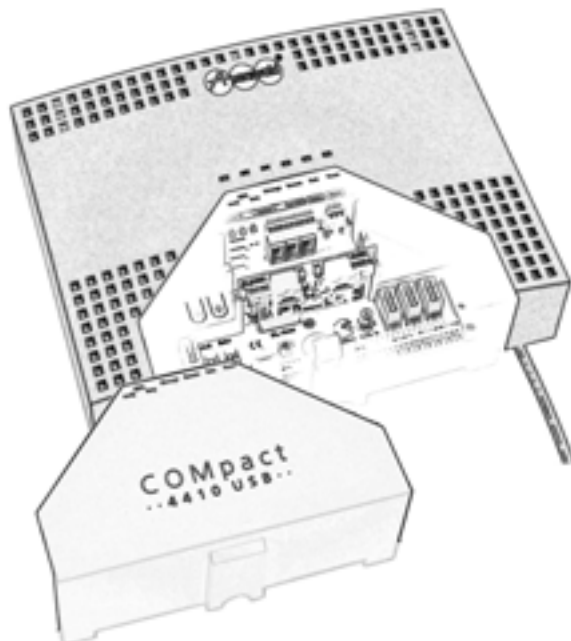# Installation and Configuration Manual

for the Administrator

> The PBX is able to download the latest firmware by pressing a button or by time automation. The manual has information about being up-to-date in the chapter "Automatic PBX Software Update".
> Attention: Outside of Germany you have to add the international access code for Germany with the PC program COMset to the number of the update server.

ISDN PBX Systems

COMpact 4410 USB
COMpact 2206 USB

COMpact 4410 USB

Auerswald ®

Special Functions for Business Applications

Service Functions, Problem Solving

Dear Customer!

In order to install your new PBX please contact an authorized dealer.

The case may only be opened by authorized personnel[1]. Installation work inside the open case as well as maintenance services involving the keys inside the case are only allowed to be executed by authorized personnel[1].

Please pay attention to the General safety advises on .

---

1. Authorized personnel: These are persons that are trained for this purpose (e.g. certified electricians). They must have the necessary knowledge about the work in an area with potentially hazardous voltages. They must also have the knowledge about the latest electrical safety standards and requirements.

Functional Description and Overview

The PBX is designed for the connection to the digital telecommunications network ISDN (Point-to-Point connection and/or Point-to-Multipoint connection). It enables the switching from the public communication net to different internal devices. The so-called terminals may be system telephones (COMfort 1000, 1200 and 2000), ISDN devices as well as analog devices.

The ISDN devices (e.g. ISDN telephones, ISDN PC controllers) should be certified Euro-ISDN devices in order to guarantee a proper functionality. The analog subscriber connections enable the connection of most pulse dialling, dual-tone multifrequency dialling and also of CLIP compatible units (telephone, fax machine, answering machine, modems). Devices with dual-tone multifrequency dialling must have a FLASH key (also called signal key R).

Thanks to functions like e.g. Short-Code Dialling, conference, splitting and internal free of charge connections the PBX makes the daily telephone communication simple, comfortable and time saving. Additional to the telephoning the PBX offers numerous functions such as call charge recording.

The PBX can be configured to your special personal requirements with the configuration software *COMset*. Three further PC programs allow to comfortable manage call charge data, Short-Code Dialling, call allowances, wake-up calls, Music on Hold and the data for the automatic or manual Least Cost Routing.

With help of the ISDN application package the functionality of the integrated USB interface can be used to perform the most important features of modern data communication (fax, answering machine, data transfer, internet) in a professional way via PC.
Please observe the system requirements ().

☞ *The scope of functions described here is only completely usable with a professional installation and a correct configuration of the PBX and the connected PC. We highly recommend to consult your authorized dealer first.*

Please ask your network operator about the availability of some ISDN service attributes. Some of these functions may be available for an extra fee.

There may be some incompatibility in combination with terminals and devices of other vendors, that adversely influence the usability of functions.

*To fully utilize the scope of functions described here, the PBX system must have the **Software version 1.6 A** and the system telephone must have the software version 2.0 H or newer (you may receive information about these versions via system telephone). If this is not the case, please perform a firmware update of the respective device.*

Extent of Supply

- 1 COMpact 4410/2206 USB in the basic unit.
- 1 ISDN connection cable.
- 1 USB connection cable.
- PC software:
  For Windows 95/98/Me/2000/XP and Windows NT4.0 (with Service Pack 3 or better), if you use the USB interface Windows 98 SE/Me/2000/XP only.
- manual set, consisting of:
  1 installation and configuration manual for the administrator, 1 operation manual for the user and 1 CAPI/TAPI user manual.
- installation material: screws and plugs.

Functions and Features of the basic Unit

- Connecting possibilities for 6 analog subscribers (*COMpact 2206 USB*) or 10 analog subscribers (*COMpact 4410 USB*) and 1 system display SD-420 (Auerswald accessory).
- 1 external S_0 port.
- 1 internal S_0 port.
- Free configurable telephone numbers (10-59/100-599) for the internal subscribers/groups.
- Charge control by 6 different classes of service, blocking numbers, release numbers and special Short-Code Dialling authorization as well as by setting of a call allowance account.
- Watching the charging information via PC or via telephone (AOCE or AOCD necessary). Metering pulse for analog telephones.
- Call data management via PC software. Recording of 3000 call data entries in a power failure proof call data memory.
- Selection of the telephone number presented to the caller or the person you called.
- Dialling assistance by a power failure proof Short-Code Dialling memory or setting of direct public exchange telephones.
- Wake-up and timer functions via internal clock. Automatic setting of summer/winter time.
- Music on Hold, 7 internal or external melodies via audio input, prerecorded announcement text can be activated.
- Music on Hold downloadable as a .wav-data file into the PBX (*COMpact 4410 USB* only).
- Text before answering and alarm announcement: Text is storable in the PBX (*COMpact 4410 USB* only).
- Announcement function via audio output.
- Different ringer rhythms for the distinction of the calls.
- Protection against unauthorized programming/telephoning with passwords and programming protection.
- Room monitoring and programming of the Call Forwarding from external telephones.

- Optimal availability due to internal and external Call Forwarding, Call Waiting and Busy-on-Busy.
- Security in emergency situations by baby/senior call, emergency Short-Code Dialling memory, emergency priority call and priority call in case of Do-not-Disturb service.
- Call Forwarding, Splitting, Conference via 2nd B channel.
- Call protection against certain callers.
- Group formation of internal subscribers.
- Up to 57.600 bps data transfer (V.90) on the analog extensions.
- Exchange line reservation, pick-up and explicit call transfer to an external phone.
- PBX software update via PC or telephone connection.
- Dialling support by PC (TAPI).
- Remote reading, remote programming, remote programming via exchange line from the outside.
- Integrated data interface (ISDN PC adapter functions) via USB interface.
- NDIS-WAN-driver for
  - channel bundling, internet access with up to 128 kBit/s,
  - dynamic bandwidth use in combination with Windows 2000.

T-Net-Functions of analog Telephones supported by the PBX

If you use a T-Net compatible analog telephone, these functions will be able to be executed via the existing function keys.

- Permit, accept, refuse Call Waiting.
- Alternation.
- Start conference with 3 persons.
- Start Query, finish.
- Configure Subscriber Call Forwarding.
- Configure connection without dialling (baby call).
- Start recall on busy.
- Suppress telephone number presentation once.

ISDN Features supported by the PBX

- Conditional suppression of the own telephone number presentation (CLIR).
- Parking (TP) on the PTMP connection or on the internal S_0 port.
- Call forwarding on busy (CFB), if nobody takes the call (CFNR), always (CFU).
- Transmission of the connection charges during (AOCD) and at the end (AOCE) of the connection.
- Recall on busy (CCBS) and on no reply (CCNR).
- Telephone number display (CLIP) on SD-420, system telephones, internal ISDN units and analog telephones (special analog terminals are necessary that support CLIP).

☞ *Please ask your network operator about the availability of some ISDN service attributes. Some of these functions may be available for an extra fee.*

Extension Options (Slots)

The PBX may be extended by special modules.

The mainboard of the *COMpact 2206 USB* has 1 module slot for the following module:

- *COMpact TS-Module (slot B).*

The mainboard of the *COMpact 4410 USB* has 3 module slots for the following modules:

- two *COMpact TS modules (slot B and C[1]).*
- one *COMpact 2S$_0$ modul*e *(slot A).*

Extension Options (Module Features)

The COMpact 2S$_0$ module has 2 S$_0$ ports (one internal S$_0$ port and one S$_0$ port that can alternatively be used as internal or as external S$_0$ port).

With the *COMpact TS Module you get the following additional functions:*

- Door terminal function with 1 door terminal system TFS-Dialog or TFS-Dialog pro (Auerswald accessory) or another door handsfree device according to FTZ 123 D12-0.
- connection of 1 door opener.
- 2 door bell key inputs.
- Alarm function with up to 2 alarm contacts[2].
- Remote switching with up to 3 relays[3].

---

1. If a COMpact TS Module is used in slot C, the audio in/out function is not available.
2. One door bell input is replaced by one alarm contact.
3. 2 switching relays are used for each door terminal.

Instructions for using the Manual

The package of the *PBX* includes three manuals:

- 1 installation and configuration manual for the service and
- 1 operation instruction manual for the user.
- 1 CAPI/TAPI manual (Fax, Internet, data transfer)

This manual describes the installation and configuration of the *PBX*. It also includes a short description of the included software and the associated options for the configuration of the *PBX*.

This manual sorts explanations according to certain question types.

In order to get certain information quickly and carefully directed, the manual will offer you different helps and guide lines:

- The table of contents on page 3 gives you an idea of content and organization of the operating manual.
- The index on page 63 helps you to find text locations for a certain term.
- In the texts you will be referred to other chapters or pictures with the help of cross references.
- The headlines on each page remind you in which chapter you are at the present. On the left side of the pages the headlines of the actual chapter will be repeated. On the right side the headlines of the paragraph will be repeated.

Abbreviations used in this Manual

DDI	Direct Dialling In number in case of a PTP connection (**D**irect **D**ialling **I**n)
MSN	Multiple Subscriber Number in case of a PTMP connection (**M**ultiple **S**ubscriber **N**umber)
NT	Network termination unit for the basic connection (**N**etwork **T**ermination)
CF	Call forwarding

Symbols used in the manual

The danger sign shows you an important advice. You must absolutely take care of these in order to avoid damages to devices or even to persons.

The hand gives you additional advice. These refer you to circumstances that were often disregarded and therefore led to misunderstandings and longer search for an error.

LED flashes.

LED is on.

General Safety Advice

When handling with 230 volt supply voltage and with the units supplied by this voltage the relevant electric safety regulations must absolutely be observed.

Please pay attention to the following general safety advice by all means:

- All devices must be installed without current. (e.g. in case of maintenance work).
- All devices may only be put into operation if they are properly built into the case.
- Units that operate with external voltage - especially with supply voltage - may only be opened if they were disconnected from the voltage source or from the mains first.
- The mains cables of the electric devices and the connection cables must regularly be checked for damages. If you discover damages, the concerning cables must be replaced.

- The use of tools near or on covered or open circuit lines and circuit boards as well as on and in devices that are supplied with external power - especially with mains voltage - must be avoided as long as the supply voltage is not switched off and the device is not made free of voltage by discharging existing capacitors. The charge capacitor of the switching power supply unit can be charged for a long time in case of a failure even after being switched off.
- If you use construction elements, components, assembly groups, connections and units, you must absolutely take care of the limitation values for voltage, currency and power consumption indicated in the technical data. Exceeding those limitation values (also shorttime) may cause extensive damages.
- The units, unit assemblies or connections mentioned in this operation instructions may only be used as described. If you are not sure how to use the merchandise, please ask a specialist.

Technical Data

PBX Basic Configuration

Power Supply

Operating Voltage	230 V∿ ± 10%, 50 Hz
Nominal current	*COMpact 2206 USB*: max. 140 mA
	COMpact 4410 USB: max. 160 mA
Isolation class	I
Power consumption	*COMpact 2206 USB*: max. 16 VA
	COMpact 4410 USB: max. 25 VA

Temperature Range

Operational	+0...+40 Degree Celsius, Protect against direct sunlight!
Storage and Transport	-20...+70 Degree Celsius
Humidity	10 - 75%, non condensing

External Connections

Usage	1 S_0 port external
Connector Type	Western modular jack RJ-45
Connection Type, external	S_0 basic rate connection as Point-to-Multipoint or Point-to-Point connection, Euro-ISDN (DSS-1), PBX is self powered
Termination Resistors	not available

Analog Subscriber Connection

Usage	*COMpact 2206 USB*: 8 connections for analog devices *COMpact 4410 USB*: 8 connections for analog devices
Connector Type	detachable screw clamp connectors (for three subscribers also TAE-jacks[1])
Dialling method	pulse dial or DTMF
Voltage unloaded	max. 40 VDC
Loop current	app. 21 mA
Range	2 x 50 Ω, app. 800 m at 0,6 mm $\emptyset$
Ringer Voltage	app. 45 V_{eff}, switchable 25 Hz/50 Hz
Dial Tones	425 Hz $\pm$ 5%, Interval $\pm$ 10%
Impedance analog	symmetric Germany, Switzerland, Luxembourg, Denmark: Z_R Austria and Spain: 600 Ω
Charge meter pulse	switchable, 12 kHz/16 kHz

Internal S_0 Port

Usage	1 S_0 port internal
Connector Type	4-pole detachable screw clamp connectors, additionally western modular jacks
Connection Type, internal	S_0 basic rate connection as Point-to-Multipoint connection, EURO-ISDN (DSS-1)
Devices, internal	8 ISDN devices maximum, 4 line powered devices maximum e.g. different ISDN telephones (2 telephones is recommended)
Range, internal	150 m maximum (for bus wiring, please observe the european standards ENV 41001 [DINV 41001] and EN 28877)
Termination Resistors	switchable; default factory settings: on

System Display Connection

Connector Type	detachable screw clamp connector (and TAE-jack)

PC Connection

Serial Interface	RS-232-C, V.24, 9600-57600 Baud (8 bit, no parity, 1 stop bit), no handshake detachable screw clamp 3-pole connector
USB Interface	Full Speed, V 1.1

Music Input/Output

Input Level	adjustable from -18 to +10 dB (1 V_{eff})
Output Level	max. 1 V_{eff}
Impedance	1 kΩ

Other Data

Casing	ABS, Cabinet with cover
Size (W x H x D)	301 mm x 243 mm x 86,5 mm
Weight	app. 1500 g
Safety	EN 60950, CE

COMpact 2S$_0$ Module

Connection Options

Usage	1 S_0 port internal, 1 S_0 port switchable as internal or external S_0 port (jumper)
Connector Type	4-pole detachable screw clamp connectors, additionally western modular jacks
Connection Type, external	S_0 basic rate connection as Point-to-Multipoint or Point-to-Point connection, Euro-ISDN (DSS-1), PBX is self powered
Connection Type, internal	S_0 basic rate connection as Point-to-Multipoint connection, EURO-ISDN (DSS-1)
Devices, internal	8 ISDN devices maximum, 4 line powered devices maximum e.g. different ISDN telephones (2 telephones recommended)
Range, internal	150 m maximum (for bus wiring, please observe the european standards ENV 41001 [DINV 41001] and EN 28877)
Termination Resistors	switchable; default factory setting: on

Other Data

Installation	Slot insert in the case of the *COMpact 4410 USB*
Power Supply	from *COMpact 4410 USB*
Size	92 x 60 x 17 mm
Weight	ca. 49 g
Safety	EN 60950, CE

COMpact *TS Module*

Connection Options

Usage	3 Relay outputs, default factory settings: for the door terminals, 2 door key inputs reconfigurable to alarm inputs
Connector Type	detachable screw clamp connectors
Interface Door Terminal	FTZ-123-D12-0
Power Supply Door Terminal	12 VDC, 100 mA
Relay Contact	floating, 30 V/1 A maximum
Door Key Input Voltage	configuration dependent 0 V or 5-15 VAC/DC with door key (make contact)
Alarm input voltage	Depending on configuration 0 V or 5-15 V AC/DC via alarm contact (make contact)
Active condition Alarm input	Contact closed for more than 0,5 sec

Other

Installation	Slot in the cabinet of *COMpact 4410 USB* or *COMpact 2206 USB*
Power Supply	from *COMpact 4410 USB* or *COMpact 2206 USB*
Size	92 x 60 x 14 mm
Weight	ca. 47 g
Safety	EN 60950, CE

Technical changes may be introduced without prior notice

Technical Advice (Power Outage)

If you like to use the PBX during a power outage, you will need an uninterruptable power supply, e.g. the USV-500 Sinus (Auerswald accessory).

You can switch a single emergency mode telephone like the system telephone *COMfort 1000* (Auerswald accessory) during a power outage from the internal to the external S_0 port with the ISDN-Autoswitch (Auerswald accessory).

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1. Outside of Germany Western modular jacks (Layout)

This chapter may help you to install and power-up your PBX for the first time and to define the necessary basic configuration that allows internal as well as external telephoning.

It is presumed that you use the PBX in the default factory setting mode without extension modules and that you only like to connect a couple of telephones for trying out. In the following chapters the installation of the modules and the laying of fixed wiring is described.

Open the Case (Connection Area)

Grasp with the forefinger into the opening of the cover as shown in Pic. 1 and move this part of the cover away from the case to release the locking. At the same time take the cover upwards to completely remove it from the connection area.

⚠️ *ATTENTION: The case may be only opened by authorized personnel[1]*

Please pay attention to the fact that the plug must always be pulled out while opening the case. Touching the voltage leading conductor tracks or the telephone connections may be danger to life.

Do not install your PBX during a thunderstorm.

As some of the component parts are sensitive to electrostatic discharge, it is important to discharge yourself before touching the mainboard with your hands or with tools. You should touch a grounded metal device, such as a radiator or the case of a PC.

The screw mounted case cover part serves as a touching protection against dangerous voltage and must not be removed. Removed or destroyed caps on top of the screws (Pic. 2) will let the guarantee be terminated.
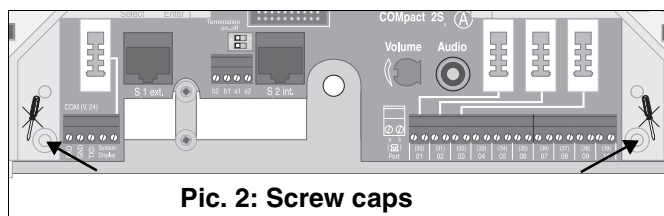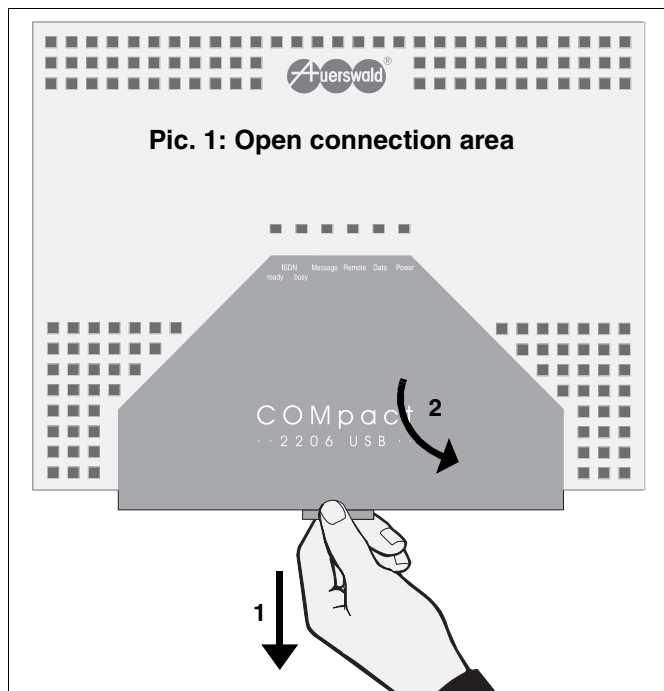
Pic. 1: Open connection area

Pic. 2: Screw caps

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1. Authorized personnel: These are persons that are trained for this purpose (e.g. certified electricians). They must have the necessary knowledge about the work in areas with potentially hazardous voltage. They must also have the knowledge about the latest electrical safety standards and requirements.

Select Installation Location

Please pay attention to the following issues when selecting the installation location for the PBX:

■ The PBX may only be operated in closed and dry rooms.

■ Near the installation location you are in need of an **unobstructed** 230 volt mains plug with protective earthing for the power supply. Please make sure that the mains plug is properly connected (according to electric safety regulations).

■ The PBX must be next to the NT in order to avoid long transmission ways between both units (the enclosed ISDN connection cables are app. 1 m long). If it is not possible, a fixed wiring (S_0 bus) between both units will be necessary.

■ The surrounding temperature must be from 0 °C up to + 40 °C.

■ The devices may not be exposed to direct sun light.

■ The relative humidity may be between 10 % and 75 %.

■ No condensation may occur.

■ The unit must be protected against splashing water and excessive dust.

■ Please avoid mechanical stress (e.g. vibrations) and the close neighbourhood to devices that radiate electromagnetic fields or interfere with these units (e.g. radios, HAM-radio installations, mobile telephones, DECT-systems or similar).

Mount the Case onto the Wall

The installation material (screws and wall plugs) as well as a drill template is part of the extent of supply.

■ Hold the drill template onto the place where is should be mounted and mark the drill holes on the wall. There are three holes available for wall mounting.

■ Make sure that around the marks no hidden supply pipes or cables are in the wall.

■ Drill the holes with a diameter of 6 mm and put the dowels into the holes.

■ Screw the two top screws into the wall until the screw heads have app. 5 mm distance to the wall.

■ Now you hang the PBX on the screws and pull it on the wall downwards until it stops.

■ Screw the PBX with the third screw into the bottom dowel. (see Pic. 4).

Pic. 4: Screw the case onto the wall

Abb. 3: Distance of the screws to the wall
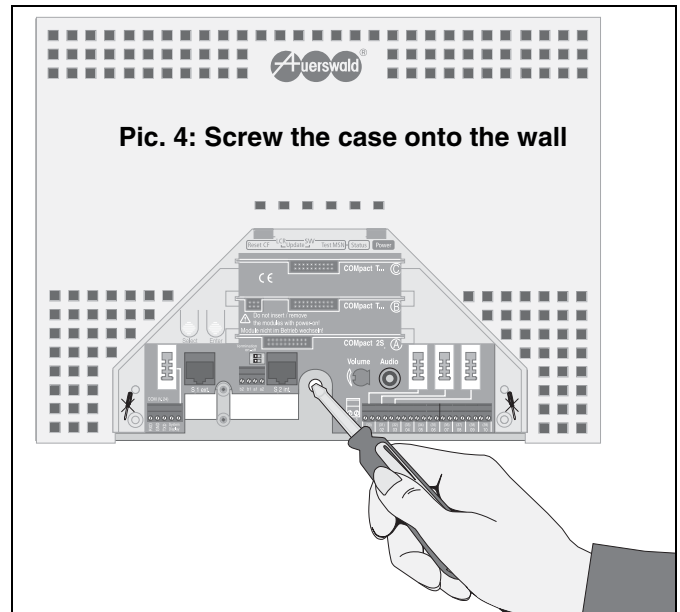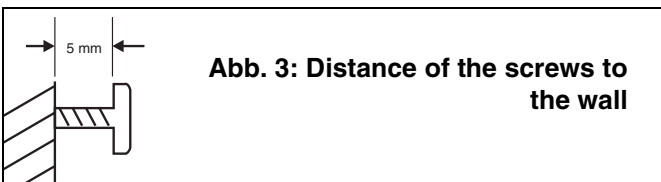
Connect the Telephones

Connect an ISDN telephone directly to the western modular jack[1] called „S02 int." or use an ISDN distribution jack such as e.g. the ISDN Multiplug (Auerswald accessory) to connect multiple ISDN devices (see Pic. 6).

Connect up to three analog telephones directly with the three TAE jacks[2] at the right side (see Pic. 5).

☞ *If the distances are longer than 10 m you have to lay an internal S_0 bus for the ISDN telephones. These and additional facts are described on .*

If the analog telephones work on a longer distance to the PBX, the connection is done via wall jacks connected to the analog screw clamp. These and other facts are described on .

Pic. 5: Connect analog Telephones
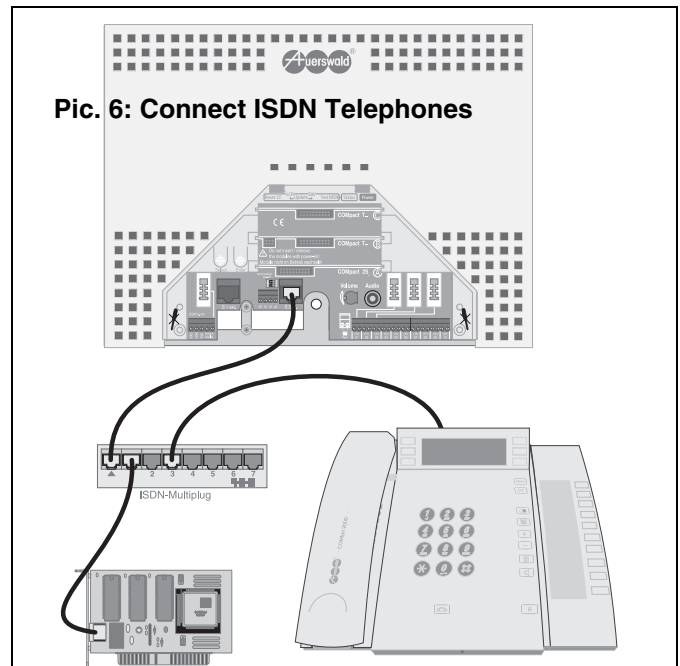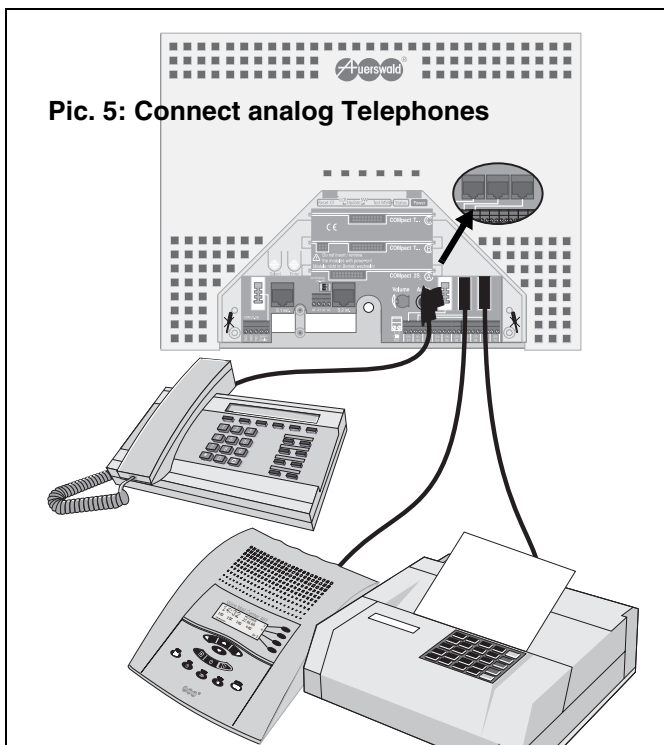
Pic. 6: Connect ISDN Telephones

ISDN-Multiplug

---

1. Technical modifications in the layout may lead to a change in the position of the ISDN jacks and clamps.
2. Outside of Germany Western modular jacks (layout diagram)

Connect a PC for the Configuration

To be able to configure the *PBX*, you have to establish a connection between your PC and the *PBX* and install the software on your PC. Depending on the connection option of your PC, please observe the following advises:

① Your PC is connected directly via USB port with the *PBX* (Pic. 7). This requires a USB interface on the PC. The cable is enclosed.

② Your PC is directly connected via serial port with the *PBX* (Pic. 8). The cable is not enclosed.

③ Your PC is connected with the *PBX* via an ISDN PC-controller with CAPI 2.0 driver software installed in your PC. This ISDN PC-controller is connected on the internal ISDN bus.

④ Connection between PC and USB port of a system telephone *COMfort 1200 or 2000* on the internal S_0-Port of the *PBX*. This requires a USB interface on the PC.

☞ *You will get more information especially about the fixed wiring of connections and about the minimum requirements of the PC on page 30.*
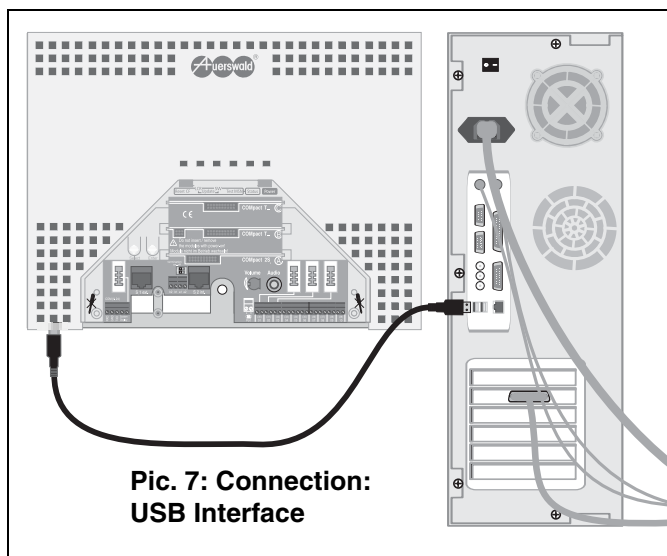
Pic. 7: Connection: USB Interface
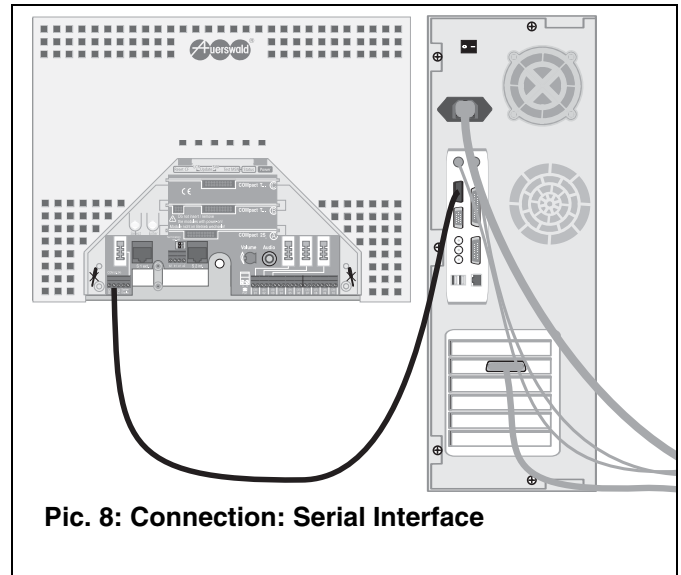
Pic. 8: Connection: Serial Interface

Connection to the NT

Connect the western modular jack[1] named „$S_0$1 ext." directly with the enclosed ISDN cable to the NT (see Pic. 9 on page 13).

☞ *You will get more information especially about the connection to a remote NT page 20.*
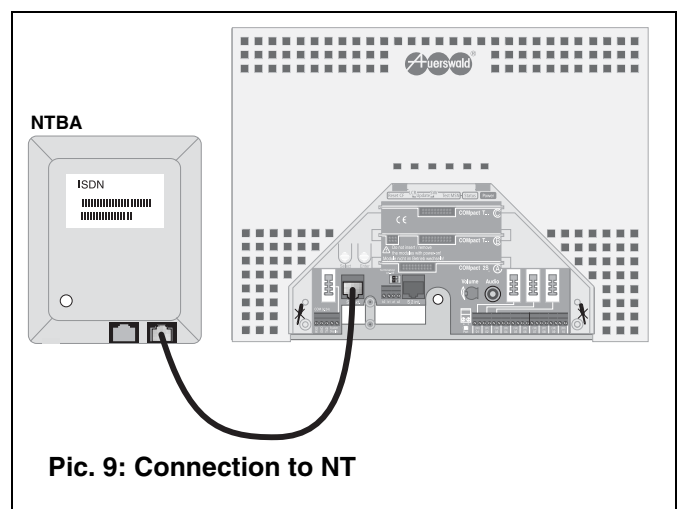
Pic. 9: Connection to NT

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1. Technical modifications in the layout may lead to a change in the position of the ISDN jacks.

First Power-On

Connect the PBX with an **unobstructed and accessible 230 Volt wall socket with protection earth contact.** The green power LED shows the connection with the supply voltage.

After power-on the Data/Status-LED will glow red (orange) for some seconds: The PBX is initializing. As soon as the Data/Status-LED is off, the PBX is ready for operation. But if the Data/Status-LED remains red, there may be some defect (other possible displays: see chapter *Default Information Status of the LED Display* on page 52)

☞   *If you like to do a functional test prior to the configuration of the PBX, e.g. you will be able to make an internal call. Simply use the internal telephone numbering plan that was created by the PBX during the first operation. The initially created internal telephone numbering plan is described in chapter The Default Factory Set-tings on page 36).* These are printed for the analog subscribers in front of the screw clamps (30, 31, 32, ...) on the mainboard **and can be changed via configuration program at any time.** *For the ISDN telephones attached to the internal S_0-Port the telephone numbers 41 and 42 are configured in the default settings. The 1st MSN entered into individual Auerswald system telephones, ISDN telephones as well as ISDN PC-controllers must match with the here created internal number (please consult the chapter Configuration of ISDN Devices on page 18 and make sure that this 1st MSN of the corresponding device is also presented to the PBX).*

For some ISDN telephones the connection to the 230 volt mains for power supply is needed.

Install the Configuration Software

Now start the connected PC and install the configuration program *COMset* from the Auerswald Mega CD.

① Insert the CD-ROM (Auerswald Mega Disk) into the CD-ROM drive.

② Sometimes the installation will not be started automatically. In this case you can start Setup manually: On your desktop click on the „Start" button in the task bar and select „Run".
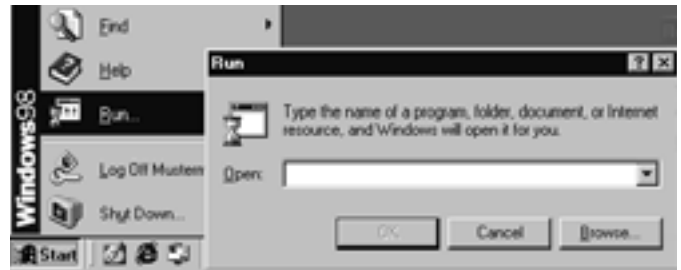
③ Open the CD-ROM drive with the Auerswald CD-ROM. Select the application „Setup" in the root directory by double click.

④ Then click on „OK".

⑤ Follow the instructions on the screen. You will find the installation for the configuration program *COMset* under the software for the corresponding system.

☞   *If you connect the PBX via USB to the PC and if both devices are switched on, the hardware assistant of Windows 98 SE/ 2000/Me/XP will start automatically in order to support you when installing the necessary drivers. Please consult the description of the Auerswald USB driver installation in your CAPI/TAPI manual.*

Creating a Basic Configuration

☞ *After the first power-on the configuration of the PBX via CAPI (ISDN-PC-controller or COMfort 2000) is possible one time only. For later configurations you have to configure an ISDN PC-controller as internal subscriber of the corresponding S_0 port. (In case that the ISDN PC-controller does not present any MSN, the PBX will automatically map the PC-controller to this subscriber).*
The ISDN PC controller may not be used as „Direct Exchange line telephone". The programming authorization must be configured for the corresponding S_0 port.

① Start the configuration software for the PBX by clicking on the corresponding symbol on the desktop or via „Start ... program ... Auerswald ... COMset .... (It may be necessary to cancel the dialog „load configuration" after the start.)

② Select the interface in the menu under „options... interface".
If there is a connection via USB interface, select the „USB" option.
If there is a connection via serial interface, select the correct V.24 COM port of the PC (e.g. COM 1).
If there is a connection via an ISDN PC-controller, select the option „ISDN PC-controller (CAPI 2.0)".
If there is a connection via COMfort 2000 (Routing, page 35) select „ISDN PC-controller (CAPI 2.0)" or „USB".
If there is a connection via COMfort 1200 (Routing, page 35) select the „USB" option.

☞ *In case of an indirect connection of the PC to the terminal to be configured (e.g. PC connection to the USB port of a COMfort 2000 to configure the PBX), the transmission will be faster if the interface is set to „ISDN controller (CAPI 2.0)" (using the B channel) instead of the selection „USB" (using the D channel).*

③ Click on the top left button „New" to open a new configuration.
In the next dialog you select the device type to configure.

☞ *If you like to modify the internal telephone numbers assigned by the default settings of your PBX, read the existing configuration out of the PBX instead of opening a new configuration (with the button „Open" and then „PBX").*

④ Open the window „Module settings" and click with the left mouse key on the picture of the external S_0 port ($S_0$1) at the right bottom to display the configuration options. Select the „Kind of connection" of the attached NTs.

On the right side of the window the modules (here for the *COMpact 4410 USB*) still available are displayed. If you extend the PBX with a module, activate it with a right mouse key. Then you click with the left mouse key on the corresponding picture again to display the configuration options of the module. If you configure a $2S_0$ module the „kind of use" - that means internal or external - is selectable in addition to the „kind of connection".

①

②

③

④

⑤ Now click on „Exchange line numbers" in the left window pane. The window content appearing is dependent the kind of connection (Point-to-point connection, Point-to-multipoint connection or mixed).

You have to enter the country code and area code into entry fields at the top of the window.

Point-to-point connection: In case of a Point-to-point connection (a base number with additional **D**irect **D**ial **I**nward numbers) you have to enter your base number **without** area code into the column „PtP base number" of the first table.

If you have two ISDN exchange lines with the same base number (*COMpact 4410 USB* with 2 external S_0 ports only), please enter these separately and activate both check boxes in the column „bundle".

(The reception number, e.g. „0", is not part of the base number, but is a **D**irect **D**ial **I**nward number.)

The **D**irect **D**ial **I**nward numbers received from the network provider are entered into the column „MSN/DDI" of the following table.   (If you have the **D**irect **D**ial **I**nward number block 1-99 and use the 1, the numbers 10-19 are not available anymore) Assign an S_0 port to each number by activating a check box in the column „S_0 1, ...". (If you have a trunk bundle for S_0 ports 1 and 2 on a *COMpact 4410 USB* both columns are activated simultaneously.)

Example:

05306 / 9200 - 0

area code   base number   DDI number

Point-to-multipoint connection: In case of one or two Point-to-multipoint connections you have to enter your MSNs **without** area code into the column „MSN/DDI". Assign an S_0 port to each number by activating a check box in the column „S_0 1, ...".

PtP connection

⑤

PtmP connection

⑥ Now click on „internal telephone numbers" in the left window pane. You can create internal subscribers in this table by entering the number and assigning this number to a port (select analog or S_0 ports in the column „Module", select port number in the column „Internal port" and kind of device in the corresponding column).

The two-digit numbers 10-59 and the three-digit numbers 100-599 are available. The usage of two-digit numbers reduces the available amount of three-digit numbers. Example: If the **number 11** is assigned, the numbers **110-119 (Emergency numbers!)** are not available anymore.

The program can also generate a rising list of numbers (enter the smallest number, step into the name entry field to the right with the right arrow-key and start the function by clicking the right mouse key).

☞ *The 1st MSN entered into individual Auerswald system telephones, ISDN telephones as well as ISDN PC-controllers must match with here created internal number (please consult the chapter Configuration of ISDN Devices on page 18 besides this make sure that this 1st MSN of the corresponding device is also presented to the PBX.*

⑥

⑦ Now click on „call distributions ... External -> subscriber" in the left window pane. You can define the distribution of external calls to individual internal subscribers in this table (the exchange line numbers are listed top to bottom and the internal numbers are listed left to right). Click on the coloured buttons „immediately" or „delayed" first and then into the fields to be modified.

If internal numbers and external **D**irect **D**ial **I**nward numbers (**DDI**s) are matching, you can create a 1:1 assignment with the „linear call distribution". If you have received the **D**irect **D**ial **I**nward numbers - 40 to -59 for your PtP-connection and created the same numbers 40 to 59 in the window „internal telephone numbers", you can assign the corresponding internal number to each external DDI by clicking on the button „linear call distribution".
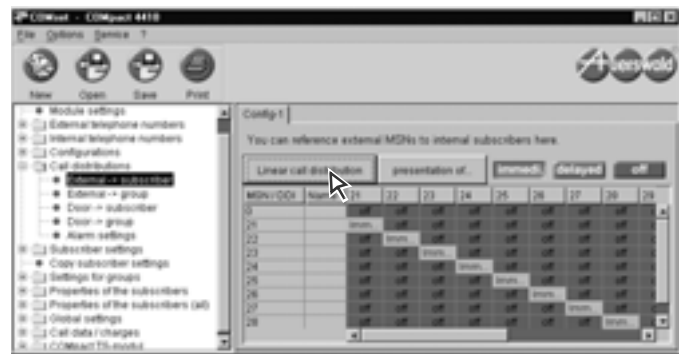
⑦

⑧ You have defined a basic configuration now which enables you to make and receive calls. This configuration has to be stored into the PBX. Click on the button „Save" and then on „PBX".

For backup purposes you can save this configuration to disk by clicking on „Save" and then „File".

⑧

⑨ If you connect more than one Auerswald device to the selected interface (e.g. PBX and system telephone to the USB port), select the direct connection to the PBX here. If this is not available, you are able to store this configuration via system telephone *COMfort 1200 or 2000* into the PBX (Routing; see also).
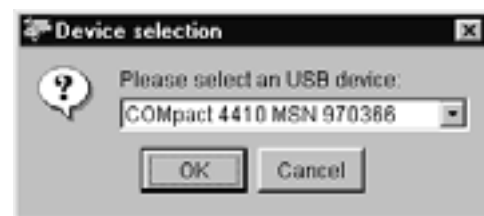
⑨

⑩ If you stored the configuration into the PBX and saved it to a file (option), you may close the configuration (click „File" and „Close") or leave the PC program (click „File" and „Quit"). In either case, you will be asked, if you like to discard your settings. Click on „No".

⑩

Final Steps

Configuration of analog Devices

If you pick up the receiver telephone after having plugged in a new telephone, please dial ⑦ and hang up. Thanks to this the PBX will learn the dialling mode.

If the new telephone has a dual-tone multifrequency dialling, check whether the FLASH key was set and set the FLASH period as short as possible (see operation instruction of the telephone). Then you execute the programming described in the following. Subsequent to this the PBX has learned the exact duration of the FLASH time of your telephone. This is very important e.g. for the transfer or Query. Analog telephones that execute certain function via T-Net function key/menu are using a long FLASH (300 ms). Often an additional FLASH key is available. Configure this also to 300 ms and execute the following programming again.

Learn Flash duration

| your DTMF telephone | 7 | public password | 5 5 | press the FLASH key twice | # |

Configuration of ISDN Devices

You must inform each Auerswald system telephone and each ISDN device (Euro-ISDN telephones, ISDN FAX machines, ISDN PC controllers etc.), about the internal telephone number it has to react on. For this purpose you enter the telephone number (for example 27; see pic. ⑥ on page 16) as 1st MSN into the device. How this does work can be learned in the operation manuals of the corresponding devices.

Due to the free telephone numbering plan it is only clear after having finished the configuration which internal telephone number is available for the corresponding internal S_0 port. If you like to enter telephone numbers into a couple of telephone numbers nevertheless in order to make internal test calls before starting the configuration, simply use the internal telephone numbering plan created by pressing a button.

Please use each of these telephone numbers once. If one of these numbers is assigned twice, a proper functionality cannot be guaranteed anymore.

Besides this make sure that this 1st MSN of the corresponding device is also presented to the PBX.

You may also perform the terminal device test to check the numbers (chapter *Terminal Test on the internal S_0 Ports* on page 55).

Normally an ISDN subscriber is fixed to the internal S_0 port which he was configured for. But if you activate in the configuration program _COMset_ that the ISDN subscribers may move from port to port, all the ISDN devices will be allowed to be connected to any other internal S_0 port. The PBX recognizes the subscriber again and registers him to the other port if the receiver is picked up for a short moment after plugging into another ISDN wall jack. Also in this case the maximum quantity of ISDN devices on one internal S_0 port must not be exceeded.

PBX Software Update

If you like to make sure that the PBX has the most current operation software, you can execute an automatic PBX software update now (see chapter *Automatic PBX Software Update* on page 55).

Close the Case

If you finished the installation and put the cable properly into the cable space you can close the cover. Insert the cover of the connection area at the top into the cabinet and press the bottom down until it clicks into position.

The PBX has 1 internal S_0 port and 1 S_0 port. The connection to the external S_0 port is possible via a Western modular jack. The connection to the internal S_0 port is possible via fixed wiring to the 4 clamps b2, b1, a1 and a2 or directly to a western modular jack.

The *COMpact 4410 USB* may be extended by two additional S_0 ports with one *COMpact 2S_0 Module*.

Description and Installation of the COMpact 2S_0 Module

The *COMpact 4410 USB* may be extended by two additional S_0 ports with one *COMpact 2S_0 Module*. The module is not in the extent of supply of the *COMpact 4410 USB*. It has 1 internal S_0 port and 1 S_0 port that can alternatively be switched as internal or external S_0 port. The switching is done by a three-row jumper. Pay attention to the labelling on the *COMpact 2S_0 Module* and insert the jumper into the correct position (see also Pic. 10). Per default this S_0 port is configured as external S_0 port.

The connection to the S_0 ports is possible via fixed wiring to the 4 clamps b2, b1, a1 and a2. Besides this you have western modular plugs.

Insert the module between the board rails (slot A) and press it to the mainboard until it clicks well into it´s position (Pic. 11).

⚠️ *Disconnect the device from the 230 Volt power supply and wait another 10 seconds before you plug a module in or remove it.*

As some of the component parts are sensitive to electrostatic discharge, it is important to discharge yourself before touching the controller with your hands or with tools. You should touch a grounded metal device, such as a radiator or the case of a PC.

☞ *Please perform the necessary settings on the module before insertion. This is important for the termination resistors and the S_0 port configuration (internal/external).*

Pic. 10: Reconfigure S_0 port 3

external | internal

S_0 int. / ext. | S_0 int. / ext.

Pic. 11: Insert COMpact 2S_0 Module
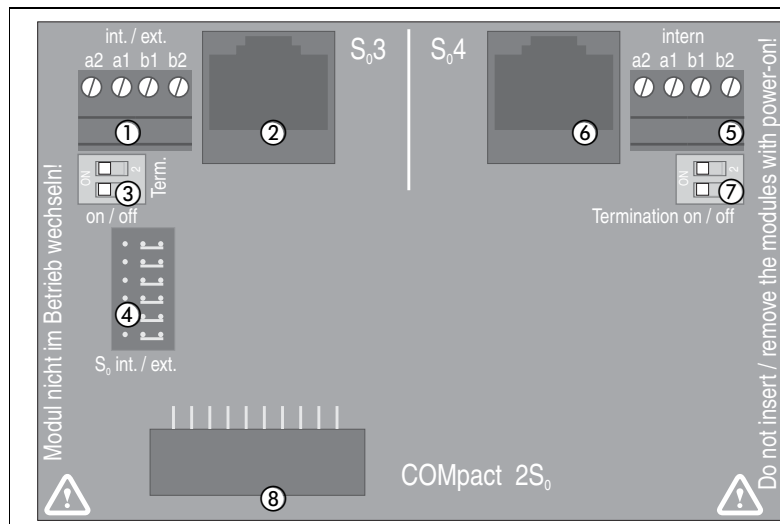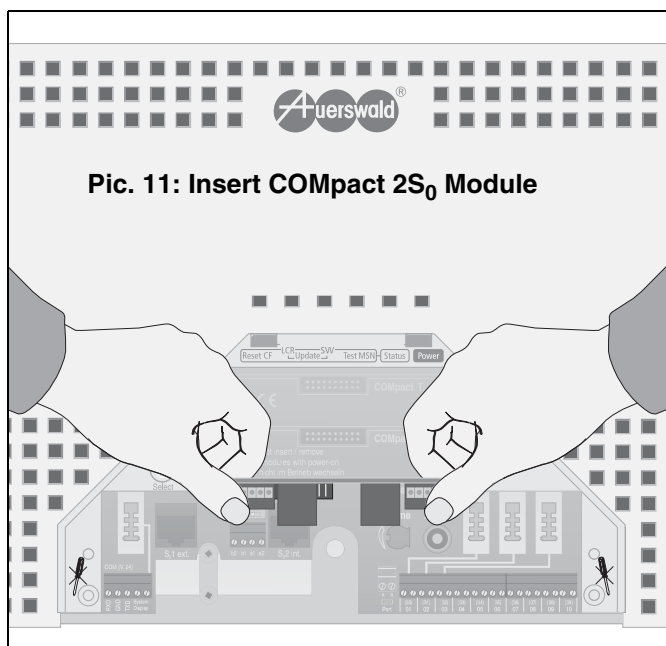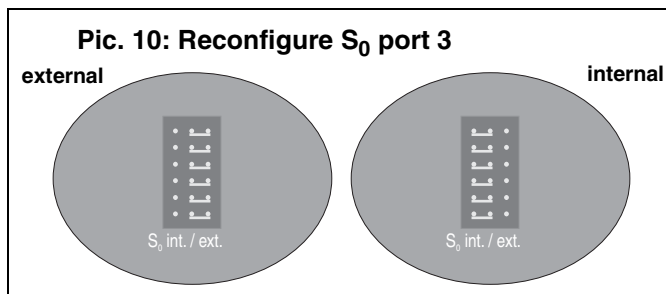
Pic. 12: *COMpact 2S_0 Module*

① Connection clamp (detachable) of S_0 port 3.

② Western modular plug of S_0 port 3.

③ DIL switch for termination resistors of S_0 port 3.

④ Jumper internal/external of S_0 port 3.

⑤ Connection clamp (detachable) of S_0 port 4.

⑥ Western modular plug of S_0 port 4.

⑦ DIL switch for termination resistors of S_0 port 4.

⑧ Plug for attachment to the mainboard (slot A).

Connect the PBX to the NT

For the external connection to the ISDN, one or more NT with the European protocol DSS1 (Euro-ISDN) are necessary.

The external S_0 ports of the *PBX* are designed for the following types of connections:

■   ISDN Basic rate as Point-to-Point connection.

■   ISDN Basic rate as Point-to-multipoint connection.

If the NT is next to the PBX, you put one end of the enclosed ISDN cable into the western modular jack of the PBX with the labelling „$S_0$1 ext." and the other end in one of the western modular jacks of the NT (Pic. 13). The termination resistors must be switched on in the NT as well as for the corresponding S_0 port of the PBX.

☞   *As there are some differences depending on the kind of connection – PTP connection or PTMP connection – referring to the NT, please observe the following differences:*

It is possible to operate only **one** *ISDN device on one NT with PTP connection that means only the PBX in our case. All additional ISDN devices have to be operated as internal subscriber of the PBX.*

It is permitted to operate multiple ISDN device on one NT with a PTMP connection. If there are additional devices directly connected to the NT in parallel to the PBX the 230 Volt power supply of the NT must be plugged in. If the PBX is connected exclusively to the NT, you may leave the NT unpowered in order to **save energy***.*

Install Wall Jacks (External S_0 Bus)

1st variant (Pic. 14): If the NT is in a longer distance to the PBX, it is necessary to use fixed wiring with an ISDN wall jack at the end (external S_0 bus). One end of the enclosed ISDN cable is put into the western modular jack of the PBX with the labelling „$S_0$1 ext." and the other end into the ISDN wall jack. The termination resistors in the NT must be switched on. On the other end, the termination resistors are built into the ISDN wall jack.

Advice concerning the cables and ISDN wall jacks to be used as well as the assignment is similar to the wiring of an internal S_0-bus and can be found in (Pic. 15 on page 21).

2nd variant with *COMpact 2S$_0$ Module* (Pic. 16 on page 21): If you extended your *COMpact 4410 USB* with a *COMpact 2S$_0$ Module* and you configured the switchable S_0 port as an external S_0 port, you may use the 4-pole connection clamp of this S0 port on the module. Connect these with the clamps in the NT. The termination resistors must be switched on in the NT as well as on the corresponding S_0 port of the *PBX*. The maximum distance between NT and PBX may be

■   1000 m for a Point-to-Point connection

150 m for a Point-to-Multipoint connection

☞   *Advice concerning the cables and ISDN wall jacks to be used as well as the assignment will be found in the chapter Installation of Wall Jacks (internal S0 Port) on page 21.*

Pic. 13: Direct connection to the NT
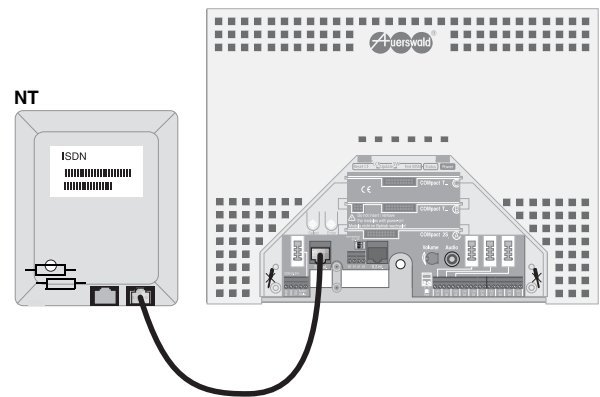
Pic. 14: Connection to an external S_0 bus
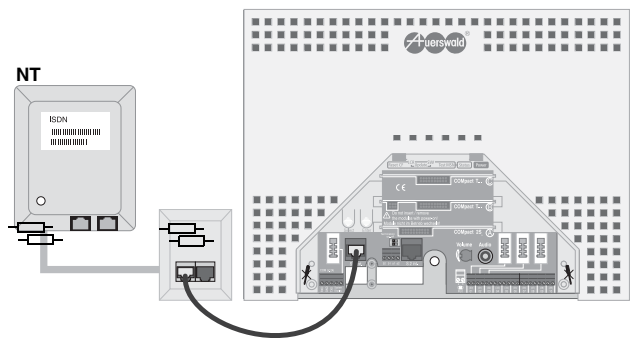
Pic. 15: Connection of multiple devices to the external S$_0$ bus (PTMP connection only)
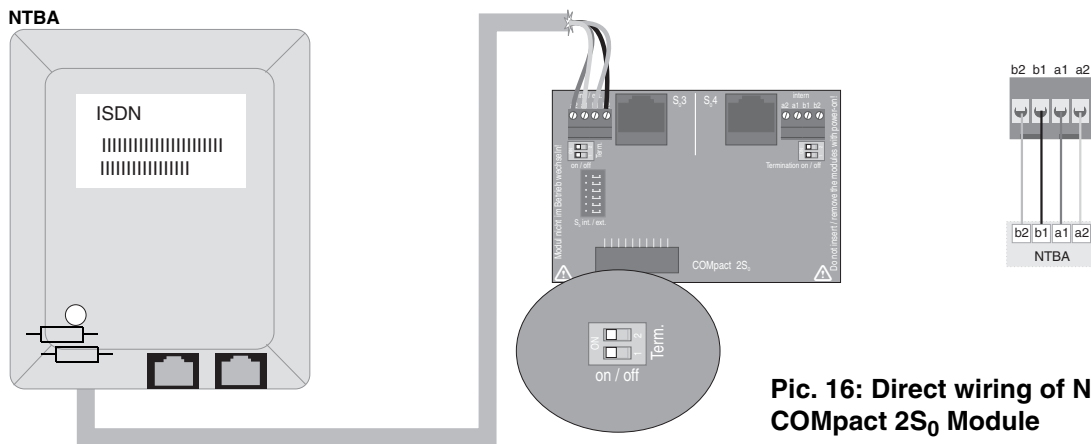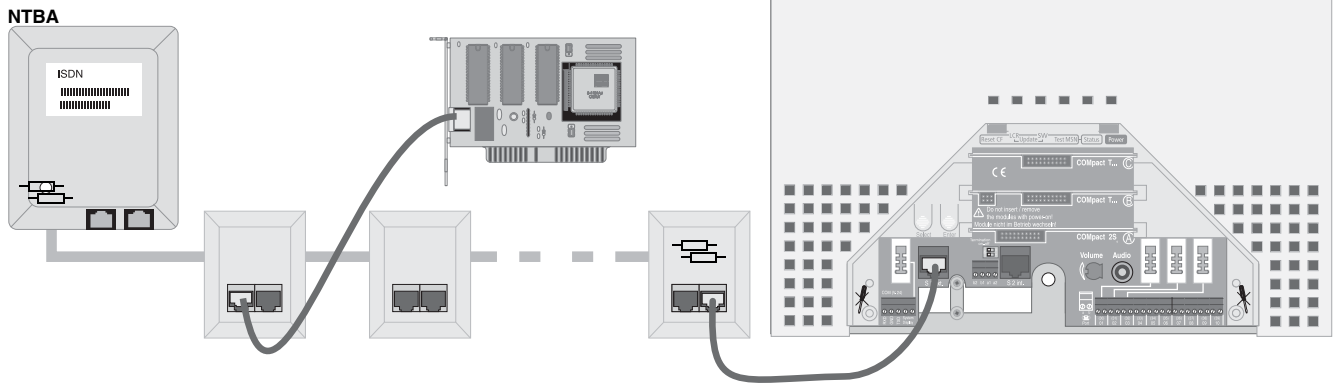
Pic. 16: Direct wiring of NT and COMpact 2S$_0$ Module

Connection of ISDN Devices to the internal S$_0$ Port

An internal S$_0$ port offers similar features like an ISDN Point-to-Multipoint exchange line connection. Here you can also connect up to eight ISDN units, a maximum of four of them without an own power supply (that is the case with most of the ISDN telephones). All the devices should be certified Euro-ISDN devices in order to guarantee a proper functionality.

There is a western modular jack labelled „S$_0$2 int." on the module. This jack allows the direct connection of an ISDN device to the PBX.

The connection cable of an ISDN device may have a maximum length of 10 m. It is equipped with a western plug that you will plug into the ISDN wall jack (Western modular RJ-45). (If you like to remove the western plug out of the jack, you will have to press the lever and pull at the same time to remove it.). In case of ISDN devices with an own power supply you have to plug them into to the 230 V mains.

The western modular plug can also be used for the connection of an ISDN Multiplug. Use this option only in case all the ISDN devices that are to be connected to the corresponding internal S$_0$ port are operating next to the PBX and you like to do this without installing ISDN wall jacks.

The specialized dealers will offer you the ISDN Multiplug for this kind of wiring (Auerswald accessory).

The connecting cables of the ISDN devices and the connecting cable between the PBX and the ISDN multiple socket may have a maximum length of 10 m. The termination resistor on the module must be activated for the corresponding S$_0$ port.

You have to install an internal S$_0$ bus for longer distances (see chapter *Installation of Wall Jacks (internal S0 Port) on page 21*).

Installation of Wall Jacks (internal S$_0$ Port)

If the ISDN devices should not be operated next to the PBX, they must be connected via firmly attached ISDN wall jacks. In this case the ISDN wall jacks are attached with a cable and connected in parallel to the internal S$_0$ port (internal S$_0$ bus).

The S$_0$ bus consists of up to twelve parallel connected western modular wall jacks. But the restriction applies that a maximum of eight ISDN devices or four ISDN units without an own power supply are attached like on the NT (Point-to-Multipoint connection).

Pic. 17: Wire position

**Pic. 18:
Layout of the Western
modular jack**

2b 1b 1a 2a
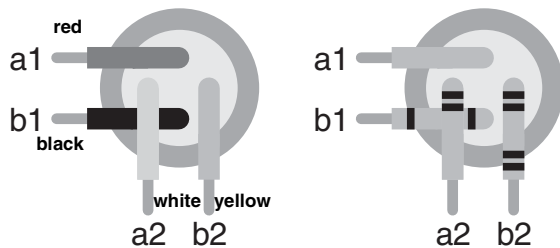
The connection of the internal S$_0$ bus happens at the internal S$_0$ port on the four clamps[1] b2, b1, a1 and a2. This labelling of the clamps is printed in front of the clamp on the circuit board. The clamp blocs can be detached from the module to simplify the installation.

Normally you use an unshielded twisted pair cable for wiring installation (J-YY 2x2x0,6 St III Bd). Under certain circumstances (e.g. near a strong radio/television station or a power cable), you have to use a shielded twisted pair cable.

In any case it should be twisted pair cable with four wire positioning like in Pic. 17. Here both sending data wires (a1 and b1) as well as both receiving data wires (a2 and b2) are positioned vis-a-vis. This cable configuration will help to compensate interferences considerably.

You can buy many different types of wall jacks. They are sometimes called IAE (ISDN-Anschluss-Einheit), UAE (Universal-Anschluss-Einheit), RJ-45, Western modular, wall jacks with integrated termination resistors as well as shielded wall jacks belong to them.

In order to make the setting as simple as possible, please pay attention to the following points: Use only wall jacks of one type for one S$_0$ bus and check the wall jacks before installation. The pin assignment may be different compared to the usually used products or the termination resistors are integrated into the ISDN wall jacks.

The maximum length of the total bus wiring should be 150 m. As at any rewiring position (ISDN wall jack etc.) reflections occur, the maximum quantity of allowed clamp positions (12) has to be respected. This and the cable quality as well as the proper adjustment of the termination resistors can be the key factor for a proper function of the S$_0$ bus.

If you use western modular wall jacks with the clamp labelling 1a, 1b, 2a and 2b, you connect the clamp b2 of the PBX with the clamp 2b of the first wall jack socket, b1 with 1b and so on (see Pic. 19). Then the clamps of the first wall jack socket are connected with the corresponding same marked clamp of the second wall jack socket.

In the last wall jack socket a resistor of 100 Ω (power rating min. 0,25 W) must be inserted between the clamps 1a and 1b **and also** 2a and 2b each. The so-called termination resistors are avoiding unwanted reflections.

If you use wall jacks with eight clamps you only use the middle four clamps that are marked with 3, 4, 5, 6, instead of all eight existing clamps. How to connect them to the PBX is shown in Pic. 20.
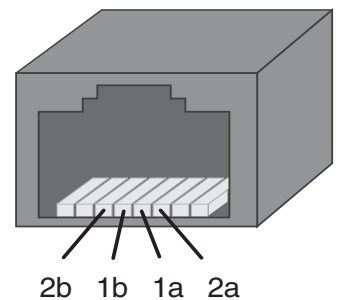
Pic. 19: Clamp connection of ISDN wall jack (IAE)
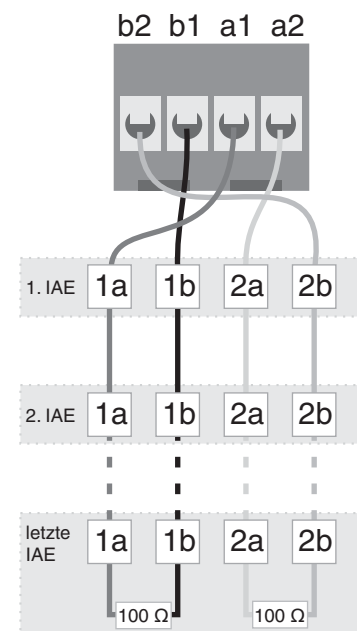
Pic. 20: Connection of ISDN wall jack (UAE)
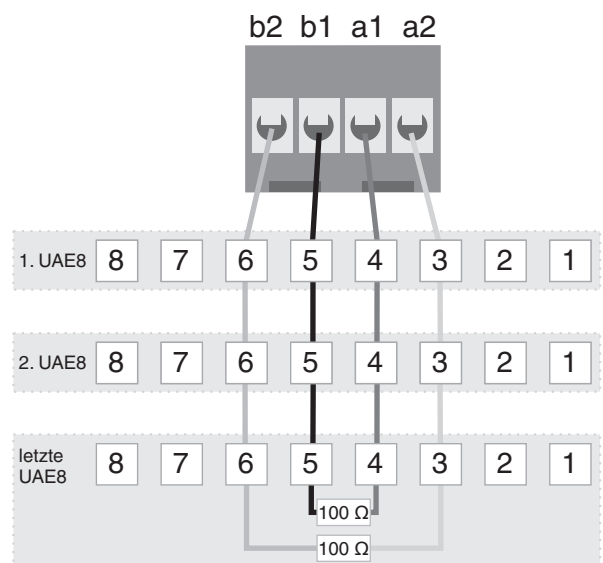
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1. Technical modifications in the layout may lead to a change in the position of the ISDN jacks and clamps.

Starting at the PBX you can lay the S$_0$ bus in one or in two directions (divided bus).

When laying the S$_0$ bus into one direction, on the last ISDN wall jack the termination resistors need to be installed. At the other end the termination resistors of the PBX are switched on via DIL switches on the circuit board (see Pic. 21).

If you lay the S$_0$ bus into two directions, the termination resistors on the circuit board are switched off via DIL switch. Instead you must install the necessary termination resistors on both bus ends that means in the last

ISDN wall jack (see Pic. 22). The maximum length of the S$_0$ bus and the maximum quantity of ISDN wall jacks is the addition of both bus parts in this case.

☞ *You can lay the S$_0$ bus starting at the* PBX *into two directions. A star formed wiring is not allowed.*
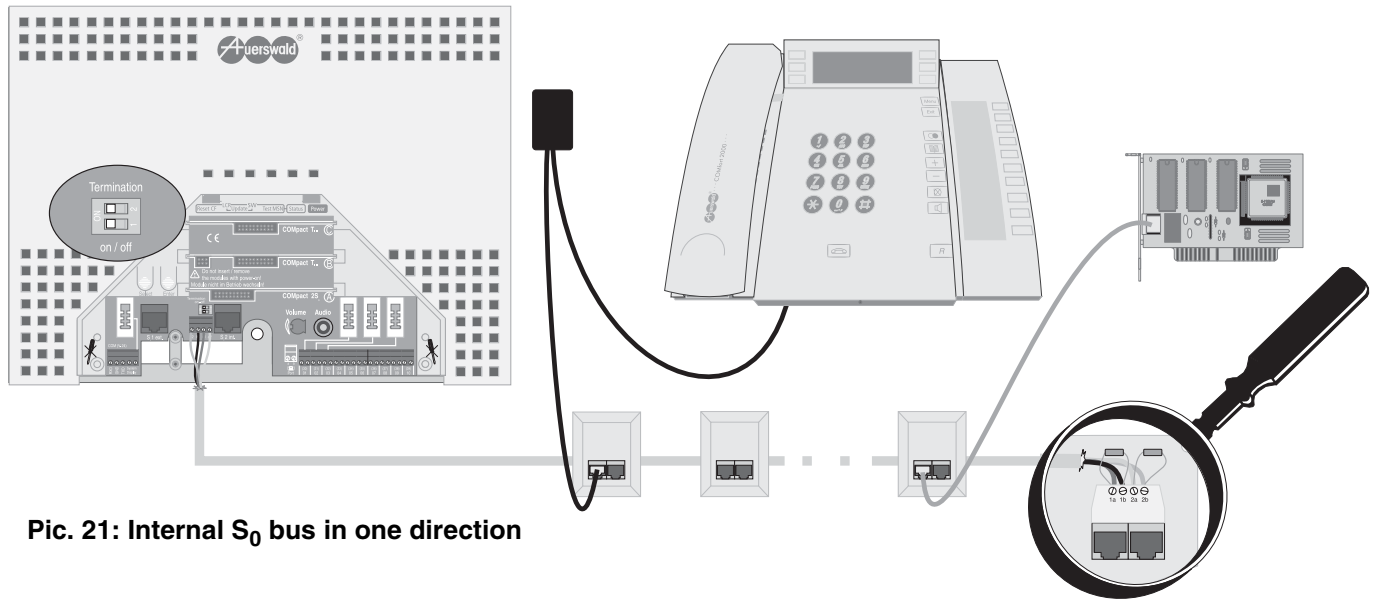
Pic. 21: Internal S$_0$ bus in one direction
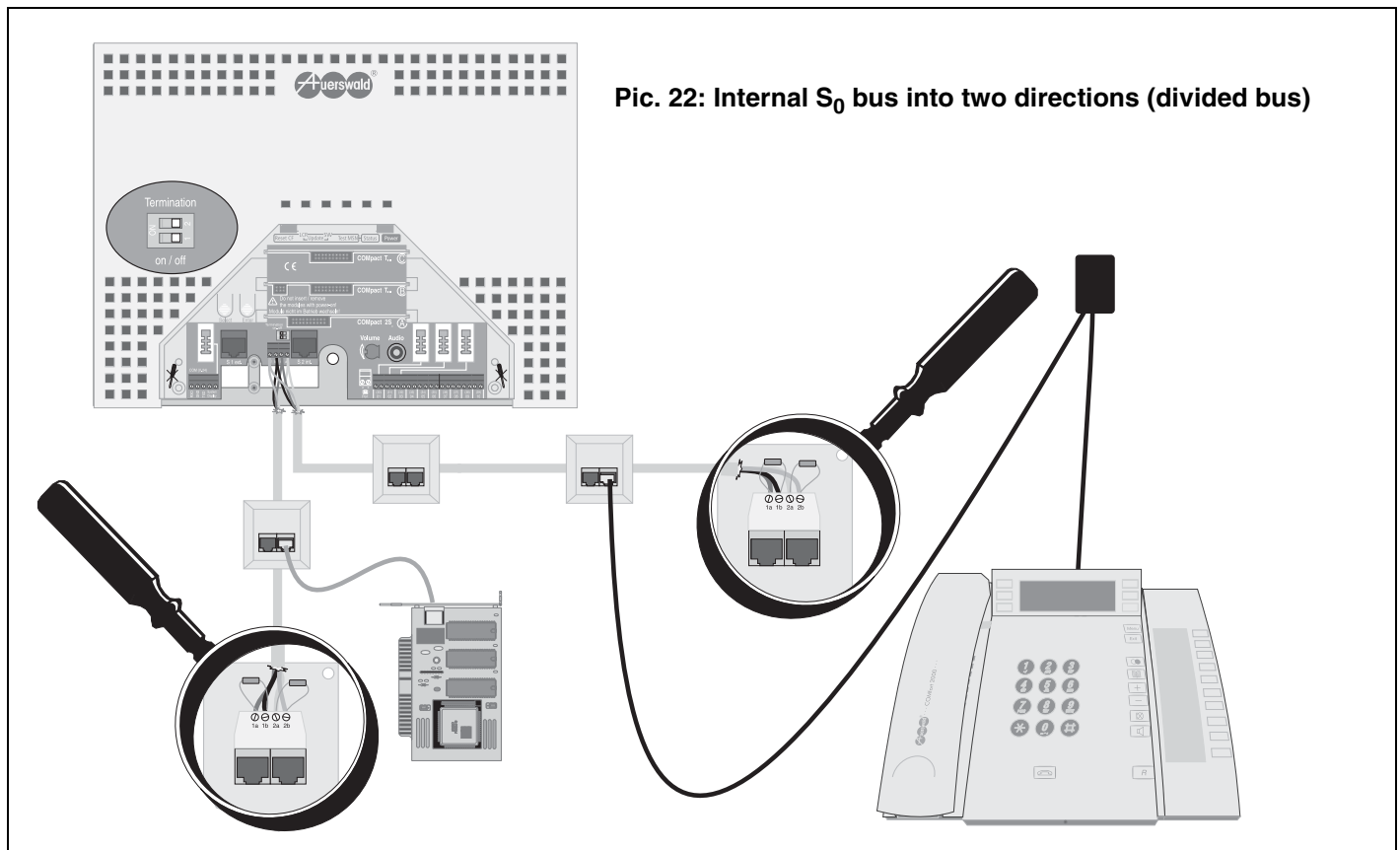
Pic. 22: Internal S$_0$ bus into two directions (divided bus)

Switch Termination Resistors

The termination resistors for the internal and external S_0 ports are to be switched on or off with help of the DIL switch on the circuit board (see Pic. 23). The external S_0 port „$S_0$1" is not terminated.

If the corresponding S_0 port of the PBX is at the beginning/end of several units or if there is only one connection between two units, the appropriate termination resistors need to be activated.

This is the case e.g. if the PBX is connected directly to the NTBA as a single device which is always the case with a PTP connection. (Exception: An ISDN connection box with integrated terminal resistors was switched in between).

The termination resistors needs to be activated e.g. if you lay an internal S_0 bus to two directions starting at the corresponding internal S_0 port.

But you also have to deactivate the termination resistors if you connected an external S_0 bus directly to the NT with termination resistors in the last connection box and if you connect the PBX to one of these connection boxes.

In the individual installation chapters the different possibilities will be explained in detail again. (see chapter *Installation of Wall Jacks (internal S0 Port) on page 21* and chapter *Install Wall Jacks (External S0 Bus) on page 20*).

Pic. 23: Termination resistors

on / off   Term.   on / off   Term.

switched on   **switched off**
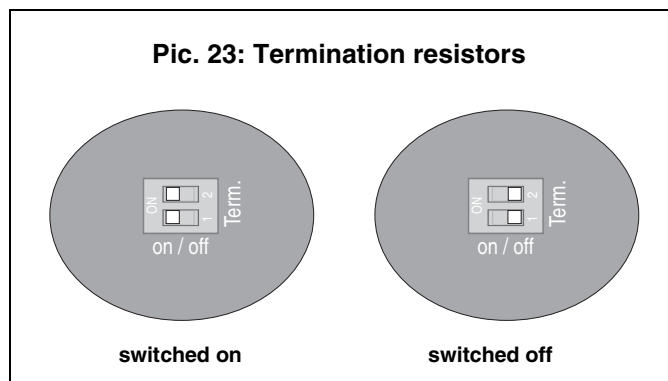
The PBX *COMpact 2206 USB* has analog subscriber ports for 6 analog devices. You can connect up to 10 analog devices to the *COMpact 4410 USB*.

Thanks to this you can connect analog telephones, fax machines etc. with pulse or DTMF dialling. Devices with DTMF dialling have to have a FLASH-key (alternatively named signal key R).

Up to three telephones can directly be connected to the existing TAE sockets (Pic. 25). For some of the international varieties of the PBX there are Western modular jacks with the layout shown Pic. 24 for the direct connection of analog telephones.

These three telephones have the internal telephone numbers 30, 31 and 32 (from left to right) in the default settings. **These telephone numbers can be changed with the configuration program _COMset_ at any time.**

The connection of additional devices to the PBX will be made with additional wall jacks (chapter *Install Wall Jacks for analog Devices on page 26*).

Pic. 24: Layout of analog Western modular jacks
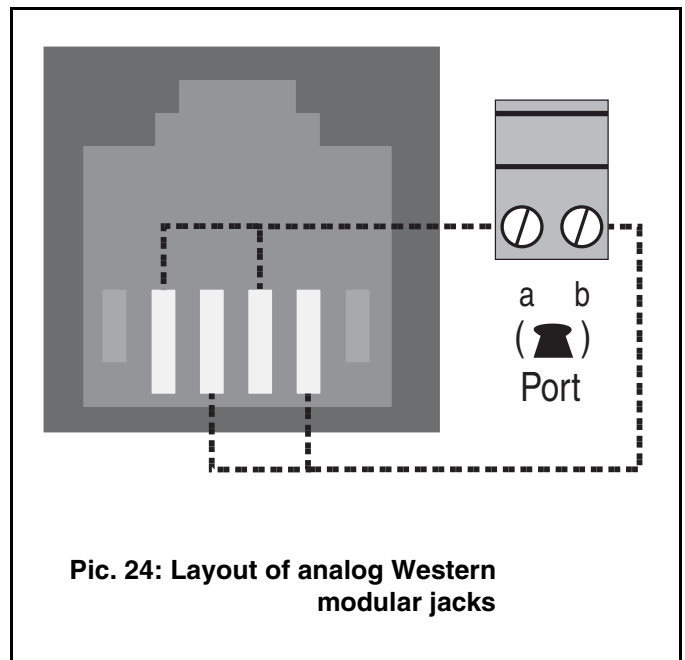
Pic. 25: Connect analog telephones
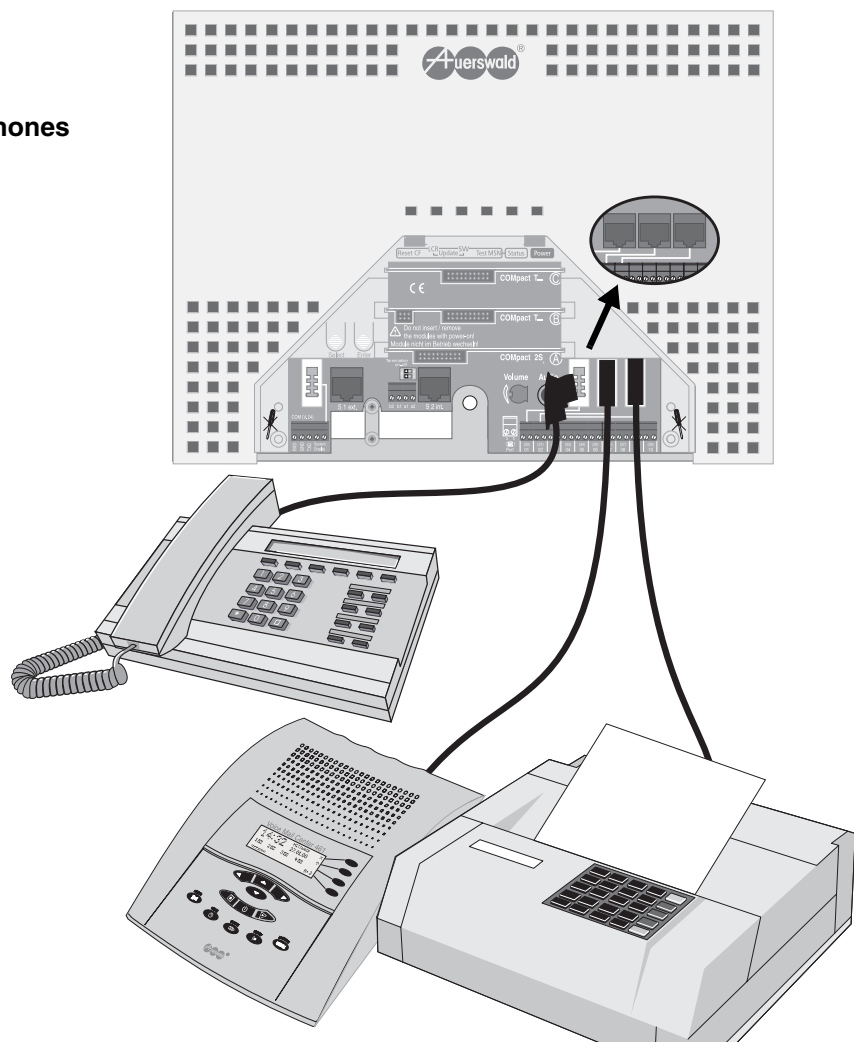
Install Wall Jacks for analog Devices

The connection of more than three analog devices to the PBX will be made with additional wall jacks[1].

The connection of these devices to the detachable clamps labelled with 01 to 06 (or 10) will be made with telecommunications cable (e.g. JYY 0,6 mm). This name of the clamp is printed on the mainboard in front of the clamp.

You are in need of one wire pair per subscriber or per wall jack. If you use a wire diameter of 0,6 mm, the lines may have a distance of 800 m between the PBX and the wall jacks.

---

1. Outside of Germany Western modular jacks or other local types of wall jacks are used.

In order to avoid interferences, lay the wires carefully and use twisted pair cables. And avoid longer parallel leading of the lines especially next to power supply cables.

Use of TAE Wall Jacks

Connect each clamp pair (e.g. 01) with the connector a and b of a single wall jack (see Pic. 26).

If you only like to connect telephones or FaxTAM machines, TAE single wall jacks with F code (a jack marked „F") will be sufficient. But for the connection of fax machines, modems and answering machines you are in need of the N-coded TAE wall jacks.

The plugs of the telephones or FaxTAM machines will be plugged into the jack marked „F". However, the plugs of the other devices will be inserted into the jack marked „N".

Pic. 26: TAE wall jacks for analog telephones

Description and Installation of the *COMpact TS Module*

The *COMpact TS module* does not belong to the supply of extent. The *COMpact 2206 USB* has 1 module slot (B) for this module. The *COMpact 4410 USB* has 2 corresponding module slots (B and C).

Thanks to the module you can connect or control one door terminal, each consists of a door handsfree system, a door opener and two door keys. Herewith the door ringing to all internal subscribers will be possible as well as the door conversation and door opening.

In order to execute different switching and controlling processes, the module has a total of three relays that have to be configured correspondingly to the special purpose. Two of these relays are preconfigured for controlling the door terminal. If no door terminal is to be controlled, these relays can be reconfigured for other uses.

If you use the module slot B, the relays are numbered consecutively from 1 to 3 in the configuration. If you use the module slot C (only *COMpact 4410 USB*), the relays are numbered consecutively from 4 to 6.

In case that not both door key inputs are necessary in connection with a door terminal, the inputs can be reconfigured to alarm contacts.

The three **L**ight-**E**mitting **D**iodes on the module circuit board display the activation status of the three relays.

LED switched on: Relay is switched on

LED switched off: Relay is switched off

To install a module, insert it in between the board rails and press it to vertically the mainboard until clicks well into its position. (Pic. 28).

⚠️ *Disconnect the device from the 230 Volt power supply and wait another 10 seconds before you plug a module in or remove it.*

As some of the component parts are sensitive to electrostatic discharge, it is important to discharge yourself before touching the mainboard with your hands or with tools. You should touch a grounded metal device, such as a radiator or the case of a PC.

☞ *Advice for COMpact 4410 USB: Use a COMpact-TS Module for door functions in slot B. The Announcement/Music on Hold function will not be available if you use a COMpact TS Module in slot C.*
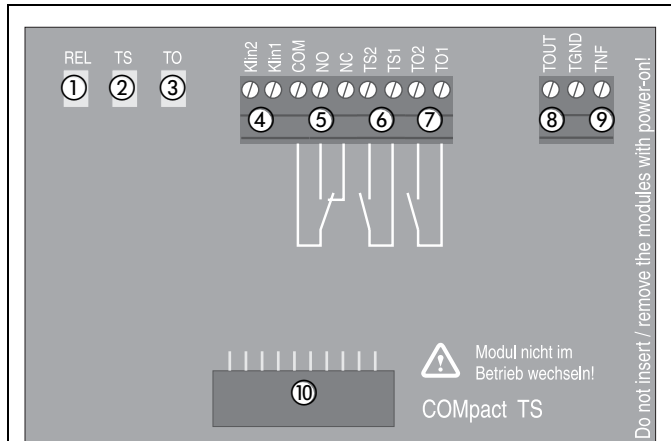
Pic. 27: Door/Switching module

① LED for indicating the on/off mode of the relay no. 3/6 (REL).

② LED for indicating the on/off mode of the relay no. 1/4 (TS).

③ LED for indicating the on/off mode of the relay no. 2/5 (TO).

④ Inputs for connecting the door keys 1 and 2 (also usable as alarm contact).

⑤ Make/Break contact of relay no. 3/6 (REL).

⑥ Make contact of relay no. 1/4 for supplying the door handsfree system (TS).

⑦ Make contact of relay no. 2/5 for supplying the door opener (TO).

⑧ Output of the 12 Volt operation voltage.

⑨ In/Output of NF voltage against TGND.

⑩ Plug for attachment to the mainboard.

Pic. 28: Insert COMpact TS module
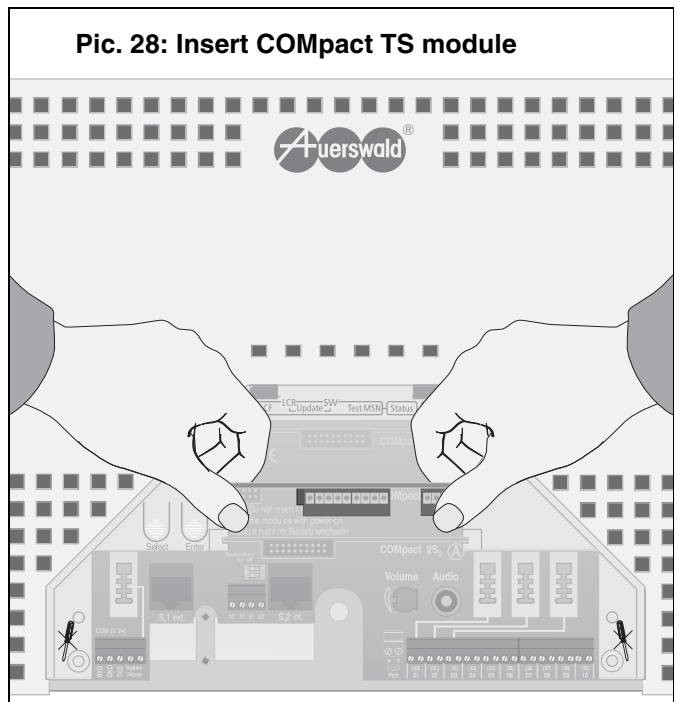
Connect a Door Terminal

Connect a Door Terminal System

For switching the operating voltage of a door terminal TFS-Dialog or TFS-Dialog pro (Auerswald accessory) you will need the 1st/4th relay. The 12 Volt operation voltage is available on the *COMpact TS module* (TOUT). It must be connected with a clamp to the 1st/4th relay (Pic. 29). The speech transmission is established via a two-wiring connection to TNF1 and TGND.

If you like to connect other manufacturer's door terminal systems instead of the TFS-Dialog or TFS-Dialog pro by Auerswald, the speech transmission of these systems must work in two-wire technic according to FTZ-123-D12-0 (a signal line and a ground connection).

But if the door terminal system to be connected works with four-wire technic (two wires per call direction), you must interconnect a converter (e.g. TSA-500 by Auerswald) from two- to four-wire connection.

Circuit diagrams for the connection of door terminals may be found on the CDROM or on the Auerswald homepage.

Connect Door Bell Button

If there is already a house wiring with ringing transformer and door bell ringing, the door bell button inputs (Klin1, Klin2) of the *COMpact TS Module* can be integrated into the wiring like in Pic. 30. For this reason the currently used ringing transformer must offer a voltage of 5-15 V AC/DC.

If there is no ringing transformer, the 12 Volt operation voltage of the *COMpact TS Module* (TOUT) can be used by a door bell button to trigger the door bell button inputs (Klin1, Klin2) (Pic. 31). If the door bell button inputs were reconfigured with the configuration program *COMset*, a GND can be connected instead of the 12 Volt output.

Connect Door Opener

You are in need of the relay no. 2/5 with the clamp labelled TO1/TO2 (Pic. 32) for switching the door opener for the first door terminal.

As the necessary supply voltage is not offered by the PBX, the use of an external transformer is necessary. Please pay attention to the maximum ratings of the relay contacts (30 V AC/1 A).

Pic. 29:
Door terminal TFS-Dialog or TFS-Dialog pro

Pic. 30: Door bell button and door bell

Pic. 31: Door bell button

Pic. 32: Door Opener
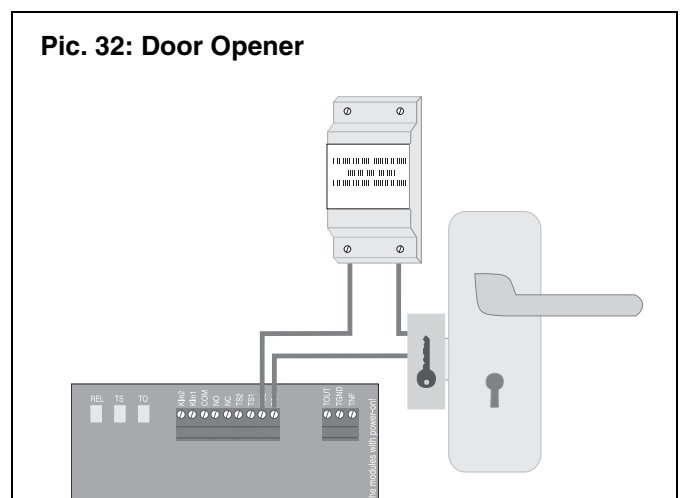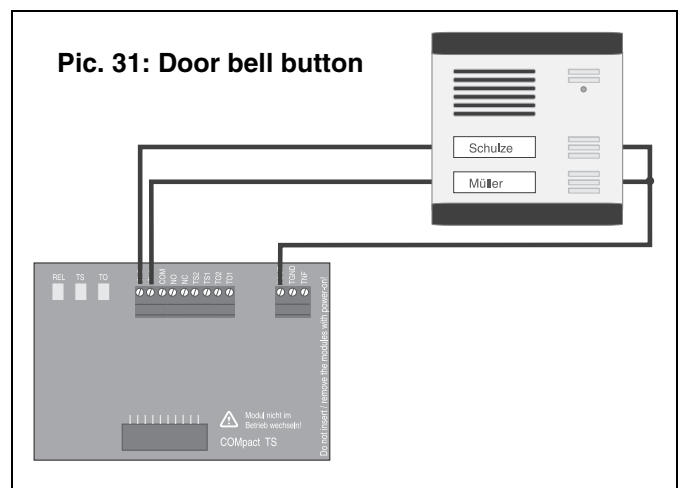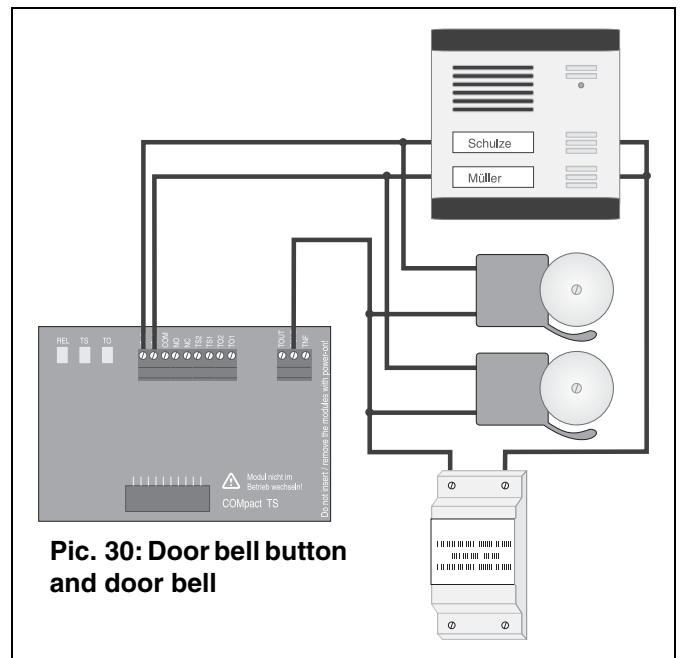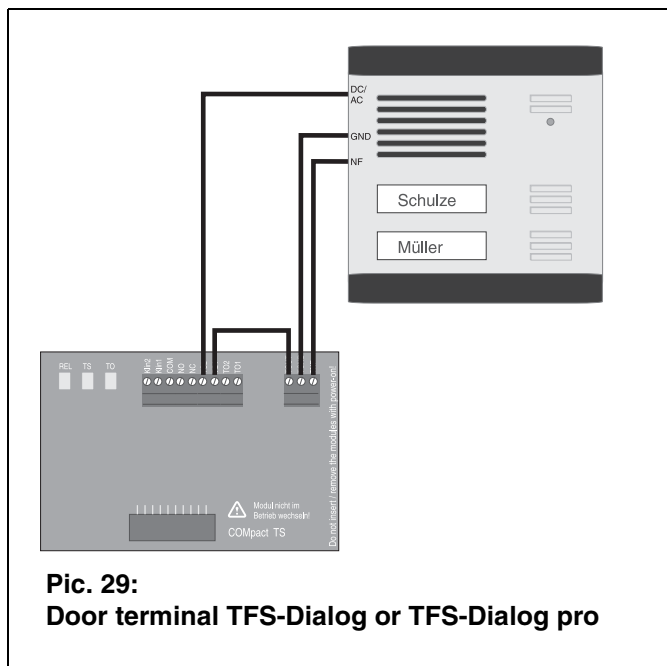
Connect an Alarm System

If you do not need all the door key inputs for the door ringing, you are able to use the door key inputs as alarm inputs. In order to obtain one alarm input, the door key input has to be reconfigured with the configuration program *COMset*.

An alarm input can be connected to an alarm indicator output like in Pic. 33. You will get more details in the chapter *COMpact TS Module on page 10*.

Pic. 33: Alarm
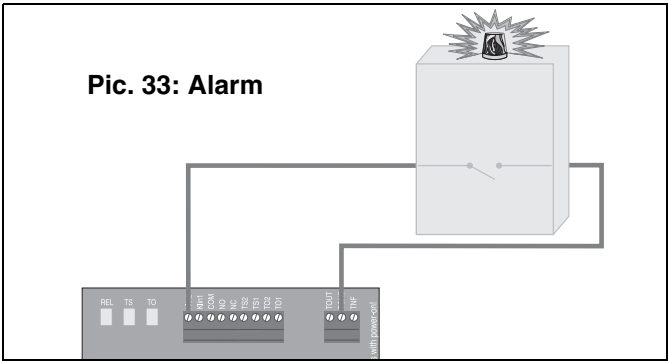
Connection of external Devices to the switching Relays

In the default factory settings the available relays are configured for door functions. Changes are possible with *COMset*. Which configuration options for the relays are available with the PBX or which operation modes are selectable for the relays are shown in the following tables. A more detailed description of the configuration options can be learned in the chapter *Configure the COMpact TS Module on page 46*.

Relay no.	Operation Mode: Door Function
1/4	Talking to the door when picking up the receiver
2/5	Door opening for 1-99 sec after dialling a number during a door talk
3/6	Simultaneous switching on e.g. floor light for 1-99 min.

Relay no.	Operation Mode: Alarm Function
1/4 and 3/6	Switching on e.g. a siren for 1-99 sec when activating the alarm contact
2/5	Switching on e.g. a signal light for 1-99 min. when activating the alarm contact

Relay no.	Operation Mode: Music Function
1/4, 2/5 and 3/6	Switching on e.g. a CD player for 1-99 min. as soon as the Music on Hold is needed (during transfer, Query etc.

Relay no.	Operation mode: Universal switching Relay
1/4, 2/5 and 3/6	Switching on e.g. a fax machine (different switching options on): 1st Switched on during the 1st to 6th PBX configuration (during day, night, at noon etc.) 2nd Remote switching from an internal telephone 3rd Remote switching from an external telephone 4th Switch on for 1-99 min. as soon as a defined internal subscriber of the PBX is called (PC relay)

Relay no.	Operation mode: Announcement Function
1/4, 2/5 and 3/6	Switching on of e.g. a loudspeaker when the announcement output (audio output) is called.

The relays no. 1/4 offer the make contact each, the relays no. 2/5 a make contact with protection circuit (100 nF, 220 Ω) and the relays no. 3/6 offer a make and break contact.

The *COMpact TS Module* offers no supply voltage on the clamps that means the supply of the connected units has to be made by an external voltage.

Pay attention to the maximum rating of the relay contacts (30 V AC/1 A) that are absolutely not suited for mains-operated devices. Due to this fact an interconnecting of a mains relay is necessary.

Minimum Requirements for the PC

■ PC with Intel Pentium 266 or compatible processor

■ Windows 95,98, Windows Me, Windows 2000, Windows XP, Windows NT 4.0 with service pack 3 or later
but: Windows 98 SE, Windows Me, Windows 2000, Windows XP if you use USB interface

■ RAM memory
for Windows 95/98/M2: 32 MB, 64 MB recommended
for Windows 2000/XP/NT: 64 MB, 128 MB recommended

■ USB interface (if used) according to USB specification 1.1

■ CD-ROM drive

■ Mouse or compatible pointer device.

■ SVGA graphic board with 800*600 resolution and 256 colours/grey scales 32768 colours recommended

Connection via the USB Interface

The connection of the PBX to an existing USB interface is made with the included USB cable with two different plugs at both ends. It depends on how many devices you like to connect to your PC, you are able to connect the PBX to a hub directly to the PC (you will find more details about it in the chapter *General Information on USB* on page 30). The flat plug is plugged into the master device (PC or hub) and the other plug into the PBX.

☞ *If you connected the PBX to your PC, the „Add new Hardware" assistant of Windows will be started automatically to support you when you install the necessary driver. Consult the description of the Auerswald USB driver installation in your CAPI/TAPI manual.*

The LEDs of the PBX will show you information about the USB connection (see page 53).

General Information on USB

The USB (Universal Serial Bus) is a serial bus system that connects different device types. Starting at the root hub, which the PC provides, the USB is set up in several levels (up to 5) with the so-called hubs (distributors) and the USB devices (up to 127 units).

Hubs are connected to the USB port of the PC or to the outputs of the preceding hubs. They work as receiver of signals of the PC and of preceding hubs as well as sender of signals to further hubs and to connected devices. The old and existing PC interfaces (parallel, serial...) can now be replaced by only one.

Another advantage of this system is the possibility of Plug-and-Play. In order to start operation of USB devices, it is not necessary anymore to open the PC and perform a complicated configuration. The device is simply connected to the existing bus and the corresponding drivers are installed on the PC. The unit will be ready for use at once. The Plug-and-Play compatible operating system Windows is essential for the PC. (e.g. Windows 98 SE).

There are two speed classes of USB devices – „full speed" (12 MBit/s) and „low speed" (1,5 MBit/s). Due to the different data transfers rates different cable types and lengths for these both types of units are in use. For „full speed" devices such as this PBX only USB cables with a maximum length of 5 m are used.

There is another distinctive feature for the USB devices concerning the power supply. Self powered units such as the PBX supply themselves via an own power supply so that the USB power is not used. In contrast to this bus powered devices have to be supplied via the USB. These devices have the power supply classes „high powered" (up to 500 mA) and „low powered" (up to 100 mA). The USB is able to deliver a power supply up to a maximum of 500 mA for devices.
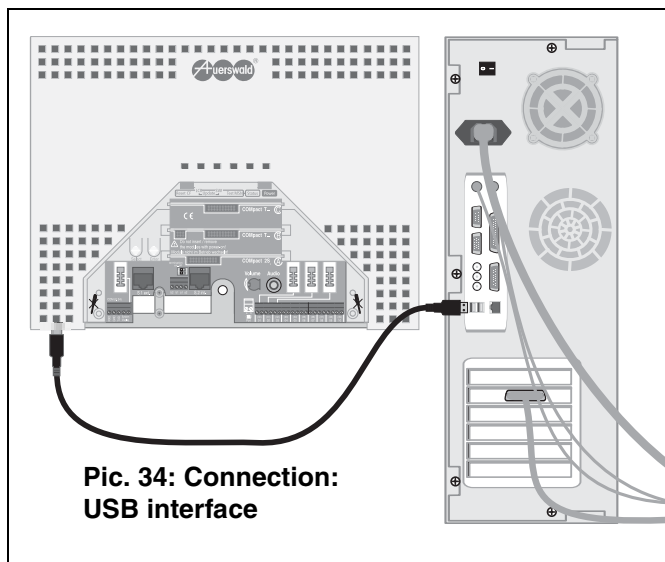
Pic. 34: Connection: USB interface
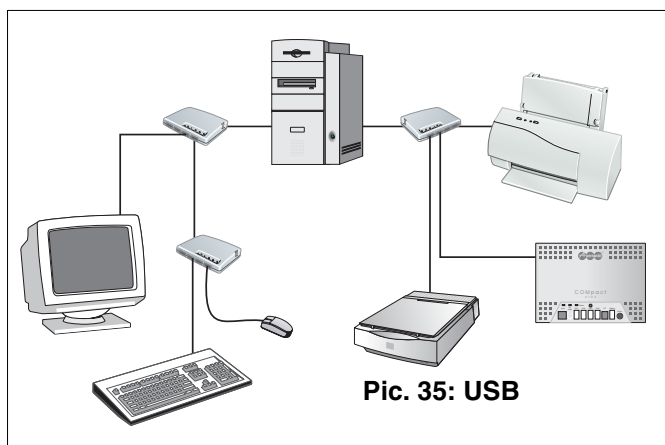
Pic. 35: USB

Connection via serial Port (V.24)

The serial port of the PBX can be connected with the serial port of a PC (COM 1 to 4) as well as with the serial port of a printer (in case the customer wants to print the charge and call data directly).

If the unit does not operate next to the PBX, it is recommended to make a fixed wiring of the cables. For longer transfer distances (longer than 2 m) we recommend to use a shielded two wires cable (e.g. LIYCY 2 x 0,3 mm). Distances of more than 10 m length may be problematic even with shielded cable. A function guarantee cannot be offered here because the wiring of the cable and the construction of the computer interface may have a strong influence.

For the connection of the computer or printer you need a 9- or 25-pole D Sub connector (see PC/printer). On the side of the PBX (on the mainboard) is a removable clamp with three screw clamps. At the authorized dealer you can get a fabricated cable with 9- or 25-pole D Sub connector (Auerswald accessory).

If you like to assemble such a cable for yourself, try to use a two-wire, shielded cable (e.g. LIYCY 2 x 0,3 mm). The meshed shield of this wire is to be used for the clamp with the label PC-GND, the both wires inside for RXD and TXD. The PC side of the wire, depending on the computer connection, needs a 9-pole or 25-pole D-Sub connector as shown in Pic. 36.
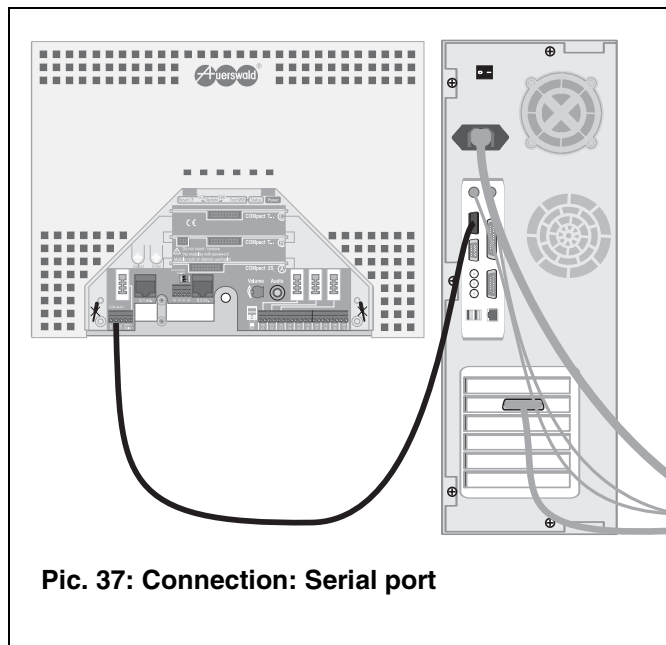
Pic. 37: Connection: Serial port
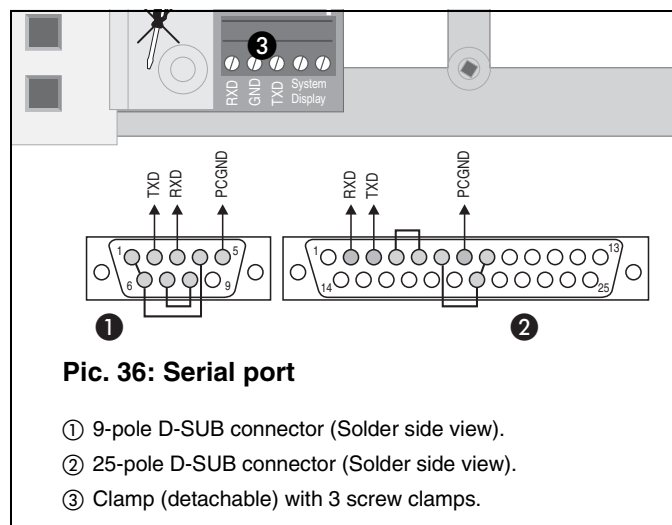
Pic. 36: Serial port

① 9-pole D-SUB connector (Solder side view).

② 25-pole D-SUB connector (Solder side view).

③ Clamp (detachable) with 3 screw clamps.

Connection via ISDN PC-Controller

If you like to configure the PBX via the internal S_0 port, you need a CAPI 2.0 compatible ISDN PC-controller. Get the latest information from the manufacturer of the ISDN PC-controller about the support of CAPI 2.0.

If you have problems with your ISDN PC-controller, please read the manual of your ISDN PC-controller or contact the vendor of the ISDN PC-controller directly about compatibility with CAPI 2.0. Try to get the most recent drivers with CAPI 2.0 support. Most vendors offer the option to download new drivers from the Internet or via mailbox.

Install the ISDN PC-controller in the PC and connect it to an internal S_0 port. Details on this operation can be learned in chapter *Installation of Wall Jacks (internal S0 Port) on page 21*). If you encounter problems during a running transfer, please check your cabling. If necessary, contact your dealer or administrator for help.

ISDN PC-controller

Pic. 38:
ISDN PC-controller on internal bus
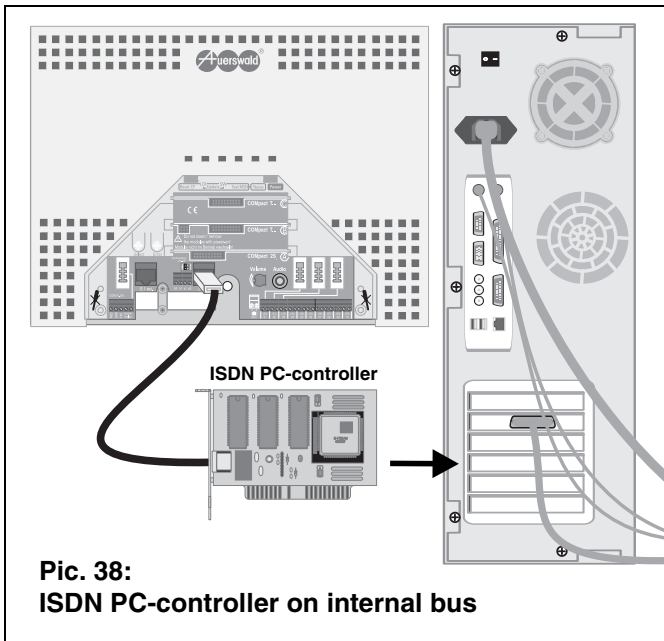
Connect the System Display SD-420

The PBX allows the connection of a system display SD-420 (Auerswald accessory). The system display can be connected to the PBX with the built-in TAE-jack or with a remote TAE wall jack similar to other analog telephones. The connection to the clamps have to be made with tele-communications cable (e.g. JYY 0,6 mm).

You are in need of one wire pair for a system display SD-420. If you use a wire diameter of 0,6 mm, the wires may have a length of 800 m between the PBX and the wall jacks.

The connector of the system display is plugged into an F-coded jack (Pic. 39).

Pic. 39:
Wall jack for the system display

or direct connection to an available TAE jack
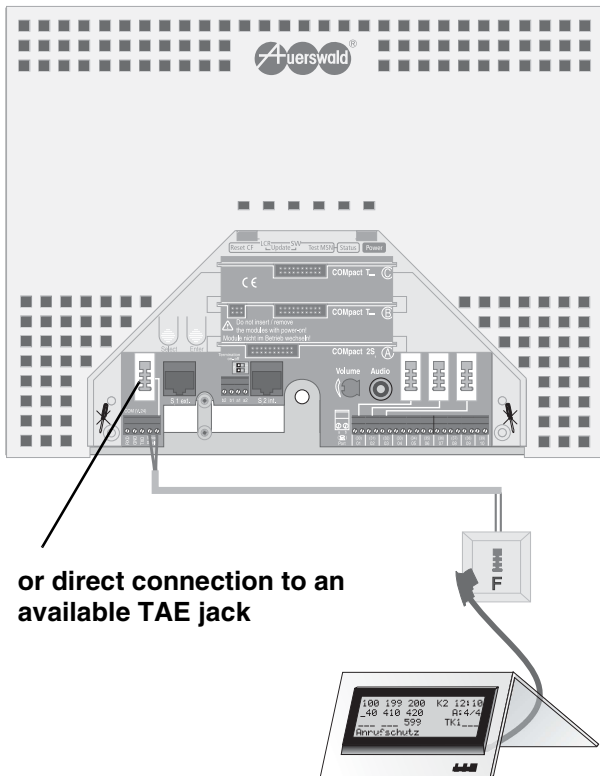
Connect a Loudspeaker System for Announcements

On the mainboard you have a Cinch connector (labelled „audio") for announcements. This can be used as an audio output (for announcements) or as an audio input (for Music on Hold).

If you like to use the Cinch connector as an audio output for announcements, you will have to connect an amplified loudspeaker system or an active loudspeaker (see chapter *Technical Data on page 9*).

☞ *If there is a COMpact TS module, you will also be able to switch on/off the loudspeaker system or another device with the relay function of the PBX.*

Advice for COMpact 4410 USB: Use a COMpact-TS Module for door functions in slot B. The Announcement/Music on Hold function will not be available if you use a COMpact TS Module in slot C.
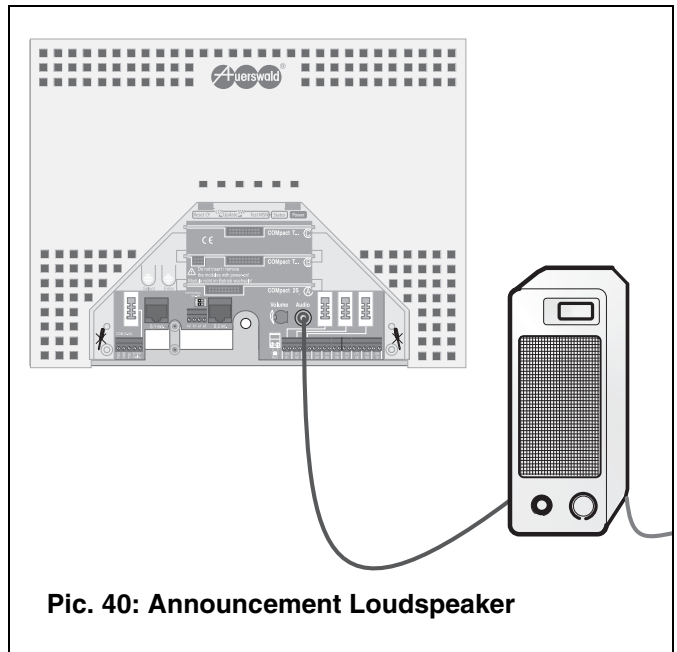
Pic. 40: Announcement Loudspeaker

Connection of an Input Device for external Music on Hold

On the mainboard you have a Cinch connector (labelled „audio") for announcements. This can be used as an audio output (for announcements) or as an audio input (for external Music on Hold alternatively to the internal Music on Hold).

You can connect an external music device (e.g. a CD player) to the Cinch connector, if you like to use it as an input for external Music on Hold. Another option may be the connection of a digital music and speech memory that continuously plays a melody or a text.

The volume control for the external Music on Hold happens via a trimmer that is on the module near the Cinch connector (labelled with „Volume").

With this input, you can also record a music that will be stored as the new internal Music on Hold in the PBX (only *COMpact 4410 USB*).

☞ *If you use external Music on Hold, pay attention to the copyright issues for certain music. Please contact the corresponding copyright holder or music agency.*

If a *COMpact TS module* is available, you are able to switch on/off the external music source with the relay function of the *PBX (Pic. 41)*.

Advice for COMpact 4410 USB: Use a COMpact-TS Module for door functions in slot B. The Announcement/Music on Hold function will not be available if you use a COMpact TS Module in slot C.
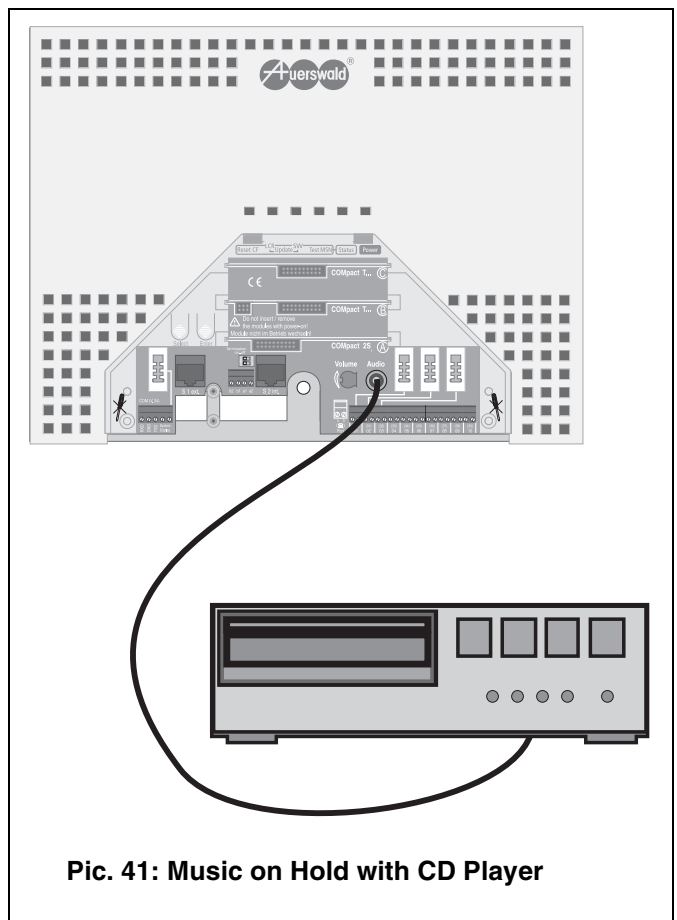
Pic. 41: Music on Hold with CD Player

Description of the bundled Software

Part of the product is a CD-ROM with four PC programs for use with the *PBX*.

The configuration program *COMset* will be needed in any case to adjust the PBX for the ISDN connection and to enter the requirements of the customer installation. The configuration options are described in the following. It is also possible to program the customers PBX over an external telephone connection from a remote location (see chapter *Remote Programming* on page 57).

With the program *COMtools* separate PC programs can be launched. These programs can modify wake-up times, call allowance accounts, Short-Code Dialling numbers, special numbers and the Music on Hold.

The PC program *COMlist* will let you manage and analyse the data in the call data memory of the *PBX*.

The PC program *Soft-LCR* manages the data for the Least Cost Routing.

General Advice for using the Configuration Software

Program Windows: This is divided into two parts:

- In the left view are the themes listed in the order to be worked on. If you leave out a theme, it may happen that the following page is not available (e.g. because no subscriber with an internal telephone number has been configured yet).
- The right view shows the page of the selected theme. For working on the program pages you need not the menu line. All the entries and changes are made directly on the pages via mouse or keys.

Help: With the menu „Help...Topics" or with the F1-key you can open a help window that will offer you explanations to the respectively open page.

Entry into a free field: A free entry field lets you enter a name or a number. Click into the corresponding field with the left mouse key and then enter a number or a name with the keyboard.

Modify number or name: If you entered a number or a name and like to completely change these, click twice onto the entry to be written over with the left mouse key. After that it will be marked blue and can be directly written over or be deleted with delete/backspace.

Extendable tables: In order to delete an entry in extendable tables (e.g. exchange line access numbers, internal subscriber telephone numbers), the whole line can be deleted here. Therefore click with the left mouse click into a field of the line to be deleted. This field gets a yellow margin. By pressing the right mouse key then, a menu opens. Click on „delete line".

Automatic number generator: If you like to use several successive telephone numbers in the table for internal telephone numbers, you can use the program to create these. First you enter the lowest telephone number into a free field. Then you click into this field with the left mouse key. The field will get a blue edging. If you click the right mouse key then, a menu will open. Click on „new numbers until ...". Now you can enter a second telephone number to limit the range of telephone numbers.

Switch functions on or off: A square displays a switch field. An empty square means „off" or „no"; a little hook means „on" or „yes".

- The switch over happens by simply clicking on it with the left mouse key.
- If there are more boxes in a table column, the switching over is also done by simply clicking with the left mouse key.
- If you like to switch over a whole column or a bigger part of this, first mark the corresponding fields by drawing with the pressed left mouse key over the corresponding fields. You can mark the whole column by clicking on the headline of the column with the left mouse key. Then you can open a Popup-menu by clicking with the right mouse key into the corresponding column and select with the left mouse key. All marked fields will be changed at the same time.

Toggle functions: For functions that offer more than switching on/off, but whose settings are limited to a few setting options, a default setting was made in the field. If you like to change this, you will have to select the option with the left or right mouse key out of the opened pop-up menu.

- If there is a single field with an arrow pointing down, you open the pop-up menu by mouse click with the left mouse key onto the field.
- If there are more fields in a table column, you will open the pop-up menu by clicking twice with the left mouse key.
- If you like to modify a whole column or a bigger part of it, first you mark the corresponding fields by drawing the corresponding fields with pressed left mouse key. The whole column can be marked by clicking on the headline of the column with the left mouse key. Then you can open the pop-up menu by clicking with the right mouse key and make your choice. The marked fields will be changed at the same time.

Routing

You can configure the PBX and all connected system telephones (COMfort 1000, COMfort 1200 and COMfort 2000) with a PC connected to the PBX or to one of the connected system telephones.

If you are using the program COMfort Set the dialog „Connection paths" will be opened after clicking on the buttons „Save/Open". Please select the telephone to configure here.

☞ *In case of an indirect connection of the PC to the terminal to be configured (e.g. PC connection to the USB port of a COMfort 2000 to configure the PBX), the transmission will be faster if the interface is set to „ISDN controller (CAPI 2.0)" (using the B channel) instead of the selection „USB" (using the D channel).*

PC connected to PBX: Double-click on the PBX icon to display the connected system telephones.

Please select the telephone to configure and accept it with „OK".

PC connected to system telephone (COMfort 1200 or COMfort 2000) and PBX: Double-click on the PBX icon to display the other connected system telephones.

Please select the telephone to configure and accept it with „OK".

The Default Factory Settings

The default factory settings listed here, can be re-established with a push of a button (see).

Alarm function:	deactivated
Exchange line authorization:	unrestricted exchange line authorization
external call ringing/external call distribution	no preset
External to External Transfer:	with special exchange line access number only, limited to 15 minutes
Call Waiting:	deactivated, Call Waiting only, if call can be taken without finishing the other call and no other telephone rings
Do-not-disturb	deactivated
Call forwarding (AWS):	deactivated; are executed via the 2nd B channel
Response time remote switching	10 seconds
Call forwarding from door terminal, external	deactivated
Call forwarding from door terminal, internal	analog subscribers off, ISDN subscribers on
Connection without dialling/Automatic dialling:	deactivated
Authorization for programming of subscriber CF:	activated
Authorization for programming of group AWS:	deactivated
Authorization of programming of MSN/DDI CF:	deactivated
Alarm function:	deactivated

Busy after end of call:	activated
Busy-on-Busy:	deactivated
Direct exchange line telephone:	deactivated
Firmware Update, with time automation:	deactivated; from 4-8 a.m., simultaneous update of the system telephones
FLASH timing for analog telephones:	300 ms
Follow-me (Call forwarding):	deactivated
Call charge registration with changing subscriber:	remain with the subscriber who established the call
Call charge metering:	activated
Call charge allowance:	effective in case of private and business calls, but unlimited
Call charge rate:	depends on the PBX firmware version: 0,12 DM/charge unit or 0,06 EUR/charge unit (rounding errors are accepted here)
Call data management:	the oldest calls are overwritten if the memory is full; telephone numbers are recorded (private numbers truncated), free of charge calls (unsuccessful calls and incoming calls are in this category) are not recorded
Pick-up:	deactivated
InterCom to system telephones:	deactivated
Ringer rhythm for internal calls:	3 x short
Ringer rhythm for external calls:	1 x long (similar to Telekom)
Automatic Configuration switching, time controlled:	deactivated
Authorization for manual configuration switching:	deactivated
Configuration dependent programming:	for all configuration at the same time
Short-Code Dialling authorization:	deactivated
LCR:	deactivated
Emergency call priority function:	activated
Passwords:	public password: 2, secret password: 1111, external password: 4321, private password: no preset, administrator password: no preset; user password: no preset
Project number:	2-digit
Programming devices:	not assigned, programming possible from each telephone
Programming (CAPI) on internal S_0 port:	permitted on all internal S_0 ports
Programming on internal telephone:	permitted with public password
Programming of an CF from external telephone:	not permitted
Switching relay, internal:	permitted
Relay operation mode	door functions
Relay switch timing	Relay 2 and 5: 2 seconds; Relay 3 and 6: 2 minutes
Reservation of a B channel	no reservation
Recall on busy	switched on
Number presentation:	no MSN, not suppressed
Number presentation analog (CLIP):	deactivated

Numbering plan internal; is created when the first operation starts (chapter *Initialize Telephone Settings* on page 57) depending on the modules in use.	analog subscribers: internal telephone numbers 30-35 (30-39)
	$S_0$2: internal telephone numbers 41, 42, 43.
	$S_0$3: internal telephone numbers 21, 22 (*COMpact 4410 USB only*).
	$S_0$4: internal telephone numbers 25, 26 (*COMpact 4410 USB only*).
	USB port (ISDN PC-controller): internal telephone numbers 54, 55, 56, 57
	Groups: internal telephone numbers 201-208 and 401-408
	Call to system display: internal telephone number 50 (The first analog subscriber is assigned to the system display as user. Referring to this telephone numbering plan this is the subscriber 30.)
	Door 1: internal telephone number 51
	Door 2: internal telephone number 52 (*COMpact 4410 USB only*)
	Audio Out: internal telephone number 53
	Short-Code Dial memory 8110: internal telephone number 110 (entry 110)
	Short-Code Dial memory 8112: internal telephone number 112 (entry 112)
Call distribution external (external call, ringing):	no preset
Serial port:	no special function
Immediate exchange dial tone copy:	deactivated
Special dial tone call data memory/filling level	deactivated/80 %
Special dial tone Do-not-Disturb, Baby Call, CF:	activated
Blocking numbers, release numbers:	no entry, deactivated
Door key call distribution:	the first analog subscriber 30 rings on each door bell
Door key signalling:	deactivated
Door key inputs:	all inputs for door key, switchable with 5 - 15 V AC/DC
Door opener authorization:	activated
Moving function for ISDN/change of port:	activated
Delay time for delayed external ringing:	20 seconds
Delay time for delayed call forwarding	20 seconds
Preferred exchange line (preferred external S_0 port):	1st external S_0 port
Dial tone, internal:	3 x short for all subscribers
Wake-up time:	no entries, deactivated

Call Distribution

In order to be reachable from internal or external telephones, the individual subscribers must get internal telephone numbers and be entered into the external call distribution (external call ringing, see also chapter *Creating a Basic Configuration* on page 15).

Assign internal Telephone Numbers

The PBX allows the free assignment of internal telephone numbers to internal subscribers, groups etc. These must be entered under *internal telephone numbers* in COMset. At your disposal are the 2-digit telephone numbers from 10 to 59 as well as the 3-digit telephone numbers 100 - 599.

The use of 2-digit telephone numbers restricts automatically the availability of 3-digit telephone numbers. If e.g. the telephone number 12 was given away, the telephone numbers 120-129 would no longer be available.

You can connect the numbers in the emergency Short-Code Dial memory to these numbers. The advantage is that even persons without PBX experience or knowledge of exchange line access numbers can dial these numbers without any problems (e.g. 110). In the default factory settings such a connection has already been made for the telephone numbers 110 and 112. So these telephone numbers will not be available any longer for assignment.

External Call Distribution (External Call Ringing)

To reach internal subscribers from the exchange line, the telephone numbers available on the ISDN connections have to be registered as **exchange line numbers** in COMset first (up to 100 telephone numbers can be managed) and have to be distributed to the internal subscribers and groups under *Call Distribution*. The configuration of a delayed external call ringing is also possible. The **External call ringing delay time** can also be changed in COMset.

Callers dialling a wrong DDI (existing on the basic rate connection but not configured in COMset) or an incomplete DDI, will be switched to the first entered DDI of the corresponding exchange line after 4 seconds.

Call Waiting

Each user can switch on/off „knocking" on his unit if necessary (page 24 in the user manual). With COMset the activation can depend on some *Call Waiting conditions* for individual subscribers. So e.g. the „knocking" can be permitted in case that the corresponding subscriber is allowed to take the call without hanging up the receiver and/or in case that no other telephone rings with the same telephone number.

Busy-on-Busy

For an incoming call via an external telephone number the external call distribution may include several telephones, e.g. because somebody likes to be reachable at several places. But if this person has a call on one of these telephones, the other telephones will also ring in case of a new incoming call to the external telephone number. Then the caller will think that nobody is there (at least when the call can not be taken by another person because e.g. after hours only one person is in the office). In order to avoid this situation, the function „Busy-on-Busy" can be activated with *COMset*. The incoming caller gets the busy tone then.

Call Forwarding

If you assigned the corresponding authorization, a call forwarding can be configured by each subscriber for his telephone ([page 25 in the user manual](#)), for one of the groups ([page 52 in the user manual](#)) or for one of the telephone numbers of the ISDN exchange line (MSN/DDI, [page 28 in the user manual](#)). A configuration of the **Call forwarding** in *COMset* is also possible.

For each of these call forwarding settings the options „unconditional", „on busy" and „on no Reply" are possible. Besides this one group can be forwarded in case that all members are logged out (e.g. to an answering machine). Internal as well as external forwarding targets are possible.

In the default factory settings an external call forwarding is always executed via 2nd B channel. So the PBX establishes a connection to the external destination number automatically by using an additional free B-channel in addition to the B-channel used by the incoming call. The charges for the connection established by the PBX will be charged to the PBX subscriber. If you like to avoid that any free B-channel is used by the PBX (e.g. because the costs for the different S_0 ports are paid by different persons), you will be able to configure with the configuration

program that the call forwarding will not use other exchange lines. Please note that the possibility of a not successful CF will be higher because of a busy B channel.

If you like to avoid the multiple usage of the B-channels, you can configure the PBX to perform the MSN/DDI call forwarding always in the public exchange instead of the 2nd B-channel. The programming with the subscriber telephone will be the same. But you may experience a longer configuration response time.

The **delay time** for a Call forwarding „if nobody takes the call" is adjustable in *COMset* (only if configured via the 2nd B channel).

For the Call forwarding „on busy" the **fallback on busy** be switched on in *COMset*. If the busy subscriber hangs the receiver up, the already forwarded call falls back to him again (if nobody has taken the call in the meantime).

Do-not-Disturb

If you do not temporarily like to be disturbed by your telephone, you can configure your telephone to prevent external and internal calls. The so-called **Call protection** for internal and external calls can be switched on in *COMset* or via telephone ([page 30 in the user manual](#)).

If he likes to be reachable for certain persons with the activated „do-not-disturb", it will be possible to enter their external telephone number into a VIP list with the PC software *COMtools*.

If you do not like to be called by certain persons, you are able to enter their external telephone numbers into the Robinson list with the PC software *COMtools*.

Then the lists can be activated or deactivated in *COMset* or via telephone ([page 30 in the user manual](#)). It is necessary for the PBX to identify the caller: The caller has to present his telephone number.

The call protection is only valid for calls directed to the own telephone. In order not to get group calls, the user has to „log out". Exception: The Robinson list can also be activated for groups with *COMset*.

Configure different Devices

The following settings are recommended for the subscriber connection of fax machines, FaxTAM, modem, ISDN PC-controller or answering machines and can be configured in *COMset*:

■ Do-not-Disturb off,

■ Call Waiting off,

■ no charge impulse,

■ no group membership (besides of answering machine - group),

■ Door call distribution off (except answering machine with internal call forwarding from door terminal),

■ Door opener authorization off,

■ no internal special dial tones

■ continuous dial tone, internal/external

■ ringer melody internal/external 1 x long,

■ **answering machine only:** Pick-up permitted,

■ **answering machine only:** partial exchange line authorization.

☞ *Analog telephones that execute certain function via T-Net function key/menu are using a long FLASH (300 ms). This FLASH-timing is preconfigured in the PBX. An additional FLASH key is often available. Configure this also to 300 ms (see manual of the telephone).*

You like to limit Telephone Costs (Cost Control)

Exchange Line Authorization

If you like to prevent high telephone charges due to calls to e.g. high price service numbers, you can limit the dialling options for each individual internal telephone or for each group. You can configure with the configuration program *COMset* exchange line authorizations (separate for business and private calls) for each subscriber. These authorizations are defining which type of numbers are allowed to be called by the subscriber (all national and international numbers, national numbers only or local calls only). A subscriber can also be limited to internal calls or

accepting external calls only. Blocking numbers are limiting an exchange line authorization, release numbers and Short-Code Dialling authorization are extending a limited exchange line authorization. These numbers can be modified with *COMtools*.

Call Allowance

If you like to have a fixed limit for call charges, you can configure a defined amount of charge units for each subscriber. You can configure with *COMset,* if the call allowance accounts are charged for all calls, private calls, business calls, group calls (calls made as group member logged in outgoing). The customer can modify the account for each subscriber by telephone (page 32 in the user manual) or with *COMtools*.

☞ *To use the function „call allowance" without restrictions, you will need the feature „Advice of charge during the call (AOCD)" for your ISDN exchange line. With „Advice of charge at the end of the call (AOCE)" the PBX can only find out at the end of the call, if the call allowance has been exceeded.*

Please note that some providers do not transmit call charges. If such a provider is used to make a call, a configured call charge allowance cannot work for the corresponding call. To avoid this, the provider numbers should be entered as restricted numbers with COMtools telephone book and be activated for each telephone via COMset.

Least Cost Routing

The PBX enables you to call easy and without prior thinking via the cheapest available network provider. This is called automatic Least Cost Routing. You have to configure several options with the PC software *Soft-LCR* in order to use this feature.

You can enable this feature for each individual subscriber by telephone. This configuration can also be done by each individual subscriber (page 31 in the user manual). If you enable the automatic LCR for a telephone, the PBX will search for each external call started by you the cheapest provider. The provider will be dependent on the dialled number, date and time. The provider code number will automatically be dialled in front of the external number.

☞ *LCR does not work for a Call forwarding to external telephone numbers.*

Register and analyse Call Charge Data

The PBX has a permanent call charge data memory for 3000 data sets. A call charge data set contains the following information:

- ■ Number of the call partner, if presented.
- ■ Exchange line and MSN used for the call.
- ■ Date and time at call beginning.
- ■ Call duration or ringing duration for unsuccessful calls.
- ■ Charge units and call cost sum.
- ■ Internal subscriber involved in the call.
- ■ Internal group involved in the call.
- ■ Type of call: Incoming or outgoing, business or private, successful or unsuccessful.
- ■ Project number, if assigned to the call.

The bundled software for call charge data management *COMlist* and a PC connected to the PBX lets you manage, analyse and transfer call charge data from the PBX. It is also possible to print the data directly to a printer attached to the serial port of the PBX.

In case of a call data memory overflow you can enable the recording of additional calls by activating the setting **Overwrite the memory automatically** in *COMset*. If this is not what you want, you have to delete the call data memory via telephone in time before no new data can be recorded anymore (page 34 in the user manual). To know early when this would be the case, a **Special dial tone if usage of the call data memory has exceeded %** can be configured in *COMset* for certain subscribers.

To avoid a fast filling of the memory (e.g. by unsuccessful calls), you can configure in *COMset* which **kind of calls** should be recorded. The **Registration with telephone numbers** can be switched off or deactivate **Show the private number completely the telephone numbers of the private calls are not completely shown** for privacy reasons.

Analyse Call Data with the PC Program *COMlist*

The PC program *COMlist* helps the customer to manage and analyse the call data in the call data memory of the PBX. Installation and use of the PC program are described in the chapter *Installation and Use of the bundled Software on page 58 in the user manual*.

Call Data Management with external Programs

If you do not like to manage your call charge data with *COMlist* but like to use your own software, you have to configure the operation mode of the serial interface to „data exchange with external programs" and connect your PC with the PBX (chapter *Connection via serial Port (V.24) on page 31*).

Direct Output to a serial Printer

If you do not like to analyse your data on the PC, but like to send the data directly to a printer, you can directly connect a serial printer to the serial port (chapter *Connection via serial Port (V.24) on page 31*). You have to configure the parameters of the serial port in the printer (no handshake, 9600 baud, 8 bit data, 1 stop bit, no parity). The output format of the headers and footers can be customized according to the printer and customer requirements. For printing all information a line width of 112 characters needs to be configured in the configuration program *COMset*. If a smaller line width is configured, certain columns will not be printed. The following shortcuts/IDs are used in the printouts:

*	no number presented
Ax:yyy	Call via exchange line x and MSN yyy
TNxxx	Call of subscriber xxx
I	Type of call: Incoming.
O	Type of call: Outgoing.
B	Type of call: Business.
P	Type of call: Private.
U	Type of call: Unsuccessful.
Gxxx	Call of group xxx
Pxxxxxx	Project number xxxxxx
xxxmyys	Duration xxx minutes and yy seconds
xxxxxe	xxxxx units
CF x	Call forwarding via exchange line x
UPD	Software update
S0PR	configuration via ext. S_0 port
Alarm	alarm call
Door x	Door to external call from door terminal x

If the printer is always on and you like to see the call data of the call just finished you have to configure the serial port to operation mode „continuous call data output". If you like to remove the printer in this operation mode from time to time without losing data, you will need the Start-/Stop command for the „continuous call data output" (page 33 in the user manual).

If the call data is printed on demand only, the operation mode of the serial port may remain „exclusive, for configuration software only". The printing will start, if the customer enters the command for the call data printing by telephone (page 34 in the user manual).

Control the Call Charges with a Telephone

To control the call charges for each single subscriber, the call charges are also registered for each subscriber in the PBX. An enquiry and deletion of the charge sum can be performed from time to time (page 32 in the user manual). Deleting the charges has no effect on the call data in the call data memory.

To control the call charges during or directly after a call, the charges are send and displayed on ISDN telephones in the moment they occurred. This is even the case, when the receiver is already on-hook. For analog telephones with a charge meter display, the PBX can be configured to translate the ISDN charging information into analog metering pulses.

If external calls are transferred to internal subscribers often, you can configure the „Call Charge Registration with changing Subscriber", to charge the call charges to the next subscriber from the time of transfer on.

☞ *For the function „Call Charge Registration with changing Subscriber" you need the feature „Advice of Charge during the Call (AOCD)" on you exchange line. Otherwise all charges will be registered to the last subscriber.*

If the PBX is used e.g. in a hotel, it may be better to use a separate S_0 port for each room. This way you avoid the situation that a hotel guest modifies his telephone MSN to make calls to the bill of other guests. Please note: A subscriber configured as „ISDN PC-controller" also accepts calls from devices without an MSN or with a different MSN presentation. This enables the use of controllers that do not present an MSN at all (chapter Programming via PC (Interface CAPI 2.0) on page 44).

Configure Telephone Number Presentation

With ISDN you have the feature to transmit your own telephone number to the person you called or to the caller. If this one has an ISDN connection and an ISDN telephone (or a CLIP compatible analog telephone), he will be able to see the transferred telephone number on his display before the conversation or at the beginning of the call.

Present your Number to the incoming Caller

For each subscriber and each group can be configured which telephone number (MSN/DDI) will be presented for incoming calls. The transmitted telephone number will enable the caller to identify whether he is connected to the desired calling partner or whether his call was forwarded or taken via pick-up.

Presentation of private or Business Number

In *COMset* the telephone number to be presented in case of **an outbound business call** (for the subscribers additionally for **private calls**) can be configured for each subscriber and each group.

Restriction of Number Presentation (CLIR)

If the called person should not see your telephone number, the telephone number presentation of outbound and incoming calls (**CLIP/COLP**) can be switched off in COMset. These settings can also be done by each user for outbound calls on his own telephone (page 24 in the user manual). He has also the possibility to restrict the number presentation from call to call (page 12 in the user manual).

☞ *You can only use this function if you applied for the ISDN service feature „Optional restriction of the telephone number presentation (CLIR)" at your provider and if it is activated.*

Show the Telephone Number transmitted by the Caller (CLIP)

The telephone number of a caller (if transmitted) is shown on the ISDN telephones and on the optionally connected system displays SD-420 (Auerswald accessory).

If CLIP-compatible analog telephones are connected to the PBX, the telephone number information can also be transferred to the corresponding analog subscribers. In order that these telephones are able to recognize this information without problems, you are in need of a special ringer signal that must be switched on for these subscribers. **Show CLIP Information** has to be switched on for these subscribers in COMset. All other subscribers better switch off this function (default factory setting).

☞ *Some CLIP compatible analog telephones support the recording of date and time in the caller list. Sometimes the display of the name instead of the number is possible. If you like to use this function the **Extended CLIP info** has to activated. If you like to see names you have to enter these into the telephone book of the PBX with COMtools telephone book.*

Simplify dialling an external Telephone Number

Direct Exchange Line

Telephones mainly used for external calls, but without functions such as Short-Code Dialling, project number and private calls, may be configured with *COMset* as direct exchange line telephones to simplify operation. These are able to make external call without entering the exchange line access number ⓪. It should be a DTMF or ISDN telephone because internal calls are only possible with a previous dialling of the ⁎-key (2 x).

Short-Code Dial Memory

To prevent entering frequently used external numbers each time, you can assign these numbers to a 4-digit Short-Code Dial Number. This Short-Code Dial Number will be dialled instead of the exchange line access number ⓪ + external number. The PBX will automatically dial the exchange line access number and the stored number.

Some of the available Short-Code Dial Numbers are reserved to the individual subscriber that means the subscriber dials his own private telephone numbers when he uses the memory 8200-8219. The rest of the Short-Code Dial memory (public, long and emergency numbers) are used by all subscribers together. The administrator of the PBX can enter the telephone numbers via telephone into the short-code dial memory (page 35 in the user manual) or comfortably enter and manage the telephone numbers with names in *COMtools telephone book*.

In order to guarantee that the emergency Short-Code Dial Numbers (e.g. police and fire-brigade) can always be dialled independently from the current business actions, the emergency call priority option (emergency call has priority) must be activated (default) with *COMset*.

The Short-Code Dial authorization may extend the exchange line authorization of a subscriber. Then this subscriber may dial all the telephone numbers entered into the Short-Code Dial memory overriding his restricted exchange line authorization.

☞ *The PBX phonebook entries (number and name) can be accessed from the phonebook menu of the system telephones COMfort 1000, 1200 and 2000. A number presented by an incoming call matching an entry in this phonebook, will be represented by the name in the telephone display.*

With the program COMtools telephone book you can transfer some of the short-code dial numbers (maximum 65) of the PBX into the telephone book of a connected system telephone COMfort DECT 800.

Use Memory Aids

Special Dial Tone

To help the subscriber to remember when he picks up the receiver that e.g. he configured a subscriber call forwarding for his telephone, a special dial tone can be configured with *COMset* for each individual subscriber for these settings: Connection without dialling (automatic dialling), call protection and subscriber call forwarding.

If the call data memory is not automatically overwritten, new data entries may be lost if the memory is not deleted in time. In order to be informed in advance when this will be necessary, a special dial tone can be heard on certain telephones if the call data memory reaches a certain filling level.

☞ *Due to the missing internal dial tone a notification by a special dial tone for a Direct Exchange Line Telephone is not possible.*

Wake-up Function

For each internal subscriber a wake-up time can be configured separately. This may be configured with the PC program *COMtools* or by each subscriber with his telephone (page 36 in the user manual).

Change Dial Tones and Ringer Rhythms

Different internal dialling tones and ringer rhythms can be configured with *COMset* for each subscriber. This setting can be made by each user with his telephone. He is able to hear all the dial tones first (page 37 in the user manual).

If some of the subscribers are reachable via several external telephone numbers (MSN/DDI), it may be important to identify before picking up which telephone number has been dialled by the caller (e.g. private or business call). The PBX allows the selection of different ringer rhythms with *COMset*. The customer can also configure the requested ringer rhythm himself with the telephone (page 38 in the user manual).

If the external dial tone is not properly generated by the public exchange, this tone can also be simulated internally in the PBX. Therefore the **Immediate imitation of the public exchange line dial tone** has to be switched on in *COMset*.

☞ *The functionality of this setting for ISDN subscribers is dependent on the connected ISDN telephone. Many ISDN telephones only support their own ringer melodies and not the melodies of the PBX.*

In case of a system telephone COMfort 1000, 1200 and 2000 and COMfort DECT 800 the ringer melodies may be configured in the telephone.

Music on Hold and Music on Hold-Announcement

In case of a transfer or Query the calling partner waiting in the background will hear a Music on Hold with an optional announcement overlay played by the PBX. The external Music on Hold is connected to the audio input (see also page 46). The internal Music on Hold is stored in the PBX but may be overwritten by e.g. a song recorded from the audio input (*COMpact 4410 USB only*).

The Music on Hold and announcement functions can be configured via telephone (page 43 in the user manual) or with *COMtools Music on Hold*.

Configure the System Telephones

You can connect the system telephones *COMfort 1000, 1200 and 2000* or *COMfort DECT 800* (Auerswald accessory) to the internal S$_0$ port of your PBX. The configuration of these telephones can be made with the PC program *COMfort Set*. The settings for the *COMfort DECT 800* are made in the menu of the telephone.

Use different PBX Configurations (Day, Night etc.)

The PBX makes it possible that some functions with the configuration program _COMset_ are differently configured e.g. for day, night, holiday and lunch break. Up to a maximum of 6 different configurations are supported. The following functions are dependent on the configuration:

- Exchange line authorizations
- External and door call distribution
- External call forwarding from door terminal
- Connection without dialling (Automatic dialling)
- Follow-me
- Internal dialling tone
- Number presentation
- Subscriber-/group-call forwarding
- Preferred exchange line

The switching from one configuration to another can be done by time automation controlled by the internal clock of the PBX or via telephone (manually) (page 23 in the user manual). To use configurations the following settings have to be done in _COMset_ for the use of the configuration:

First you have to create the necessary number (up to 6) of **configurations**. The here listed stated functions can be configured depending on the configurations.

The **time automated switching** has to be switched on the **switching times** for each day of the week must be entered (up to 10). The activation of the automatic configuration switching is also possible via telephone (page 24 in the user manual).

If you want to use **manual switching**, the **authorization** has to be assigned to individual subscribers.

☞ _After a power failure the time information is lost. In this case automatic switching and the Wake-up function will not be performed. After adjusting the time by the programming sequence on page 47 in the user manual or by an outgoing external call the functions will be active again (you can configure in COMset an automatic call to a number e.g. it´s own number for this purpose)._

You can switch and monitor the configurations with comfort on a system telephone. (see manual of the telephone).

Configure the System Display SD-420

For the system display SD-420 (Auerswald accessory) connected to the PBX three different operation modes can be selected in _COMset_:

- Operation Mode „Subscriber Display" 1 and 2
- Operation Mode „Reception" 3

Operation Mode „Subscriber Display" 1 and 2

In these operation modes the system display is assigned to one **subscriber** in _COMset_.

```
100 --- --- K5 14:59
--- 350 --- ⇥⥒ A:1/2
530 540 550    K:1---
               T:-2
```
Example for COMpact 4410 USB with 2 door terminals

```
100 --- --- K5 14:59
--- 350 --- ⇥⥒ A:1/2
530 540 550    K:1---
Ruf an 390
```

In the idle mode (Example above) the system display shows the time (14:59) and the busy status. The subscriber gets information about the active exchange line connections (A:1/2: 1 of 2 available exchange lines) and who can not be called at the present moment, e.g. he is currently making a call (100: Subscriber 100 can not be called, ---: Subscriber is available). For this purpose you need to configure with _COMset_ the 9 subscribers.

If one or more door terminals are available, a busy door terminal (T:-2: Door 2 is busy) and a pressed door bell button (K:1---: door bell button 1 is pressed) will be displayed.

Additional informations are displayed: The currently active configuration (K5: Configuration 5 is active). The bell (⥒) is signalling, that there is an active wake-up service configured for the subscriber. The arrow (⇥) is signalling an existing entry in the caller list that has not been called back.

In a status line outgoing (Ruf an 390) and incoming calls or settings are displayed that have been assigned to the subscriber. Depending of the configuration in _COMset_, incoming external calls are displayed with the caller number (Mode 1) or the called number (one of your external numbers; Mode 2).

By dialling a number preconfigured with _COMset_ you will reach the main menu of the system display. Pressing the digits displayed in the main menu you will get into the other menus (e.g. for display of the caller list, the call charges, wake-up times and configuration switching times). You can go one level back by pressing the ⁎ key. This is easy to use. Please consult the manual of the system display.

Operation Mode „Reception" 3

In this operation mode, the system display is not assigned to a certain subscriber. Among other things the system display shows the time (15:10) and the busy status. The receptionist gets information on the active exchange line connections (A:1/2: 1 of 2 available exchange lines) and who can not be called at the present moment, e.g. he is currently making a call (125: Subscriber 125 can not be called, ---: Subscriber is available).

If more than 10 subscribers are indicated (in _COMset_ up to **30 or 35 subscribers** can be configured without door/switching module, multiple display of a subscriber is possible) and **toggle display** is switched on, the display changes from one page to the other in short intervals.

If one or two door terminals are available, a busy door terminal (T:1-: Door 1 is busy) and a pressed door bell button (K:-2--: door bell button 3 is pressed) is displayed. The status of the six relays is also displayed (R:1-3---: Relay 1 and 3 are switched on). The currently active configuration (K2: Configuration 2 is active) is also displayed.

```
A:1/2          K2 15:10
T:1- K:-2-- R:1-3---
125 126 --- --- 129
500 --- --- --- ---
```
Example for COMpact 4410 USB with 2 door terminals

```
--- 319 320 --- ---
300 --- 500 --- ---
```

Requirements for external Remote Switching and Programming

If the customer wants to program call forwarding settings, switch relays, activate the alarm or monitor a room from an external telephone, you have to make some configurations first in _COMset_:

One of the available external numbers must be configured as **remote switching and programming MSN/DDI**. The PBX will be called via this MSN/DDI for these purposes. This number must not be forwarded and should not be assigned to another subscriber, otherwise you have to configure the delay time for external remote switching and programming.

To program a call forwarding from an external telephone, the **external programming of the call forwarding** must be permitted.

Please note, that strangers with knowledge of the remote switching and programming MSN/DDI and the external password (the default factory setting is identical for all PBX) may be able to program a call forwarding (and may generate call charges on the bill of the PBX owner). You better change the external password if you plan to do these settings.

Required Configurations for the time-automated Software Update

You can perform an automatic PBX firmware update by pressing a button. During this update the PBX will make independently a telephone connection to one of the servers at Auerswald and the current software will be transferred while the call data and configurations will remain preserved.

It is also possible to activate an automatic update by the PBX in certain time intervals (e.g. once a year). The PBX tries (in a timeframe of four hours) to connect and receive the most recent firmware from the server. If the update was not successful in this timeframe, the PBX will try again on the following day at the same time. The following configurations have to be made with _COMset_:

Please select **how often** (time interval) an automatic update should be performed.

Select the **time** (time frame of four hours) for the update to minimize the effects of an automatic updated on the daily work schedule.

Activate firmware update **immediately,** if the update should be performed without preserving ongoing calls.

Select also, if the PBX should also additionally update the **connected system telephones (COMfort 1000, 1200 and 2000)** with the most recent firmware. First only one system telephone will be updated via external ISDN connection and the firmware will be distributed internally from this telephone to the other system telephones.

The **number of the server** is stored in the PBX, but may be changed (if necessary). The **telephone number of the system telephone server** can be changed with the PC program _COMfort Set_.

☞ _The system telephones need to have a firmware version better than V 1.2K to perform the central update._

There are no costs involved in addition to the normal telephone charges for the telephone connection (PBX -> Server and 1st system telephone -> Server).

After a PBX firmware update, the LCR data may be deleted

Priority for certain Subscribers or S_0 Ports

B Channel Reservation

If one of the subscribers should have the possibility to make an external call at any time, you can reserve a B channel in _COMset_ from the available S_0 ports of the users.

Preferred Exchange Line

If a certain S_0 port should be used by a telephone as often as possible you can configure a **Preferred exchange line** for business and/or private calls in _COMset_ for the corresponding subscriber or group.

Restrict Programming, Telephoning and Forwarding (Protection against Exploits)

Programming Telephone

The customer has the option to configure certain settings e.g. the refill of the call allowance, with the telephone. This is possible with every telephone but only with knowledge of the secret password. If these settings should be available to a single telephone only (accessible to authorized personnel), a programming telephone has to be configured in _COMset_.

Authorizations

Some functions may be configured by each individual subscriber with his telephone. There may be substantial changes due to some of these programming, so some functions are only available with an authorization. The **authorization for subscriber-, group-, and MSN/DDI call forwarding** as well as **for remote switching** and **manual configuration switching** have to be assigned in _COMset_.

Programming via Telephone

If individual telephones should not have access to any programming, you have to deactivate the authorization **to program with digit „7"** for the corresponding subscriber in _COMset._ Then programming (e.g. activate call forwarding, Call waiting configuration) and information functions (e.g. interrogate charge allowance) are not possible from this telephone any longer.

Programming via PC (Interface CAPI 2.0)

For programming with an ISDN PC-controller the **internal CAPI programming** must be allowed in _COMset._ If the ISDN PC-controller in use does not transfer any MSN, a subscriber should be configured as **ISDN PC-controller** in _COMset_ under **internal telephone numbers** for the corresponding S_0 port. This subscriber will automatically be used then.

Passwords

By using secret passwords you can prevent unauthorized persons from programming your PBX. The passwords pre-configured in the default setting of *COMset* (**Public, Secret, Remote**) have to be changed. For the password protected separation of private calls a **private password** can be set for each telephone in *COMset*.

Your configuration made with *COMset* can be protected with a administrator password against unauthorized intervention. The configuration cannot be changed without knowledge of the password.

The data edited with *COMtools* can be protected with the user password by the administrator of the PBX. This password will absolutely be necessary for reading out the call data with *COMlist*. The **user password** has to set in *COMset* first, but it can be changed later in *COMtools* or *COMlist* also.

Exchange line to Exchange Line Transfer

Each subscriber who makes external calls, can transfer/forward a call between two external subscribers. To prevent this happens by mistake (the forwarding person will be charged with the costs for the call at the end), you can withdraw the **authorization for the Exchange line to Exchange Line Transfer** from a subscriber in *COMset*. If you want to perform an Exchange line to Exchange Line Transfer without this authorization, the user has to start the second call with a special access code (page 17 in the user manual). The transferred call is limited to the maximum **Exchange line to Exchange Line Transfer Time** configured in *COMset*.

Blocking Numbers

The Blocking numbers cannot only be used to prevent the dialling of certain numbers on telephones, but they also offer a reliable protection against dialling of so-called 0190 dialer programs that enforce the dial-up into the Internet via expensive telephone numbers (e.g. 019x or 0900x).

The **Blocking numbers** have to be entered with *COMtools telephone book* into the PBX and additionally in *COMset* the activation of the Blocking numbers for **the** ISDN PC-controllers has to be done on the internal S_0 and USB ports.

If the PBX was configured incompletely or wrong, 0190 dialers may perhaps avoid the Blocking numbers. Therefore please pay attention to the following points when configuring your PBX and ISDN PC-controllers:

- On each internal S_0 port with an ISDN PC-controller there are always two internal telephone numbers configured as „ISDN PC-controller". For these two telephone numbers the Blocking numbers have to be activated. This is necessary because there are dialers trying to build up a channel-bundled connection or one of both internal telephone numbers is already in use and the dialer will take automatically the second internal telephone number then.

- If the ISDN PC-controller has the option, assign an internal telephone number to it. This number has to be configured for the corresponding internal S_0 port as „ISDN PC-controller" first.

☞ *In general there is no 100 per cent protection against malicious use of PBX functions. Please pay attention that a protection against malicious use can only be guaranteed if you have defined a administrator and user password in the PBX.*

... if you do not allow the access to the PBX and its programming.

... if you use the available authorizations with care (authorization for the programming via the internal S_0 port, programming authorization, exchange line authorization, Blocking numbers etc.).

A responsible use of passwords is absolutely necessary for the protection against malicious use.

Further advice for the protection against malicious use can be found in the report of the Bundesamtes für Sicherheit in der Informationstechnik: „Sicherer Einsatz von digitalen Telekommunikationsanlagen" on the Internet at http://www.bsi.de/literat/tkanlage/6001.htm.

Security Functions

In addition to the functions that protect against unauthorized programming, telephoning and transfers, the PBX has several other security functions.

Emergency Short-Code Dialling and Priority Function

Emergency has priority (emergency priority circuit) is switched on in *COMset* and makes a public exchange line available at any time when dialling a emergency short-code dial number or when tripping an alarm. If all lines are busy, an existing call will be terminated for the emergency call. The **Emergency short-code dial numbers** can be entered into the short-code dialling memory by the administrator with *COMtools telephone book* or via telephone (page 35 in the user manual).

Alarm Functions

If your PBX is equipped with a door/switch module, and the alarm input on the module (unused door bell button input) is properly connected (e.g. to the output of an alarm system), you can also use the alarm functions (page 46).

Automatic Dialling (Baby Call)

With the automatic dialling function (baby call) you can configure your telephone to dial automatically an internal or external number. This may be configured with *COMset* or by each subscriber with his telephone (page 39 in the user manual).

Room Monitoring

A room can acoustically be monitored from internal or external callers if **room monitoring** has been enabled for a telephone in the room (page 40 in the user manual). It is only possible for one telephone at the same time. For the external room monitoring the **remote programming and switching MSN/DDI** as well as the **Remote password** have to be configured in *COMset*.

Configure the COMpact TS Module

If you have extended the PBX with one (or two) *COMpact TS modules*, you will have 3 (or 6) switch relays and much more. These offer many configuration options to you. The table on page 29 gives a short overview to you.

Use Door Functions

If you like to enable the door telephony and the door opener function, the following settings are necessary or possible in *COMset*:

For the buttons the corresponding **door terminal**, the **key determination** door as well as the **kind of contact** have to be set.

Under *Internal telephone numbers* a *door terminal* has to be configured.

Under *Call distributions* the assignment *Door -> Subscriber* has to be set.

For the relays the operation modes *Door terminal function*, *door opener function* and perhaps *Floor light* with the requested *Duration time* have to be set.

For the case that nobody takes the door call, the visitor, in front of the door, can also be connected to the answering machine. Under *Internal call forwarding from the door terminal* the **ringer rhythm** used by the answering machine has to be configured properly.

The door call can also be diverted to an external connection. The *External call forwarding from the door terminal* has to be used. The configuration of this function is also possible via telephone (page 40 in the user manual).

To identify the visitor's door bell button the **signalization of the door bell button number** for individual subscribers can be enabled.

If a telephone should only be used for the door function, you can set it as **door terminal phone**. This telephone will immediately be connected to the assigned door right after the receiver has been picked up.

If door opening should not be possible with a certain telephone, you can withdraw the **authorization to open the door** from this subscriber.

☞ *Advice for COMpact 4410 USB: Use for door functions a COMpact TS Module in slot B. If you use a TS Module in slot C the announcement/Music on Hold function of the audio jack is not available.*

Use the universal switching Relays

If a relay should be used as an universal switching relay, the following settings are necessary in *COMset*:

For the relay the operation mode **Universal mode** has to be selected.

If the relay has to be switched configuration dependent, you have to activate **Turn on if configuration x is active** and **create the corresponding configuration**.

If the relay has to be switched on as soon as a certain internal subscriber of the PBX is called, you have to activate *Turn on if PC relay subscriber is called* and to select the **PC relay subscriber** as well as the **Duration time**.

But you can also switch manually from an internal or external telephone (remote switching, page 41 in the user manual). For the internal and remote switching the **authorization to switch to the relays** has to be assigned. For the remote switching the *MSN/DDI for room monitoring and external programming* and the **external password** have to be configured.

Music Functions

The *PBX* has an input for external Music on Hold alternatively to the internal Music on Hold stored in the PBX. You can connect e.g. a CD player here. If the connected CD player should not to be powered-on all the time, it can be activated by a relay as soon as it will be needed. You have to configure the operation mode **Music on Hold** and the requested **Switching time** for the relay in *COMset*.

If you want to change the internal Music on Hold, there is an alternative to the external Music on Hold input. It is also possible to store another music than the existing internal Music on Hold in the PBX (*COMpact 4410 USB only*). This can be done with *COMtools Music on Hold* (save a song as wave file[1] in the PBX) as well as via telephone (record a song with the PBX on the external Music on Hold input) (page 44 in the user manual).

Use Alarm Functions

The alarm order of events:

■ Alarm detection at the alarm input (contact closed longer than ½ a second).

■ The configurable alarm delay time is running (0-99 seconds).

■ Non recurring start of the siren (for 1-99 seconds) and/or the alarm indication light (for 1-99 minutes).

■ Simultaneously the first alarm call run starts (Alarm calls to the alarm subscribers):

☐ Calling the first alarm subscriber for 60 seconds. Internal alarm subscribers are called with a special ringer rhythm (ISDN telephones: See manual of your telephone).

☐ After taking the receiver, you will hear an alarm announcement stored in the PBX (*COMpact 4410 USB only;* page 46 in the user manual) again and again. (*COMpact 2206 USB: You will hear a signal tone*). The called party must acknowledge the alarm call within 60 seconds by sending the DTMF number ⓪ (page 22 in the user manual).

☐ If the called party does not acknowledge the alarm call, the next alarm subscriber will be called some seconds after finishing the first call. And so on....

■ If all alarm subscribers are called without receiving an acknowledgement, the alarm run will be repeated after a configurable alarm waiting period (0-99 seconds) has elapsed (you can configure 1-10 alarm runs).

■ The alarm will be terminated (including siren and alarm indication light), as soon as one of the alarm subscriber acknowledges the alarm. If the alarm input has been configured to „active once", it is deactivated afterwards. If the alarm input has been configured to „active repetitive", it is activated again and a new alarm can be triggered.

If the alarm function of the PBX has to be used the following settings are necessary in *COMset*:

For the door key input the **door key determination alarm** as well as **kind of contact** have to be configured. With the corresponding circuity (e.g. output of an alarm system) an alarm can be activated.

To control a siren and/or a code light, a relay has to be set the operation mode **siren** or *code light* with the requested **duration timing.**

You can enter up to four internal and external telephone numbers under **alarm subscribers 1-4**. It is recommended for calling external alarm subscribers to activate *emergency call has priority*.

Depending on how often and how long an alarm has to be signalled, modify the settings for alarm cycles, alarm time delay as well as alarm waiting period.

You may **activate the alarm function** now. But the alarm can also be activated or deactivated by an internal or external telephone (page 43 in the user manual).

COMpact 4410 USB: The announcement has to be recorded by telephone (page 46 in the user manual) or transferred with *COMtools Music on Hold* into the PBX.

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1. Standard Windows format for audio data

The functions described in this paragraph are especially intended for the business applications. Nevertheless they could also be used in private homes to e.g. save money with Call Through.

Reception and Secretary Function and Text before Answering

Waiting Loop: This function offers an indirect transfer of an external calling partner to an internal subscriber if this one is busy. The external calling partner can be put into the waiting loop. There he is held for up to 3 minutes and is listening to the Music on Hold in the meantime. If the corresponding internal subscriber is not busy anymore, he will be called for up to 60 seconds. If he takes the call, he will immediately be connected to the external subscriber.

A special configuration of the function is not necessary.

Waiting Field: (only available for *COMpact 4410 USB* and *COMpact 4406 DSL* in combination with a system telephone *COMfort 2000 plus* Xtension module) This function enables the configuration of a Waiting Field Reception that can park, retrieve or forward incoming exchange line calls in a Waiting Field (these are listening to the Text before Answering once and then to Music on Hold). The Waiting Field is especially useful if many calls have to be taken at the telephone reception at the same time. Depending on the number of available external B channels up to 8 calls can be taken and managed.

Boss-/Secretary function: (only in combination with a system telephones *COMfort 1000*, *COMfort 1200* and *COMfort 2000*) This function shields the boss´ telephone against direct calls by redirecting these calls to the secretary's telephone. The main difference to a standard call forwarding is, that the boss´ telephone can be reached from the secretaries telephone and important calls can be switched from the secretary to the boss´ telephone.

Announcement before answering: (only available for *COMpact 4410 USB* and *COMpact 4406 DSL*) This function enables a welcome message to the caller before taking the call. If a called subscriber does not take the receiver when it rings once (within 5-24 seconds), the call will be taken by the PBX (the external caller will be charged). The external caller will hear a welcome message (e.g. information on the company) while the called telephone is still ringing. As soon as one of the called subscribers picks the receiver up, he will be connected to the external caller.

Required Configuration for the Waiting Field Function
The following configurations have to be made with *COMset* to use the Waiting Field:

Select one subscriber (System telephone *COMfort 2000* with Xtension Module) as a **Waiting field Reception** (*switchable on/off*).

Assign external telephone numbers to the Waiting Field Receptions in the **external call distribution**. As soon as an Waiting Field Reception is active, all of these call will only be signalled in the Waiting Field. The other internal telephones will not ring anymore for these external telephone numbers. One exception: The external telephone number is set to „delayed" for the Waiting Field Receptions and to „immediately" for the other subscribers. If the waiting field reception is deactivated, all the telephones will ring again as configured in the call distribution.

The following configuration may be made with an internal telephone or with *COMtools*:

Record a „**Text before Answering**" via telephone (page 48 in the user manual) or load it via .wav-file into the PBX. If you have not Text before Answering, the caller will only hear the Music on Hold.

The following configuration may be made via telephone menu or with *COMfort Set*:

Configure on the **Waiting Field reception** for each B-channel available one **Waiting Field key**. This key is used for monitoring and switching external calls.

If you like to deactivate this function from time to time, configure a key for switching the **Waiting Field** activation.

☞ *After the activation of the Waiting Field Reception an activated subscriber call forwarding or call protection for the telephone is switched off. Only after the deactivation of the Waiting Field Reception (on the telephone) these functions (e.g. a call forwarding to an answering machine) may be possible again. The corresponding function has to be reactivated again.*

The parallel use of a system telephone as a Waiting Field Reception and as a Hotel Reception Telephone is not possible.
The usage of the **Waiting Field reception** *is described in detail in the manual of the system telephone.*

Required Configuration for the Boss/Secretary Function
The following configurations have to be made with *COMfort Set* or via telephone menu:

Configure a **secretary key** on the boss´ telephone.

Configure a **boss key** on the secretary's telephone.

☞ *A maximum of five secretary or boss keys per telephone are possible.*

It is not possible to configure both types of keys on one telephone.
The configuration is only possible on the first level of the keys.

It is recommended to configure a speed dial key with the boss number on the secretary's telephone in addition to the boss key to monitor the busy status.

To identify a call from the secretary via ringer melody, the secretary's number may be assigned to a special ringer melody with the PC program **COMfort Set** *in the phonebook of the boss´ telephone.*

The usage of the **Boss/Secretary function** *is described in detail in the manual of the system telephone.*

Required Configuration for Announcement before answering
The following settings have to be done in *COMset* for the Announcement before Answering:

For each individual external telephone number the function **Announcement before answering** can be activated.

Alternatively you can configure a key on the system telephone *COMfort 1000*, *COMfort 1200* and *COMfort 2000* to switch on/off Announcement before Answering if needed. The switching is separately done for each external telephone number.

The following settings have to be done by an internal telephone or in *COMtools Music on Hold*:

Record a „**Text before Answering**" via telephone (page 48 in the user manual) or load it via .wav-file into the PBX.

Use Call Data to separate Call Charges

Separation of private and business calls: The private exchange line access enables a separated registration of business and private calls for individual employees. Calls started with the private exchange line access will get a special code in the call data memory. If private calls at work have to be paid by the employee himself, he can additionally protect his telephone with a password against malicious use.

Project assignment: The project assignment enables the assignment of an external call to a certain project/client (e.g. within a lawyer's office). In the view of the call data management program the charges as well as the time expense can separately be listed for the different projects/clients.

Mandatory Settings for the Separation of business and private Calls

The following settings can be done for the private exchange line access in COMset:

Configure the **Call number presentation, exchange line authorization, activation of Blocking and Release numbers, short-code dialling authorization, preferred exchange line** as well as t**he call charge allowance** properly for private and business calls.

In the **call charge data recording** it is possible to **record** the telephone numbers of private calls **truncated** to guarantee privacy in opposite to business calls.

You may also enter a **private password** for the internal telephones.

☞ *In addition to this the private password can be changed on the corresponding telephone.* (page 50 in the user manual).

Mandatory Settings for the Project Assignment

The following settings have to be done in COMset to make exchange line calls with project assignment:

The project numbers may be invented while starting the outbound call, only the **number of digits** have to be configured once (2 to 6 are possible).

☞ *In case of the system telephones COMfort 2000, 1200 and 1000 the length of the project numbers between 2 to 6 digits is also not limited during the entry. Besides this a project assignment is also possible in case of incoming calls.*

Announcements via Loudspeaker and System Telephones

Announcement/handsfree operation (InterCom) via system telephone: (only in combination with the system telephones *COMfort 1000*, *COMfort 1200*, *COMfort 2000* as well as *smar-tel-i*) This function enables an announcement to a system telephone from any available internal telephone without actively taking the call at the target telephone (e.g. in a doctor's office).

Besides this you can instruct a system telephone to switch on the microphone in addition to the loudspeaker (handsfree operation) so that a person nearby can talk to you via the built-in intercom.

Announcement via loudspeaker: (only in combination with a door/switch module *COMmander 2TSM analog*) This function enables an announcement to a loudspeaker device or an active loudspeaker (e.g. ELA system in a department store or supermarket) connected to the audio output (Cinch jack marked with „audio output") of the PBX. A previously configured internal telephone number is called from an internal telephone. The voice connection is established right after dialling the telephone number.

Mandatory Settings for Announcement/Handsfree Operation (InterCom) via System Telephones

On the target system telephone the InterCom function has to be allowed in the configuration program COMfort Set or in the menu of the system telephone (see manual of the telephone).

Mandatory Settings for Announcement via Loudspeaker

The following settings have to be done for the use of the audio output in COMset:

The **internal telephone number of the audio output** as well as the necessary **announcement authorization** for individual telephones have to be configured. If needed, you can configure the operation mode **Announcement** for one or more relays of the PBX (if available) to switch the loudspeaker system or another device on or off during the announcement.

☞ *COMpact 4410 USB: If a COMpact TS Module is used in slot C the announcement/Music on Hold in/out function is not available.*

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Save Money and get Information away from Home

Call Through: This function enables the use of the Least Cost Routing of the PBX for e.g. the travelling sales man. To avoid high costs when making e.g an international call with the mobile phone you can call the PBX first and you will be connected to the requested target by it. The function Call Through enables the post dialling of any telephone number.

Function:

① The user dial on his mobile telephone a telephone number assigned to Call Through.

② The PBX checks the Call Through authorization by checking the number presented by the mobile phone.

③ If the Call Through authorization is verified, the PBX accepts the call and sends a special tone.

④ The user dials (DTMF) the target number on his mobile phone. This number is dialled by the PBX and the connection will be established.

The biggest savings can be achieved if the telephone number of the PBX has been selected as a favourite special telephone number (e.g. „TellyActive Local" or „Partner & Family") at the mobile phone provider.

SMS function: (only in combination with the system telephones *COMfort 2000* and *COMfort 1200*) The PBX supports the sending and receiving of Short Messages (SMS) in the fixed network[1] together with the system telephones COMfort 1200 and 2000 (e.g. to inform a sales man about a new appointment). Sender or receiver can be other SMS compatible terminals in the fixed network (e.g. SMS equipped telephones) and mobile phones within the GSM network. With the system telephone

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1.   currently available only in Germany, Austria and Luxembourg (the SMS centers described here are invalid for Austria and Luxembourg)

you can comfortably write, read and modify the messages. It is even more comfortable with the program *COMfort SMS* bundled in the scope of delivery.

Required Configurations for Call Through

The following configurations for Call Through have to be made with *COMset*:

Configure the **incoming MSN** as an external number that is used to call the PBX for Call Through. **This number is not to be used for the external call distribution**.

Configure the **outgoing MSN** out of the available external numbers that should be presented to the called party when called via Call Through. If you have multiple external S_0 ports, you can configure an **outgoing MSN** for each S_0 port or deactivate S_0 ports for outgoing Call Through connections.

For safety reasons, you can time limit outgoing external Call Through calls in the PBX. Configure the **maximum duration** (1-99 minutes).

The telephone numbers in the phonebooks of mobile phones are most often entered with a plus (+) in front of the country code (e.g. +49). The PBX can accept and use this format. Configure the **country code** for this purpose.

You can also configure if **Least Cost Routing for Call Through is activated**.

The following configurations for Call Through have to be made with *COMtools*:

The numbers of the mobile phones used and authorized for Call Through, have to be entered as **Public Short-code dialling numbers with Call Through authorization**. The number presentation of the mobile phone must be activated.

You can also configure for each individual mobile phone number if **Blocking Numbers** are used.

☞ *For the call data management with the PC program COMlist the Short-code Dialling Number of the Call Through user is stored in the column „project".*

Mandatory Settings for the SMS Function

The following settings are needed for the use of the SMS functions in *COMset*:

A SMS is not directly transferred to the receiver, but through a message center (SMS center) of a network provider. For the transport of messages with the system telephone **at least one** SMS center (up to a maximum of 10) has to be configured in the PBX with the PC program *COMset*. SMS in the fixed network is currently supported by two SMS centers: Telekom (telephone number „0193 010") and Anny Way (telephone number „0190 01504"). The SMS call distribution has to be properly configured to distribute incoming SMS to SMS compatible telephones.

The telephone number presentation must not be restricted.

The following settings have to be made on the individual system telephones to receive SMS messages:

For receiving messages you have to be subscribed to the SMS center used by the sender. At the SMS center of the Deutsche Telekom the subscription can be done by sending one SMS with the text „ANMELD" to the telephone number „8888" (free of charge). For „Anny Way" it is sufficient to send one SMS with any text via this SMS center.

☞ *If you did not subscribe your telephone at the transporting SMS center, your telephone is not registered to be SMS compatible. But you are still getting your message. Instead of a text message on the display you will receive a call with a voice message like on other not SMS compatible telephones.*

SMS in the fixed network is currently only possible on fixed network connections of Deutsche Telekom or Arcor. If you are connected to another provider, please stay informed about changes.

Sending or receiving of SMS to/from mobile phone networks may have some restrictions. Please stay informed about the capabilities of your provider's SMS center.

If more than one SMS center is configured in the PBX, you will be asked which SMS center you like to use for sending a message. But you can also preselect one of the existing centers for the sending.

If you have a connection between a PC and the USB interface of the telephone, you can use the bundled PC program COMfort SMS for preparing, reading, sending or storing of SMS messages.

The usage of the SMS function is described in detail in the manual of your system telephone.

Call Groups (Teams)

Additionally to the internal subscribers the PBX is able to manage 16 groups. Internal subscribers can be member of more than one group. These groups can be used in order to reach e.g. the internal subscribers of certain departments/teams (support, marketing, sales).

A group has, like an internal subscriber, an internal number, which has to be configured under **Internal Numbers** in *COMset*. Some settings are also handled similar to an internal subscriber. The call distribution (External and door) can be configured in *COMset* for groups. The group number can also be forwarded to an internal or external subscriber (group call forwarding).

Your membership in a group is configured under **Group settings** in *COMset*, does not mean that you are always called when your group is called. If you do not like to be reachable via the group calling number for a certain time but only as an individual subscriber, you will be able to „log out" of this group ().

This way there are active and passive members of the group. This function can be important for members of service lines or call centers who do not like to be available for their customers around the clock. Group functionality is not available for a subscriber that is logged out, but only for a certain period. There are three different modes to log in:

■ incoming + outgoing

■ only incoming

■ only outgoing

A subscriber that is member of several groups can be only be „logged in outgoing" in one single group at the same time. If he likes to get also the calls of the other groups in this case, he will be able to log in there as „incoming". Therefore he will be in the call distribution of more groups for internal -, public exchange - and door terminal calls.

With „log in outgoing" into a certain group, the subscriber gets a number of features/authorizations of the group which will replace his own features/authorizations as an individual subscriber in case of outgoing business calls:

■ Exchange line authorization for business calls

■ Activating of blocking/release numbers for business calls

■ Short-Code Dialling authorization for business calls

■ Calling number presentation for business calls

■ Preferred exchange line for business calls

These features/authorizations are configured under **Group settings** in *COMset*.

Hotel Functions for Reception and Room Telephones

(only *COMpact 4410 USB*) The hotel function enables the comfortable room and call data management if the PBX is used in a hotel. The scope of functions can be divided into three main areas.

Hotel Reception Telephone: (only in combination with a system telephone *COMfort 2000 plus* Xtension module) The hotel reception telephone enables various control and information functions via display and LEDs on the Xtension module. An additional PC is not necessary at the reception in many cases. The guests' Check in and Check out are directly controlled with the menu of the telephone. There are various functions available for the affected room in different phases.

Arrival of the guest (check in):

- View Room status (clean, uncleaned, blocked)
- Perform „check in"

During the guest´s stay (after check in):

- Permit/block outbound calls from the room telephone
- Configure the wake-up time of the room telephones
- View guest information (e.g. accrued telephone charges, time of check in)
- Print informational invoices (of the currently accrued telephone charges) for the guest directly to a printer

The guest leaves:

- Perform „check out"
- Print invoice for the accrued telephone charges directly to a printer

Hotel Room Telephones: The PBX has many functions not making sense or being harmful if used from a hotel room telephone. This is the reason for blocking programming functions (like e.g. Do-not-disturb, Call forwarding) exchange functions and special exchange line access types. This way, the guest can only make outbound calls and accept calls and configure the personal wake-up time. In addition to this it is possible for the room service to configure the room status (clean, uncleaned, blocked) by entering a digit sequence.

The advantage of a system telephone COMfort 1000, 1200 or 2000 compared with the use of an analog or standard ISDN telephones is e.g. the remote controlled delete function when checking out the guest (privacy protection), the various comfort functions and specifically configured function keys. The functions which are still allowed for room telephones are handled the same way as described for normal telephones. With one exception: A programmable function key configured with the function „hotel room" allows the setting of a wake-up time and the display of call charges and of the check in time. The following functions are also possible:

- Starting and accepting internal and external calls
- Delete lists and charges via the menu point „functions" (the call charge meter of the PBX is not influenced)
- Interrogation of e.g. call charges via the menu point „information"
- Use of the caller/call/redial list as well as the telephone book (internal telephone number as well as the short-code dial numbers of the PBX are not listed in the telephone book)
- Sending and receiving of SMS
- Memo, scheduled call and Power Dialling
- Interrogation of call charges and setting of the wake-up time with a function key.

Print-out Function: (available only in combination with a serial printer, the A4 printer EPSON LX300+ is recommended). This function enables the output of the accrued telephone charges as a guest invoice (or informational invoice) with a separate line for each call. This function is controlled by the hotel reception telephone.

☞   *The hotel room telephones have a limited function set for programming and usage. Additional protection for your PBX is achieved by the use of the dealer and user password. Block the CAPI access on the ISDN ports used for the hotel room telephones. Additional advice may be found in chapter Restrict Programming, Telephoning and Forwarding (Protection against Exploits) on page 44.*

Mandatory Configuration Settings for the Hotel Reception Telephone

These configurations are necessary for the reception telephone in *COMset*:

Select one system telephone *COMfort 2000* with Xtension Module as a **Waiting field Reception**.

These configurations are necessary in *COMfort Set* or the menu of the reception telephone:

There must be one programmable function key configured for each hotel room telephone on the hotel reception telephone.

☞   **Some providers do not transmit charge information. If LCR is enabled for the hotel reception telephone and calls are transferred to hotel guests the charges for these calls may not be available.**

To add charges for an assisted call transfer to the guest´s bill the function „Call charge recording changes with S" has to be activated. A useful feature is the „Advice of charge at the end of the call (AOCE)", because all charges are billed to the last subscriber. If the ISDN connection has the feature „Advice of charge during the call (AOCD)", at least one unit will be charged to the hotel bill.

Please pay attention that the hotel reception telephone is not available for incoming calls during the check in or check out (caller hears the busy signal). The configuration of a call forwarding on busy is recommended.

The simultaneous use of a system telephone as a waiting field reception and as a hotel reception telephone is not possible.

Please make sure that the listing of internal calls in the caller list is activated if you like to be informed about unsuccessful guest calls to the hotel reception telephone.

The function „hotel room" can only be configured on the first level of the keys. Afterwards the second level is blocked. An existing function on the second level will be deleted.

The hotel room key is also a destination speed dialling key for the corresponding room telephone.

Mandatory Configuration Settings for the Hotel Room Telephones

These configurations are necessary in *COMset* for the room telephones:

At least one telephone has to be assigned to the function **Hotel Room Telephone**.

If the hotel wants to be reachable (e.g. for room reservations) even if many guests are making calls an external S_0 port can be **blocked for Hotel Room Telephones**.

If system telephones *COMfort 1000*, *1200* or *2000* are used as Hotel Room Telephones these settings can be made in *COMfort Set*:

An Xtension key can be configured with the function **Hotel Room** for the **telephone number of this telephone**. The guest can use this key to configure the wake-up time and get information about the accrued telephone charges.

Other Xtension keys may be assigned with numbers for the exchange line (0), Reception, Room service, Emergency etc. .

☞ *Some providers do not transmit charge information. If a hotel guest is using such a provider to make outbound calls the accrued charges can not be billed to him. Out of this reason it is not useful to activate Soft-LCR for a hotel room telephone. To avoid manual dialling of a provider these numbers should be added to the Blocking Numbers with COMtools telephone book. The Blocking Numbers have to be activated for each hotel room telephone. Pre-configured files with Blocking/Release Numbers are available on the CDROM or in the Internet at http://www.auerswald.de. These files are imported into COMtools Telephone book by pressing on the button „CSV-Import" in the window „Blocking Numbers". The completeness of the files is not guaranteed.*

If you are using a standard ISDN telephone, it may be better to use a separate ISDN port for each hotel room. This way you avoid the situation that a hotel guest can make calls after changing his telephone MSN (password protected if you use a system telephone COMfort) on the bill of another guest.

There are no charges transmitted for an Internet connection. Uncontrolled Internet connections by hotel guests can be avoided by not configuring an ISDN PC-controller on the ISDN ports used by the hotel guests. Be aware that a subscriber configured as „ISDN PC-controller" also accepts devices that do not transmit any or a different MSN to support these non standard card configurations (chapter Programming via PC (Interface CAPI 2.0) on page 44).

The exchange line authorization of the hotel room telephones is controlled by check in/check out at the hotel reception telephone. Exchange line authorizations configured in COMset are not invalid.

The hotel room telephones should not be assigned to a group in COMset.

*System telephones COMfort 1000, 1200 or 2000 as hotel room telephones: To avoid misunderstandings the value for **cost per charge unit** configured in COMfort Set should match the value configured in COMset.*

Mandatory Configuration Settings for the Print-out Function

These configurations are necessary in *COMset* for the print-out function:

The hotel reception telephone for controlling the print-out functions has to be configured (see chapter *Mandatory Configuration Settings for the Hotel Reception Telephone* on page 50).

The hotel room telephones (the invoices are printed for the telephones) have to be configured (see chapter *Mandatory Configuration Settings for the Hotel Room Telephones* on page 51).

The **Print Template** has to be created. This includes the **Activation of the Print-out Function** and the configuration of the **Number of Prints** if invoice copies are necessary. Additionally, individual settings for the design of the Print template can be configured.

Header and **Footer** are empty in the default settings and may be filled with texts like hotel address, additional information and best wishes for the travel back home. This text can be printed **Bold** line by line.

The same is valid for the line **Concerning**, that my be filled with the words e.g Invoice or Call charge listing.

The pre-defined words **Receipt no.**, **check in**, **check out**, **Date**, **Time**, **Duration**, **Telephone Number**, **Amount**, **Sum**, **VAT incl**. and **Tax** may be replaced by your own words if necessary (e.g. for language adaptations).

Also the **separators** used for **Date** and **Time** may be adapted to the local versions.

You can enter under **Currency Name** your local currency e.g. Euro.

If the printer should **print the tax**, this function has to be activated and the valid **percentage** has to be entered.

If in case of long term guests some individual call listings have been erased from the call data memory these missing data is explained by the text under **Missing Call data**.

If the **Form Feed** is activated a new page is used for each invoice copy. If a partially printed page should not be ejected at the end of the text to save paper the Form feed has to be deactivated. The copies are printed now one after the other and you may have to cut the paper.

☞ *The PBX has a permanent call charge data memory for 3000 data sets. If the capacity of this memory is filled and some of the calls of a long term guest are overwritten a text explaining that not all calls are listed (entered under **Missing Call Data**) is printed on the invoice. The sum listed on the invoice is taken from the call charge meter that counts independently from the individual call data. Tip: Activate on the hotel reception telephone the **Special dial tone if call data memory full**. Than you have the option to print-out an informational invoice in time.*

*If you deactivated the registration of certain call types to save space in the **Call data memory**, these are not listed on the individual call data listing of the invoice. The sum listed on the invoice is taken from the call charge meter that counts independently from the individual call data*

*To enable the listing of individual calls on the invoice, the **registration of the telephone number** has to be activated in the **call data mangement**.*

If you read the call data with a PC (e.g. with the program COMlist) the invoice number is listed as project number. This number will be assigned automatically during „check in".

⚠️ ***The case may only be opened by authorized personnel[1].***

Installation work with open case or services involving the keys inside the case are only allowed to be executed by authorized personnel[1].

1. Authorized personnel: These are persons that are trained for this purpose (e.g. certified electricians). They must have the necessary knowledge about the work in an area with potentially hazardous voltage. They must also have the knowledge about the latest electrical safety standards and requirements.

Default Information Status of the LED Display

The green power LED (hardware LED) shows only that the PBX is connected to the 230 Volt mains. This meaning will not change.

The meaning of the other five LEDS of the PBX is marked on the blue case cover in its default condition (that means without clicking the keys).

■ The LED „ISDN ready" signals the external S_0 bus monitoring (see page 52).

■ The LED „ISDN busy" displays information about the exchange line status (see page 52).

■ The LED „Message" signals the availability of messages (see page 53).

■ The LED „Remote" displays information about remote programming (see page 53).

■ The LED „Data" displays information about the USB connection (see page 53).

■ The LED „Data" displays also information during power-on (see page 53).

Symbol Definitions

☀ LED flashes.

☀ LED glows.

ISDN ready: Testing external S_0 Ports

If you established a connection to the NT, the LED „ISDN ready" will show the functional condition of the external S_0 ports (layer 1 active)[2].

☞ *If this function is not usable with public exchanges outside of Germany, it can be switched off in COMset.*

ISDN ready   busy   Message   Remote   Data   Power

All the existing external S_0 ports are ready for operation.

One of two possible external S_0 ports are not ready for operation. (only for *COMpact 4410 USB* with two external S_0 ports).

No external S_0 port can be activated.

ISDN busy: Information about the Exchange Line Status

The LED „ISDN busy" reflects the traffic status on the external S_0 ports.

ISDN ready   busy   Message   Remote   Data   Power

All existing B channels are busy.

(At least) one B channel is free.

All the existing B channels are free.
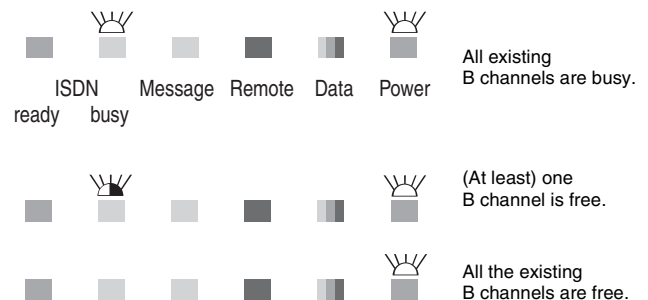
2. In the ISDN definition a so-called layer model is used in order to describe certain conditions of the communication protocol. In order to establish a connection, a setup of the layers 1 to 3 is necessary. The layer 1 (bit transmission layer) is providing the physical transmission of raw data.

Message: Notification about existing Messages

The LED „Message" shows whether messages (e. g. in your Voice Mail Center 461) are received.

ISDN Message Remote Data Power
ready busy

You have got a message.

Remote: Information about Remote Access

The LED „Remote" is on during any remote access to your PBX (Remote programming).

ISDN Message Remote Data Power
ready busy

There is a remote access to your PBX.
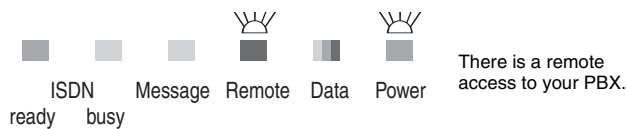
Data: Information about the USB Connection

The LED „Data" informs about the integrity of the data connection between the USB interface and the PC and about the transport of data across this interface.

Immediately after power-on it also informs about the status and success of the initialisation (see chapter *Data/Power: Information after Reset* on page 53).

green

The communication via USB is possible, that means there is a connection to a switched on PC with all necessary drivers installed.

ISDN Message Remote Data Power
ready busy

green

Data is transmitted via USB interface.

orange

USB suspend mode; (chapter *Error Messages for USB* on page 62).
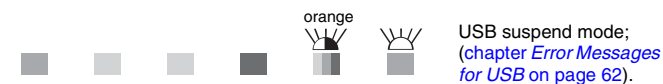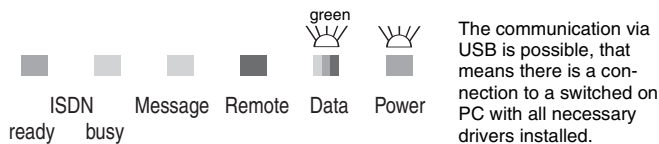
Data/Power: Information after Reset

When switching on/resetting the data/status LED glows as a proof that the PBX is initializing.

The power LED (hardware LED) shows that the PBX is connected to the 230 V mains.

☞ *After a reset (may last some seconds) the LED „Data" usually stops glowing. If this is not the case and the LED glows/blinks red, there was an error.*

If you have a USB connection, the LED remains glowing after a Reset, to give a feedback about the operation status. The LED „Data" displays information about the USB connection instead (see chapter Data: Information about the USB Connection on page 53 or chapter Data: Information about the USB Connection on page 53)

ISDN Message Remote Data Power
ready busy

The PBX is switched off.

Plug into the 230 volt mains.

red

1st phase: Reset/Initialisation (some seconds)

orange

2nd phase: Reset/Initialisation (some seconds)

The PBX is ready for operation.

red

If the LED glows/blinks red, there was an error.
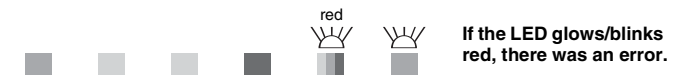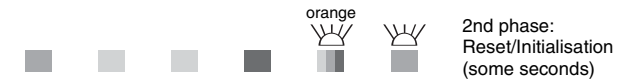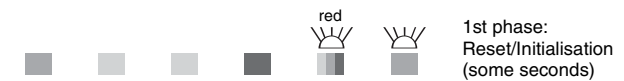
Key Functions with LED Display

Thanks to the two keys inside the case you are able to access different functions:

- Reset MSN/DDI Call Forwarding Settings; page 54
- Automatic PBX Software Update; page 55
- Terminal Test on the internal S$_0$ Ports; page 55
- Initialize Telephone Settings; page 57
- Perform a Reset of the PBX; page 56

As soon as you have pressed the *Select* key, the LED display will leave the default level and represent the functions selected with the keys.

⚠️ ***Services with the keys inside the case may only be executed by authorized personnel[1].***

👉 *If the keys have not been pressed during the function selection for more than 30 seconds, the LED display will return to the default level.*

	Default level of the LED display (see page 52)
Select	press once

green/orange

Reset CF — LCR Update SW — Test MSN — Status — Power	Status: Leaving the default level.
Select	Select a function: Press once or more than once.
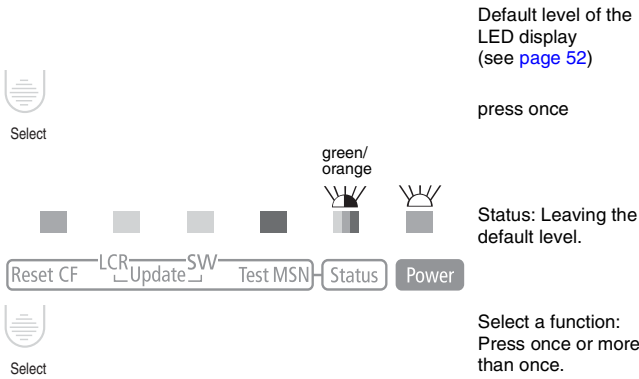
Reset MSN/DDI Call Forwarding Settings

This function deletes all the MSN/DDI call forwarding settings.

👉 *If the function has been finished, the LED display will return to the default level after 30 seconds (or after 2 seconds pressing the **Select** key continuously) (see chapter Default Information Status of the LED Display on page 52). If you like to start the function once again (function has been failed), press the **Enter** key for 2 seconds again.*
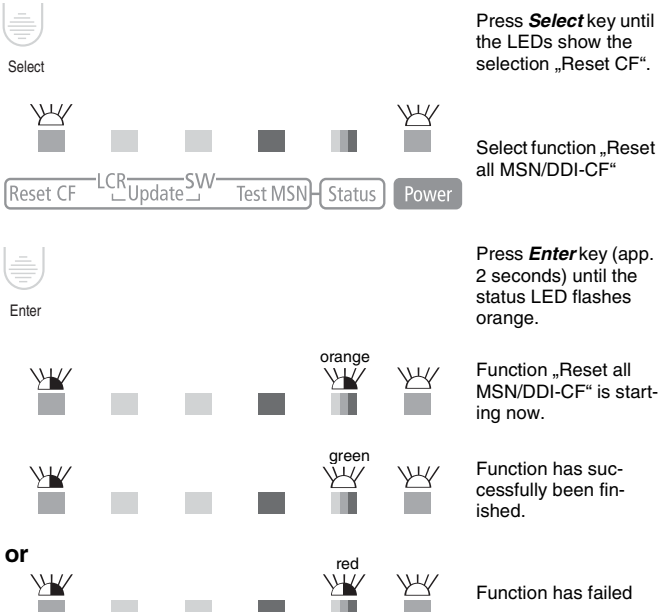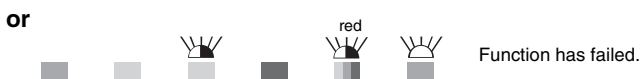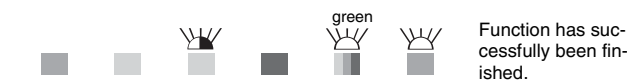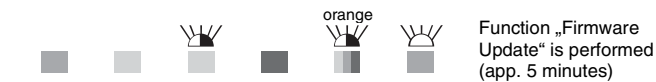
Select	Press *Select* key until the LEDs show the selection „Reset CF".
Reset CF — LCR Update SW — Test MSN — Status — Power	Select function „Reset all MSN/DDI-CF"
Enter	Press *Enter* key (app. 2 seconds) until the status LED flashes orange.
orange	Function „Reset all MSN/DDI-CF" is starting now.
green	Function has successfully been finished.
or red	Function has failed

---

1. Authorized personnel: These are persons that are trained for this purpose (e.g. certified electricians). They must have the necessary knowledge about the work in an area with potentially hazardous voltage. They must also have the knowledge about the latest electrical safety standards and requirements.

Automatic PBX Software Update

Stay informed on the news in the PBX software of the PBX (on our homepage on the Internet). The version number of the software used in this PBX can be requested via system telephone (*COMfort 1000, 1200* or *2000*), a connected system display SD-420 (special accessory) or via telephone (see chapter *Interrogate the Firmware Version* on page 57).

If the software is not up to date, you will have to make an automatic PBX software update **after the installation and the configuration**. During this update the PBX will make independently a telephone connection to one of the servers at Auerswald and the current software will be transferred while the call data and configurations will remain preserved. Besides of the costs incurred for the necessary telephone connection this update is free of charge. The PBX already knows the telephone number of the server at Auerswald. If the telephone number changes, you will be able to enter this change into the configuration program.

The update may be initialized via telephone by dialling a sequence of digits (see chapter *Perform an automatic PBX Firmware Update on page B-62 in the user manual*), time-controlled (chapter *Required Configurations for the time-automated Software Update* on page 44) or by pressing the buttons inside the case as described here. You should only start this procedure, if the PBX is idle (that means not during business hours) because all the calls will automatically be terminated by the PBX. The procedure will last 5 minutes.

☞ *If the function is finished, the LED display will return to the default level after 3 minutes (or after 2 seconds pressing the* ***Select*** *key continuously) (see chapter Default Information Status of the LED Display on page 52). If you like to start the function once more (function has failed), press the* ***Enter*** *key once more for 2 seconds.*

If the procedure lasts less than 60 seconds and you get a display „function finished successfully", the PBX software has already been up to date.

After a successful PBX software update existing LCR data may be deleted.

Select	Press ***Select*** key often until the LEDs show the selected function „Update SW"
Reset CF — LCR Update SW — Test MSN — Status — Power	Function „Update SW" is selected
Enter	Press ***Enter*** key (app. 2 seconds) until the status LED flashes orange.
orange	Function „Firmware Update" is performed (app. 5 minutes)
red/orange	Reset/Initializing (some seconds)
green	Function has successfully been finished.
or red	Function has failed.
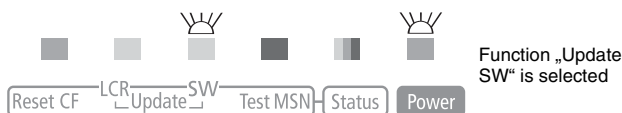
Terminal Test on the internal S$_0$ Ports

With this function you can test whether the telephone numbers (MSNs) were correctly entered into the internal ISDN and system telephones and if these numbers are correctly presented to the PBX (see chapter *Configuration of ISDN Devices* on page 18). If this is not the case, you will get an error message during this test when picking up the receiver. This error message will remain until you reactivate the test again or the LED display will automatically return to the default level (after one hour of testing).

☞ *If the function is activated, the LED display will return to the default level after 1 hour (or after pressing the* ***Select*** *key for 2 seconds) (see chapter Default Information Status of the LED Display on page 52). If you like to restart the function once more (after an error message or before the test time expires), press the* ***Enter*** *key once more for 2 seconds.*
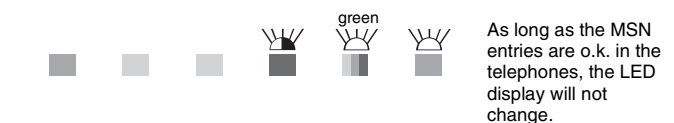
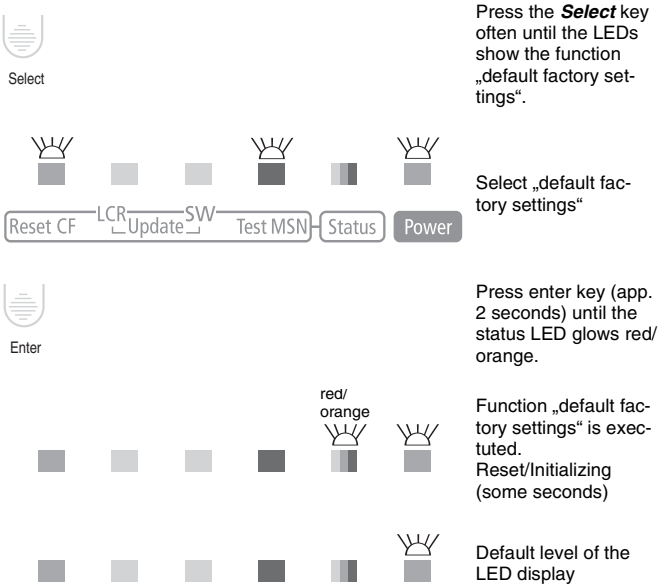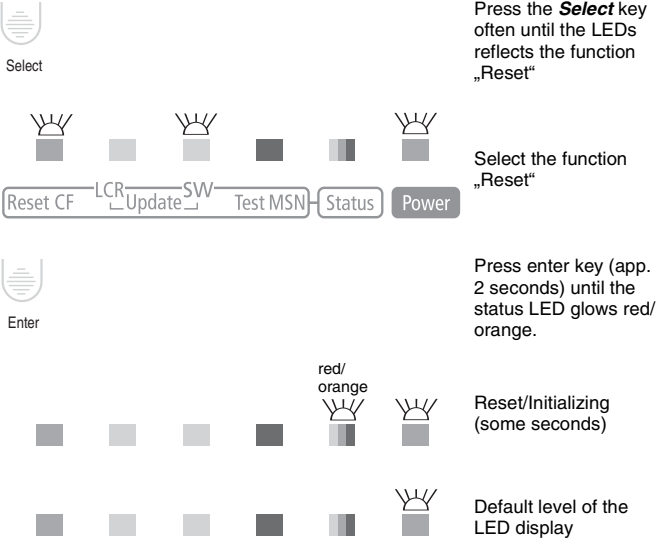|	
Select	Press ***Select*** key often until the LEDs shows the function „Test MSN"
Reset CF — LCR Update SW — Test MSN — Status — Power	Function „terminal test" is selected
Enter	Press ***Enter*** key (app. 2 seconds) until the status LED glows green.
green	„Test MSN" is activated (will automatically be switched off after 1 hour.)
(pick up / hang up receiver)	Now pick up the receiver of each ISDN telephone one after the other and hang them up again.
green	As long as the MSN entries are o.k. in the telephones, the LED display will not change.
red	As soon as the PBX has detected an error, you will get an error message.
Enter	Activate „Test MSN" again after error removal: press ***Enter*** for 2 seconds
green	„Test MSN" is activated again.
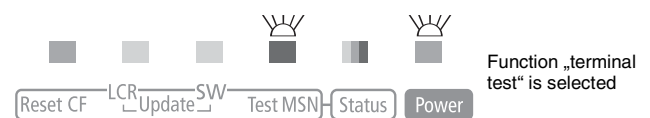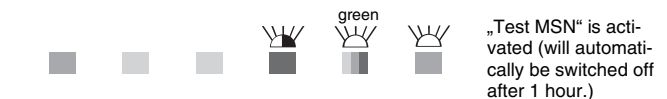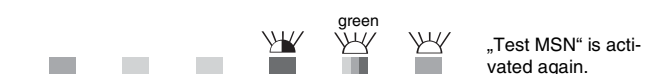
Return to the Default Factory Settings

If the other problem solving tips cannot help you, it is possible to initialize the PBX with a push on a button. Hereby **all settings will be reset-ted into the default factory settings** (administrator and subscriber password are maintained). How this default factory setting and the internal telephone numbering plan look like in detail can be learned on page 36.

Press the *Select* key often until the LEDs show the function „default factory set-tings".

Select „default fac-tory settings"

Reset CF — LCR Update SW — Test MSN — Status — Power

Press enter key (app. 2 seconds) until the status LED glows red/orange.

Function „default fac-tory settings" is exec-tuted.
Reset/Initializing (some seconds)

red/orange

Default level of the LED display

Perform a Reset of the PBX

In contrast to removing the 230 volt power plug, the supply voltage will not be interrupted by performing the reset this way. All internal and external connections, recalls and exchange line reservations will be deleted in case of a reset. All configurations done by configuration pro-gram or by telephone will remain valid. The same is valid for the call data memory.

Press the *Select* key often until the LEDs reflects the function „Reset"

Select the function „Reset"

Reset CF — LCR Update SW — Test MSN — Status — Power

Press enter key (app. 2 seconds) until the status LED glows red/orange.

red/orange

Reset/Initializing (some seconds)

Default level of the LED display

Interrogate the Firmware Version

The version number of the software used in this PBX can be requested via system telephone (*COMfort 1000, 1200* or *2000*), a connected system display SD-420 (special accessory) or via any internal telephone, as described here:

The version number is compounded by two digits and one letter (e. g. 1.2b) and is output on the phone with help of four digits:

- 1st digit: before the comma;
- 2nd digit: after the comma;
- 3rd and 4th digit: letter, e.g. a=01, b=02,..., z=26)

[📞 phone icon] [7]

public password

[🔓 lock icon with 2] [5] [6] [#]

Output digit by digit (see example B: page 8 in the user manual), followed by an acknowledgement tone

[📞 ring icon]

Interrogate the firmware version by telephone

Reset Settings (Initialization)

Telephones with the correct authorization can activate call forwarding settings. The possible problem is that the call forwarding settings are forgotten later.

If this problem occurs on single telephones, the initializing of the corresponding telephone may help. The connection of the PC may not be necessary. But consider the possibility that you will probably delete settings that you will have to reconfigure later again.

If the call distribution of incoming external calls does not work as it was configured first, it is possible that MSN/DDI call forwarding settings were activated by the individual subscribers. You can switch them all off at the same time (see chapter *Reset MSN/DDI Call Forwarding Settings* on page 54).

If this does not help you, it is possible to initialize the PBX with the buttons (see chapter *Return to the Default Factory Settings* on page 56).

Initialize Telephone Settings

With the following initialization functions, you will reset the settings for subscriber call forwarding, Follow-Me, recalls, exchange line reservations, calls without dialling and call protection.

[📞 phone icon]
your telephone

[7]

[🔓 lock icon with 2]
public password

[0] [4] [#]

Remote Programming

Thanks to the function „Remote Programming" you are able to read or save the configuration data of the customer´s PBX during an external connection.

A remote programming can be realized when observing the following requirements:

- an ISDN PC-controller with CAPI 2.0 support operating on the public telephone network or on the internal S_0 port of an ISDN PBX.
- **or:** PC connected to the USB interface of a *COMpact 4410 USB* or *COMpact 2206 USB*. To simulate the functionality of an ISDN PC-controller on the internal S_0 port, the *Auerswald USB driver* as well as the *Auerswald CAPI 2.0 driver* has to be installed on the PC (see CAPI/TAPI manual). You also have to configure an internal subscriber „ISDN PC-controller" on the „USB port" with <u>COMset</u>.
- **or:** PC that is connected to a *COMfort 2000* via USB interface. In order to imitate the functions of an ISDN PC controller with a system telephone on the internal S_0 port, the *Auerswald USB driver* as well as the *Auerswald CAPI 2.0 driver* have to be installed on the PC (see CAPI manual). Besides this you have to configure an internal

subscriber „ISDN PC-controller" with the configuration program of your PBX (on the same internal S_0 port as the *COMfort 2000*).

[☞ hand icon] *You should only store data into the PBX, if it is idle (that means not during business hours) because all calls will automatically be interrupted by the PBX.*

If you connect your ISDN PC-controller directly to the external NT for remote programming, no outgoing MSN will be selectable.

Remote Programming with manual Authorization by the Customer

Open the configuration program *COMset* and select the interface ISDN PC-controller (CAPI 2.0) in the menu under „options...interface".
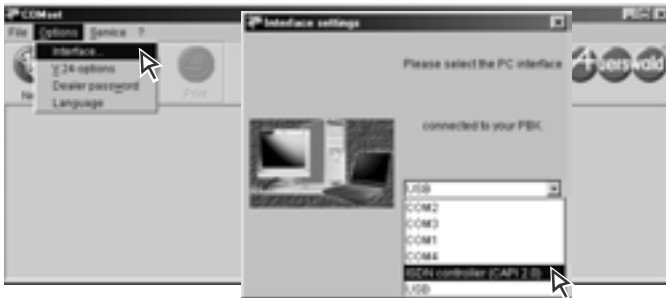
If you save an open file into the customer's PBX click on the button „Save". If you like to read the data out of the PBX click on the button „Open". Select then „remote config.".
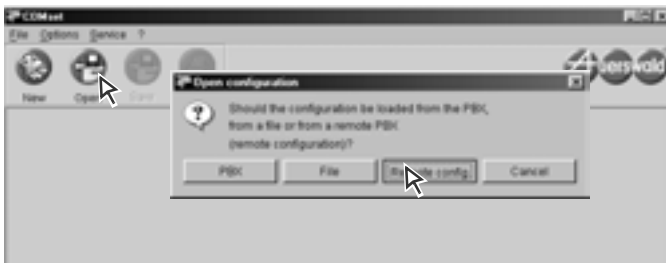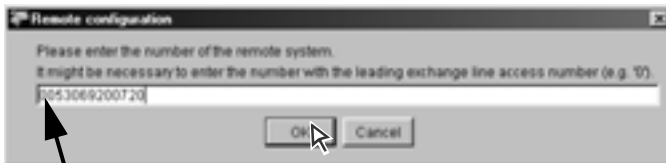

Enter, if existing, the administrator password of the customer's PBX and click on „OK".
(For remote access with *COMtools* and *COMlist* the entry of the user password is mandatory.)
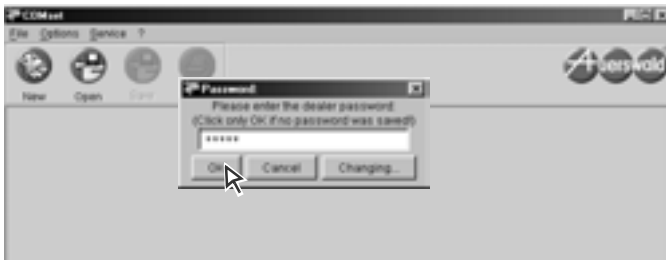
Here you enter the telephone numbers of the customer's PBX. Do **not yet** confirm the dialog.

Exchange Line Access Number 0 for ISDN PC-controller on internal S₀ port (if not configured as Direct Exchange Line Telephone)

Please establish now an external call to the customer. You explain your intended operation to the customer. If the customer agrees with you, you will ask him to pick up the receiver of another subscriber telephone of his PBX, to dial 9 9 (in case of direct public exchange twice $*$ first) and to hang up as soon as he will have heard the acknowledgement tone. Now confirm the dialog by clicking on „OK".

The conversation between you and your customer may last during the whole procedure if a free exchange line is available. (After clicking „Save", also this call will be interrupted.)

Remote Programming without manual Authorization

If you like to do remote programming without manual authorization by the customer, you have to pre-configure the customer's PBX.

Under „Passwords" in the configuration program of the PBX the **Dealer MSN** must be entered. If your ISDN PC-controller for the remote programming is directly connected to the external NT, use the main telephone number (**with area code**) of your ISDN connection.
The data accessed by the programs *COMtools*, *COMlist* and *Soft-LCR easy* can be protected by the user password.

☞   *For the read-out of call data with COMlist the user password is mandatory.*

On the page „Remote programming" select an otherwise unused telephone number of the customer as a **remote switching and programming MSN**. Besides this configure the remote switching response time to 10 seconds or less.

Enter a administrator password to protect the configuration.
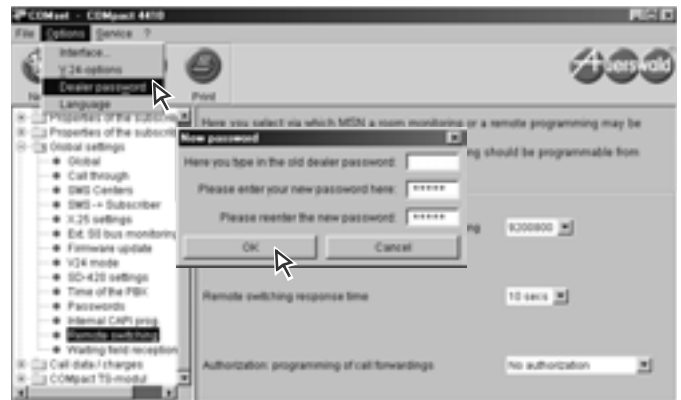
Process of the Remote Programming:

Open the configuration program of the PBX and select the interface ISDN PC-controller (CAPI 2.0) in the menu under „options...interface".

If you save an open file into the customer's PBX click on the button „Save". If you like to read the data out of the PBX click on the button „Open". Select then „remote config.".
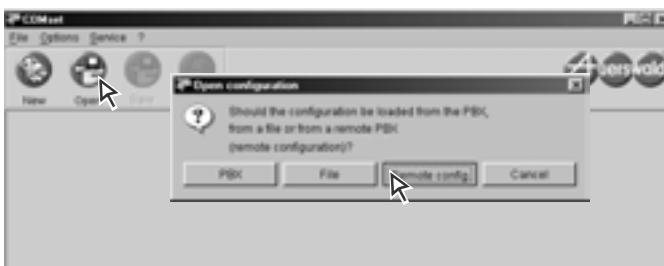
Enter the administrator password of the customer's PBX and click on „OK".
(For remote access with *COMtools* and *COMlist* the entry of the user password is mandatory.)

Here you enter the ***remote switching and programming MSN*** of the customer's PBX. Then you confirm the dialog by clicking „OK".
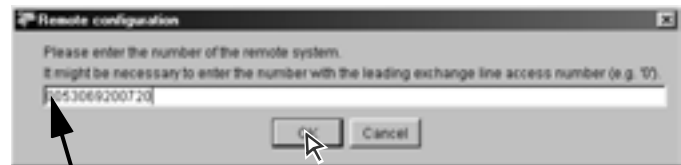
Exchange Line Access Number 0 for ISDN PC-controller on internal S_0 port (if not configured as Direct Exchange Line Telephone)

Frequent Problem Sources

If something does not work as expected, you will find some tips to solve a problem in this paragraph. If you already excluded an unwanted programming or external influences, we recommend to make an **automatic PBX software update** (see chapter *Automatic PBX Software Update* on page 55). The new software version may eventually solve some problems of the PBX. The **call data, wake-up times and configurations** remain unchanged of course. Only the operation software of the PBX will be updated.

You are hearing an unexpected Tone (Check Tones)

Various tones in the receiver are signalling various operating modes of the PBX. The PBX is generating the following tones:

Acknowledgement tone: You will hear this tone in the programming mode, e.g. as a signal for entering the correct password or the completion of a programming.

Internal dial tone: After taking the receiver off-hook or pressing the FLASH- or R-Key you will hear this tone. This signals that you can start dialling a number now. In the default factory settings, the PBX dial tone (3 x short) is configured as an internal dial tone. If you prefer to have another tone, you can configure the continuous or special dial tone (chapter *You like to configure internal Dial Tones and listen to the Result on page 37 in the user manual*).

External dial tone: This tone is a continuous dial tone. You will hear this tone after having dialled the exchange line access number (Direct exchange line telephone: After taking the receiver off-hook) as a signal for access to the exchange line.

Ringing Tone: This tone will be generated after dialling a number or when accepting a recall as a signal for calling a subscriber.

Busy line: This tone signals a busy line, a mistake in a programming sequence or a missing permission (see also chapter *You are Dialling a Number and are Hearing the busy Tone on page 13 in the user manual*).

Call Waiting Tone: This tone is signalling another external caller trying to reach you. It is also generated by an incoming door or alarm call.

Special dial tone: This tone instead of the internal dial tone signals an active do-not-disturb, baby call or subscriber call forwarding service. It also signals an almost filled call data memory. If you configured this tone as an internal dial tone, this signalling would not be possible anymore.

If you hear a different tone than expected and described in the programming description, most often a mistake in dialling or a missing authorization or permission is the reason. The following chapters will describe examples of these situations.

To get familiar with the tones, you can listen to the tones with your phone with the following function. If you are already listening to a tone, you can select another tone with the digit + #.

	7	public password	9	6		1 continuous dial tone		#	selected tone

		and/ or	2 PBX dial tone (3 x short)

		and/ or	3 acknowledge-ment tone

		and/ or	4 busy tone

		and/ or	5 special dial tone

		and/ or	6 ringing tone

		and/ or	7 Call Waiting tone (Knocking)
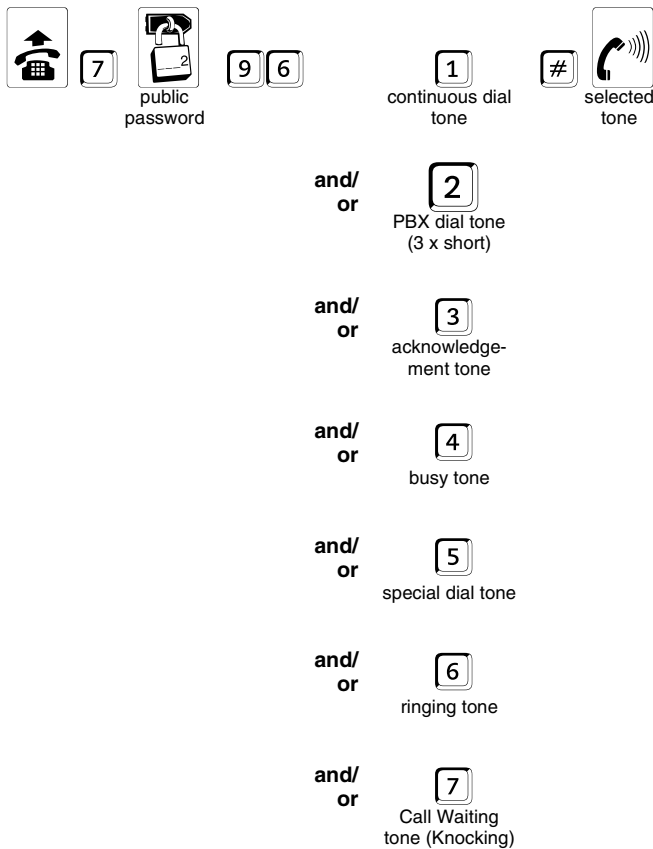
You are not hearing a Dial Tone after Picking up the Receiver

① If you only have this problem with some internal telephones, please check the wiring and plugs. Please also check the telephone.

② If you only have this problems with single internal telephones, probably no internal telephone numbers were defined via configuration program.

③ If you only have this problem with some internal telephones, these might be configured as door phones with *COMset*. In this case, you are immediately connected with the door after picking up the receiver.

④ If you have this problem with an ISDN telephone, you might not have entered the first MSN into the telephone. Try to correct this problem. Make sure that this MSN is presented to the *PBX* later (see manual of the telephone).

⑤ Disconnect the telephone from the *PBX* for 5 seconds **and** an eventually existing external power supply (Pull the plug). If the problem is solved, the telephone had a malfunction.

⑥ If you have this problem with all internal telephones, check the power plug connection of the *PBX* or the possibility of a power failure.

⑦ If you have this problem with all internal telephones, disconnect the *PBX* from the external power supply (Pull the plug) for 5 seconds or perform a reset (). If you hear the dial tone then, the PBX had a malfunction. If you are still not hearing the dial tone, please contact your dealer or administrator of the PBX.

You are hearing a Clicking/Breaking after Picking up the Receiver

① If this is an analog telephone, the „call charge transmission immediately" has been activated with the configuration program *COMset*. You will hear these charge unit pulses for the previous call after picking up the receiver (particularly, if it was an expensive long distance call). If your telephone is not able to display charges, this configuration may be obsolete.

② Check the curled cord of the receiver for defects.

You are hearing a pulsating Tone (Special Dial Tone) for 2 seconds after Picking up the Receiver

① An automatic dialling has been configured for the telephone. You can switch this function off, if unwanted.

You are hearing a pulsating Tone (Special Dial Tone) after logging into a Group

① Eventually a group call forwarding has been configured for the group. You can switch off this function, if unwanted.

You are hearing a pulsating Tone (Special Dial Tone) after Picking up the Receiver

① Eventually a subscriber call forwarding has been configured for the telephone. You can switch this function off, if unwanted.

② Eventually a do-not-disturb service has been configured for the telephone. You can switch this function off, if unwanted.

③ Please check, if the filling status of the call data memory has exceeded 80%. If possible, delete the call data memory entries.

④ Check, if the type of dial tone has been modified and reconfigure this modification, if unwanted.

You are hearing the internal Dial Tone on a direct Exchange Line Telephone

① The dialling method of the telephone is unknown to the *PBX*. Dial a 7 and put the receiver on hook.

Your are hearing the Busy Tone after picking up the Receiver on a direct Exchange Line Telephone

① All available public exchange lines are busy.

Telephoning impossible

The most important requirement for telephoning is the presence of a dial tone after picking up the receiver. If this is not the case, the previous chapter will help you.

If an external call is not possible with your telephone, please check, if this problem is also existing on other internal telephones or if dialling a different external number is possible.

Telephoning on the internal S_0 Port is not possible

① If you hear the busy tone after picking up the receiver, eventually both voice channels of the internal S_0 ports are busy. Try again later.

② Please check on your ISDN telephones, if you have entered the first MSN as an internal subscriber number. If not, try to correct this problem. Make sure that this MSN is presented to the *PBX* (see manual of the telephone).

③ Disconnect the telephone from the *PBX* for 5 seconds **and** an eventually existing external power supply (Pull the plug). If the problem is gone, the telephone had a malfunction.

④ Disconnect the *PBX* from the external power supply (Pull the plug) for 5 seconds or perform a reset (). If the problem is solved, the PBX or the telephone had a malfunction.

⑤ If an internal S_0 bus is existing, please check the wiring.

⑥ Check whether you really have configured the corresponding S_0 port as an internal S_0 port. ().

No external Call possible

① If you only have this problem with some internal telephones, please check the exchange line authorization for these subscribers (configuration program *COMset*).

② If you only have this problem with some internal telephones, please check, if there is a call allowance configured for these subscribers and if the account is empty.

③ If this problem already happens with the first power-up, please check whether the right kind of connection was configured for the external S_0 ports and modify it if necessary.

④ Please check the connection between the NT (NTBA or external S_0 bus) and the *PBX*.

⑤ Disconnect the *PBX* from the external power supply (Pull the plug) for 5 seconds or perform a reset (page 56). If the problem is solved, the PBX or the telephone had a malfunction.

⑥ You can check the function of the NT by directly connecting an ISDN telephone (If you have a Point-to-point ISDN line, the telephone must be compatible to the Point-to-point connection). If there is still no telephoning possible, disconnect the NT from the external power supply (Pull the plug) **and** the exchange line for 5 seconds. If the problem is solved, the NT had a malfunction. If the problem remains, contact your network provider for help.

Short-Code Dialling is not possible, external Calls are possible

① Eventually no number is stored under the dialled short-code number or the exchange line access number was added as a prefix.

The Telephone cannot be called

Check if your telephone is really not reachable. Try to make a call from another internal telephone to your telephone.

No internal and external Calls

① Eventually a subscriber call forwarding has been configured for the telephone. You can switch this function off, if unwanted.

② Eventually a do-not-disturb service has been configured for the telephone. You can switch this function off, if unwanted.

③ Disconnect the telephone from the *PBX* for 5 seconds **and** an eventually existing external power supply (Pull the plug). If the problem is solved, the telephone had a malfunction.

④ Please check if the ringer is deactivated or defective.

⑤ Disconnect the *PBX* from the external power supply (Pull the plug) for 5 seconds or perform a reset (page 56). If the problem is solved, the PBX or the telephone had a malfunction.

No incoming external Calls, but Calls from internal Telephones are possible

① Eventually a MSN/DDI call forwarding has been configured. You can switch this function off, if unwanted.

② If you did not configure an external ringer rhythm with *COMset* for the telephone, no external calls are possible.

③ If you did not configure an (partial) exchange line access with *COMset* for the telephone, incoming external calls are not possible. Outgoing external calls are not possible either in this case.

④ Please check the connection between the NT (NTBA or external S_0 bus) and the *PBX*.

⑤ Disconnect the *PBX* from the external power supply (Pull the plug) for 5 seconds or perform a reset (page 56). If the problem is solved, the PBX or the telephone had a malfunction.

⑥ You can check the function of the NT by directly connecting an ISDN telephone (If you have a Point-to-point ISDN line, the telephone must be compatible to the Point-to-point connection). If there is still no telephoning possible, disconnect the NT from the external power supply (Pull the plug) **and** the exchange line for 5 seconds. If the problem is solved, the NT had a malfunction. If the problem remains, contact your network provider for help.

No external Calls are reaching an internal Target Telephone with a Call Forwarding activated

① If you did not configure an (partial) exchange line access with *COMset* for the target telephone, incoming external calls are not possible. Outgoing external calls are not possible either in this case.

No incoming Calls to the Group Number

① To receive calls to the group number, you have to log in as a group member „incoming".

② To be able to log into a group, your telephone has to be configured as member of the group with *COMset*.

③ Eventually a group call forwarding has been configured for the group. You can switch this function off, if unwanted.

Query or Transfer not possible

Pressing the FLASH key disconnects the Caller

① The FLASH duration of the telephone is too long. Modify the settings of the telephone (see manual of the telephone) or the settings of the *PBX* with the function „learn flash time" (see page 18).

Pressing the FLASH key leaves you in the first Call

① The FLASH duration of the telephone is too short. Modify the settings of the telephone (see manual of the telephone) or the settings of the *PBX* with the function „learn flash time" (see chapter *Configuration of analog Devices* on page 18).

② The FLASH-key of your telephone is configured as EARTH-key and not as FLASH-key (see manual of the telephone).

ISDN Telephone is ringing after putting the Receiver on-hook and you are reconnected

① Please check with the manual of your telephone, if „Transfers on a PBX" is activated. If not, try to correct this problem.

A Query is not possible via T-Net-Function Key/Menu

① Analog telephones equipped with T-Net-function keys or menus are using a long FLASH (300 ms). Eventually your *PBX* is not configured for this FLASH timing. Most of the time an additional FLASH-key is available at the telephone. Configure this key also for 300 ms (see manual of the telephone) and let the PBX learn the FLASH timing (see chapter *Configuration of analog Devices* on page 18).

You try a Query from an external Call to an internal Call and hear the busy Signal

① The called party is probably talking. Try again later.

② If you did not configure an (partial) exchange line access with *COMset* for the called telephone, a Query call from an external call would not be possible.

You cannot identify Door Bell ringing

Door Bell rings with the Rhythm „1 x long"

① Check whether the internal Call Forwarding from the Door Terminal for the corresponding telephone is switched on.

② Check whether the CLIP function with the Telekom door signal was switched on for the corresponding telephone.

Pickup is not possible

Busy Tone during Pickup for external Call

① If you did not configure an (partial) exchange line access for business calls with *COMset* for the telephone, a Pickup of an external call is not possible.

Busy Tone during Pickup on the internal S_0 Port

① Probably both voice channels of the internal S_0 ports are busy.

Pick-up takes over ongoing Calls to another Telephone

① The Takeover function and pick-up use the same functional procedure. Switch off „conversation may be taken over" via configuration program for all telephones. The permission for a Takeover is only useful for answering machines.

PBX is not programmable

Programming with the PC is not possible

① If you forgot your setting password that you need for the access with the configuration program *COMset*, please contact the manufacturer.

② If you have this problem on the internal S_0 port, this port might be restricted for PC programming. Try again on a different S_0 port, if possible, via USB interface or with the serial port. If necessary you can try to access on all internal S_0 ports in a timeframe of 2 minutes after a PBX reset.

③ If you have this problem on the internal S_0 port, the ISDN PC-controller might not present an MSN (as a workaround, you can configure with *COMset* a subscriber as „ISDN PC-controller" on the S_0 port). Try again on a different S_0 port, if possible, or with the serial port.

④ If this problem occurred when remote programming via an internal S_0 port, you probably forgot the exchange line access number when entering the customer's telephone number.

⑤ If the other tips cannot help you, it is possible to initialize the PBX with a push on a button (). Hereby all settings will be resetted into the default factory settings (administrator and subscriber password are maintained). How these default factory settings and the internal telephone numbering plan look like in detail can be learned on .

You cannot program with one Telephone

① Eventually the configuration of some functions (Call forwarding, remote switching, manual configuration switching) or all functions are restricted for this telephone.

② If you configured a programming telephone, administrator settings (with secret password) would only be possible from that telephone.

Error Messages for USB

Data/Status LED flashes orange

① The connected PC switched into the suspend mode. Move the mouse connected to the PC.

② The USB port of your USB hub – if it exists – has been switched off. One reason for this are electromagnetic interferences near the USB hub. To eliminate this problem there is an improved driver from Microsoft. You will find more information about this matter on the internet (English):
    http://support.microsoft.com/support/kb/articles/Q236/9/34.ASP
The necessary driver to eliminate this error for Windows 98 second edition can be ordered from Microsoft under the following telephone numbers:
    Germany: 0180 5 67 22 55
    Austria: 01 50222 22 55
    Switzerland: 0848 80 22 55
You have to order a hotfix for the USB problem Q236934 and then you will get the new driver usbhub.sys by Microsoft.
For Windows 98 first edition unfortunately there is no driver available from Microsoft.