 'inactive' states can be output via an optocoupler [option].
- State transitions are logged via the printer port.

A data record containing the current contact information should thus be sent:

- each time a bit changes (for fast further processing)
- cyclically, e.g. every 10 seconds (for synchronizing and keeping the interface 'active')

After a record has been sent, the programmable controller must wait for the DAKS response with a 5-second time-out before it can send another record.

16.2 Record layout for the PLC interface

- The record from the external system consists of:
  - 10 bytes of introductory data that is not evaluated
  - 2 ASCII characters representing the record ID: 'PB' (first 'P' and then 'B')
  - up to 88 bytes of contact information
- The contact information is coded as follows:
  - the number of Profibus inputs released in the software key divided by 8 makes up the number (n) of bytes in the contact information:
  - each byte is assigned 8 Profibus inputs, e.g.:
    1. byte = Profibus input 1... 8 where bit 0 = input 1 ... bit 7 = input 8
    2. byte = Profibus input 9...16 where bit 0 = input 8 ... bit 7 = input 16
    etc.
- DAKS sends the following in response:
  - if the record ID ('PB') and record length (12 + n bytes) are correct, 4 NULL characters, that is: $00 $00 $00 $00,
  - otherwise 3 NULL characters and $FF as the fourth character, that is, $00 $00 $00 $FF.
- The time between receiving the data record and sending the response does not exceed 2 seconds.

16.3 Protocol description of the DAKS DUST interface

- The protocol is based on the Siemens 3964 R data transmission controller;
  DAKS supports 3 versions:
  - version 'BCC' (default)
  - version 'With user data volume' (increased error immunity)
  - version 'CRC' (very high error immunity)
- The external system determines whether you are using 'BCC' or 'CRC', that is, the DAKS server automatically adapts to the version selected by the external system.
- The 'with user data volume' version must be set explicitly.
- If possible, you should use the 'CRC' version because it offers the maximum level of error immunity !!!

Table: Protocol description for the 'BCC' (default) and 'CRC' versions

Baud rate	Variable: 1200, 2400, 4800, 9600 baud; usually 9600
Data bits, parity, stop bits	Variable, usually 8, even, 1 or 8, none, 1 (modems usually cannot handle 8, even, none)
Character encoding	8-bit according to the IBM-2 character set
Request to send a transmission block	<STX> (= $02)
Response to <STX>	- Positive response: <DLE> (= $10) - Negative response: <NAK> (= $15) (to prevent the two devices from sending NAKs back and forth, the external system does not respond with a NAK) - No response: the server is not currently ready to receive data (e.g. if the external system sends <STX> before the previous command was processed)
Maximum waiting time for <DLE> after <STX>	2 sec
Maximum waiting time for the beginning of the transmission block after <DLE>	1 sec (can be extended on a project spec. basis)
Max. time between characters in transm. block	200 msec
User data in record	00..$FF, a <DLE> in the record is sent as <DLE> <DLE>
End of transmission block, version 'BCC'	<DLE> <ETX> <BCC>
End of transmission block, version 'CRC'	<DLE> <EOT> <CRC>
Max. no. of characters per record	280 between <STX> and <DLE> <ETX> <BCC>
Block check character <BCC>	8-bit EXOR for all data sent after <STX> and including <DLE> <ETX>
CRC check <CRC>	16-bit CRC calculation according to CCITT for all data send after <STX> and including <DLE> <ETX>
Response to the end of transmission block	- Positive: <DLE> - Negative: <NAK>
Max. waiting time for <DLE> after transm. block	2 sec
Number or retries in the case of errors	3 (total, i.e. up to 4 attempts per data block)

Response to initiation conflict	The DAKS server has high priority, i.e.: A <STX> received by the server after sending <STX> is ignored; the server continues to wait for <DLE> from the external system. The external system must immediately cancel its sent routine, respond with <DLE>, and accept data from DAKS.

Special considerations for the 'with user data volume' version

- This version is based on the 'BCC' version but with the additional transmission of the user data volume (<#Data>). (! Amount of user data and not the amount of data transmitted).
- This version is more sensitive to errors than the 'CRC' version, but may be much easier to implement in the external system.
- <#Data> is transmitted between <ETX> and <BCC>.
- The data format is 'word' in the following order: high bytes first, then low bytes.
- A <DLE> is not sent twice in this case.
- The <BCC> calculation includes <#Data>, i.e.:
  8-bit EXOR for all data sent after <STX> and including <DLE> <ETX> <#Data>
- A length error (which may be caused by a faulty start bit in a null character) can now be detected on the protocol level and must be treated like a BCC error.

17 Data interfaces via LAN - TR500 service

17.1 Protocol (based on UDP) and supported messages

The protocol is UDP-based with standard port no. 1200 (adjustable).

DAKS communicates with several computers simultaneously (unlimited).

The protocol is based on the protocol specifications ALCATEL system general description: paging emulation 3BA 59000 0016 DTZZA, sections 5.x including 5.5 (14 pages).

The basic version supports only the message type 'Call with message' with related responses; thereby the details of position 17.2.1 apply (complies to – restricted – pos. 5.3.2.1 of the ALCATEL documentation).

The following expansions are supported on an optional basis:

- an expanded 'Call with message' type (see position 17.2.2), which uses additional features from DAKS (e.g. alerting with prepared, selectable announcements, sending of the PIN independent of the calling number) and allows longer called numbers (e.g. for external alerting)
- Alerting of DAKS broadcast groups
- the 'Stop message' (see position 5.3.2.4 of the ALCATEL documentation, see position 17.2.3), for subscriber calls as well as for group calls

The **CRC**, which is sent at the end of all data records is evaluated as follows ($ = hexadezimal):

- Exclusive-Or over all characters modulo $80
- In case the result is < $20: result = result + $20
- 1. CRC character = result / 16
- 2. CRC character = result modulo 16

17.2 Messages

17.2.1 Standard message 'call with message'

Name	No. of Bytes	Parameter	Notes
identifier	1	“0” = $30	
type	1	“C” = $43	'call with message'
frame number	3	xxx	from “000” to “zzz”, where applicable without leading zeros, filled-up with $20. Each call request is identified by the 'frame number', which becomes unique only in combination with the IP address of the sender.
destination	1	“T” = $54 *or* "G" = $47	subscriber call *or* group call (optional)
call type	1	“N” = $4E *or* “U” = $55	normal *or* urgent call
number	10	nnnnnnnnnn	*either* subscriber phone-number (destination "T") *or* group number (destination "G"; optional); *each one* left aligned, filled-up with $20
ack	1	“T” = $54 *or* “P” = $50 *or* “A” = $41	acknowledgement: T send 'TAKEN message' immediately P like T, additionally send 'acknowledgement message', if a result present A like P, but with a different requested subscriber reaction (with confirmation)
info message	max. 128		ASCII-characters In case of 'ack' = “A” (with confirmation), a “!” will precede the display text
CRC	2	pp	CRC-character (= checksum)

17.2.2 DAKS specific expansion of the message 'call with message'

Name	No. of Bytes	Parameter	Notes
identifier	1	“0” = $30	
type	1	“c” = $63	DAKS specific expanded 'call with message'
frame number	3	xxx	from “000” to “zzz”, where applicable without leading zeros, filled-up with $20. Each call request is identified by the 'frame number', which becomes unique only in combination with the IP address of the sender.
destination	1	“T” = $54 *or* "G" = $47	subscriber call *or* group call (optional)
call type	1	“N” = $4E *or* “U” = $55	normal *or* urgent call
number	20	nnnnnnnnnn nnnnnnnnnn	*either* subscriber phone-number (destination "T") *or* group number (destination "G"; optional); *each one* left aligned, filled-up with $20
ack	1	“T” = $54 *or* “P” = $50 *or* “A” = $41	acknowledgement: T send 'TAKEN message' immediately P like T, additionally send 'acknowledgement message', if a result present A like P, but with a different requested subscriber reaction (with confirmation)
announcement	4	xxxx	ID number of announcement (4 ASCII characters, filled-up with <Spaces> =$20 if necessary)
PIN	6	xxxxxx	PIN for requesting the SMS memory (6 ASCII characters, filled-up with <Spaces> = $20 if necessary)
	12	"000000000000"	12 Bytes $30 (= "0") fill characters
info message	max. 128		ASCII-characters In case of 'ack' = “A” (with confirmation), a “!” will precede the display text
CRC	2	pp	CRC-character (= checksum)

17.2.3 DAKS specific expansion of the message 'call with message' plus composed announcements

Name	No. of Bytes	Parameter	Notes
identifier	1	“0” = $30	
type	1	“c” = $63	DAKS specific expanded 'call with message'
frame number	3	xxx	from “000” to “zzz”, where applicable without leading zeros, filled-up with $20. Each call request is identified by the 'frame number', which becomes unique only in combination with the IP address of the sender.
destination	1	“T” = $54 *or* "G" = $47	subscriber call *or* group call (optional)
call type	1	“N” = $4E *or* “U” = $55	normal *or* urgent call
number	20	nnnnnnnnnn nnnnnnnnnn	*either* subscriber phone-number (destination "T") *or* group number (destination "G"; optional); *each one* left aligned, filled-up with $20
ack	1	“T” = $54 *or* “P” = $50 *or* “A” = $41	acknowledgement: T send 'TAKEN message' immediately P like T, additionally send 'acknowledgement message', if a result present A like P, but with a different requested subscriber reaction (with confirmation)
announcement	16x5	xxxxx	ID numbers of announcement (16x 4 ASCII characters, if less fill rest with spaces, plus always 1 <Space> = $20 as separator between the IDs)
PIN	6	xxxxxx	PIN for requesting the SMS memory (6 ASCII characters, filled-up with <Spaces> = $20 if necessary)
	12	"000000000000"	12 Bytes $30 (= "0") fill characters
info message	max. 128		ASCII-characters In case of 'ack' = “A” (with confirmation), a “!” will precede the display text
CRC	2	pp	CRC-character (= checksum)

17.2.4 Stop message

Name	No. of Bytes	Parameter	Notes
identifier	1	“0” = $30	
type	1	“S” = $53	'Stop message'
frame number	3	xxx	frame number of the call to stop; from “000” to “zzz”, where applicable without leading zeros, filled-up with $20 (see position 17.2.1 and 17.2.2)
CRC	2	pp	CRC-character (= checksum)

17.3 Check of received messages and acknowledgements

Since DAKS supports only the 'call with message'-message (optional also the DAKS specific 'Call with message'), it proceeds as follows:

- DAKS discards the message:
  - in case of wrong CRC
  - in case of 'identifier' ≠ “0”
  - in case of 'type' (message type) ≠ “C”, "c", "S", “A” or “E”
  - in case of syntactically wrong 'frame number'
  - when another 'call with message' with the same 'frame number' is already in process (could be a doubled UDP packet)
  - when the 'stop message' is not supported or there is no call in process, that is related to the stop message
- DAKS answers directly with a 'TAKEN message' with '**KO**'-status and does not process the request:
  - in case of 'type' (message type) = “A” or “E”
  - in case of 'destination' ≠ “T” (and ≠ "G", only if group calls allowed)
  - in case of 'call type' ≠ “N” or “U”
  - in case of syntactically wrong 'number' (phone number)
  - in case of 'ack' ≠ “T”, “P” or “A”
  - when no telephone interface is present
  - when the process memory is full and 'ack' = “T” was set (because in this case, there are no further messages)
- In all other cases DAKS answers directly with a 'TAKEN message' with '**OK**'-status and processes the request.
- In case of 'ack' = “P” or “A” was set in the request, DAKS answers with an 'acknowledgement message' (in most cases after the notification) as follows:
  - on subscriber alerting

Action/result	**Parameter 'status'**	**Parameter 'cause'**
Subscriber reached in accordance with 'reached criteria'	"O" (o.k.)	"N" (no cause)
Process memory full (will be sent immediately)	"K"	"V" (overflow)
Phone number (if detectable) or 'connection type shortcut' false	"K"	"U" (undefined user)
Subscriber logged off (may be possible in future)	"K"	"S" (out of service)
Subscriber is not reachable (if detectable) or has not answered	"K"	"C" (out of overage)
Subscriber was busy, hung up too early or all trunks busy	"K"	"N" (no cause)
Subscriber sent negative confirmation	"K"	"N" (no cause) "X" (neg. conf.) [1)]
No existing connection to the PABX network	"K"	"V" (overflow)
Other negative result	"K"	"N" (no cause)

[1)] Display depends on the settings of the TR500 parameter 'Cause X upon negative confirmation' (see section 17.4.2)

– on group alerting

Action/result	Parameter 'status'	Parameter 'cause'
Group notification finished with positive result	"O" (o.k.)	"N" (no cause)
Process memory full (will be sent immediately)	"K"	"V" (overflow)
Group does not exist	"K"	"U" (undefined user)
Group could not be started: no group members could be dialed at the moment, announcement does not exist, etc.	"K"	"S" (out of service)
Group notification finished with negative result	"K"	"N" (no cause)
No connection to PBX	"K"	"V" (overflow)
Other negative result	"K"	"N" (no cause)

17.4 Configuring the TR500-service

Configuration of the TR500 service is performed in 2 steps:

- 1. configuration of the DAKS software and
- 2. configuration via terminal software over the printer/debug interface.

17.4.1 Configuring of the DAKS software in connection with the TR500-service

Pease check and, if necessary, configure following parameters of DAKS software:

- in the basic parameters (the ‘Maximum no. of parallel calls''
- in the connection types the connection type used by the TR500-service (normally: “INT”)

- The 'Announcement for called subscribers' and the messages allocated to the below individual broadcast parameters (see: ‘DAKS User Manual’)
- In the broadcast parameters (see: ‘DAKS User Manual’):
  - on the tab 'Miscellaneous': 'No. of simultaneous broadcasts'
  - on the 'Timing' tab, 'General parameters':
    'Interval if busy'
    'Interval if no answer'
    'Minimum seizure'
    'Maximum seizure'
  - on the tab 'Timing', 'For standard broadcasts only': 'Maximum ringing time'
  - on the 'Messages' tab:
    'Intrusion message'
    message 'With pos. confirmation'
    message 'With neg. confirmation'
    number of ‘Max. dial attempts with confirmation request’
- If the SMS retrieval service is available and shall be used (see: ‘DAKS User Manual’):
  - on the 'Basic parameters', 'Enhanced' tab:
    'Max. length of SMS notes'
    'Max. time to live of SMS notes'
    'User guidance message'
  - in the 'Suffix codes':
    the suffix code 'Retrieve SMS message with 16 characters'
    the suffix code 'Retrieve SMS message with 24 characters'
- For the printer output: the editable default printer texts 20 to 23 (see: ‘DAKS User Manual’).
- For further details please consult the ‘DAKS User Manual’.

17.4.2 Configuring the TR500-service via terminal software

With the command '**TR500PAR**' you configure the TR500-service via terminal over the printer, debug and service interface of the DAKS server step by step in English.

In case of input errors, there will be an error output and a new entry request;
after confirmation to save the changes the DAKS server resets automatically.

The following table shows the parameters with explanations and allowed values:

Parameter, output	**Explanations/allowed values**
calling number	e. g. [Tie-line code DAKS] + [suffix code for SMS retrieval service] (numerical); space means: no 'calling number'
calling name	e. g. “DAKS INFO” If a text is defined, it is sent as 'calling name' and shown in the display before seizure. If there is no text defined (input: space), the beginning of the message will be sent as 'calling name' (including the preceding character “!”, where appropriate; see position 17.2.1)
connection type	e. g. “INT”, has to correspond with shortcut of a connection type within DAKS
min. pause between messages (between last call with old and first call with new message)	0..999 s; e. g. 60 s
no. of dial attempts	1..20; e. g. 3 (in case of busy or no call acceptance)
when busy @ normal call	1..5 for: no action, camp-on, forced release, intrusion, emergency intrusion; e. g. 2
ringing signal @ normal call	1..3 for: standard call, external call, emergency call; e. g. 3
when busy @ urgent call	1..5 for: no action, camp-on, forced release, intrusion, emergency intrusion; e. g. 2
ringing signal @ urgent call	1..3 for: standard call, external call, emergency call; e. g. 3
announcement for called subscribers	identifier of an announcement stored within DAKS (1 to 4 characters, announcement must be defined)
Timestamp (optional)	0...3 for: no, only time (hh:mm:ss), date and time (DD.MM. hh:mm:ss or alternative MM/DD hh:mm:ss); e.g. 1 The following will be displayed: Timestamp <cr> <Message>
Cause X upon negative confirmation (optional)	Activating effects the return of cause "X" on negative confirmation
Intrusion announcement (if line of called subscriber is busy)	identifier of an announcement stored within DAKS (1 to 4 characters, announcement must be defined)

Example for the configuration of the TR500-service:

```
<#tr500par
calling number             = ?
calling name               = ?
connection type            = INT ?
min.pause between messages = 60 (0..999) s ?
no of dial attempts        = 3 (1..20) ?
when busy @ normal call
1) no action
2) camp-on
3) forced release
4) intrusion
5) emergency intrusion
1 ?2
ringing signal @ normal call
1) standard call
2) external call
3) emergency call
1 ?3
when busy @ urgent call
1) no action
2) camp-on
3) forced release
4) intrusion
5) emergency intrusion
1 ?2
ringing signal @ urgent call
1) standard call
2) external call
3) emergency call
1 ?3
announcement for called subscribers = 4711 ?
Timestamp
0) no
1) time
2) day month time
3)month day time
0 ?1
Cause X upon negative confirmation (Y/N)= ?n
Intrusion Announcement = ?
save changes (y/n) ?y
```

17.5 Process

There is a phone-number-dependent queue which contains the oldest message for each subscriber.

In addition there is a sub-queue with further messages to the subscribers in chronological order (waiting positions).

The queue is processed step by step in turns.

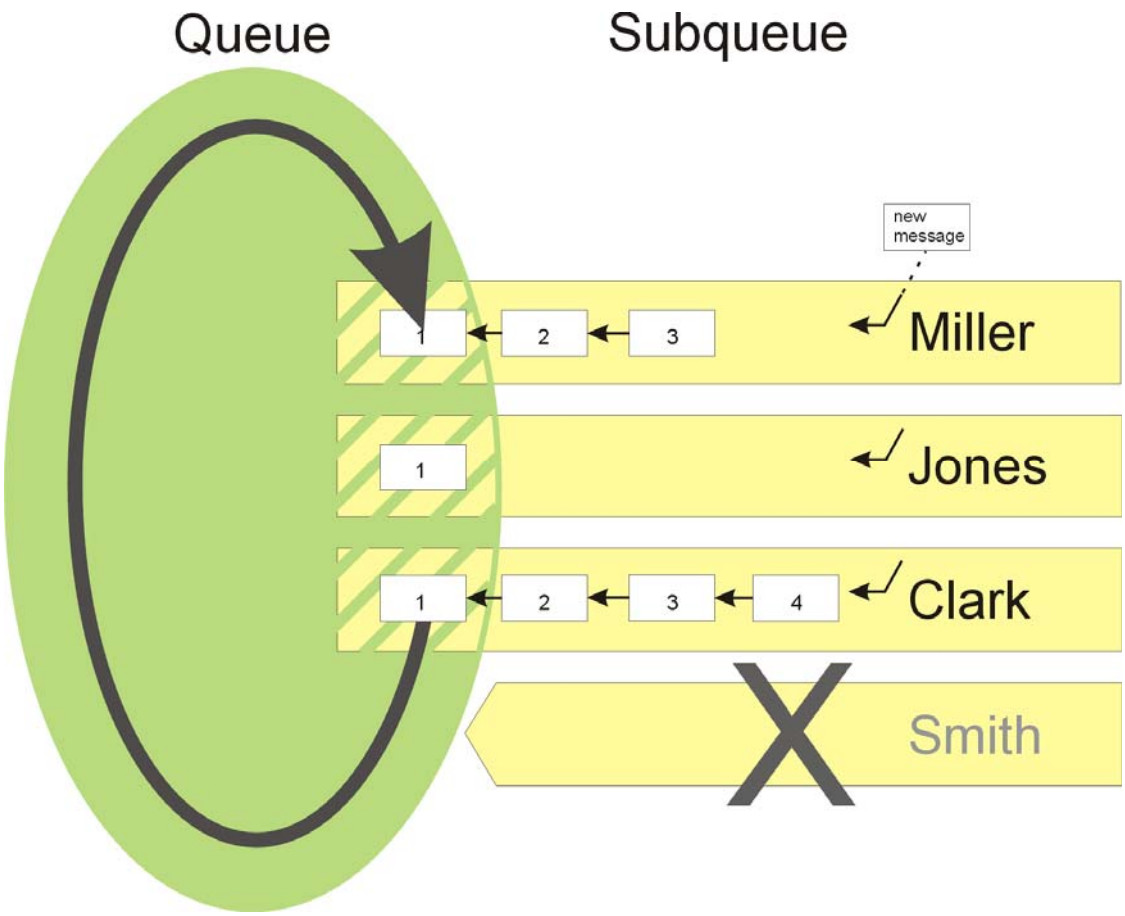
After a message for a subscriber has been processed, the next message will be moved from the sub-queue into the queue. Here you can define a minimum pause between the last call with the previous and the first call with the new message.

A subscriber will remain in the queue until there is no more message for him.

A total of 1,000 messages can be processed simultaneously, irrespective of the number of subscribers or phone numbers.

This procedure safeguards that the FIFO principle is guaranteed for each subscriber.

Group alerting uses the same queue with sub-queue as the subscriber alerting and will be added in their chronological order. This means: only one activation of a certain group at a time and guaranty of the FIFO principle for the group alerting, as well.



17.6 Notification of subscribers depending on required acknowledgement type

Regardless of the type of acknowledgement, subscribers can scroll through the display text using the '*' key for forward and the '#' key for backward.

The maximum time for call disconnection is set to a minimum of 30 s, with each scroll command resetting the countdown timer again to at least 30 s (see DAKS User Manual).

If a SMS memory is available, each SMS will be saved therein after the last dial attempt (information about the SMS retrieval service of DAKS see 'DAKS User Manual').

The relevant position in the SMS memory and the PIN to retrieve the messages result

- from the last up to 6 characters of the phone number when using the standard message 'Call with message' (see pos. 17.2.1), or
- directly from the 'PIN' field when using the DAKS specific expansion of the message 'Call with message' (see pos. 17.2.2).

17.6.1 No special confirmation (if 'ack' = “T”)

The subscriber has to accept the call and must fulfil the minimum reached criteria (time or number of cycles, DAKS Administrator-Tool ‘Broadcast Parameters’).

If the subscriber hangs up early or prematurely, he will be called again instantly; if he hangs up once more his response will lead to a negative notification result.

If the subscriber does not hang up and the maximum time is exceeded, DAKS will disconnect and consider the subscriber as reached.

17.6.2 Disconnection required (if 'ack' = “P”)

If the subscriber hangs up too early, the behavior is identical to position 17.6.1.

In contrast to the functionality described in position 17.6.1, the subscriber has to hang up himself before the maximum time has elapsed; otherwise he will be considered as not reached (answering machine detection).

17.6.3 Confirmation by keystroke with the possibility of negative confirmation ('ack' = “A”)

The subscriber has to accept the call and has to confirm by keystroke positively (1) or negatively (0).

If the subscriber neither confirms nor hangs up before the maximum time has elapsed, he will be considered as not reached and will not be called again (answering machine detection).

If the subscriber hangs up too early without confirmation, he will be called again instantly; hanging-up again leads to a negative notification result.

17.7 System printer protocol

The subscriber notifications are printed out in single lines with a max. of 130 characters, as follows:

Output	Explanations
<Date>	Format DD.MM.YYYY
<Time>	Format hh:mm:ss
TR5:	Identifier for a message triggered by TR-500
<IP address>	IP address of the PC/ control computer, who initiates the call (from software version 5.1x)
<frame number>	See position 17.2
(<type of acknowl.> <result> **)**	1. character: **T**, **P** or **A** 2. character: **O** for o.k. or **C**, **N**, **S**, **U**, **V** for not o.k. (see pos. 17.3)
<result explicitly>	Output texts editable via DAKS Administrator-Tool (printer texts 20…23), e. g. - not reached - reached - positive confirmation - negative confirmation
<destination>	See positions 17.2.1 and 17.2.2; ➢ up to software version 5.0x: only phone number to dial ➢ from software version 5.1x: *either* "T<phone number>" for a subscriber call *or* "G<group number>" for a group call (optional)
<message> (shortened if necessary)	Message to send: - up to the first <**cr**> *or* - up to the max. line length of 130 characters

Sample printer outputs:

```
10.09.2003 14:56:41 TR5: 192.168.6.227 005 (TO) reached T9954  Test 1 to a subscriber
10.09.2003 15:06:23 TR5: 192.168.6.227 087 (PU) not reached    G01    Test 2 to a group
```

Print-outs only occur, if the request was previously taken into the process memory; this means:

- the request had to have been accepted with an '**OK**' status within the 'TAKEN' message, and
- there was no overflow in the process memory when the request was taken in.

18 SNMP implementation

DAKS servers support SNMP as an SNMP agent to be monitored by SNMP managers.

The integration of SNMP within DAKS is based on the standard RFC 1157 "A Simple Network Management Protocol", where only MIB-2-groups according to RFC 1213 "Management Information Base for Network Management of TCP/IP-based internets: MIB-II" are used.

The required MIB-2 system information are administered within the SNMP manager from where they are transferred into the DAKS server.

The functionality was tested with "HP Open View"; the support by Siemens "HiPath Fault Manager" is in preparation.

Certain events, such as the setup or loss of connections, the restart of the system, or a false community string may lead to traps (non-requested messages). Additionally the current status of any of the system's interfaces can be retrieved.

Traps are generated in case of setup or loss of following connections:

- S_0 and/or S_{2M} interfaces to the PBX network (maskable)
- Profibus inputs (maskable)
- serial interfaces (maskable)
- GSM-SMS modem (maskable)
- connection to DAKSsql (maskable)

In addition to these connection depending traps, traps are generated automatically:

- in case of a system restart
- in case of an incorrect community string

The following parameters can be set via the DAKS server's printer / debug interface (see position 19.9):

- list of trap receivers (IP addresses, up to 5 receivers)
- list of systems, allowed to access the SNMP service (= white list, up to 5 IP addresses, can be switched off)
- trap community string
- public community strings (up to 5 different)
- private community strings (up to 5 different)
- selection of traps to be sent in case of connection setup or loss (see above)

The different DAKS interfaces have following numbers (independent of their presence):

- 1...4 S_0/S_{2M} interfaces on 1st ISDN interface board
- 5...8 S_0/S_{2M} interfaces on 2nd ISDN interface board
- 9...12 S_0/S_{2M} interface on 3rd ISDN interface board
- 13...16 S_0/S_{2M} interface on 4th ISDN interface board
- 17...20 S_0/S_{2M} interface on 5th ISDN interface board
- 48...51 serial interfaces on ACM boards
- 52...53 serial interfaces 2 and 3 on SBC board
- 64 LAN interface
- 80 GSM-SMS modem
- 81 DAKS-PC with DAKSsql
- 83 DPS-basic
- 84 xLink100e
- 85 DEKI
- 70 Hot-Standby
- 128...149 Profibus modules

19 Setting the DAKS server parameters

19.1 General

Certain server parameters, especially the use of the serial ports, can be set via the printer, debug and service interface (serial port no. 1) of the DAKS controller board, by using a null-modem data cable (part of theipcfg DAKS delivery) and either a terminal or a PC with terminal software (e. g. Hyperterminal).

For this the terminal or the terminal software has to be set to 9600 baud, no parity, 8 data bits and 1 stop bit.

Important: Changes can be made at any time in the normal operating state (after the switch-on messages). **A system restart is carried out automatically after storage!!**

The parameter setting includes:

- Setting of the interface functionality with protocol and interface parameters
- additional commands to set special parameters in combination with certain interfaces
- other parameters, e. g. special (project specific) behaviours
  (not part of this documentation, ask the 3rd-level support if necessary)

Here 2 entry possibilities are given:

- Commands to set or check parameters directly
- Checking and setting parameter by a menu

Parameter entries generally are started/carried out as follows:

- press **<ENTER>** to change into entry mode
- You will see the prompt: **#>**
- Now enter:
  - to open up a menu in order to change or check:
    'command' + **<ENTER>**
  - in case of a direct parameter setting in order to check:
    'command' + **<ENTER>**
  - in case of a direct parameter setting in order to change:
    'command' + **<Space>** + 'parameter' + **<ENTER>**

19.2 Command 'ver' to retrieve the version numbers of DAKS server

ver + **<ENTER>** outputs the software version of the DAKS server's process software and the serial numbers of the controller board SBC-32 and the chipcard:

<#ver DKSS 6.00 Chipcard Serial number 000090520033 SBC33 Serial number 0015507216 #>	 Software version Chipcard serial number Controller board serial number

19.3 Command '`flashpar`' to retrieve the DAKS server settings

This command is available as of DAKS software version 5.12.

`flashpar` + **<ENTER>** outputs all operation parameters stored within the DAKS server.

Attention!!
Do not change default parameters, except for the parameters, which are described in this documentation.

<#flashpar #> [MISC] dialdelay = 250 hotstandby = 0 discdelay = 150 hostfifo = 0 prdelay = 2000 [SWITCHES] recon off confdtmf off rrno* off racal off lcli off wpcs7 0 csnodtmf off cancli off	Dial parameters of the DAKS server
[SERIAL INTERFACES] SB2 9600,N,8,1;0,2,0,0,0 Function 7 PCDAKS SB3 9600,N,8,1;4,1,2,0,10 Function 3 NUC+ Extended Status = 0 Keypad Echo = 0 '1' Evaluation = 0 '1' Disconnects = 0 '#' Evaluation = 0 '#' Disconnects = 0 Speaker phone ctrl = 0 Emergency call = 0 SpecialCallback = NONE	Serial interface parameters
[GSM-SMS MODEM] Resetstring = ATZ1 Checkstring = ATI Hangupstring = ATH0 Dialstring = ATD EscapeCharacter = + Analog-Modeminit= AT S0=0 X3 S2=43 S31=64 &D2 I6 M1 L1 ISDN-Modeminit X75-Prot. = AT S0=0 X3 &D2 S2=43 I6 M1 L1 $IBP=X75 ISDN-Modeminit X75/T70-Prot.=AT S0=0 X3 &D2 S2=43 I6 M1 L1 $IBP=X75T70 [GSMSMS+ settings (UCP only!)] shortcut = UCP op-01 Address code originator (OAdC) = UCP op-01 Authentication code originator (AC) = ModemInitPlus = UCP-60 =N UCP op-60 Abbreviated number (short number alias) = UCP op-60 Password =	GSM-SMS-modem parameters

```
[MIP-0X]
MIP-02 module on SBC serial no
Dhcp use        = 0
Internet Addr   = 192.168.1.1
Subnet   Mask   = 255.255.248.0
Gateway  Addr   = 192.168.0.254
Ethernetmode    = 0 (autonegotiation)

[MIP-0X Services]
service PCDAKS protocol TCP port 2001
service LOCSVR protocol TCP port  8080 ; address 192.168.6.233 ;
hostname Hostname ; servlet Servlet
service DECTPOS  protocol TCP port  2002 ; timeout 15 s

service xLink    protocol TCP port  2003
xLink ip whitelist:
allowed ipaddr 1 = 0.0.0.0
allowed ipaddr 2 = 0.0.0.0
allowed ipaddr 3 = 0.0.0.0
allowed ipaddr 4 = 0.0.0.0
allowed ipaddr 5 = 0.0.0.0
xml namespace attr =
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="xLink-xml-appl.xsd"
xLink 100e = 0
add alarmmember msg  = 0
tcp-timeout          = 0
login                = 0
enable M2P messages  = 0

[TR500]
calling number              =
calling name                =
connection type             =
min.pause between messages  = 0
no of dial attempts         = 0
when busy @ normal call     = 0
ringing signal @ normal call = 0
when busy @ urgent call     = 0
ringing signal @ urgent call = 0
announcement for called subscribers =
Timestamp                   = 0
Cause X upon negative confirmation =
Intrusion Announcement      =

[SNMP]
trap community string         =
public community string (0)   =
public community string (1)   =
public community string (2)   =
public community string (3)   =
public community string (4)   =
private community string (0)  =
private community string (1)  =
private community string (2)  =
private community string (3)  =
private community string (4)  =
trap receiver addr (0)        =
trap receiver addr (1)        =
trap receiver addr (2)        =
trap receiver addr (3)        =
trap receiver addr (4)        =
allowed addr (0)              =
allowed addr (1)              =
allowed addr (2)              =
allowed addr (3)              =
allowed addr (4)              =
alternate IP addr             =
[SNMP TRAPS]
```

LAN interface parameters

MIP-02 only

configured services of the DAKS server

Configuration of the xLink interface

Configuration of the TR-500 interface

Configuration of SNMP parameters

19.4 Command '`serial`' to set interface functionality and protocol (parameters)

19.4.1 General

Following functionalities are supported:

- **`PC-DAKS`** Interface between DAKS server and Administration/operation PC
- **`PLC`** PLC interface
- **`HOST`** Host interface with restricted functionality
- **`HOST+`** Host interface with extended functionality
  (transparent mode / interface to a deployment control computer)
- **`NUC`** nursecall interface without callback conversation
- **`NUC+`** nursecall interface with callback conversation
- **`SIGMA`** SIGMASYS connection
- **`GSM`** interface to a GSM-SMS modem
- **`SICLI`** interface to: SICLI, conveyer belt controlling, ESSER or SIEDLE

The functionality **`PC-DAKS`** is assigned to the 2nd port of the controller board (**= `SB2`**), which cannot be changed.

The other (enabled) functions can be assigned freely to following ports:

- either to the 3rd port of the controller board SBC-3x (**`SB3`**)
- or to one of the 4 ports max. on add-on boards (**`ACM`**x).

Hint:
The PC with the 'Mail2Phone' software for application 'E-mail service for Hicom telephones' must be connected to port SB3 (internally this application uses the host interface).

19.4.2 Table: Protocols with identifiers and protocol specific parameters

Protocol	Protocol-identifier	Protocol specific parameters
DUST	**0**	**Par1** is bit oriented: bit 0 = with transmission of length bit 1 = high priority (today no effect, DAKS always high priority) bit 2 = CRC-CCITT (does not need to be set, because DAKS automatically adapts to the external system) **Par2:** 0 = no attachment of user PIN to the 'calling number' 1 = user PIN is attached to the 'calling number' **Par3** = 0, currently without effect **Par4** = 0, currently without effect
PPP	**2**	**Par1** = 0 **Par2** = 0 **Par3** = 0 **Par4** = 0
ESPA	**4**	**Par1** = ESPA address of the external system **Par2** = ESPA address of DAKS **Par3:** 0 = standard 1 = a 'status request' is answered with 'paged' immediately **Par4** = 1...50, length of process queue in comb. with NUC(+) [1])
GSM	**5**	**Par1** = 0 **Par2** = 0 **Par3** = 0 **Par4** = 0
FTI1	**6**	**Par1** = n char. (0...160) that are not evaluated **Par2** = m char. (0...160, m+n < 161) of display message **Par3** = bit field 'confirmation/check character': bit 0 = 0 => without reception confirmation bit 0 = 1 => with reception confirmation bits 2,1 = 0,0 => no check character bits 2,1 = 0,1 => Motorola checksum (sum up all characters, then ones complement) bits 2,1 = 1,0 => BCC (EXOR over all characters) bit 3 = 0 => 'Standard FTI1 mode' (see pos. 15.3) bit 3 = 1 => 'Expanded FTI1 mode' (see pos. 15.3) **Par4** = 1...50, length of process queue in comb. with NUC [1])
VIT1	**7**	**Par1** = trigger character **Par2** = end character **Par3** = bit field 'confirmation/check character': bit 0 = 0 => without reception confirmation bit 0 = 1 => with reception confirmation bits 2,1 = 0,0 => no check character bits 2,1 = 0,1 => Motorola checksum (sum up all characters, then ones complement) bits 2,1 = 1,0 => BCC (EXOR over all characters) **Par4** = 1...50, length of process queue in comb. with NUC [1])
SIGMASYS [2])	**8**	**Par1:** 0 = connection to SM port 1 = connection to SCI **Par2**...**Par4** don't care

Protocol	Protocol-identifier	Protocol specific parameters
SICLI	**9**	**Par1:** 0 = SICLI standard 1 = SICLI enhanced 2 = FBS1 3 = ESSER 4 = SIEDLE **Par2**...**Par3** don't care **Par4** = 1...50, length of process queue

[1]) Within the queue there are broadcasts that wait to be started, those being processed and broadcasts, for which status information messages still have to be sent.
Here the maximum value per interface is 50.

[2]) Note: SIGMASYS generally operates with the following general port parameters:
9600 baud, even parity, 8 data bits, 1 stop bit

19.4.3 Process of the setting of parameters

The parameters are set via menu.

DAKS outputs port by port all (still) available functions with corresponding 'function number' and, at the end, the currently assigned function or '0' for 'no function'.

- **<ENTER>** makes DAKS output the current parameters.
  (Exception SB2: Since the function PC-DAKS is fixed here, it's parameters are output immediately.)
- By pressing '0' for 'no function' + **<ENTER>** the currently assigned function is deleted.
- By entering a new 'function number' + **<ENTER>** a new function is assigned to the relevant port (assignment prepared only), and DAKS outputs the current configuration, i. e. protocol with parameters, by following INIT string:

  Baudrate,Parity,Databits,Stopbits;Proto,Par1,Par2,Par3,Par4

  Proto stands for protocol identifier, **Par1**...**Par4** are the protocol specific options (see table above).
- **<ENTER>** leaves protocol and parameters as they are.
- By entering a new INIT string + **<ENTER>** you can change protocol and parameters.

In case of NUC or NUC+ and ESPA protocol, in addition, some special DAKS behaviors in combination with this interface can be set or checked; these special behaviors are described in detail under pos. 13.

DAKS outputs the parameters line by line and each time waits for inputs at the end of each line.

Now you can:

- either by **<ENTER>** stick to the proposed parameter,
- or by 'Entry' + **<ENTER>** change the relevant parameter.

If any change has occurred, DAKS asks whether or not you want to save the changes
(Save Changes ? (Y/N)).

Example:

- The 3rd port on the controller board has currently no function and shall be configured for nursecall/ ESPA with callback functionality in combination with 'medicall 800'.
- There is another port available, which at the moment is configured for a host interface with DUST protocol; this port shall only be checked and left unchanged.

	After entry of the '**SERIAL**' command DAKS outputs the function of the 2nd port of the controller board (= SB2) first. As this assignment cannot be changed, the configuration of that port is output immediately: **Function for Port SB2 is PC-DAKS** **(cannot be changed)** **Configuration for Port SB2 9600,N,8,1;4,0,0,0,0**
Press **<ENTER>** to get to the next port	
	DAKS now step by step outputs all available ports on add-on boards with their current function and a proposal of all functions (still) possible: **Select function for port SI1** **(0) no function** **(1) PLC function** **(2) NUC function** **(3) NUC+ function** **(4) HOST function** **(5) HOST+ function** **(6) GSM function** **(8) SIGMA function** **(9) SICLI function** **4**
Press **<ENTER>** to see the port configuration	
	DAKS outputs the current configuration of the interface by an INIT string: **Configuration for Port SI1 9600,N,8,1;0,3,0,0,0**
Press **<ENTER>** to keep the configuration	
	Finally DAKS outputs the current function of the 3rd port of the controller board (here: nothing assigned yet) and proposes all functions (still) possible: **Select function for port SB3** **(0) no function** **(1) PLC function** **(2) NUC function** **(3) NUC+ function** **(4) HOST function** **(5) HOST+ function** **(6) GSM function** **(8) SIGMA function** **(9) SICLI function** **0**
Press **3 <ENTER>** to select 'nursecall with callback functionality'	
	DAKS outputs the current configuration of the interface by an INIT string: **Configuration for Port SB3 9600,N,8,1;4,1,2,0,5**

1200,E,7,2;4,1,2,0,50 <ENTER> adjusts to: ESPA protocol, 1200 baud, 7 data bits, 2 stop bits, ESPA addresses = 1 and 2, no immediate 'paged' response and length of process queue e.g. 50	DAKS now offer the opportunity to enter further parameters (extended functions). **Extended functions for NUC+ on SB3** **Extended Status = 0**
press **1 <ENTER>** press **1 <ENTER>** press **1 <ENTER>** press **0 <ENTER>** press **1 <ENTER>** press **1 <ENTER>** press **0 <ENTER>** press **<ENTER>** press **0 <ENTER>** press **y** to save the changes	**Keypad Echo = 0** **'1' Evaluation = 0** **'1' Disconnects = 0** **'#' Evaluation = 0** **'#' Disconnects = 0** **Callback mode** **0 normal** **1 Speaker-phone-control** **2 Emergency call** **0** **Callback prefix** **Special Callback mode NONE** **0) NONE** **1) TELEVIC VA8** **2) TUNSTALL1** **0** Finally DAKS will ask you if you want to save your changes: **Save Changes ? (Y/N)** **!!! A DAKS server restart is now carried out automatically.**

19.5 Command '**ipcfg**' to configure the MIP module

The LAN interface module is configured with the software command '**ipcfg**' and designated, depending on the slot, as either an 'MIP module on SBC' or an 'MIP module on ACM-01 slot M0/M1'.

Basic parameters like IP address, subnet mask, gateway address, and Ethernet mode are set up first. In addition you can determine if the services Telnet and Ftp shall be enabled or – for security reasons – disabled.

Now you can activate and configure the services (e.g. LAN link of the DAKSsql-PC, TR500) with the corresponding port and, if needed, additional parameters.

After you confirm to save the changes the DAKS server will automatically reset.

The cable K-10207-0050 (supplied if needed) is a mere downloading/debugging service cable and not required for operating the LAN interface module.

Screenshot of the basic configuration of a LAN interface module:

<#ipcfg	start configuration
MIP-02 module on ACM 1 slot M0 Internet Addr 192.168.0.246 Subnet Mask 255.255.255.0 Gateway Addr 192.168.0.254	slot of the module set Internet Addr., Subnet Mask and Gateway Address
Ethernetmode: 0: autonegotiation (default) 1: 10 Mps half duplex 2: 10 Mps full duplex 3:100 Mps half duplex 4:100 Mps full duplex ETH_MODE (0) :	Ethernet-Mode for MIP-02 only
Enable Telnet/Ftp on MIP 0:	From softw. version 5.22d: Enabling or disabling of the services Ftp and Telnet on the IP module (1 = enabled, 0 = disabled)
Services on MIP-02 module on ACM 1 slot M0 : :	Available services see pos. 19.5.1...0
save changes (y/n) ?y	Save the changes with '**y**'

19.5.1 Service 'PCDAKS' to connect the DAKS Administration an operation PC

This service enables the LAN connection between DAKS Administration and operation PC.

If this service has not been configured yet, the following appears:

: add service PCDAKS (y/n) ?y port 2001 ?	The service can be activated with variable port.

If this service is activated already, the following appears:

: service PCDAKS protocol TCP port 2001 (p) - change port (d) - delete service (p/d) ?	The port for this service can be changed, and the service can be switched off. <**Enter**> = continue without changes

19.5.2 Service 'TR500'

This service enables that external computers can access DAKS using the TR500 protocol (alerting of subscribers and, if enabled, groups); for further information about the TR500 service see pos. 17).

If this service has not been configured yet, the following appears:

: add service TR500(y/n) ?y port 1200 ?	The service can be activated with variable port.

If this service is activated already, the following appears:

: service TR500 protocol UDP port 1200 (p) - change port (d) - delete service (p/d) ?	The port for this service can be changed, and the service can be switched off. <**Enter**> = continue without changes

19.5.3 Service 'xLINK-100'

This service enables external computers to access DAKS using the xLink-100 protocol.

If this service has not been configured yet, the following appears:

: add service xLink(y/n) ?y	The service can be switched on or off. <**Enter**> = continue without changes

If this service is activated already, the following information will be indicated:

: service xLink protocol TCP port 2003 (p) - change port (d) - delete service (p/d) ?	Includes the option to change the port for this service and switch this service off. <**Enter**> = continue without changes

Configure the protocol form you want to use:

: 0) xLink 100e 1) add alarmmember msg 2) login 3) tcp-timeout 4) enable M2P messages 0,2	xLink 100e -> Choose between enabled and bocking for the xLINK-100e protocol add alarmmember msg -> Send a message whenever a new group member is added to the alarm memory login -> Login required tcp-timeout -> Automatic disconnect if no data transfer for more than 120 seconds enable M2P messages -> Send info on Broadcasts started by Mail2Phone All activated functions are output in the bottom line (here: 0,2). To activate/deactivate the functions, enter the corresponding positive/negative numbers separated by commas e.g.: **0,-2** activates the functions 0 and at the same time deactivates the function 2. <**Enter**> = continue without changes

External computers are enabled using a white list:

: Xlink ip-whitelist: allowed ipaddr 1 = 0.0.0.0 allowed ipaddr 2 = 0.0.0.0 allowed ipaddr 3 = 0.0.0.0 allowed ipaddr 4 = 0.0.0.0 allowed ipaddr 5 = 0.0.0.0 xml namespace attribute:	Up to 5 IP addresses from external computers can be enabled to communicate with DAKS using the xLINK protocol. If no IP addresses are entered here, every IP address will be enabled. xml namespace attribute: string with up to 256 characters (include in every data set). <**Enter**> = continue without changes

19.5.4 DPS service "Localisation request from a positioning server to the HiPath network"

This service enables that an external positioning server (e. g. DPS-basic or Location Manager) can access the HiPath network through DAKS:

- to retrieve field strength values (from base stations received by the handset) or
- to request the 'visited station' only (the latter if the handset has limited positioning capability only).

If this service has not been configured yet, the following appears:

: add service DECTPOS (y/n) ?y port 7777 ? timeout [s] 35 ?	The service can be activated with variable port and variable localisation request timeout (from 5 to 60 s, default value 35 s).

If this service is activated already, the following appears:

: service DECTPOS protocol TCP port 7777; timeout 15s (p) - change port (t) - change timeout (d) - delete service (p/t/d) ?	The port for this service and the timeout can be changed, and the service can be switched off. <**Enter**> = continue without changes

19.5.5 DPS service "Localisation request to a positioning server"

This service enables the interface between the DAKS server and a positioning server (e. g. DPS-basic or Location Manager) to send localisation requests from the DAKS server to a positioning server e. g. in case of a personal security alert or a n (un-)intentional alarm.

If this service has not been configured yet, the following appears:

: add service LOCSVR (y/n) ?y IP addr 0.0.0.0 ? port 8080 ? hostname DPS-SVR-A? servlet /LocationServer/locate ?	The service can be configured: - with variable port *) - with variable IP address of the positioning server *) - with variable name of the positioning server *) - with variable path and name of the relevant CGI script on the positioning server *) *) required parameters see documentation of the positioning server

If this service is activated already, the following appears:

: service LOCSVR protocol TCP address 168.192.1.1 port 8080 Hostname DPS-SVR-A; Servlet /LocationServer/locate (i) - change IP addr (p) - change port (h) - change hostname (s) - change servlet (d) - delete service (i/p/h/s/d) ?	The following service parameters can be edited: - port - IP address of the positioning server - name of the positioning server - path and name of the relevant CGI script The service can be switched off. <**Enter**> = continue without changes

19.5.6 'SYSLOG' Service

This service logs the the most important information on a SYSLOG server.

If the SYSLOG service has not yet been set up, the following info will be output:

: add service SYSLOG(y/n) ?y	The service can be activated.

If the SYSLOG service has already been activated, the following info will be output:

: service SYSLOG address 0.0.0.0 TCP port 514 (i) - change IP addr (p) - change port (d) - delete service (i/p/d) ?	The following service parameters can be edited: - the IP-address - the port The service can be switched off. <**Enter**> = continue without changes

19.5.7 Service 'DEKI'

This service enables the link-up to the EIBus with the DEKI gateway produced by Weinzierl Engineering GmbH.

If this service has not been configured yet, the following appears:

: add service DEKI(y/n) ?y port 5000 ?	The service can be activated with variable port.

If this service is activated already, the following appears:

: service DEKI address 168.10.1.1 port 5000 (i) - change IP addr (p) - change port (d) - delete service (p/d) ?	The IP address and the port for this service can be changed and the service can be switched off. <**Enter**> = continue without changes

19.6 Command '`settime`' to set date and time

You can set date and time of the DAKS server with the software command '**`settime`**'.

Example for setting date and time:

`settime`	Start 'set date and time'
`enter time 'dd.mm.yyyy hh:mm:ss' :` **`04.01.2005 10:47:53`**	Input date and time (e.g. "04.01.2005 10:47:53")
`04.01.2005 10:47:53`	Output of date and time (if the entry was OK)

Upon wrong entry, the message "bad format" appears and the inputs are rejected. For correction you must enter the command '**`settime`**' once again.

You can show the date and time with '**`gettime`**'.

19.7 Other operational parameters

19.7.1 Par. '`rrno*`' to start a broadcast with a current announcement without the * key

With '**`rrno*`**' you can configure, whether or not you have to push the * key to activate a broadcast with a current announcement.

- **`rrno* 0`** = Default setting; * key required;
  Advantage: Cancellation option in case of a faulty recording, or if the menu has been activated accidentally
  Disadvantage: Operation with old RTD phones impossible
- **`rrno* 1`** = Special mode; * key not required;
  Advantage: Operation with old RTD phones possible
  Disadvantage: No cancellation option in case of a faulty recording, or if the menu has been activated accidentally

19.7.2 Parameter '**ko-ad-hoc**' to specify the dialing parameters of ad-hoc conferees (supported starting with software version 6.01)

The '**ko-ad-hoc**' defines the dialing parameters that are applied by the system when dialing ad-hoc conferees during an already active conference to bring them in.

<#ko-ad-hoc	Start the configuration
--------- Ringing signalling -------	Selection of the ringing signal:
(1) Normal (2) External (3) Alarm select one of 1 .. 3:1	- Internal - External - Alarm Selection 1..3
--------- Destination busy ---------	Behavior if the called line is busy:
(1) No action (2) Camp-on (3) Intrusion (4) Emergency intrusion (5) Forced release select one of 1 .. 5:1	- No action - Camp-on - Intrusion - Emergency intrusion - Froced release Selection 1..5
--------- Trunk busy ----------	Behavior if the trunk is busy:
(1) No action (2) Forced release (3) Intrusion select one of 1.. 3:1	- No action - Forced release - Intrusion Selection 1..3
---------- Other features ----------	Selection of additional features:
(0) Ignore call pickup group (1) Ignore call forwarding (2) Ignore secretary-executive configuration (3) Ignore do-not-disturb (4) Direct speakerphone control 0,4 ?	- Ignore call pickup group - Ignore call forwarding - Ignore secretary-executive configuration - Override do-not-disturb function - Direct speakerphone control !!! Note: The features "Ignore call forwarding" and "Ignore secretary-executive configuration" cannot be used in combination! All currently enabled features (ON) are listed in the last line (here: `0,4`). To enable/disable any of the above features, enter their corresponding integers in positive (ON) or negative (OFF) values and use a colon as separator sign, e.g.: **`0,-1,3`** to switch ON the features 0 and 3 and at the same time switch OFF the feature 1.
save changes (y/n) ?y	To save your changes enter '**y**'.

19.7.3 Pa. '**lcli**' to enable/disable the CLI check with subscriber log-on and log-off

'**lcli**' determines whether the CLI (phone number of the caller) is evaluated or not, when subscribers log on or off; if an evaluation takes place, the CLI must match with the first phone number of the relevant subscriber (detected by PIN).

- **lcli 0** = The CLI is not evaluated (default setting)
- **lcli 1** = The CLI is evaluated

19.7.4 Command WPCS7 to set the DAKS behaviour in the conference waiting position

Conferences can be administered to support a waiting position for subscribers who dial the entry code for active participation while the conference is not active (see 'DAKS User Manual' for details).

In this waiting position via WPCS7 the DAKS behaviour can be determined as follows:

- **WPCS7 0** DAKS answers the call and generates ringback tone (German or International, see 'DAKS User Manual')
- **WPCS7 1** DAKS remains in the ringing state and generates ringback tone (German or International, see 'DAKS User Manual')
- **WPCS7 2** DAKS answers the call but does not play back any tone to the waiting subscriber
- **WPCS7 3** DAKS answers the call and plays back the message 'To parked conferees' to the waiting subscriber

19.7.5 Par. '**cancli**' to enable/disable the CLI check if the 'Active number' is changed

'**cancli**' determines the behaviour of the DAKS server in combination with application 'Personal calls / Group calls' = 'Call service profiles', if the active number is changed via telephone.

- **cancli 0** = Standard setting, no CLI check (= no check of the calling number of the caller)
- **cancli 1** = If the 'Active Number' is changed by one of the 'Active number' change menus, DAKS checks the presence of a CLI.
  If not, DAKS disconnects immediately after reception of the respective dial-thru code (without error tone injection).

In both cases DAKS records the phone number from where the changes have been made.

19.7.6 Par. '**csnodtmf**' to switch off the Keypad-to-DTMF-conversion in 'Call-Serv.-Profiles'

- **csnodtmf 0** = Default setting; conversion keypad to DTMF takes place
- **csnodtmf 1** = Conversion keypad to DTMF switched off

19.8 Commands to set the parameters of the GSM-SMS modem interface

19.8.1 General

- First prepare a serial port for the connection of a modem for GSM-SMS by the '**serial**' command (see position 19.4):
  - Interface function: **GSM**
  - Parameters e. g.: **9600,N,8,1;5,0,0,0**
- Then carry out a system restart of the DAKS server;
  you will see the following in the restart outputs:
  <DATE><TIME> SYS:GSM on device xxx OK.
- Now connect the modem to the prepared serial port (an analog modem, an ISDN modem that can be controlled via standard AT commands, or a combined modem analog/ISDN)
  and switch it on!!
- In order to guarantee that the modem works correctly, certain command strings that are sent to the modem need to be configured:
  - either via the menu '**gsmsettings**' (see below) for any modem,
  - or via command '**gsmsettings new**', that automatically enters the default values for devolo modem, MicroLink 56k i type (is equivalent to ELSA modem, Microlink ISDN/TL V.34 type).
- Finally start the application with the new parameters by using the '**gsmreset**' command;
  this command:
  - disconnects a possibly active connection to a service center,
  - deletes all possibly stored SMS messages and
  - recalls the power-on state of the GSM-SMS application.

19.8.2 Command '**gsmsettings**'

Via this command you can specify certain command strings for the modem step by step.

Note !!
Some of the strings are modem-specific, i. e. differ depending on manufacturer and type of modem.

You can always either keep the values which are output under “actually” by pressing **<ENTER>**, or you can overwrite them by <Entry> **+ <ENTER>**

After these steps the administered commands are sent to the connected modem (in order to check them), and the modem responses “**OK**” or “**ERROR**” are output.

Finally the parameters can be either stored or discarded.

Part A - diverse strings:

Resetstring	Reset the modem, mostly **ATZ**
Checkstring	During idle state the modem is cyclically accessed to check it's presence. This command must be responded to with an **OK**, e. g. **ATI** or only **AT** can be used.
Dialstring	Parameters for dialing, where appr. with prefix for an outside line, mostly **ATD** or **ATD0W** (dial “0” first and then wait for dial tone)
Hangupstring	Command to hanging up (to go on-hook) of the modem, mostly **ATH0**
Escapechar	Escape character, mostly **+**. If, during an existing modem connection the escape character is sent 3 times with a certain pause, the modem changes from the transfer mode into the command mode. Now via hang-up string the modem can go on-hook.

Part B - Initstrings:

- Following commands must be included in all strings (modem and vendor specific, see below):
  - Disconnection when DTR->off, normally **&D2**. The modem should hang up, when the DTR line becomes inactive.
  - No automatic call acceptance, normally **ATS0=0**. An incoming call (it rings) may not be accepted by the modem.
  - Setting of the escape character, normally **ATS2=43** for **+**.
  - To echo the commands by the modem, normally **ATE1**
- The strings may include additional commands such as e. g. speaker control (e. g. **M1** for switch on the speaker when trying to connect, **L1** for low volume etc.)

Analoginit	Initstrings for analog modems, examples for different vendors: CPV-PICO-T: **AT &D2 S0=0 X3 S2=43 S31=64 I6 M1 L1** ZYXEL 1496: **AT &D2 S0=0 X3 S2=43 M1 L1** ELSA Microlink 33.6TQV: **AT &D2 S0=0 X3 S2=43 M1 L1** devolo MicroLink 56k i: **AT &D2 S0=0 X3 S2=43 M1 L1 B21**
ISDNInit X75	Default initstring to set an ISDN modem to B-channel protocol X.75 (it is imperative that you pay attention to the modem vendor information !): e. g. for devolo MicroLink 56k i: **AT &D2 S0=0 X3 S2=43 I6 M1 L1 B26 \N6**
ISDNInit X75/T70	Default initstring to set an ISDN modem to B-channel protocol X.75/T70 (it is imperative that you pay attention to the modem vendor inform!): e. g. for devolo MicroLink 56k i: **AT &D2 S0=0 X3 S2=43 I6 M1 L1 B26 \N8**

- All 3 init strings must be entered, where valid init strings may only be entered for those modes that are supported by the modem.
- If e. g. you work with an analog modem, both of the ISDN initstrings have to be overwritten with dummy strings:

  ISDN-Modeminit X75-Prot. (actually 'at 0'):

  <Entry> (e.g.: '**AT 0**') + **<ENTER>**

  ERROR !!!

  ISDN-Modeminit X75/T70-Prot. (actually 'at 0'):

  <Entry> (e.g.: '**AT 0**') + **<ENTER>**

  ERROR !!!

- The modem response **ERROR!!!** guarantees, that the Initstring is invalid and so the analog modem cannot be accessed as an ISDN modem.

Part C: GSMSMS+ settings:

- These settings are only required for providers:
  - who cannot be addressed with the settings under *Part B* (see above),
  - or who require a password on connection setup.
- If settings are made here, *this* connection type automatically (regardless of parameter settings under DAKS Administrator-Tool) uses 8 bits per character and UCP as the protocol type.
- The following settings are possible:

Shortcut	(3 characters) Short name of the connection type, e.g. “SW+” for expanded Swisscom-GSM-SMS access ***Hint:*** This short name must tally exactly with the short name for this connection type in DAKS Administrator-Tool
UCP op-01 Address code originator (OAdC)	Field normally blank, but entries are necessary e.g. for UCP-60 (e.g. password); these must be requested from the relevant provider (applicable to Proximus, Swisscom and others)
UCP op-01 Authentication code originator (AC)	Field normally blank, but PROXIMUS must be entered e.g. for the Belgian provider Proximus; details must be requested from the relevant provider
ModemInitPlus	Special modem setup only valid for this connection type (se above for examples of Initstrings) ***Hints:*** · If no settings are made here, the modem settings under *Part B* apply. · Entering “-” + <ENTER> deletes an existing entry.
UCP-60 (y/n)	Activate or deactivate protocol type UCP-60 (large account database option = log-in procedure before sending SMS)
UCP op-60 Abbreviated number (short number alias)	Only displayed if UCP-60 = 'y'; entries must be requested from the relevant provider
UCP op-60 Password	Only displayed if UCP-60 = 'y'; entries must be requested from the relevant provider

A test is then automatically carried out with the selected settings of *Part A* and *Part B*; in the event of an error, 'ERROR!!!' will be fed out.

- To store the settings, answer '**Store Settings? (Y/N)**' with “**y**”

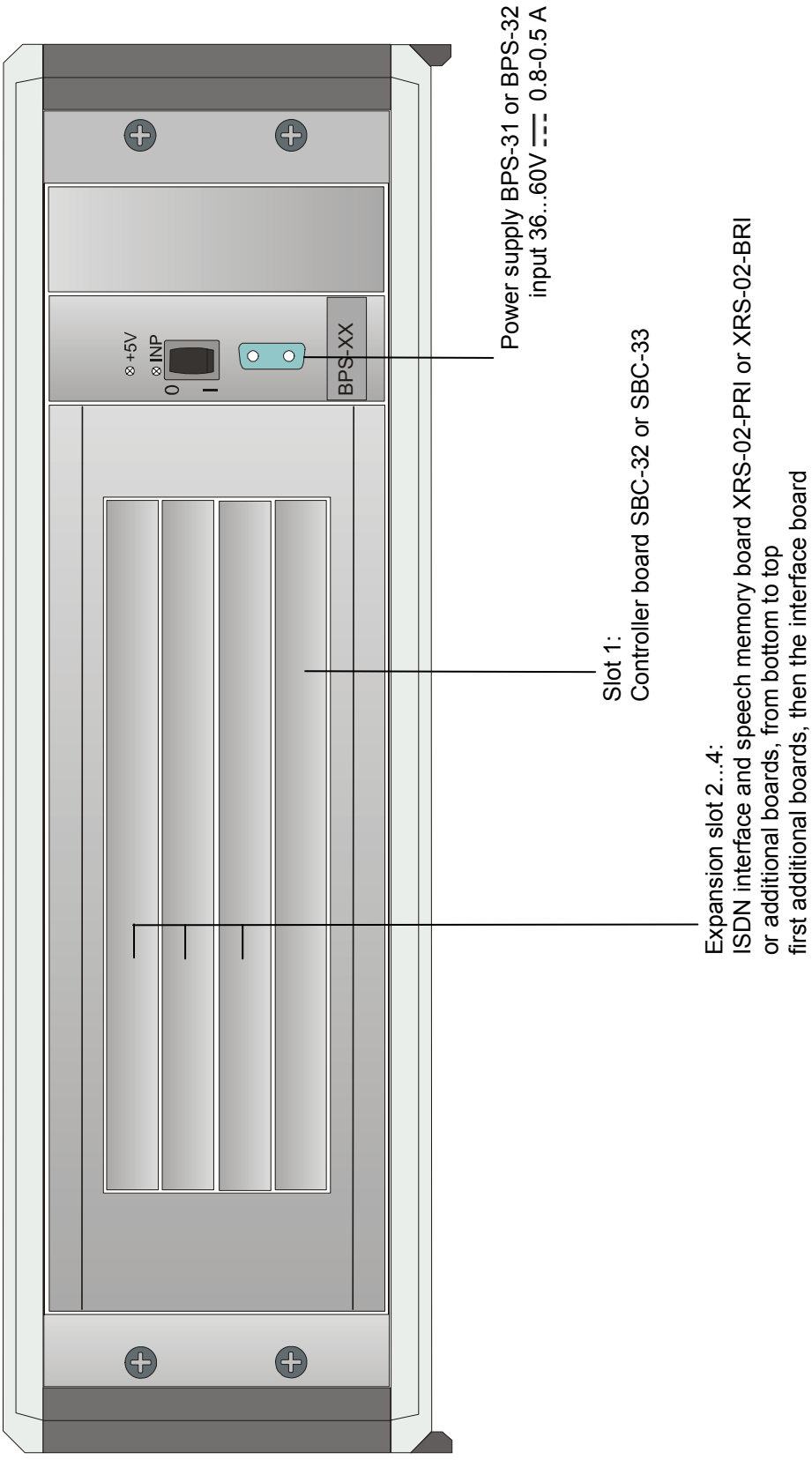
19.9 Command 'snmp' to configure the SNMP service

<#**snmp**	Start configuration
trap community string = **public**	Community string for traps sent from DAKS to the SNMP manager; in a standard environment use "public".
public community string (0) = **public** public community string (1) = public community string (2) = public community string (3) = public community string (4) =	Community string for the SNMP manager(s) to retrieve DAKS SNMP settings; up to 5 entries are possible; in a standard environment use "public".
private community string (0) = **private** private community string (1) = private community string (2) = private community string (3) = private community string (4) =	Community string for the SNMP manager(s) to set/change DAKS SNMP settings; in a standard environment use "private".
trap receiver addr (0) = trap receiver addr (1) = trap receiver addr (2) = trap receiver addr (3) = trap receiver addr (4) =	IP addresses of SNMP manager(s) (up to 5) that receive traps from DAKS
allowed addr (0) = allowed addr (1) = allowed addr (2) = allowed addr (3) = allowed addr (4) =	IP addresses of managers that may access the SNMP service of DAKS: - up to 5 addresses (managers) can be entered; - no entry means no limitation
alternate IP addr =	When using NAT (e. g. with routers between DAKS and the TCP/IP network), traps are sent with this IP address instead of the assigned IP address
TrapMask 0) Trap S2/S0 Interfaces 1) Trap Serial Interfaces 2) Trap Profibus Interfaces 3) Trap MIP Interface 4) Trap GSM/SMS Modem 5) Trap DAKS-SQL 6) Trap DPS-basic 7) Trap xLink 8) Trap Deki 9) Trap Hotstandby 1,2,4,5 ? **0,-1,3** #>	Enabling/disabling of certain traps; enabled traps are listed in the last line (here 1,2,4,5). Enter negative/positive numbers separated by comma to disable/enable appropriate traps, e. g.: **0,-1,3** enables traps 0 and 3 and disables trap 1.

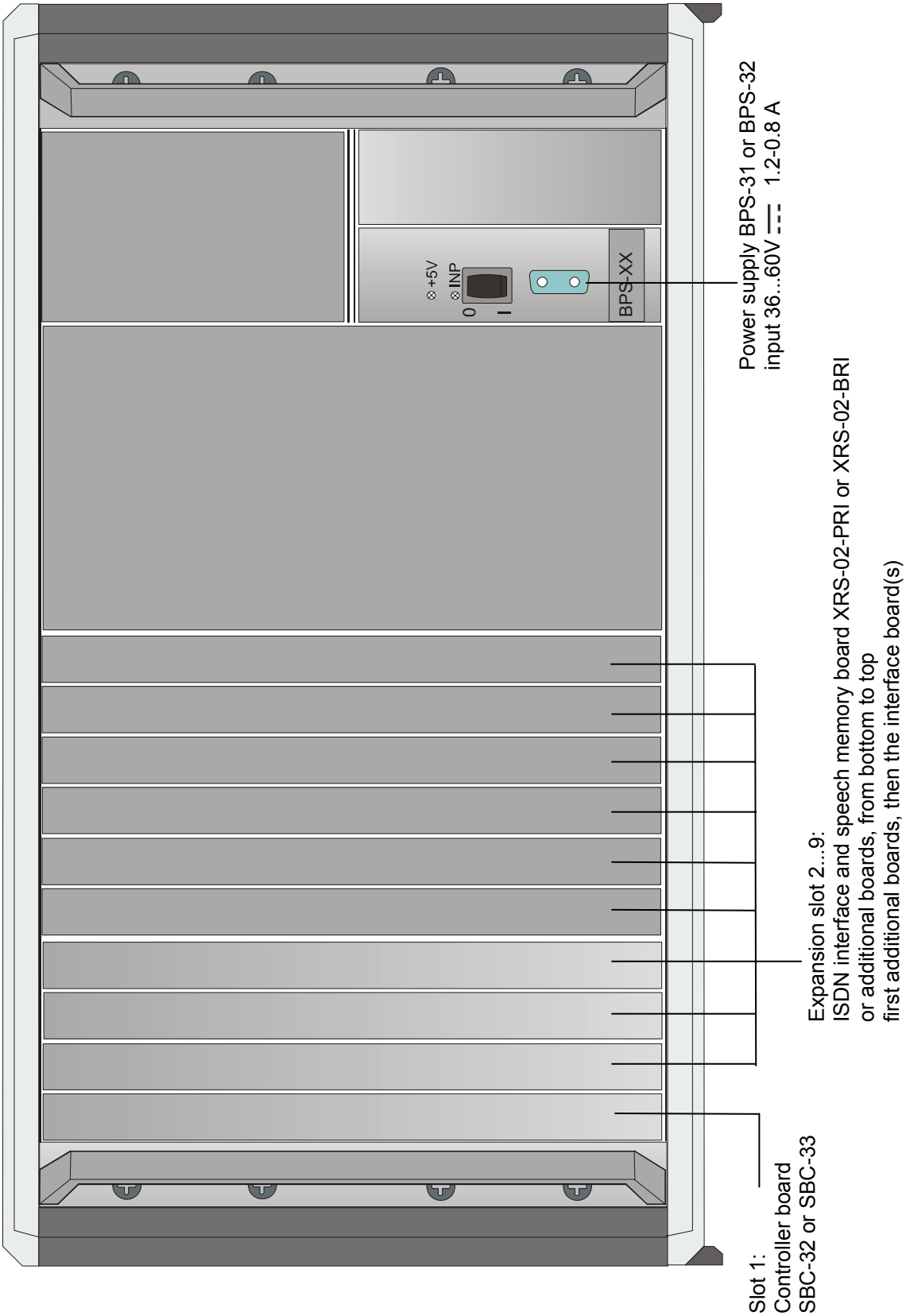
Hint *The changes will only become valid when the DAKS server is restarted.*

20 Configuration overview

20.1 DAKS 3HE basic unit with DC power supply



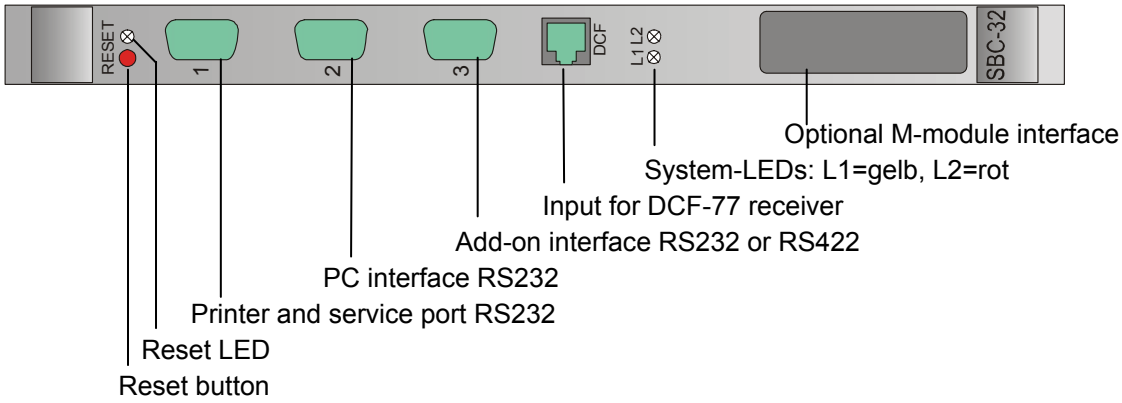
20.2 DAKS 6 HE basic unit with DC power supply (for 9 x 6 HE-boards)



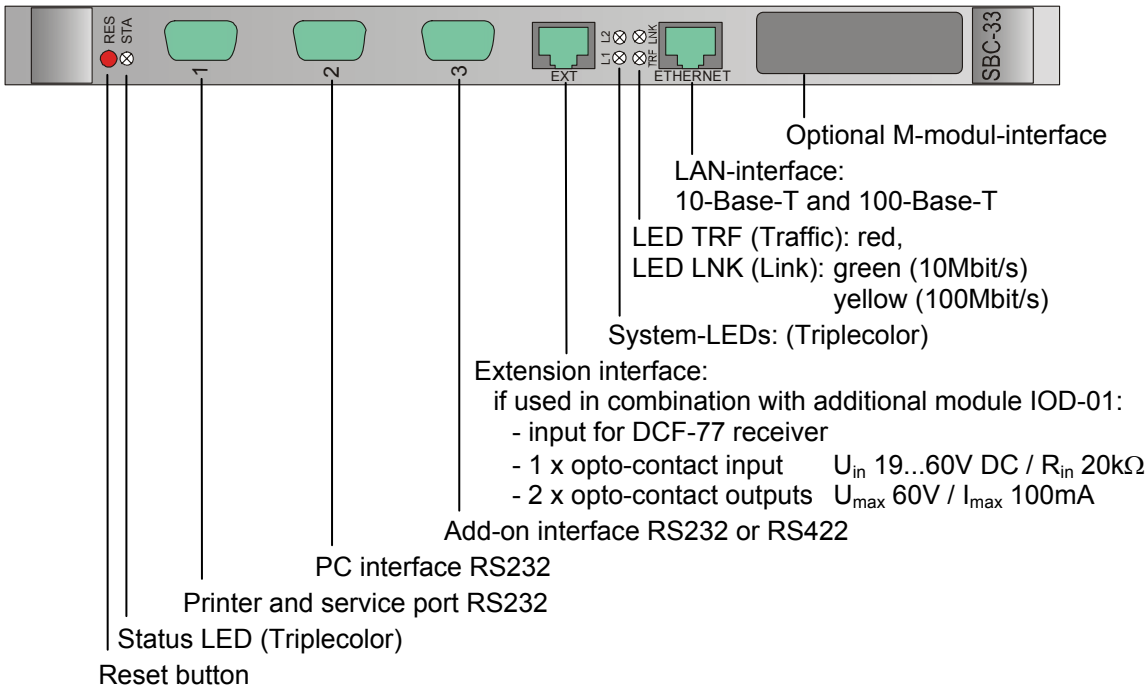
20.3 Boards

20.3.1 Controller boards

- SBC-32 controller

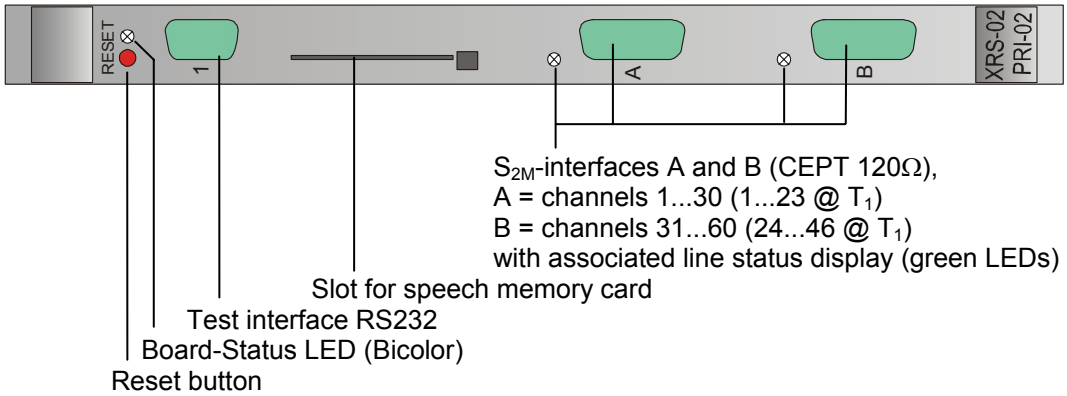


- SBC-33 controller

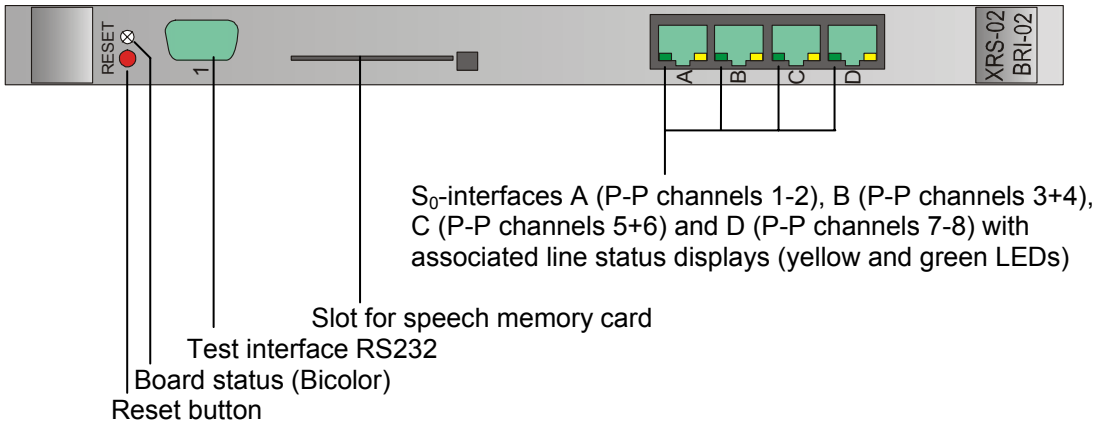


20.3.2 ISDN interface and speech memory board

- S_{2M}-interface and speech memory board XRS-02-(SC-)PRI (E_1 (S_{2M}) or T_1)

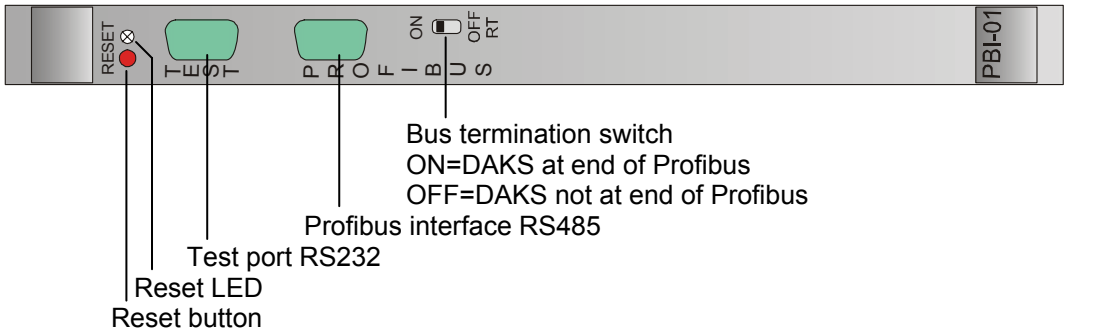


- S_0-interface and speech memory board XRS-02-(SC-)BRI

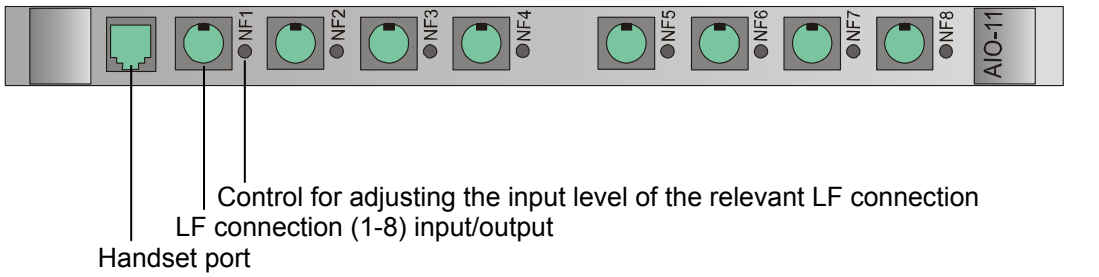


20.3.3 Add-on boards

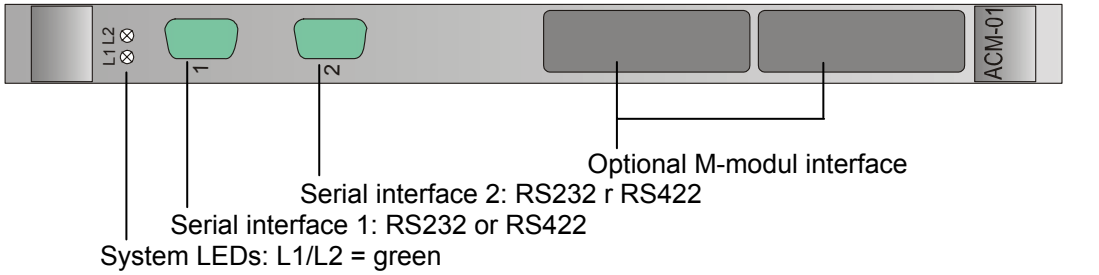
- Profibus interface board PBI-01



- Analog I/O board AIO-11

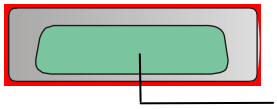


- Serial interface board with M-module interfaces ACM-01



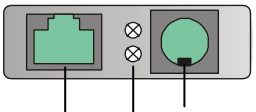
20.3.4 M-module interface

- contact in-/output module MIO-11



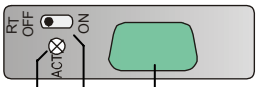
16 opto-contact inputs — U_{IN} 19...60V DC / R_{IN} 20kΩ
8 opto-relay outputs — limit data: U_{max} 60V / I_{max} 100mA
1 relay output — limit data: U_{max} 60V / I_{max} 2A

- LAN interface module MIP-01/MIP-02



RS232 interface Mini DIN 8pins (debug/download interface)
LEDs: TRF (Traffic) red,
LNK (Link) green (10 Mbit/s)
yellow (100 Mbit/s, MIP-02 only)
LAN interface (MIP-01:10-Base-T, MIP-02:100-Base-T)

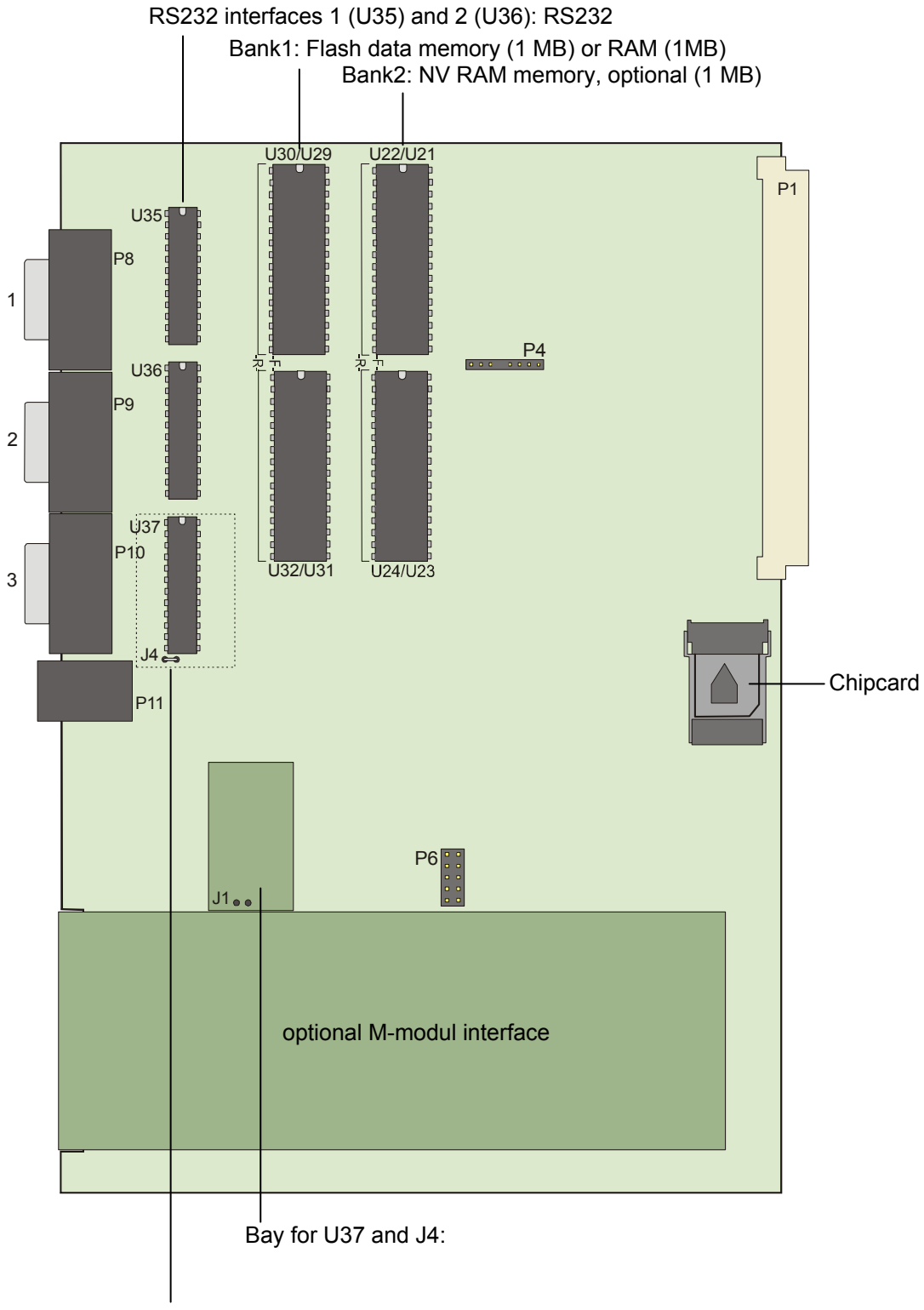
- Profibus module MPB-01



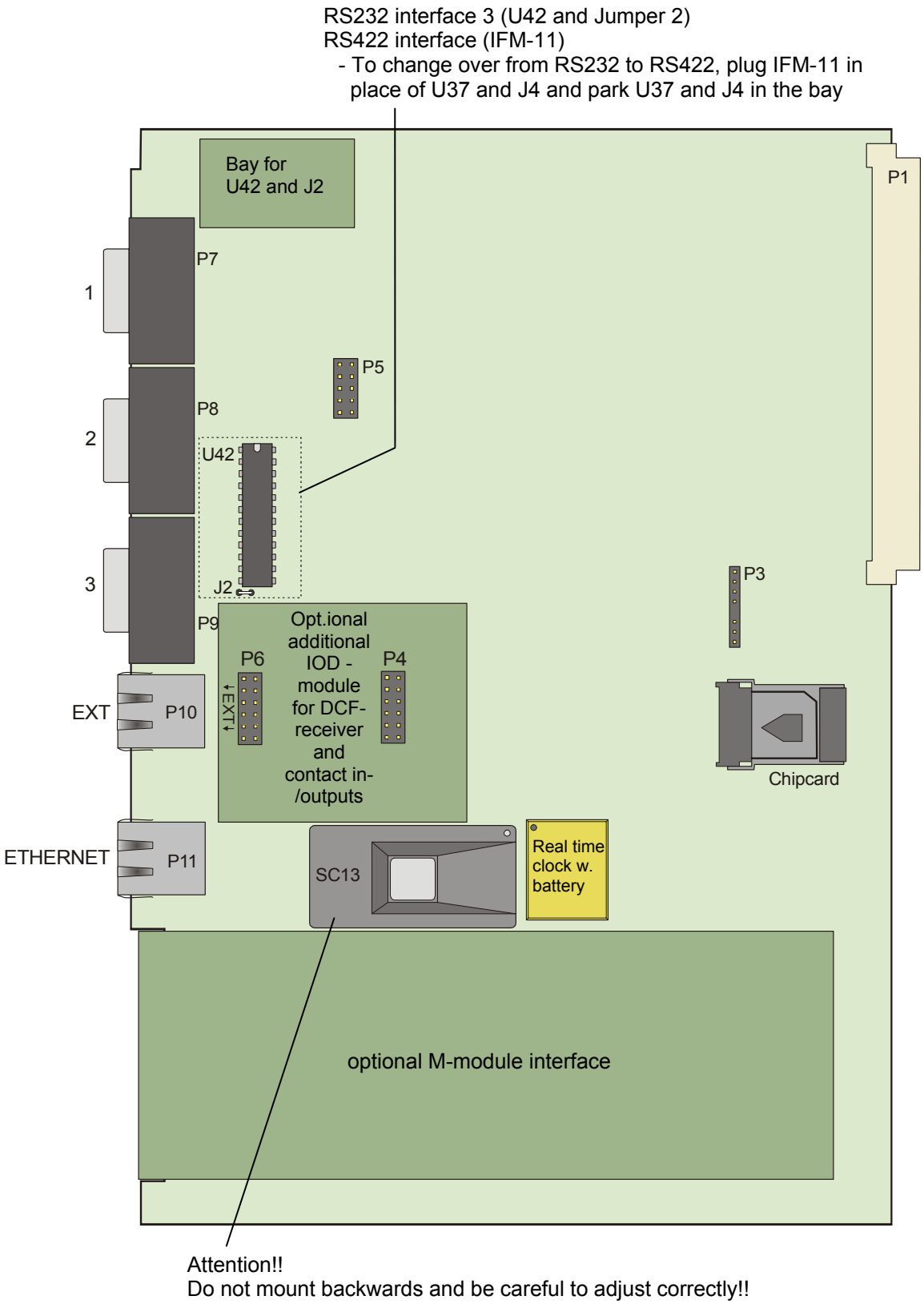
Profibus interface RS485
Bus termination switch
ON=DAKS at end of Profibus
OFF=DAKS not at end of Profibus
Activity LED: ACT (bicolor)

21 Configuration

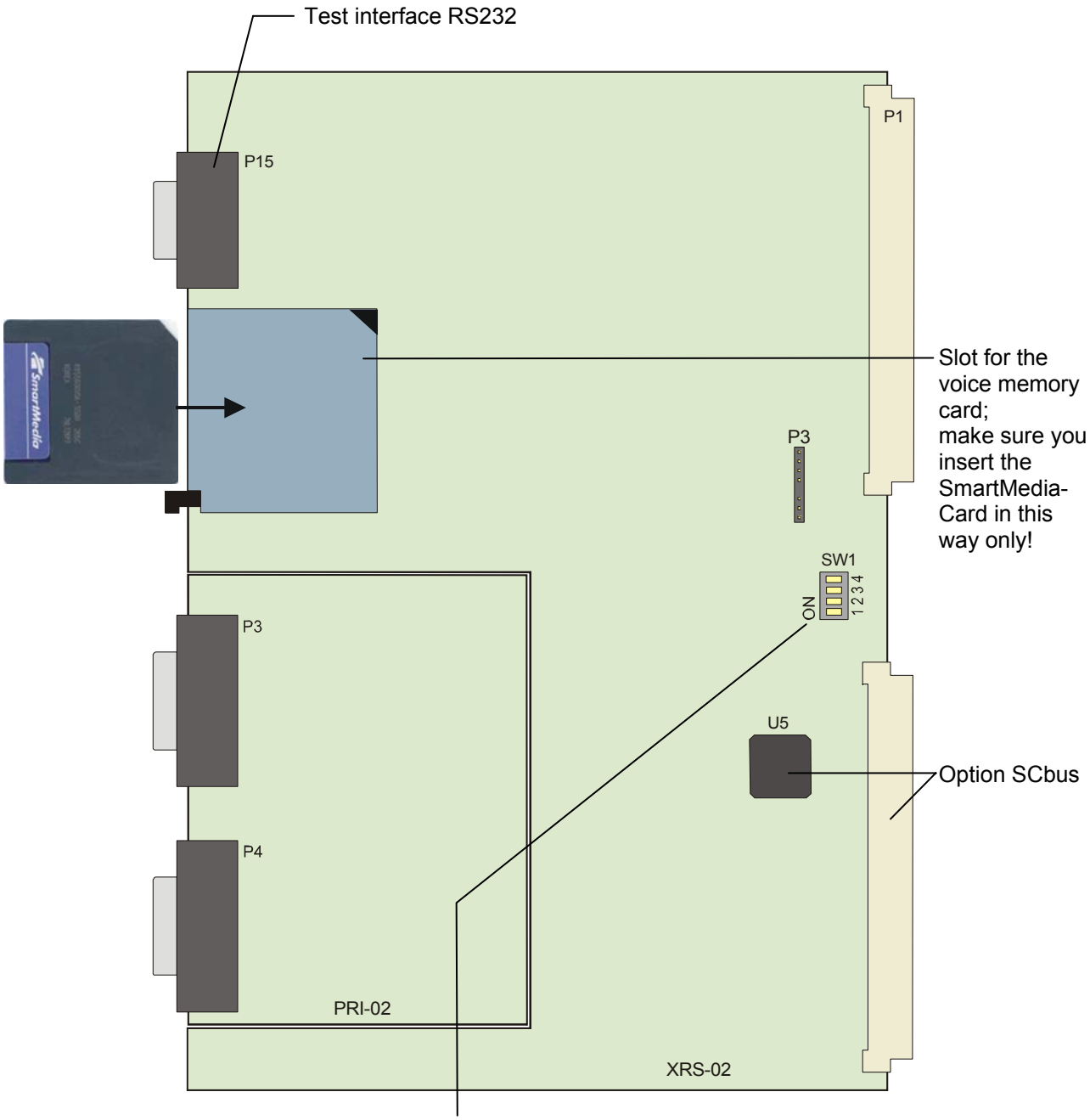
21.1 SBC-32 board



21.2 SBC-33 board



21.3 XRS-02- (SC-) PRI board

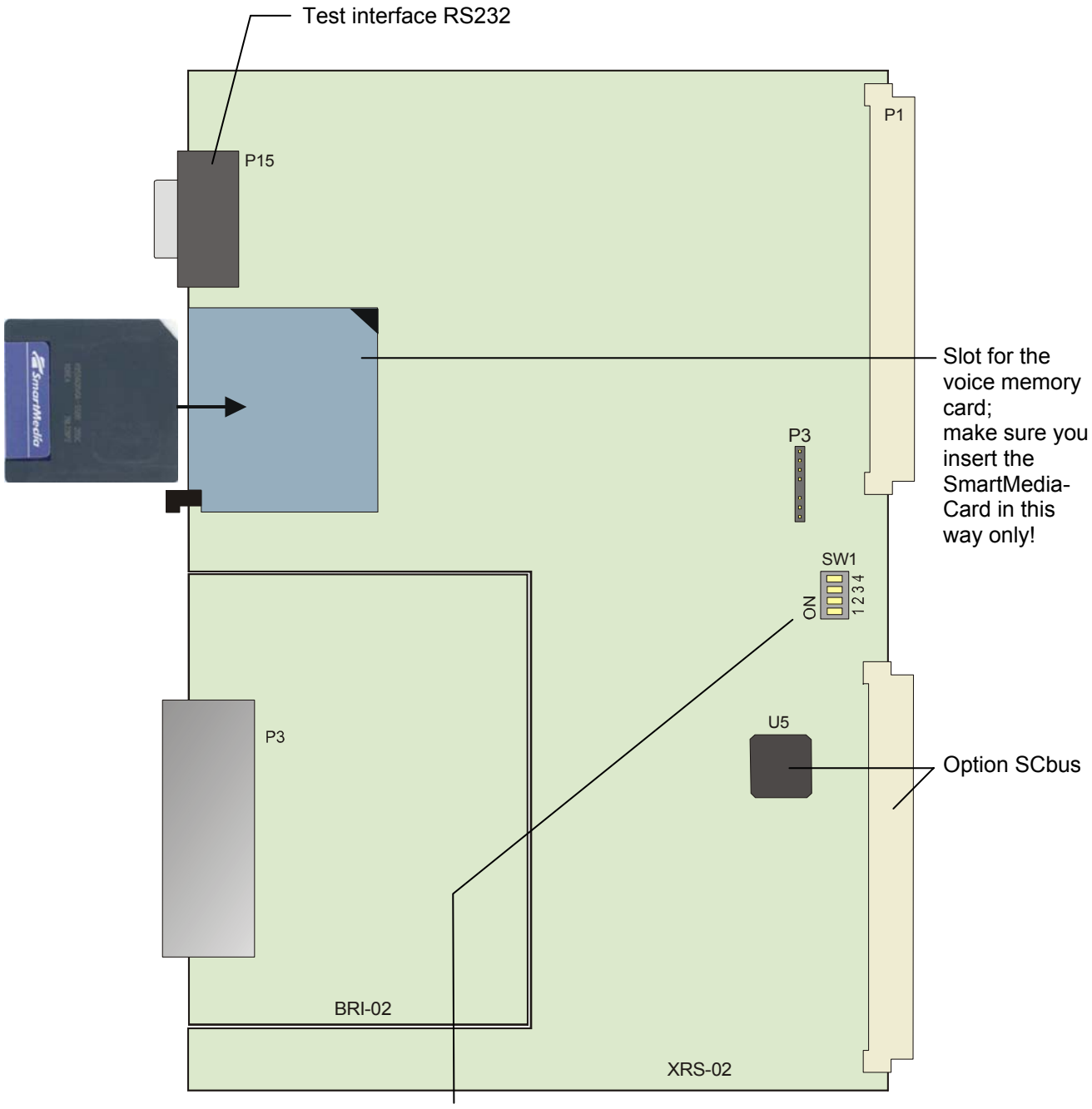


Switch positions of SW1:

1	2	3	Function
OFF	OFF	OFF	board 1 (default)
ON	OFF	OFF	board 2
OFF	ON	OFF	board 3
ON	ON	OFF	board 4
OFF	OFF	ON	board 5

4	Function
OFF	normal operation

21.4 XRS-02- (SC-) BRI board

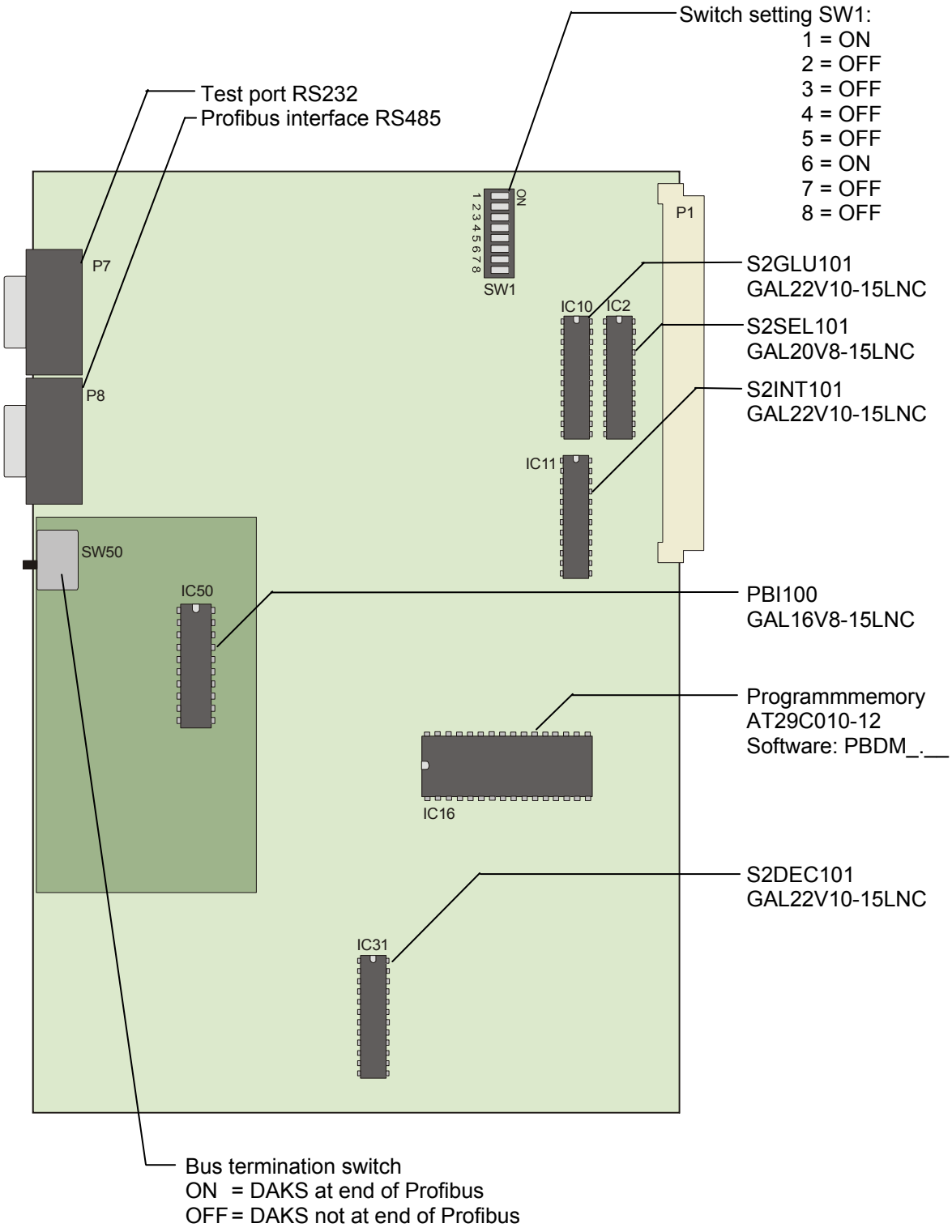


Switch positions of SW1:

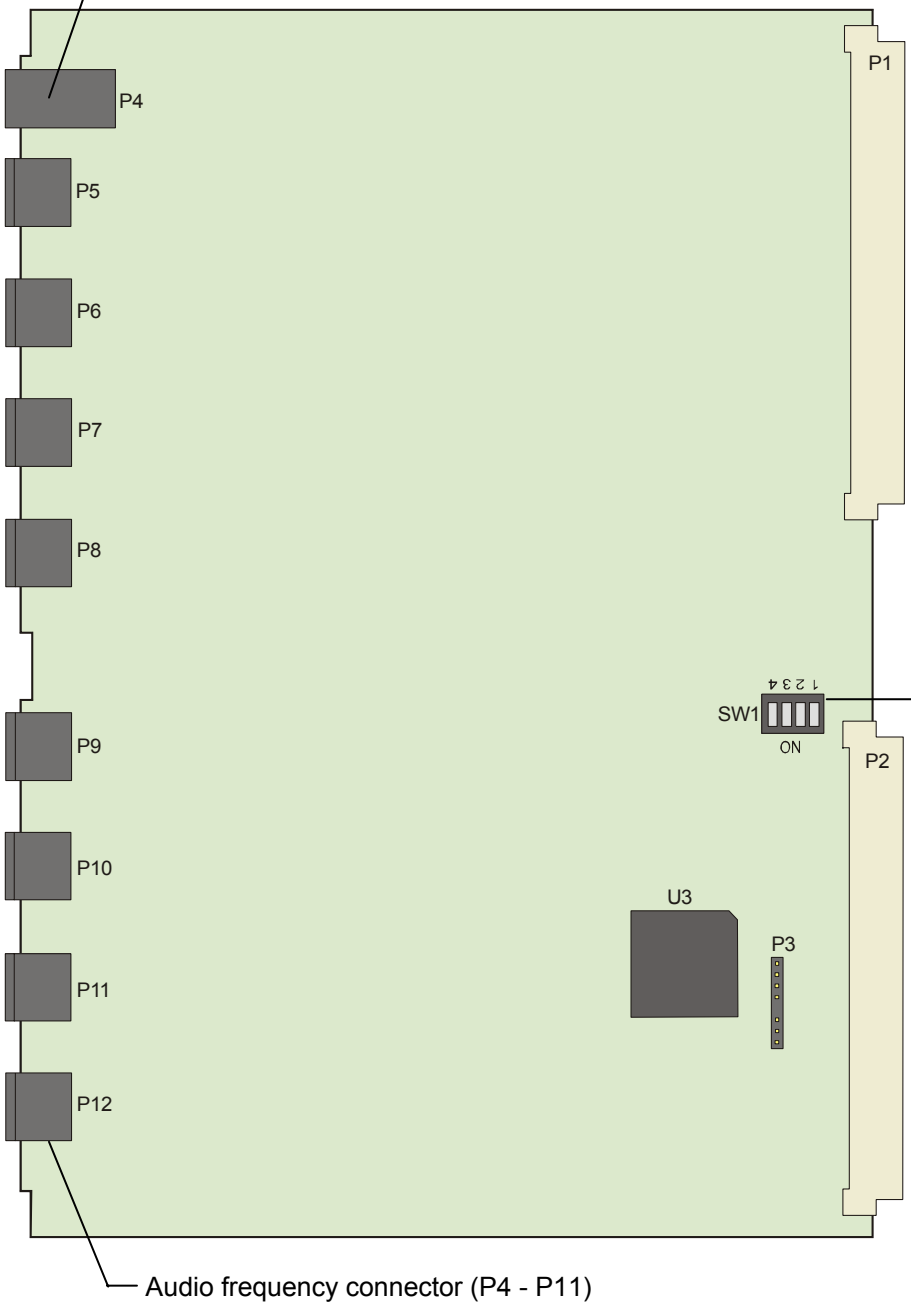
1	2	3	Function
OFF	OFF	OFF	board 1 (default)
ON	OFF	OFF	board 2
OFF	ON	OFF	board 3
ON	ON	OFF	board 4
OFF	OFF	ON	board 5

4	Function
OFF	normal operation

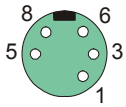
21.5 PBI-01 board



21.6 AIO-11 board

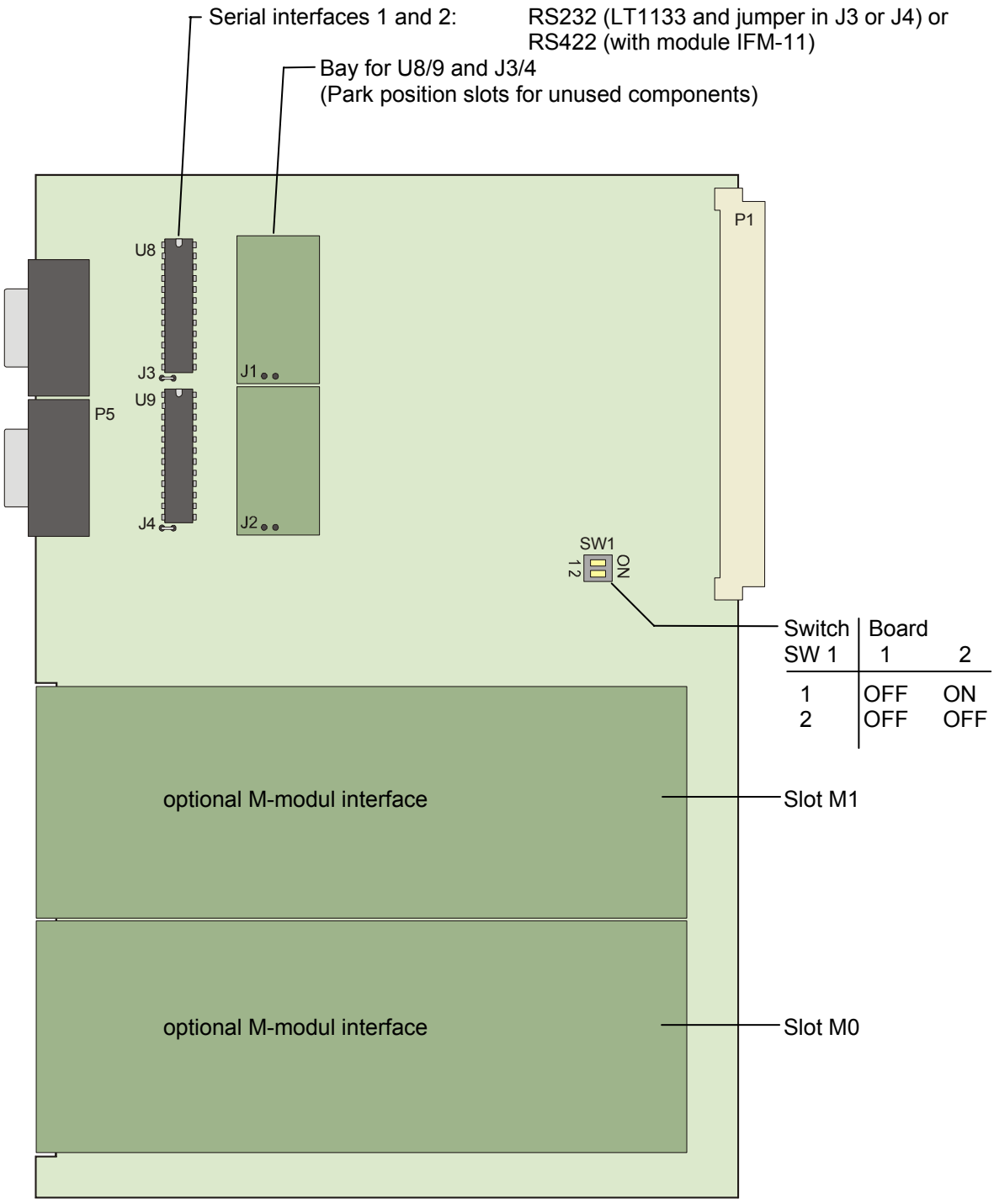


Solder side of Pins



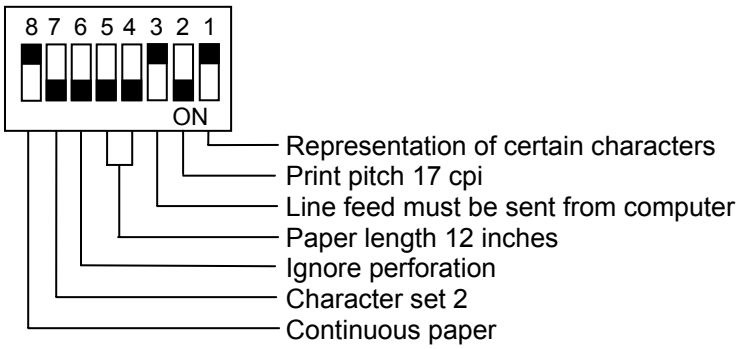
Level and impedance:	AF input (sym):	max -6dBm (vol. control)	7KΩ
	AF output:	0dBm	600Ω

21.7 ACM-01 board



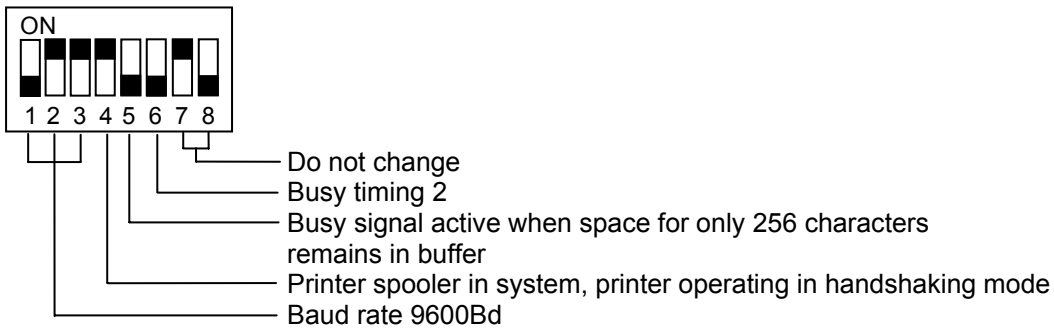
21.8 Printer configuration OKI Microline 280, vers. 07, rev. 2

Position of DIL switches on the controller board:

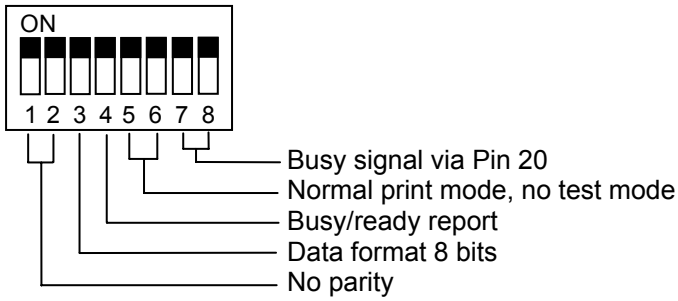


Position of DIL switches on the interface board: (super-speed serial interface)

SW2

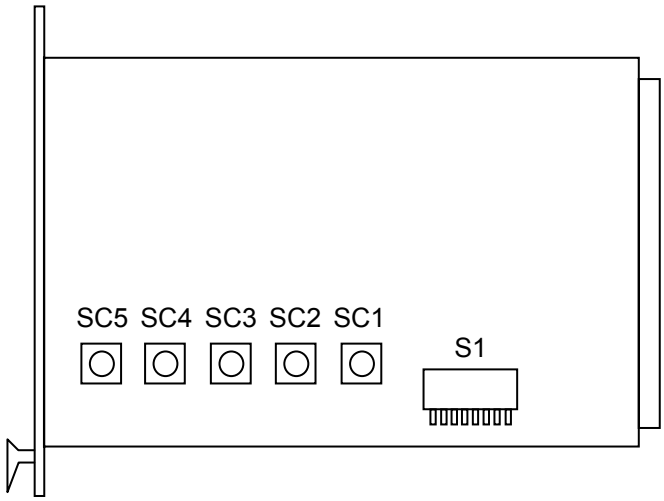


SW1



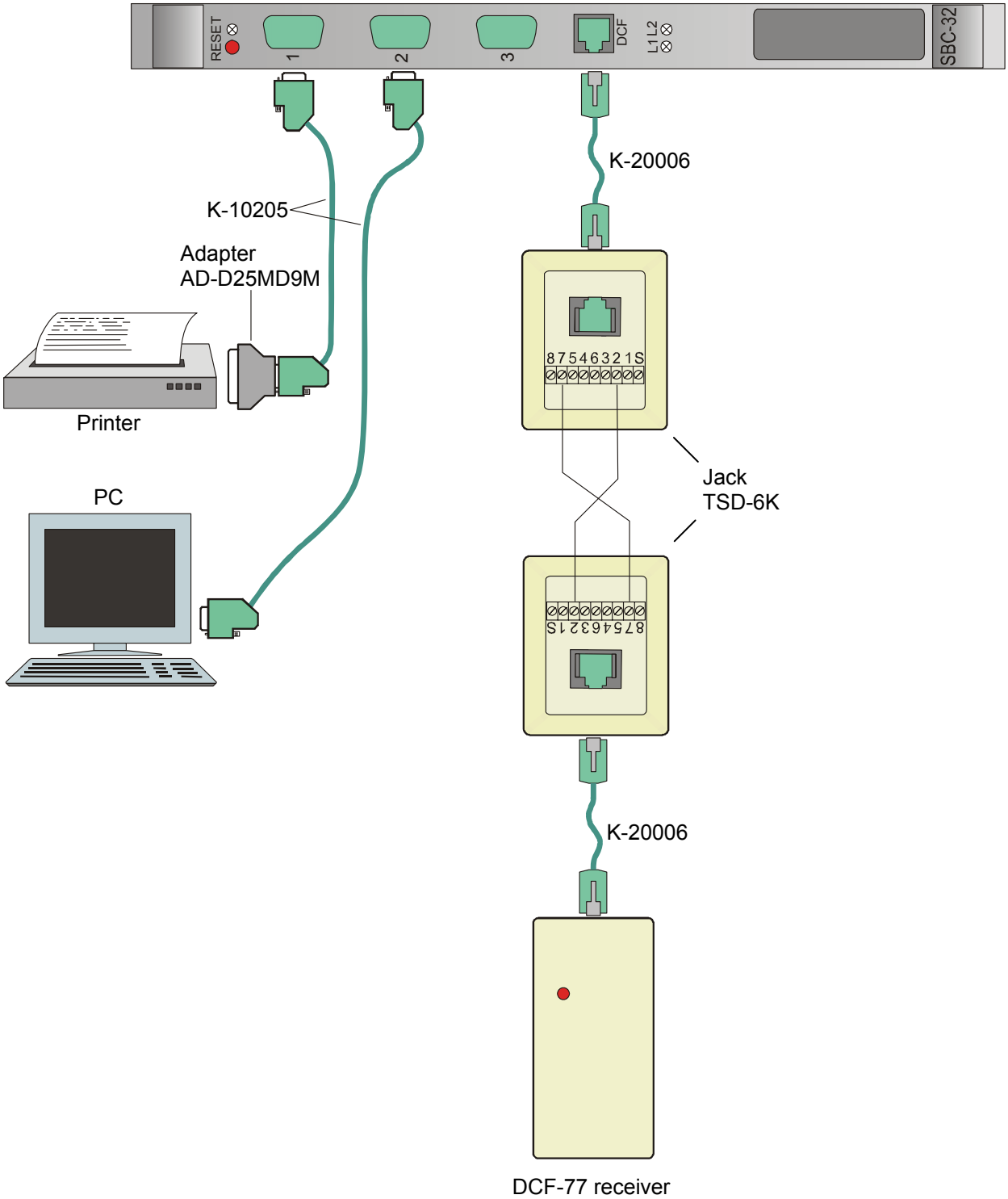
21.9 Modem configuration E-Link IV, V2.4

Switch	Pos.
SC1:	3
SC2:	7
SC3:	3 (master)
	2 (slave)
SC4:	D
SC5:	0
S1:	1 = OFF
	2 = OFF
	3 = OFF
	4 = OFF
	5 = ON
	6 = ON
	7 = ON
	8 = OFF

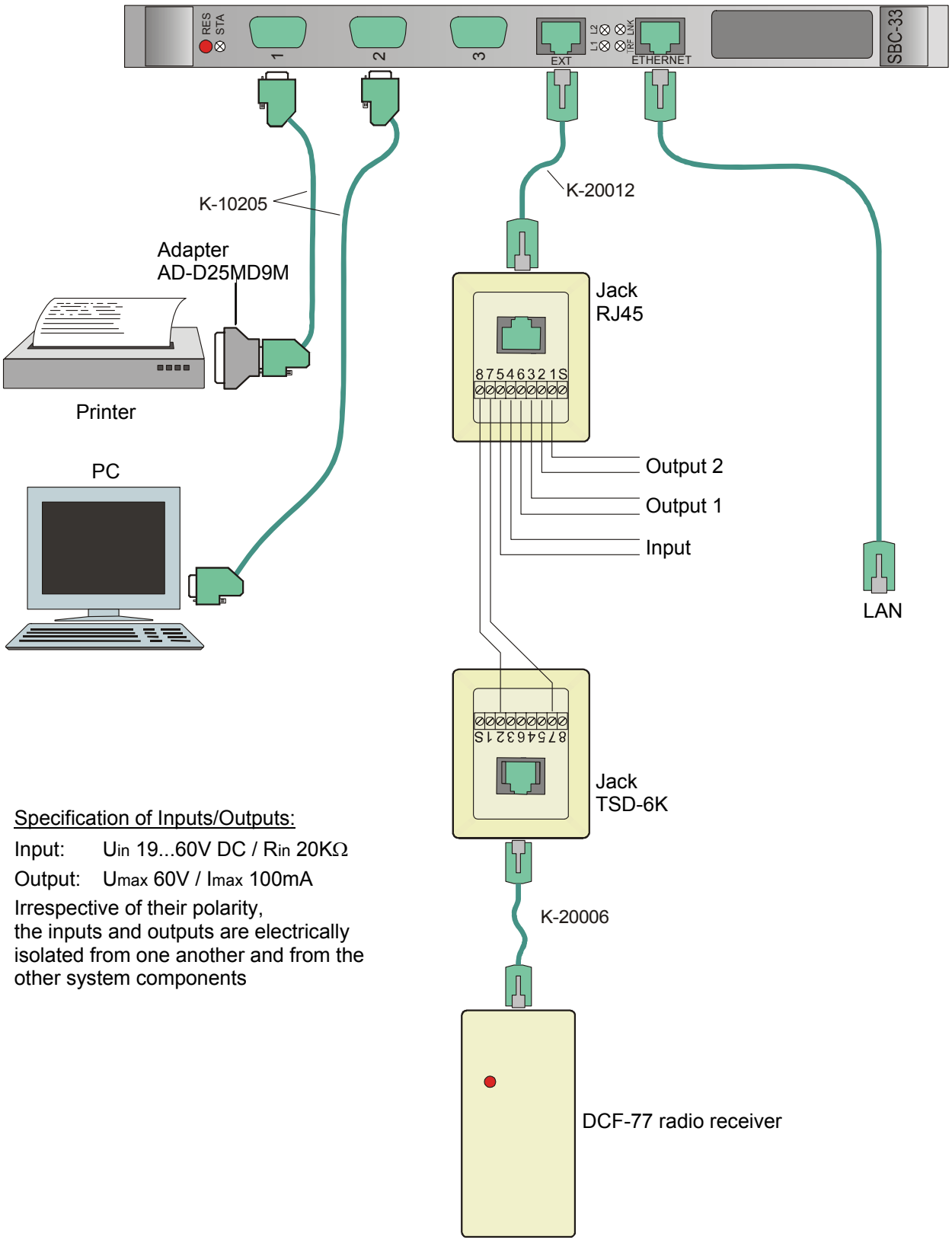


22 Wiring plans

22.1 Controller board SBC-32



22.2 Controller board SBC-33 with DCF-77 radio receiver CF-77NC2



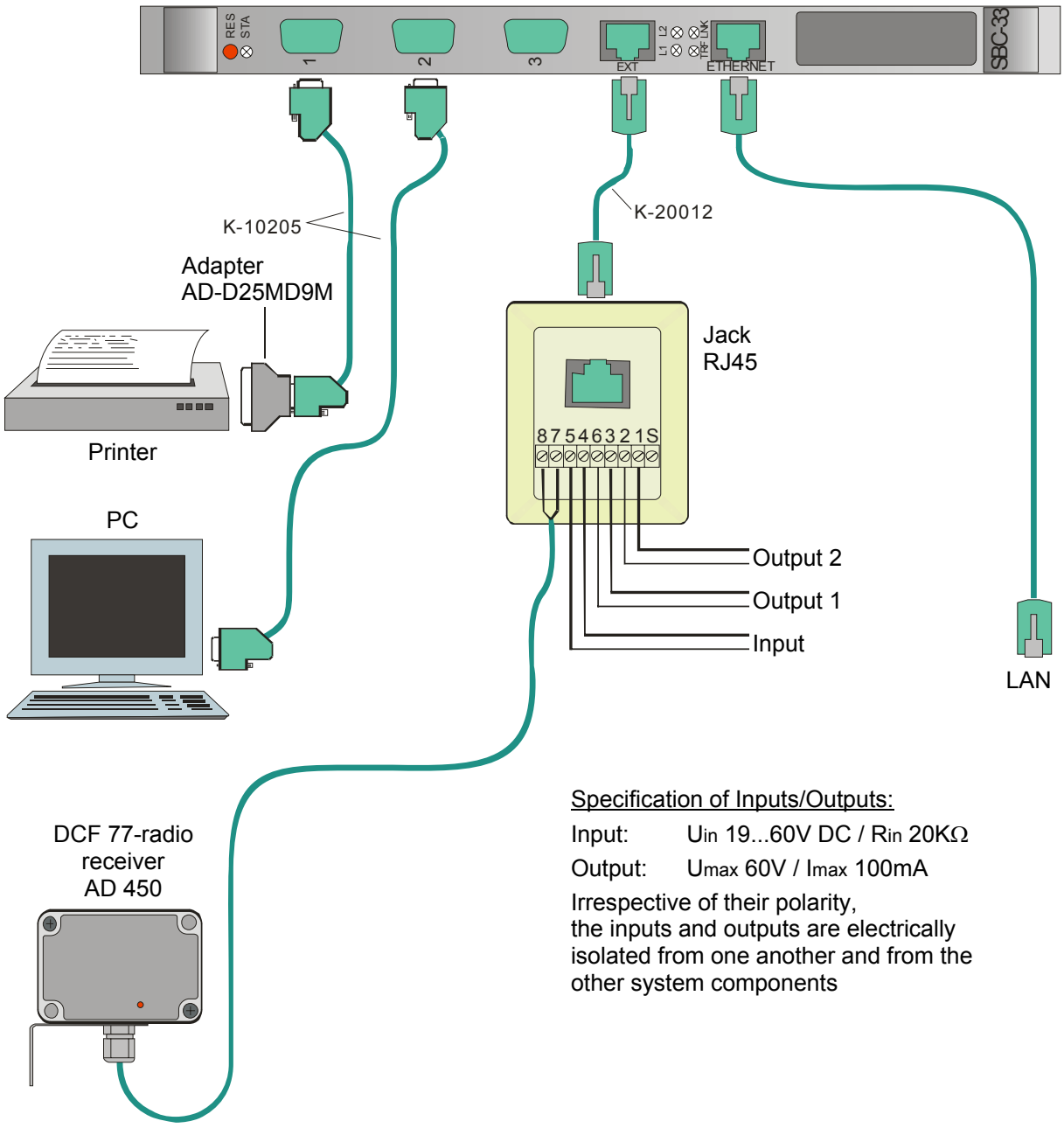
Specification of Inputs/Outputs:

Input: U_{in} 19...60V DC / R_{in} 20KΩ

Output: U_{max} 60V / I_{max} 100mA

Irrespective of their polarity, the inputs and outputs are electrically isolated from one another and from the other system components

22.3 Controller board SBC-33 with DCF-77 radio receiver AD 450



Specification of Inputs/Outputs:

Input: U_{in} 19...60V DC / R_{in} 20KΩ

Output: U_{max} 60V / I_{max} 100mA

Irrespective of their polarity, the inputs and outputs are electrically isolated from one another and from the other system components

Installation of the DCF 77 radio receiver:

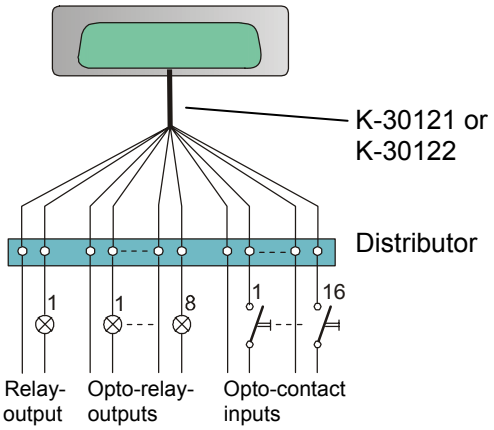
Assembly:

- suitable for indoor and outdoor installation (ingress protection IP65)
- mount enclosure with cable entry from below and the ferrite rod in a horizontal position
- place as far as possible from all sources thay might cause interference
- place as high up as possible
- do not mount in buildings with highly insulated and shielding walls or metallic roof constructions

Connection:

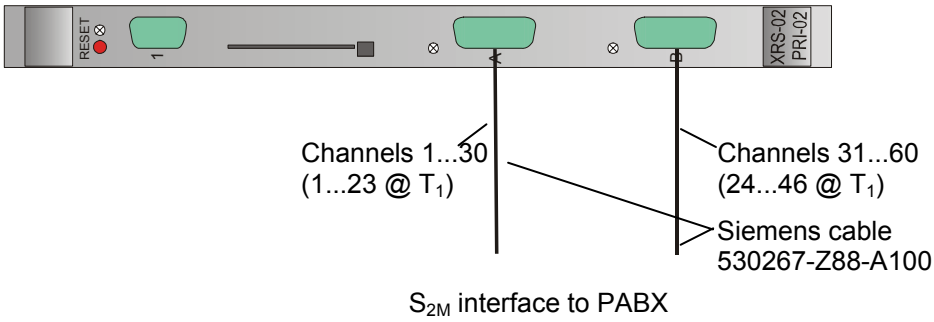
- polarity is irrelevant
- the maximum cable length supported is 200m, with a minimum width of 0.4mm (twisted pair recommended, no single strands) if the cable length needed is below 10m, shorten the cable to the just length (do not coil!)
- rotate the receiver until you obtain an optimum reception and the LED of the receiver blinks in regular intervals of one second (if neceessary, relocate receiver)

22.4 Contact in-/output module MIO-11



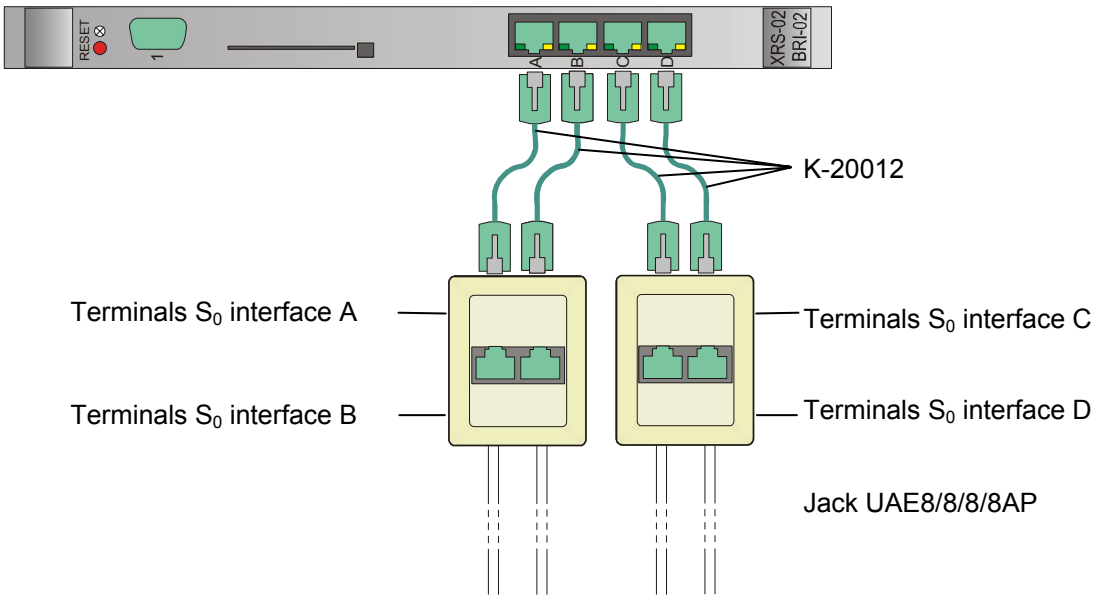
All inputs and outputs are independent of polarity

22.5 Primary-Rate-Interface board XRS-02- (SC-) PRI



S_{2M} interface to PABX

22.6 S_0 interface board XRS-02- (SC-) BRI



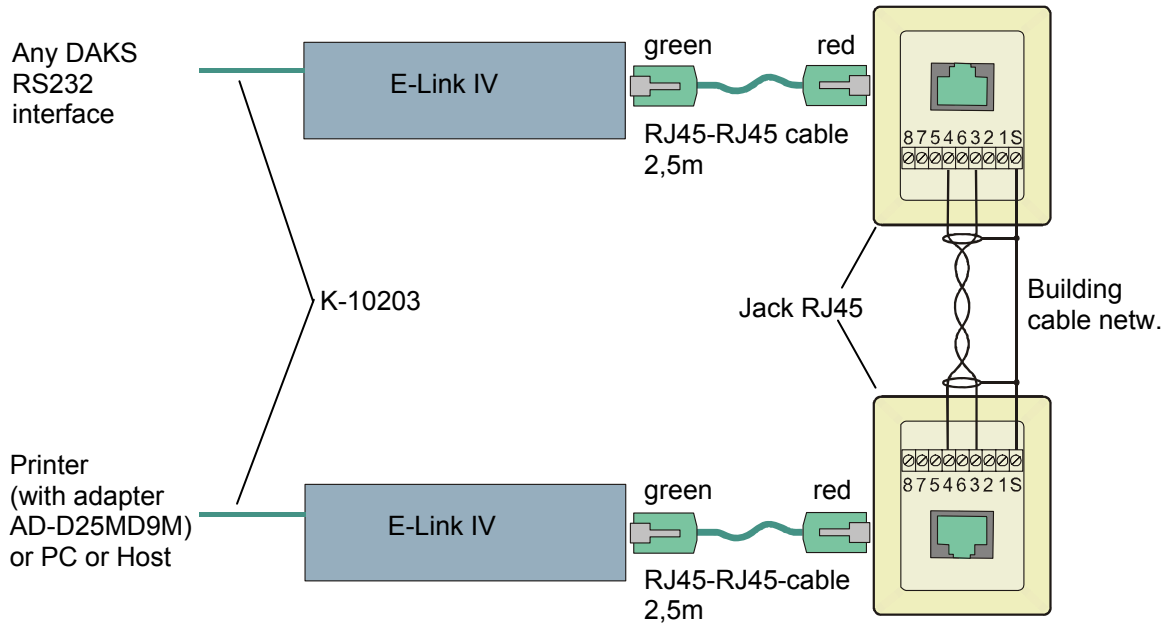
S_0 interface to PABX

Jack UAE8/8/8/8AP for S_0 interface:

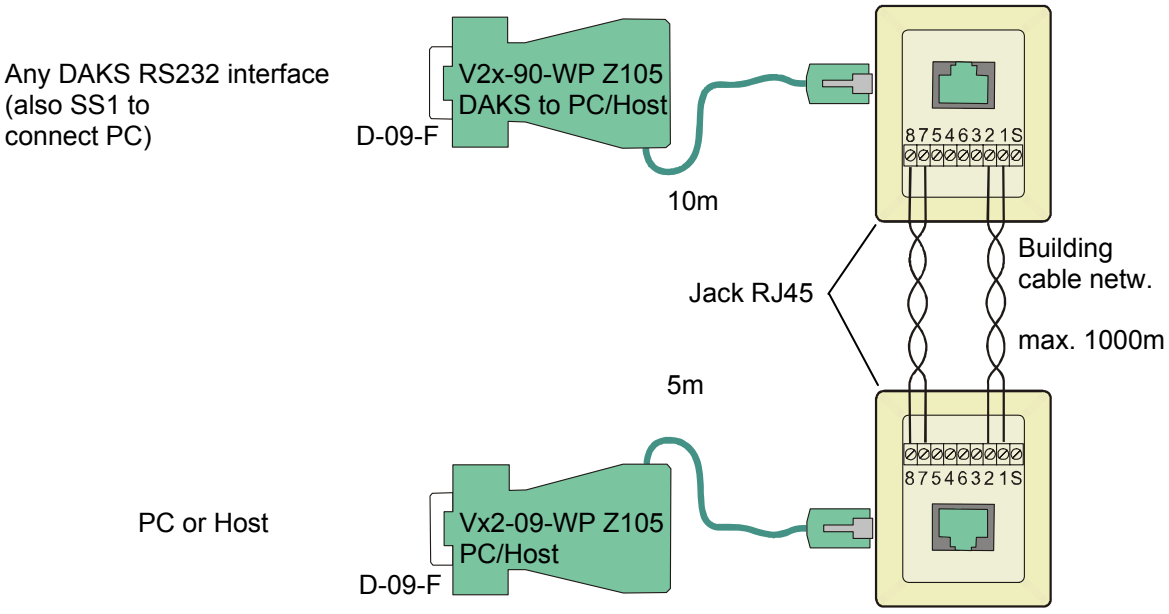
Terminal 4/5=a/b: Transmit from PABX
Terminal 3/6=a/b: Receive from PABX

22.7 Connecting printer, PC or Host system via modem/ line extension

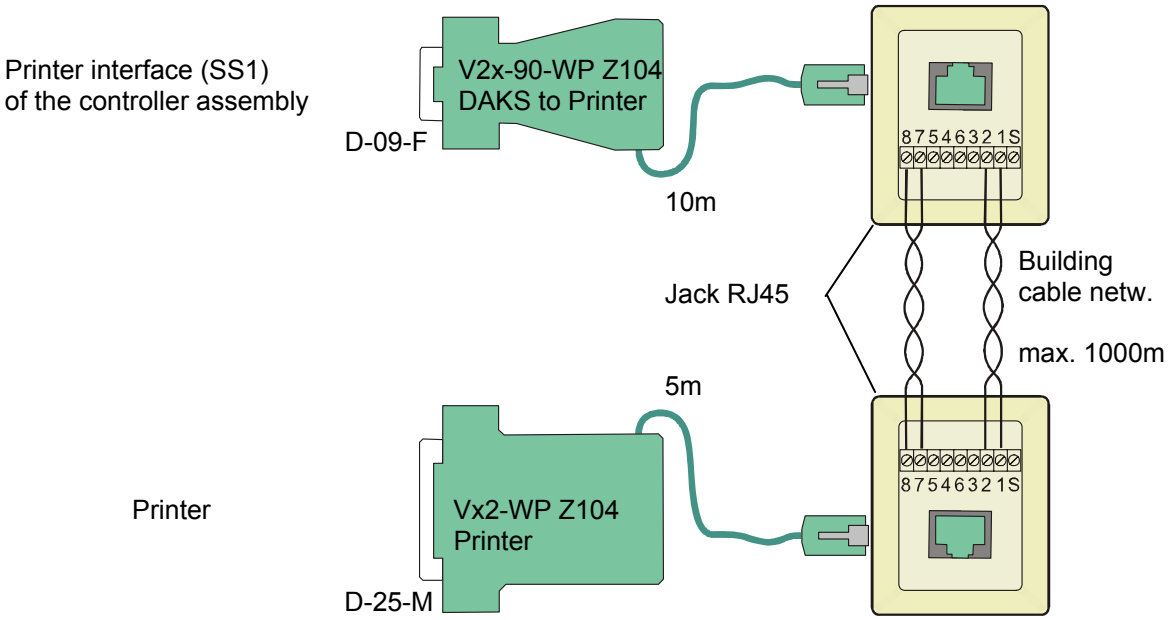
22.7.1 Modem E-Link IV



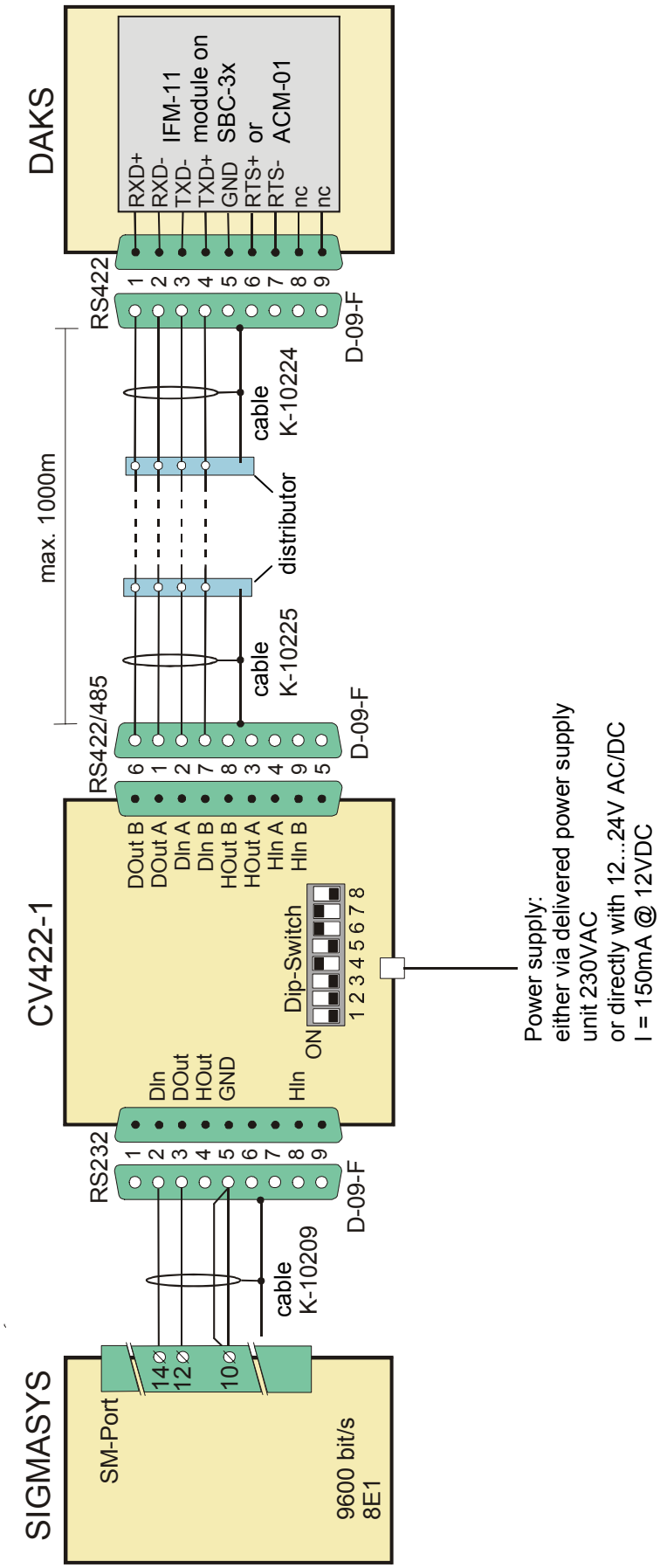
22.7.2 Line extension to PC or Host system



22.7.3 Line extension to printer

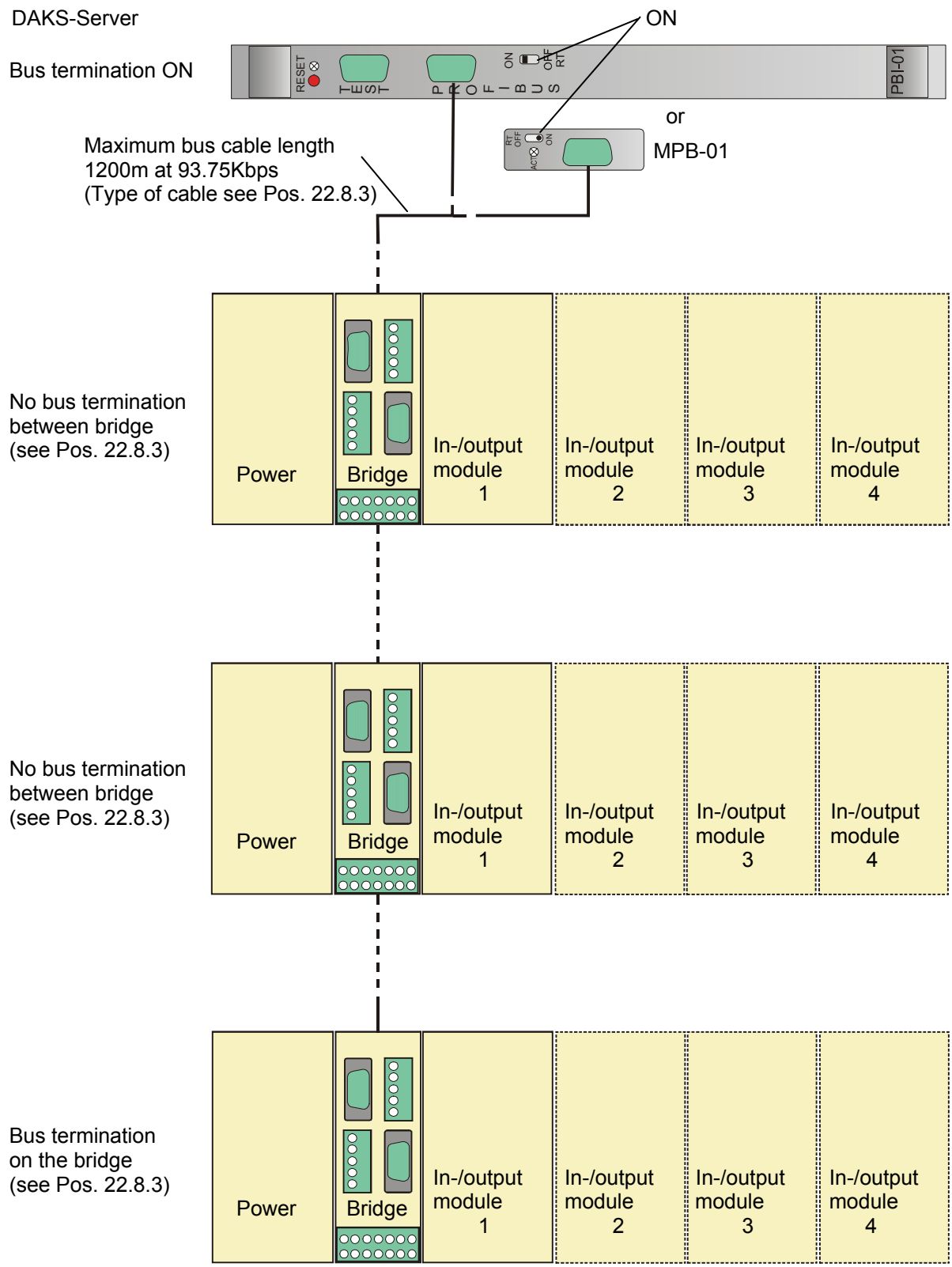


22.7.4 RS232/RS422 converter CV422-1 (e.g. to connect SIGMASYS to DAKS)

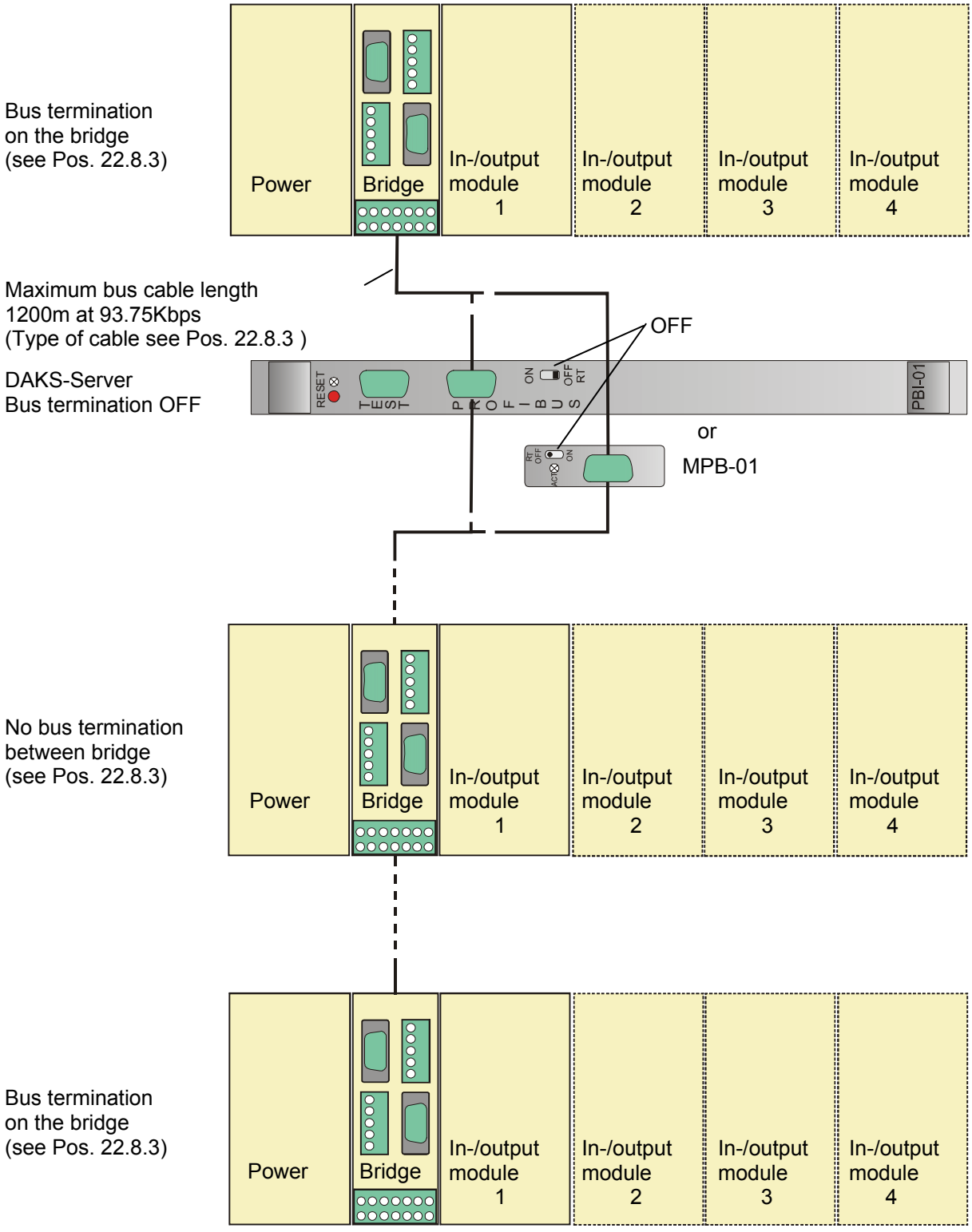


22.8 Contact inputs via Profibus-DP

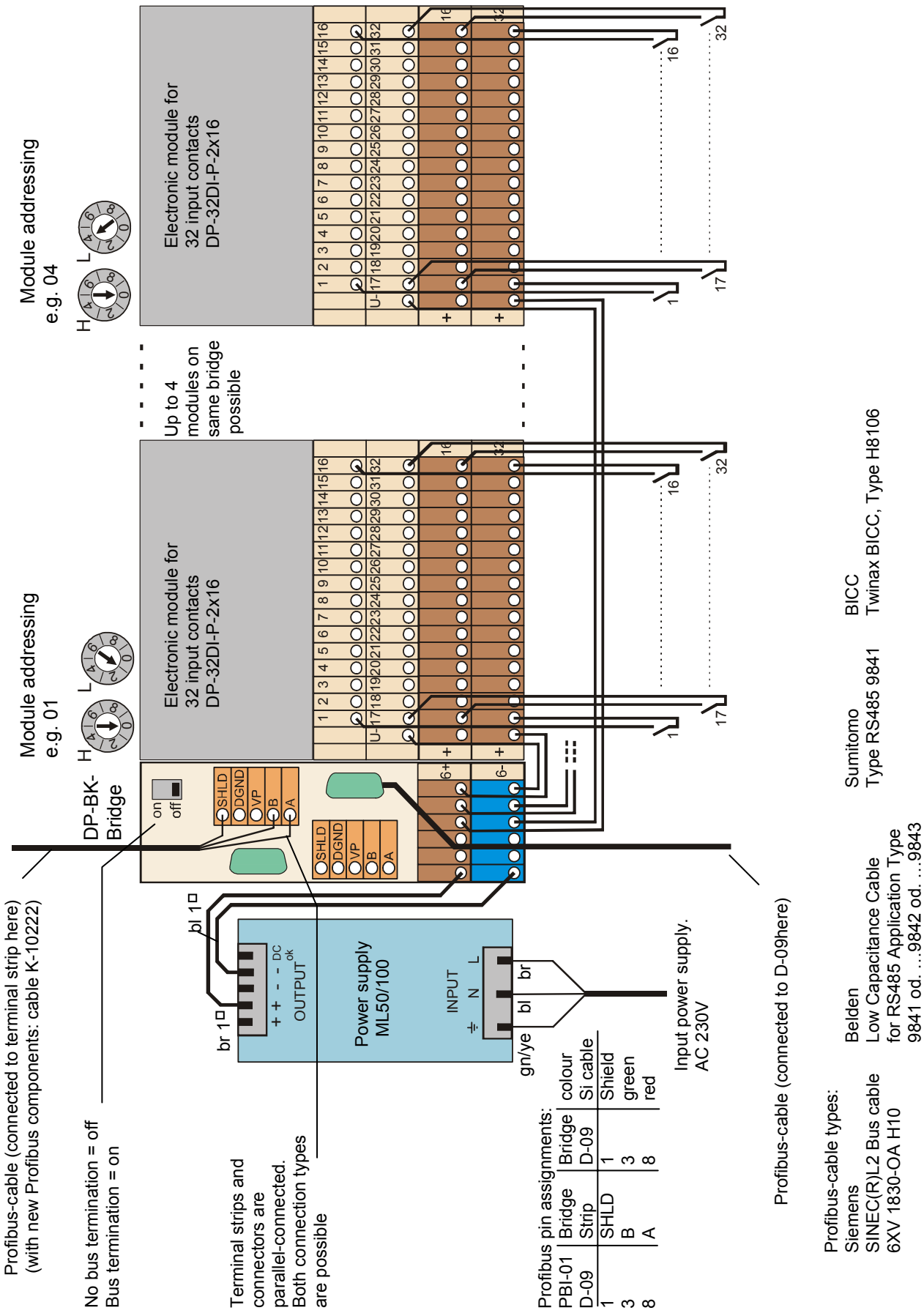
22.8.1 Profibus interface board PBI-01 at end of the bus



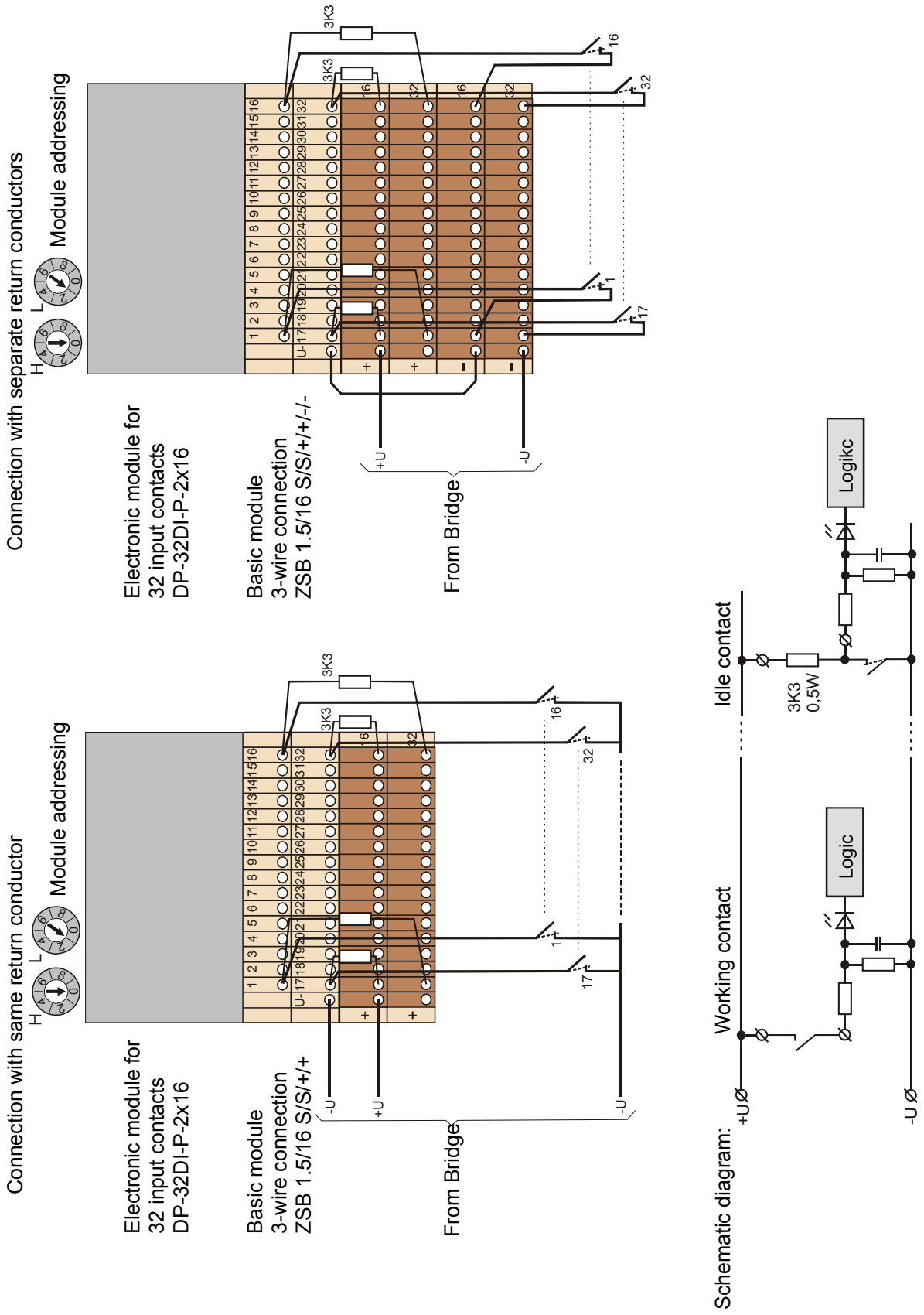
22.8.2 Profibus interface board PBI-01 not at end of Profibus



22.8.3 Wiring of modules and power supply unit with working input contacts

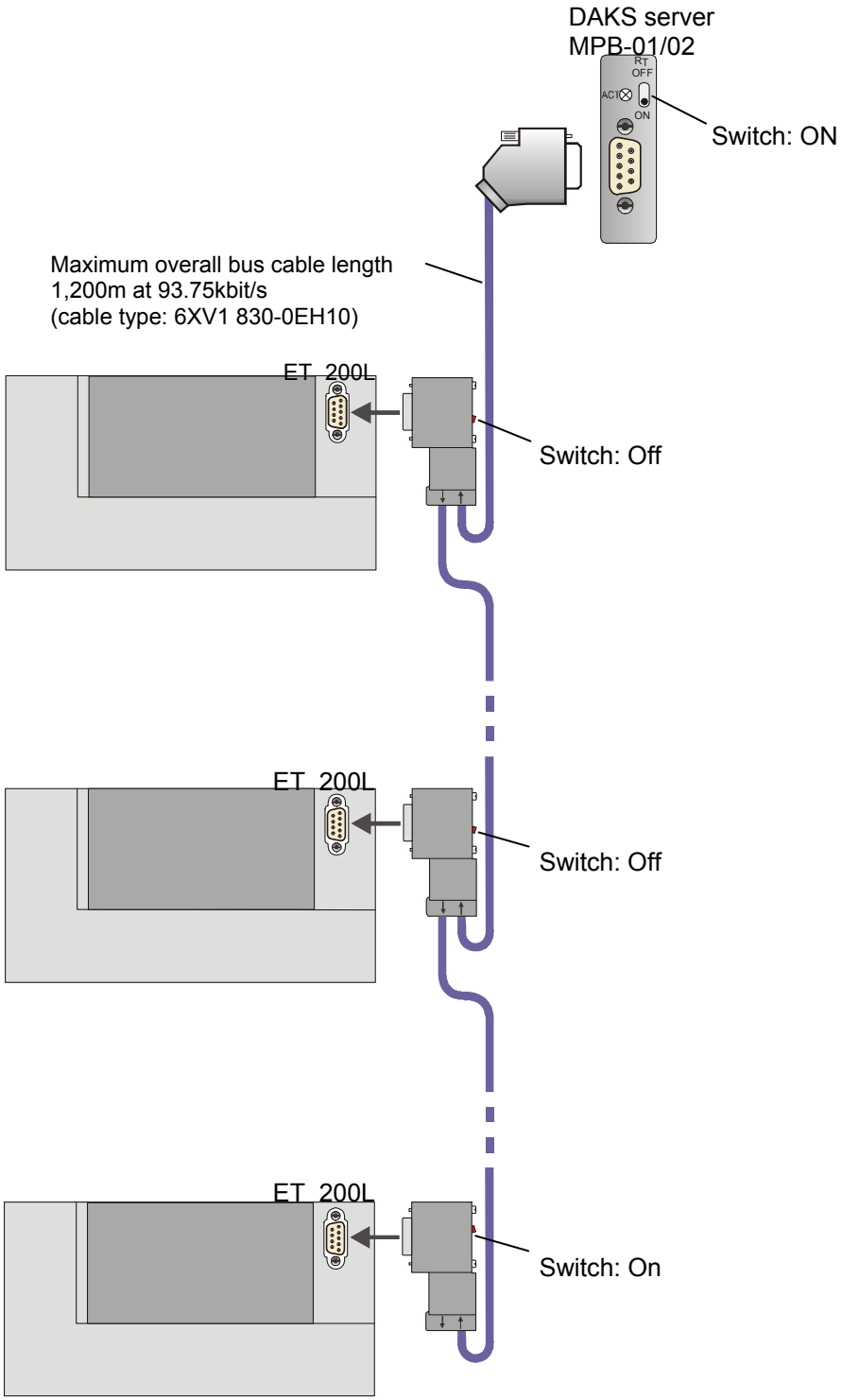


22.8.4 Modification in the wiring of modules with idle input contacts



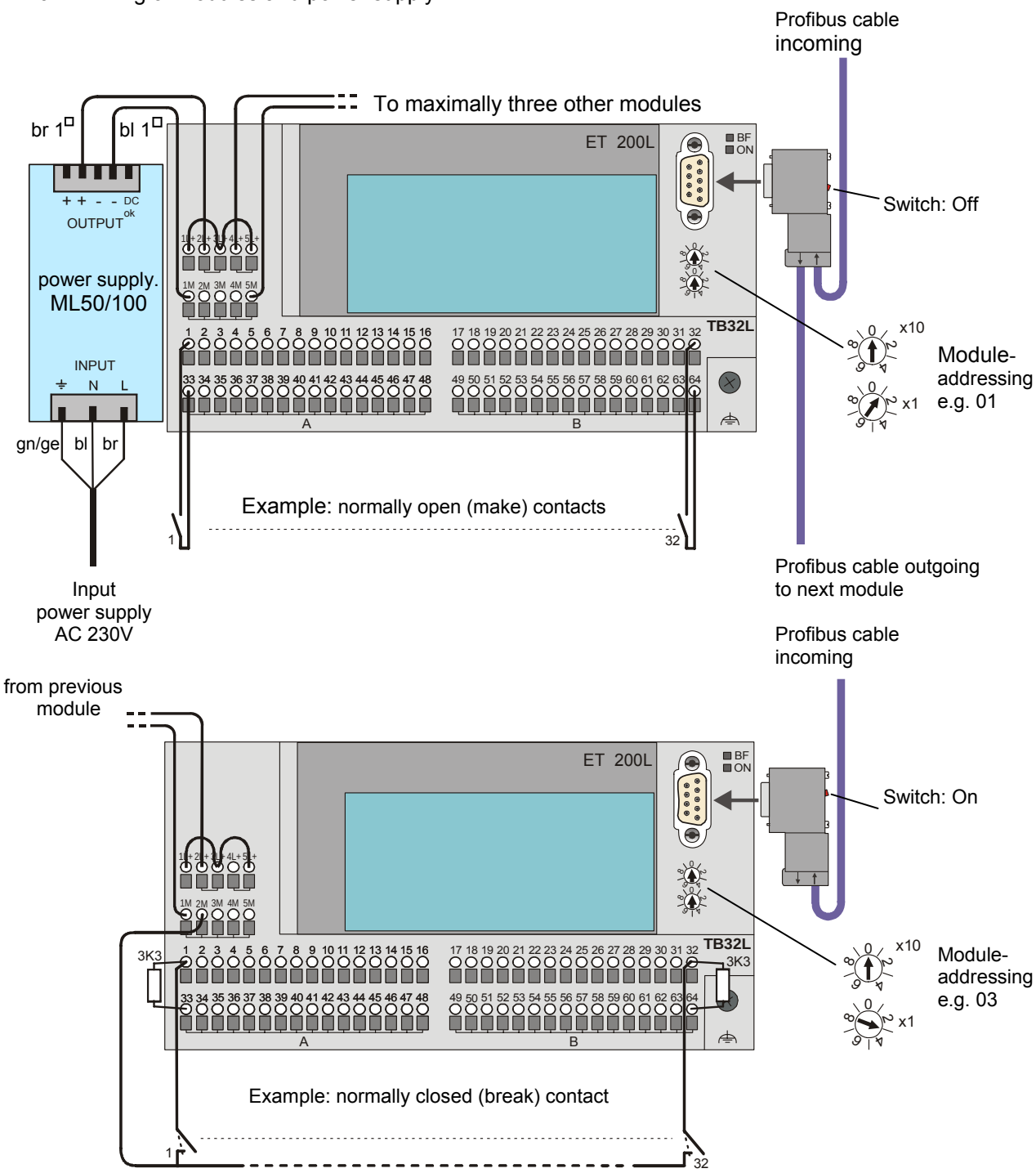
22.9 Contact inputs via Profibus-DP with ET 200L

22.9.1 Wiring plan

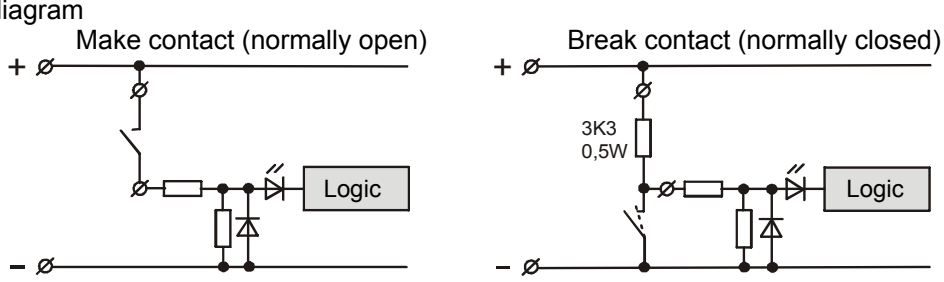


Note: Be careful to set the bus terminating resistor switches at the respective bus ends to: ON.

22.9.2 Wiring of modules and power supply

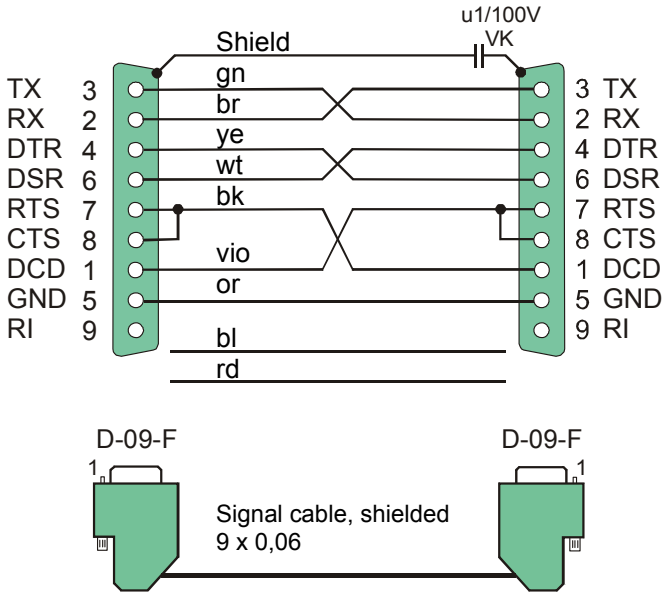


22.9.3 Circuit diagram

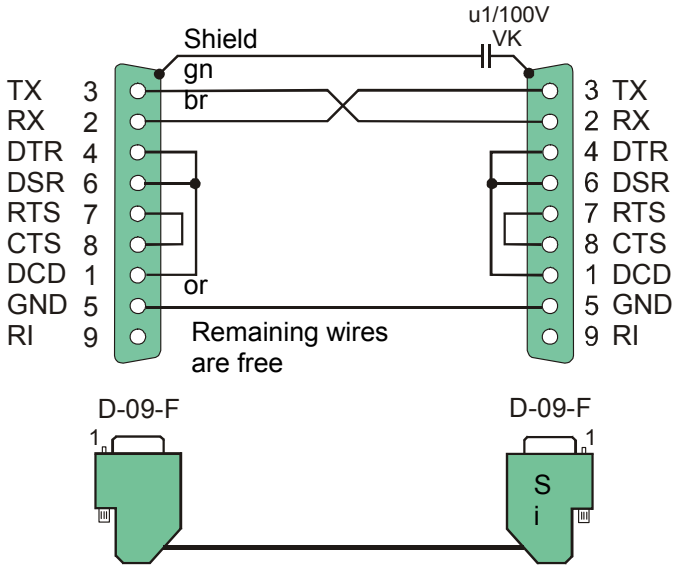


23 Cables

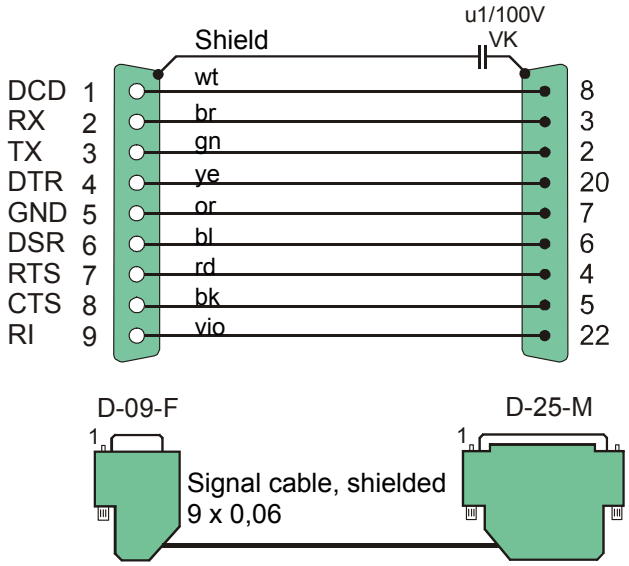
23.1 K-10205-XXXX, Null modem 9-pin with handshake mode



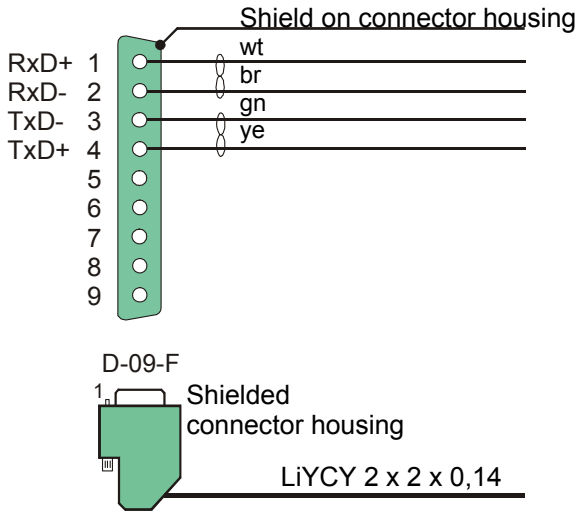
23.2 K-10204-XXXX, Null modem 9-pin, without handshake mode



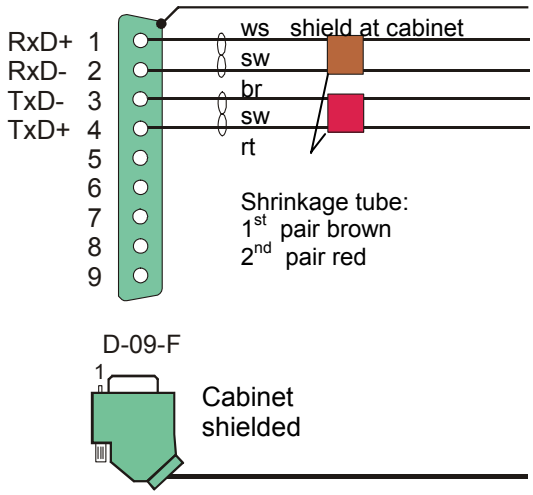
23.3 K-10203-XXXX, Adapter cable: D-9-F to D-25-M



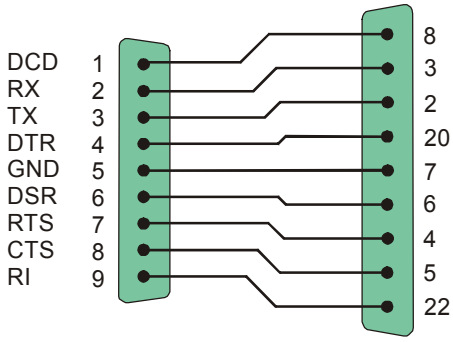
23.4 K-10224-XXXX, shielded RS422-cable (version 1)



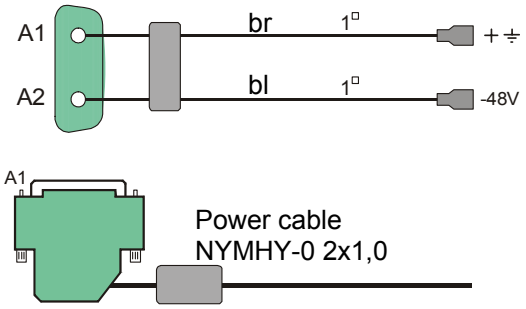
23.5 K-10224/2-XXXX, shielded RS422 cable (version 2)



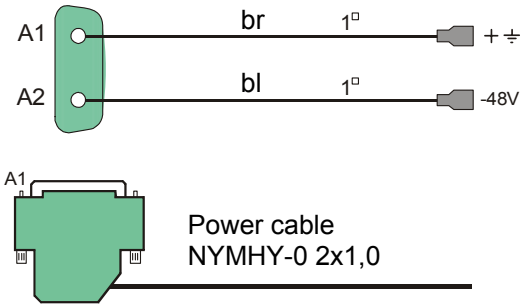
23.6 Printer adapter cable D9M-D25M



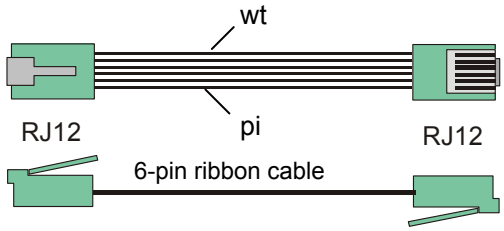
23.7 K-50005-XXXX (DC power supply unit with ferrite core for BPS-31 and BPS-32)



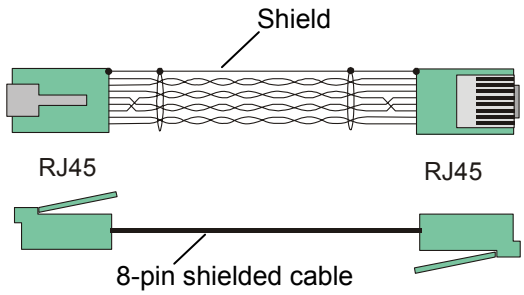
23.8 K-50008-XXXX, DC power supply unit (for BPS-32)



23.9 K-20006-XXXX, Ribbon cable 6-pin, standard

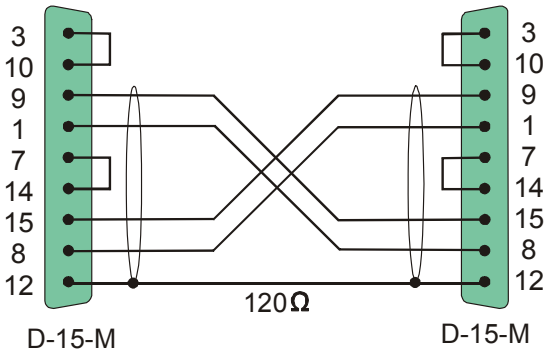


23.10 K20012-XXXX, Interface cable for S_0

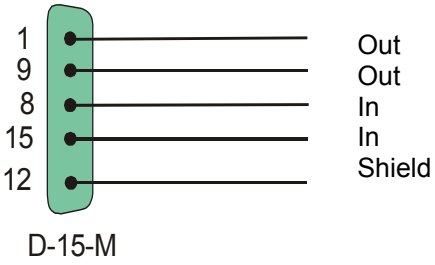


23.11 E1/T1 connection to the XRS board

23.11.1 Siemens E1-/S_{2M} cable 530267-Z88-A100

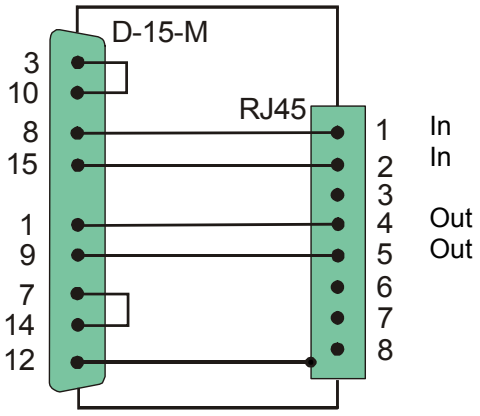


23.11.2 Direct D-15 connection without adaptor (not included)

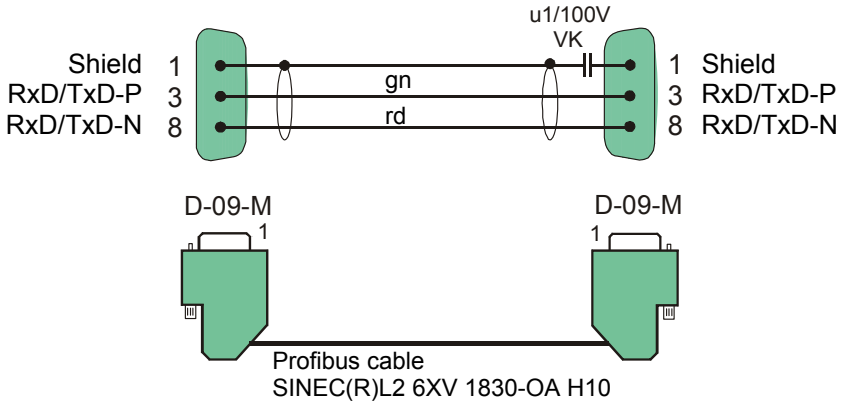


Out = Data from DAKS to PABX
In = Data from PABX to DAKS
Shield = Connect to Ground

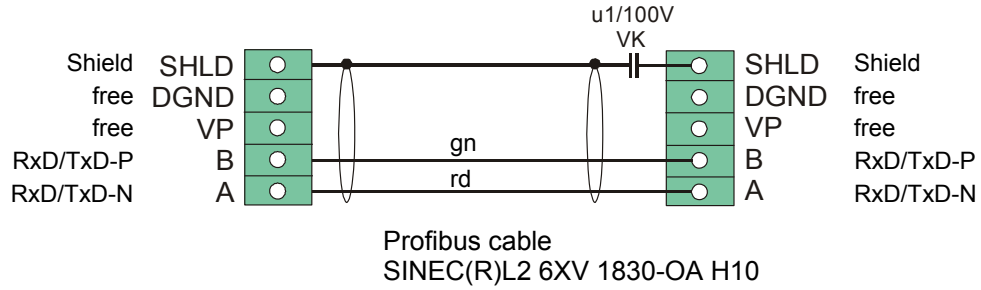
23.11.3 Adaptor "AD-D15MRJ45-2" (Connection via cable with RJ45 plug):



23.12 K-10220-XXXX, Profibus cable D-09

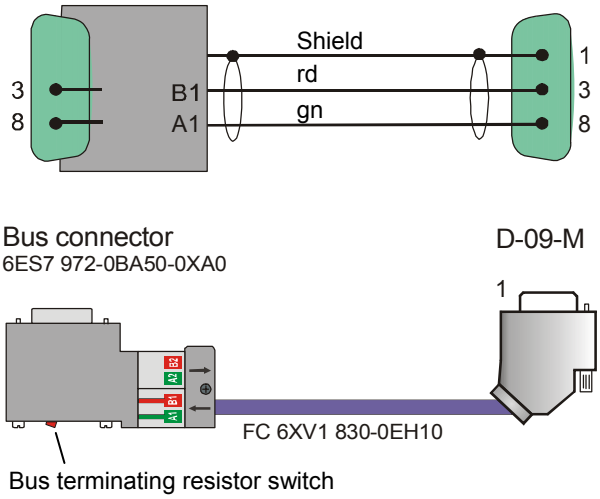


23.13 Profibus cable connection to bridge terminal strip



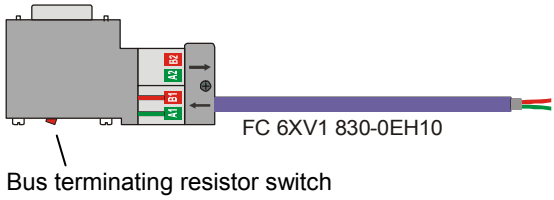
Note: Any connection type (terminal or plug) can be used for connection to the bridge.

23.14 K-10221-XXXX, Profibus-server connecting cable



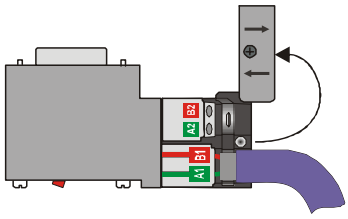
23.15 K-10222-XXXX, Profibus- extention cable

Bus connector
6ES7 972-0BA50-0XA0



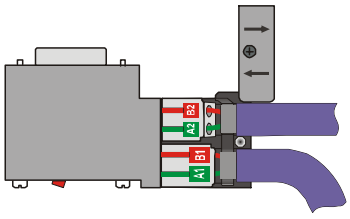
23.16 Connecting the bus connector

Step 1



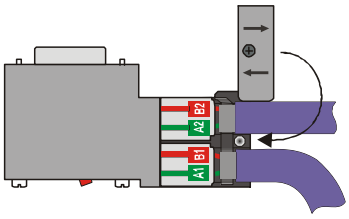
- unfasten the screws of the stain relief and swing the lid it to the side
- lift the clear cable guide

Step 2



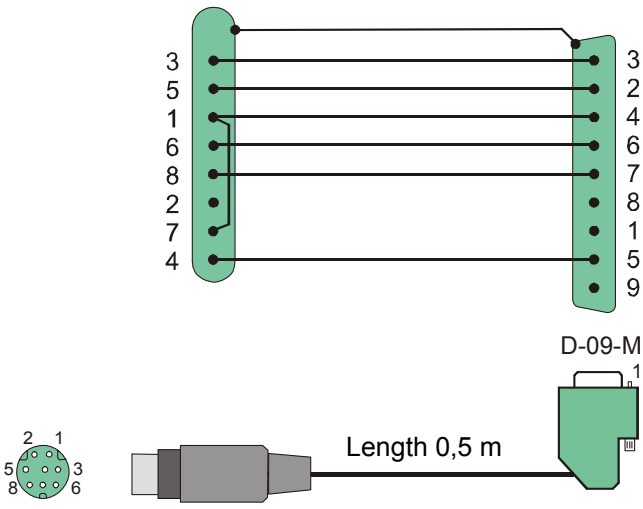
- insert the Profibus cable into the cabel guide green → A2, ret → B2
- press the cable guide down

Step 3

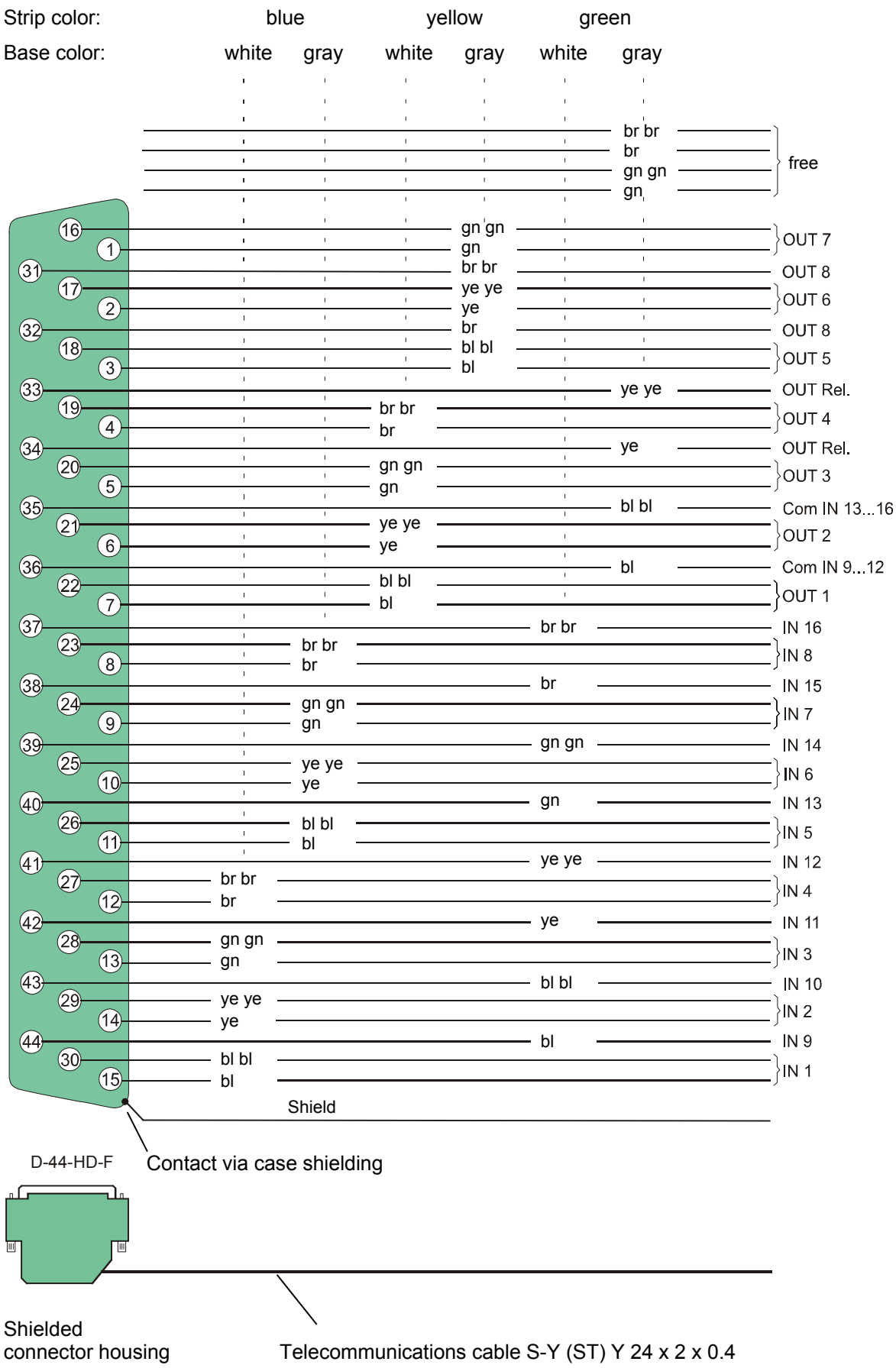


- now close the lid of the stain relief and tighten the screws
- set the switch to Off

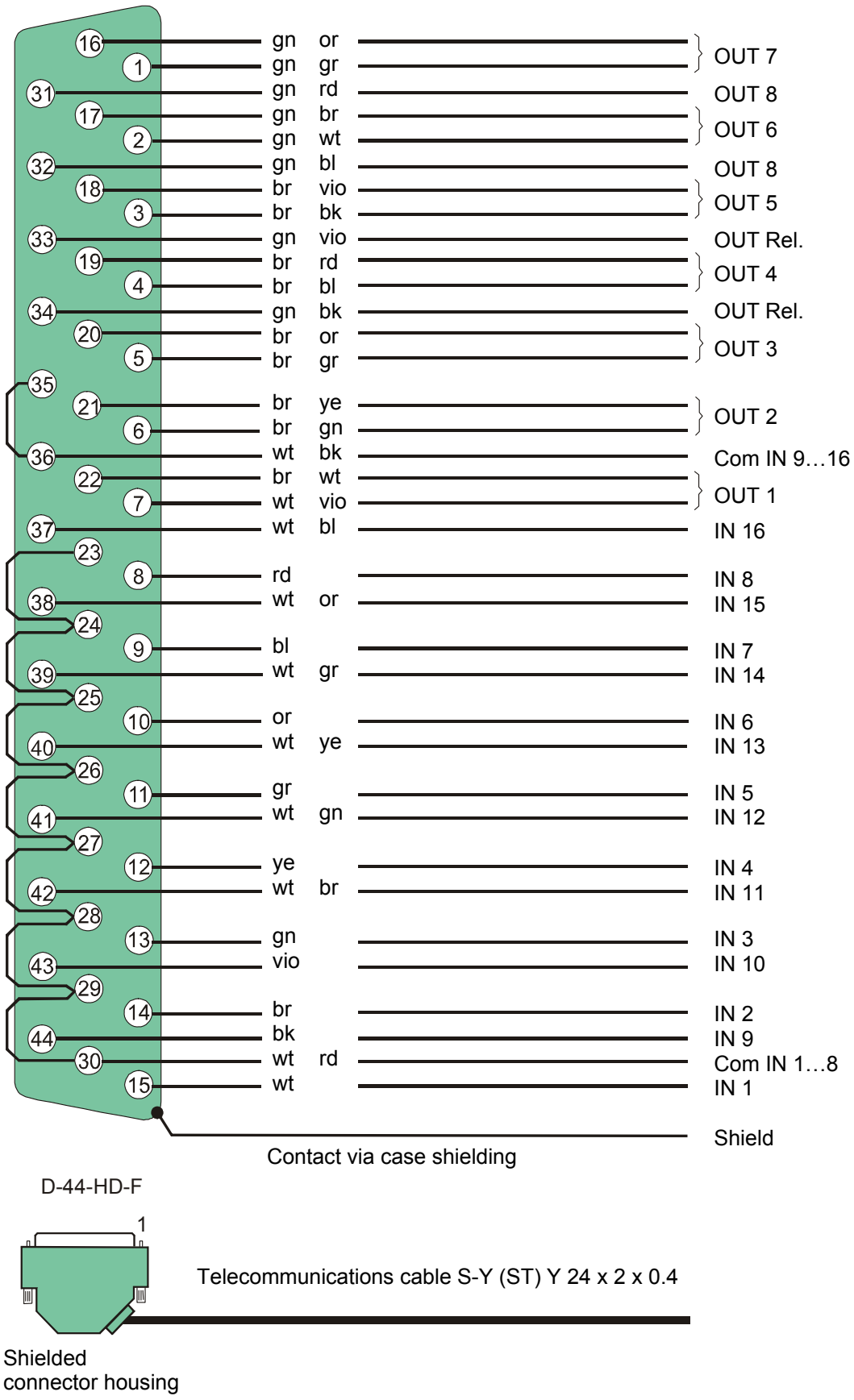
23.17 K-10207, service cable (debug/download) for LAN interface module



23.18 K-30121-XXXX, MIO-11 connecting cable



23.19 K-30122-XXXX, MIO-11 connecting cable



24 Declarations

DECLARATION OF CONFORMITY

We

tetronik GmbH
Angewandte Elektronik und Nachrichtentechnik

Silberbachstrasse 10, D-65232 Taunusstein / Germany

declare that the product

DAKS Release 6

(name, type, model or version)

to which this declaration relates, conforms to the following European Directives and European standards:

Radio and Telecommunication Terminal Equipment Directive 99/5/EEC:

EN 60950-1 First Edition	Safety
EN 55022:1998+A1:2000+A2:2003 Class A	EMC, Emission ITE Residential Environment
EN 55024:1998+A1:2001+A2:2003	EMC, Immunity ITE Residential Environment

tetronik GmbH AEN
(Name of company)

Taunusstein, September 19, 2005
(Place and date of issue)

Rainer Seelgen
(Name of authorized person)

(Signature of authorized person)

CE-Erklärung DAKS Rel_6.doc Owner: tetronik GmbH AEN Number of Declaration: 05/ 03

Tested To Comply
With FCC Standards

FOR HOME OR OFFICE USE

This device complies with part 15 of FCC Rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation

Certificate of Compliance

Certificate Number 111005 - E235206
Report Reference E235206, September 14th, 2005
Issue Date 2005 October 11

Page 1 of 1

Underwriters Laboratories Inc.®

Issued to: Tetronik GmbH
Silberbachstrasse 10
D-65232 Taunusstein Germany

This is to certify that representative samples of DAKS- Server
Model: DAKS US

Have been investigated by Underwriters Laboratories Inc.® in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 60950-1 - Information Technology Equipment Safety - Part 1: General Requirements
CSA C22.2 No. 60950-1 - Safety of Information Technology Equipment

Additional Information: Rating(s):
DAKS (3HE): Input: -36VDC up to -60VDC, max 30W
DAKS (6HE): Input: -36VDC up to -60VDC, max 60W

Only those products bearing the UL Recognized Component Marks for the U.S. and Canada should be considered as being covered by UL's Recognition and Follow-Up Service and meeting the appropriate U.S. and Canadian requirements.
The UL Recognized Component Mark for the U.S. generally consists of the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory. As a supplementary means of identifying products that have been produced under UL's Component Recognition Program, UL's Recognized Component Mark, ᴿᴿ may be used in conjuction with the required Recognized Marks. The Recognized Component Mark is required when specified in the UL Directory preceeding the recognitions or under "Markings" for the individual recognitions. The UL Recognized Component Mark for Canada consists of the UL Recognized Mark for Canada: ᴿᴿ and the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory.

Look for the UL Recognized Component Mark on the product

Issued by: Elisabeth Gingelmaier
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UL International Germany GmbH

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