



BOSCH

Fire Brigade Indicator Panel (FAT)

FAT 2002 / FAT 2002 RE

ZPA 2002 / ZPA 2002 RE

without / with a redundant connection

Operating and Installation Instructions

FAT

Steel plate housing - silica grey
Standard version (4 keys):



Version with 2 additional keys :



ZPA

Plastic housing - grey / black



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1 General

The devices FAT and ZPA are based on the same electronic component. The only difference consists in the housing. FAT2002 / ZPA2002 are the non redundant versions and FAT2002RE / ZPA2002RE are the redundant versions. The following descriptions refer to FAT and ZPA similarly.

The fire brigade indicator panel FAT 2002 (Standard version) according to DIN14662 is an additional unit for the connection to control and indicating equipments (CIE) of fire alarm systems. It is designed to display certain operating states (alarm, fault, disabled) as a group message by means of LED as well as plain text on an alphanumeric display. The ZPA doesn't correspondent to DIN14662 because of the different housing. The additional keys of the special version FAT2002 are not defined in DIN14662 but tolerated.

The FAT as a first information mean of the fire brigade has to fulfill the requirements according to DIN EN 54-2, 12.5.3. This is realized by the redundant connection of the FAT2002RE. That means, operating voltage and serial interface are supplied via two separately laid cable systems. So, the function of the FAT remains unchanged in case of failure of a connection (interruption or short-circuit).

The FAT2002RE (redundant version) is based on the FAT2002 (non-redundant version). It is differed by a special programming (adjustments in the configuration file *.fat), and it has a controller module Dual485 as an interface module. This module provides two connection systems (with each RS485 bus + operating voltage) and realizes the bus management as well as the data transfer from / to the FAT via the ring.

The connection to the CIE is directly carried out to a TTY interface in case of FAT2002 (non-redundant) and via an adapter to a V.24 / RS232 interface in case of FAT2002RE (redundant).

The connection between FAT 2002 RE and CIE is serially carried out via cables which are redundant and separately installed. The adapter ADP-NB realizes the adjustment between the RS232 interface (ADP-NE TTYB interface) and the RS485 bus to the FAT in the CIE. There are two connections with each one RS485 and operating voltage at the ADP-Nx.

The power supply in the area of 10..30 V DC is carried out by the CIE and is accumulator-supported with that. If a separate energy supply is used, it has to fulfill the requirements of DIN EN 54-4.

The fault relay has to be connected to a suitable input of the BMA for supervision to be able to indicate faults of the FAT at the fire alarm system.

The device is configured and functionally delivered by the manufacturer. The additional texts have to be programmed (programming software FatProgWin) by the installer. Messages for which no additional texts deposited are displayed in a standard format.

The FAT is put as a single device in an identically constructed housing like the fire brigade operating panel FBF 100 LSN. The FAT is arranged over the FBF in the FIBS (fire brigade information and operating system). The FAT/FIBS housing is opened with a key (fire brigade locking-devices).



Attention !

The devices **FAT2002** (non-redundant) and **FAT2002RE** (redundant) are **not identical** !
An interchange of the types can lead to the destruction of the interfaces !

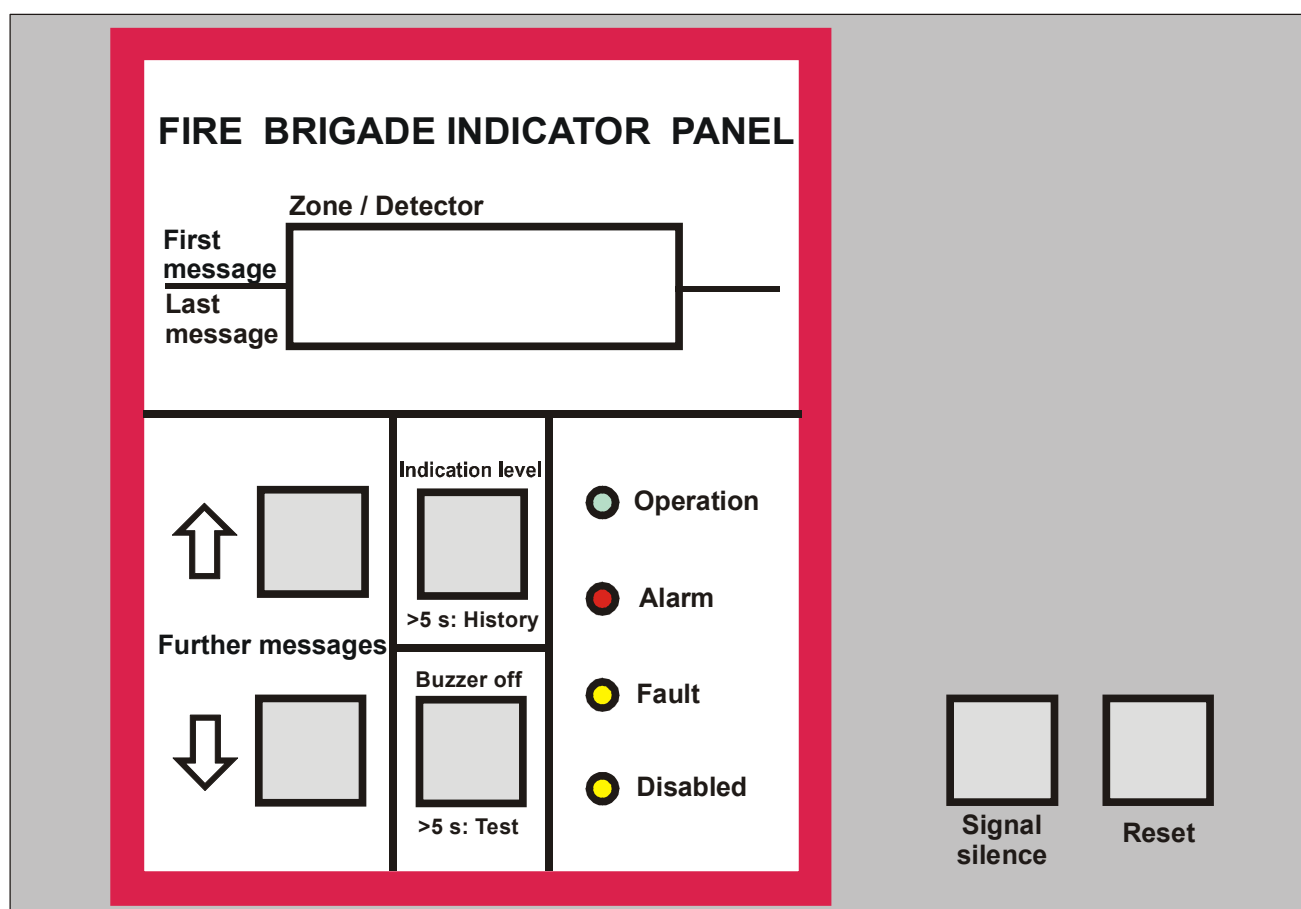
These instructions were made with the greatest care. The manufacturer reserves the right to carry out changes without separate information. A liability for additional expenditures and/or possible resultant damages resulting from it is excluded !

2 Operating instructions

2.1 Summary of the display and controlling parts

Display and controlling parts of FAT:

- LED group displays operation, alarm, fault, disabled
- Alphanumeric display with 4 x 20 characters (LCD)
- Cursor keys for scrolling up and down
- Key display level / History
- Key buzzer on / Test
- Special version with 2 additional keys: Key "Signal silence" (Special FAT version only !)
- Special version with 2 additional keys: Key "Reset" (special FAT version only !)
- Buzzer for acoustic signalling
- Fault relays for retransmission of a FAT fault to the CIE



Picture 1 : Display and operating elements

Messages are stored in the FAT and indicated according to the DIN14662. Alarm messages are immediately visible as a group and plain text display. Faults and disabled device messages are only signalled as a flashing group signal (LED) and must be retrieved by keys. The currently indicated level is marked by its permanently lighting group LED.

Additional keys need special setting in FAT programming (file *.fat) ⇒ see chapter "Programming".

2.2 LED group displays

A flashing LED alarm, fault or disabled means that at least one message is existing to this status but it isn't shown in the alphanumeric display. They can be retrieved with the key 'Display level'. The indicated level is marked by its statically lighting group LED.

A flashing operating LED signals system start-up or fault in the communication. This function is active at all monitored interfaces. Only the permanent-statically lighting operating LED means readiness for operation!

All LED are out of order in the programming mode. A corresponding identification is carried out on the LCD.

Operating states are indicated by means of the LED:

LED	Colour	Function
Power	Green	On : Ready for operation Flashing : Operating voltage on, system restart, no communication Off : No operating voltage FAT in programming mode (⇒ LCD display)
Alarm	Red	On : Existing fire alarm and shown on LCD Flashing : Existing fire alarm, fire alarm not shown on LCD Off : No fire alarm FAT in programming mode (⇒ LCD display)
Fault	Yellow	On : Existing fault alarm and shown on LCD Flashing : Existing fault alarm, fault alarm not shown on LCD Off : No fault alarm FAT in programming mode (⇒ LCD display)
Disabled	Yellow	On : Disabled device message, shown on LCD Flashing : Disabled device message, not shown on LCD Off : No existing disabled device message FAT in programming mode (⇒ LCD display)

2.3 Alphanumeric display

The alphanumeric display is carried out as a LCD matrix display which has 4 lines with each 20 characters. The display shows information about single detectors or detector groups.

Two lines are planned for one alarm (see picture 1). Every alarm starts with the group and detector number in the format GGGGG/MM in the 1st line. 5 places are reserved for the group number GGGGG. Leading zeros are replaced by blanks. The detector information MM is two-digit. A slash separates group and detector if the detector information is existing. A blank is inserted before the following plain text.

The temporally first alarm is indicated in the upper part and the last alarm is indicated in the lower part in case of several alarm messages of a level. The next message appears in the upper part during scrolling done by means of the controlling parts 'Further messages'. The resetting to the first and last message is automatically carried out after 30 seconds without activity.

Only messages of the level alarm are immediately indicated on the LCD without operation. Messages of the levels fault and disabled are only indicated by a flashing group signal LED and must be retrieved by means of the key 'Display level'. The corresponding LED permanently illuminates for identification of the select level.

If there is an indication of messages of the levels fault or disabled, an automatic resetting to the alarm level (in case of fire alarm) or normal display (no current fire alarm) is carried out after 30 seconds without a further operation of the FAT.

System restart and programming mode are special cases. The initialization phases are marked during the system restart. The display for normal operation appears after initialization. A corresponding identification is carried out in the programming mode. No FAT functions are active in this operating status. That means, alarm messages are not received, processed or indicated!

Display for normal operation :

(no message)

First message	B O S C H
Last message	Security systems 21.02.02 12:23:56

Display of messages :

(example)

First message	23/12 Fire DKM Ground floor
Last message	127/ 8 Fire ATM Top floor

Display programming mode :

(no signal processing)

First message	FAT 2002
Last message	Programming mode

The date and time of the normal display serve as sign of life (control of the second indication). In case of messages which also transmit time information, the date and time are automatically updated.

The LCD lighting is activated with every key action or every new event and goes out after approx. 30 seconds again. The display remains illuminated if there are current alarm messages.

2.4 Acoustic signal transmitter

The acoustic signal transmitter (piezo buzzer) indicates alarm messages and is disabled by using the key 'Buzzer off / Test' (double function).

The function of the signal transmitter is programmable (programming software → code table). So, it can be individually defined which messages trigger acoustic messages as continuous or pulsating tone. The following specification is valid according to DIN14662: Every fire alarm status which was received by the FAT is signalled by an intermittent acoustic message till the message is confirmed.

2.5 Controlling parts

There are four keys for operation of the FAT:

- Two cursor keys 'Further messages'
- One key 'Level' / History
- One key 'Buzzer off / Test'
- One key 'Signal silence' (special FAT version with 2 additional keys only !)
- One key 'Reset' (special FAT version with 2 additional keys only !)

LED are integrated in the cursor keys. These illuminate if further information can be retrieved in the respective selected direction by using the controlling part (e.g. message scrolling of a level).

The key 'Level' serves for switchover of the indication level (alarm, fault, disabled). The switchover function is only activated if there are messages in the levels fault and / or disabled.

Pressing key "Level / History" for at least 5sec the history function is entered. There are fire alarm indicated only. After 90 minutes alarms are removed from history automatically. Thus the fire brigade has information of alarms happens for a short time. This function is defined in standard DIN14662 in this manner.

The key 'Buzzer off / Test' serves for confirmation of acoustic messages as well as for the display test. After key pressing of at least 5 seconds the display test is triggered.

The additional keys 'Signal silence' and 'Reset' when operated will initiate according commands transmitted to the control and indicating equipment. These keys can be operated when the door is open only.

2.6 Display test

A display test is carried out if the key 'Buzzer off / Test' is pressed longer than 5 seconds. It takes at least 5 seconds or as long as the key remains pressed. All points of the LCD matrix are selected, all LED and the LCD lighting are switched on as well as the acoustic signal transmitter is activated.

2.7 Providing the time / date

The date and time are automatically taken by the CIE if corresponding messages are sent via the interface. However, there is the possibility of the manual input.

To reach the editor mode both cursor keys are simultaneously pressed in the normal operation (no indication of messages). The edit position flashes and can be changed with the cursor keys. The next position is selected by using the key 'Display level'. The edited value is overwritten again if a time or date transmission is carried out via the serial interface!

You can finish the editing mode by pressing both cursor keys or by using the key 'Display level' at the end of the line.

The indication of the date / time can be suppressed by a special programming. In this case, a moving cursor is on the lowest line.

2.8 Special FAT version with additional keys

The FAT2002 version with 2 additional keys at the right side is designed to control the fire control panel by operating these special keys. Normally there is no ZPA version with additional keys available. These keys should be protected against unauthorized operating.

Connection to FAT is done by a 10-pin flat wire via 10-pin male connector X2.

The additional keys can be operated when the door of the FAT is open. These keys are protected against unauthorized operation by an angle plate when front door is closed and the windows glass is not inserted.

Operating the additional keys will generate an according command being transmitted to the control and indicating equipment via the serial communication of the FAT with the panel. The action can be delayed for some seconds.

The command 'Signal silence' will silence the acoustics only, but not disable them. Any next alarm will reactivate the acoustics.

The command 'Reset' will initiate a reset cycle of the panel. Alarms and faults will be cleared if the detectors are set to normal state.

The function of these keys is to activate by programming in menu "Extended system settings" (see chapter "Programming" – set: IntEventLatches = 128).

3 Installation instructions

3.1 Installation of FAT

The FAT with an own housing is planned for wall installation. The housing can be screwed onto the wall through four openings in the housing base. The dismantling of the electronics from the housing isn't necessary. Only the bezel must be removed. After this, the installation openings and the clamps are accessible.

Corresponding openings for the cable installation are available in the base if there is concealed wiring. In the housing, there are sleeves above and below for surface wiring.

The installation is carried out by means of studs in case of installation into the system FIBS (Fire brigade operating and information system).

The FAT must be installed near the FBF in a height of 1700 (+100-200) mm (measured from the position of the operator up to the middle of the FAT). Further requirements have to be taken from the DIN14662.

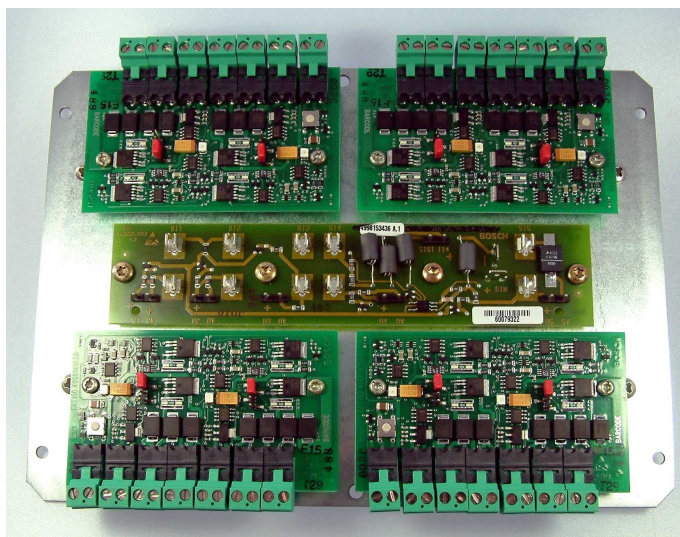
3.2 Installation of FAT adapter ADP-Nx into UGM2020

The FAT adapter ADP-Nx is installed on the mounting plate 3 MPL3 (F.01U.509.021) in the UGM2020 analog to the ERT100 modules or LSN coupler.

On the mounting plate, there can alternatively be: ERT100 modules, interface modules for the redundant FAT interfacing (ADP-Nx) or various LSN couplers. Up to four modules can be installed. The additional installation of a distribution fuse-board is possible.

The plate can be installed at all installation places which are planned for ATBL (backplane / side panel) and ÜSS (angle) within the UGM control panel cabinet.

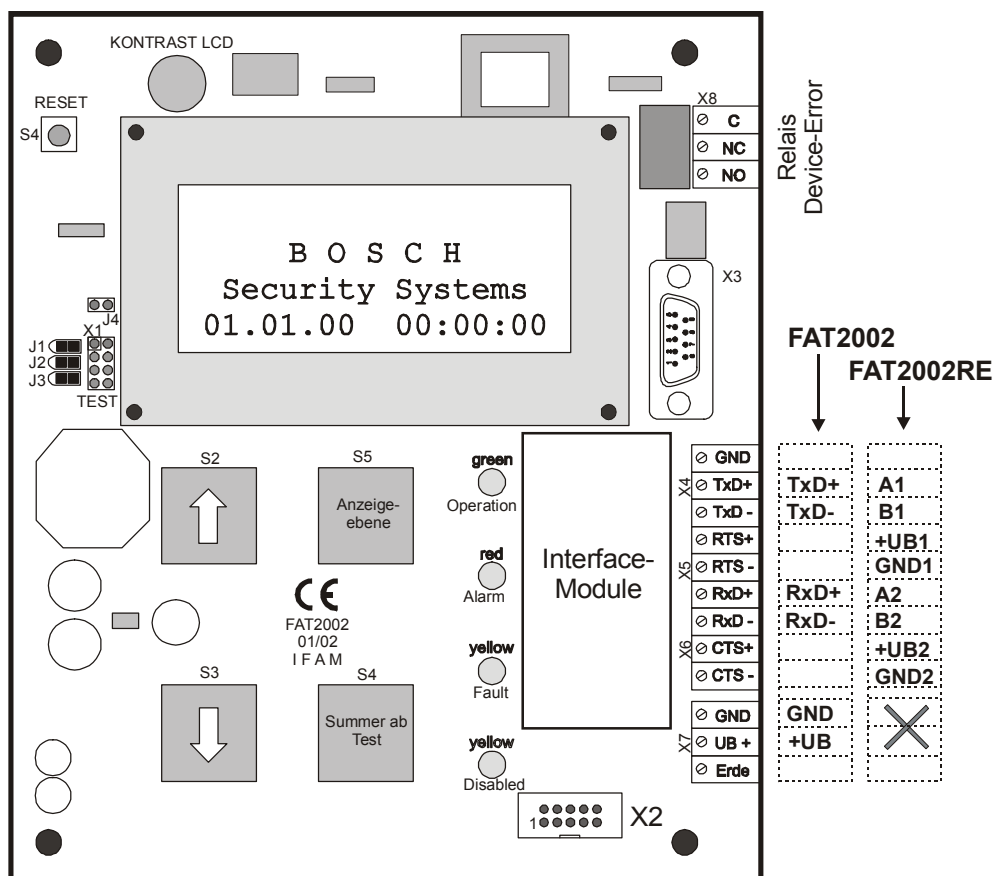
Please, see to this: IHB UGM2020 ZE or IHB UGM2020 EE.



Picture 2 : Installation example: 4 modules ERT100 with distribution fuse-board SIV

3.3 Layout of the FAT module

The layouts of FAT2002 and FAT2002RE are different !



Picture 3 : FAT layout

The bezel must be dismantled for the connection of the device as well as for the programming. Then, all connections or the programming plug are accessible.

The voltage and interface connections are executed as plug-in screw contacts.

The operating voltage and the serial interface for the redundant information transfer from the CIE has to be connected to the screw contacts X4, X5 and X6 (TxD+, TxD-, RTS+, RTS-, RxD+, RxD-, CTS+, CTS-) according to the applications.

The FAT2002 is connected to the control panel according to the standard applications (see section 3.4, Interfacing of FAT2002 (non redundant)).



The changed layout of the interface connections at the FAT2002RE (redundant FAT) must be noted :

Cable system 1 :

TxD+	A1	Cable A (+) of the RS485 interface 1
TxD-	B1	Cable B (-) of the RS485 interface 1
RTS+	+UB1	Operating voltage of lead wire 1
RTS-	GND1	Mass of lead wire 1

Cable system 2 :

RxD+	A2	Cable A (+) of the RS485 interface 2
RxD-	B2	Cable B (-) of the RS485 interface 2
CTS+	+UB2	Operating voltage of lead wire 2
CTS-	GND2	Mass of lead wire 2



It is **not allowed to connect** the FAT connections for the operating voltage (X7) at the **FAT2002RE** !



The modules **Dual485M** and **Dual485S** replaces the module **Dual485**. The module Dual485M is suitable for ADP-Nx, and the module Dual485S is suitable for FAT. The both modules are not allowed to interchange !



The **fault relay** of the ADP-Nx has to be connected to a suitable input of the fire alarm system for **supervision** to be able to indicate faults of the FAT or the bus system at the fire alarm system.

A resistance $R31 = 10\text{ k}\Omega$ is integrated in the incoming cable to the connection C! It is placed above the relay N1 and clamp X8. The beside placed soldering jumper J8 can be used for jumpering the resistor.

The contacts of the fault relay connected to a suitable input of the CIE for signalling a fault in the FAT ring are available at X8. The relay is active if no faults were detected in the FAT. Then, the connections C (Common, center contact) and NO (Normally Open, closing contact) are closed. C is connected (NO is open) to NC (Normally Closed, break contact) without operating voltage or in case of faults).

The programming interface which is next to the LCD display serves for the programming. This is a 9-pole sub D connector.



The FAT (or all FAT) must be reset after supplying the CIE (programming by means of programming software)! This can be realized by the key Reset S4 (on the top left on the FAT module) or by Power-On (simple measure at the redundant FAT2002RE: interruption of the voltage supply on the ADP-Nx for a short time).

Plug and play !

The **FAT** is programmed in the **delivery condition** and so, it is **ready for operation!**

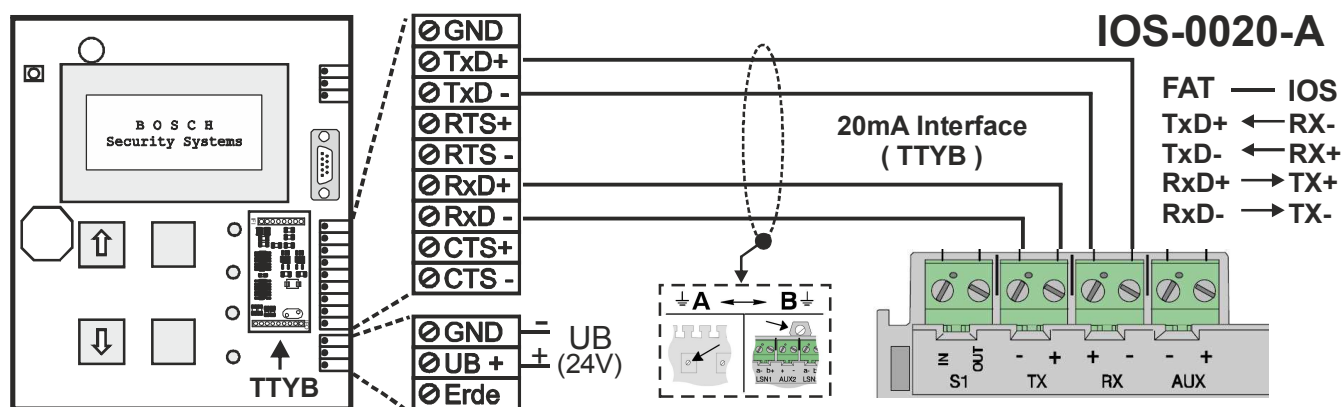
The programming of additional texts should only be carried out when required and after installation (green LED is permanently on, messages are correctly indicated).

3.4 Interfacing of FAT2002 (non redundant) to the control panel

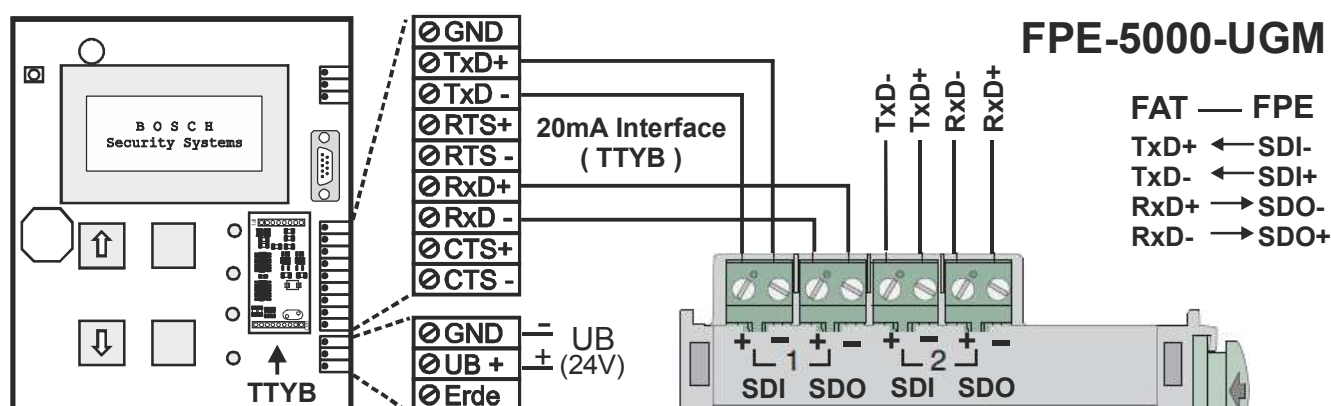
- Via optocoupler (TTY module, 20mA), reach max. 1000 m (SM20)
- Interface on FAT / FBF Austria, parameterization of 9600 baud
- UGM 2020 : SGK2 software from A 2.05



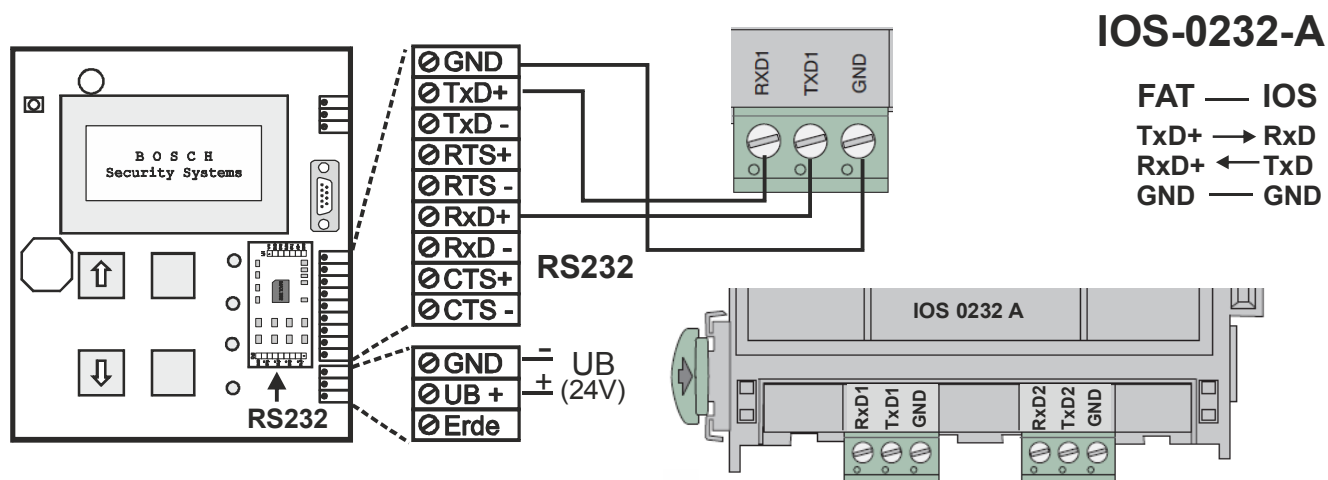
In FAT programming set Network-address = 0 (non redundant) !
Checkmark at 'redundant version with Dual485 module' is not set !



Picture 4 : FAT2002 to FPA5000 20mA interface IOS-0020-A



Picture 5 : FAT2002 to FPA5000 20mA interface FPE-5000-UGM



Picture 6 : FAT2002 connected to FPA5000 RS232 interface IOS 0020 A



3.5 Interfacing of FAT2002RE (redundant) to the control panel

- Via ADP-Nx in the control panel and two separately installed cable systems
- Via double RS485 and operating voltage
- Interface on FAT / FBF Austria, parameterization of 9600 baud
- UGM 2020 : SGK2 software from A2.05

 **The network address = 1 must be set in the FAT programming at the FAT2002RE (redundant FAT) ! There must be a checkmark at 'redundant version with Dual485 module' !**

The layout of the FAT2002RE isn't identical with the FAT2002 !

 **The redundant operation is possible from FAT release version 4.24-R005 !**

 **The modules Dual485M and Dual485S are not interchangeable !**

 The ADP-Nx can supply voltage for max. 2 FAT2002RE at UB=12 V or 3 FAT2002RE at UB=24 V ! Shall several (max. 8) FAT be operated in one ring, then, a separate power supply is to be used for further FAT (see picture 8). This power supply has to meet the requirements of the norm EN54-4! A power demand of 170 mA (12 V) or 100 mA (24 V) must be planned for every FAT.

The interfacing of the FAT2002RE is carried out via redundant connections with an operating voltage and a RS485 bus each. The cables of the two systems have to be installed separately! The wiring corresponds to it of the sensor bus (primary line). So, the function of the FAT is also ensured in case of a connection failure (interruption or short-circuit.)

The operating voltage applied to the ADP-Nx is also used for the supply of the FAT.

Up to 2 FAT (at UB=12V) or 3 FAT (at UB=24V) are supplied with voltage by the ADP-Nx. A protection circuit which limits the current in case of short-circuit is integrated on the adapter.

The Dual485 module on the FAT realizes the disconnecter function for UB and RS485 when there is a short-circuit.

The connections of the serial interface at the FAT have a changed function at the FAT2002RE! X7 (UB) isn't connected!

The ADP-NB is connected to the RS232 interface (module SM24 or SGK2 RS232) of the CIE and supplied with the CIE operating voltage (24 V GS, protection 2 AT).

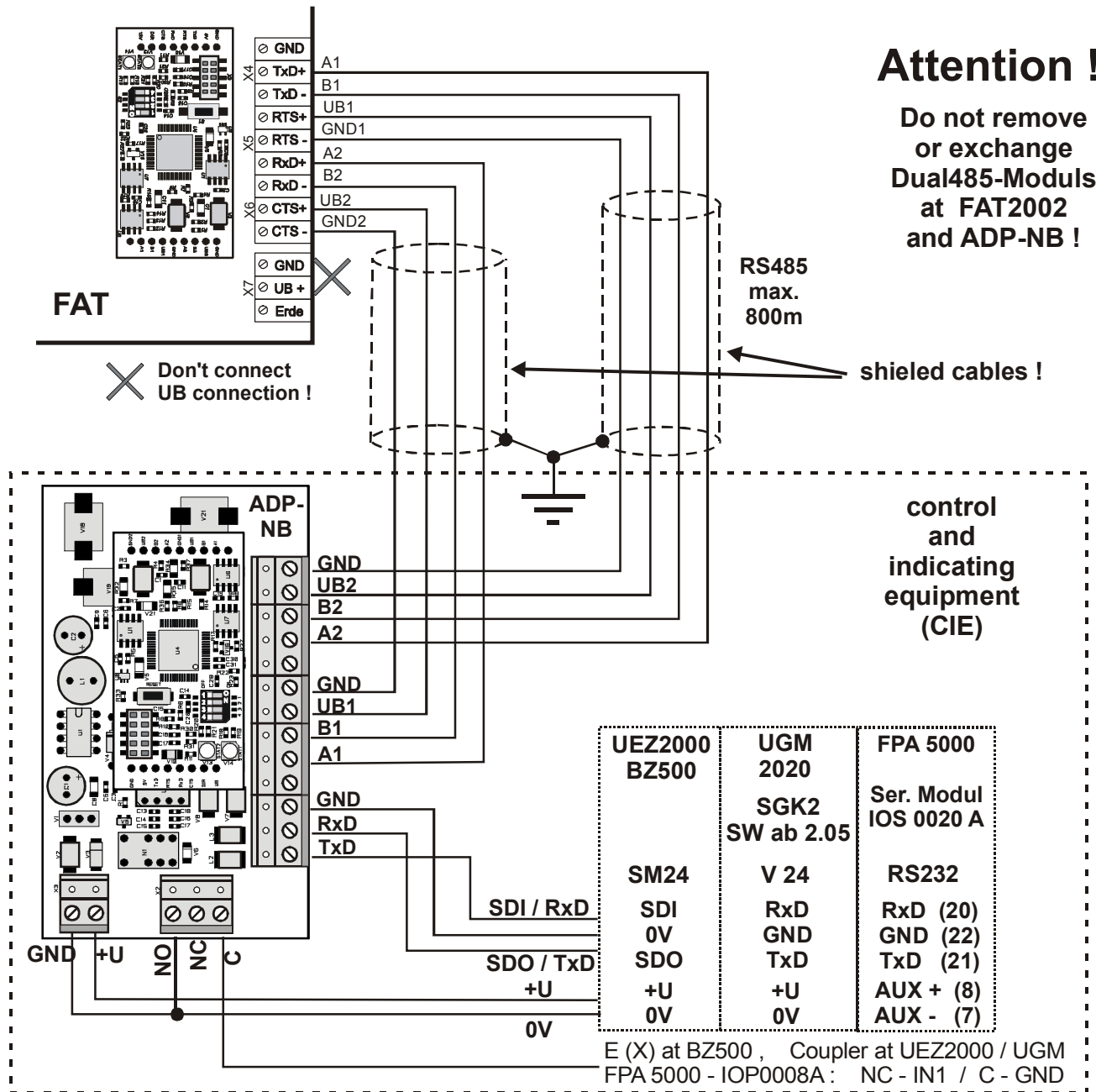
The ADP-NE is connected to the TTY interface (module SM20) of the CIE and supplied with the CIE operating voltage (24 V GS, protection 2 AT).

The relay 'Fault' is connected with a corresponding input of the CIE to signal a fault in the FAT net to the control panel.

 **Attention ! The PTC V18 – V21 on the ADP-Nx (see Picture 9) turn hot in case of UB short-circuit !** The module is not to be installed in close cable proximity !

 The **fault relay of the ADP-Nx** has to be connected to a suitable input of the BMA for the **supervision** to be able to detect faults of FAT or bus system at the BMA (see non redundant connection). The FAT also tries to maintain the communication with the CIE in case of a faulty ring bus so that no fault of the interface is generated.

Use shielded cables between adaptor ADP-NB / ADP-NE and FAT with the following pictures.



Picture 10 : Interfacing of a FAT2002RE using ADP-NB (RS232 panel interface)

Pay attention to the layout at FAT :

Cable system 1 :

TxD+	A1	Cable A (+) of the RS485 interface 1
TxD-	B1	Cable B (-) of the RS485 interface 1
RTS+	+UB1	Operating voltage of lead wire 1
RTS-	GND1	Mass of lead wire 1

Cable system 2 :

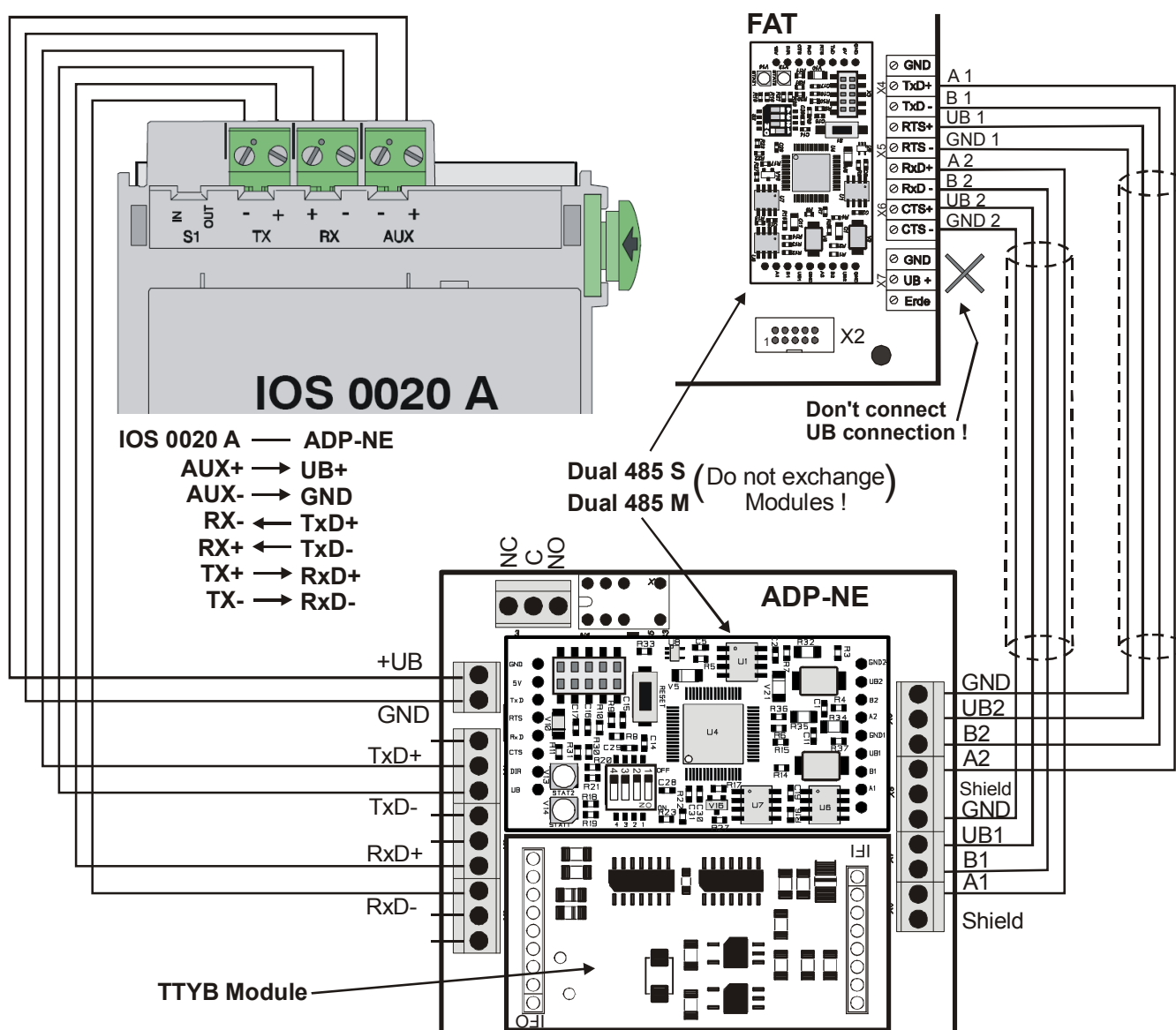
RxD+	A2	Cable A (+) of the RS485 interface 2
RxD-	B2	Cable B (-) of the RS485 interface 2
CTS+	+UB2	Operating voltage of lead wire 2
CTS-	GND2	Mass of lead wire 2

IOS-0020-A

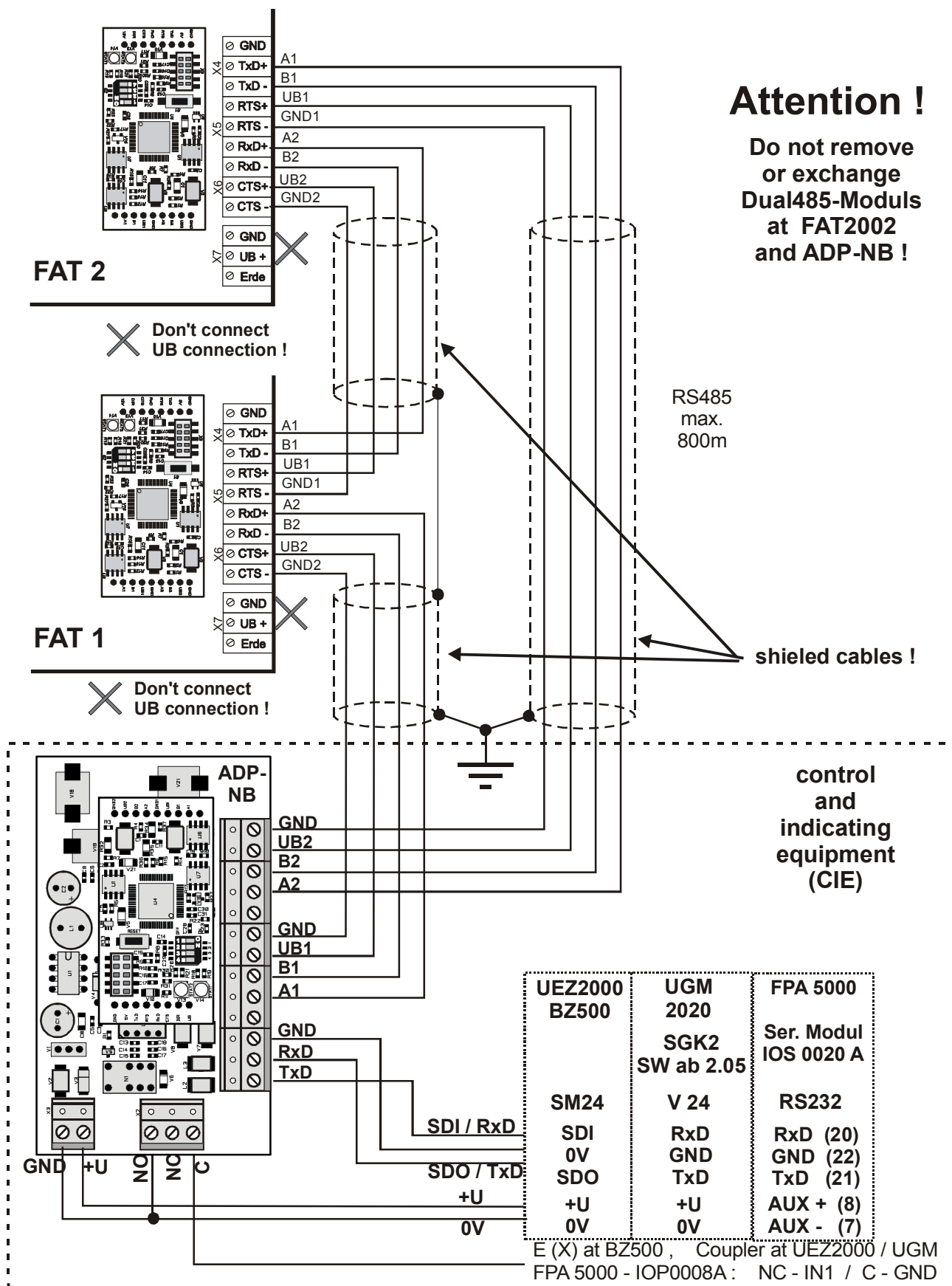
FAT — IOS
 TxD+ ← RX-
 TxD- ← RX+
 RxD+ → TX+
 RxD- → TX-

FPE-5000-UGM

FAT — FPE
 TxD+ ← SDI-
 TxD- ← SDI+
 RxD+ → SDO-
 RxD- → SDO+



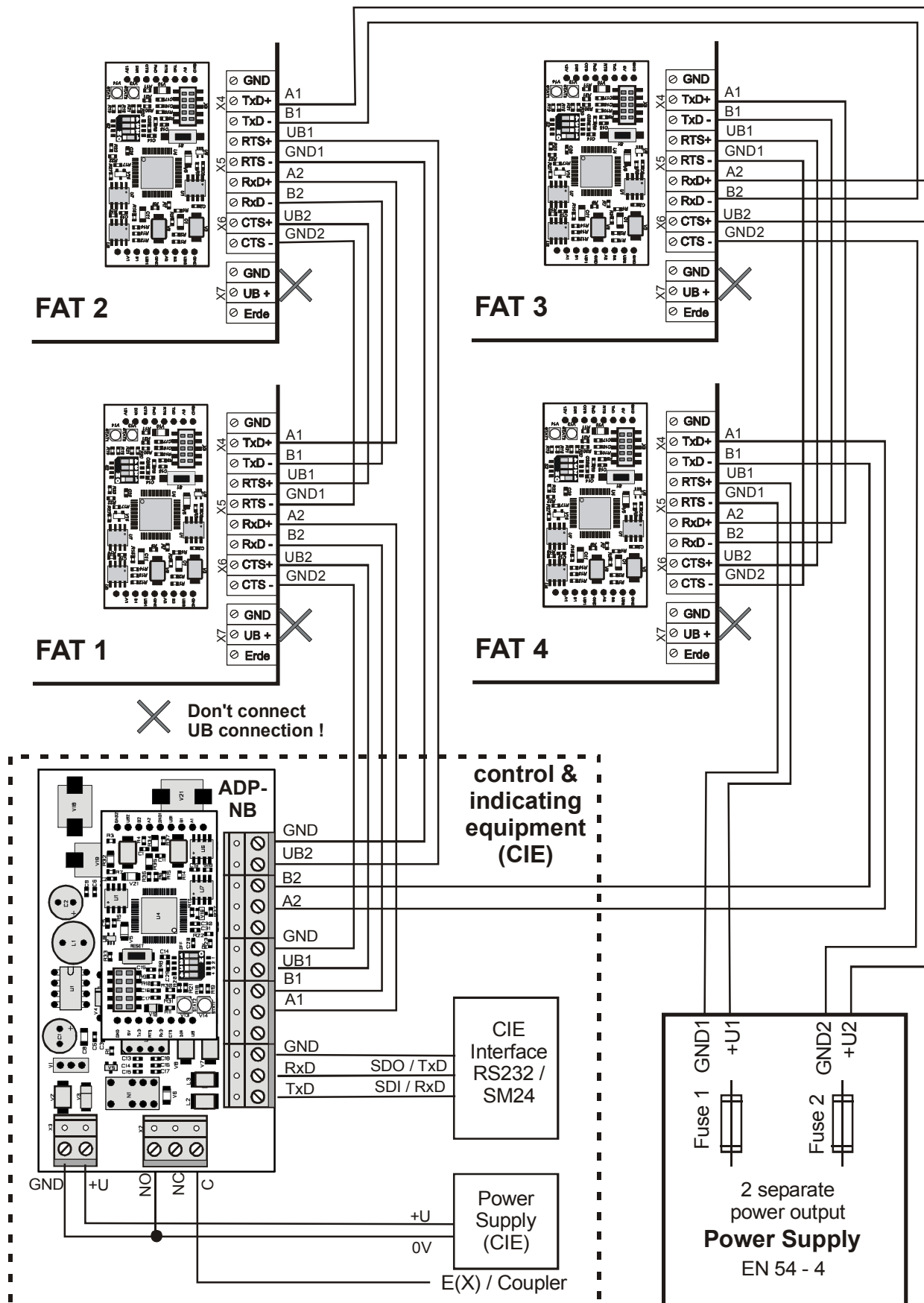
Picture 11 : Interfacing of a FAT2002RE using ADP-NE (20mA panel interface TTY)



Picture 12 : Interfacing of two FAT2002RE (RS232 panel interface)

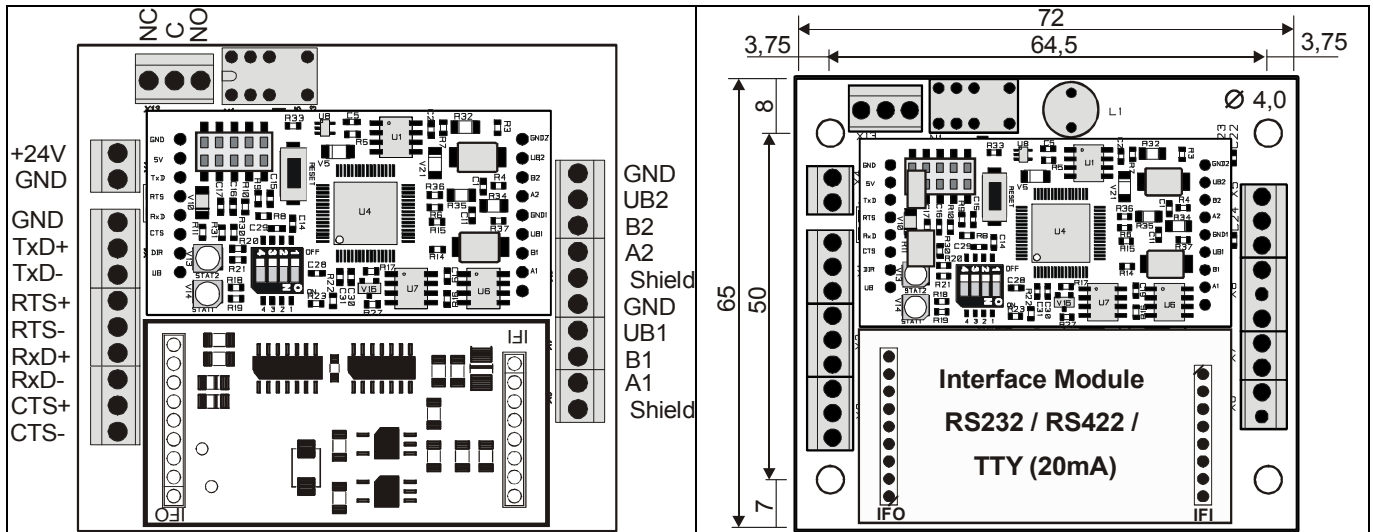
Using ADP-NE (20mA panel interface) for redundant connection of FAT2002RE equivalent interconnection is done.

Shield cables !

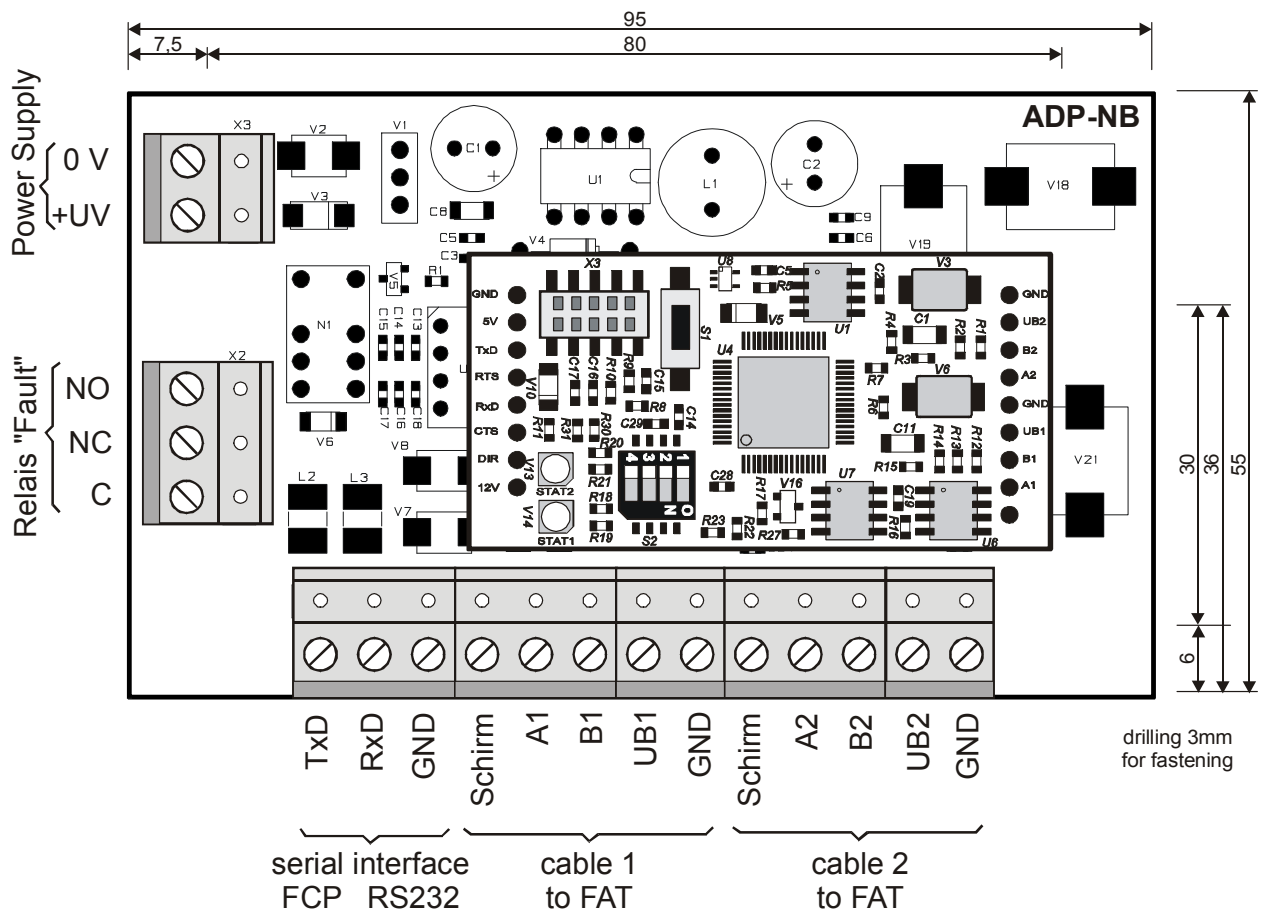


Picture 13 : Several FAT with separate power supply for FAT3 and FAT4

3.6 Layout of the adapters ADP-NE and ADP-NB



Picture 14 . Anschlussbelegung Adapter ADP-NE



Picture 15 : Layout of the adapter ADP-NB

The adapter ADP-NB contains an electrical isolated RS232 interface. This is used for the connection to the CIE.

The operating voltage serves for the supply of the adapter and the FAT. It is passed on to the FAT via UB1/GND and UB2/GND. The current limitation on the ADP-Nx (PTC) serves as a protection against an external short-circuit.

The supply of operating voltage and serial RS485 interface to the FAT via two spatially separated cable systems (ring wiring, not about the same cable route!) has the task to ensure

the further function of the FAT in case of a connection failure. This is analogously carried out to the signalling ring (primary line). Every Dual485 module on the FAT realizes the disconnecter function when there is a short-circuit of the line.

The relay 'Fault' is activated in the faultless status, i.e. C and NO are closed. In the fault case, the relay is deactivated so that the contacts C / NO are opened and C / NC are closed.



The **fault relay of the ADP-Nx** has to be connected to a suitable input of the BMA for the **supervision** to be able to detect faults of FAT or bus system at the BMA.

3.7 Comments for the ring organization of the redundant FAT

The FAT contains one Dual485 module each and the adapter ADP-Nx one Dual485M module which realize the communication by means of the own controller on the RS485 ring bus. The Dual485M module on the ADP-Nx (DIL1 = OFF) has the master function in the ring. Only one master module (DIL1 = OFF) may be connected in the ring! At most 8 FAT can be addressed in the RS485 ring. It has to be paid attention to the correct position of the DIL switches on the Dual485 modules! The Dual485M module has an additional function for the detection of a sub-break in the grounding line.

Because of the current limitation on ADP-Nx (approx. 250mA), at most 3 FAT can be supplied with voltage of 24 V DC (or 2 FAT at 12 V DC) via it. An external voltage supply must be used when there are more than 3 FAT2002RE (see Picture 8, requirements of standard EN-54-4!).

The RS485 loop is controlled by the Dual485M module on the ADP-Nx. The modules on the FAT (DIL1=ON) are organized by it and receive a ring address during the ring construction. The first FAT gets a master function during the ring construction, i.e. this Master FAT takes on the communication with the CIE and supplies all further FAT with the current messages. The ring construction starts generally at the connection A1/B1. If there is a fault in the ring (RS485 bus or UB), two stubs are organized. If no FAT is detected at the stub 1, the first FAT gets the master function at the stub 2.

Therefore, at least both FAT nearest to ADP-Nx have to be provided with the texts if additional texts have to be programmed into the FAT! The Master FAT transmits the messages and the corresponding texts to the further FAT (Slave-FAT).



Important comments :

- FAT is programmed (address 1) in the delivery condition - plug and play at individual FAT.
- All FAT are to program (interface, address, code list, texts, etc.) in case of changes.
- Every redundant FAT gets the network address 1 under 'system configuration' - 'system config' (delivery condition of the FAT2002RE, default setting in `bosch_redundant.fat`).
- The possible Master FAT must not have any restrictions in the code list or work selectively.
- Pay attention to section 4.3 Important comments for the FAT programming !
- The fault relay has to be connected to a suitable input of the CIE to signal a ring fault.

3.8 Interface modules - used at FAT2002 / FAT2002RE

3.8.1 FAT-TTYB module (optocoupler / 20mA - SM20 interface)

Typical voltage data : (Status 1 = Release Status)

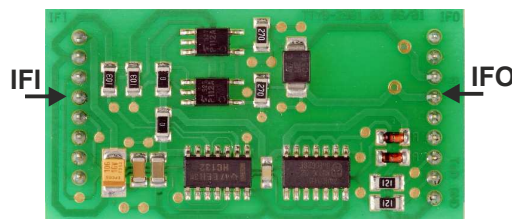
Status 1 : +TxD = 0..1,5V -TxD = 3,2..5V

Status 0 : +TxD = 3,2..5V -TxD = 0..1,5V

Status 1 : +RxD = 3,2..5V -RxD = 0..1,5V

Status 0 : +RxD = 0..1,5V -RxD = 3,2..5V

Connector IFO below, IFI above next to the LCD.



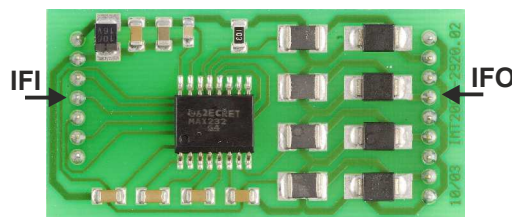
3.8.2 FAT-RS232 module (V.24/V.28 - SM24 interface)

Typical voltage data : (Status 1 = Release Status)

Status 1 : +TxD / +RxD = -3 -12V

Status 0 : +TxD / +RxD = +3 ... +12V

Connector IFO below, IFI above next to the LCD.

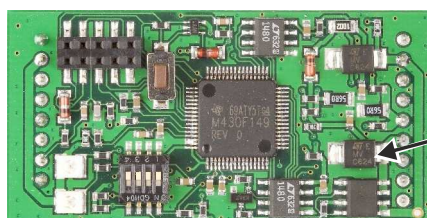


3.8.3 Dual485M/S interface module for ADP-NB or ADP-NE / FAT2002RE

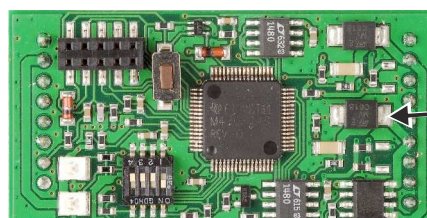
The modules with controller provide two separate connections with an operating voltage (GND, +UB 10-30V DC) and a RS485 bus with the lines A(+) / B(-) each.

The module Dual485 was optimized with regard to the use and divided into two versions Dual584M and Dual485 S. The module Dual485M is used on the adapter ADP-Nx (master), and the Dual485S is used on the FAT2002 (Slave). It is not allowed to interchange these modules for each other!

Dual 485 M (master at ADP-Nx, DIL1=OFF) Dual 485 S (slave at FAT2002RE, DIL1=ON)



nahe IC
bestückt
near IC
placed



mittig
bestückt
centric
placed

Diagnosis LED:

Display	V13 (green) - RS485 bus	V14 (yellow) – operating voltage
Short flashing	Okay	UB break
Alternating	Fault bus, data transfer possible	UB fault (short-circuit, etc.)
Static On	Initialization, no data transfer	----
Off	No operating voltage, failure	UB okay (or complete failure)

DIL switch DIL1 defines the use of the module at FAT (DIL1=ON - slave) or on adapter ADP-Nx (DIL1=OFF - master). The setting of the DIL switches controls the software of the module and must not be changed ! The master module at ADP-Nx controls the bus management (RS485). It determines the total status, checks the ring status and controls the transmission direction. The total failure of the ADP-Nx module means the failure of the complete system, since no communication can be carried out to the CIE in this case!

Comment for RS485 :

Differential voltages in a 3,3V area are measurable between the signal lines A(+) and B(-). Line A supplies a higher potential in normal position (signal=1). The average value is about 1,6 V. Typical data are A=1,7V and B=1,4V.

3.9 Restart characteristics of FAT

The restart of the system is carried out by connecting the supply voltage as well as after pressing the reset key (key on the FAT LP, on the top left next to the LCD display). The individual phases are taken down on the LCD display if the key 'Test' is pressed at reset.

The operating LED is statically illuminates (permanently on) after the successful course of all initialization steps, and the identification for the normal operation (see section 2.3) gets visible at the display.

If there is the message for normal operation and the operating LED flashes, then no connection could be made. A fault message (interface fault) is generated at the same time. This is shown by the flashing fault LED. The fault message can additionally be retrieved by the key 'Display level'.

The time and date are also transferred at some messages. The correct takeover is a signal for the successful initialization in these cases.

3.10 FAT relay fault

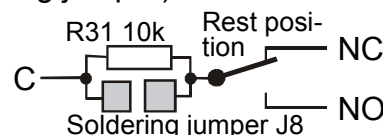
The fault relay (N1) on the FAT provides a switching contact for the external FAT fault detection. The resistance R31 of 10 k Ω is connected in serie to the common contact C (R31 is above the relay N1 and the connection X8). J8 can be used to shunt the 10k Ω to 0 Ω if soldering pads J8 are closed (soldering jumper) placed under the resistor.

C and NO are connected in the faultless status (relay is activated).

The relay has the task to signal faults and has to be connected to a suitable input of the CIE. The relay of the ADP-Nx signalizes bus state faults only but the relay at FAT2002RE signalizes also communication faults in addition !

The resistance R31 can be short-circuited by the jumper J8 (soldering jumper).

Relay connections: C (common) centre contact
 NO (normally open) closing contact
 NC (normally closed) break contact



3.11 Installation comments

The **FAT** is programmed in the **delivery condition** and thus **ready for operation!**

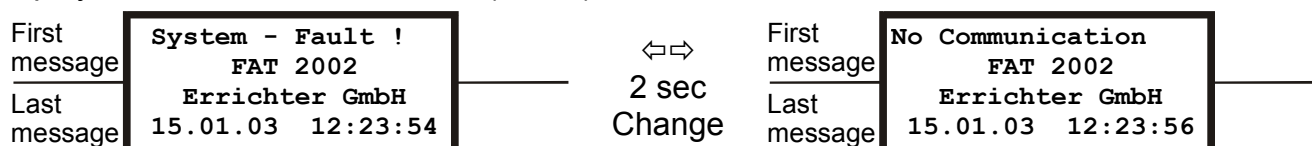
A possible programming should be carried out only after installation!

3.11.1 Indication of the communication fault

If there is a detected communication fault the green operating LED flashes.

The FAT marks communication faults with the text 'No communication' in the normal display, too. This is accordingly marked in the fault level. The fault message is also generated at a partial failure so that measures for the fault correction can be taken in due time.

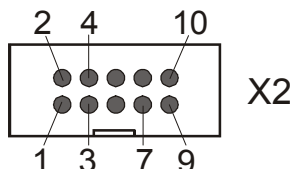
Display of the communication fault (1. line) :



3.11.2 Installation of FAT2002 (non redundant)

The LED are used for the identification of the serial data transfer in a special test mode to support the installation.

The test mode can be reached if the pins 7 and 9 (below right like Picture 16 : I/O bus connection X2) are jumpered at the 10-pole connector of the I/O bus connection during reset (e.g. short-circuiting with a little screwdriver and pushing the reset key). The test mode display can be seen on the LCD according to Picture 17.



Picture 16 : I/O bus connection X2

First message	Test mode SIO0 -> LED
	D-Sub: 09=TxD 10=RxD
Last message	Module: 11=TxD 12=RxD
	21.02.02 12:23:56

Picture 17 : Test mode display LCD

The LED power, alarm, fault and disabled indicate the serial data transfer in the test mode. The corresponding LED is controlled for approx. 50 ms at every received or sent character. So, the activities get visible on the serial interfaces. The most important control usually refers to the activities of the interface to the CIE.

There is the following LED assignment:

- Power (green) Transmit data TxD programming interface (RS232, D-Sub male)
- Alarm (red) Receive data RxD programming interface (RS232, D-Sub male)
- Fault (yellow) Transmitted data TxD CIE interface (plug-in module, screw contacts)
- Disabled (yellow) Receive data RxD CIE interface (plug-in module, screw contacts)

The test mode is left by reset of the module without a jumper to X2.

3.11.3 Installation of FAT2002RE (redundant)

Two diagnosis LED V13 and V14 on the Dual485 module signalize the status of the system.

- | | | | |
|-----|--------|------------|---|
| V13 | Green | OFF : | Fault of the communication to the FAT |
| | | lightning: | Fault of the RS485 bus communication |
| | | flashing : | Communication to the FAT and on the RS485 bus is okay |
| V14 | Yellow | OFF : | Supply voltage UB is okay |
| | | Flashing : | Supply voltage UB is faulty |

The Dual485 module communicates internally with the FAT or the adapter ADP-Nx (via the plug-in station connections = internal communication) and externally via the both RS485 bus connections (screw terminal strips RS485 bus). The status is indicated by means of the LED V13. All communication channels are all right if the LED V13 permanently illuminates. This is signalled according to the above-mentioned display in the fault case.

Faults on the redundant lines RS485 and UB are indicated by means of V14. So, a help is given during the fault locating.

If several FAT are connected to the CIE a net communication which is analog to the non redundant FAT net is taken. It has to be differed between the Master FAT and the Slave FAT.

The Master FAT has the lowest address in the system (standard address=1) and realizes the communication with the CIE. In fault case of the master, the takeover of the control is carried out in the redundant system by the FAT with the lowest address in the system. This means that different faults can appear in the communication.

A fault message is generated at the CIE by means of the relay when there are faults in the FAT system. If it is a simple fault (only of a transmission way or of a part), then all messages of the CIE to the FAT are further indicated. The fault message at the CIE is an additional signalling of the fault status.

4 Programming

Plug and play !

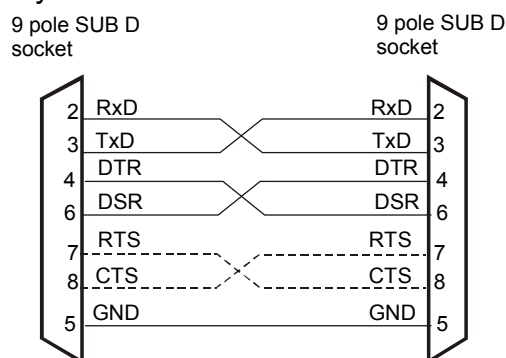
The **FAT** is programmed in the **delivery condition** and so, it is **ready for operation!**

The programming of additional texts should only be carried out when required and after installation (green LED is permanently on, messages are correctly indicated).

4.1 PC connection

The programming is carried out with the software FatProgWin (component of delivery / download from the internet). The necessary configuration files *.FAT are provided on inquiry.

A null modem cable is needed (a component of delivery) for the connection with the PC. The cable pair RTS/CTS isn't used by the FAT.



Picture 18 : Null modem cable

4.2 Programming software FatProgWin

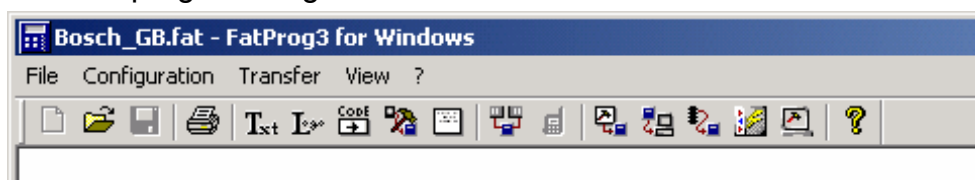
A configuration file (* fat), e.g. 'bosch.fat', is needed for the work with the program. It is enclosed on CD or provided by e-mail.

The FAT are programmed with the standard setting and without texts in the delivery condition. The texts are taken by the UGM or UEZ. The BZ500 doesn't provide any texts via the interface. A programming is necessary here (text takeover from the MPP file, see 4.3 Important comments for FAT programming).

Data for a project should generally be saved in a separate file, so that the enclosed standard file is further available as a pattern.

The help function also contains comments for the individual menu items.

Menu overview of the programming software:



File File operations: open, save, etc.

Configuration Settings of the FAT regarding the texts, company name, code table, system settings (interfaces and network parameters, etc.), comment

Transfer Transfer of the programming data to the FAT, reading back of the data from the FAT, update of the firmware (only in special cases)

View Selection of the toolbars

Menu 'File':

Open loads an existing configuration file. The possibly open file is closed.

Save as makes the storage of the current data possible in a new file and under a new name. Separate files with a corresponding name should be produced for every project.

Close closes the current file. If data were changed, there is a query regarding the storage/saving.

Exit finishes the program.

Menu 'Configuration':

Text data for the programming of customer texts for the detectors

Company name text in the both middle lines in the break display

Code table fixes characteristics of the message codes and allows new definitions between line status and FAT code.

System config contains settings for the interface, networking and further system settings.

Info for project information regarding the current use case of the FAT

Menu 'Transfer':

Download Configuration transmits the customer data to the FAT (texts, settings etc.). The checkmarks in the selection fields for the individual data blocks are set by the program.

Upload configuration reads the customer data from the FAT into a file. The currently opened file remains unchanged! This new file must be opened via the file menu to edit or check the read data!

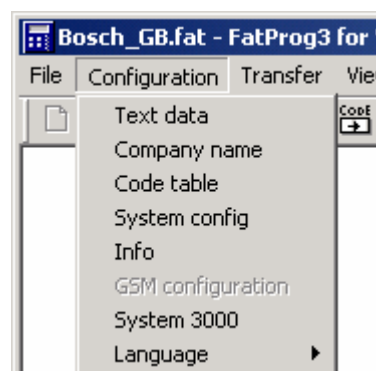
Firmware download is only be needed in special cases for the update of the firmware (operating system of the FAT). The customer data (texts etc.) programmed in the FAT remain unchanged.

Event memory reading is not available for FAT / ZPA 2002. This function operates with FAT3000 only.

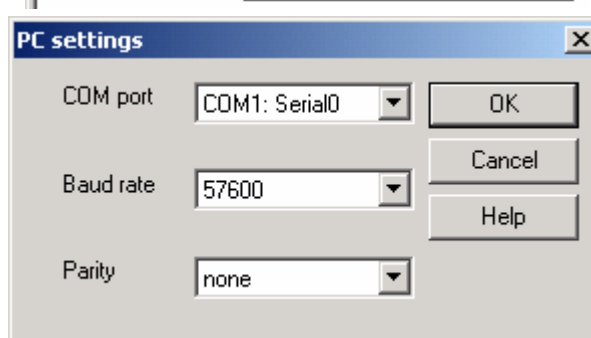
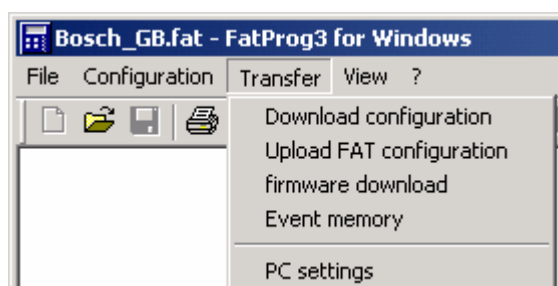
PC settings refer to the selection of the programming interface of the PC to the FAT (not to the CIE)! The **parameters** (57600 Bd, parity) **may not be changed!**

Menu 'View':

This is needed for the selection of the menu bars. These are activated according to the standard.



Further comments after the overview



Dialog in the menu 'Configuration' - 'System Config'

The **system settings** are processed in this menu.

The **baud rate** fixes the transmission rate to the CIE.

The **parity** is generally set with 7-bit format to '**none**'. The data transmission is realized with **7 bits** and **even parity** by firmware internally. This is considered with the adaptation to the 8 bit format by the **FAT** software.

Test duration defines the display test duration.

The GMA address isn't assigned (unused).

Non redundant version FAT2002:

Network address = 0,

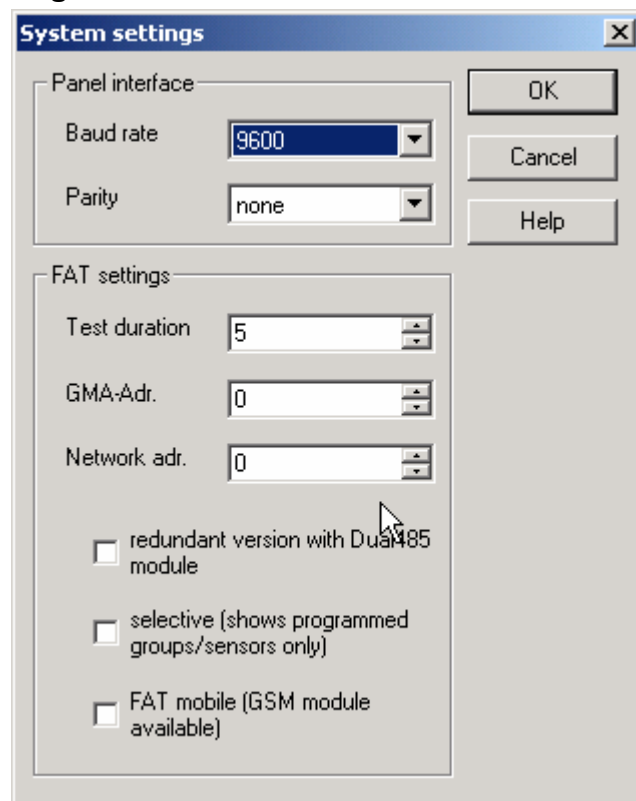
checkbox "redundant version..." = not set;

Redundant version FAT2002RE;

Network address = 1,

checkbox "redundant version..." = set;

Selective means that only the messages contained in text list ("Text configuration" ↓) are processed, stored and indicated.



Note: With redundant version FAT2002RE and more than one FAT2002RE in redundant loop one of them acts as master to communicate with the CIE. This master transmits the received and stored data to all slaves in redundant loop. The master will be automatic defined with startup of the FAT2002RE loop (system internal procedure).



Warning : If the master is defined to selective mode it will transmit only its selective data to the slaves ! FAT2002RE connected next to the redundant adaptor ADP-NB or ADP-NE (both end of bus) should not operate in selective mode !

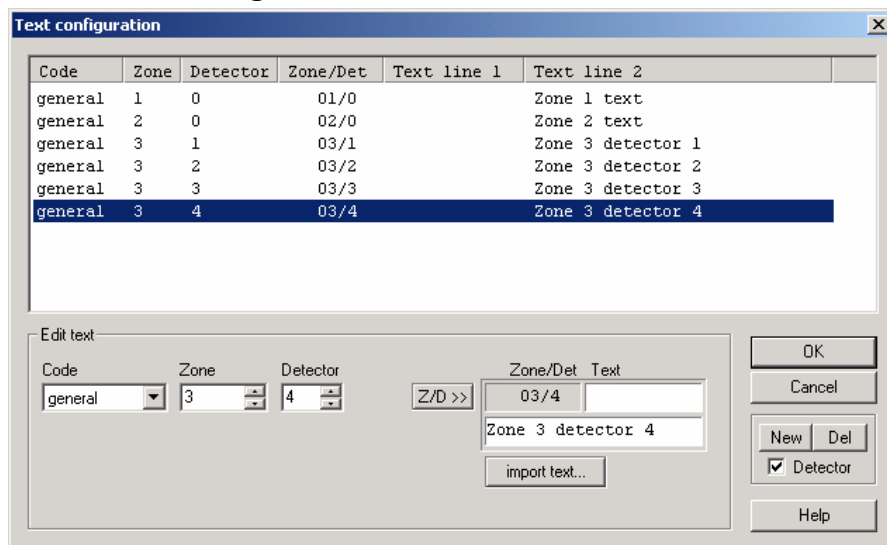
If needed please use the modern generation System4000 (FAT4000 / ADP4000).

Dialog in the menu 'Configuration' - 'Text configuration' :

Texts are assigned to the detectors in this menu.

The code 'generally' stands for all codes alarm, fault, disabled etc. An entry can alternatively be assigned to only one special detector code. If e.g. the code 'fault' is selected, the additional text is only indicated when there is a fault to this element.

Note: Redundant FAT2002RE acting as master in loop will transmit only these selective events to the slaves ! (see warning above ↑)



Code	Zone	Detector	Zone/Det	Text line 1	Text line 2
general	1	0	01/0		Zone 1 text
general	2	0	02/0		Zone 2 text
general	3	1	03/1		Zone 3 detector 1
general	3	2	03/2		Zone 3 detector 2
general	3	3	03/3		Zone 3 detector 3
general	3	4	03/4		Zone 3 detector 4

Button 'import text' ⇒ read texts from the MPP file.

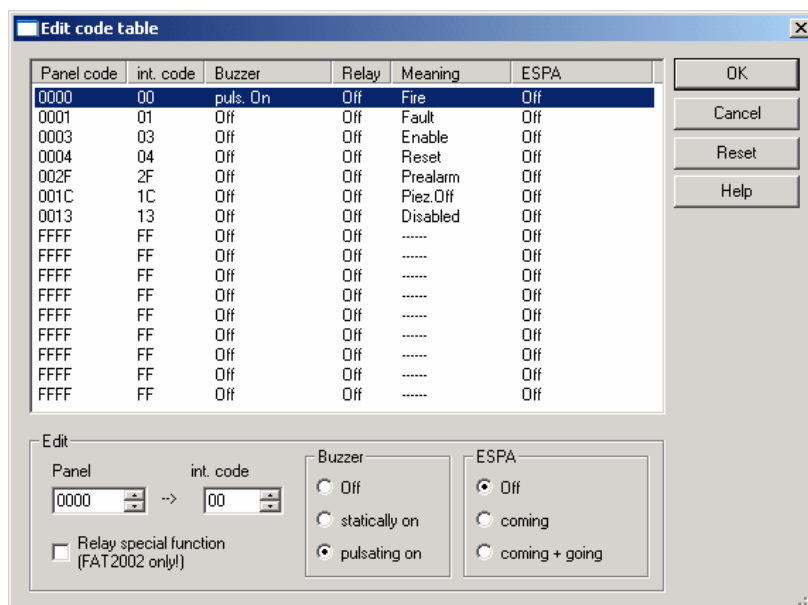
Dialog in the menu 'Configuration' - 'Code table'

The code dialog serves for the adaptation of the signalling codes.

The selection of the signalling codes to be indicated is carried out. The CIE codes are generally like the internal code. If single codes are deleted (resetting) no messages with this event code are processed, stored and indicated.

There is a predefined assignment of the line states to the FAT codes in the FAT firmware. Corrections can be realized via this table in single cases. Comments for it are contained in the following section.

The ESPA flags are selecting new or new/leaving events to transmit by ESPA communication.



Panel code	int. code	Buzzer	Relay	Meaning	ESPA
0000	00	puls. On	Off	Fire	Off
0001	01	Off	Off	Fault	Off
0003	03	Off	Off	Enable	Off
0004	04	Off	Off	Reset	Off
002F	2F	Off	Off	Prealarm	Off
001C	1C	Off	Off	Piez.Off	Off
0013	13	Off	Off	Disabled	Off
FFFF	FF	Off	Off	-----	Off
FFFF	FF	Off	Off	-----	Off
FFFF	FF	Off	Off	-----	Off
FFFF	FF	Off	Off	-----	Off
FFFF	FF	Off	Off	-----	Off
FFFF	FF	Off	Off	-----	Off
FFFF	FF	Off	Off	-----	Off
FFFF	FF	Off	Off	-----	Off
FFFF	FF	Off	Off	-----	Off

Edit
 Panel: 0000 --> int. code: 00
 Buzzer: ☐ Off ☐ statically on ☒ pulsating on
 ESPA: ☒ Off ☐ coming ☐ coming + going
☐ Relay special function (FAT2002 only!)

4.3 Important comments for FAT programming

The parity to the CIE interface is set to 'none' (internal adaptation to 'even') !!!

FAT2002 (non redundant) and FAT2002RE (redundant) are programmed differently. The most important entries are under 'Configuration' - 'System Config'. The network address fixes the function in a network. Setting the check button in the field 'redundant version with Dual485 module' causes the adaptation to the redundant bus with ADP-NB / ADP-NE.

Parameter	FAT2002	FAT2002RE
Network address	0	1 .. 2
Redundant version (check button)	Not selected	Selected

Plug & play ! The texts are as default read and taken from the CIE FPA5000, UGM and UEZ (lockable in the extended system dialog, see below).

Texts for the individual detectors or detector zone can be programmed under the menu 'Configuration' - 'Texts'. The file *.MPP with the detector texts (is created by the parameterization software of the control panel) can be read for simplification. The texts which are programmed in the FAT have priority.

The display for normal operation includes an editable text (company name) in the 2nd and 3rd lines which can be adapted according to the special application.

The code selection and the buzzer function can be changed in the code table. The pulsating buzzer function is only assigned to the fire alarm according to the standard.

Additional line states can be programmed in this table. The FAT uses internal codes (fire, fault etc.) and converts the line states of the CIE into internal codes. The most line states are already defined in the FAT software. There is the possibility of the additional assignment in special cases. The line status + 0x100 is entered in the column 'CIE code' and the FAT internal code is entered in the column 'int.Code'. All values are hexadecimal! The internal code 0xff isn't evaluated by the FAT.

The most important FAT internal codes are

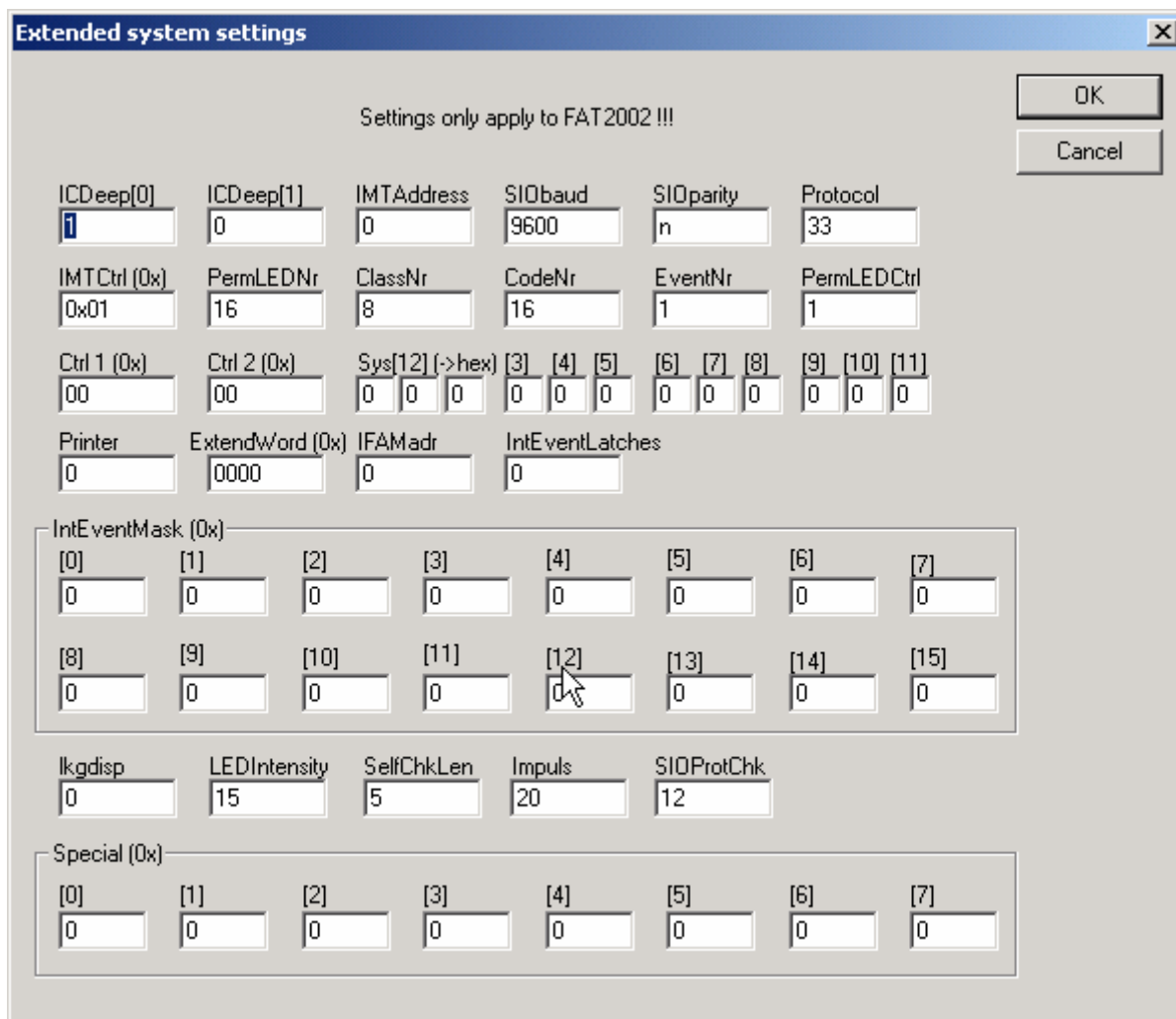
Fire	(Pre) alarm	Fault	Technical alarm	Disabled
00	2F	01	25	13

The FAT changes independently over into the programming mode with the start of the data transmission to the FAT at realized connection between PC and FAT. This gets visible while all LED displays go out and the programming mode is indicated in the LCD (see section 2.3).

If the FAT is in the programming mode, no messages are received or indicated. After programming, the FAT must be reset again (reset key on the left above and next to the LCD or Power-on by disabling and reclosing the operating voltage). The reset deletes all data (also disconnections) received by the control panel before. On the other hand, the reset order of the control panel deletes only the alarm messages and faults. Disconnections remain unchanged furthermore.

Comments for the 'Extended system settings' :

Some special settings are possible. These functionalities don't partly correspond to the specifications of the DIN14662!



Extended system settings

Settings only apply to FAT2002 !!!

OK Cancel

ICDeep[0] ICDDeep[1] IMTAddress SIObaud SIOparity Protocol

1 0 0 9600 n 33

IMTCtrl (0x) PermLEDNr ClassNr CodeNr EventNr PermLEDCtrl

0x01 16 8 16 1 1

Ctrl 1 (0x) Ctrl 2 (0x) Sys[12] (->hex) [3] [4] [5] [6] [7] [8] [9] [10] [11]

00 00 0 0 0 0 0 0 0 0 0 0

Printer ExtendWord (0x) IFAMadr IntEventLatches

0 0000 0 0

IntEventMask (0x)

[0] [1] [2] [3] [4] [5] [6] [7]

0 0 0 0 0 0 0 0

[8] [9] [10] [11] [12] [13] [14] [15]

0 0 0 0 0 0 0 0

lkgdisp LEDIntensity SelfChkLen Impuls SIOProtChk

0 15 5 20 12

Special (0x)

[0] [1] [2] [3] [4] [5] [6] [7]

0 0 0 0 0 0 0 0

Text takeover: The detector text query to the CIE can be suppressed. The special menu 'Extended System Dialog' is opened by the key combination Alt-E in the menu 'Configuration' - 'System-Config'. Special [2]-bit0 is set (0x01) in the lowest line. Spezial[2]=0 allows the text query, and Spezial[2]=1 stops it.

Date / time : The time and date are replaced by a moving cursor in the normal display, if bit 0 is set in IMTCtrl (2nd line, 1st value). Example: 01 (non redundant FAT) / 81 (redundant FAT).

Pre-alarm priority : Pre-alarm messages are only indicated as information after the disabled level and no alarm LED is activated in accordance with VdS.

Level order: alarm fault technical alarm disabled pre-alarm

Shall the pre-alarm be indicated with a high priority after the alarm level, the following setting must be done:

FAT-firmware Ver.4.24-R005 : confi.ICDeep[1] = 128,

from FAT-firmware Ver.4.24-R007 : confi.ExtendWord = 0x0080. (set Bit 7)

ESPA 4.4.4 - Option : see ESPA documentation !

ESPA-Parameter: 1200,e,7,2, FAT: Control station '1', PSA/TC: Slave-Station '2'

The components Code-Info and zone/detector can be removed from message. The text will be always transmitted. Ctrl2=0x0B defines a text message without Code, zone/det and without communication monitoring. with firmware 4.24.10.x all alarms (new only) are transmitted. With 4.24.11.0 in the Code table is to define the messages are to transfer.

Activating ESPA-function: Configuration ⇒ ESPA(system) / Code- / Text-data

ESPA-function settings: Configuration ⇒ ESPA activate and configure messages.

Code-Programming for ESPA-application : **Firmware 4.24.11.0 or later**

- **ESPA-Flags** are to set in **Code-Table** to select new or new/leaving events to transmit !

Text Programming for ESPA application :

- **Text data are to program** in FAT (use MPP-file)
- **Line 1 part 2** is assigned to special function : this is the call **address** !
- First entries in text data with all parameters set to zero define the general calls.
- Entries for calls to different addresses are to placed one after another.
- entries with specified code are to place before the entry with general code.



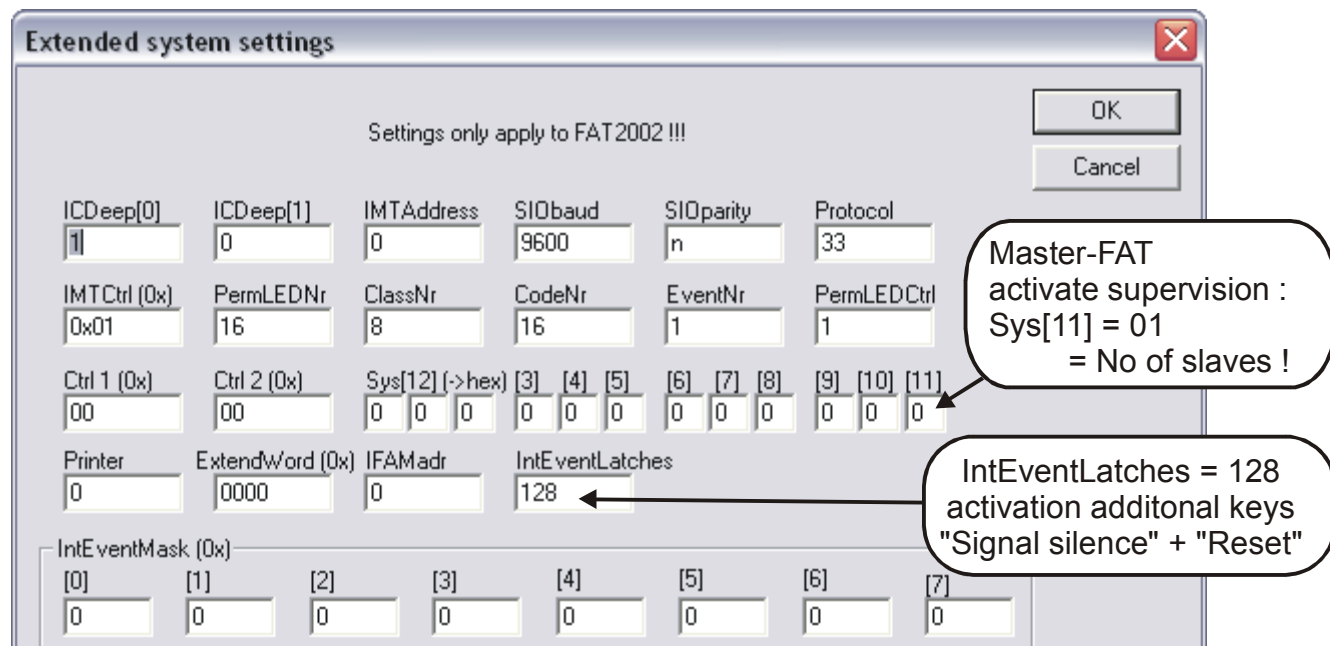
If ESPA function is selected all text data are to store in FAT !

With firmware 4.24.11.0 or later ESPA is to select in the Code-table !

Pay attention to the separate ESPA application document !

The request of detector's text data from panel is an option only with very low priority in FAT. This option is not supported by all main panels and if supported the delay time is not defined ! That's why with ESPA all detector text data are to store in FAT to have a fast access to this data for ESPA data transmission.

Activation of additional keys: Configuration ⇒ System config ⇒ key combination Alt-E



Extended system settings

Settings only apply to FAT2002 !!!

ICDeep[0] 1 ICDDeep[1] 0 IMTAddress 0 SIObaud 9600 SIOparity n Protocol 33

IMTCtrl (0x) 0x01 PermLEDNr 16 ClassNr 8 CodeNr 16 EventNr 1 PermLEDCtrl 1

Ctrl 1 (0x) 00 Ctrl 2 (0x) 00 Sys[12] (->hex) 0 0 0 [3] 0 [4] 0 [5] 0 [6] 0 [7] 0 [8] 0 [9] 0 [10] 0 [11] 0

Printer 0 ExtendWord (0x) 0000 IFAMadr 0 IntEventLatches 128

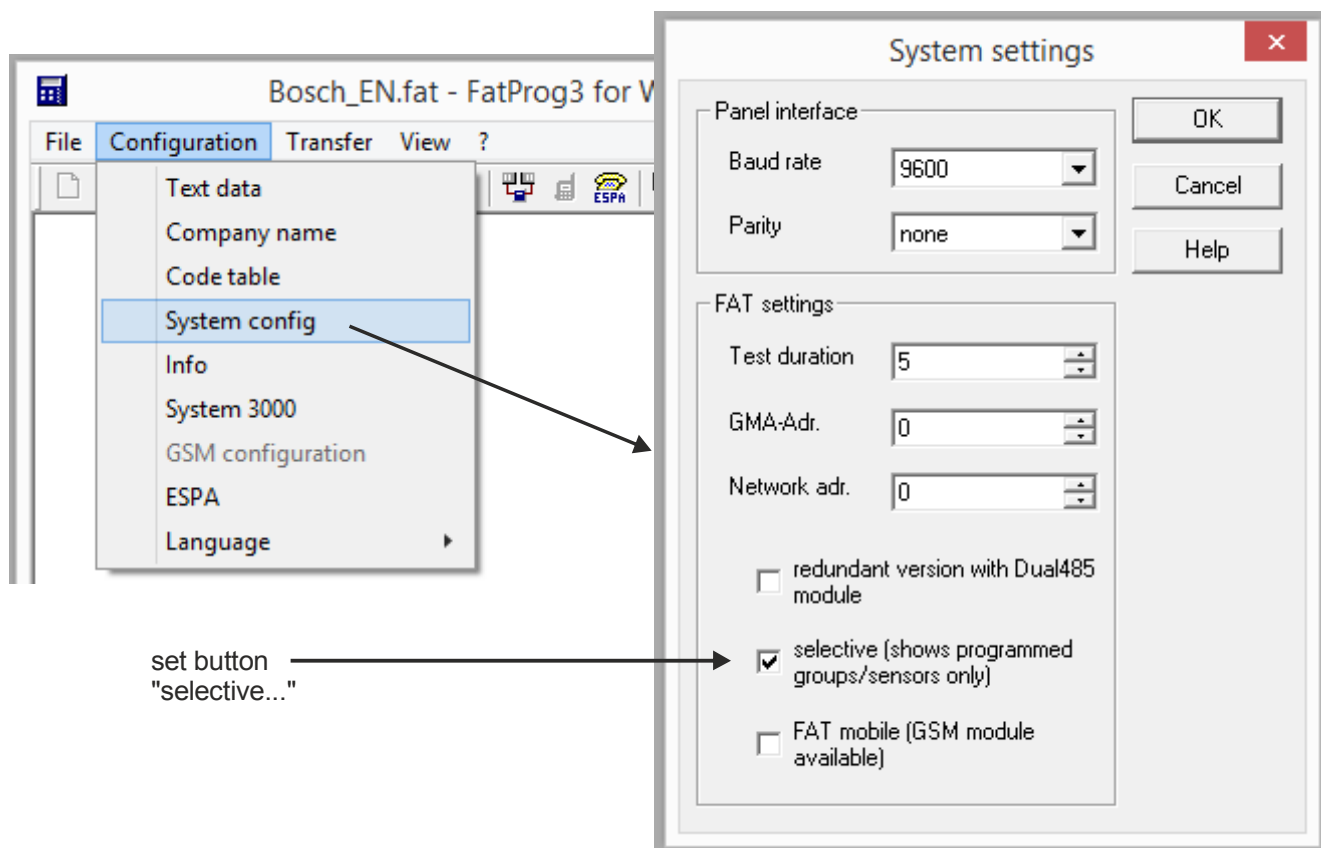
IntEventMask (0x) [0] 0 [1] 0 [2] 0 [3] 0 [4] 0 [5] 0 [6] 0 [7] 0

Master-FAT activate supervision : Sys[11] = 01 = No of slaves !

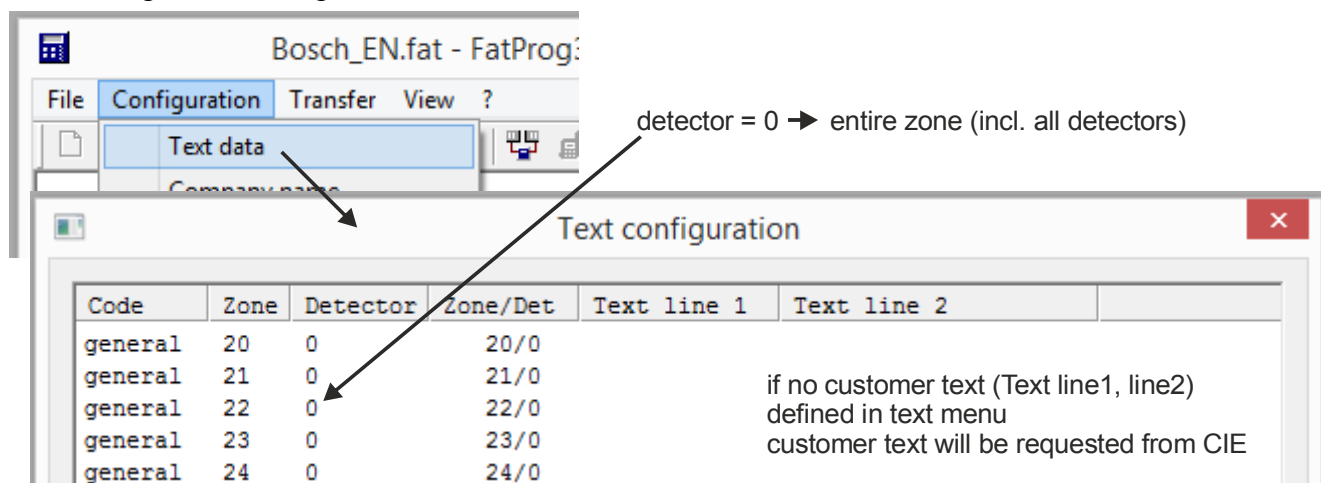
IntEventLatches = 128 activation additional keys "Signal silence" + "Reset"

Selective display mode : FAT2002 processes, stores and displays only selected zones !

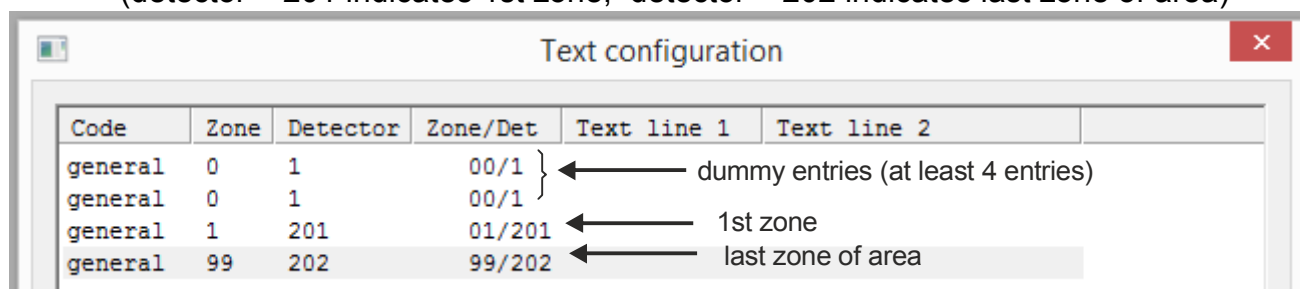
Warning ! If FAT acts as master only stored events will be transmit to slaves !



select single zones e.g. 20, 21, ... 24 etc. :



or select one or more area of zone e.g. zone 1 ... zone 99 : (Firmware Ver.4.24.12.63 or later)
(detector = 201 indicates 1st zone, detector = 202 indicates last zone of area)



5 Technical data

FAT2002 / FAT2002RE :

Operating voltage	10 .. 30 V DC		
Current consumption	c. 50 mA / 12V	30 mA / 24V	(no operation)
	c. 150 mA / 12V	90 mA / 24V	(with LCD lighting)
	max. 170mA / 12V	100 mA / 24V	(display test)
Dimensions	255 x 185 x 58 mm (W x H x D)		
Housing	Steel plate, silica grey, RAL 7032, suitable for surface mounting		
Weight	c. 3.5 kg		
Type of protection	IP 30 DIN 40050		
Operating temperature	0 °C to 50 °C		
Storage temperature	-10 °C to +60 °C		
VdS approval	G 203086		

ZPA2002 / ZPA2002RE :

Dimensions	223 x 273 x 54 mm (W x H x D)
Housing	plastic, grey RAL7035 or black RAL9011, suitable for surface mounting
Weight	c. 1.5 kg
VdS approval	none

Adapter module ADP-Nx :

Operating voltage	10 .. 30 V DC	
Current consumption	c. 30 mA / 12V	c. 15 mA / 24V
	max. 35mA / 12V	max. 20 mA / 24V
Dimensions	95 x 55 x 25 mm	
Operating temperature	0 °C to 50 °C	
Storage temperature	-10 °C to +60 °C	

Relays :	1 changeover contact
Switching voltage max.	125 V AC / 60 V DC
Switched current max.	0.5 A / 125 VAC 1 A / 24 VDC
Ambient temperature	-25°C .. +70°C

Parameter / limit values of FatProgWin :

Baud rate PC ↔ FAT	57600 bit/sec
Number of detector texts	4000 standard / 1300 at selective mode

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