

HZS 7321

Heating Control

Instruction Manual

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Touch Operating Panel

HZS 7321

The HZS 7321 is an intelligent terminal for programming and visualization of automated processes. Process diagnostics as well as operating and monitoring automated procedures are simplified using this terminal.

A projective capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 7" WVGA TFT color display.

With the LASAL visualization tool, graphics can be created on the PC, then stored and displayed on the build-in touch terminal.

The available interfaces can be used to exchange process data or configure the build-in terminal. In the internal Flash memory, the operating system, application and application data are stored.



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1 Introduction

1.1 Target Group/Purpose of this Operating Manual

This operating manual contains all information required to operate this product.

This operating manual is intended for:

- Project planners
- Technicians
- Commissioning engineers
- Machine operators
- Maintenance/test technicians

General knowledge of automation technology is required.

Further help and training information, as well as the appropriate accessories can be found on our website www.sigmatek-automation.com

Our support team is happily available to answer your questions.
Please see our website for our hotline number and business hours.

1.2 Contents of Delivery

1x HZS 7321
Mating plugs

2 Basic Safety Guidelines

2.1 Symbols Used

The following symbols are used in the operator documentation for warning and danger messages, as well as informational notes:

DANGER



Danger indicates that death or serious injury **will occur**, if the specified measures are not taken.

⇒ To avoid death or serious injuries, observe the all guidelines.

Danger indique une situation dangereuse qui, faute de prendre les mesures adéquates, **entraînera** des blessures graves, voire mortelles.

⇒ Respectez toutes les consignes pour éviter des blessures graves, voire mortelles.

WARNING



Warning indicates that death or serious injury **can** occur, if the specified measures are not taken.

⇒ To avoid death or serious injuries, observe the all guidelines.

Avertissement d'une situation dangereuse qui, faute de prendre les mesures adéquates, **entraînera** des blessures graves, voire mortelles.

⇒ Respectez toutes les consignes pour éviter des blessures graves, voire mortelles.

CAUTION



Caution indicates that moderate to slight injury **can** occur, if the specified measures are not taken.

⇒ To avoid moderate to slight injuries, observe the all guidelines.

Attention indique une situation dangereuse qui, faute de prendre les mesures adéquates, **peut** entraîner des blessures assez graves ou légères.

⇒ Respectez toutes les consignes pour éviter des blessures graves, voire mortelles.



INFORMATION

Provides important information on the product, handling or relevant sections of the documentation, which require attention.



Danger for ESD-sensitive components.

Les signes de danger pour les composants sensibles aux décharges électrostatiques.

2.2 Disclaimer



The contents of this operating manual were prepared with the greatest care. However, deviations cannot be ruled out. This operating manual is regularly checked and required corrections are included in the subsequent versions. The machine manufacturer is responsible for the proper assembly, as well as device configuration. The machine operator is responsible for safe handling, as well as proper operation.

The current operating manual can be found on our website. If necessary, contact our support.

Subject to technical changes, which improve the performance of the devices. The following operating manual is purely a product description. It does not guarantee properties under the warranty.

Please thoroughly read the corresponding documentation and this operating manual before handling a product.

SIGMATEK GmbH & Co KG is not liable for damages caused through non-compliance with these instructions or applicable regulations.

2.3 General Safety Guidelines

The safety guidelines in the other sections of this operating manual must be observed. These instructions are visually emphasized by symbols.



According to EU Guidelines, the operating instructions are a component of a product.

This operating manual must therefore be accessible in the vicinity of the machine since it contains important instructions.

This operating manual should be included in the sale, rental or transfer of the product, or its online availability indicated.

Maintain this operating manual in readable condition and keep it accessible for reference.

Regarding the requirements for Safety and health connected to the use of machines, the manufacturer must perform a risk assessment in accordance with machine guidelines 2006/42/EG before introducing a machine to the market.

Before commissioning this product, check that conformance with the provisions of the 2006/42/EG guidelines is correct. As long as the machine with which the product should be used does not comply with the guideline, operating this product is prohibited.

Operate the unit with devices and accessories approved by SIGMATEK only.

CAUTION

Handle the device with care and do not drop or let fall.

Prevent foreign bodies and fluids from entering the device.

The device must not be opened, otherwise it could be damaged!

The module complies with EN 61131-2.

In combination with a machine, the machine builder must comply with EN 60204-1 standards.

For your own safety and that of others, compliance with the environmental conditions is essential.

The control cabinet must be connected to ground correctly.

To perform maintenance or repairs, disconnect the system from the power supply.

2.4 Software/Training

The application is created with the software LASAL CLASS 2 and LASAL SCREEN Editor.

Training for the LASAL development environment, with which the product can be configured, is provided. Information on our training schedule can be found on our website.

3 Norms and Guidelines

3.1 Guidelines

The product was constructed in compliance with the following European Union guidelines and tested for conformity.

3.1.1 EU Declaration of Conformity



EU Declaration of Conformity

The product HZS 7321 conforms to the following European guidelines:

- **2014/35/EU** Low-voltage guideline
- **2014/30/EU** “Electromagnetic Compatibility” (EMC guideline)
- **2011/65/EU** “Restricted use of certain hazardous substances in electrical and electronic equipment” (RoHS Guideline)

The EU Conformity Declarations are provided on the SIGMATEK website. See Products/Downloads or use the search function and the keyword “EU Declaration of Conformity”.

4 Technical Data

4.1 Performance Data

| | |
|---|--|
| Processor | EDGE2 Technology |
| Processor cores | 1 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 1024 Mbytes |
| Internal remnant data memory | 512-kbyte SRAM (battery buffered) |
| Internal storage device | 4 GB microSD card (3D-TLC pSLC technology) ¹⁾ |
| Internal I/O | no |
| Interfaces | 1x USB 2.0, Type A (back) 1x USB device 2.0 OTG, Type Mini-B (back) 1x Ethernet 10/100 (RJ45) 2x CAN bus (6-pin Weidmüller) 1x RS485/Modbus (6-pin Weidmüller) 1x RS232 (10-pin Weidmüller) 1x M-BUS for 10 participants (4-pin Phoenix Contact) |
| Internal interface connections and devices | 1x TFT-LCD color display 1x touch screen |
| Display | 7" TFT color display |
| Resolution | 800 x 480 Pixels |
| Operating panel | touch screen (projective capacitive) |
| Signal generator | no |
| Status LEDs | no |
| Real-time clock | yes |
| Cooling | passive (fanless) |

¹⁾ The 4 GByte microSD card is formatted to 1 GByte in order to achieve the lifetime of a standard SLC card. A format change to the full 4 GByte is not allowed and will result in a massive reduction of the microSD card's lifetime.

4.2 Electrical Requirements

| | | |
|---|--|---|
| Supply voltage | +24 V DC $\pm 20\%$ | |
| Current consumption of power supply at +24 V | typically 275 mA (without externally connected devices) | maximum 675 mA (with external devices connected) |
| Current consumption of standby voltage at +24 V | typically 170 mA (without externally connected devices) | maximum 580 mA (with external devices connected) |
| Inrush current | maximum 27 A for 50 μ s | |

4.3 Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -10 ... +80°C | |
| Environmental temperature | 0 ... +60°C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC stability | according to product standard EN 60730-1 Residential and industrial environment (EN 61000-6-1, EN 61000-6-2, EN 6100-6-3, EN 61000-6-4) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz amplitude 3.5 mm 9-200 Hz 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²) |
| Protection type | EN 60529 protection through housing | front: IP54 cover: IP20 |

4.4 Display 7" WVGA incl. Touch

| | |
|------------------|-----------------------------------|
| Type | 7" TFT LCD color display |
| Resolution | WVGA 800 x 480 pixels |
| Color depth | 16 Bit RGB (65K colors) |
| LCD mode | normal white ⁽¹⁾ |
| LCD Polarizer | transmissive ⁽²⁾ |
| Pixel size | 0.1926 x 0.1790 mm |
| Number of pixels | 800*3 (RGB) x 480 |
| Active surface | 154.08 x 85.92 mm |
| Backlighting | LED |
| Contrast | 500:1 |
| Brightness | typically 350 cd/m ² |
| Visible field | left, right, below 70°, above 50° |

⁽¹⁾If there is no display data, the display is white (LED backlight visible)

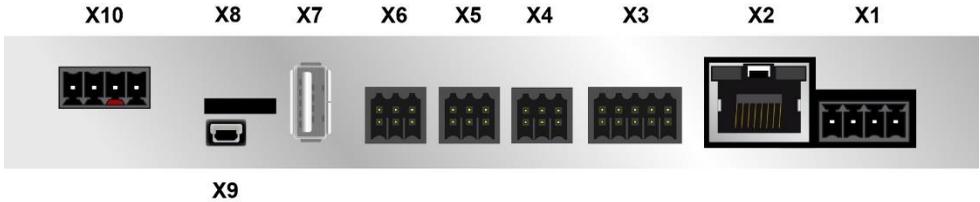
⁽²⁾ Display technology, with which display backlighting is used.

4.5 Miscellaneous

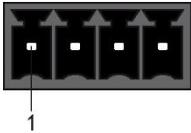
| | |
|--------------------------------|----------------|
| Article number | 05-895-7321 |
| Hardware version | 1.x |
| Article number in-wall housing | 05-895-555-SZ1 |
| Approvals | CE |

5 Connector Layout

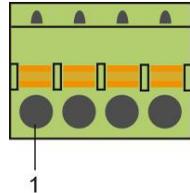
5.1 Rear



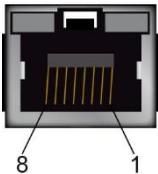
X1: Power supply (4-pin Phoenix Contact)



| Pin | Function |
|-----|----------|
| 1 | +24 V DC |
| 2 | +24 V DC |
| 3 | GND |
| 4 | GND |



X2: Ethernet 10/100 (RJ45)



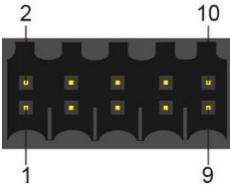
| Pin | Function |
|-----|----------|
| 1 | Tx+ |
| 2 | Tx- |
| 3 | Rx+ |
| 4 | n.c. |
| 5 | n.c. |
| 6 | Rx- |
| 7 | n.c. |
| 8 | n.c. |

n.c. = do not use



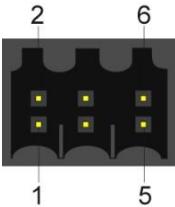
Problems can arise if a control is connected to an IP network, which contains modules that are not running with a SIGMATEK operating system. With such devices, Ethernet packets could be sent to the control with such a high frequency (i.e. broadcasts), that the high interrupt load could cause a real-time runtime error or runtime error. By configuring the packet filter (Firewall or Router) accordingly however, it is possible to connect a network with SIGMATEK hardware to a third-party network without triggering the error mentioned above.

X3: COM 1 (10-pin Weidmüller)

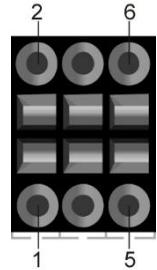


| Pin | Function: RS232 |
|-----|-----------------|
| 1 | RxD |
| 2 | RTS |
| 3 | TxD |
| 4 | CTS |
| 5 | DTR |
| 6 | GND |
| 7 | DCD |
| 8 | DSR |
| 9 | RI |
| 10 | Shield |

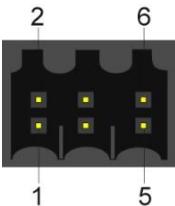
X4: CAN 1 (6-pin Weidmüller) - 120 Ω internal termination



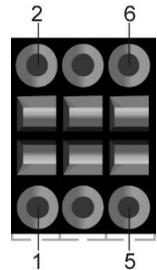
| Pin | Function |
|-----|-----------------|
| 1 | CAN A (CAN LOW) |
| 2 | CAN B (HIGH) |
| 3 | CAN A (CAN LOW) |
| 4 | CAN B (HIGH) |
| 5 | CAN GND |
| 6 | n.c. |



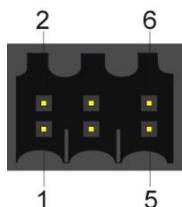
X5: CAN 2 (6-pin Weidmüller) - 120 Ω internal termination



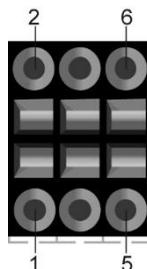
| Pin | Function |
|-----|-----------------|
| 1 | CAN A (CAN LOW) |
| 2 | CAN B (HIGH) |
| 3 | CAN A (CAN LOW) |
| 4 | CAN B (HIGH) |
| 5 | CAN GND |
| 6 | n.c. |



X6: COM 3 (6-pin Weidmüller) - 120 Ω internal termination



| Pin | Function |
|-----|------------------|
| 1 | RS485/Modbus-A |
| 2 | RS485/Modbus-B |
| 3 | RS485/Modbus-A |
| 4 | RS485/Modbus-B |
| 5 | RS485/Modbus GND |
| 6 | RS485/Modbus-A |

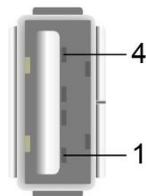


The RS485/Modbus interface is protected against external voltages of ±30 V DC, there is no function for an error voltage!



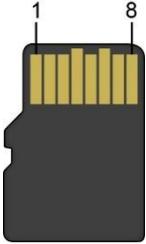
The termination is made between the RS485/Modbus-A and RS485/Modbus-B lines.

X7 USB Host 2.0 (Type-A)



| Pin | Function |
|-----|----------|
| 1 | +5 V |
| 2 | D- |
| 3 | D+ |
| 4 | GND |

X8: microSD Card



| Pin | Function |
|-----|----------|
| 1 | DAT2 |
| 2 | CD/DAT3 |
| 3 | CMD |
| 4 | +3V3 |
| 5 | CLK |
| 6 | GND |
| 7 | DAT0 |
| 8 | DAT1 |



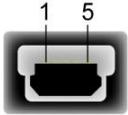
It is recommended that only storage media provided by SIGMATEK(CompactFlash cards, microSD cards etc.) be used.

Order number for 4 Gbyte EDGE2 microSD card: 12-630-105

The number of read and write actions have a significant influence on the lifespan of the storage media.

The microSD card is, in this case, not used as an exchangeable storage medium and therefore should not be removed from the holder.

X9 USB-Device 2.0 OTG (Type Mini-B)

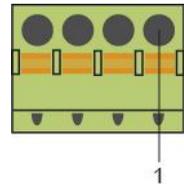


| Pin | Function |
|-----|----------|
| 1 | +5 V |
| 2 | D- |
| 3 | D+ |
| 4 | ID |
| 5 | GND |

X10: M-BUS (4-pin Phoenix Contact)



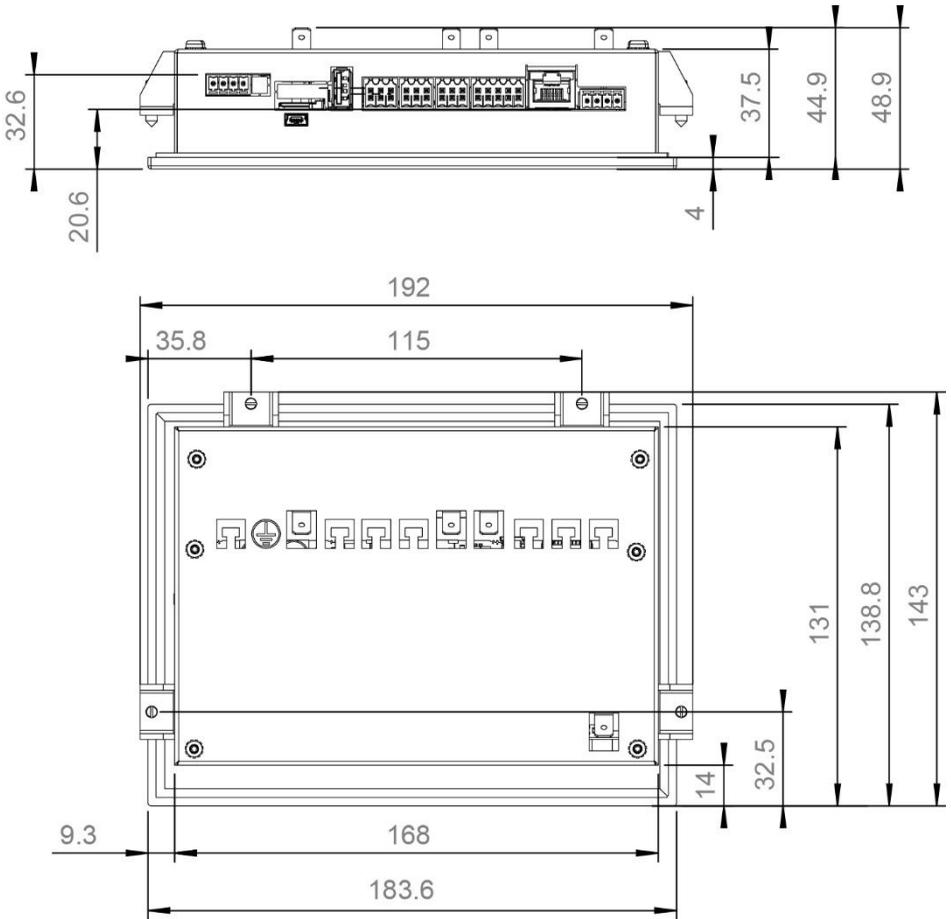
| Pin | Function |
|-----|----------|
| 1 | M-Bus+ |
| 2 | M-Bus+ |
| 3 | M-Bus- |
| 4 | M-Bus- |



5.2 Applicable Connectors

- X1:** 4-pin Phoenix Contact plug with spring terminals FK-MCP 1.5 / 4-ST-3.5 (included in delivery)
- X2:** 8-pin RJ45 (not included in delivery)
- X3:** 10-pin Weidmüller (included in delivery)
- X4, X5, X6:** 6-pin Weidmüller connector B2L/B2CF 3.5/6 (included in delivery)
- X7:** USB Type A (not included in delivery)
- X8:** microSD card
- X9:** USB 2.0 (Mini-B) (not included in delivery)
- X10:** 4-pin Phoenix Contact plug with spring terminals FK-MCP 1.5 / 4-ST-3.5 (included in delivery)

6 Mechanical Dimensions



| | |
|------------|--|
| Dimensions | 183.6 x 138.8 x 48.9 mm (W x H x D) |
| Material | housing: aluminum/chromated Color front: black front: Glass 1.1 mm |
| Weight | 1.27 kg |

7 Assembly/Installation

7.1 Check Contents of Delivery

Ensure that the contents of the delivery are complete and intact. See chapter 1.2 Contents of Delivery for more information.



On receipt and before initial use, check the device for damage. If the device is damaged, contact our customer service and do not install the device in your system.

Damaged components can disrupt or damage the system.

7.2 Cooling

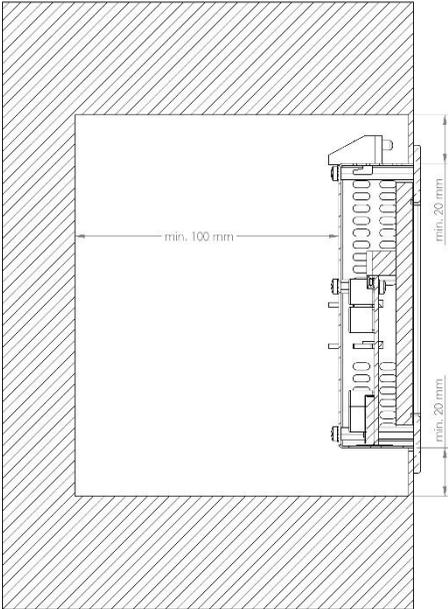
The terminal's power loss can reach up to 16.5 Watts. To ensure the necessary air circulation for cooling, the following mounting instructions must be followed!

7.2.1 Mounting Instructions

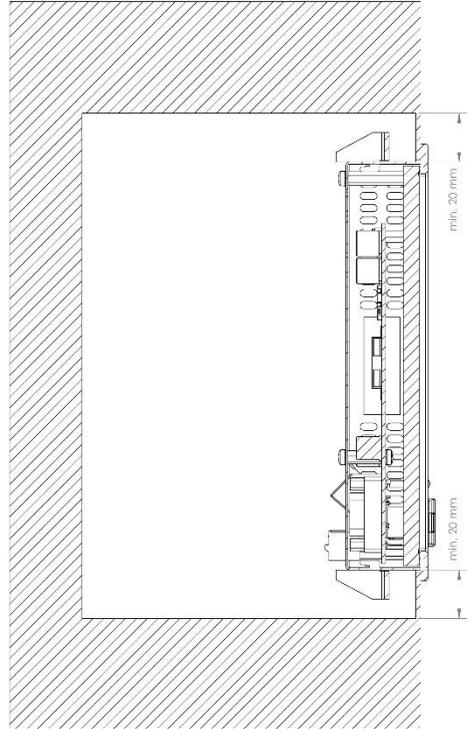
The following distance from the housing should be maintained:

- Left, right, below, above 2 cm
- Rear, 10 cm

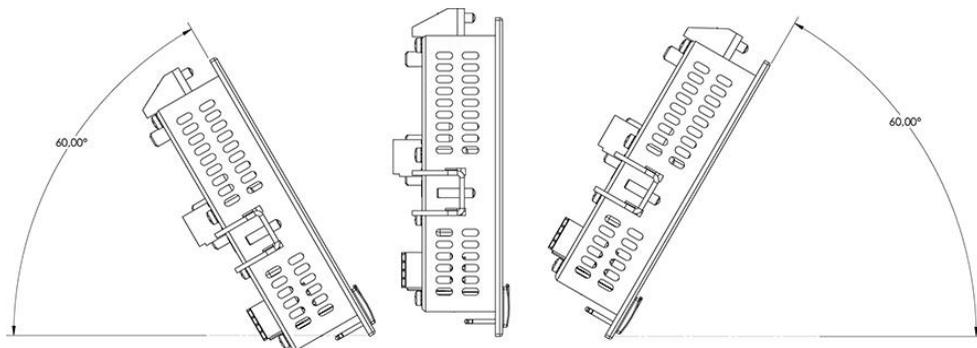
Side View:



Top view:



A mounting position of 60°-120° is also required.



8 Wiring Guidelines

8.1 Ground

The terminal must be connected to ground via the assembly on the control cabinet or over the connection provided. It is important to create a low-ohm ground connection, only then can error-free operation be guaranteed. The ground connection must be made with the maximum cross section and largest (electrical) surface possible.

8.2 Shielding

For the Ethernet, CAT5 cables with shielded RJ45 connectors must be used. The shielding on the CAT5 cable is connected to ground over the RJ45 plug connector. Noise signals can therefore be prevented from reaching the electronics and affecting the function.

The M-bus line must be shielded. The shielding must have a low-Ohm connection to ground.

8.3 ESD Protection



Typically, USB devices (keyboard, mouse, etc.) are equipped with non-shielded cables. These devices are disrupted by ESD and in some instances, no longer function.

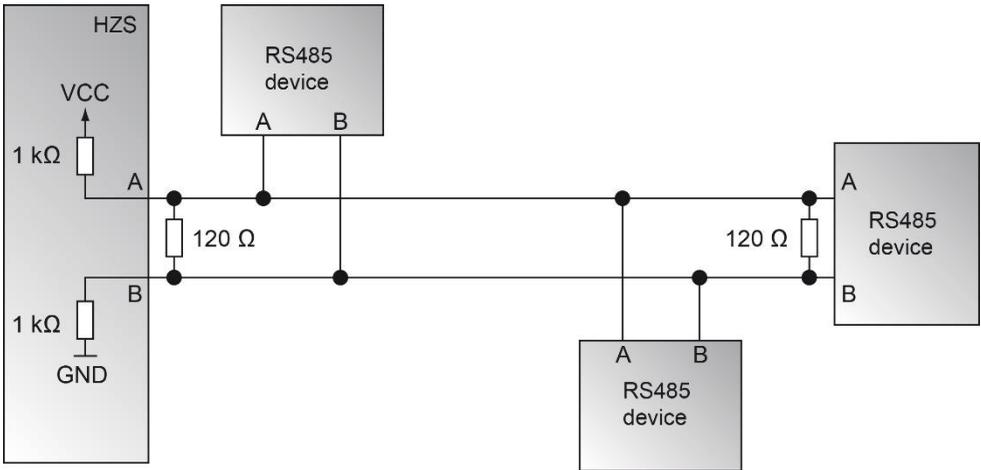
Before any device is connected to, or disconnected from the product, the potential should be equalized (by touching the control cabinet or ground terminal). Electrostatic loads (through clothing and shoes, etc.) can thereby be dissipated.

8.4 USB Interface Connections

The terminal has a USB interface. In LASAL, this interface can be used for various USB devices (keyboard, mouse, storage media, hubs, etc.). Using a hub, several USB devices can be connected that are then fully functional in LASAL.

8.5 RS485

- Because the RS485 requires a defined quiescent point, a pull-up and pull-down resistor is required in addition to the termination resistor. The resistors are already implemented in the device.
- The $120\ \Omega$ terminating resistors must be placed at each bus end.
- Star wiring should be avoided.



9 CAN Bus Setup

This section explains how to configure a CAN bus correctly. The following parameters must first be set: Station number and data transfer rate.

9.1 CAN Bus Station Number

Each CAN bus station is assigned its own station number. With this station number, data can be exchanged with other stations connected to the bus. In a CAN bus system however, each station number can only be assigned once!

9.2 Number of CAN Bus Participants

The maximum number of participants on the CAN bus depends on the cable length, termination resistance, data transfer rate and the drivers used in the participants.

With a termination resistance of 120 Ω , at least 100 participants are possible.

9.3 CAN Bus Data Transfer Rate

Various data transfer rates (baud rates) can be set on the CAN bus. The longer the bus line, the lower the data transfer rate that must be selected.

| Value | Baud rate | maximum length |
|-------|-------------|----------------|
| 0 | 615 kbit/s* | 60 m |
| 1 | 500 Kbits/s | 80 m |
| 2 | 250 Kbits/s | 160 m |
| 3 | 125 Kbits/s | 320 m |
| 4 | 100 Kbits/s | 400 m |
| 5 | 50 Kbits/s | 800 m |
| 6 | 20 Kbits/s | 1200 m |
| 7 | 1 Mbit/s | 30 m |

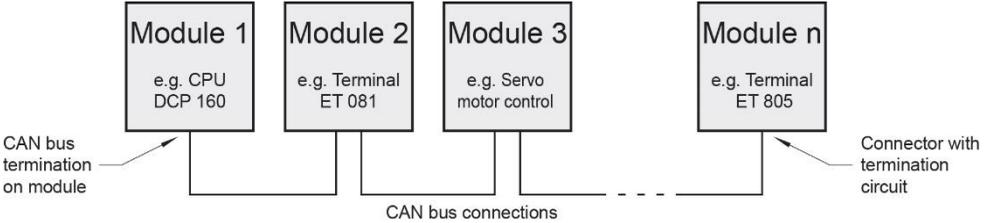
*only between devices with EDGE2 technology

These values apply to the following cable: 120 Ω Twisted Pair.

Note: For the CAN bus protocol: 1 Kbits/s = 1 kBaud

9.4 CAN Bus Termination

In a CAN bus system, both end modules must be terminated. This is necessary to avoid transmission errors caused by reflections in the line.



The termination is made by an internal $120\ \Omega$ resistor between CAN A (LOW) and CAN B (HIGH).

10 M-Bus

The M-bus (meter bus) is used to recording consumers. The data are serially transmitted from the measurement device to the master over a 2-wire connection.

The M-bus is standardized to the European norm EN13757.

10.1 M-Bus Number of Participants

The maximum number of participants on the M-bus depends on the cable length, data transfer rate (Baud rate) and the drivers used in the participants.

On the HZS 7321, a maximum of 10 M-bus participants can be used. Each with 6 Unit Loads.

10.2 M-Bus Baud Rate

The M-bus supports the following Baud rates: 300, 600, 1200, 2400, 4800 and 9600 Baud.

10.3 M-Bus Topology

The M-bus can be configured in star, line and tree topologies.

10.4 M-Bus Addressing

The M-bus uses a defined range of addresses for communication with remote stations, which are composed as follows:

| Address | Usage |
|---------|--|
| 0-250 | Device addresses |
| 251-252 | Reserved |
| 253 | Use of secondary addressing |
| 254 | Sends a broadcast to all devices with the request for acknowledgement / answer |
| 255 | Sends to all M-bus devices without requesting an answer. |

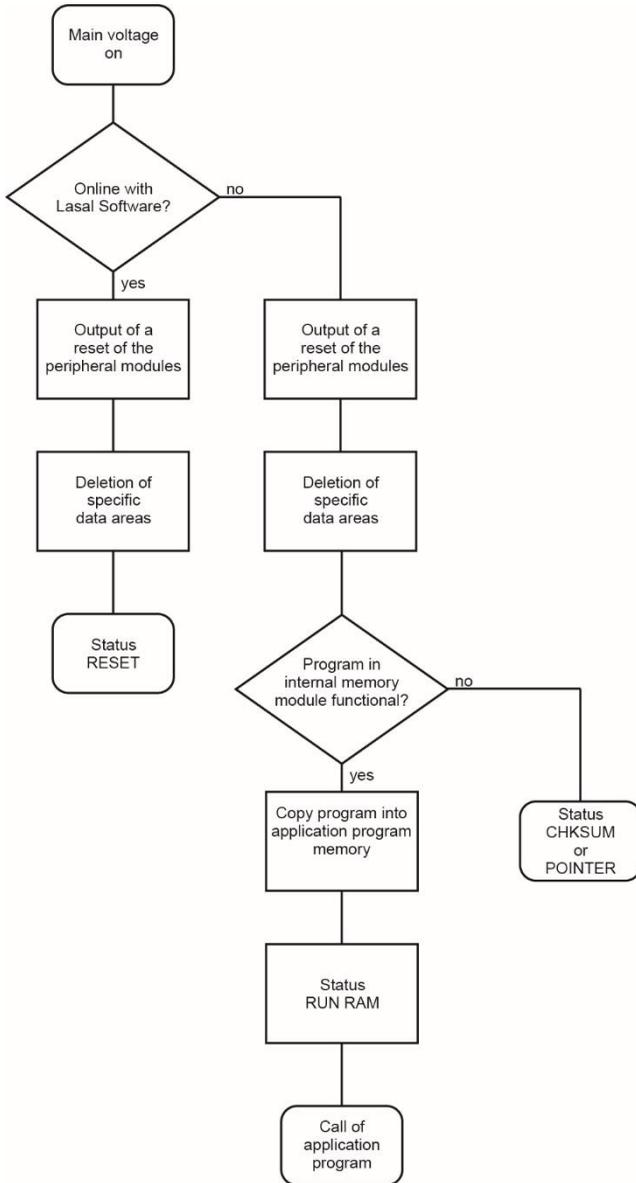
Via the address 253, a secondary addressing is possible. This allows a large range of addresses or participants.

10.5 Further Information

The M-bus specifications can be found under <https://m-bus.com/> and in the corresponding norm.

For the initial start-up of the M-bus network, the handbooks for the remote stations (e.g. heating meter) must be reviewed.

11 Process Diagram



12 Status and Error Messages

Status and error messages are displayed in the LASAL CLASS software status test. POINTER or CHKSUM messages are shown on the terminal screen.

| Number | Message | Definition | Cause/solution |
|--------|----------------|--|--|
| 00 | RUN RAM | The user program is currently running in RAM. The display is not affected. | Info |
| 01 | RUN ROM | The user program stored in the program memory module was loaded into the RAM and is currently running. The display is not affected. | Info |
| 02 | RUNTIME | The total time for all cyclic objects exceeds the maximum time; the time can be configured using 2 system variables: - Runtime: Remaining time - SWRuntime: Preset value for runtime counter | Solution: - Optimize the application's cyclic task. - Use higher capacity CPU. - Configure preset value |
| 03 | POINTER | Incorrect program pointers were detected before running the user program | Possible Causes: - The program memory module is missing, not programmed or defective. - The program in the user program memory (RAM) is not executable. - The buffer battery has failed. - The user program has overwritten a software error. Solution: - Reprogram the memory module, if the error reoccurs exchange the module. - Exchange the buffering battery - Correct programming error |
| 04 | CHKSUM | An invalid checksum was detected before running the user program. | Cause/solution: s. POINTER |

| | | | |
|----|-----------------------|---|---|
| 05 | WATCHDOG | The program was interrupted via the watchdog logic. | <p>Possible Causes:</p> <ul style="list-style-type: none"> - User program interrupts blocked over a longer period of time (STI command forgotten). - Programming error in a hardware interrupt. - INB, OUTB, INW, OUTW instructions used incorrectly. - The processor is defective. <p>Solution:</p> <ul style="list-style-type: none"> - Correct programming error. - Exchange CPU |
| 06 | GENERAL ERROR | <p>General error</p> <p>An error has occurred while stopping the application via the online interface.</p> | This error occurs only during the development of the operating system. |
| 07 | PROM DEFECT | An error has occurred while programming the memory module. | <p>Causes:</p> <ul style="list-style-type: none"> - The program memory module is defective. - The user program is too large. - The program memory module is missing. <p>Solution:</p> <ul style="list-style-type: none"> - Exchange the program memory module |
| 08 | RESET | <p>The CPU has received the reset signal and is waiting for further instructions.</p> <p>The user program is not processed.</p> | Info |
| 09 | WD DEFECT | <p>The hardware monitoring circuit (watchdog logic) is defective.</p> <p>After power-up, the CPU checks the watchdog logic function. If an error occurs during this test, the CPU deliberately enters an infinite loop from which no further instructions are accepted.</p> | <p>Solution:</p> <ul style="list-style-type: none"> - Exchange CPU |
| 10 | STOP | The program was stopped by the programming system. | |
| 11 | PROG BUSY | Reserved | |
| 12 | PROGRAM LENGTH | Reserved | |
| 13 | PROG END | A memory module was successfully programmed. | Info |
| 14 | PROG MEMO | The CPU is currently programming the memory module. | Info |

| | | | |
|----|-----------------------|--|--|
| 15 | STOP BRKPT | The CPU was stopped by a breakpoint in the program. | Info |
| 16 | CPU STOP | The CPU was stopped by the programming software. | Info |
| 17 | INT ERROR | The CPU has triggered a false interrupt and stopped the user program or has encountered an unknown instruction while running the program. | Causes: - A nonexistent operating system was used. - Stack error (uneven number of PUSH and POP instructions). - The user program was interrupted by a software error. Solution: - Correct programming error. |
| 18 | SINGLE STEP | The CPU is in single step mode and is waiting for further instructions. | Info |
| 19 | READY : | A module or project has been sent to the CPU and it is ready to run the program. | Info |
| 20 | LOAD | The program is stopped and the CPU is currently receiving a new module or project. | Info |
| 21 | INVALID MODULE | The CPU has received a module that does not belong to the project. | Solution: - Recompile and download the entire project |
| 22 | MEMORY FULL | The operating system memory (heap) is too small. No memory could be reserved while calling an internal function or an interface function is called from the application. | Causes: - Memory is only allocated but not released. Solution - Clear memory |
| 23 | NOT LINKED | When starting the CPU, a missing module or a module that does not belong to the project was detected. | Solution: - Recompile and download the entire project |
| 24 | DIV BY 0 | A division error has occurred. | Possible Causes: - Division by 0. - The result of a division does not fit in the result register. Solution: - Correct programming error. |
| 25 | DIAS ERROR | While accessing a DIAS module, an error has occurred. | Hardware problem |
| 26 | WAIT | The CPU is busy. | Info |

| | | | |
|----|----------------------------|---|---|
| 27 | OP PROG | The operating system is currently being reprogrammed. | Info |
| 28 | OP INSTALLED | The operating system has been reinstalled. | Info |
| 29 | OS TOO LONG | The operating system cannot be loaded; too little memory. | Restart, Log in SIGMATEK |
| 30 | NO OPERATING SYSTEM | Boot loader message. No operating system found in RAM. | Restart, Log in SIGMATEK |
| 31 | SEARCH FOR OS | The boot loader is searching for the operating system in RAM. | Restart, Log in SIGMATEK |
| 32 | NO DEVICE | Reserved | |
| 33 | UNUSED CODE | Reserved | |
| 34 | MEM ERROR | The operating system loaded does not match the hardware configuration. | Solution: - Use the correct operating system version |
| 35 | MAX IO | Reserved | |
| 36 | MODULE LOAD ERROR | The LASAL Module or project cannot be loaded. | Solution: - Recompile and download the entire project |
| 37 | BOOTIMAGE FAILURE | A general error has occurred while loading the operating system. | Contact SIGMATEK |
| 38 | APPLMEM ERROR | An error has occurred in the application memory (user heap). | Solution: - Correct allocated memory access error |
| 39 | OFFLINE | This error does not occur in the control. | This error code is used in the programming system to show that there is no connection to the control. |
| 40 | APPL LOAD | Reserved | |
| 41 | APPL SAVE | Reserved | |
| 44 | VARAN MANAGER ERROR | An error number was entered in the VARAN manager and stopped the program. | Solution: - Read LogFile |
| 45 | VARAN ERROR | A required VARAN client was disconnected or a communication error has occurred. | Solution: - Read LogFile - Error Tree |

| | | | |
|----|-------------------------------|--|---|
| 46 | APPL-LOAD-ERROR | An error has occurred while loading the application. | Cause: - Application was deleted. Solution: - Reload the application into the control. |
| 47 | APPL-SAVE-ERROR | An error has occurred while attempting to save the application. | |
| 50 | ACCESS-EXCEPTION-ERROR | Read or write access of a restricted memory area. (I.e. writing to the NULL pointer). | Solution: - Correct application errors |
| 51 | BOUND EXCEEDED | An exception error has occurred while accessing arrays. The memory area was overwritten by accessing an invalid element. | Solution: - Correct application errors |
| 52 | PRIVILEGED INSTRUCTION | An unauthorized instruction for the current CPU level was given. For example, setting the segment register. | Cause: - The application has overwritten the application program code. Solution: - Correct application errors |
| 53 | FLOATING POINT ERROR | An error has occurred during a floating-point operation. | |
| 60 | DIAS-RISC-ERROR | Error from the Intelligent DIAS Master. | Restart, Log in SIGMATEK |
| 64 | INTERNAL ERROR | An internal error has occurred, all applications are stopped. | Restart, Log in SIGMATEK |
| 65 | FILE ERROR | An error has occurred during a file operation. | |
| 66 | DEBUG ASSERTION FAILED | Internal error | Restart, report error to SIGMATEK. |
| 67 | REALTIME RUNTIME | The total duration of all real-time objects exceeds the maximum time; the time cannot be configured. 2 ms for 386 CPUs 1 ms for all other CPUs | Solution: - Optimize the application's real-time task (RtWork). - Reduce the clock time for the real-time task of all objects. - Correct application errors. - CPU is overloaded in real-time => use a higher capacity CPU. |
| 68 | BACKGROUND RUNTIME | The total time for all background objects exceeds the maximum time; the time can be configured using 2 system variables: -BTRuntime: Remaining time -SWBTRuntime: Preset value for runtime counter | Solution: - Optimize the application's background task (background) - Use higher capacity CPU - Set SWBTRuntime correctly |

| | | | |
|-----|-----------------------|---|---|
| 70 | C-DIAS ERROR | A connection error with a C-DIAS module has occurred. | <p>Cause:</p> <ul style="list-style-type: none"> - The cause of the error is documented in the log file <p>Solution:</p> <ul style="list-style-type: none"> - This depends on the cause |
| 72 | S-DIAS ERROR | A connection error with an S-DIAS module has occurred. | <p>Possible Causes:</p> <ul style="list-style-type: none"> - Real network does not match the project - S-DIAS client is defective <p>Solution:</p> <ul style="list-style-type: none"> - Analyze log file |
| 75 | SRAM ERROR | An error occurred while initializing, reading or writing SRAM data. | <p>Possible Causes:</p> <ul style="list-style-type: none"> - SRAM configured incorrectly - Battery for powering the internal program memory is empty <p>Solution:</p> <ul style="list-style-type: none"> - Analyze log file (Event00.log, Event19.log) - Check configuration - Exchange battery for powering the internal program memory |
| 97 | USER DEFINED 2 | User-definable code. | |
| 98 | USER DEFINED 3 | User-definable code. | |
| 99 | USER DEFINED 4 | User-definable code. | |
| 100 | C_INIT | Initialization start; the configuration is run. | |
| 101 | C_RUNRAM | The LASAL project was successfully started from RAM. | |
| 102 | C_RUNROM | The LASAL project was successfully started from ROM. | |
| 103 | C_RUNTIME | | |
| 104 | C_READY | The CPU is ready for operation. | |
| 105 | C_OK | The CPU is ready for operation. | |
| 106 | C_UNKNOWN_CID | An unknown object from a stand-alone or embedded object, or an unknown base class was detected. | |

| | | | |
|-----|------------------|---|--|
| 107 | C_UNKNOWN_CONSTR | The operating system class cannot be created; the operating system is probably wrong. | |
| 108 | C_UNKNOWN_OBJECT | Indicates an unknown object in an interpreter program; more the one DCC080 object. | |
| 109 | C_UNKNOWN_CHNL | The hardware module number is greater than 60. | |
| 110 | C_WRONG_CONNECT | No connection to the required channels. | |
| 111 | C_WRONG_ATTR | Wrong server attributes. | |
| 112 | C_SYNTAX_ERROR | Non-specific error. Recompile and download all project sections. | |
| 113 | C_NO_FILE_OPEN | An attempt was made to open an unknown table. | |
| 114 | C_OUTOF_NEAR | Memory allocation failed | |
| 115 | C_OUT OF_FAR | Memory allocation failed | |
| 116 | C_INCOMPATIBLE | An object with the same name already exists but has a different class. | |
| 117 | C_COMPATIBLE | An object with the same name and class exists but must be updated. | |
| 224 | LINKING | The application is currently linking. | |
| 225 | LINKING ERROR | An error has occurred while linking. | |
| 226 | LINKING DONE | Linking is complete. | |
| 230 | OP BURN | The operating system is currently being burned into the Flash memory. | |
| 231 | OP BURN FAIL | An error has occurred while burning the operating system. | |
| 232 | OP INSTALL | The operating system is currently being installed. | |
| 240 | USV-WAIT | The power supply was disconnected; the UPS is active. The system is shutdown. | |
| 241 | REBOOT | The operating system is restarted. | |
| 242 | LSL SAVE | | |
| 243 | LSL LOAD | | |
| 252 | CONTINUE | | |

| | | | |
|-----|-------------------------|-----------------------------|--|
| 253 | PRERUN | The application is started. | |
| 254 | PRERESET | The application is ended. | |
| 255 | CONNECTION BREAK | | |

13 Transport/Storage



This device contains sensitive electronics. During transport and storage, high mechanical stress must therefore be avoided.

For storage and transport, the same values for humidity and vibration as for operation must be maintained!

During transport, temperature and humidity fluctuations may occur. Ensure that no moisture condenses within or on the device by letting the device climatize to the room temperature while turned off.

14 Storage



When not in use, store the operating panel according to the storage conditions. See chapter [7](#).

During storage, ensure that all protective covers are placed correctly, so that no contamination, foreign bodies or fluids enter the device.

15 Maintenance



During maintenance as well as servicing, observe the safety instructions from chapter 2.

15.1 Cleaning and Disinfecting the Touchscreen

CAUTION



Before cleaning and disinfecting the touch screen, it must be deactivated by either turning off the terminal or disabling the touchscreen via the application to prevent triggering functions or commands unintentionally!

The touch screen can only be cleaned with a soft, damp cloth. To dampen the cloth, a mild cleaning solution such as antistatic foam cleaner is recommended. To avoid fluids/cleaning solutions from getting into the housing, the device must not be sprayed directly. To clean, no erosive cleaning solutions, chemicals, abrasive cleansers or hard objects that can scratch or damage the touch screen may be used. The use of steam jets or compressed air is prohibited.

To disinfect, an alcohol-based surface disinfectant that contains no lubricating agents can be used. For error-free function of the touchscreen, the disinfectant used cannot leave any residue on the touchscreen.

WARNING



If the device is contaminated with toxic or erosive chemicals, it must be carefully cleaned as quickly as possible to prevent personal injury and machine damage!



To ensure the optimal function of the panel, the touch screen should be cleaned in regular intervals!

15.2 Service

This product was constructed for low-maintenance operation.

15.2.1 Calibrating the Touch Screen

The touch screen is calibrated at the factory. You should therefore only recalibrate the touch screen when press-point changes are noticed.

This can be achieved via the CLI command or the application, if the application engineer has provided the option.

```
calib
```

15.3 Repair



When sent for repair, the panel should be transported in the original packaging if possible. Otherwise packaging should be selected that sufficiently protects the product from external mechanical influences, such as cardboard filled with air cushioning.

In the event of a defect/repair, send the panel with a detailed error description to the address listed at the beginning of this document.

16 Buffer Battery

The exchangeable buffer battery ensures that the clock time (RTC) and SRAM data of the HZS 7321 is preserved in the absence of a supply voltage. A lithium battery is installed at the manufacturer.

After delivery of the HZS 7321 and storage of one year, the lifespan of the battery reaches 10 years, if it can be assumed that the module is continually in operation (connected to supply voltage).

We recommend however, that the battery be replaced every 8 years to ensure optimal performance.



If the module is not powered for a period of 2 years, the battery is emptied.

Battery order number: 01-690-055

Use batteries from RENATA with the label CR2032 only!

| | Company | Data |
|------------------------|---------|---------------|
| Lithium battery CR2032 | RENATA | 3.0 V/235 mAh |

WARNING



Danger of fire and explosion!

Slight to serious injuries can occur from incorrect use of the battery.

Do not recharge, disassemble or throw batteries into fire!

If the battery voltage is located between both thresholds of the monitoring switch, the battery can be detected as good during operation, but as low after turning off and on. If this is the case, it is recommended that the battery be replaced.

16.1 Exchanging the Battery: 1. Option

1. Connect power supply
2. Using the correct Torx screwdriver, loosen and remove the battery cover.



When exchanging the battery, caution must be taken to avoid a short circuit since it could cause a defect in the terminal!

3. Using the strap, remove the battery from the holder.



4. Insert the new battery with the correct polarity (plus side facing the back of the terminal) and remount the battery cover.

16.2 Exchanging the Battery: 2. Option

1. The SRAM data are saved to the microSD card via the CLI command “sramsave *FILE-NAME*”.

Example: sramsave C: \sram.backup

The commands can be run via the remote CLI from LASAL CLASS 2 or by direct input to the device.



If the data is not previously saved, the settings in the heat controller are lost

2. Disconnect the HZS 7321 supply.

3. Using the correct Torx screw-driver, loosen and remove the battery cover.



4. Using the strap, remove the battery from the holder.



5. Insert the new battery with the correct polarity (plus side facing the back of the terminal) and remount the battery cover.

6. Apply voltage to the device.

7. Load the SRAM data from the Flash using the CLI command “sramload *FILENAME*” and reset the time. The time and date can be set via set Time and set Date.

Example: sramload C: \sram.backup

17 Display “Burn-In” Effect

The “Burn-In” effect describes a pattern burned into the display after displaying the same contents over a longer period of time (e.g. a single screen).

This effect is also described mostly as “image sticking”, “memory effect/sticking” or “ghost image”. Here, a distinction is made between a temporary and permanent effect. While the temporary effect fades after the screen has been turned off for some time or when dynamic content is displayed, damage from the permanent effect is irreversible.

This effect can have the following causes:

Operation without a screen saver

The same contents displayed over a longer time period (e.g. a single screen)

Operation at high ambient temperatures

Operation above specifications

The effect can be avoided/reduced by the following actions:

Using a screen saver

Deactivating the display when not in use (e.g. screen display black)

Continuously changing screen content (e.g. video)



Deactivating the display backlighting only does not prevent Burn-In!

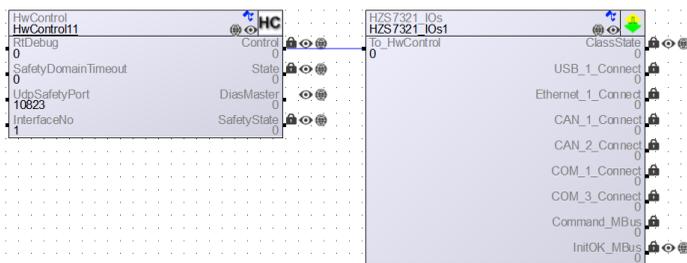
18 Application Information

18.1 Interface Assignment

In LASAL CLASS 2, the interfaces are addressed as follows:

| Connection | Function | Port assignment (Internal connection) |
|------------|--------------|--|
| X3 | RS232 | COM 1 |
| X4 | CAN 1 | CAN 1 |
| X5 | CAN 2 | CAN 2 |
| X6 | RS485/ModBus | COM 3 |
| X10 | M-Bus | M-Bus Command |

Use the hardware class “HZS7321_IOs” for the interfaces.



18.2 Configuration

The control can be configured in LASAL via USB interface (USB device) or via Ethernet.

In delivery condition, the IP address is set to 10.10.150.1. It is recommended that this be adapted in the autoexec.lsl file

19 Disposal



Should you need to dispose of the device, the national electronic scrap regulation must be observed.

The panel cannot be discarded with domestic waste.



Documentation Changes

| Change date | Affected page(s) | Chapter | Note |
|-------------|-------------------|----------------------------------|-----------------------|
| 04.09.2020 | Complete document | | Restructuring |
| 27.09.2021 | 19 | 5.2 Applicable Connectors | Mating plugs included |
| 09.01.2024 | 19 | 5.2 Applicable Connectors | B2CF added |
| 13.03.2024 | 12 18 | 4.1 Performance Data 5.1 Rear | microSD card updated |

