interflex
Access, Time and Data

Technical Manual

for

Master Terminals IF 1525

German Version: 7/2004
English Version: 7/2004

LI-1525

	This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received including interference that may cause undesired operation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: ■ Reorient or relocate the receiving antenna. ■ Increase the separation between the equipment and receiver. ■ Connect the equipment into an outlet on a circuit different from that to which the receiver in connected. ■ Consult the dealer or an experienced radio/TV technician for help.
	Caution Changes or modifications not expressly approved by the Party responsible for compliance could void the user's authority to operate the equipment.
	Usage in Accordance with the Intended Purpose The described proximity reader is used for reading data of proximity identification media. Any other use is not permitted.
	Interflex is not to be held responsible for damages caused by the use of the proximity reader. Interflex reserves the right to make modifications without prior notification in the interest of technical progress.

Technical Manual

Master Terminals for Access Control as well as Time & Attendance Recording

This manual describes the functions of the individual boards, configurations, connections and tests as well as the procedure during installation. *Instructions referring to connections and configurations are marked with the symbol ☞. Please observe these instructions as they guarantee malfunction-free operation of the entire system.* Information required for the connection and the operation of the system is also pointed out.

Relevant information and instructions concerning your safety are marked with

☞ **Caution and must be observed!**

Interflex systems comply with the regulations made by the Association of German Electrical Engineers and valid at the time of printing.
They have been produced according to DIN VDE 0805 (IEC 74 CO 64, EN 60950), protection category 1.

The electrical connection may only be carried out in consideration of the valid technical regulations (*VDE standards, **DIN standards). Constructional changes are not permitted.

☞ Caution:

- **Usage in accordance with the intended purpose**: Terminals of the series IF- 152x are used for time and attendance recording. Any other use is not in accordance with the intended purpose and is therefore not permitted.
- Interflex systems may only run on electrical installations which correspond to DIN VDE 0100. To guarantee malfunction-free operation, it is advisable to carry out the electrical installation according to the rules of the TN-S-Systems, i.e. separate neutral and grounded conductors.
- The connection as well as the initial operation require specialized knowledge. Therefore, the electrical connection may only be carried out by an electrotechnically trained person. Only persons with an instruction certificate VBG 4 are authorized to perform the startup procedure.

Interflex reserves the right to make modifications that serve technical improvement.

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In case you have any questions, please contact your Interflex office.

* VDE = Association of German Electrical Engineers
** DIN = German Standards Institution

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Functional Description

Functional Description

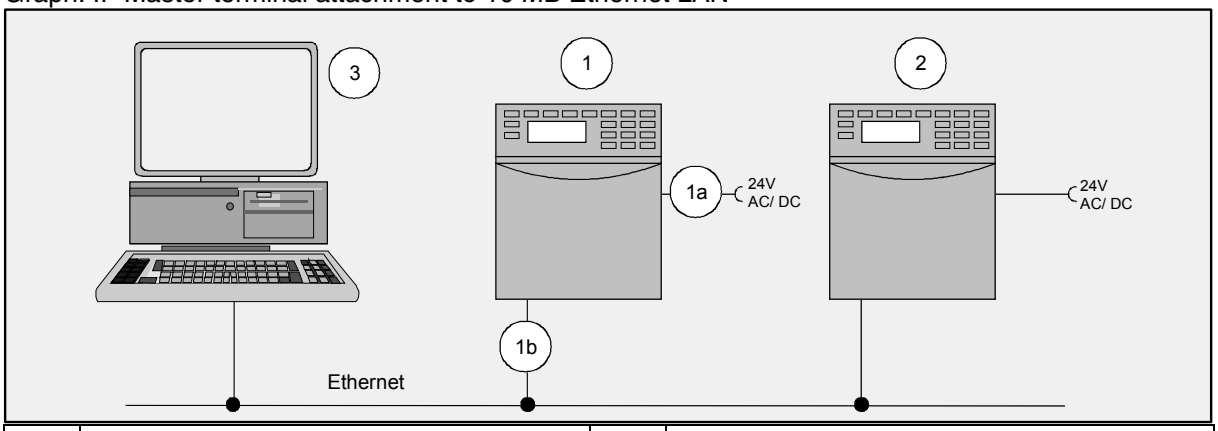
The master terminals of the series IF 152x are part of a time and attendance recording system. They are installed close to where employees work and connected directly to the higher-ranking system, e.g. to a PC or a router by means of a data line. These master terminals have been designed to record time data such as work time begin, work time end, cost center data as well as change of cost center.

For entering data, these master terminals are equipped with a magnet swipe card reader, a numeric keypad, soft keys, special keys - Clear, Enter, Right, Left -, Depending on the host program and the parameter settings, different functions can be assigned to the soft keys, e.g. IN, OUT, DISPLAY, ABSENCE REASONS or COST CENTRES.

A 4 x 20-digit back lighted alphanumeric LCD display guides the operator and shows the current time.

All card bookings and events are recorded in the internal RAM and transferred to the higher-ranking system. Depending on the preset conditions in the access/ time program, a booking is either rejected or accepted and the decision is shown on the display.

Graph: IF Master terminal attachment to 10 MB Ethernet LAN



1	IF MD 1525 master terminal	2	IF master terminal
1a	Main power cable[1]	3	Host system
1b	Twisted pair cable[2]		

[1] Recommended cable type NYM 3x 1,5mm²

[2] Recommended Ethernet standard patch cable

Master Functions

Depending on the hardware equipment, the master terminal is capable of handling the data traffic of IF XXX terminals independently. The required data, such as information on booking-authorized card numbers, day and week programs, keys and display texts, is stored in the RAM. Part of the RAM is used as a ring booking storage. All the bookings and events recorded - also those from the terminals connected - are stored there. The access/ time host system can retrieve this data repeatedly, if required. In offline mode - when the host system cannot be reached - the master terminal takes over part of the functions of the time/ access program. This usually does not affect the performance of the terminal's/ master terminal's functionality.

Connections and Modes of Operation

Connection to the Higher-Ranking System

Master terminals are available with attachment to 10 MB Ethernet LAN (TCP/ IP data protocol)

Modes of Operation

Online mode
In this mode of operation, data is permanently exchanged between the master terminal and the higher-ranking system. The time/ access program on the host system initiates the polling of the master terminal. The master terminal acknowledges and responds to each polling either by a sign of life, a status message or with booking data if bookings are carried out at the integrated card reader. The time/ access program on the host computer evaluates the data and sends a positive or negative booking response, e.g. account information back to the master terminal. From there, the response is transferred to the booking site where it is also displayed. Time-controlled functions, such as the activation of output relays, can be specified in the time recording/ access program. All booking data and events entered at the master terminal.

Offline Mode
If data is not exchanged with the higher-ranking system, the master terminal switches to offline mode. The master terminal then independently makes decisions by means of the parameterized conditions, checks the card bookings. In the case of a positive decision, account information or a signal for triggering the output relay is transmitted. In the case of a negative decision, the reason for the booking rejection is transmitted. All the bookings recorded in offline mode are stored in the ring buffer of the RAM with a special remark. The master terminal transmits this data during the next online operation and marks it in the RAM as collected. The execution of time-controlled and automatic functions are limited in offline mode. The mode is indicated on the display of the master terminal by the # sign..

Autonomous Mode
The function is similar to the offline mode, but the master terminal additionally tries to send booking data and event data to the Host system as quickly as possible. The mode is indicated on the display of the master terminal by the # sign..

Functional Units

The master terminal is equipped with the following functional units:

- **Controller Unit** (master unit) consisting of the following hardware assembly units: MPU board with CPU IC 68EN302, D-RAM, C-RAM, Flash-RAM, I/O interfaces and an interface to the data entry unit.
- **Recording Unit** (terminal unit) CPU IC 68 HC 12, card reader, display and interface to the controller unit.

Controller Unit

The controller unit has the following tasks:

- Control of the data traffic between the host computer and the internal data entry.
- Switchover to mode.
- Maintenance of operation, e.g., if the connection to the host computer is interrupted or if the host computer is switched off.
- Triggering of output relays when bookings are carried out or other conditions specified in the host program are fulfilled.
- Management of booking-authorized employee records.
- Management of day and week programs.
- Acknowledgement of bookings recorded in offline mode.
- Storage of all bookings and events including information on the time and the location.
- Triggering of output relays.

Data Entry Unit

The data entry unit has the following tasks:

- Reading card data and transferring it to the controller unit.
- Recording events such as keypad entries and transferring them to the controller unit.
- Indicating booking acknowledgements from the host computer or the controller unit on the display.

Memory

The master terminal IF 1525 is equipped with the following memory:
- CMOS-RAM
- Flash-PROM
- D-RAM

CMOS-RAM, 1 MB

The check sum of the application software as well as user-specific data, which is loaded via host, is stored in the CMOS-RAM.

The CMOS-RAM is power supplied by a lithium battery. Therefore, data is also preserved in case of down time of the main power supply.

Flash-PROM

The following software is stored in the Flash-PROM:
- operating system software
- network software (drivers)
- application software

If the storage capacity is not sufficient, memory can be expanded.

D-RAM

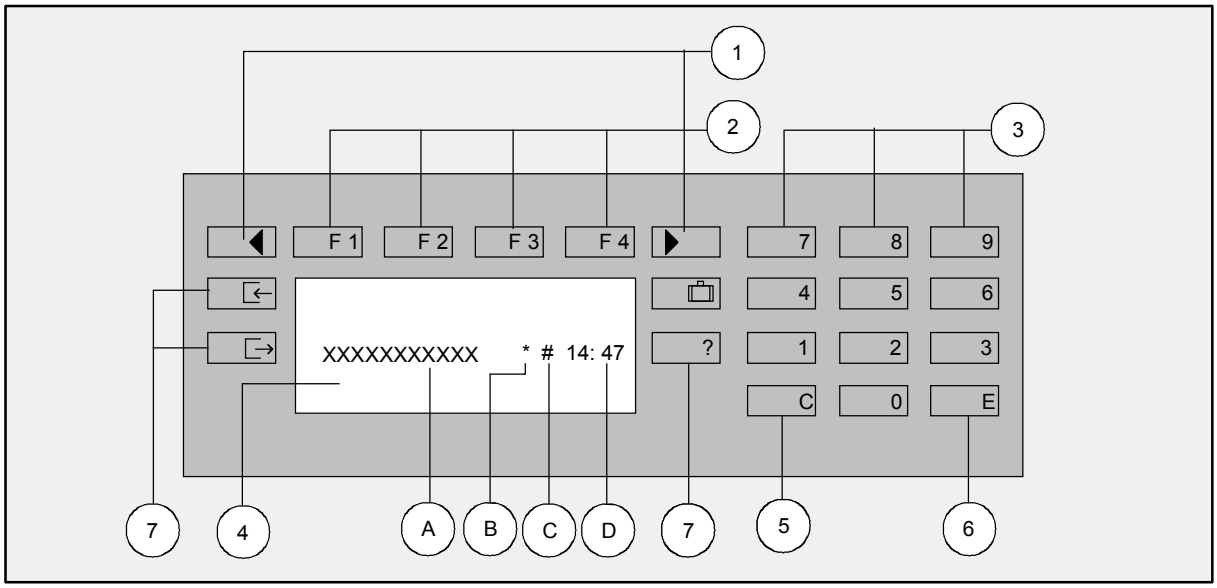
A main memory is available for the operating system.

Technical Data

Technical data

Power supply:	
- Power consumption	16 VA
- Mains voltage	24V AC or DC, +/- 10%
- Internal emergency power supply (option)	For 0,2 hours
Data memory:	
- Flash-PROM	2 MB controller software
- C-RAM	1 MB user data
- D-RAM	4 MB main memory
Retention of data in C-RAM	8 years (lithium battery)
Processors:	Motorola 68EN302, 25 MHz Motorola 68HC12 Clock IC, crystal-stabilized
Interfaces:	
- Interface to host systems	10 Mbit Ethernet 10 Base T, according to IEEE 802.3, TCP/ IP
- Interface for service system	RS 232, 9,600 baud, Ethernet (TELNET protocol)
Card reader:	Integrated Proximity reader
Foil keypad:	Keys with mechanical action point and surface embossment
Indication for user:	4X20 digit LCD
General data:	
- Ambient temperature	+ 4° C to + 50° C
- Humidity	Min 20%, Max. 95%, non-condensing
- Protection category	IP 32
- Electromagnetic compatibility	DIN/ VDE 0843 degree of severity 3 or EN 50081/ 82
- Insulation class	II (according with EN 60950)
- Dimensions	239x210x78 (HxWxD mm)
- Weight	Approx. 3 kg
- Housing material	Polyflam HSF 20, Pocane

Display and Operating Units



1 Keys for scrolling accounts during info bookings and for forwarding dialog menus during cost center bookings.
2 Softkeys/ function keys, locked or not locked
3 Numeric keys for additional entries
4 Display 4x 20 digit
5 Correction/ clear key
6 Enter key
7 Key with fixed function
A Date
B * sign for indicating main power off or Accumulator low or lithium battery low
C # sign for indicating autonomy or offline mode
D Time

Softkeys/ Function Keys (2)
These keys can be parameterized as "locked" or "not locked". If the keys are "locked", the last basic function selected will remain active and will also be indicated on the display (a). If the keys are "not locked", the respective booking type must be selected each time a booking is to be carried out.

Clear Key (5)
This key has two functions. 1 x C deletes the current entry, 2 x C cancels the entry and then the basic menu is displayed again.

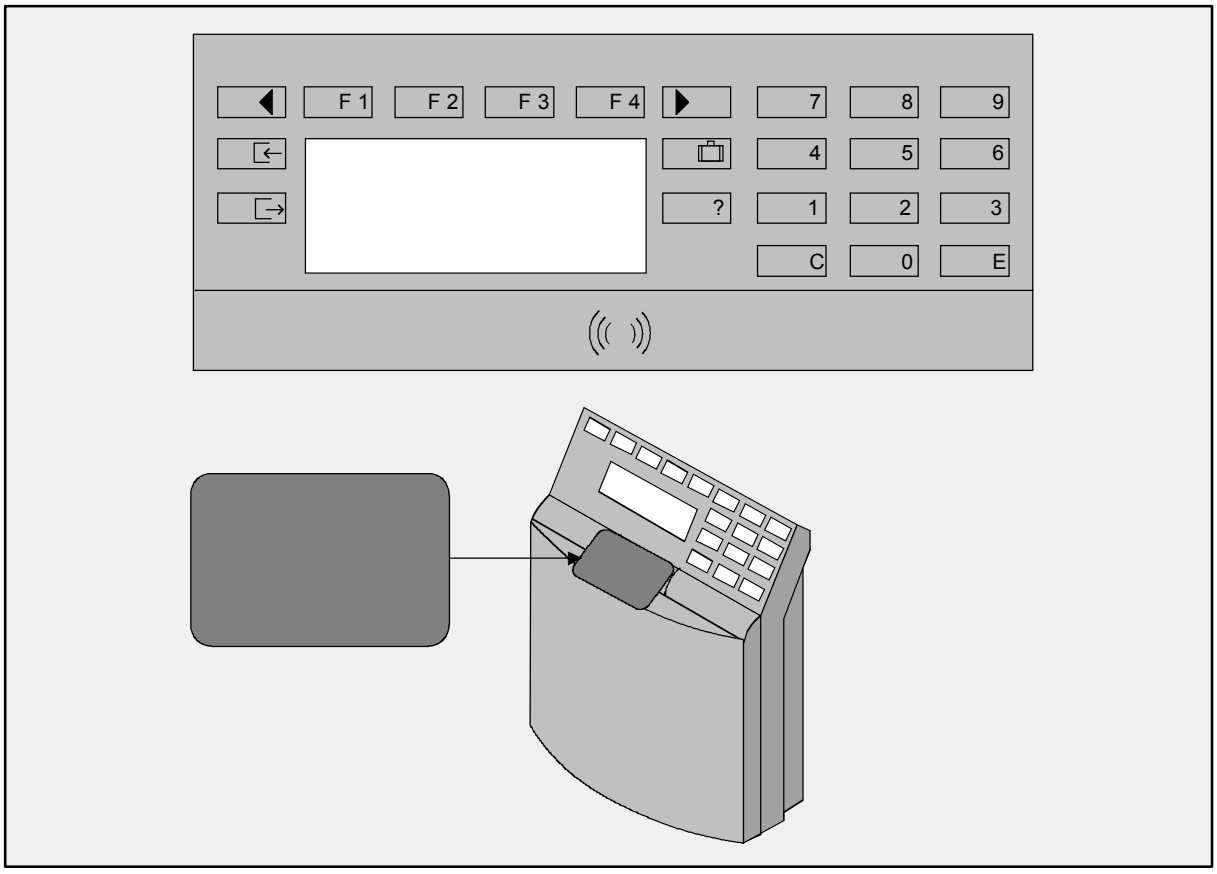
Enter Key (6)
With this key, manual entries can be confirmed and the user can move on to the next dialog level.

Function Keys with Fixed Programmed Function (7)
These keys are configured with following functions: IN, OUT, CLOCKING IN AND OUT REASON, INFO.

Time Recording Booking

1. Press one of the keys to select the desired booking type.

2. Present the identification medium at a distance of 2 cm in front of the pictogram  and wait until the master terminal acknowledges the action with a short ‘beep’ and by displaying the user account.



Master Terminals for Time Recording

Master terminals of the series IF 152x are mainly used for time recording.

Time Recording

The application depends on the software features of the time/access program and also on the parameter settings.
The following can be recorded:

- Times of IN/ OUT/ INFO/ ABSENCE REASON bookings
- Future absence reasons

Information for Employees

The application depends on the software features of the time/access program and also on the parameter settings.

The following can be indicated on the display:

- Time accounts (totals, balance, week, holiday accounts, etc.)
- Orders or orders on hand
- General or personal information

Terminal Equipment

The master terminals are equipped as follows:

- **Proximity reader**.

- **Data interface to higher-ranking system (host computer, router)**
  Ethernet 10 BASE T network connection
  Master terminals are equipped with an Ethernet 10 Base T interface. Data is transferred exclusively with the TCP/IP data protocol.

- **RAM**
  CMOS-RAM (battery buffered)

- **D-RAM**

- **Flash-PROM**
  The Flash-PROM is used as program memory for the controller software. A special download program allows changes to be made and the software to be exchanged without mechanical intervention in the appliance.

- **Clock module**
  Master terminals are equipped with a crystal-controlled clock module. During offline operation, this clock takes over the control. In online mode, the clock is synchronized by the host computer.

- **Acoustic signal transmitter**
  The acoustic signal transmitter can acknowledge the actuation of keys and signalize a booking rejection as well as a positive booking decision.

- **Keypad**
  The membrane keypad is equipped with a numeric block 0 to 9, a clear/cancel key C and an enter key E for input acknowledgement, key left and right and 4 soft keys and 4 dedicated key.

- **Housing lock**
  A mortise lock secures the housing against manipulation and unauthorized opening. The housing can only be opened after the mortise lock has been pulled out.

- **LCD** Master terminal is equipped with a 4x20 digit display. This display serves as a source of information for employees. Depending on the type of application and parameter settings of the master terminal, key texts, time accounts, reasons for booking rejections, orders and general or personal information can be displayed.

- **Internal emergency power supply (Option)**
  The emergency power supply enables the retention of the full master terminal function during voltage breakdown.

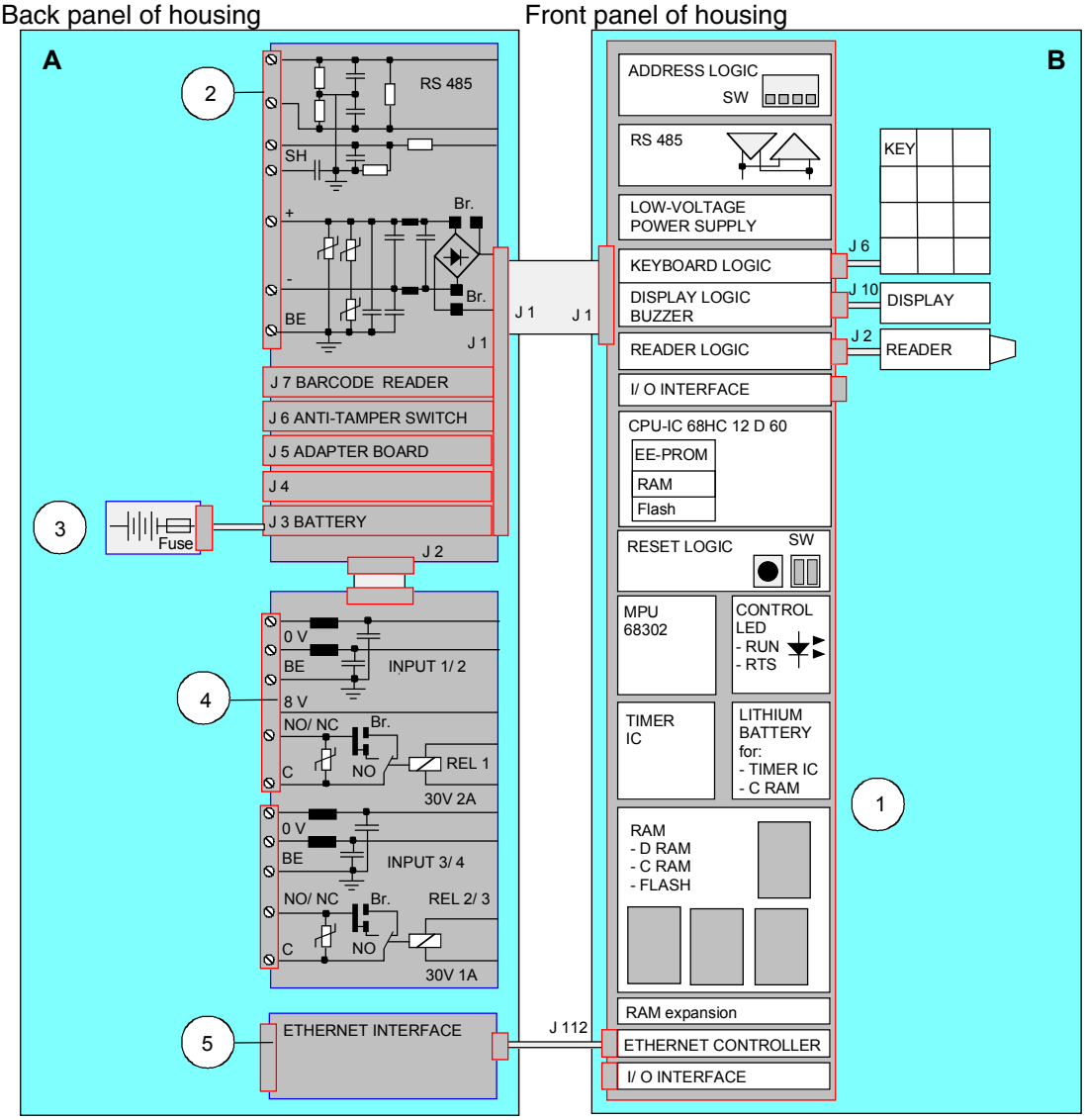
  The emergency power supply supports all data input, data retention and communication functionality of terminal at least for 4 hours in case of a power failure.

Block Diagram and Assembly Unit Overview

The following graph shows the functional units of the electronic boards with MPU main board 02-0448 A.

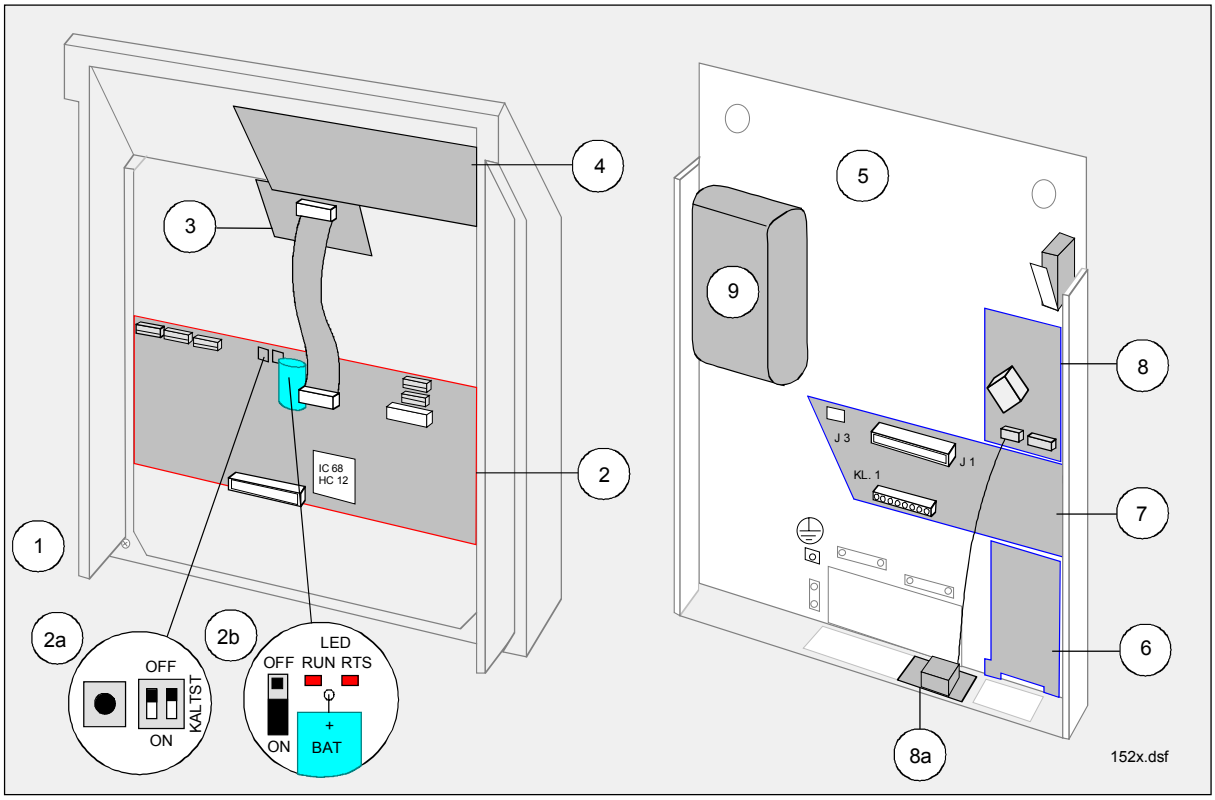
Back panel of housing

Front panel of housing



1	MPU board 02-0448 index A	4	Input/ output connector board (optional)
2	Connector board	5	Ethernet interface board with RS 232 interface
3	Internal emergency power supply (optional)		

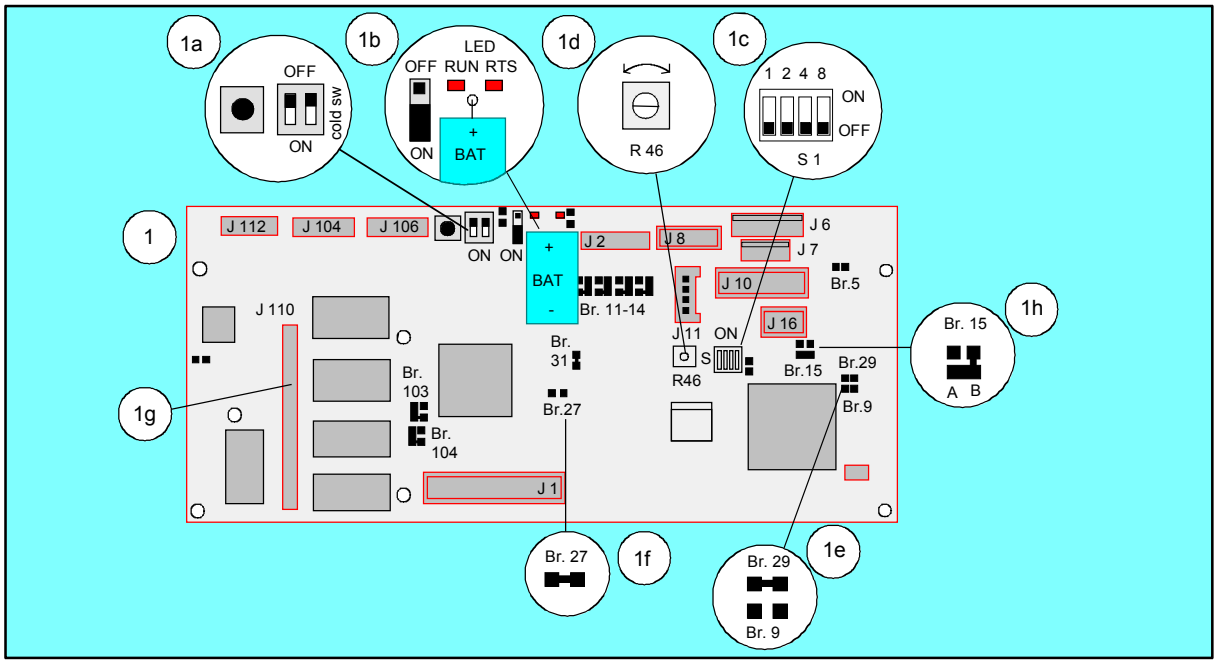
View on the Input Side of Terminal and Electrical Components



1	Housing	3	Proximity reader board	7	Connector board
2	MPU main board 02-0448	4	Display	8	Ethernet board
2a	RESET switch	5	Housing back	8a	RJ 45 Ethernet (Option)
2b	Lithium battery	6	In/output connector board	9	Battery charger+ accumulator

MPU main board 02-0448 index A (with J 16 connector and Br. 15)

1	MPU main board 02-0448 index A	1c	Address selection dip switch (all off)
1a	RESET button and dip switch for cold reset	1d	Contrast of display regulation potentiometer
1b	Jumper to disconnect lithium battery (38-0002)	1g	Memory expansion connector



Solder jumpers (Pos. 1e, 1f,	Open	Closed
Br. 27 Operating Voltage:	10.5 V to 38 VDC (Pos.1f)	20.5 V to 38 VDC
Br. 29 Display back lighting:	On, during power down (1e)	Off, during power down
Br. 15 A/ D Converter	A	B

Control LEDs

The control LEDs RUN and RTS on the solder side of the MPU board indicate the operating statuses.

RUN LED

This LED is always on during normal operation. It is off if the processor has been halted or if the controller program is not active.

RTS LED

In normal operation, this LED monitors the RS 485 data interface to the IF terminals. It flashes if both the master terminal and the IF terminals are connected correctly.
After a cold boot this LED signalizes the run of the RAM test. It flashes rhythmically during this phase.

Cold Boot / Debug Switch and RESET Button

Cold boot switch

The cold boot switch is used for deleting, testing and initializing the C-RAM. It is usually only used after initial operation or after the controller software has been exchanged. During running operation, this switch must be set to the position marked OFF. See chapter "Initial Operation" for further information on the cold boot.

Debug switch

The debug switch is used for testing purposes. During running operation, it must be set to the position marked OFF.

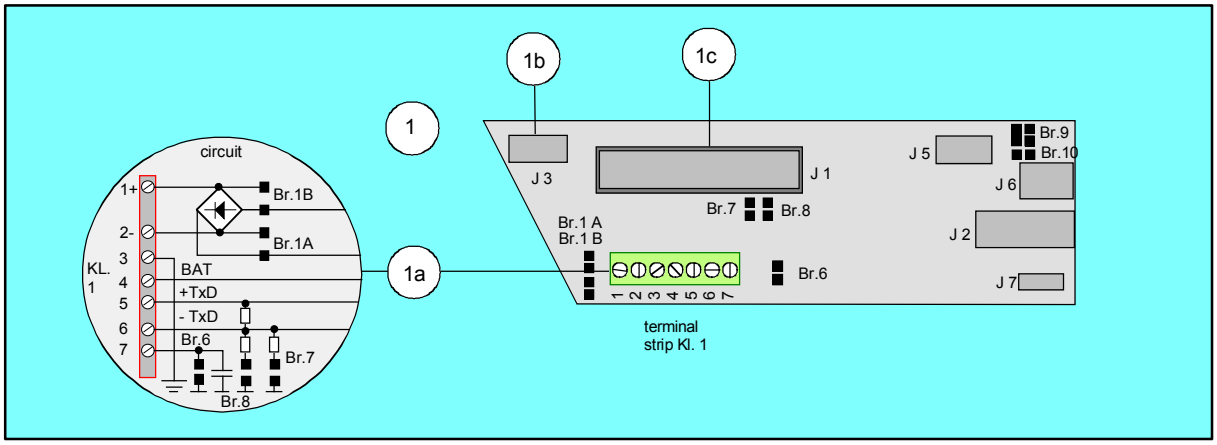
RESET button

The RESET button is used to "restart" the master terminal and also to execute a "cold boot" if the cold boot switch is set to the position marked ON.

Connector Board

The connector board is necessary for the connection of:

- Low voltage
- Emergency power board



1	Connector board	1b	Connector to MPU main bard
1a	Connector for low voltage	1c	Connector for emergency power board

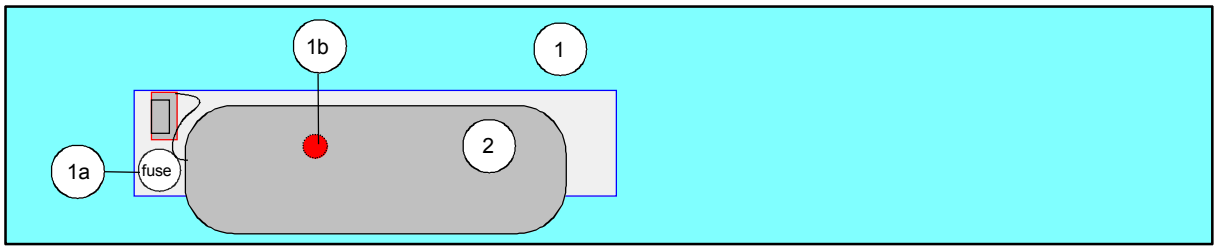
Emergency Power Board (Option)

This board assures continuity of function in case of primary power supply failure.

Note: When mains power fails the terminal sends a message to the host system.

Technical data

Accumulator:	12 V 250 mAh
Charging current:	25 mA (recharge time 24 hours)
Operation time assured:	4 hours
Life of accumulators:	about 5 years in normal environment conditions.



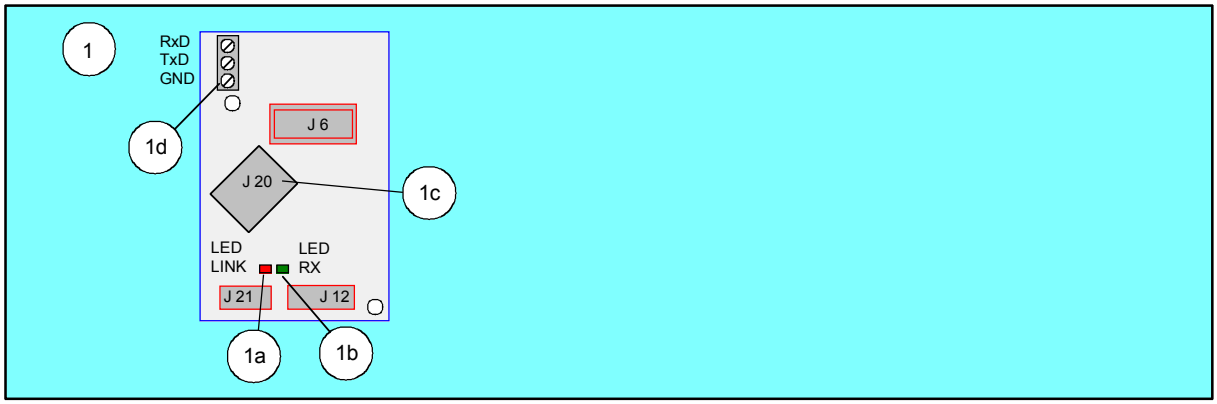
1	Emergency power board	1b	LED showing charging process
1a	Fuse	2	Accumulator

Ethernet Board

The RJ 45 connectors are available for the connection of the network cable (10 Base T).

Control LEDs

The LEDs LINK (Pos.1a) and RX (Pos.1b) light up if the connection to the network is correct.



1	Ethernet board	1c	Connector for network cable
1a	LED LINK	1d	Terminal strip for RS 232 cable
1b	LED RX		

Input/ Output Connector Board (Optional)

The input/ output connector (article no. 02-0128, figure 1) serves as the input for indicator or counting contacts as well as for the activation of electrical control elements and external systems.

Relay 1 (Figure 2)
Relay 1 is exclusively used for the activation of an electrical access control element.
Switching power of the contacts: 30V 2A

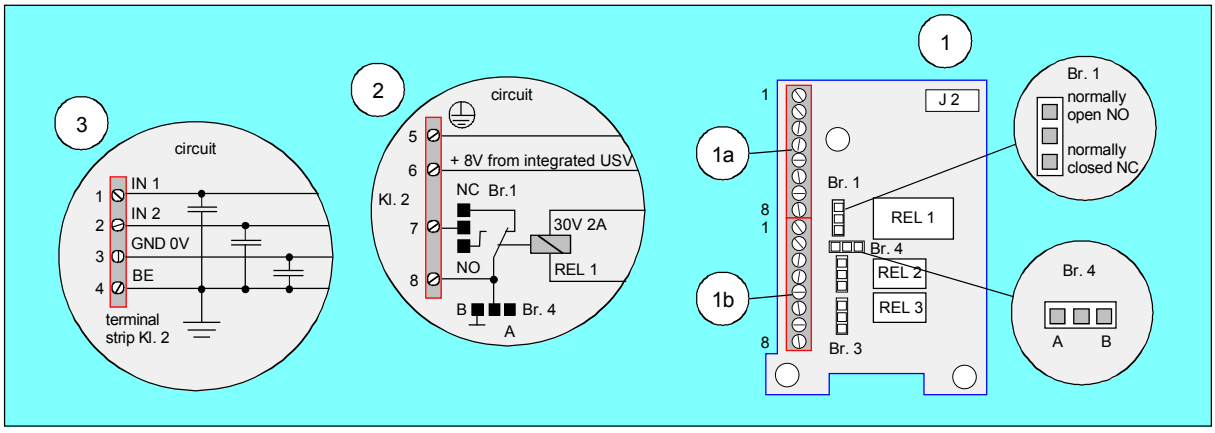
Relays 2 and 3
The relays 2 and 3 are provided for custom-specific applications. Depending on the programming of the host software, these relays are switched on, off or timed.
Switching power of the contacts: 30V 1A

All of the relays are equipped with floating NO and NC contacts. The adjustment of the desired contact type is carried out by means of jumpers.

Input Contacts (Figure 3)
Input contacts serve to scan the status of indicating sensors: Two contact inputs can also be used as counting contacts, if required.

Input Contacts 1 and 2
These two input contacts are exclusively reserved for the connection of door indicator contacts.

Contact Inputs 3 and 4
The input contacts 3 and 4 are provided for custom-specific applications. Depending on the parameterization, they can be used as counting or indicator/ status contacts.



1	Input/ output connector board	2	Relay circuit REL 1
1a	Terminal strip Kl.2	3	Input circuit of the contacts IN 1 and IN 2
1b	Terminal strip Kl.3		

Assignment of Terminal Strip Kl. 2 (1a):
1 to input contact IN 1
2 to input contact IN 2
3 to input contact GND
4 to system ground BE
5 to system ground BE
6 to 8 V internal USV
7 to REL 1 NO/ NC
8 to REL 1 C

Assignment of Terminal Strip Kl. 3 (1b):
1 to input contact IN 3
2 to input contact IN 4
3 to input contact GND
4 to system ground
5 to REL 2 NO/ NC
6 to REL 2 C
7 to REL 3 NO/ NC
8 to REL 3 C

Open/ Close Housing

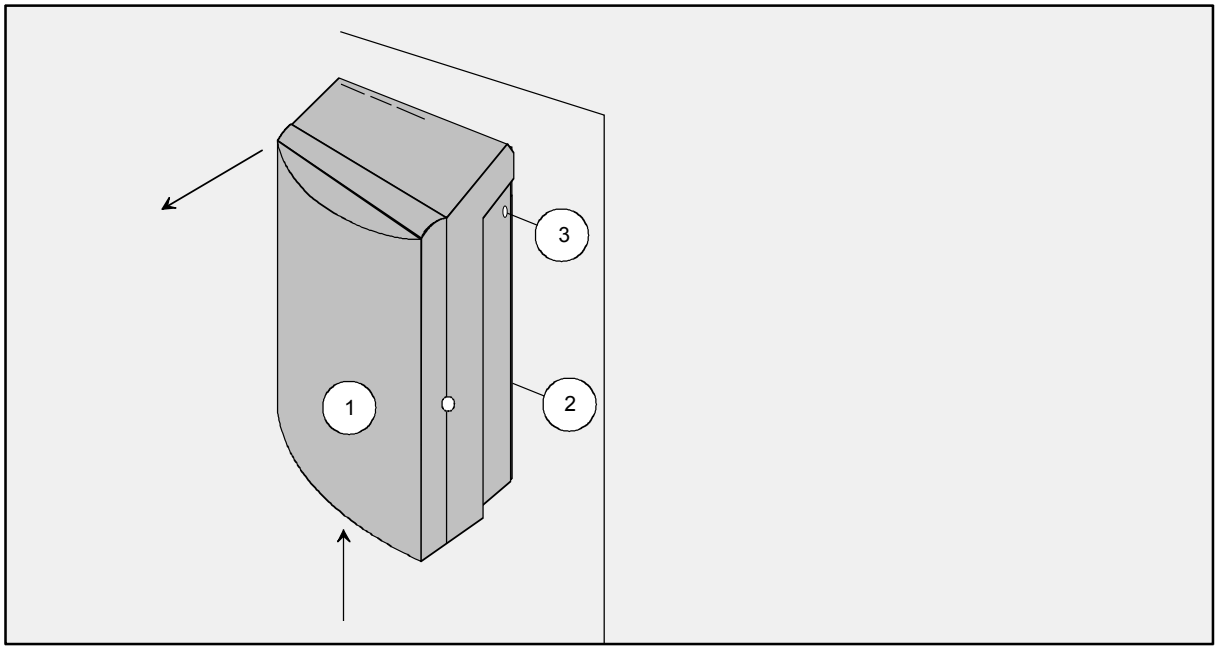
The housing consists of two parts:
- Front part
- Wall part

Both parts are connected via guiding mechanism and secured by a mortise lock.

☞ **Caution: Switch off the voltage supply before opening the housing !**

Open housing:
- ☞ Open the mortise lock with the key and pull it out.
- ☞ Push the front part of the housing as far upwards as possible and remove it by pulling it to the front.
- ☞ Remove the connecting cables from the boards in the wall part of the housing and take off the front part of the housing.

Close housing:
- ☞ Reconnect all of the connecting cables.
- ☞ Hook the front part of the housing to the guiding mechanism of the wall part.
- ☞ Push the front part down.
- ☞ Insert the mortise lock and lock it with the key.



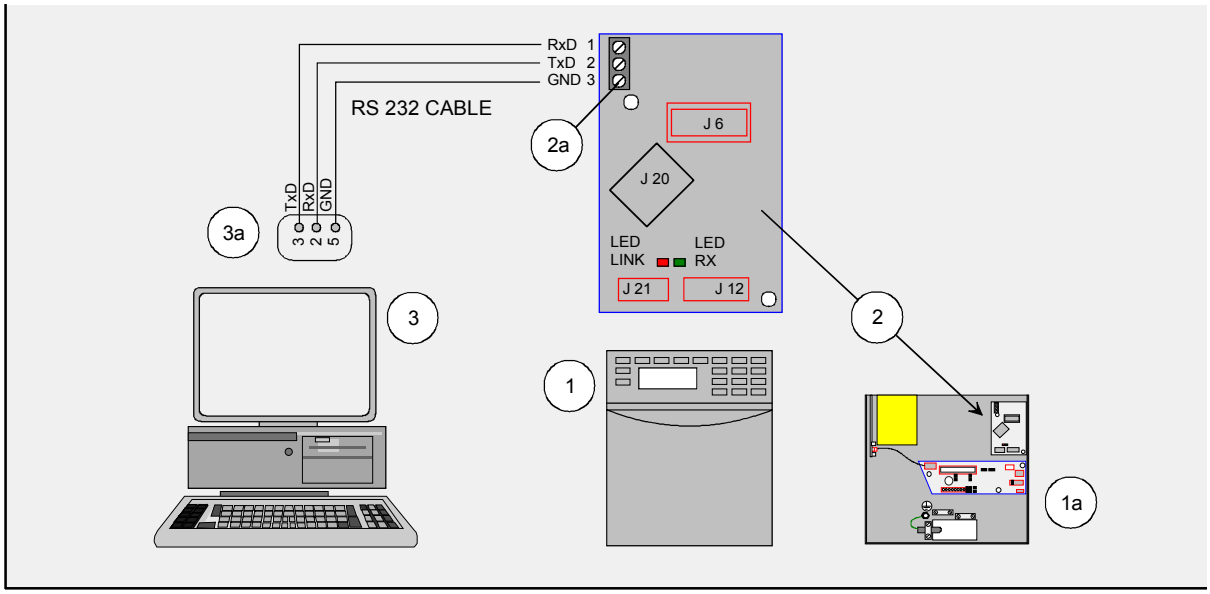
1	Front part	3	Mortise lock
2	Wall part		

Connection Service PC (Optional)

The terminal strip of the Ethernet board integrated serves the connection of a dialog station or a PC with COM interface. Details on the connection are shown in the following graph.

Technical data of the RS 232 test/ service interface

Baud rate: 9,600 baud
Data format: 8 bit, no parity, 1 stop bit
Operation: Full duplex (no handshake)



1	IF 152x front part	2a	Terminal strip for RS 232 cable
1a	IF 152x back panel with board	3	PC with COM or monitor with RS 232
2	Ethernet board with RS 232 interface	3a	Cable connection on PC COM (SUB D 9)

Assignment of Terminal Strip (2a)

Terminal strip:	Signal:
1	RxD
2	TxD
3	GND

Procedure:

- ☞ Connect the data cable to the terminal strip.
- ☞ Set the interface of the service PC to 9,600 baud, 8 bit, no parity, no handshake.
- ☞ Switch on the master terminal and the service PC.
- ☞ Press the return key of the service PC and wait for the $ symbol which indicates input readiness.
- ☞ Press the reset button on the MPU board if the input readiness ($ symbol) or a login is not indicated.

Installation Specifications

Master terminals for time and attendance recording are mounted close to where employees work.

To ensure proper installation, we recommend an "on-site inspection" with the future operator of the system and the preparation of an installation plan.

The plan should include information on the following:
- Mounting location of the master terminal, installation height.
- Connecting cables required, cable layout and cable types.

Mounting Location

Master terminals are designed for vertical wall mounting. They require an even mounting surface of 210 mm x 239 mm.
For terminals with protection category IP 32, we recommend locations that are as dry and dust-free as possible, an ambient temperature of + 4°C to max. +50°C. Locations which are directly exposed to incidence, isolation, electrostatic charging or extraordinary mechanical loads are to be avoided.

Laying and Feeding of the Connection Cables

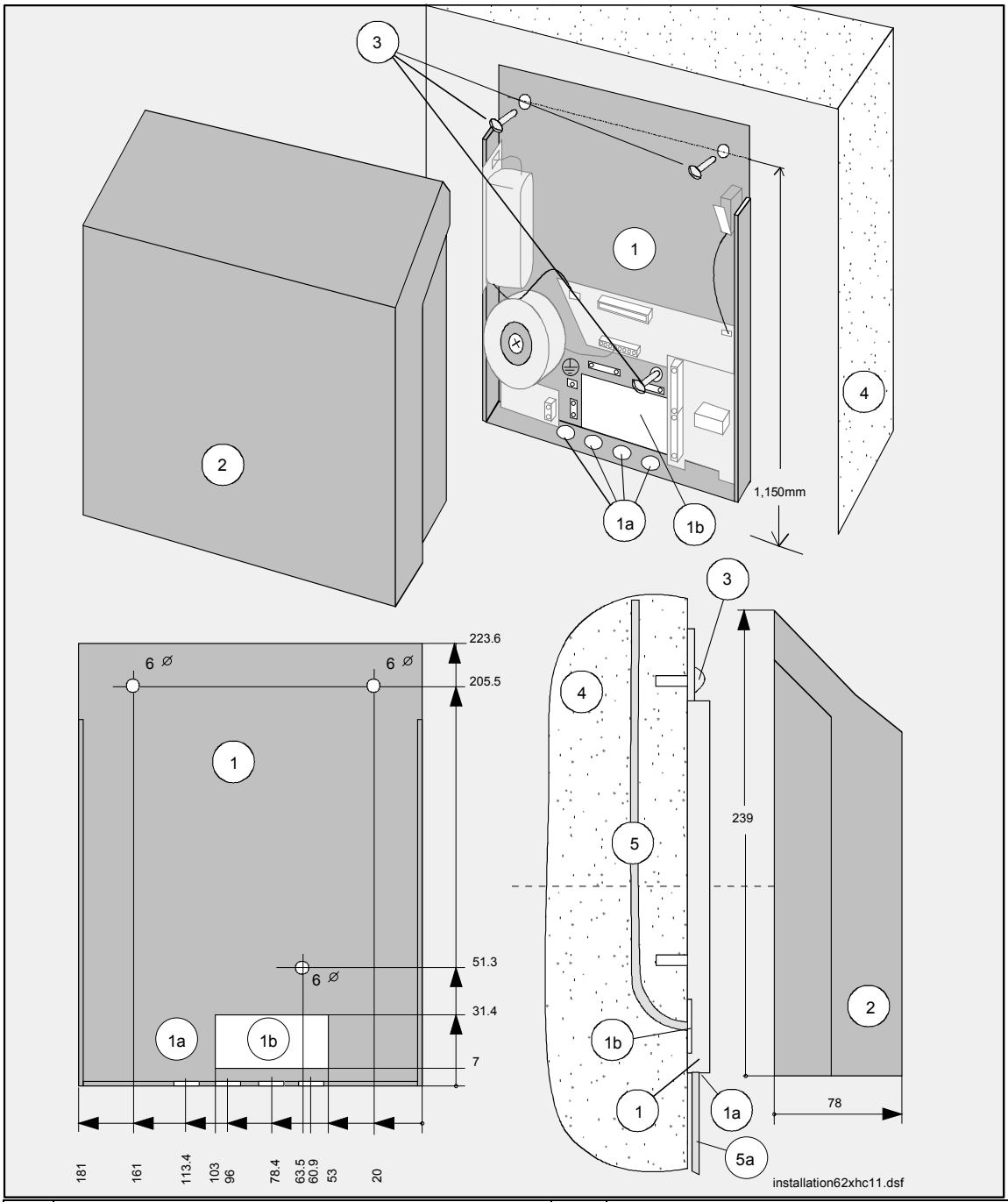
The cables for the power supply can either be wall- or flush mounted. Certain network cable installations, however, are exceptions. They are connected to the master terminal from the outside via patch cable.

☞ Lay the connecting cables directly and/or via line distributor to the mounting location.
☞ Let the cables jut out approx. 40 cm at the mounting location of the master terminal.

Fastening

The wall part of the housing is fastened to an even surface with three screws. Details on the wall fastening as well as the feeding of the connecting cables for wall/ flush mounting are shown in the graph below.

- ☞ Select an installation height which makes optimal operation possible for all users.
- ☞ Use the boring pattern to trace the bore holes.



1	Back panel of housing	3	Screws for fastening the back panel
1a	Opening for wall-mounted cables	4	Wall
1b	Opening for recessed cable mounting	5	Cable feeding in wall
2	Front panel of housing	5a	Wall cable feeding

Connection

- *All of the connections and settings are to be carried out according to this manual.*
- *Detailed instructions can be found in the respective chapters of this manual.*
- *Connect the cables and external systems required for operation as described to ensure malfunction-free operation.*
- *Switch on the operating voltage and put the master terminal into operation.*

☞ **Caution: Switch off mains power before connecting the master terminal.**

How to proceed

1. Cut the mains power cable to the required length.
2. Connect the wires to the respective terminal strip.
3. Secure the cable with a strain relief.
4. Check the connection of the cables once more.
5. Connect the Ethernet patch cable on Ethernet board.
6. Switch on the emergency accumulator.
7. Connect boards from back panel of housing to front panel of housing.
8. Switch on mains power.
9. Put the master terminal into operation (see chapter "Initial Operation").

Details on the step procedure are described in the following chapters.

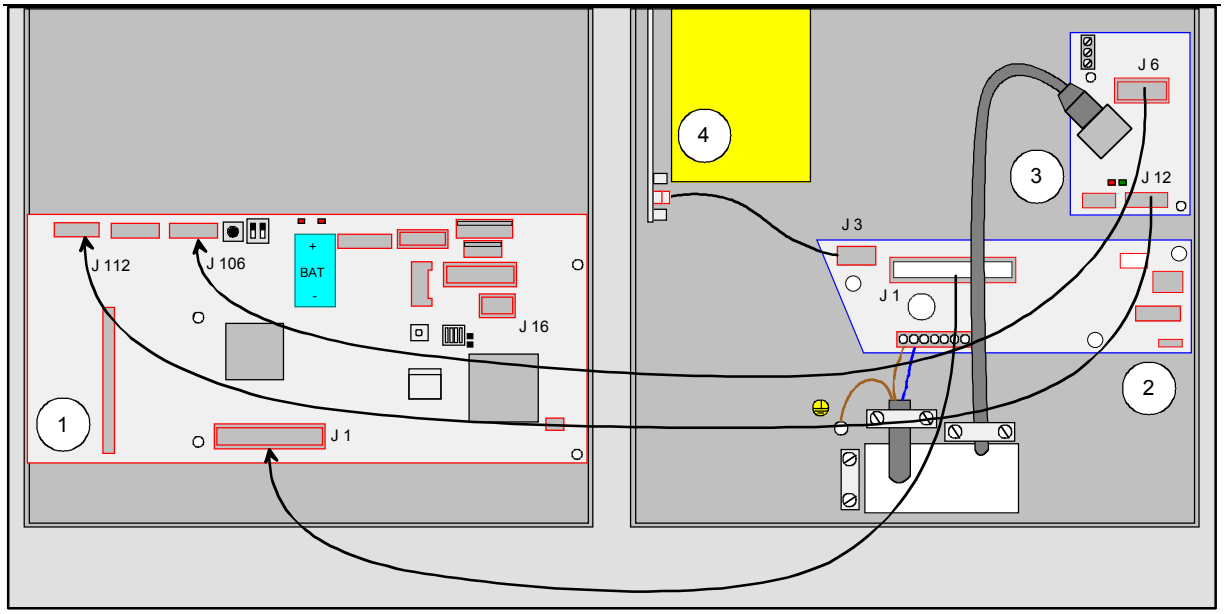
☞ **Caution by step:**

Therefore, only persons that have been instructed in the danger of electricity, based on the rules for the prevention of accidents, are authorized to switch on 230V mains power and to perform initial operation.

Connection of Cables

Connections on Front Panel and Back Panel

front panel back panel



Graph: Cable connection on back panel and front panel			
1	MPU board (02-0448, index A)	3	Ethernet board
2	Connector board	4	Battery charger and accumulator

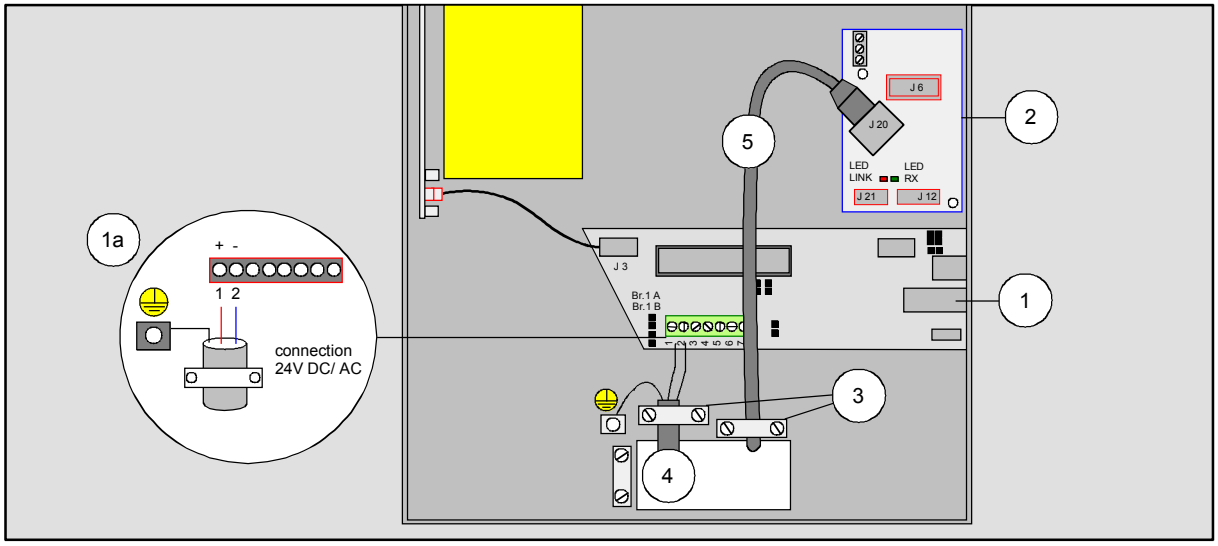
Connection 24 V Mains Power Cable

Connect 24 V mains power cable (recommended cable type NYM 3x 1.5 mm) to terminal strip Kl. 1 as follows:

+ 24V DC/ AC	to terminal 1
- 24V DC/ AC	to terminal 2
Ground	⏚

Connection Ethernet Network Cable (10 Base T)

Connect Ethernet twisted pair cable to Ethernet connector RJ 45.



1	Connector board	3	Strain relief
1a	Fasten 24V main power cable KL.1	4	24 V mains power cable
2	Ethernet board	5	RJ 45 connector for Ethernet patch cable

☞ **Caution:** Secure all cables with a strain relief.

Connection - Accumulator Cable

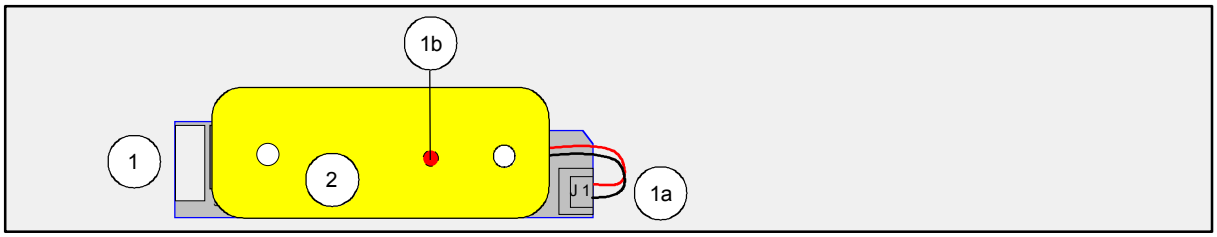
Procedure:

- ☞ Insert both accumulator cables in J 1 (1a).
- ☞ Connect boards from back panel of housing to front panel of housing
- ☞ Set mains power ON.
- ☞ Check that LED (behind accumulator 1b) is on.

Note: LED shows charge process in progress. Accumulator recharge faulty see chapter “Display and Operating Units”.

☞ Caution:

The check is only possible if the operating voltage is switched on and the housing is open. Therefore, only persons that have been instructed in the danger of electricity, based on the rules for the prevention of accidents, are authorized to perform initial operation.



1	Emergency power board	1b	Accumulator charge LED
1a	Terminal strip J 1 for a cable	2	Accumulator

Connection of Electric Access Point Actuators (Optional)

Closed-circuit or open-circuit control elements for DC or AC operation and a maximum power of 30 V 2 A can be switched with relay 1. The connection and the required settings are shown in the graph below.

Connect electric access point actuators (graph, 2) to the input/ output connector board.

Terminal strip 2:

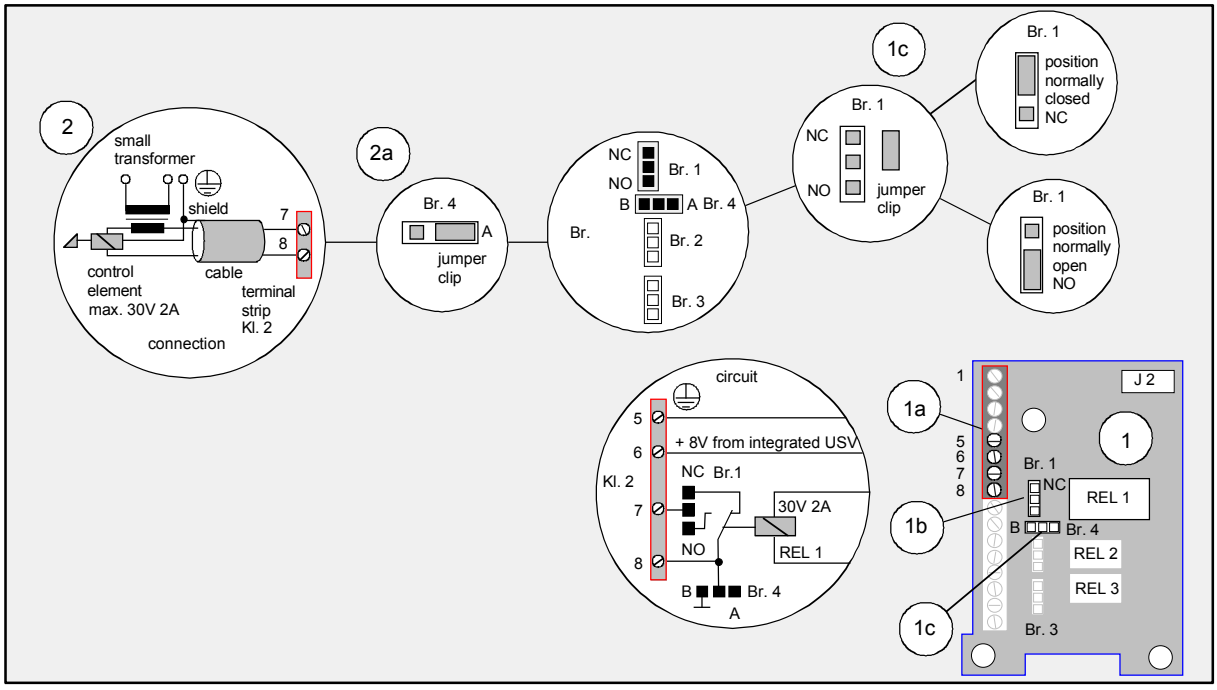
Terminal 7 to control cable of the access point actuator
Terminal 8 to control cable of the access point actuator

Plug the short-circuit jumper clip on to jumper Br.1 (1c) to the following position:

- NO position if the access point actuator is to be operated as access point actuator on operating current.
- NC position if the access point actuator is to be operated as an idle-current actuator.

Plug the short-circuit jumper clip Br.4 (2a) into position A, thus setting the switching contact of the relay to operation on a floating basis will be possible.

Please note: System failures due to static discharges can be avoided if the housing of the access point actuator is grounded directly to the protective conductor of the external power supply.



Graph: Connection of electric access point actuators to the input/ output connector board			
1	Input/ output connector board	1a	Terminal strip
2	Connection - AC access point actuator	1b	Jumper clip Br 4
3	Connection - 8V 300mA DC access point actuator[1]	1c	Jumper clip Br 1 NO/ NC contacts

☞ **Caution:** Secure all cables with a strain relief.

[1] Only possible with and integrated emergency power supply or if operated with an USV 600.

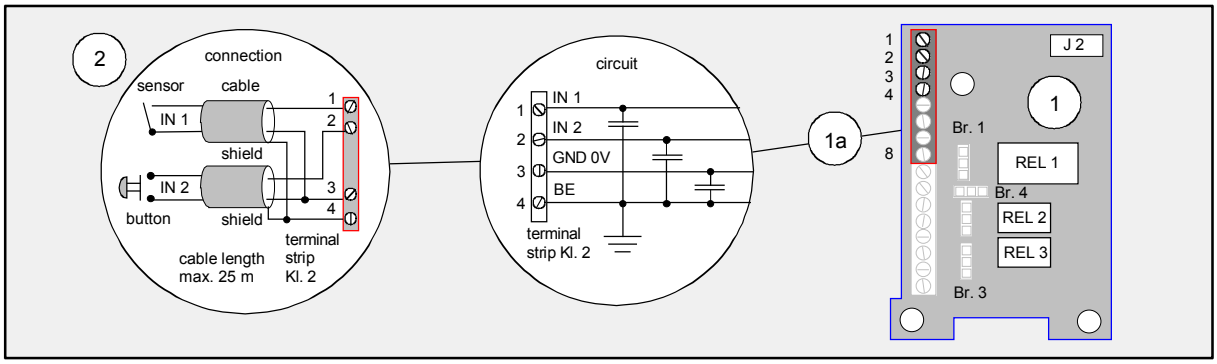
Connection of Surveillance Sensor, Opening Contact/ Handle Contact

☞ Connect the surveillance sensor to the input/ output connector board.

Terminal 1 to IN 1 signal cable to surveillance sensor
Terminal 3 to GND signal cable to surveillance sensor.
Terminal 4 to line shield

☞ Connect the door opening button or the handle contact to terminal strip 2 of the input/ output connector board:

Terminal 2 to IN 2 signal cable to contact
Terminal 3 to GND signal cable to the contact
Terminal 4 to line shield



Graph: Connection of surveillance sensor and door opening button to input/ output connector board			
1	Input/ output connector board	2	Connection of floating sensors
1a	Terminal strip Kl.2		

☞ **Caution:** Secure all cables with a strain relief.

Initial Operation

☞ Caution:

Initial operation is only possible if the operating voltage is switched on and the housing is open. Therefore, only persons that have been instructed in the danger of electricity, based on the rules for the prevention of accidents, are authorized to perform initial operation.

Once the initial operation has been carried out, the master terminal is ready for operation. The readiness for operation is indicated by the LEDs on the MPU board (see chapter "MPU Board") and the date, time of LCD display.

Initial operation comprises the following steps:

1. Erasure and initialization of the RAM via cold boot.
2. Configuration of the network interface via PC with RS 232 or TELNET from a remove network PC if the network addresses are identical. Detailed information on PC RS 232 connection can be found in the chapter Service PC Connection. The program (OC task menu) for the configuration is part of the controller software and can only be operated if the password entered corresponds to the password saved.
3. Setting of the display contrast.

Each of these steps are to be carried out in this order after the mounting and the cable laying have taken place. Details on the procedure are described in the following chapters.

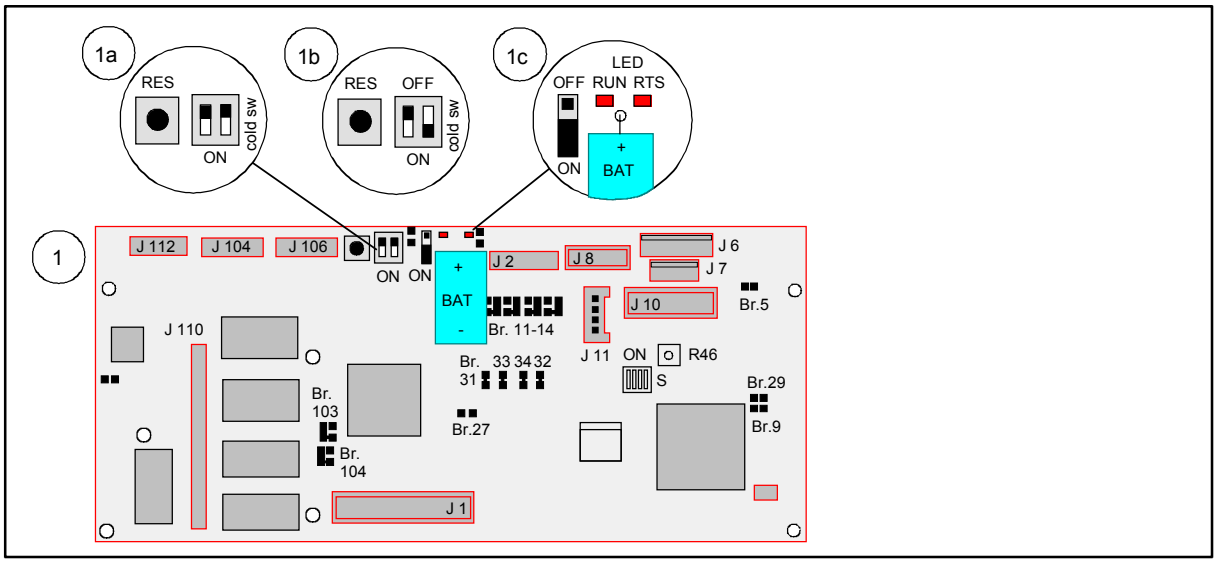
How to Erase and Initialize the RAM (Cold Boot)

The cold boot erases all the user data, initializes the C-RAM and sets the default values required for operation. **All the data must be reloaded.**

A cold boot is required after:
- Initial operation (imperative)
- Change of the controller software depending on the respective instructions

The cold boot is carried out by means of the "cold boot switch" and the reset button, both to be found on the MPU board (see graph 1).

The following graph shows the positions of the switches for warm (1a) and cold (1b) start.



How to perform a cold boot:
- ☞ Open the housing of the terminal without removing any of the connecting cables.
- ☞ Set the cold boot switch on the MPU to ON (see graph 1b).
- ☞ Push the reset button on the MPU board (RTS and RUN-LED are off).
  Wait while RAM test* is running. The test is finished when the RTS-LED stops blinking.
  RAM test OK: - RTS LED is flickering
  Negative RAM test: - RTS-LED off (RAM defective or insufficient C-RAM section)
- ☞ Afterwards, the cold boot switch must be set back to OFF.

⇨ **Note:** The cold boot switch must always be set back to OFF (see graph 1a) after a cold boot has been carried out !!! Otherwise the C-RAM will be erased every time a power failure occurs, which means that the booking data will be lost and the data required for operation will have to be reloaded from the host system.

RESET

The actuation of the reset button or also a short voltage breakdown will cause the master terminal to reset (warm boot). Stored data will not be erased or changed.

A RESET (warm boot) is required after:
- Interface parameters have been changed
- System failures

Configuration of Network Interfaces

The master terminal requires the following data for building up TCP/ IP connections:
- Internet address (default factory setting 172.18.70.52).
- Port number (default factory setting 2001)
- Subnet mask
- Routing to host system

The data is partly given by the network administrator and must be saved in the Flash-PROM of the MPU by means of a configuration menu during initial operation.

Internet address (default setting: 172.18.70.52)
The default Internet address is automatically restored after a cold reboot if the cold reboot switch of the terminal is replaced in the original position within 8 seconds.

Port number* (default setting: 2001)
Port numbers are used to distinguish between data blocks, which belong to different connections and address different processes. The combination of the Internet address and the port number is called "socket". The socket is used for the unique identification of the connection.

Subnet mask
The subnet mask is used to determine which part of the IP address is to be the network address and which part is to be the host address.

Routing
A routing entry is required if the master terminal and the host system are operated in different networks or via subnets. The IP address of the gateway via which the master terminal is to send data as well as the number of gateways to the target host are always required.

⇨ **Points to Note:**
- Except for the port number*, all the data is given by the network provider. Please ask for this data prior to installation. The configuration can then – in advance - be carried out at your branch office.
- Do not forget to save the changed values.
- Reset the master terminal after changes have been made by pressing the reset button or via the menu $ *oc -s*. The new parameters are active after the reset has been carried out.

* The port number is normally given by the IF central system. This number can be found in the respective IF system manual.
** Ethernet node numbers are uniquely defined all over the world. The number $0020acXXXXXX is assigned to Interflex. The last 6 digits (XXXXXX) are used for the consecutive numbering of the IF Ethernet boards.

How to Retrieve Information on Internet Address and Port Number

Parameterization
With the OC menu $ ***netpar*** you can retrieve information on the currently stored network parameters and the Ethernet node number.

How to Change and Save the Internet Address and the Port Number

Parameterization
The IP address and the port number are changed with the OC menu $ ***netpar -x*** and stored in the EE-PROM.

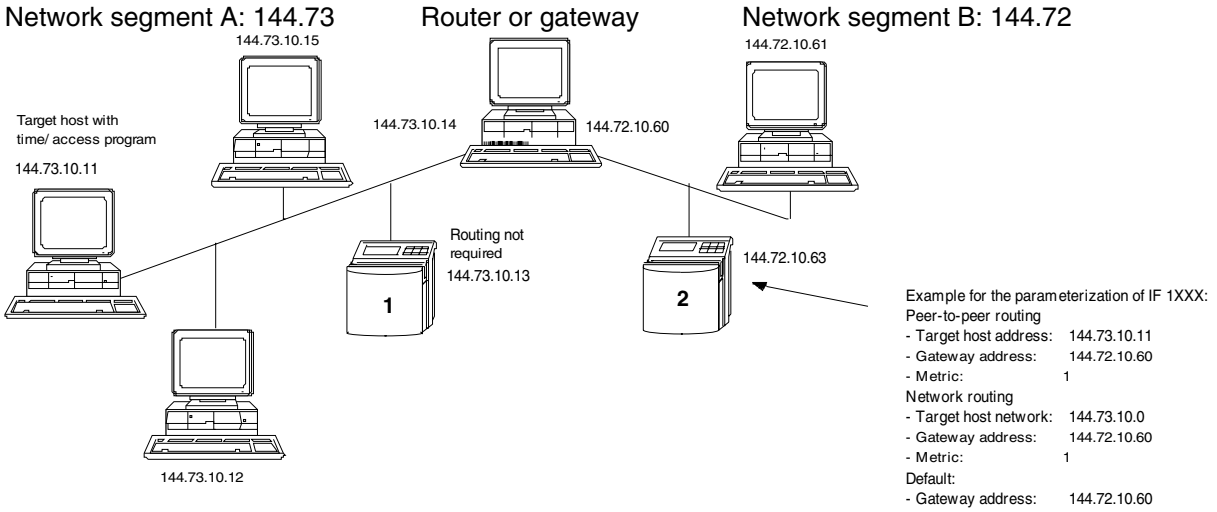
- ☞ Enter the IP address under which the host can reach the master terminal in the input field marked "Internetadresse".
- ☞ Enter the number with which the host can build up the connection to the master terminal in the input field marked "Portnummer"*.
- ☞ Enter „ *j* “ in the input line if you wish to save the previous data without making further changes. Enter „*n*“ if you do not want to save the data or if you wish to change the previous data.

How to Change and Save the Routing and the Subnet Mask

Both the Ethernet controller and the Token Ring controller support the following routing types:
- Peer-to-peer routing for a specific host.
- Network routing for all the hosts within a specific network.
- Default routing for each target that is not reached by the two other types.

Example: Ethernet LAN with router or gateway
Network A, target network address: 144.73.0.0
- Host computer, target network address: 144.73.10.11
- IF 152x master terminal (1), IP address: 144.73.10.13
- Router/ gateway, gateway address for network segment A: 144.73.10.14

Network B, network: 144.72.0.0
- IF 152x/ 16XX master terminal (2), IP address: 144.73.10.63
- Router/ gateway, gateway address for network segment B: 144.72.10.60



* The port number is usually given by the IF central system which can be found in the respective IF System Manual.

Routing entries of the previous example

With subnetworks

IF 152x (1)	Subnet mask entry required, other input fields all set to 0.0.0.0
IF 152x (2)	Subnet mask and routing entries required, preferably peer-to-peer, other input fields all set to 0.0.0.0

Without subnetworks

IF 152x (1)	No routing entries required, **all input fields set to 0.0.0.0**
IF 152x (2)	Routing entries required, preferably peer-to-peer, other input fields all set to 0.0.0.0

Parameterization

The routing types, the subnet mask and the metric are specified with the OC menu $ ***netpar -r*** and saved in the EE-PROM.

Subnet mask

☞ Enter the subnet mask with which the network administrator manages the master terminal in the input field marked "Subnetmaske".
If no subnet is used for management, the input field must be set to *0.0.0.0*.

Peer-to-Peer Routing (not use)

☞ Enter the IP address of the target host on which the IF application (time recording/access control program) is installed in the input field marked "Peer-to-Peer Routing".
Enter the IP gateway address via which the local network (master terminal) sends data in the input field marked "Gateway address".
Enter the number of gateways to the host in the input field marked "Metric".

Network routing (not use)

☞ Enter the IP target address if connections to other systems are to be built up in the target network in the input field marked "Network-Routing".
Enter the IP gateway address via which the local network (master terminal) sends data in the input field marked "Gateway address".
Enter the number of gateways to the target network in the input field marked "Metric".

Default routing

☞ Only enter the IP gateway address via which the local network of the master terminal sends data in the input field marked "Default-Routing".
Enter the number of gateways to the target network in the input field marked "Metric".

Save

☞ Enter „*j*“ in the input line if you wish to save the previous data without making further changes.
Enter „*n*“ if you do not want to save the data or if you wish to change the previous data.

⇨ **Points to Note:**

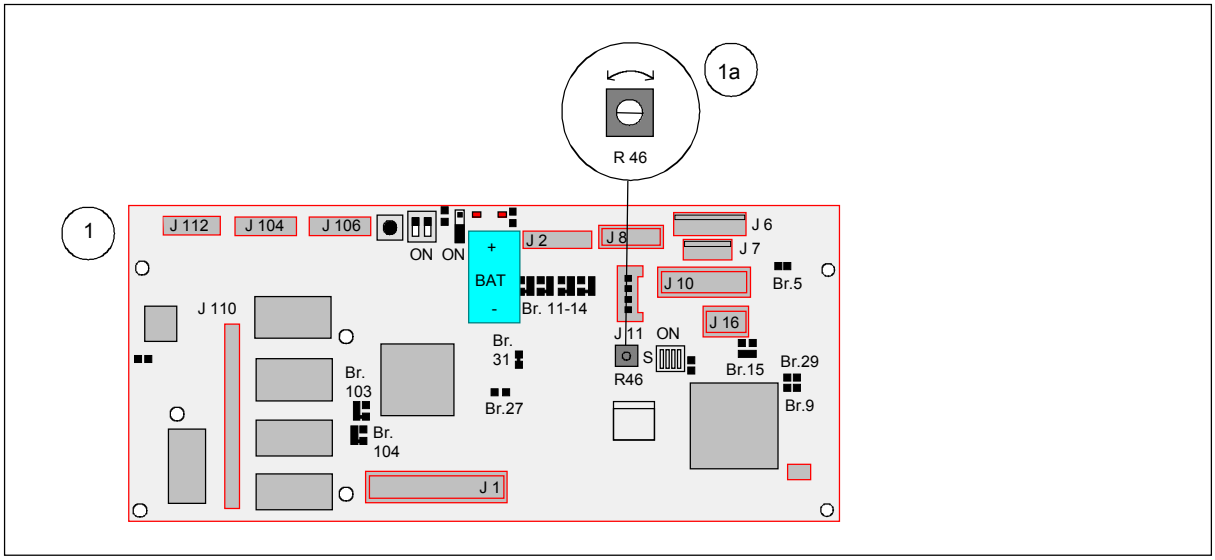
- Up to two routing types can be parameterized. Always set the input fields of the other routing types which are not needed to 0.0.0.0.
- Do not forget to save the changed values.
- Reset the master terminal after changes have been made by pressing the reset button or via the menu $ *oc -s*. The new parameters are active after the reset has been carried out.

How to Adjust the Display Contrast

The contrast of the display can be adjusted with the potentiometer R 46 (MPU board). The contrast is correct and must not be changed if the dots of the characters can be recognized from different points of view. Regardless of a person's size (eye level), the characters are legible. The contrast must only be adjusted if the characters can hardly be recognized from some angles of view (eye level).

Adjustment
The master terminal must be ready for operation and the housing must be open to carry out the adjustment.

☞ Turn the potentiometer R 46 (1a) by the use of a little screw driver until the display is visible from all angles of view and only indicates digits with information.



Graph: MPU board index A with potentiometer R 46

Test

The controller software of the master terminal contains a test program (OC task) which can be operated via service interface per dialog station or via network connection with TELNET. The following can serve as a dialog station:

- PC with RS 232 interface service cable and terminal emulation program. Detailed information on the connection and the settings can be found in the chapter "Service PC Connection".
- PC within a network and TELNET.

In order to reach the command level of the program, the master terminal must be ready for operation and the dialog station must be connected to the service interface. A host connection via network requires a network connection via TELNET (port number 23). The invocation of the program is protected by a password. The program can only be operated if the password entered corresponds to the password saved.

The program is ready for input when the „$“ symbol or the login appears on screen. This can take up to 20 seconds after a RESET or after the mains voltage has been switched on. During normal operation, an entry is usually possible once the Enter key has been pressed.

⇨ **Please Note:** If the input readiness is not indicated after the Enter key has been pressed, please check the connection and the interface parameters of the dialog station and then switch the operating voltage of the master terminal off and back on again.

Enter $ oc to retrieve an overview of the current program menus. Enter menu -? (example: $ *oc -?*) to retrieve further information on the respective menu.

How to Check the Checksum of the Controller Software

The controller software is protected by a CRC checksum. The 2 byte CRC is automatically created and stored in the C-RAM after the controller software has been loaded. After a RESET or a cold boot, the program automatically checks this CRC character. In case of an incorrect CRC, the start-up procedure will be terminated and the boot routine will be activated.
Check the CRC by means of the OC menu $ *checkappl* if the master terminal does not start working after a RESET or a cold boot. A correct checksum will be acknowledged with Good Application CRC, an incorrect checksum with Bad Application CRC. In case of an incorrect checksum, the application software must be reloaded. In some cases, e.g. voltage loss of the C-RAM, it is sufficient to determine the checksum with $ *checkappl -x*.

How to Check the Network Connection

The following menus of the test program are used specifically for checking the network connection and for reading network-specific settings of an Ethernet/token ring controller.

- *ping* (see next chapter)
- *netpar -?* ?= Options
- *netpar* Display the Ethernet node number and the internet address
- *ifconfig nat0* Display the network addresses and network-specific data
- *netstat - ?* Options:
- - n= Active internet connection
- - s= Statistics
- - r= Display the routing tables
- *bw* Display the TCP processes and errors (only when connected)

⇨ **Note:** Check the connection to and from local systems first. Local connections within a network must be working before inter network connections can be set up.

PING

With PING, the connection between two network users can be checked.

PING is started at a network host or via dialog station, which is connected to the master terminal, by entering the target internet address or the assigned host name (not possible at the master terminal).

Once the connection has been built up successfully, the target system acknowledges the inquiry. The acknowledgement itself is displayed according to the respective operating system.

☞ OC menu $ *PING XXX.XXX.XXX.XXX* (X= user's IP address).

An invocation without a positive acknowledgement can mean that:
- one of the users is not correctly connected to the network.
- one of the user connections is defective.
- the invoked IP address is not available within the network.
- a connection via router or gateway is not possible.

Please check:
- the connection of the master terminal to the network.
- the specified internet address.
- the routing table.

How to Check the Master Terminal via TELNET

TELNET is a service/terminal emulation program and usually part of the TCP/IP programs that run on WIN 95/ NT. The target IP address and port number 23 are specified when TELNET is started. Then the connection to the target is built up.

If the *IP address* and the *port number of the master terminal* are entered as the target during the invocation procedure and the connection is set up successfully, it is possible to address the master terminal directly with IT data records, e.g., to poll the software version number or also to activate/deactivate a relay. An operative master terminal responds to each data record received. The response is displayed on screen at the "TELNET station".

☞ *TELNET XXX.XXX.XXX.XXX YYYY* (X= IP address of the master terminal, Y= port number)

The software version number can be polled of the master terminal can be triggered with the following IT data records:
☞ *Ctr A 10 Ctrl X* (master terminal A, poll software version)

An unsuccessful connection set up can have one of the following reasons:
- one of the users is not correctly connected to the network.
- one of the user connections is defective.
- the invoked IP address is not available within the network.
- a different port number is specified in the master terminal.
- a connection via router or gateway is not possible.

Please check:
- the network connection with PING.
- the network-specific parameters in the host.
- the internet address in the master terminal.
- the routing entries in the master terminal.
- the function of the internal emergency power supply (LED charge control on), if available.

Keep-Alive Function

A keep-alive function is provided in order to periodically send messages to the system server. The function can freely be parameterized.

Repair and Maintenance

Repair and Exchange

Repairs are usually limited to the exchange of the complete master terminal. However, it is also possible to detect the cause of trouble and to exchange the assembly units concerned, especially the interface boards. Please note that the software of the master terminal can also be responsible for malfunctions and that a program update can sometimes eliminate the error. Therefore, exchange boards only if you are sure that the exchange will eliminate the error. Information on the item numbers of assembly units and other replacement parts can be found in the chapter "Replacements".

☞ **Caution: Switch off the voltage supply before opening the housing !**

MPU Board

The MPU board can be changed with a similar board following the instructions below.

⇨ **Points to note on the exchange of the MPU board in case of servicing:**

- ☞ Check the software status with OC menu *$ cfg.* Download the current IF 1XXX controller software, if required. For detailed information see manual "IF 1XXX Download Program".
- ☞ Check the checksum of the application software by means of the OC menu $ checkappl (see chapter "Test").

Card Reader

A card reader can be replaced by another card reader of the same type.

Other Boards

Interface and connector boards can always be replaced by boards of the same type.

⇨ **Note:**
Compare the solder bridge and jumper clip settings before installing the boards. In case of deviations, change the settings to the right position.

Maintenance

Preventive maintenance of master terminals is usually not required.

How to Replace the Accumulator Block

Replace the accumulator block of the internal emergency power supply board after:

- 5 years if the master terminal is operated in an environment with an ambient temperature of approx. 20° C.

How to Replace the Lithium Battery

Replace the lithium battery (38-0002) on the MPU board after 8 years at the latest.

☞ **Caution:** Incorrect handling during the exchange of the lithium battery may cause an explosion! Avoid causing a short circuit of the poles.

Procedure:

- Switch the master terminal to online mode and collect all the unprocessed data.
- Switch off the supply voltage and the emergency power supply.
- Open the front part of the housing.
- Remove the MPU board.
- Remove short circuit jumper clip (1).
- Unsolder the lithium battery and replace it by one of the same type. Mind the polarity.
- Plug in the short circuit jumper clip and install the MPU board.
- Re-determine the checksum of the application software with the OC menu *„$ checkappl -x*“.
- Initialize the master terminal (cold boot 2).
- Set the switch to the operating position (3).
- Initialize the master terminal (load data).

Disposal of Accumulators, Lithium Batteries, Components and Assembly Units

☞ **Attention:** Old, defective accumulators and lithium batteries as well as defective, non-repairable assembly units must be disposed of properly.

- Only discharged accumulators and lithium batteries should be thrown into waste disposal containers. To be on the safe side, use electrician's tape to cover the poles of the accumulators/batteries or wrap each accumulator/battery into a plastic bag before throwing it away.
- Send old assembly units back to Interflex marked "old components/ assembly units to be disposed of".

How to Exchange the Firmware/ Application Software

The master terminal requires the following software for operation:
- Firmware with terminal functions (terminal firmware)
- Controller software (MPU board) consisting of:
  - Application software
  - Operating system software
  - Network software

Each software version has its own number which gives information on the respective software release. It can be polled via service/test interface or via TELNET with OC menu $ *cfg*

OC Menu to Recall Software Version

Show controller application software, operating system software Network software.

$ cfg -v
Software configuration IF1xxx

BSystem_DM: OS9 3.03 V01.00.0
TcpIp_DM: Ethernet Tcp/Ip V01.01.0
Downl_DM: Download module V01.00.0
ReadMe_DM: V5.10.8c
Show terminal software

$ cfg

Terminal configuration IF1xxx 5.10.8c16 (software version) Host: Ethernet

No	B	A	HA	TNo	type	HWU	**SWU**	display	keys	read1	read 2	In/ Out
1	1	A	1	1	IF 625	**2.01**		-	-	-	-	-

How to Exchange the Controller Software

The controller software can be loaded via the respective host interface. The housing does not have to be opened. Alternatively, loading is also possible via the service/test interface*.

The following is required for loading:
- PC with:
  - Operating system WIN 95, NT or newer.
  - At least 12 MB free memory on the hard disk.
  - COM interface and service cable or Ethernet interface.
- Download program IF 1XXX.
- Current controller software.

The procedure is described in a separate manual.

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