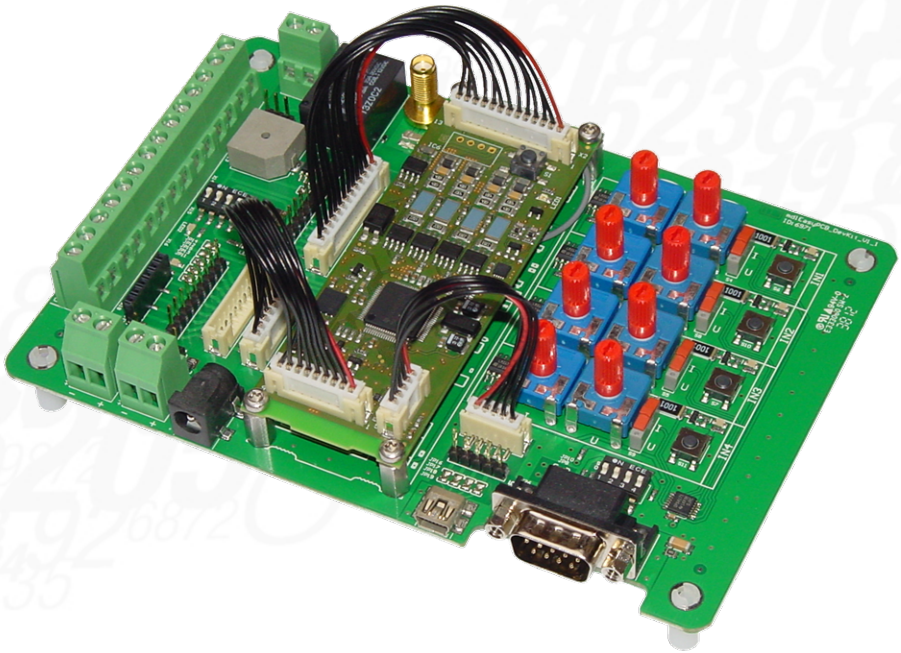
User manual for the EASY PCB E230 developer package



Rev. 01 valid from:

- Firmware version: 02v007
- Modem version: 03v002
- Hardware version: 1.1

CE

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Chapter 2 Technical data

Note: *The following technical specifications apply to the EASY PCB Board for developers with the EASY PCB E230 installed. A detailed technical description of the EASY PCB E230 is provided in chapter "Technical data" on page 49.*

Voltage supply	Supply via V_{in}: 5...32 VDC , max. t.b.d. mA@12V Supply via V_{batt}: 3,2...4,5 VDC , max. t.b.d. mA@3,6V Additional information is provided in "Technical details regarding the energy supply" on page 27.
Housing	Weight: 180g (incl. EASY PCB E230) Dimensions (WHD): 160 x 25 x 110mm (without antenna and connection cable)
Operating temperature	-5...+40°C, 15...90%rH non-condensing
Storage temperature	-20...+70°C
Display	LED for indicating the operating state and error codes LED to display the switching state of the isolated switch contact LED to display the switching state of the "$3V3_{ext}$" voltage Buzzer that can be controlled by the open drain output LEDs to display the status of the buttons for simulating an impulse
Operation	Button to initiate ALOHA transmission mode
USB interface	1 x mini-B USB slave for establishing a connection to a PC. The myDatanetDeviceConfig configuration program must be installed on the PC to enable communication with the EASY PCB E230 developer package .
Antenna connector	SMA

Universal inputs	4 x analogue or digital Modes: • 0 to 20mA: Resolution 6µA, max. 22,5mA, load 100Ω • 4 to 20mA: Resolution 6µA, max. 22,5mA, load 100Ω • 0 to 2V: Resolution 610µV, max. 2,5V, load 220k1 • 0 to 10V: Resolution 8,3mV, max. 32V, load 8k9 • PWM: 1...99%, max. 100Hz, min. impulse length 1ms, output load 8k9 • Frequency: 1...1000Hz, 8k9 • Digital: max. 32V, low ‹1,36V, high ›2,73V, load 8k9 • Digital LP: max. V_{AUX}, low ‹100mV, high ›200mV, load 220k1 • Day counter: min. impulse length 20ms, load 8k9 • Interval counter: min. impulse length 20ms, load 8k9 Additional information is provided in "Technical details about the universal inputs" on page 61.
Modbus	1 x RS485 or RS232 for connecting one or several modbus slaves. (RS232 only with optional equipment myDatalogEASYmbm RS232 SUB-D(f) connection cable (206.688)) (206.688) required) • Baud rate: 300-115200 • Stop bits: 1,2 • Parity: N, E, O • Data bits: 7,8 Modes: • RTU • ASCII Number of processable registers • Input register: 64 • Output register: 32 Additional information is provided in "Technical details regarding the Modbus interface" on page 21.

Outputs	1 x open drain output • I_{max}: 2A • U_{max}: 32V • R_{on}: 0,065Ω • f_{max}: 500Hz 1 x isolated switch contact • I_{max}: 130mA • U_{max}: 32V • R_{on}: 35Ω • f_{max}: 500Hz Additional information is provided in "Technical details about the outputs" on page 63.
Extension slot	1 x extension slot for inserting extension modules Output voltage via V_{ext}:3,3V , max. 100mA Additional information is provided in "Extension slot" on page 29.
Simulation circuits	4 x circuits for simulating the sensors Modes: • mA sensor: 4...20mA • Sensor with voltage output: 0...(V_{in}-0,5V) • Impulse/switch contact ("low" impulse only) Additional information is provided in "Circuits to simulate the sensors" on page 33.
Relay	1 x relay that can be controlled via the open drain output • I_{max}: 8A@30VDC, 8A@250VAC • U_{max}: 125VDC, 250VAC • R_{on}: 30mΩ • f_{max}: 40Hz
Data memory	Internal flash memory for up to 1740 measurement cycles
Data type	f32 (32 Bit floating point)
Data transmission	By means of GSM/GPRS quad-band modem to the respective myDataweb server
SIM	The EASY PCB E230 is equipped with an integrated SIM chip.
Monthly data volume	t.b.d. at two-minute measurement cycle and 120-minute transmission cycle

Chapter 3 General specifications

3.1 General product information

It is a developer package that is designed to help the customer to integrate the EASY PCB E230 in his own devices. The EASY PCB Board for developers is equipped with standardised connectors, plug connectors, terminal strips, buttons, LEDs and circuits to simulate analogue and digital sensors (see "Overview" on page 17) to ensure test circuits can be established easily and efficiently. The EASY PCB E230 included in the scope of supply of the EASY PCB E230 developer package is a module for recording and transmitting measurement data read-out from one or several modbus slaves. 64 channels are provided for this purpose, whereby the physical connection between the EASY PCB E230 developer package and the modbus slaves is established via a RS485 interface. The optional equipment myDatalogEASYmbm RS232 SUB-D(f) connection cable (206.688) is required to connect slaves equipped with a RS232 interface. The EASY PCB E230 , however, does not support simultaneous operation via RS232 and RS485 connected modbus slaves. The connection to the modbus slaves can also be used to write data back. 32 output registers are provided for this purpose. The output data can be specified via the input screen of the myDataweb server. There are also 4 universal inputs available, which can be operated in various analogue and digital modes. 2 output channels are also available. One of these is an open drain output that can either be used directly or can be utilised to switch an optionally available DC/DC (see "Output 1: Open drain output (OCout1)" on page 63). The other is a galvanically isolated switch contact. Both output channels can be configured independently so that they can each be switched by the device itself prior to a measurement (to supply a sensor) or so that they can be switched wirelessly from a central location. All of the input measurement data is temporarily saved to an internal data memory along with the output statuses and output registers and are then wirelessly transferred to a central location at freely selected intervals. The device is also configured via this connection. The device is equipped with an integrated SIM chip. The EASY PCB E230 developer package is equipped with a mini-B USB slave interface for establishing a connection to a PC.

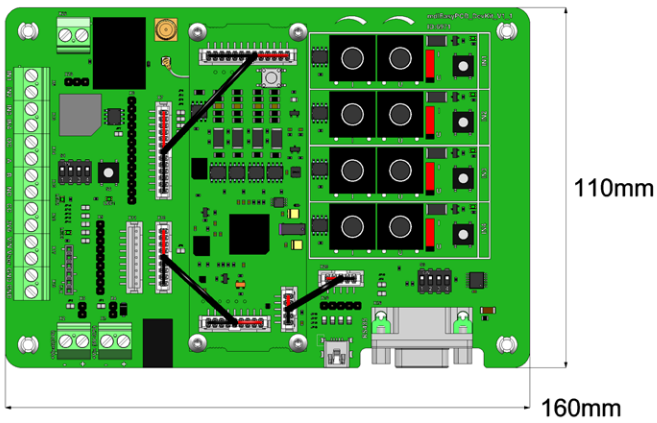
3.2 Scope of supply

The standard scope of supply of the developer package (300072) includes:

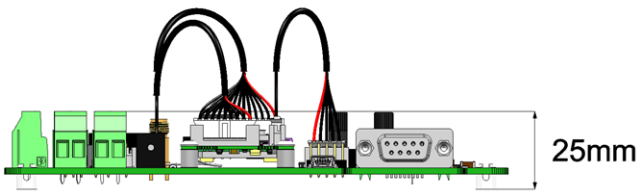
- EASY PCB Board for developers
- EASY PCB E230 (300048)
- Plug-in power supply (6W 12V)
- U.FL antenna cable
- Magnetic roof antenna SMA (300085)
- JST cable set JST to JST for EASY PCB E2xx (300080)
    - 1 x 5-pin JST to JST
    - 1 x 9-pin JST to JST
    - 1 x 13-pin JST to JST
- 10 x jumpers
- myDatanet Tool Pen (206.646)
- Quick Guide (300124)

Additional accessories such as the M2M modules, antennas, power supplies, sensors, etc. are dependent on the order specifications. Please check these against the delivery slip.

3.3 Dimensions



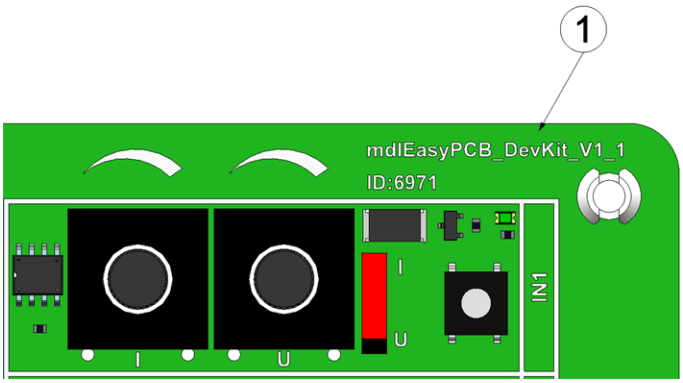
Dimensions: Width and depth



Dimensions: Height

3.4 Device labelling

The hardware version of the developer board is specified on the right above the circuits used to simulate the analogue and digital sensors.



Hardware identification of the developer board

1 Hardware version	

The correct specification of the type designation and hardware version is important for all queries and spare part orders. Only then can we process requests promptly and properly.

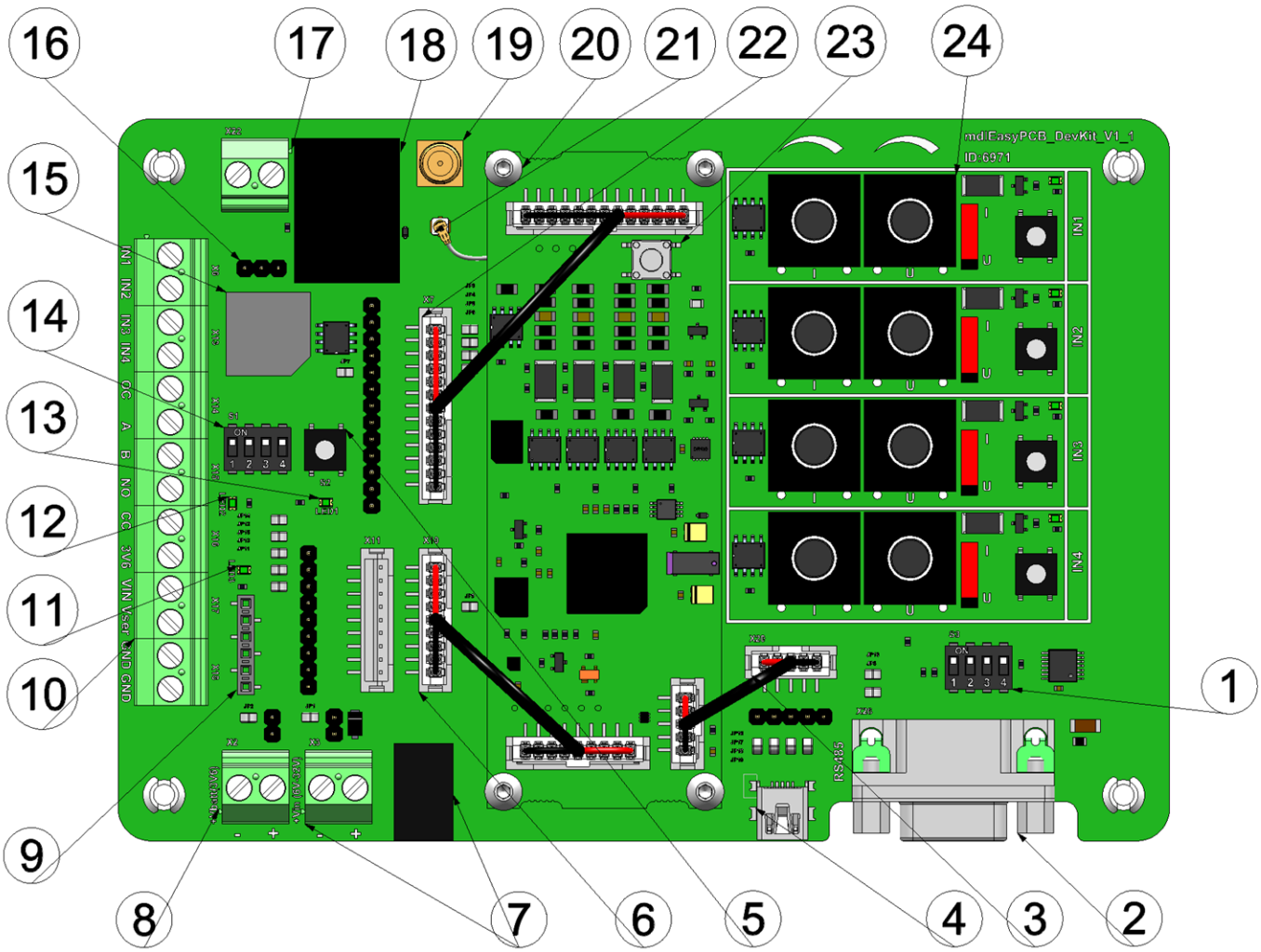
3.5 Storage of the product

To safeguard the developer package, ensure that all of the relevant data was transmitted to the myDataweb server. If necessary initiate the ALOHA transmission mode using the button (see "ALOHA transmission mode" on page 65) and then check again that all of the relevant data has been transmitted. With the "online" connection type, the determined measurement data is immediately transmitted to the myDataweb server. The data on the server is always up-to-date and the device can be switched off at any time. Then disconnect the EASY PCB Board for developers from the supply voltage. The remaining cables and antenna can then be removed. Store the EASY PCB E230 developer package including the accessories and connection cable in the original packaging.

The configuration and most recently determined data are retained. However, without a power supply, the system clock will not keep running. This means that following recommissioning, the time must be synchronised to ensure that the measurement and log data timestamps are correct. This occurs automatically either when first connected to the myDataweb server or when the developer package is connected to the PC. The myDatanetDeviceConfig configuration program is required for this purpose.

Chapter 4 EASY PCB Board for developers

4.1 Overview



Overview EASY PCB E230 developer package

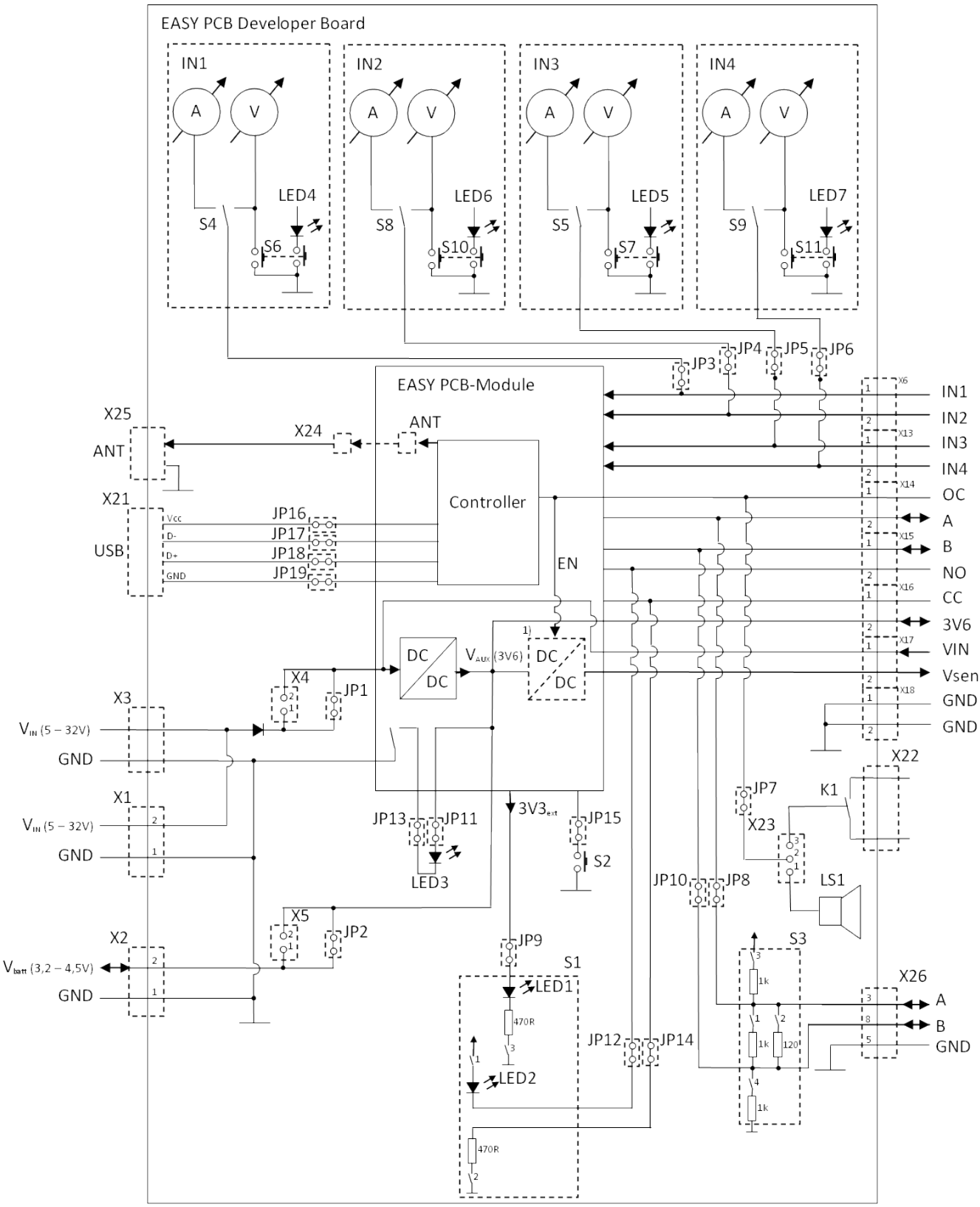
1	Dip switch for activating/deactivating the load or clamp resistances for RS485 (S3) (see "RS485 mode" on page 21)	13	LED to display the switching state of the "$3V3_{ext}$" (LED1) voltage (see "LEDs" on page 30)
2	9-pin Sub-D(f): RS485 interface (X26) (see "RS485 mode" on page 21)	14	Dip switch for activating/deactivating the signalling LEDs for the switching state of the isolated switch contact and the switching state of the "$3V3_{ext}$" (S1) voltage. (see "LEDs" on page 30)

3 5-pin JST connector for connecting the USB connector of the E230 with the EASY PCB Board for developers (X20) (see "Inserting the E230 module" on page 42)	**15** Buzzer (LS1) (see "Output 1: "OC" open drain" on page 32)
4 Mini-B USB (X21) (see "USB interface" on page 24)	**16** Jumper for connecting the buzzer or the relay with the open drain output (X23) (see "Output 1: "OC" open drain" on page 32)
5 Button for initiating ALOHA transmission mode (S2) (see "Button for initiating ALOHA transmission mode (S2)" on page 26)	**17** Relay contacts of the EASY PCB Board for developers (X22) (see "Output 1: "OC" open drain" on page 32)
6 9-pin JST connector for connecting the extension slot of the E230 with the EASY PCB Board for developers (X10) (see "Inserting the E230 module" on page 42)	**18** Relay (K1) (see "Output 1: "OC" open drain" on page 32)
7 V_{in} supply:5...32 VDC (DC coaxial connector (X1) or terminal strip (X3)) (see "Technical details regarding the energy supply" on page 27)	**19** SMA antenna connector (X25) (see "Connection of the GSM antenna" on page 48)
8 V_{batt} supply: 3,2...4,5 VDC (X2) (see "Technical details regarding the energy supply" on page 27)	**20** Holding fixture for the E230 module (see "Inserting the E230 module" on page 42)
9 Slot to insert extension modules (X12) (see "Extension slot" on page 29)	**21** U.FL antenna connector to connect the EASY PCB E230 with the EASY PCB Board for developers (X24) (see "Inserting the E230 module" on page 42)
10 Main terminal block (see "Connecting the sensors, actuators and power supply" on page 44)	**22** 13-pin JST connector for connecting the main connector of the E230 with the EASY PCB Board for developers (X7) (see "Inserting the E230 module" on page 42)

11 Status LED (LED3) (see "LEDs" on page 30)	**23** EASY PCB E230 (see "EASY PCB E230 " on page 49)
12 LED to display the switching state of the isolated switch contact (LED2). (see "LEDs" on page 30)	**24** Circuits to simulate the analogue and digital (impulse) sensors (see "Circuits to simulate the sensors" on page 33)

4.1.1 Block diagram of the developer board

Note: A block diagram of the EASY PCB E230 is included in the chapter "Block diagram of the E230 " on page 53.



[1] The converter used to generate the sensor supply V_{sen} is not assembled as standard and is available as an accessory.

4.1.2 Technical details regarding the Modbus interface

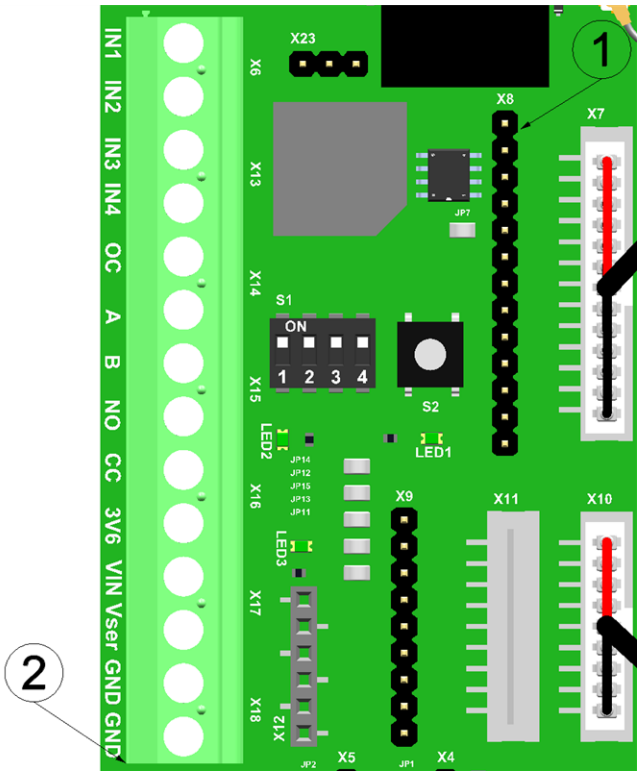
The EASY PCB Board for developers is equipped with a RS485 interface as standard. The optional equipment myDatalogEASYmbm RS232 SUB-D(f) connection cable (206.688) is required to connect slaves equipped with a RS232 interface. Simultaneous operation of both of the interfaces is not possible.

> ***Note:*** *Please note that the compatible interface must be selected in the "Modbus interface" configuration section (see "Modbus interface" on page 97).*

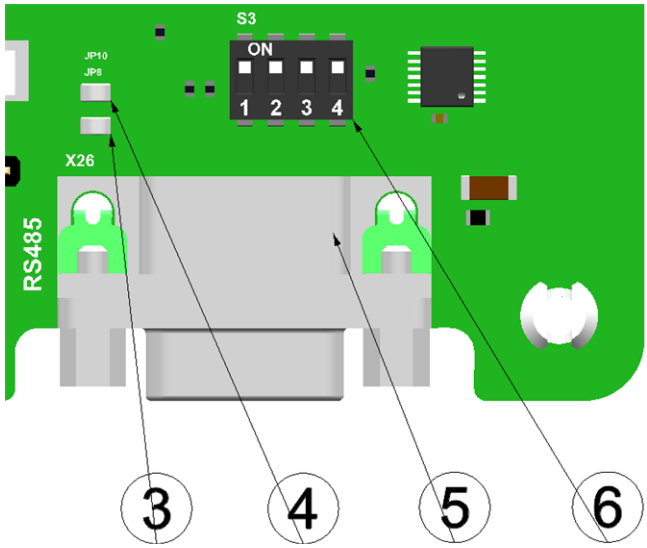
Baud rate	300-115200
Stop bits	1,2
Parity	N, E, O
Data bits	7,8
Modes	RTU ASCII

4.1.2.1 RS485 mode

The signal lines of the RS485 (A, B) on the EASY PCB E230 developer package can be accessed via the main terminal block, plug connector X8 or via the 9-pin Sub-D(f) connector X26. Using solder bridges JP10 and JP8, the 9-pin Sub-D(f) connector X26 including the resistances that can be connected via dip switch S3 can be separated from the RS485 bus (see "Block diagram of the developer board" on page 20).



Detailed overview: Main terminal block and plug connector X8



Detailed overview: connector X26, dip switch S3, JP10 and JP8

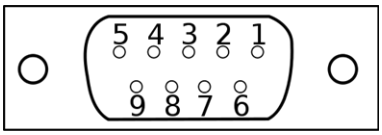
1	Pin 1 of plug connector X8	4	JP10 for disconnecting the RS485 B line
2	Main terminal block	5	9-pin Sub-D(f): RS485 interface (X26)
3	JP8 for disconnecting the RS485 A line	6	Dip switch for activating/deactivating the load or clamp resistances for RS485 (S3)

Assignment of the main terminal block and plug connector X8 [1)]

Main terminal block	X8	Signal
A	Pin 6	RS485 A
B	Pin 7	RS485 B

[1)] A full explanation of the assignment of the main terminal block and plug connector X8 is included in the chapter "Connecting the sensors, actuators and power supply" on page 44.

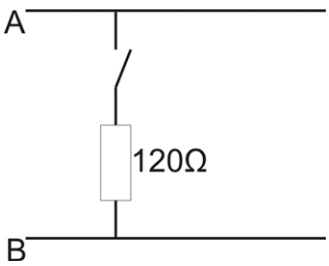
Assignment of Sub-D connector X26



9-pin Sub-D(f)

Pin	Signal
1-2, 4, 6-7, 9	NC
3	RS485 A
5	GND
8	RS485 B

The 120Ω load resistance between RS485 A and B can be activated via the "Termination" configuration parameter of the "Modbus interface" configuration section (see "Modbus interface" on page 97). This resistance is located directly in the RS485 driver block of the EASY PCB E230 .

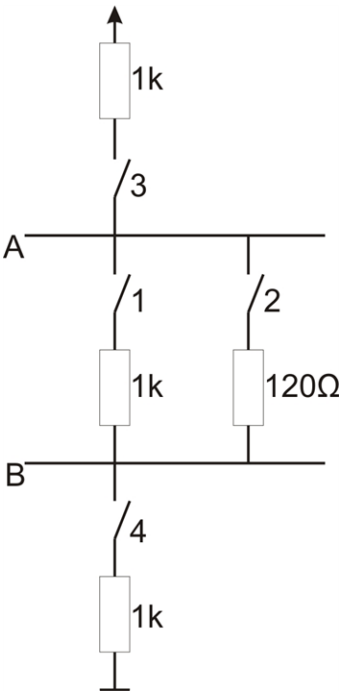


Schematic diagram of the switchable load resistance of the driver block

The EASY PCB Board for developers also includes additional load and clamp resistances that can be connected via dip switch S3 (see "Overview" on page 17).

Dip switch for activating/deactivating the load or clamp resistances for RS485 (S3)

1	1k load resistance between RS485 A and B
2	120Ω load resistance between RS485 A and B
3	1k pull up to RS485 A
4	1k pull down to RS485 B



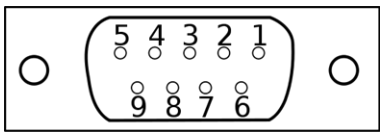
Schematic diagram of the switchable load resistances via dip switch S3

> ***Note:*** *The load resistance of the RS485 driver block of the EASY PCB E230 and one of the load resistances that can be connected via dip switch S3 should not be activated simultaneously.*

4.1.2.2 RS232 mode

You will require the optionally available equipment "myDatalogEASYmbm RS232 SUB-D(f) connection cable "(206.688) to connect modbus slaves equipped with a RS232 interface. It comprises the RS232 extension board, the connection cable, a gender changer and a null modem adaptor. The RS232 extension board can either be inserted in the slot for the extension module of the developer board (see "Inserting the RS232 extension board" on page 24) or solder directly into the respective slot of the EASY PCB E230 (see "Inserting the RS232 extension board" on page 61).

Assignment of the Sub-D(f) connector of the myDatalogEASYmbm RS232 SUB-D(f) connection cable "(206.688)



9-pin Sub-D(f)

The direction of the signals corresponds to that of a DTE (e.g. PC).

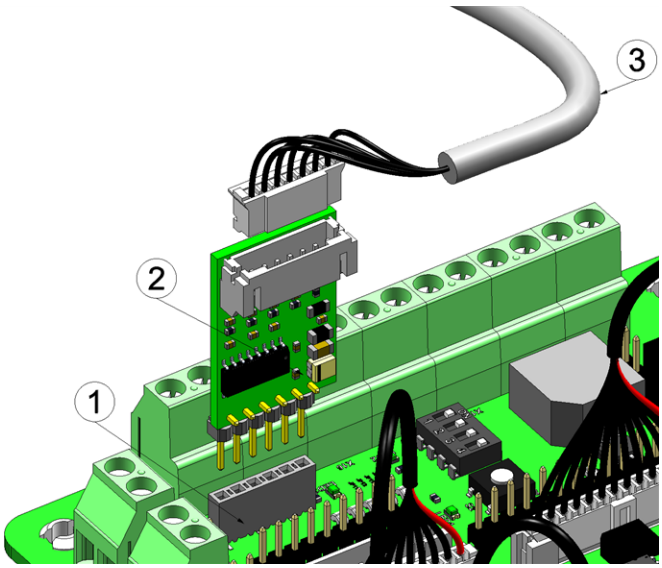
Pin	Signal
1, 7-9	NC
2	RXD
3	TXD
4	DTR
5	GND
6	DSR

The DTR/DSR handshake can be activated via the "DTR handshake" configuration parameter of the "Modbus interface" configuration section (see "Modbus interface" on page 97).

4.1.2.2.1 Inserting the RS232 extension board

Important note:

- *The RS232 extension board must be inserted in the de-energised state.*
- *Improper handling can cause injuries and/or damage to the instruments!*



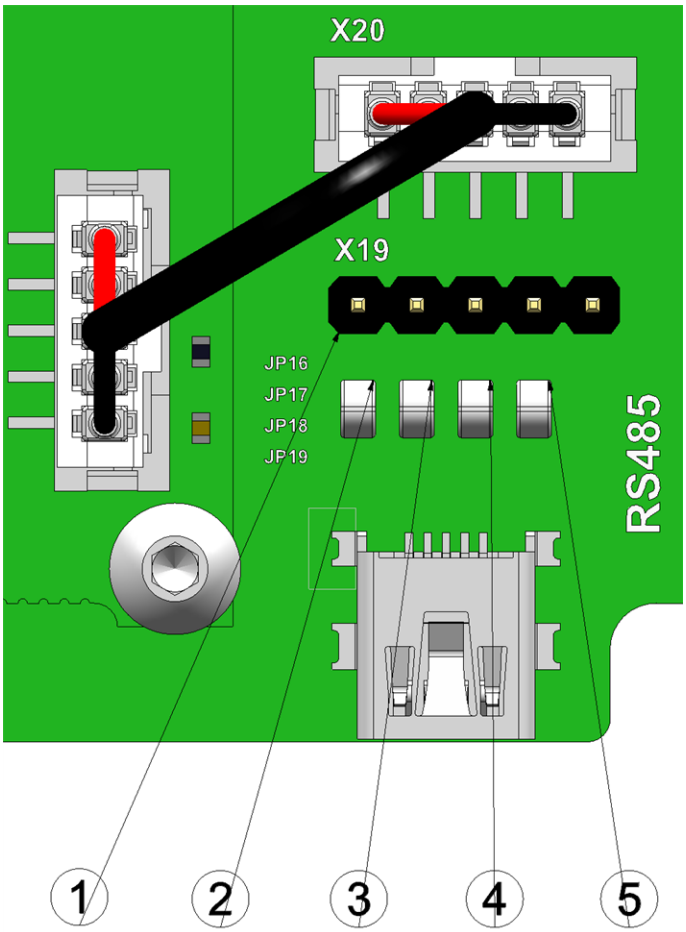
Inserting the RS232 extension board

1	Slot to insert extension modules (X12)	3	RS232 connection cable
2	RS232 extension board (included in the scope of delivery of 206.688)		

1. Connect the RS232 connection cable (3) with the RS232 extension board (2).
2. Then insert the RS232 extension board (2) in the slot for extension modules (X12) of the EASY PCB Board for developers in accordance with Figure "Inserting the RS232 extension board" on page 24. The RS232 extension board (2) must be inserted in such a way that the populated side of the board is facing towards the centre of the developer board.

4.1.3 USB interface

The signal lines of the USB interface on the EASY PCB E230 developer package can be accessed via the mini-B USB connector (X21) or plug connector X19. The mini-B USB connector (X21) can be disconnected from the USB interface by means of solder bridges JP16 to JP19 (see "Block diagram of the developer board" on page 20).



Detailed overview: mini-B USB connector (X21) and JP16-JP19

1 Pin 1 of plug connector X19	4 JP18 for disconnecting the D+ line
2 JP16 for disconnecting the V_{cc} line	5 JP19 for disconnecting the GND line
3 JP17 for disconnecting the D- line	

Assignment of plug connector X16

Pin	Signal
1	V_{cc}
2	D-
3	D+
4	GND
5	NC

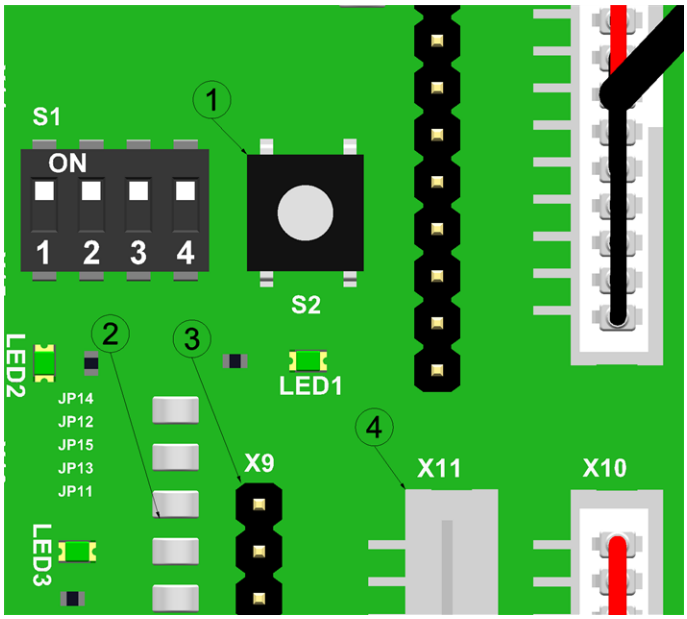
The USB slave interface is designed to establish a connection to a PC. The myDatanetDeviceConfig configuration program must be installed on the PC to enable communication with the EASY PCB E230 developer package . This program can be used to read all of the stored log entries, including those that have not yet been transmitted to the myDataweb server. It is also possible to update the firmware of the EASY PCB E230 via the USB interface.

Important note: *It is not possible to establish a USB connection if the EASY PCB E230 is currently establishing a GPRS connection or it is connected to the myDataweb server. In this case wait until the device has disconnected the GPRS connection. The status of the connection is signalled by the status LED (see "Status LED" on page 57).*

A more detailed description regarding the evaluation of the device log and update of the firmware using myDatanetDeviceConfig is included in the user manual for the myDatanetDeviceConfig ("myDatanetDeviceConfig user manual " 206.887).

4.1.4 Button for initiating ALOHA transmission mode (S2)

The contact that is grounded by button S2, can also be accessed via pin 1 of plug connector X9 and connector X11. Button S2 can be isolated from the EASY PCB E230 by means of solder bridge JP15 (see "Block diagram of the developer board" on page 20).



Detailed overview: button S2, plug connector X9 and JP15

1	Button for initiating ALOHA transmission mode (S2)	3	Pin 1 of plug connector X9
2	JP15 to disconnect the line to button S2	4	Connector X11

Assignment of connector X11 and plug connector X9 [1)]

X11	X9	Signal
Pin 1	Pin 1	Button to initiate ALOHA transmission mode

[1)] A full explanation of the assignment of connector X11 and plug connector X9 is included in the chapter "Extension slot" on page 29.

Button S2 can also be used to initiate the ALOHA transmission mode or to instruct the EASY PCB E230 to immediately issue the error/status code.

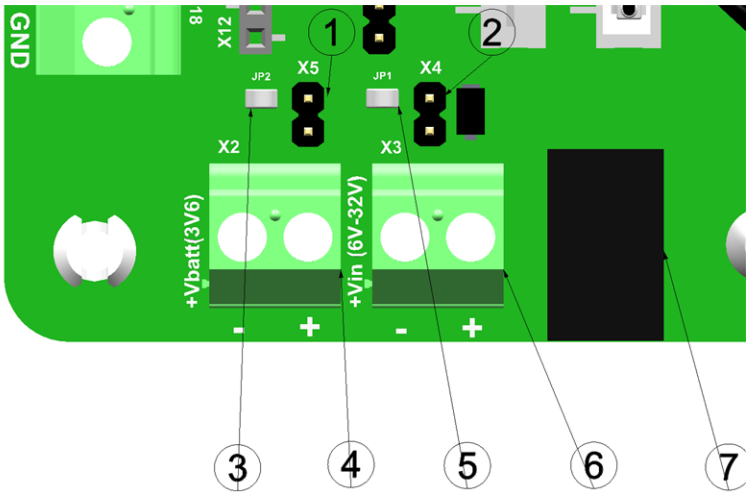
User action	Device response	Operation after releasing the button
Press briefly for approx. one second	Status LED illuminates.	Error/status code is issued (see "Status LED" on page 57)
Press and hold for five seconds	Status LED flashes three times and then remains on.	ALOHA transmission mode

4.1.5 Technical details regarding the energy supply

Depending on the voltage available, there are two options to supply the EASY PCB E230 developer package :

- V_{batt}: 3,2...4,5 VDC
- V_{in}: 5...32 VDC

The supply lines can be disconnected by means of solder bridge JP1 (V_{in}) or JP2 (V_{batt}) so that an amp metre can be connected via plug connector X4 (V_{in}) or X5 (V_{batt}) to measure the current consumption (see "Block diagram of the developer board" on page 20).



Detailed overview: terminal strip X2 and X3, DC coaxial connector X1, plug connector X4 and X5, solder bridge JP1 and JP2

1	Pin 1 of plug connector X5	5	JP2 to disconnect the V_{in} line
2	Pin 1 of plug connector X4	6	DC coaxial connector X1 to supply via supply V_{in}:5...32 VDC
3	JP2 to disconnect the V_{batt} line	7	Terminal strip X3 to supply via V_{in}:5...32 VDC
4	Terminal strip X2 to supply via V_{batt}: 3,2...4,5 VDC		

4.1.5.1 Supply via V_{in}

The supply of the developer board is either provided via the DC coaxial connector (X1) or the terminal strip (X3). The internal supply voltage (3,6V) is generated by the DC/DC converter of the E230 module (see "Block diagram of the E230 " on page 53). The DC/DC converter is equipped with a soft start function to ensure the load on the energy source is minimised when activated. It therefore takes 50ms until the internal supply voltage has reached its maximum value. The terminal strip X2 (V_{batt}) functions as a voltage output for the internal 3,6V supply voltage if the EASY PCB E230 developer package is supplied via V_{IN}.

> ***Note:*** *Please note that to ensure the correct functionality of relay K1, the supply to V_{in} must be at least 12VDC .*

In addition to the plug-in power supply included in the scope of delivery, the power supply units that meet the requirements described in the following chapters can also be used.

4.1.5.1.1 Terminal strip (X3)

U	5...32 VDC
I_{min}	t.b.d. mA@5V t.b.d. mA@12V t.b.d. mA@24V

Assignment of the terminal strip (X3)

1	GND	Mass
2	$+V_{in}$	Supply voltage:5...32 VDC

4.1.5.1.2 DC coaxial connector (X1)

U	5...32 VDC
I_{min}	t.b.d. mA@5V t.b.d. mA@12V t.b.d. mA@24V
External/internal Ø	5,5/2,1mm
Polarity	+internal

4.1.5.2 Supply via V_{batt}

The DC/DC converter of the E230 module (see "Block diagram of the E230 " on page 53) is omitted and the supply voltage is fed directly in to the EASY PCB E230 developer package via terminal strip X2 (V_{batt}).

> ***Note:*** *Please note that when supplying the developer package via V_{batt}, the circuits for simulating the sensors and relay K1 are not fully functional.*

The power supply units that meet the following requirements can all be used:

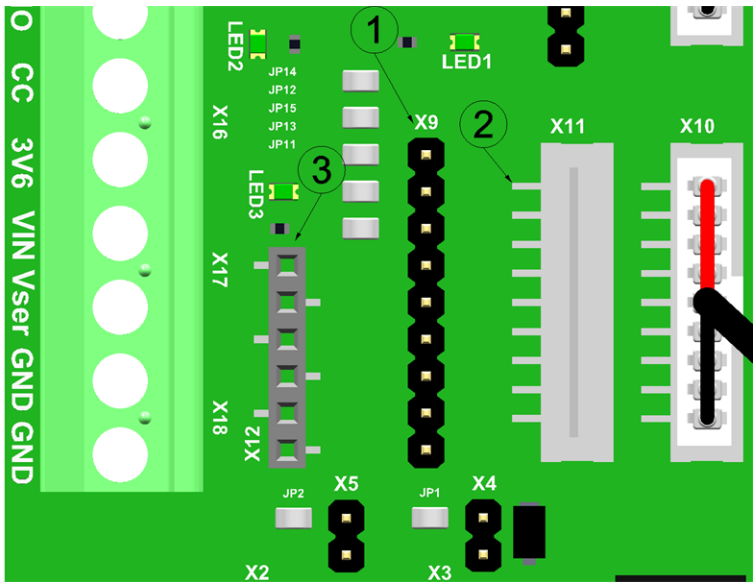
U	3,2...4,5 VDC
I_{min}	t.b.d. mA@3,6V

Assignment of the terminal strip (X2)

1	GND	Mass
2	$+V_{batt}$	Supply voltage:3,2...4,5 VDC

4.1.6 Extension slot

The signal lines of the extension slot on the EASY PCB Board for developers can be accessed via connector X11, plug connector X9 and socket board X12. The contact for connecting the button (see "Button for initiating ALOHA transmission mode (S2)" on page 26), the 3,6V supply for the status LED and the open drain output to control the status LED (see "LEDs" on page 30) can also be accessed via connector X11 and plug connector X9.



Detailed overview: connector X11, plug connector X9, socket board X12

Assignment of connector X11, plug connector X9 and socket board X12

X11	X9	X12	Signal
Pin 1	Pin 1	---	Button to initiate ALOHA transmission mode
Pin 2	Pin 2	---	Open drain output for the status LED
Pin 3	Pin 3	---	3,6V supply for the status LED
Pin 4	Pin 4	Pin 1	$3V3_{ext}$ power supply for the extension module
Pin 5	Pin 5	Pin 2	Mass
Pin 6	Pin 6	Pin 3	I/O
Pin 7	Pin 7	Pin 4	I/O
Pin 8	Pin 8	Pin 5	I/O
Pin 9	Pin 9	Pin 6	I/O

The range of functions of the EASY PCB E230 can be expanded by using extension modules. It must be ensured that the corresponding module is supported by the firmware of the EASY PCB E230 . A list of compatible modules is included in the chapter "Extension module" on page 109.

4.1.7 LEDs

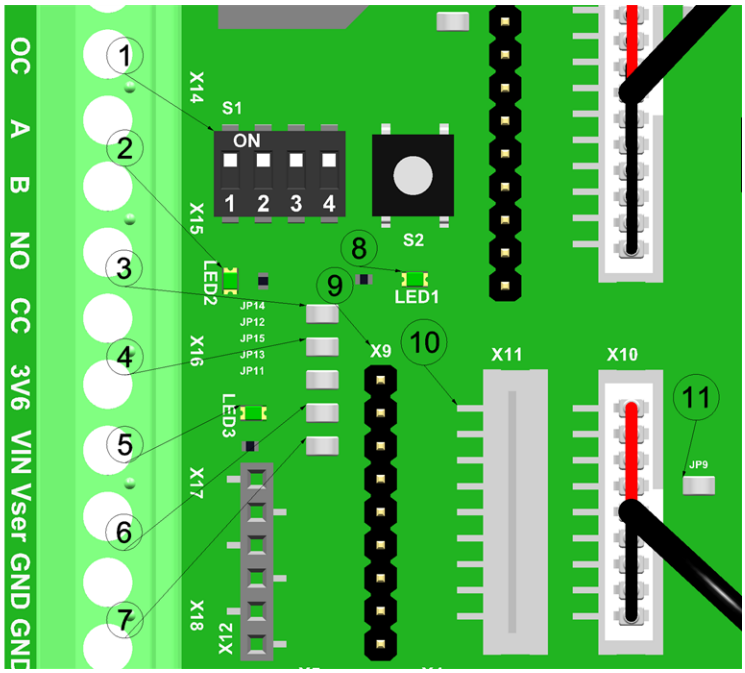
The EASY PCB Board for developers comprises 3 LEDs to indicate:

- Display of the switching state of the "$3V3_{ext}$" (LED1) voltage
- Display of the switching state of the isolated switch contact (LED2)
- Status LED (LED3)

The LED for displaying the switching state of the "$3V3_{ext}$" (LED1) voltage is activated when contact 3 of dip switch S1 is closed. This LED, the series resistor and contact 3 of dip switch S1 of the EASY PCB E230 can be isolated via solder bridge JP9 (see "Block diagram of the developer board" on page 20).

Contact 1 and 2 of dip switch S1 must be closed to activate the LED to display the switching state of the isolated switch contact (LED2). Solder bridges JP12 and JP14 must be opened to isolate this LED, the series resistor and contact 1 and 2 of dip switch S1 from the EASY PCB E230 (see "Block diagram of the developer board" on page 20).

The status LED (LED3) is controlled parallel to the status LED located on the EASY PCB E230 (see "Overview" on page 52). The status LED (LED3) and the series resistor can be isolated from the EASY PCB E230 via solder bridges JP13 and JP11 (see "Block diagram of the developer board" on page 20). The 3,6V supply for the status LED and the open drain output to control the status LED (see "Extension slot" on page 29) can be accessed via connector X11 and plug connector X9.



Detailed overview: LED1-3, dip switch S1, JP9, JP11-14, plug connector X9 and connector X11

1	Dip switch for activating/deactivating the signalling LED (S1)	**7**	JP11 to disconnect the lines between the 3,6V supply of the status LED and the series resistor of the status LED
2	LED to display the switching state of the isolated switch contact (LED2)	**8**	LED to display the switching state of the "$3V3_{ext}$" (LED1) voltage
3	JP14 to disconnect the line between the CC of the isolated switch contact and the series resistor for LED2	**9**	Pin1 of plug connector X9
4	JP12 to disconnect the line between the NO of the isolated switch contact and LED2	**10**	Connector X11
5	Status LED (LED3)	**11**	JP9 to disconnect the line to LED1
6	JP13 to disconnect the line between the open drain output used to control the status LED and status LED		

Dip switch for activating/deactivating the signalling LED (S1)

1	LED	Activate the LED to display the switching state of the isolated switch contact (LED2)
2	470Ω	
3	Activate the LED to display the switching state of the "$3V3_{ext}$" (LED1) voltage	
4	NC	

Assignment of connector X11 and plug connector X9 [1)]

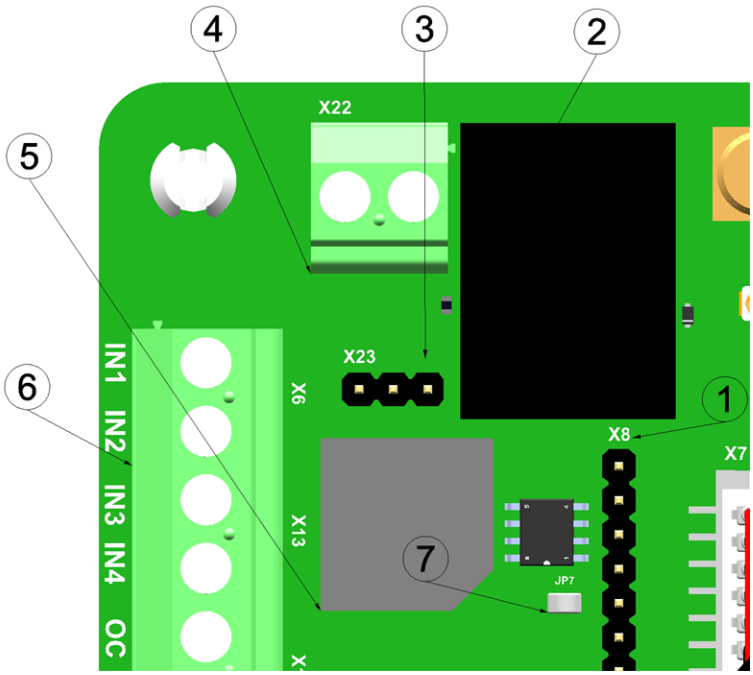
X11	X9	Signal
Pin 2	Pin 2	Open drain output for the status LED
Pin 3	Pin 3	3,6V supply for the status LED

[1)] A full explanation of the assignment of connector X11 and plug connector X9 is included in the chapter "Extension slot" on page 29.

4.1.8 Output 1: "OC" open drain

The "OC" open drain output on the EASY PCB Board for developers can be accessed via the main terminal block, pin 5 of plug connector X8 and pin 2 of plug connector X23. The "OC" open drain output can either be connected with buzzer LS1 or relay K1 via plug connector X23. The connection to pin 2 of plug connector X23 can be disconnected by means of solder bridge JP7 (see "Block diagram of the developer board" on page 20).

> ***Note:*** *If one of the optionally available DC/DC converters for generating the sensor supply V_{sen} (see "Spare parts and accessories" on page 109) is installed on your EASY PCB E230 , you must ensure that the sensor supply V_{sen} is always activated at the same time as the "OC" open drain output (see "Block diagram of the developer board" on page 20).*



Detailed overview: plug connector X8 and X23, main terminal block, terminal strip X22, relay K1 and buzzer LS1

1	Pin1 of plug connector X8	5	Buzzer (LS1)
2	Relay (K1)	6	Main terminal block
3	Pin 1 of plug connector X23	7	JP7 for disconnecting the connection between the "OC" open drain output and pin 2 of plug connector X23
4	Relay K1 contacts of the developer board (X22)		

Assignment of the main terminal block and plug connector X8 [1)]

Main terminal block	X8	Signal
OC	Pin 5	Output 1: Open drain

[1)] A full explanation of the assignment of the main terminal block and plug connector X8 is included in the chapter "Connecting the sensors, actuators and power supply" on page 44.

Assignment of plug connector X23

Pin	Signal
1	Activation of the buzzer (LS1)
2	Output 1: Open drain
3	Activation of the relay (K1)

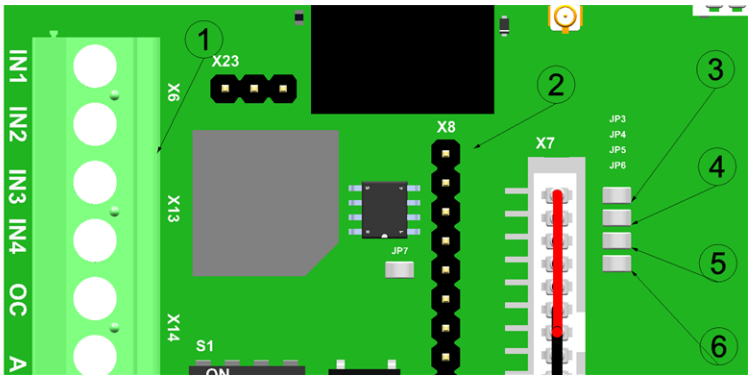
4.1.8.1 Technical details regarding relay K1

I_{max}	8A@30VDC, 8A@250VAC
U_{max}	125VDC, 250VAC
R_{on}	30mΩ
f_{max}	40Hz

4.1.9 Circuits to simulate the sensors

The EASY PCB Board for developers comprises four identical circuits to simulate analogue or digital (impulse) sensors, each of which is connected to one of the universal inputs of the EASY PCB E230 . These simulation circuits can be disconnected from the inputs of the EASY PCB E230 by means of solder bridges JP3 (IN1) to JP6 (IN4). In addition to the connection to the simulation circuits, the universal inputs can also be accessed via the main terminal block and plug connector X8.

> ***Note:*** *If you want to connect your own sensor to one of the universal inputs, you must first disconnect the simulation circuit from the EASY PCB E230 by means of the relevant solder bridge.*



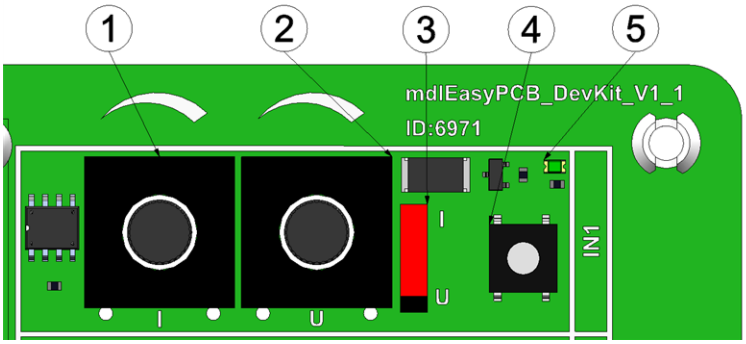
Detailed overview: Main terminal block and plug connector X8

1	Main terminal block	4	JP4 for disconnecting the connection between universal input 2 and the simulation circuit
2	Pin 1 of plug connector X8	5	JP5 for disconnecting the connection between universal input 3 and the simulation circuit
3	JP3 for disconnecting the connection between universal input 1 and the simulation circuit	6	JP6 for disconnecting the connection between universal input 4 and the simulation circuit

Assignment of the main terminal block and plug connector X8 [1)]

Main terminal block	X8	Signal
IN1	Pin 1	Universal input 1
IN2	Pin 2	Universal input 2
IN3	Pin 3	Universal input 3
IN4	Pin 4	Universal input 4

[1)] A full explanation of the assignment of the main terminal block and plug connector X8 is included in the chapter "Connecting the sensors, actuators and power supply" on page 44.



Detailed overview: Circuits to simulate the sensors

1	Potentiometer for simulating a mA sensor (4...20mA)	4	Button to simulate an impulse (moves universal input to "low")
2	Potentiometer for simulating a sensor with a voltage output (0...(V_{in}-0,5V))	5	LEDs to display the status of the buttons for simulating an impulse
3	Switch for selecting between the I or U simulation (see "Block diagram of the developer board" on page 20)		

Important note:

- *Always ensure that the mode selection of the universal input (see "Measurement channels" on page 69) and the position of the switch for the selection between I and U simulation match.*
- *Both of the potentiometers must be set to the minimum value (left position) before switching between I and U simulation.*

4.1.9.1 Simulation of a 4-20mA sensor

1. Set both potentiometers of the simulation circuit for the required universal input to the minimum value (left position).
2. In the "Measurement channels" configuration section (see "Measurement channels" on page 69), select 4-20mA mode or 0-20mA mode and initiate the ALOHA transmission mode (see "ALOHA transmission mode" on page 65) so that the configuration of the site is transferred to the EASY PCB E230 .

   Note: *The output range of the simulation circuit is 4...20mA .*
3. Set the switch used to select I or U simulation (see "Circuits to simulate the sensors" on page 33) to the "I" position.
4. Use the potentiometer labelled with the letter "I" to simulate the mA sensor (see "Circuits to simulate the sensors" on page 33).

4.1.9.2 Simulation of a sensor with a voltage output

1. Set both potentiometers of the simulation circuit for the required universal input to the minimum value (left position).
2. In the "Measurement channels" configuration section (see "Measurement channels" on page 69), select 0-2V mode or 0-10V mode and initiate the ALOHA transmission mode (see "ALOHA transmission mode" on page 65) so that the configuration of the site is transferred to the EASY PCB E230 .

   Note: *Please observe the output range (0...(V_{in}-0,5V)) of the simulation circuit. If you have selected 0-2V mode, the end of the measurement range for the universal input is achieved before the potentiometer reaches the maximum value (right position). From a certain potentiometer setting, the value measured on the universal input therefore does not change any further. The input is not damaged during this process.*

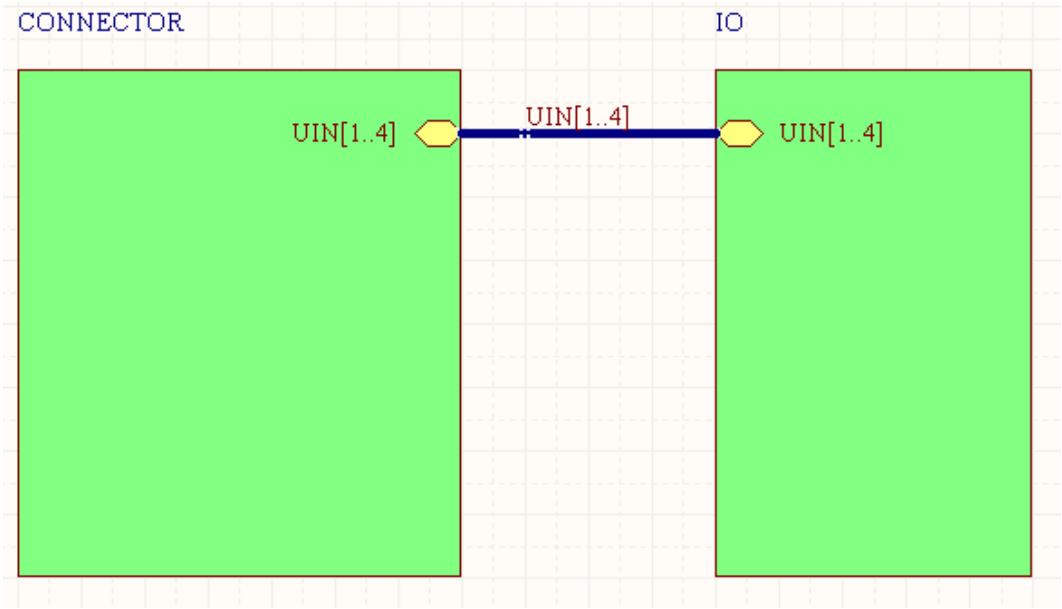
3. Set the switch used to select I or U simulation (see "Circuits to simulate the sensors" on page 33) to the "U" position.
4. Use the potentiometer labelled with the letter "U" to simulate the sensor (see "Circuits to simulate the sensors" on page 33).

4.1.9.3 Simulation of a digital (impulse/switching contact) sensor

1. Set both potentiometers of the simulation circuit for the required universal input to the minimum value (left position).
2. In the "Measurement channels" configuration section (see "Measurement channels" on page 69), select one of the digital modes (e.g. digital or cnt. day) and initiate the ALOHA transmission mode (see "ALOHA transmission mode" on page 65) so that the configuration of the site is transferred to the EASY PCB E230 .
3. Set the switch used to select I or U simulation (see "Circuits to simulate the sensors" on page 33) to the "U" position.
4. Set the potentiometer labelled with the letter "U" to the maximum value (right position) (see "Circuits to simulate the sensors" on page 33).
5. Press the button to simulate an impulse thus setting the universal input to "Low" and simulating an impulse or switching of a contact. The LED for the simulation circuit will remain lit as long as the button is pressed.

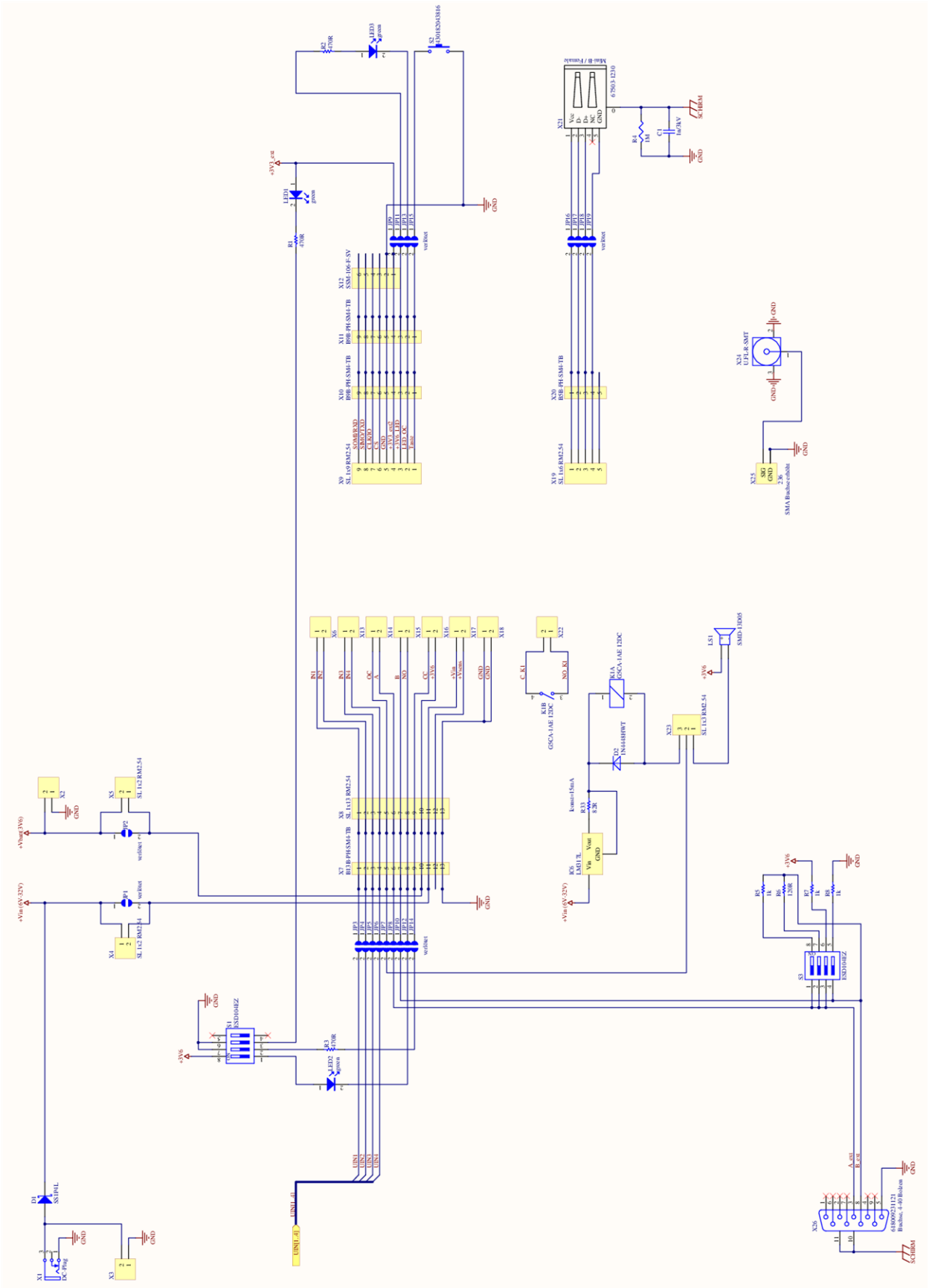
4.2 Circuit diagram

4.2.1 Overview

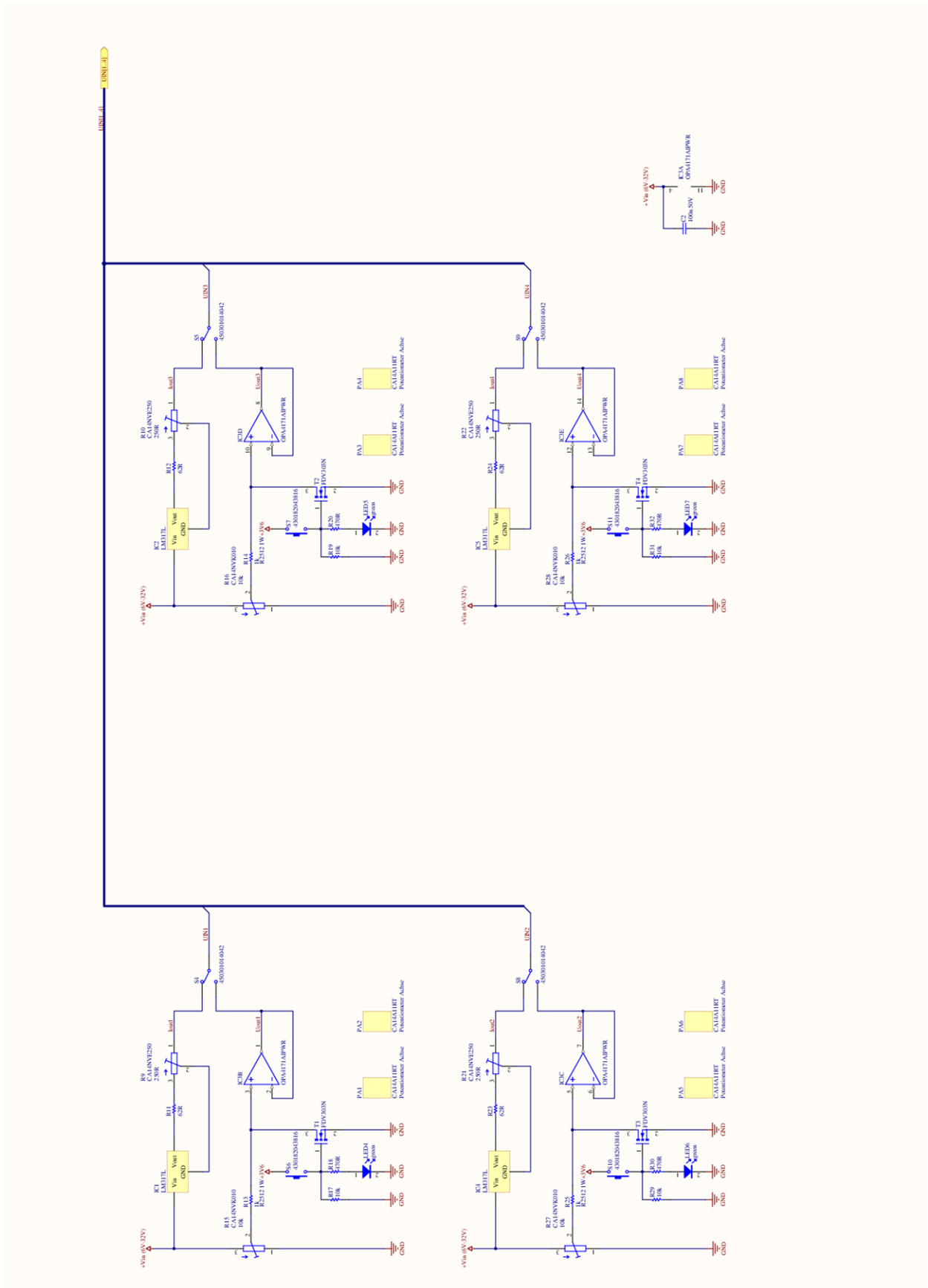


Overview of the circuit diagram of the developer board

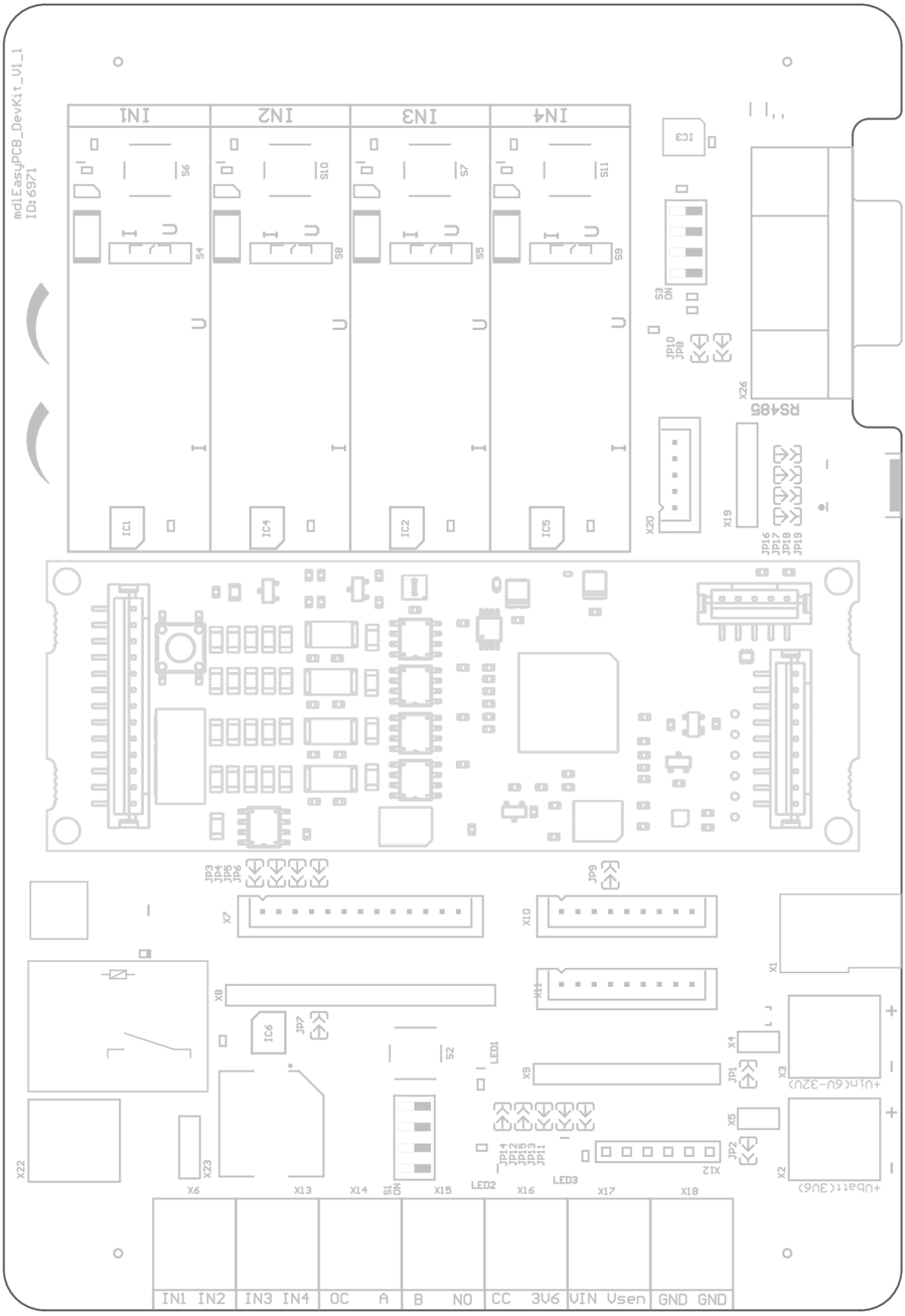
4.2.2 Connector



4.2.3 IO



4.3 Layout


mdlEasyPCB_DevKit_V1_1
ID:6971
IN1
IN2
IN3
IN4
RS485
IN1 IN2
IN3 IN4
OC A
B NO
CC 3V6
VIN Vsen
GND GND

4.4 Electrical installation

Important note: Only qualified personnel should undertake the installation described in this chapter of the operating instructions to avoid any damage to the device.

4.4.1 Information on preventing electrostatic discharges (ESD)

Important note: Maintenance procedures that do not require the device to be connected to the power supply should only be performed once the device has been disconnected from the mains power supply to minimise hazards and ESD risks.

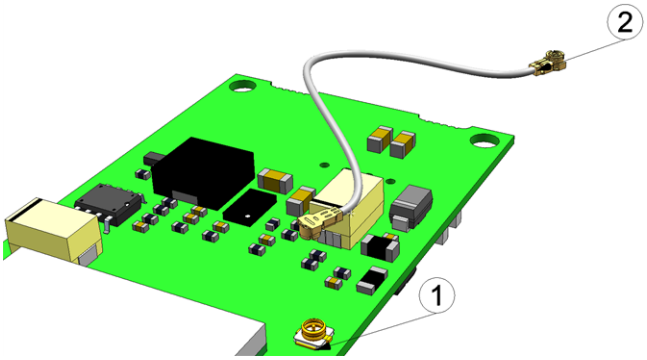
The sensitive electronic components inside the device can be damaged by static electricity, which can impair the device performance or even cause the device to fail. The manufacturer recommends the following steps to prevent any damage to the device caused by electrostatic discharges:

- Discharge any static electricity present on your body before handling the electronic components of the device (such as circuit boards and components attached thereto). To do this, you can touch a grounded metallic surface such as the housing frame of a device or a metal pipe.
- Avoid any unnecessary movements to prevent the build-up of static charges.
- Use antistatic containers or packaging to transport components that are sensitive to static.
- Wear an antistatic wristband that is grounded via a cable to discharge your body and keep it free of static electricity.
- Only touch components that are sensitive to electric charges in an antistatic working area. If possible, use antistatic mats and work pads.

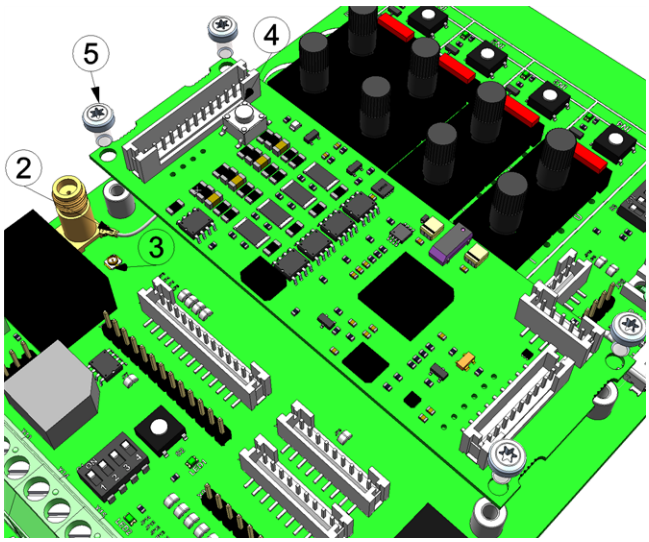
4.4.2 Inserting the E230 module

Important note:

- *The E230 module must be inserted in the de-energised state.*
- *Improper handling can cause injuries and/or damage to the instruments!*

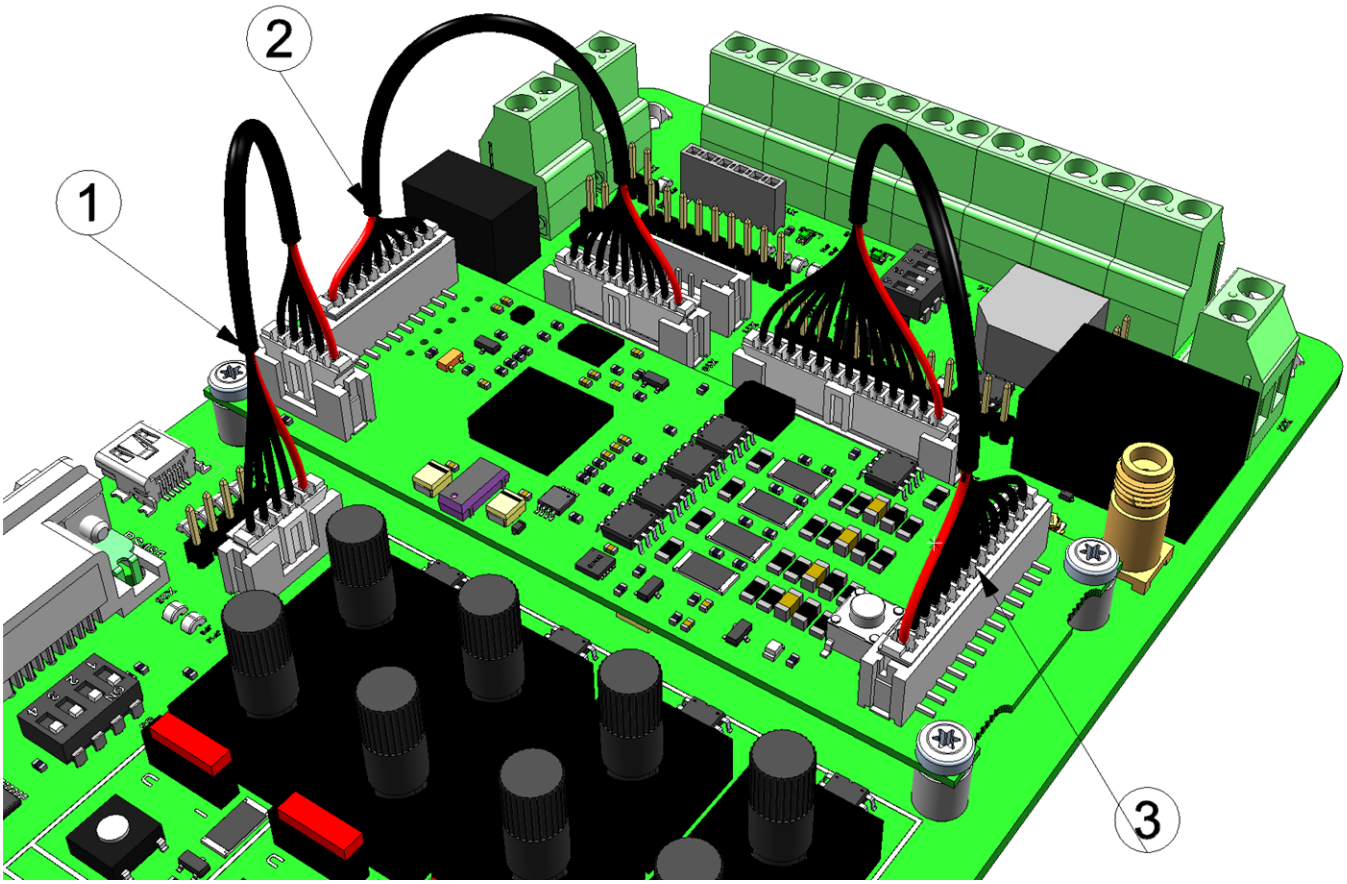


Inserting the E230 module - step 1



Inserting the E230 module - step 2

1	U.FL antenna connector of the EASY PCB E230	4	EASY PCB E230
2	U.FL antenna cable	5	M3x6 Torx 10
3	U.FL antenna connector of the developer board (X24)		



Inserting the E230 module - step 3

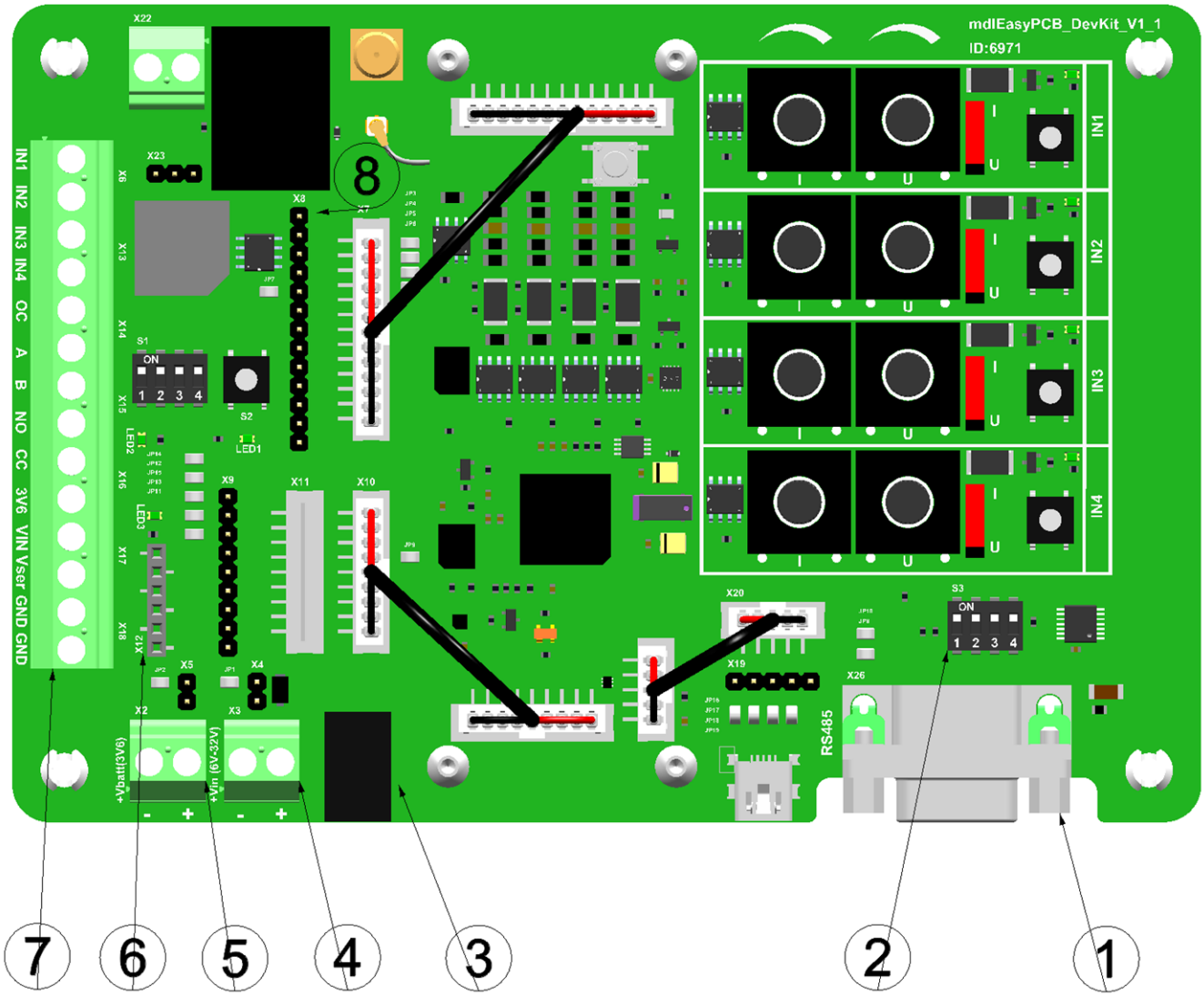
1	5-pin cable for connecting the USB connector of the E230 with the EASY PCB Board for developers (X20)	3	13-pin cable for connecting the main connector of the E230 with the EASY PCB Board for developers (X7)
2	9-pin cable for connecting the extension slot of the E230 with the EASY PCB Board for developers (X10)		

1. Connect the U.FL antenna connector of the E230 module to the U.FL antenna cable included in the scope of delivery (see "Inserting the E230 module - step 1 " on page 42).
2. Then connect the other end of the U.FL antenna cable with the U.FL antenna connector of the developer board and attach the EASY PCB E230 to the EASY PCB Board for developers using the M3x6 screws included in the scope of delivery (see Figure "Inserting the E230 module - step 2" on page 42).
3. Then use all three of the JST cables (5-pin, 9-pin and 13-pin) to connect the EASY PCB E230 with the EASY PCB Board for developers in accordance with the Figure "Inserting the E230 module - step 3 " on page 43.

4.4.3 Connecting the sensors, actuators and power supply

Important note:

- *All cabling work must be performed in the de-energised state.*
- *Comply with the existing legal and/or operational directives.*
- *Improper handling can cause injuries and/or damage to instruments!*



Sensor connection and supply

1	9-pin Sub-D(f): RS485 interface (X26)	5	V_{batt} supply: terminal strip (X2)
2	Dip switch for activating/deactivating the load or clamp resistances for RS485 (S3)	6	Slot to insert extension modules (X12)
3	V_{in} supply: DC coaxial connector (X1) 5,5/2,1mm (external/internal diameter)	7	Main terminal block
4	V_{in} supply: terminal strip (X3)	8	Pin1 of plug connector X8

Dip switch for activating/deactivating the load or clamp resistances for RS485 (S3)

1	1k load resistance between RS485 A and B
2	120Ω load resistance between RS485 A and B
3	1k pull up to RS485 A
4	1k pull down to RS485 B

Assignment of the DC coaxial connector (X1) 5,5/2,1mm (external/internal diameter)

External contact	-	Mass
Internal contact	+	Supply voltage:5...32 VDC

Assignment of terminal strip (X3) [1)]

1	-	Mass
2	+	V_{in} supply voltage:5...32 VDC

[1)]For detailed information regarding the power supply, refer to "Technical details regarding the energy supply" on page 27.

Assignment of terminal strip (X2) [1)]

1	-	Mass
2	+	V_{batt} supply voltage: 3,2...4,5 VDC

[1)]For detailed information regarding the power supply, refer to "Technical details regarding the energy supply" on page 27.

Assignment of the main terminal block, plug connector X8 and Sub-D connector X26

Main terminal block	X8	X26	Signal
IN1	Pin 1	---	Universal input 1
IN2	Pin 2	---	Universal input 2
IN3	Pin 3	---	Universal input 3
IN4	Pin 4	---	Universal input 4
OC	Pin 5	---	Output 1: Open drain [1)]
A	Pin 6	Pin3	RS485 A
B	Pin 7	Pin8	RS485 B
NO	Pin 8	---	Output 2: Isolated switch contact
CC	Pin 9	---	
3v6	Pin 10	---	3,6V voltage output if the EASY PCB Board for developers is supplied via V_{in}. Supply voltage input (3,2...4,5 VDC), if no voltage is applied to V_{in}.
VIN	Pin 11	---	Supply voltage
V_{sen}	Pin 12	---	Output 1: Sensor supply [1)2)]
GND	Pin 13	Pin 5	Mass

[1)]The V_{sen} sensor supply is always switched at the same time as the "OC" open drain output (see "Block diagram of the developer board" on page 20).

[2)]The V_{sen} sensor supply is only available if one of the optionally available DC/DC converters for generating the sensor supply is installed on your EASY PCB E230 (see "Spare parts and accessories" on page 109).

1. Connect your sensors and actuators with the universal inputs and outputs.

The following steps are only required if you want to use the modbus slaves with the RS485 interface:

2. Connection of the modbus slaves with the RS485 interface

> ***Important note:*** *Please note that the simultaneous operation of modbus slaves connected via RS232 and RS485 is not supported by EASY PCB E230 .*

1. Ensure that the RS485 interface is selected in the "Modbus interface" configuration section (see "Modbus interface" on page 97).
2. Then connect the modbus slaves with the RS485 interface either via the main terminal block, plug connector X8 or Sub-D connector X26 of the developer package. If necessary, activate the load or clamp resistances for the RS485 bus via dip switch S3.

> ***Note:*** *An adapter may be required to connect the modbus slaves to the Sub-D connector X26. A*

selection of available adapters is specified in the chapter "Spare parts and accessories" (see "Adapter" on page 110).

The following steps are only required if you want to use the modbus slaves with the RS232 interface:

3. Connection of the modbus slaves with the RS232 interface

   Important note: You will require the optionally available equipment "myDatalogEASYmbm RS232 SUB-D(f) connection cable "(206.688) to connect modbus slaves equipped with a RS232 interface.

   1. Insert the RS232 extension board in the slot for the extension module of the developer board (see "Inserting the RS232 extension board" on page 24) or solder it directly into the respective slot of the EASY PCB E230 (see "Inserting the RS232 extension board" on page 61).
   2. Ensure that the RS232 interface is selected in the "Modbus interface" configuration section (see "Modbus interface" on page 97).
   3. Connect the modbus slave with the myDatalogEASYmbm RS232 SUB-D(f) connection cable (206.688). If your modbus slave also comprises a SUB-D(f) connector, use the gender changer provided. The connection characteristics (transmission direction of the individual signal lines) of the connection cable correspond to that of a DTE (e.g. PC). If your modbus slave is also a DTE, use the null modem adaptor provided.

4. Connect the antenna (see "Connection of the GSM antenna" on page 48).

5. Provide a power supply to the developer board (for more information see "Technical details regarding the energy supply" on page 27):

   Supply via V_{in}:

   The EASY PCB Board for developers can be powered via the DC coaxial connector X1 or the terminal strip X3. Either use the plug-in power supply included in the scope of delivery or any power supply unit with a voltage of 5...32 VDC . If the developer board is to be powered via terminal strip X3, connect the cables to terminal strip X3 in a de-energised state.

   Supply via V_{batt}:

   You can use any power supply with a voltage of 3,2...4,5 VDC to supply the EASY PCB Board for developers via terminal strip X2. To do so, connect the cable to terminal strip X3 in a de-energised state.

6. Then switch on the power supply of the sensors (if these are not powered via the developer board) and the developer board. The status LED should then start to flicker (see "Status LED" on page 57), indicating that a connection is being established.

The following step is not mandatory.

7. Check whether the connection to the myDataweb has worked correctly (see "Testing communication with the device" on page 66).

4.4.4 Connection of the GSM antenna

> ***Important note:*** *To ensure the correct functionality, only use antennas that are supplied by the manufacturer.*

The Magnetic roof antenna SMA (300085) included in the scope of supply is connected directly to the antenna connector (see "Overview" on page 17) of the developer board.

If the 2.5 m connection cable of the Magnetic roof antenna SMA (300085) is not long enough, you can use a 2.5 m Extension for ANT900 SMA (206.807).

1. Ensure that the EASY PCB Board for developers is de-energised.
2. If you need an antenna extension, connect this to the antenna first.
3. Connect the antenna extension or antenna directly to the antenna connector of the developer board (see "Overview" on page 17).

   > ***Important note:*** *Do not apply too much force when tightening the antenna. Do not use any tools to tighten the antenna or antenna extension; only manual tightening is required.*

4. Switch the power supply of the developer board back on.

The following step is not mandatory.

5. Check whether the connection to the myDataweb has worked correctly (see "Testing communication with the device" on page 66).

Chapter 5 EASY PCB E230

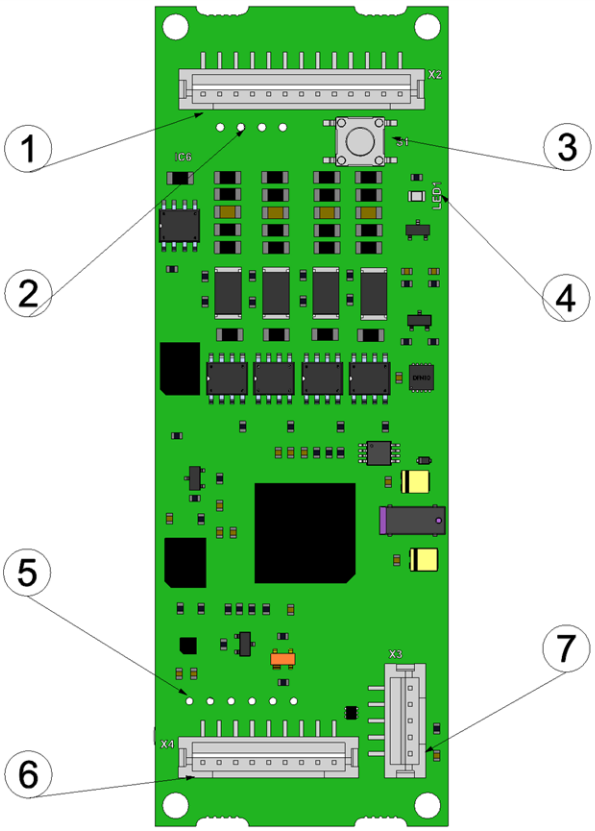
5.1 Technical data

Voltage supply	Supply via V_{IN}: 4,5...32VDC , max. t.b.d. mA Supply via V_{AUX}: 3,2...4,5V , max. t.b.d. mA Additional information is provided in "Technical details regarding the energy supply" on page 59.
Output voltage (only when supplied via V_{IN})	Output voltage to V_{AUX}: 3,6V , max. 300mA
Housing	Weight: 21g Interface: • 5-pin JST connector: USB • 9-pin JST connector: extension slot/ext. LED/ext. button • 13-pin JST connector: main connection Dimensions (WHD): 36 x 12 x 100mm (without optional DC/DC converter for the sensor supply)
Operating temperature	-20...+60°C, 15...90%rH non-condensing
Storage temperature	-30...+85°C
Display	LED for indicating the operating state and error codes Open drain output to connect an external LED to indicate the operating state and error codes
Operation	Button to initiate ALOHA transmission mode Contact for connecting an external button for initiating ALOHA transmission mode
Antenna connector	U.FL

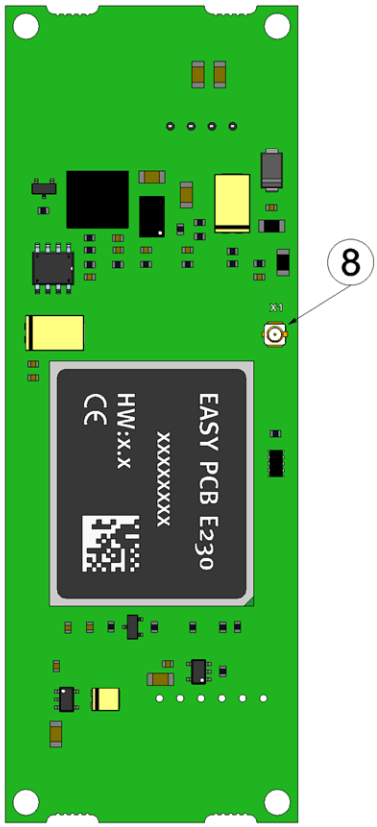
Universal inputs	4 x analogue or digital Modes: • 0 to 20mA: Resolution 6µA, max. 22,5mA, load 100Ω • 4 to 20mA: Resolution 6µA, max. 22,5mA, load 100Ω • 0 to 2V: Resolution 610µV, max. 2,5V, load 220k1 • 0 to 10V: Resolution 8,3mV, max. 32V, load 8k9 • PWM: 1...99%, max. 100Hz, min. impulse length 1ms, output load 8k9 • Frequency: 1...1000Hz, 8k9 • Digital: max. 32V, low ‹1,36V, high ›2,73V, load 8k9 • Digital LP: max. V_{AUX}, low ‹100mV, high ›200mV, load 220k1 • Day counter: min. impulse length 20ms, load 8k9 • Interval counter: min. impulse length 20ms, load 8k9 Additional information is provided in "Technical details about the universal inputs" on page 61.
Modbus	1 x RS485 or RS232 for connecting one or several modbus slaves. (RS232 only with optional equipment myDatalogEASYmbm RS232 SUB-D(f) connection cable (206.688)) • Baud rate: 300-115200 • Stop bits: 1,2 • Parity: N, E, O • Data bits: 7,8 Modes: • RTU • ASCII Number of processable registers • Input register: 64 • Output register: 32 Additional information is provided in "Technical details regarding the Modbus interface" on page 59.

Outputs	1 x open drain output • I_{max}: 2A • U_{max}: 32V • R_{on}: 0,065Ω • f_{max}: 500Hz 1 x isolated switch contact • I_{max}: 130mA • U_{max}: 32V • R_{on}: 35Ω • f_{max}: 500Hz Additional information is provided in "Technical details about the outputs" on page 63.
Extension slot	1 x extension slot for inserting extension modules Output voltage via V_{ext}: 3,3V , max. 100mA
Data memory	Internal flash memory for up to 1740 measurement cycles
Data type	f32 (32 Bit floating point)
Data transmission	By means of GSM/GPRS quad-band modem to the respective myDataweb server
SIM	The EASY PCB E230 is equipped with an integrated SIM chip.
Monthly data volume	t.b.d. at 2 min. measurement cycle and 120 min. transmission cycle

5.2 Overview



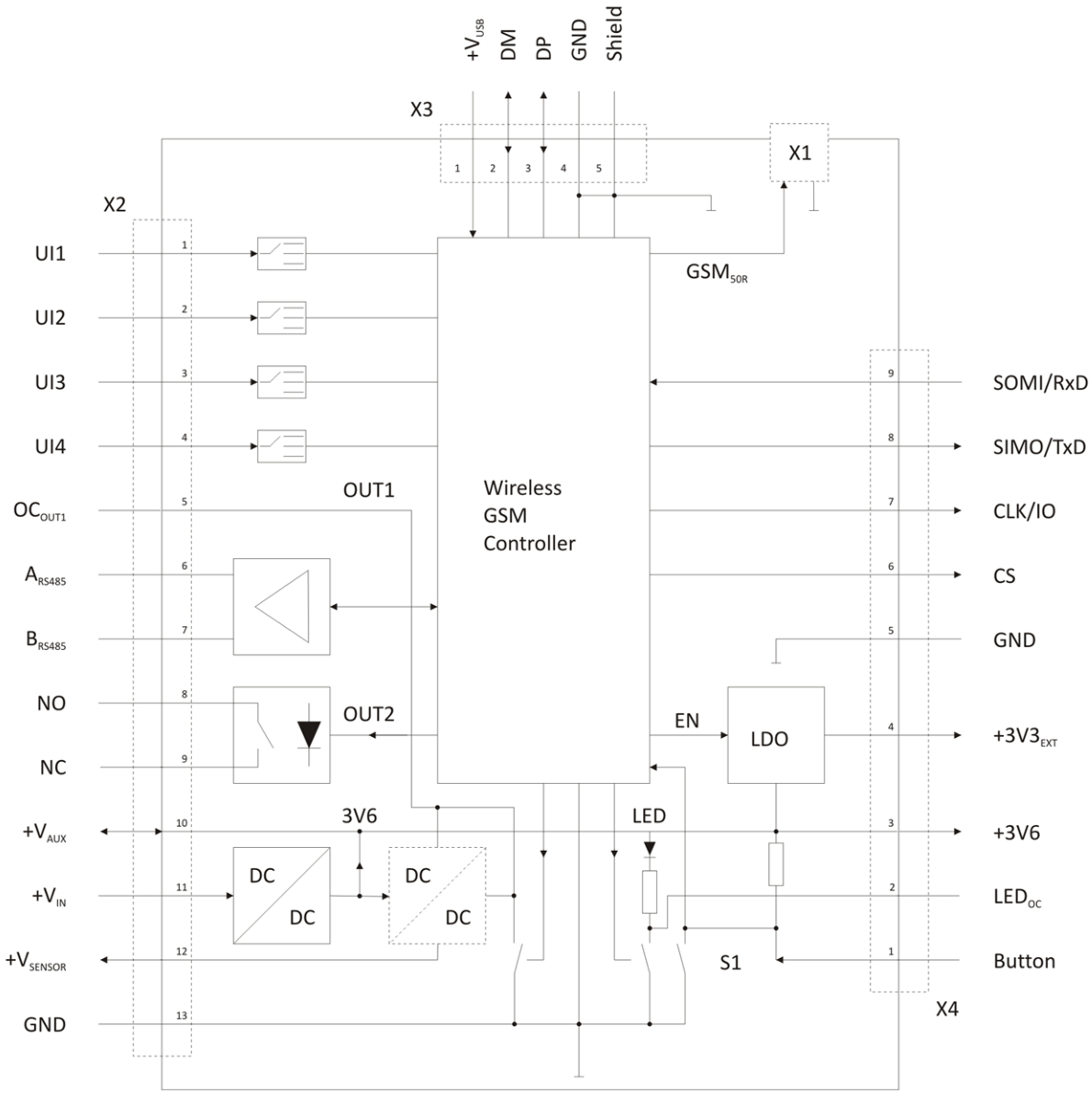
Front of the EASY PCB E230



Rear of the EASY PCB E230

1	13-pin JST connector: Main connector X2	5	Pin 1 of the slot for inserting extension modules (X5)
2	Slot for the optional DC/DC converter to generate sensor supply V_{sen} (IC6) (see "Inserting the DC/DC converter to generate the sensor supply Vsensor" on page 64)	6	9-pin JST connector: extension slot/ext. LED/ext. button (X4)
3	Button for initiating ALOHA transmission mode (S1)	7	5-pin JST connector: USB (X3)
4	Status LED for indicating the operating state and error codes (LED1) (see "Status LED" on page 57).	8	U.FL antenna connector of the EASY PCB E230 (X1)

5.2.1 Block diagram of the E230



Block diagram of the E230 module

5.2.2 Main connector X2

Pin	Type	Title	Description
1	I	UI1	Universal input 1
2	I	UI2	Universal input 2
3	I	UI3	Universal input 3
4	I	UI4	Universal input 4
5	O	OC_{OUT1}	Output 1: Open drain [1)]
6	I/O	A_{RS485}	RS485 A
7	I/O	B_{RS485}	RS485 B
8		NO	Output 2: Isolated switch contact
9		NC	
10	I/O	V_{AUX}	3,6V voltage output if the EASY PCB E230 is supplied via V_{IN} Supply voltage input (3,2...4,5V) if no voltage is applied to V_{IN}
11	I	V_{IN}	Supply voltage (4,5...32VDC) for the EASY PCB E230
12	O	V_{SENSOR}	Output 1: Sensor supply [1)2)]
13		GND	Mass

[1)]The V_{sen} sensor supply is always switched at the same time as the "OC" open drain output (see "Block diagram of the developer board" on page 20).

[2)]The V_{sen} sensor supply is only available if one of the optionally available DC/DC converters for generating the sensor supply is installed on your EASY PCB E230 (see "Spare parts and accessories" on page 109).

5.2.3 Extension slot/ext. LED/ext. button X4 and extension slot X5

Pin X4	Pin X5	Type	Title	Description
1	---	I	Button	Contact for connecting an external button for initiating ALOHA transmission mode
2	---	O	LED_{OC}	Open drain output for the external status LED
3	---	O	$3V6_{EXT}$	3,6V supply for the status LED
4	6	O	$3V3_{EXT}$	$3V3_{ext}$ power supply for the extension module
5	5		GND	Mass
6	4	I/O		dependent on the extension module
7	3	I/O		dependent on the extension module
8	2	I/O		dependent on the extension module
9	1	I/O		dependent on the extension module

5.2.4 USB X3

Pin	Type	Title	Description
1	I	V_{USB}	+5V
2	I/O	DM	Data -
3	I/O	DP	Data +
4		GND	Mass
5		Shield	Cable shielding

5.2.5 Device labelling

The type plate is located on the rear of the module and includes the following specifications:

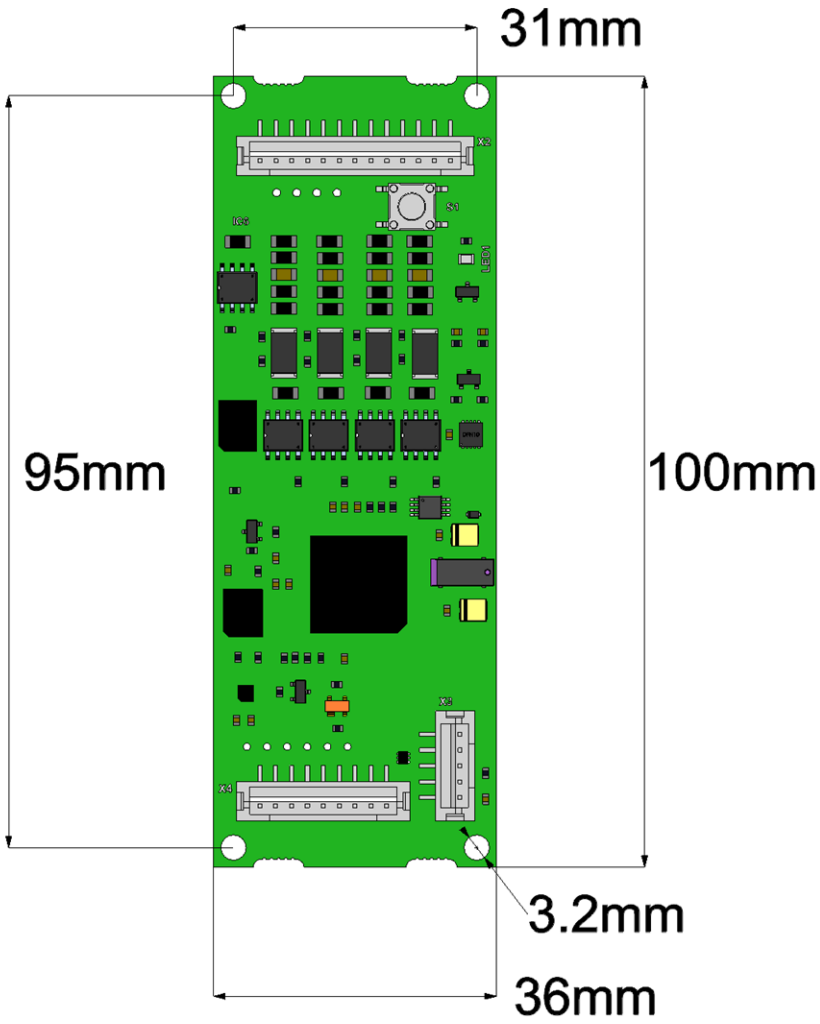
- Type designation
- Serial number
- CE marking
- Hardware revision

The correct specification of the type designation and hardware version is important for all queries and spare part orders. Only then can we process requests promptly and properly.

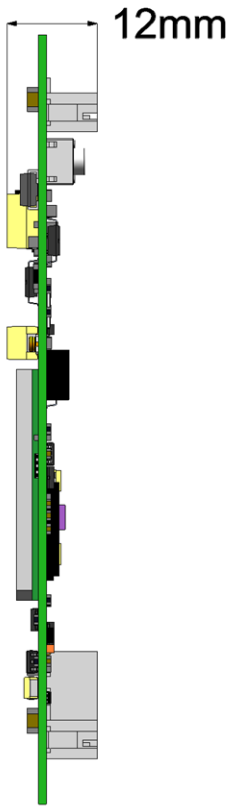


Type plate EASY PCB E230

5.3 Dimensions



Dimensions: Width and depth (view from above)



Dimensions: Height

5.4 Operating elements

The EASY PCB E230 comprises a status LED for indicating the operating state and error codes (LED1), as well as a button for initiating ALOHA transmission mode (S1) (see "Overview" on page 52). As both of these operating elements may not be accessible when the EASY PCB E230 is integrated in customer-specific hardware, an external LED and external button can be connected via connector X4 where required (see "Extension slot/ext. LED/ext. button X4 and extension slot X5" on page 54).

5.4.1 Status LED

The status LED is used both to display the error/status codes and to indicate the current operating state. If the ALOHA transmission mode was activated or the power supply was provided (PowerOn), the status LED shows the current operating state for 10 minutes. During these ten minutes, the error/status codes are transmitted every three seconds.

Error/status codes

Flashing code	Description	Solution/cause
0x	Transport lock (GPRS off, measurement off)	If the ALOHA transmission mode is initiated by the button, the EASY PCB E230 switches back into "RUN" mode (GPRS ON, measurement ON).
1x	Last connection OK	
2x	Last transmission faulty	Try again later
4x	Standby (GPRS ON, measurement OFF)	see "transport lock"
6x	Offline (GPRS OFF, measurement ON)	see "transport lock"
7x	Network block/no matching provider	• Improve position of the antenna • Check whether the device is located in the coverage area of a service provider that is supported by the integrated SIM chip (www.microtronics.at/footprint) • Lift the network block (see "myDatanetDeviceConfig user manual " 206.887)
8x	No GSM network	• Try again later • Improve position of the antenna
10x	No GPRS connection	Improve position of the antenna
11x	No myDataweb server accessible	• Check whether port 51241 is enabled on the myDataweb server • Try again later
12x	Faulty SIM chip	Contact support

Operating states

Status LED	Description
Flickering	Establishing connection
Lights up	GPRS connection established or button actuated
Off	Normal measuring operation according to configuration until the next transmission

5.4.2 Button

The button can be used to initiate the ALOHA transmission mode or to instruct the device to immediately issue the error/status code.

User action	Device response	Operation after releasing the button
Press briefly for approx. one second	Status LED illuminates	Error/status code is displayed (see "Status LED" on page 57)
Press and hold for five seconds	Status LED flashes three times and then remains on	ALOHA transmission mode

5.4.3 External status LED

The EASY PCB E230 includes an open drain output to connect an external status LED ("LED_{OC}" pin on connector X4. see "Extension slot/ext. LED/ext. button X4 and extension slot X5" on page 54). This output is controlled in synchronisation with the status LED installed on the EASY PCB E230 (see "Status LED" on page 57).

A LED and a resistor can be directly connected between $3V6_{EXT}$ and the open drain output LED_{OC}.

Parameter	min.	typ.	max.
$R_{DS(on)}$		0,6Ω	
I_{out}			20mA

5.4.4 External button

A button that can be used in the same way as the button installed on the EASY PCB E230 (see "Button" on page 58) to initiate the ALOHA transmission mode or instruct the device to immediately issue the error/status code can be connected directly between the "Button" pin of connector X4 (see "Extension slot/ext. LED/ext. button X4 and extension slot X5" on page 54) and the GND pin.

Parameter	min.	typ.	max.
V_{IL}	0,75V		1,65V
V_{IH}	1,5V		2,1V

5.5 Technical details

5.5.1 Technical details regarding the energy supply

Depending on the voltage available, there are two options to supply the EASY PCB E230 :

- V_{AUX}: 3,2...4,5V
- V_{IN}: 4,5...32VDC

Both of the voltage inputs are at main connector X2 (see "Main connector X2" on page 54).

5.5.1.1 Supply via V_{IN}

The internal supply voltage (3,6V) is generated by the DC/DC converter of the E230 module (see "Block diagram of the E230 " on page 53). The DC/DC converter is equipped with a soft start function to ensure the load on the energy source is minimised when activated. It therefore takes 50ms until the internal supply voltage has reached its maximum value. If the EASY PCB E230 is supplied via V_{IN}, the V_{AUX} pin of main connector X2 serves as the voltage output for the internal 3,6V supply voltage.

5.5.1.2 Supply via V_{AUX}

The DC/DC converter of the E230 module (see "Block diagram of the E230 " on page 53) is omitted and the supply voltage is fed directly in to the EASY PCB E230 via the V_{AUX} pin of main connector X2 .

5.5.2 Technical details regarding the Modbus interface

The EASY PCB E230 is equipped with a RS485 interface as standard. Optional equipment "myDatalogEASYmbm RS232 SUB-D(f) connection cable " (206.688) can also be used to establish a connection to modbus slaves equipped with a RS232 interface. Simultaneous operation of both of the interfaces is not possible.

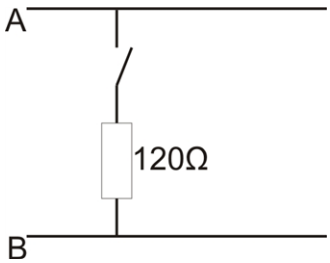
> ***Note:*** *Please note that the compatible interface must be selected in the "Modbus interface" configuration section (see "Modbus interface" on page 97).*

Baud rate	300-115200
Stop bits	1,2
Parity	N, E, O
Data bits	7,8
Modes	RTU ASCII

5.5.2.1 RS485 mode

The signal lines of the RS485 (A, B) on the EASY PCB E230 can be accessed via main connector X2 (see "Main connector X2" on page 54).

The 120Ω load resistance between RS485 A and B can be activated via the "Termination" configuration parameter of the "Modbus interface" configuration section (see "Modbus interface" on page 97). This resistance is located directly in the RS485 driver block of the EASY PCB E230 .



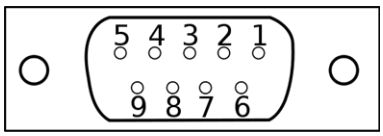
Schematic diagram of the switchable load resistance of the driver block

The EASY PCB Board for developers also includes additional load and clamp resistances that can be connected via dip switch S3 (see "Overview" on page 17).

5.5.2.2 RS232 mode

You will require the optionally available equipment "myDatalogEASYmbm RS232 SUB-D(f) connection cable "(206.688) to connect modbus slaves equipped with a RS232 interface. It comprises the RS232 extension board, the connection cable, a gender changer and a null modem adaptor. The RS232 extension board can either be soldered in the slot for inserting extension modules (X5) (see "Inserting the RS232 extension board" on page 61) or inserted in the customer-specific hardware. In the latter case, the connection between the EASY PCB E230 and the customer-specific hardware (and thus the RS232 extension board) is established via connector X4 (see "Extension slot/ext. LED/ext. button X4 and extension slot X5" on page 54).

Assignment of the Sub-D(f) connector of the myDatalogEASYmbm RS232 SUB-D(f) connection cable "(206.688)



9-pin Sub-D(f)

The direction of the signals corresponds to that of a DTE (e.g. PC).

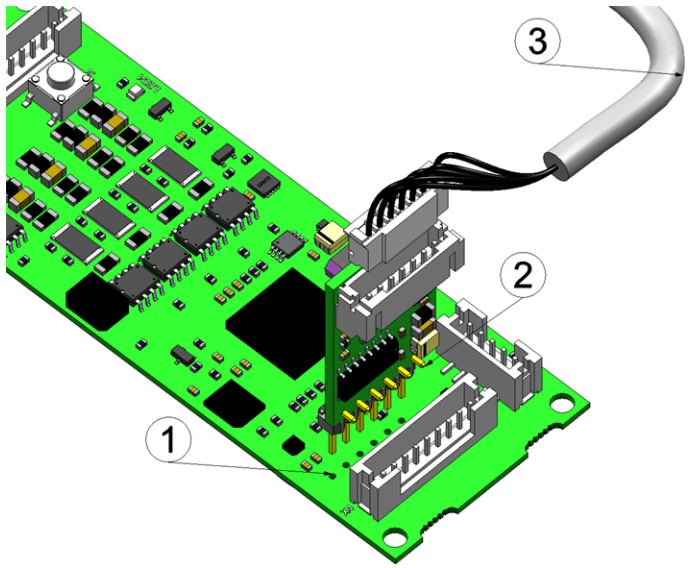
Pin	Signal
1, 7-9	NC
2	RXD
3	TXD
4	DTR
5	GND
6	DSR

The DTR/DSR handshake can be activated via the "DTR handshake" configuration parameter of the "Modbus interface" configuration section (see "Modbus interface" on page 97).

5.5.2.2.1 Inserting the RS232 extension board

Important note:

- *The RS232 extension board must be inserted in the de-energised state.*
- *Improper handling can cause injuries and/or damage to the instruments!*



Inserting the RS232 extension board

1 Pin 1 of the slot for inserting extension modules (X5)	3 RS232 connection cable
2 RS232 extension board (included in the scope of delivery of 206.688)	

1. Connect the RS232 connection cable (3) with the RS232 extension board (2).
2. Then solder the RS232 extension board (2) into the slot for inserting extension modules (X5) of the EASY PCB E230 in accordance with the Figure "Inserting the RS232 extension board" on page 61. The RS232 extension board (2) must be inserted in such a way that the unpopulated side of the board is facing towards the centre of the EASY PCB E230 .

5.5.3 Technical details about the universal inputs

5.5.3.1 0/4 to 20mA mode

Note: *Above 22,5mA, the affected input becomes highly resistive (safety shutdown to prevent damage to the universal input).*

Resolution	6µA
I_{max}	22,5mA
Load	100Ω

5.5.3.2 0 to 2V mode

Resolution	610µV
U_{max}	2,5V
Load	220k1

5.5.3.3 0 to 10V mode

Resolution	8,3mV
U_{max}	32V
Load	8k9

5.5.3.4 Standard digital modes (PWM, frequency, digital, day counter, impulse counter)

General	U_{max}	32V
	Low	‹1,36V
	High	›2,73V
	Load	8k9
PWM	Measurement range	1...99%
	f_{max}	100Hz
	Minimum impulse length	1ms
Frequency	Measurement range	1...1000Hz
Day and impulse counter	Minimum impulse length	20ms

5.5.3.5 Low power digital mode (LP digital)

Important note: *If a universal input is in "LP digital" mode, a switch contact must only be supplied by V_{batt}. Attaching an external voltage will cause damage to the universal input. In comparison to "digital" mode, the energy consumption during "LP digital" mode with a closed switch contact is reduced by a factor of 13.*

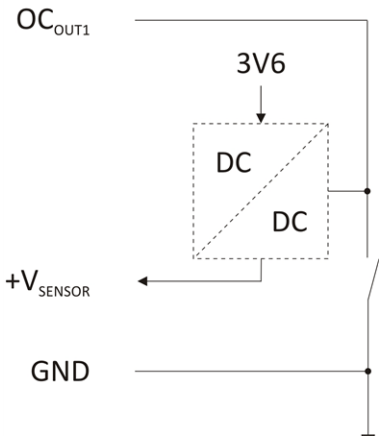
U_{max}	V_{AUX}
Low	‹100mV
High	›200mV
Load	220k1

5.5.4 Technical details about the outputs

5.5.4.1 Output 1: Open drain output (OC_{out1})

I_{max}	2A
U_{max}	32V
R_{on}	0,065Ω
f_{max}	500Hz

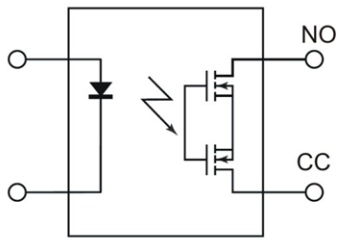
If one of the optionally available DC/DC converters for generating the sensor supply V_{sensor} (see "Spare parts and accessories" on page 109) is installed on your EASY PCB E230 , you must ensure that the sensor supply V_{sensor} is always activated at the same time as the open drain output "OC_{out1}".



Replacement circuit diagram for the open drain output including DC/DC converter for generating the sensor supply V_{sensor}

5.5.4.2 Output 2: Isolated switch contact (NO, CC)

> ***Important note:*** *The user must ensure that the current on the the isolated switch contact does not exceed 130mA.*



Replacement circuit diagram for the isolated switch contact

I_{max}	130mA
U_{max}	32V
R_{on}	35Ω
f_{max}	500Hz

5.5.5 Technical details regarding the sensor supply

> ***Note:*** *The DC/DC converter used to generate the sensor supply V_{sensor} is not assembled as standard and is available as an accessory (see "Spare parts and accessories" on page 109). Installation instructions are provided in the chapter "Inserting the DC/DC converter to generate the sensor supply Vsensor" on page 64.*

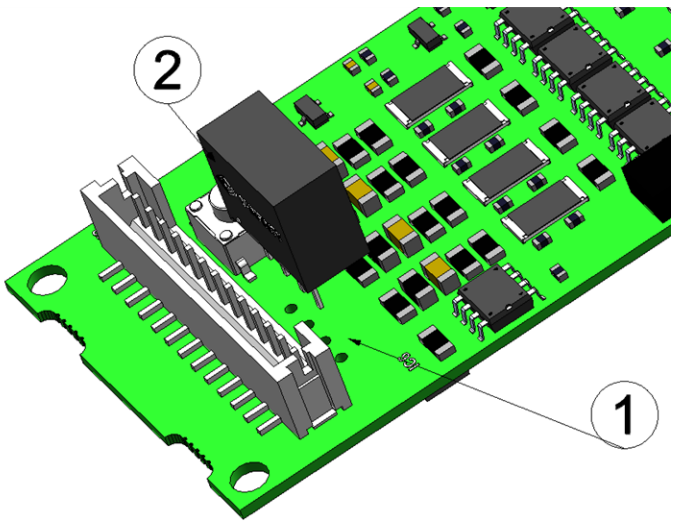
The table below comprises the specifications of the most commonly used DC/DC converters for generating the sensor supply V_{sensor}.

Description	Order number	U	I_{max}	P_{max}
12V DC/DC converter for EASY PCB E2xx	300091	12V	83mA	1W
15V DC/DC converter for EASY PCB E2xx	300092	15V	66mA	1W
24V DC/DC converter for EASY PCB E2xx	300093	24V	41mA	1W

> ***Note:*** *The DC/DC converters that are listed are short-circuit proof.*

As previously mentioned in the chapter "Technical details about the outputs" on page 63, the sensor supply V_{sensor} is always enabled at the same time as the "OC_{out1}" open drain output.

5.5.5.1 Inserting the DC/DC converter to generate the sensor supply V_{sensor}



Inserting the DC/DC converter

1 Slot for the optional DC/DC converter (IC6)	2 DC/DC converter for generating the sensor supply V_{sensor}

Solder in the DC/DC converter for generating the sensor supply V_{sensor} in accordance with the Figure "Inserting the DC/DC converter" on page 64.

Chapter 6 Placing into operation

6.1 Placing the system into operation

1. Once you have completed all of the steps described in chapter "Connecting the sensors, actuators and power supply" on page 44, the EASY PCB E230 is ready for operation and should have already made its first connection to the myDataweb server.
2. Create a site for the operation on the myDataweb server (see "myDataweb-Server user manual " 206.886).

   Note: *A "myDatalogEASYmbm " type site must be created to operate the EASY PCB E230 .*
3. Configure the created site according to your requirements (see "Site configuration" on page 69).
4. Link the EASY PCB E230 with the created site (see "Site" on page 69).
5. Initiate the ALOHA transmission mode via the myDataweb server (see "ALOHA transmission mode" on page 65) so that the configuration of the site is transferred to EASY PCB E230 .

6.2 ALOHA transmission mode

ALOHA transmission mode is a special connection mode whereby the EASY PCB E230 establishes a connection to the myDataweb server for a period of time configured via the "Basic settings" configuration section (see "Aloha/wakeup duration" in chapter "Basic settings" on page 100).

There are two options for initiating the ALOHA transmission mode:

- Directly on the device using a button (see "Button" on page 58).
- Via the myDataweb server if the "Interval & Wakeup" connection type is selected (see "Basic settings" on page 100).



A speech bubble in the measurement device list (see "myDataweb-Server user manual " 206.886) with the title "Aloha" indicates that a device is in ALOHA transmission mode.



Clicking on the speech bubble with the "Aloha" title opens the ALOHA data window (see "myDataweb-Server user manual " 206.886), which comprises the internal "voltage", "GSM level" and "battery" measurement values, as well as the measurement values of the 4 universal inputs. The measurement values for the last thirty minutes are always shown in the ALOHA data window, this can mean that data from a previous ALOHA transmission is included. The ALOHA data is generated every three seconds independently of the normal measurement value and is thus not saved with the standard measurement data.

If a measurement dataset is recorded during ALOHA transmission mode, it is immediately transferred to the myDataweb server and saved in the standard measurement data.

6.3 Testing communication with the device

1. Create a site for the operation on the myDataweb server (see "myDataweb-Server user manual " 206.886).

   Note: *A "myDatalogEASYmbm " type site must be created to operate the EASY PCB E230 .*

2. Configure the created site according to your requirements (see "Site configuration" on page 69).
3. Link the EASY PCB E230 with the created site (see "Site" on page 69).
4. Initiate the ALOHA transmission mode (see "ALOHA transmission mode" on page 65) so that the configuration of the site is transferred to the EASY PCB E230 .
5. Wait until it is indicated in the list of measurement instruments that the device is in ALOHA transmission mode. This is indicated by a speech bubble with the "Aloha" inscription.



The following steps are only required if you simultaneously want to test the measurement value acquisition and data transmission.

6. Stop the ALOHA transmission mode by clicking the cross in the speech bubble with the "Aloha" inscription or wait for the duration of the ALOHA transmission mode. This period can be set in the basic settings (see "Basic settings" on page 100) of the site configuration. The default setting is 10 minutes.
7. Then wire up the sensors (see "Connecting the sensors, actuators and power supply" on page 44) and restart the ALOHA transmission mode.

   Important note: *All cabling work must be performed in the de-energised state.*

8. Check the incoming data in the ALOHA data window of the myDataweb server, which can be accessed by clicking on the speech bubble with the "Aloha" inscription (see "myDataweb-Server user manual " 206.886). Particular attention must be paid to the internal"GSM level" and "battery" measurement values.



Note: *Additional explanation on evaluating the "GSM level":*

"GSM level"	
›-64dBm	
-64 to -73dBm	
-74 to -83dBm	
-84 to -93dBm	
-94 to -107dBm	
‹= -108dBm	

Note: *Additional explanation on evaluating the "Battery":*

"Battery"	
› 3.82V	
3.82V to 3.73V	
3.72V to 3.66V	
3.65V to 3.62V	
3.61V to 3.21V	
‹= 3.2V or invalid value	

Chapter 7 User interface on the myDataweb-Server

7.1 Site configuration

> ***Note:*** *Several of the configuration fields in the following sub chapters may possibly be hidden depending on the respective user level. In this case, please contact the myDataweb-Server administrator.*

Click on the name of the site in the list of sites to get to the input screen for configuring the site (see "myDataweb-Server user manual " 206.886).

7.1.1 Site

Customer
Specifies to which customer the site is assigned.

 **icon**
Assign site to another customer

Name
Site designation (not relevant for the device or data assignment)

Instrument S/N
Serial number of the device that is linked to the site (device assignment!)

7.1.2 Comments

Comments
Empty comment field (is also displayed below the device type in the site list)

7.1.3 Measurement channels

7.1.3.1 Basis

Title 1-4
Freely selectable channel title for the universal inputs

Title 1 wire[1)]
Freely selectable channel title for the external temperature sensor

[1)]The external temperature sensor is not supported by the E230 hardware platform.

Mode

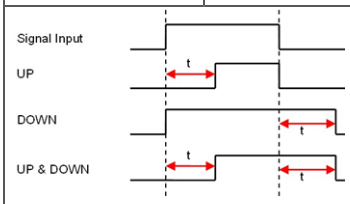
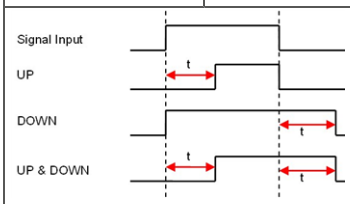
Basic settings for the measurement channel

Universal inputs (digital modes)	*Off*	*---*	*Measurement channel deactivated*
	Digital	*Invert*	*Inverts the input signal*
	Digital LP	*Invert*	*Inverts the input signal*
	Cnt.Day	*Impulse*	*Count value of an impulse in the measuring unit*
		Max	*Defines the upper scale end of the pointer instruments*
		Unit	*String that is used as a measurement unit by all of the server display elements*
		Decimal places	*Number of decimal places that are used by all of the server display elements*
	Cnt.Intervl.	*Impulse*	*Count value of an impulse in the measuring unit*
		Max	*Defines the upper scale end of the pointer instruments*
		Unit	*String that is used as a measurement unit by all of the server display elements*
		Decimal places	*Number of decimal places that are used by all of the server display elements*
	Freq	*Factor*	*Factor by which the input signal is multiplied*
		Min	*Defines the lower scale end of the pointer instruments*
		Max	*Defines the upper scale end of the pointer instruments*
		Unit	*String that is used as a measurement unit by all of the server display elements*
		Decimal places	*Number of decimal places that are used by all of the server display elements*
	PWM	*0%*	*Start of the measurement range in the measuring unit*
		100%	*End of the measurement range in the measuring unit*
		Unit	*String that is used as a measurement unit by all of the server display elements*
		Decimal places	*Number of decimal places that are used by all of the server display elements*

Universal inputs *(analogue modes)*	*0-20mA*	*0%*	*Start of the measurement range in the measuring unit*
		100%	*End of the measurement range in the measuring unit*
		Unit	*String that is used as a measurement unit by all of the server display elements*
		Decimal places	*Number of decimal places that are used by all of the server display elements*
	4-20mA	*0%*	*Start of the measurement range in the measuring unit*
		100%	*End of the measurement range in the measuring unit*
		Unit	*String that is used as a measurement unit by all of the server display elements*
		Decimal places	*Number of decimal places that are used by all of the server display elements*
	0-2V	*0%*	*Start of the measurement range in the measuring unit*
		100%	*End of the measurement range in the measuring unit*
		Unit	*String that is used as a measurement unit by all of the server display elements*
		Decimal places	*Number of decimal places that are used by all of the server display elements*
	0-10V	*0%*	*Start of the measurement range in the measuring unit*
		100%	*End of the measurement range in the measuring unit*
		Unit	*String that is used as a measurement unit by all of the server display elements*
		Decimal places	*Number of decimal places that are used by all of the server display elements*
Ext. temperature sensor	*Off*	---	*Measurement channel deactivated*
	On [1)]	---	

[1)] The external temperature sensor is not supported by the E230 hardware platform.

7.1.3.2 Config

<table>
<tr><td rowspan="11">Universal inputs
(digital modes)</td><td>Off</td><td>---</td><td colspan="2">---</td></tr>
<tr><td rowspan="6">Digital</td><td>Filter time</td><td colspan="2">Minimum signal length for the signal detection</td></tr>
<tr><td rowspan="4">Decay</td><td colspan="2">Temporal function in the measurement cycle</td></tr>
<tr><td>up</td><td>Minimum signal length for x seconds with a rising edge</td></tr>
<tr><td>down</td><td>Minimum signal length for x seconds with a falling edge</td></tr>
<tr><td>up&down</td><td>Minimum signal length for x seconds with both edges</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Time</td><td colspan="2">Time x, for which the decay modes "up" "down", and "up & down" are used</td></tr>
<tr><td rowspan="5">Digital LP</td><td>Filter time</td><td colspan="2">Minimum signal length for the signal detection</td></tr>
<tr><td rowspan="4">Decay</td><td colspan="2">Temporal function in the measurement cycle</td></tr>
<tr><td>up</td><td>Minimum signal length for x seconds with a rising edge</td></tr>
<tr><td>down</td><td>Minimum signal length for x seconds with a falling edge</td></tr>
<tr><td>up&down</td><td>Minimum signal length for x seconds with both edges</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Time</td><td colspan="2">Time x, for which the decay modes "up" "down", and "up & down" are used</td></tr>
</table>

Universal inputs (Counter modes)	Cnt.Day	Filter time	Minimum signal length for the signal detection	
		Reset at	Reset time of the day counter	
	Cnt.Intervl.	Filter time	Minimum signal length for the signal detection	
		Decay	Temporal function in the measurement cycle	
			Off	Decay deactivated
			min	The minimum of the last x measurement values is recorded.
			max	The maximum of the last x measurement values is recorded.
			avg	The arithmetic mean of the last x measurement values is recorded.
			med	The median of the last x measurement values is recorded.
			rms	The root mean square of the last x measurement values is recorded.
		Time	Time window for the decay. Up to a maximum of 60 measurement values can be used for the calculation (e.g. 1 channel: 60 measurement values; ... 4 channels: 15 measurement values each). To calculate the number of considered measurement values see "Example for explaining the recording, measuring and burst cycles (in conjunction with the decay)" on page 101.	

Universal inputs (Frequency mode 1/2)	Freq (1/2)	Filter time	Minimum signal length for the signal detection	
		Decay	Temporal function in the measurement cycle	
			Off	Decay deactivated
			min	The minimum of the last x measurement values is recorded.
			max	The maximum of the last x measurement values is recorded.
			avg	The arithmetic mean of the last x measurement values is recorded.
			med	The median of the last x measurement values is recorded.
			rms	The root mean square of the last x measurement values is recorded.
		Time	Time window for the decay. Up to a maximum of 60 measurement values can be used for the calculation (e.g. 1 channel: 60 measurement values; ... 4 channels: 15 measurement values each). To calculate the number of considered measurement values see "Example for explaining the recording, measuring and burst cycles (in conjunction with the decay)" on page 101.	
		Hold	Hold the last valid measurement value for x measurement cycles	
			Off	Function deactivated
			1-5	Number of measurement cycles for which the measurement value is held until the error value is issued
			On	In the event of an error, the last valid measurement value is held until a new valid measurement value is present.

Universal inputs (Frequency mode 2/2)	Freq (2/2)	Overflow	Handling measurement range violations	
			Ignore	The measurement value is calculated beyond the range limits.
			Silent cutoff	The measurement value is truncated at the range limits.
			Out of range	• The error value "UF" (underflow) is issued if the measurement value is below the lower limit. • The error value "OF" (Overflow) is issued, if the measurement value is above the upper limit.
			NAMUR borders	• The error value "UF" (underflow) is issued if the measurement value is below the lower limit. • The error value "OF" (Overflow) is issued, if the measurement value is above the upper limit.

Universal inputs (PWM mode 1/2)	PWM (1/2)	Filter time	Minimum signal length for the signal detection	
		Decay	Temporal function in the measurement cycle	
			Off	Decay deactivated
			min	The minimum of the last x measurement values is recorded.
			max	The maximum of the last x measurement values is recorded.
			avg	The arithmetic mean of the last x measurement values is recorded.
			med	The median of the last x measurement values is recorded.
			rms	The root mean square of the last x measurement values is recorded.
		Time	Time window for the decay. Up to a maximum of 60 measurement values can be used for the calculation (e.g. 1 channel: 60 measurement values; ... 4 channels: 15 measurement values each). To calculate the number of considered measurement values see "Example for explaining the recording, measuring and burst cycles (in conjunction with the decay)" on page 101.	
		Hold	Hold the last valid measurement value for x measurement cycles	
			Off	Function deactivated
			1-5	Number of measurement cycles for which the measurement value is held until the error value is issued
			On	In the event of an error, the last valid measurement value is held until a new valid measurement value is present.

Universal inputs (PWM mode 2/2)	PWM (2/2)	Overflow	Handling measurement range violations	
			Ignore	The measurement value is calculated beyond the range limits.
			Silent cutoff	The measurement value is truncated at the range limits.
			Out of range	• The error value "UF" (underflow) is issued if the measurement value is below the lower limit. • The error value "OF" (Overflow) is issued, if the measurement value is above the upper limit.
			NAMUR borders	• The error value "UF" (underflow) is issued if the measurement value is below the lower limit. • The error value "OF" (Overflow) is issued, if the measurement value is above the upper limit.

Universal inputs (0-20mA mode 1/2)	0-20mA (1/2)	Filter time	Temporal averaging for signal smoothing	
		Decay	Temporal function in the measurement cycle	
			Off	Decay deactivated
			min	The minimum of the last x measurement values is recorded.
			max	The maximum of the last x measurement values is recorded.
			avg	The arithmetic mean of the last x measurement values is recorded.
			med	The median of the last x measurement values is recorded.
			rms	The root mean square of the last x measurement values is recorded.
		Time	Time window for the decay. Up to a maximum of 60 measurement values can be used for the calculation (e.g. 1 channel: 60 measurement values; ... 4 channels: 15 measurement values each). To calculate the number of considered measurement values see "Example for explaining the recording, measuring and burst cycles (in conjunction with the decay)" on page 101.	
		Hold	Hold the last valid measurement value for x measurement cycles	
			Off	Function deactivated
			1-5	Number of measurement cycles for which the measurement value is held until the error value is issued
			On	In the event of an error, the last valid measurement value is held until a new valid measurement value is present.

Universal inputs (0-20mA mode 2/2)	0-20mA (2/2)	Overflow	Handling measurement range violations	
			Ignore	The measurement value is calculated beyond the range limits.
			Silent cutoff	The measurement value is truncated at the range limits.
			Out of range	• If the measurement value is above 20.1 mA, the error value "SC" (short cut) is issued.
			NAMUR borders	• If the measurement value is above 20.1 mA, the error value "OF" (overflow) is issued. • If the measurement value is above 21mA, the error value "SC" (short cut) is issued.

Universal inputs (4-20mA mode 1/2)	4-20mA (1/2)	Filter time	Temporal averaging for signal smoothing	
		Decay	Temporal function in the measurement cycle	
			Off	Decay deactivated
			min	The minimum of the last x measurement values is recorded.
			max	The maximum of the last x measurement values is recorded.
			avg	The arithmetic mean of the last x measurement values is recorded.
			med	The median of the last x measurement values is recorded.
			rms	The root mean square of the last x measurement values is recorded.
		Time	Time window for the decay. Up to a maximum of 60 measurement values can be used for the calculation (e.g. 1 channel: 60 measurement values; ... 4 channels: 15 measurement values each). To calculate the number of considered measurement values see "Example for explaining the recording, measuring and burst cycles (in conjunction with the decay)" on page 101.	
		Hold	Hold the last valid measurement value for x measurement cycles	
			Off	Function deactivated
			1-5	Number of measurement cycles for which the measurement value is held until the error value is issued
			On	In the event of an error, the last valid measurement value is held until a new valid measurement value is present.

Universal inputs (4-20mA mode 2/2)	4-20mA (2/2)	Overflow	Handling measurement range violations	
			Ignore	The measurement value is calculated beyond the range limits.
			Silent cutoff	The measurement value is truncated at the range limits.
			Out of range	• If the measurement value is below 3.9 mA, the error value "OL" (open loop) is issued. • If the measurement value is above 20.1 mA, the error value "SC" (short cut) is issued.
			NAMUR borders	• If the measurement value is below 3.6mA, the error value "OL" (open loop) is issued. • If the measurement value is below 3.9 mA, the error value "UF" (under flow) is issued. • If the measurement value is above 20.1 mA, the error value "OF" (overflow) is issued. • If the measurement value is above 21mA, the error value "SC" (short cut) is issued.

Universal inputs (0-2V mode 1/2)	0-2V (1/2)	Filter time	Temporal averaging for signal smoothing	
		Decay	Temporal function in the measurement cycle	
			Off	Decay deactivated
			min	The minimum of the last x measurement values is recorded.
			max	The maximum of the last x measurement values is recorded.
			avg	The arithmetic mean of the last x measurement values is recorded.
			med	The median of the last x measurement values is recorded.
			rms	The root mean square of the last x measurement values is recorded.
		Time	Time window for the decay. Up to a maximum of 60 measurement values can be used for the calculation (e.g. 1 channel: 60 measurement values; ... 4 channels: 15 measurement values each). To calculate the number of considered measurement values see "Example for explaining the recording, measuring and burst cycles (in conjunction with the decay)" on page 101.	
		Hold	Hold the last valid measurement value for x measurement cycles	
			Off	Function deactivated
			1-5	Number of measurement cycles for which the measurement value is held until the error value is issued
			On	In the event of an error, the last valid measurement value is held until a new valid measurement value is present.

Universal inputs (0-2V mode 2/2)	0-2V (2/2)	Overflow	Handling measurement range violations	
			Ignore	The measurement value is calculated beyond the range limits.
			Silent cutoff	The measurement value is truncated at the range limits.
			Out of range	If the measurement value is above 2.01V, the error value "OF" (overflow) is issued.
			NAMUR borders	If the measurement value is above 2.01V, the error value "OF" (overflow) is issued.

Universal inputs (0-10V mode 1/2)	0-10V (1/2)	Filter time	Temporal averaging for signal smoothing	
		Decay	Temporal function in the measurement cycle	
			Off	Decay deactivated
			min	The minimum of the last x measurement values is recorded.
			max	The maximum of the last x measurement values is recorded.
			avg	The arithmetic mean of the last x measurement values is recorded.
			med	The median of the last x measurement values is recorded.
			rms	The root mean square of the last x measurement values is recorded.
		Time	Time window for the decay. Up to a maximum of 60 measurement values can be used for the calculation (e.g. 1 channel: 60 measurement values; ... 4 channels: 15 measurement values each). To calculate the number of considered measurement values see "Example for explaining the recording, measuring and burst cycles (in conjunction with the decay)" on page 101.	
		Hold	Hold the last valid measurement value for x measurement cycles	
			Off	Function deactivated
			1-5	Number of measurement cycles for which the measurement value is held until the error value is issued
			On	In the event of an error, the last valid measurement value is held until a new valid measurement value is present.

Universal inputs (0-10V mode 2/2)	0-10V (2/2)	Overflow	Handling measurement range violations	
			Ignore	The measurement value is calculated beyond the range limits.
			Silent cutoff	The measurement value is truncated at the range limits.
			Out of range	If the measurement value is above 10.05V, the error value "OF" (overflow) is issued.
			NAMUR borders	If the measurement value is above 10.05V, the error value "OF" (overflow) is issued.
Ext. temperature sensor	Off	---	Measurement channel deactivated	
	On [1)]	---		

[1)]The external temperature sensor is not supported by the E230 hardware platform.

7.1.3.3 Alarms

"Digital" or "Digital LP" mode	WA	A "high" at the universal input triggers a "warning".	
	AL	A "high" at the universal input triggers an "alarm".	
	SW	A "high" at the universal input triggers a "fault warning".	
	SA	A "high" at the universal input triggers a "fault alarm".	
All other modes	Warning	Value low	A warning is generated, if the measurement value drops to or below this value.
		Value high	A warning is generated, if the measurement value meets or exceeds this value.
	Alarm	Value low	An alarm is generated, if the measurement value drops to or below this value.
		Value high	An alarm is generated, if the measurement value meets or exceeds this value.
	Hyst %	Hysteresis for all-clear (e.g. hyst = 5%, alarm or warning at 100 -› all-clear at 95)	

7.1.3.4 Trigger

"Digital" or "Digital LP" mode	QU	Fastrecording (recording interval = recording interval / factor)	
	SL	Slow recording (recording interval = recording interval * factor)	
	MS	Start measurement cycle immediately	
	XM	Initiate transmission	
	ON	Activate online mode	
	Edges	Selection of the edge at which the trigger should be initiated	
		rising	Rising edge initiates the trigger.
		falling	Falling edge initiates the trigger.
		both	Both edges initiate the trigger.
All other modes	QU	Fastrecording (recording interval = recording interval / factor)	
	SL	Slow recording (recording interval = recording interval * factor)	
	RO	Switch on recording	
	RF	Switch off recording	
	XM	Initiate transmission	
	ON	Activate online mode	
	Level	Levels for initiating the trigger	
		Greater or equal	The measurement value must be greater or equal to the level to initiate the trigger.
		less or equal	The measurement value must be less or equal to the level to initiate the trigger.

7.1.4 Modbus register 1-32

Note: *Some of the configuration parameters included in this configuration section also affect parameters that are not included in the tab that is currently open. In the following section, this is indicated by the "›" symbol, for example "Basis › Min" means that the "Min" configuration parameter is located in the "Basis" tab.*

7.1.4.1 Basis

Title 1-32

Freely selectable channel title for the modbus register

Mode

Basis settings for the measurement channel:

Off	*Measurement channel deactivated*			
On	*Min*	*Defines the lower scale end of the pointer instruments*		
	Max	*Defines the upper scale end of the pointer instruments*		
	Config › Format *(see "Config." on page 87)*	*Digital*	---	
		Signed	*Unit*	*String that is used as a measurement unit by all of the server display elements*
			Decimal places	*Number of decimal places that are used by all of the server display elements*
		Unsigned	*Unit*	*String that is used as a measurement unit by all of the server display elements*
			Decimal places	*Number of decimal places that are used by all of the server display elements*
		Float	*Unit*	*String that is used as a measurement unit by all of the server display elements*
			Decimal places	*Number of decimal places that are used by all of the server display elements*

7.1.4.2 Config.

Slave Ad.

Address of the modbus slave

Modbus Ad.

Address of the register that should be read

Format

Data type

Digital	*A digital value should be read.*				
	Function	*Read coils (0x01)*			
		Read discrete inputs (0x02)			
Signed	*A signed integer value should be read.*				
	Bit	*16*	*16-bit integer*		
		32	*32-bit integer. Two registers must be read from the modbus slave for this purpose.*		
			Word order	*HI-LO*	*HI word on the lower register address and the LO word on the higher register address*
				LO-HI	*LO word on the lower register address and the HI word on the higher register address*
	Function	*Read holding registers (0x03)*			
		Read input registers (0x04)			
Unsigned	*The integer value to be read is not signed.*				
	Bit	*16*	*16-bit integer*		
		32	*32-bit integer. Two registers must be read from the modbus slave for this purpose.*		
			Word order	*HI-LO*	*HI word on the lower register address and the LO word on the higher register address*
				LO-HI	*LO word on the lower register address and the HI word on the higher register address*
	Function	*Read holding registers (0x03)*			
		Read input registers (0x04)			
Float	*A 32-bit float should be read.*				
	Word order	*HI-LO*	*HI word on the lower register address and the LO word on the higher register address*		
		LO-HI	*LO word on the lower register address and the HI word on the higher register address*		
	Function	*Read holding registers (0x03)*			
		Read input registers (0x04)			

7.1.4.3 Alarms

Warning	Value low	A warning is generated, if the measurement value drops to or below this value.
	Value high	A warning is generated, if the measurement value meets or exceeds this value.
Alarm	Value low	An alarm is generated, if the measurement value drops to or below this value.
	Value high	An alarm is generated, if the measurement value meets or exceeds this value.
Hyst %	Hysteresis for all-clear (e.g. hyst = 5%, alarm or warning at 100 -› all-clear at 95)	

7.1.4.4 Trigger

QU	Fastrecording (recording interval = recording interval / factor)	
SL	Slow recording (recording interval = recording interval * factor)	
RO	Switch on recording	
RF	Switch off recording	
XM	Initiate transmission	
ON	Activate online mode	
Level	Levels for initiating the trigger	
	Greater or equal	The measurement value must be greater or equal to the level to initiate the trigger.
	Less or equal	The measurement value must be less or equal to the level to initiate the trigger.

7.1.5 Modbus register 33-64

7.1.5.1 Basis

Title 33-64

Freely selectable channel title for the modbus register

The significance of the remaining configuration parameters in this configuration section corresponds to the "Modbus register 1-32" configuration section (see "Modbus register 1-32" on page 86).

7.1.6 Modbus output register

Note: *Some of the configuration parameters included in this configuration section also affect parameters that are not included in the tab that is currently open. In the following section, this is indicated by the "›" symbol, for example "Basis › Min" means that the "Min" configuration parameter is located in the "Basis" tab.*

7.1.6.1 Basis

Title 1-32

Freely selectable channel title for the modbus output register

Mode

Basis settings for the output channel:

Off	*Output channel deactivated*			
On	*Min*	*Defines the lower scale end of the pointer instruments*		
	Max	*Defines the upper scale end of the pointer instruments*		
	Config › Format *(see "Config." on page 90)*	*Digital*	*---*	
		Signed	*Unit*	*String that is used as a measurement unit by all of the server display elements*
			Decimal places	*Number of decimal places that are used by all of the server display elements*
		Unsigned	*Unit*	*String that is used as a measurement unit by all of the server display elements*
			Decimal places	*Number of decimal places that are used by all of the server display elements*
		Float	*Unit*	*String that is used as a measurement unit by all of the server display elements*
			Decimal places	*Number of decimal places that are used by all of the server display elements*
	Setpoint	*Output value in the measuring unit*		

7.1.6.2 Config.

Slave Ad.

Address of the modbus slave

Modbus Ad.

Address of the register that should be written to

Format

Data type

Digital	*A digital value must be written.*				
	Function	*Write single coils (0x05)*			
		Write multiple coils (0x0F)			
Signed	*A signed integer value should to be written.*				
	Bit	*16*	*16-bit integer*		
		32	*32-bit integer. Two registers must be written in the modbus slave for this purpose.*		
			Word order	*HI-LO*	*HI word on the lower register address and the LO word on the higher register address*
				LO-HI	*LO word on the lower register address and the HI word on the higher register address*
	Function	*Write multiple registers (0x10)*			
		Write single register (0x06)			
Unsigned	*The integer value to be written is not signed.*				
	Bit	*16*	*16-bit integer*		
		32	*32-bit integer. Two registers must be written in the modbus slave for this purpose.*		
			Word order	*HI-LO*	*HI word on the lower register address and the LO word on the higher register address*
				LO-HI	*LO word on the lower register address and the HI word on the higher register address*
	Function	*Write multiple registers (0x10)*			
		Write single register (0x06)			
Float	*A 32-bit float should to be written.*				
	Word order	*HI-LO*	*HI word on the lower register address and the LO word on the higher register address*		
		LO-HI	*LO word on the lower register address and the HI word on the higher register address*		
	Function	*Write multiple registers (0x10)*			
		Write single register (0x06)			

7.1.7 Calculated channels

Note: *The values of the calculated channels are calculated directly for the data output (display on myDataweb server or download from myDataweb server). They are not saved in the server database.*

7.1.7.1 Basis

Title 1-5

Freely selectable channel title for the calculated channels

Mode

Possible calculation modes for the calculated channels

Off	*---*	*Calculated channel deactivated*
Table	*Min*	*Defines the lower scale end of the pointer instruments*
	Max	*Defines the upper scale end of the pointer instruments*
	Unit	*String that is used as a measurement unit by all of the server display elements*
	Decimal places	*Number of decimal places which are used by all of the server display elements*
Digital	*Invert*	*Inverts the input signal*
+, -, x, /	*Min*	*Defines the lower scale end of the pointer instruments*
	Max	*Defines the upper scale end of the pointer instruments*
	Unit	*String that is used as a measurement unit by all of the server display elements*
	Decimal places	*Number of decimal places which are used by all of the server display elements*



Shifts element down



Shifts element up

7.1.7.2 Calculation

Off	---	Calculated channel deactivated
Table	Source	Selection of the channel from which the input data is used
		Opens the screen for entering the values table (between the table rows is interpolated linearly, values outside of the defined table are extrapolated linearly.)
Digital	Source	Selection of the channel from which the input data is used
	High level	Signal recognition level
+, -, x, /	Source	Selection of the channel from which the input data is used
	+, -, x, /	
	Source	Selection of the channel from which the input data is used

7.1.7.3 Alarm

Note: *The alarm levels for calculated channels can only be evaluated once the device has transmitted the measurement data to the myDataweb server.*

Alarm low	An alarm is generated, if the measurement value drops to or below this value.
Alarm high	An alarm is generated, if the measurement value meets or exceeds this value.
Hyst %	Hysteresis for all-clear (e.g. hyst = 5%, alarm or warning at 100 -› all-clear at 95)

7.1.8 Output channels

7.1.8.1 Basis

Ext warmup time

Indicates the amount of time that an output channel is switched on in "Ext warmup time" mode before the measurement.

Title 1

Freely selectable channel title for the open drain output or the switchable sensor supply, if the optionally available DC/DC converter for generating the V_{sensor} sensor supply is installed

Title 2

Freely selectable channel title for the isolated switch contact

Mode

Basic setting for the output channel

Off	*---*	*Output channel deactivated*
Ext warmup time	*The output channel is switched on "ext warmup time" seconds prior to the measurement. If the value is "0", the output channel is not switched on.*	
Digital	*Invert*	*Inverts the level issued on the device (see "Additional explanation of "Digital" mode" on page 95).*
	Setpoint	*Setpoint (on/off) that should be issued*
Freq	*Factor*	*The setpoint multiplied by the factor equals the frequency in Hertz.*
	Min	*Defines the lower scale end of the pointer instruments*
	Max	*Defines the upper scale end of the pointer instruments*
	Setpoint	*The setpoint multiplied by the factor equals the frequency in Hertz.*
	Unit	*String that is used as a measurement unit by all of the server display elements*
	Decimal places	*Number of decimal places that are used by all of the server display elements*
PWM	*0%*	*Start of the measurement range in the measuring unit*
	100%	*End of the measurement range in the measuring unit*
	Setpoint	*Output value in the measuring unit*
	Unit	*String that is used as a measurement unit by all of the server display elements*
	Decimal places	*Number of decimal places that are used by all of the server display elements*
Impulse	*Factor*	*The setpoint multiplied by the factor equals the impulse/min.*
	Min	*Defines the lower scale end of the pointer instruments*
	Max	*Defines the upper scale end of the pointer instruments*
	Setpoint	*The setpoint multiplied by the factor equals the impulse/min.*
	Unit	*String that is used as a measurement unit by all of the server display elements*
	Decimal places	*Number of decimal places that are used by all of the server display elements*

Note:

Additional explanation of "Digital" mode

Invert	*Setpoint*		*Output on the device*
Off	*Off*	=	*Off (low)*
Off	*On*	=	*On (high)*
On	*Off*	=	*On (high)*
On	*On*	=	*Off (low)*

7.1.8.2 Config

Off	---	
Ext warmup time	---	
Freq	---	
PWM	---	
Impulse	Duration	Duration of an output impulse

7.1.9 Internal channels

7.1.9.1 Basis

Voltage title	Freely selectable channel title for V_{in} (supply voltage)	
	Unit	String that is used as a measurement unit by all of the server display elements
Battery title	Freely selectable channel title for V_{AUX} (internal supply voltage)	
	Unit	String that is used as a measurement unit by all of the server display elements
GSM level title	Freely selectable channel title for the GSM level	
	Unit	String that is used as a measurement unit by all of the server display elements
Int. temperature title	Freely selectable channel for the internal device temperature	
	Unit	Selection of the temperature unit used by all of the server display elements

7.1.9.2 Alarms

Warning	Value low	A warning is generated, if the measurement value drops to or below this value.
	Value high	A warning is generated, if the measurement value meets or exceeds this value.
Alarm	Value low	An alarm is generated, if the measurement value drops to or below this value.
	Value high	An alarm is generated, if the measurement value meets or exceeds this value.
Hyst %	Hysteresis for all-clear (e.g. hyst = 5%, alarm or warning at 100 -› all-clear at 95)	

7.1.9.3 Trigger

QU	Fastrecording (recording interval = recording interval / factor)	
SL	Slow recording (recording interval = recording interval * factor)	
RO	Switch on recording	
RF	Switch off recording	
XM	Initiate transmission	
ON	Activate online mode	
Level	Levels for initiating the trigger	
	Greater or equal	The measurement value must be greater or equal to the level to initiate the trigger.
	Less or equal	The measurement value must be less or equal to the level to initiate the trigger.

7.1.10 Modbus interface

Interface

Selection of the interface that should be used for the modbus communication.

RS485	*Retry*	*In the event of a communication error, the corresponding command is repeated once. The error is only indicated if this second attempt also fails.*	
	Baud rate	*300*	*Selection of the required baud rate*
		600	
		1200	
		2400	
		4800	
		9600	
		19200	
		38400	
		57600	
		115200	
	Stop bits	*1*	*Selection of the required stop bits*
		2	
	Parity	*None*	*Selection of the required parity*
		Odd	
		Even	
	Data bits	*7*	*Number of data bits to be used*
		8	
	Termination	*Activates the 120Ω load resistance between RS485 A and B*	
	Mode	*RTU*	*Data is transferred in binary format.*
		ASCII	*Data is transferred in ASCII format.*
	Response timeout	*Time during which the modbus slave must react to the command from the EASY PCB E230 developer package*	

RS232 [1)]	*Retry*	*In the event of a communication error, the corresponding command is repeated once. The error is only indicated if this second attempt also fails.*	
	DTR handshake	*Activates the DTR hardware handshake*	
	Baud rate	*300*	*Selection of the required baud rate*
		600	
		1200	
		2400	
		4800	
		9600	
		19200	
		38400	
		57600	
		115200	
	Stop bits	*1*	*Selection of the required stop bits*
		2	
	Parity	*None*	*Selection of the required parity*
		Odd	
		Even	
	Data bits	*7*	*Number of data bits to be used*
		8	
	Mode	*RTU*	*Data is transferred in binary format.*
		ASCII	*Data is transferred in ASCII format.*
	Response timeout	*Time during which the modbus slave must react to the command from the EASY PCB E230 developer package*	

[1)] Order option "myDatalogEASYmbm RS232 SUB-D(f) connection cable (206.688)" required

7.1.11 Alarm settings

Acknowledgement	Standard	The global server setting is used (see "myDataweb-Server user manual " 206.886) to determine whether to acknowledge alarms automatically or manually.
	Automatic	Alarms are acknowledged automatically as soon as all of the messages have been sent. If SMS that have a tariff with a delivery confirmation function have also been sent, acknowledgement is provided after delivery confirmation.
	Manual	Alarms must be acknowledged by the user.
Offline alarm	Alarm in the event that the device does not respond for longer than the set transmission cycles	
Transfer volumes	Standard	The configuration for the transfer volume alarm is adopted from the global server setting (see "myDataweb-Server user manual " 206.886).
	Off	The transfer volume alarm is deactivated.
	Individual	The level at which the transfer volume alarm should be triggered can be entered in the adjacent field in KB.
On alarm	A	The alarm is recorded in the alarm list.
	Ü	An immediate transmission is initiated.
On warning	A	The alarm is recorded in the alarm list.
	Ü	An immediate transmission is initiated.
On fault alarm	A	The alarm is recorded in the alarm list.
	Ü	An immediate transmission is initiated.
On fault warning	A	The alarm is recorded in the alarm list.
	Ü	An immediate transmission is initiated.
Test alarm	A test message is sent to all recipients ("parallel" alarm call plan type) and/or the first recipient ("serial" alarm call plan type) as soon as this page is saved. The check box is subsequently reset automatically.	

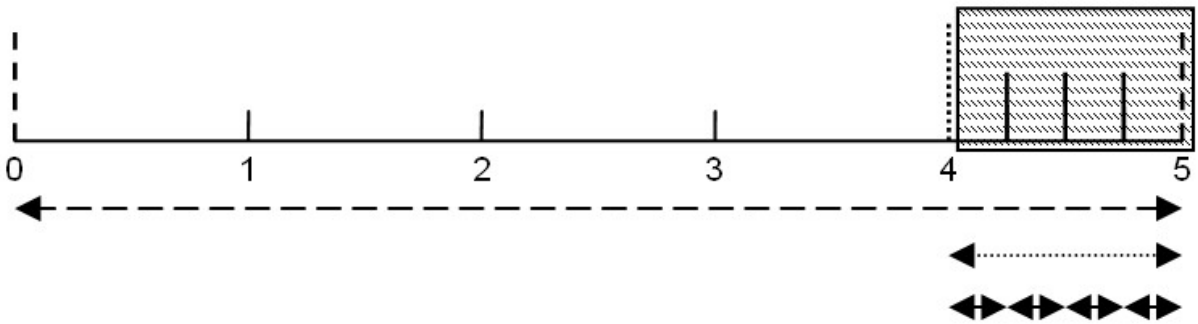
7.1.12 Basic settings

Connection type	Cycle	The device registers in the transmission cycle
	Cycle & wakeup	The device registers in the transmission cycle and can be placed into the ALOHA transmission mode via the server. 
	Online	The device does not disconnect the connection and continuously transmits the measurement data.
Aloha/wakeup duration	Aloha/wakeup duration connection	
Transmission cycle	Time between transmissions	
Recoding cycle	Time between measurement data recordings	
Measure quick divisor	Recoding cycle = recording cycle / factor (from triggering)	
Measure slow factor	Recoding cycle = recording cycle * factor (from triggering)	
Measurement cycle	Time between measurements (00:00 same as recoding cycle)	
Burst cycle	Period of time, during which measurement intervals are used for measuring, before recording begins. (00:00 measurement cycle is permanently activated)	
Time zone	Regional setting (not relevant for raw measurement data as this is stored in the UTC)	
Daylight saving time	Configuration for automatic time adjustment	
	Standard	The configuration for the time adjustment is adopted by the global server setting (see "myDataweb-Server user manual " 206.886).
	Off	Automatic time adjustment deactivated
	USA	Predefined setting for the American area
	EU	Predefined setting for the European area
Position cycle	Time between position update	
Default view	Report, which is loaded into the map by clicking on the device link	

Note:

Example for explaining the recording, measuring and burst cycles (in conjunction with the decay)

Basic setting		*Recoding cycle*	*5 min.*
		Burst cycle	*1 min.*
		Measurement cycle	*15 sec.*
Measurement channels -> Config.		*Decay*	*Med*
		Time	*60 sec.*



Measured value formation: The last four measurement values are used to determine the median and recorded as the measurement value.

Note: *Additional explanation of the connection types*

Connection type	*Energy consumption*	*Data volumes*	*Response time*
Online			
Cycle & wakeup			
Cycle			

7.1.13 FTP export settings

Note: *This configuration section is only visible if the "FTP Agent Extended" licence for the myDataweb-Server has been enabled.*

FTP export profile	off	FTP export deactivated
	"Name of an FTP export profile"	List with the FTP export profiles that were created on the myDataweb-Server (for creating an FTP export profile, see "myDataweb-Server user manual " 206.886).
Settings of the selected profile	shows an overview of the most important parameters of the selected FTP export profile	
FTP directory	makes overwriting the standard directory of the selected FTP export profile possible	

7.2 Device configuration

> ***Note:*** *Several of the configuration fields in the following sub chapters may possibly be hidden depending on the respective user level. In this case, please contact the myDataweb-Server administrator.*

You can reach the input screen for configuring the device by clicking on the serial number in the site list (see "myDataweb-Server user manual " 206.886) or by clicking on the device name in the device name list (see "myDataweb-Server user manual " 206.886).

7.2.1 Comments

Comments

Empty comment field (is also displayed below the site name in the measurement instrument list)

7.2.2 Measurement instrument

Customer	Name of the customer to whom the measurement instrument is assigned
IMSI	IMSI of the used SIM chip or SIM card
Serial number	Serial number of the instrument
Instrument class	The instrument class of the site and instrument must match for an instrument to be able to be connected to a site.
Telephone number	Telephone number of the SIM card. The control SMS messages (e.g. wakeup) are sent to this number. Format: +43555837465
Instrument flags	Additional information on the instrument class (for internal use)
Firmware version	Current software version installed on the measurement controller
Modem version	Current software version installed on the modem controller
OS version	OS version of the modem

Last connection	In each case, the last time stamp of the affected operation	
Last wakeup		
Last disconnection		
Last transmission error		
Last Aloha connection		
Firmware update	Off	Firmware update is deactivated
	On	As soon as a new version of the selected firmware type is available, this is installed immediately.
	Even if tag is missing	Firmware is also transmitted to the device if the device has not transmitted the current firmware version to the server. (NOT RECOMMENDED!)
	Allow downgrade	Facilitates the installation of an older firmware version than the one on the device. (NOT RECOMMENDED!)
	Once	Performs a single firmware update. If no new firmware is available or the firmware was installed successfully, the firmware update is automatically switched to "OFF".
Firmware type	Released	Only firmware versions that have successfully undergone internal and field testing are installed (this practically eliminates malfunctions).
	Release candidate	Only firmware versions that have successfully undergone internal testing are installed (malfunctions cannot be excluded).
	Beta release	Even firmware versions that have not successfully undergone all of the internal tests are installed (malfunctions may occur).

7.2.3 Device-specific settings

Operating type	HOLD	Measurement: OFF, transmission: ON
	RUN	Measurement: ON, transmission: ON
	OFF	Measurement: OFF, transmission: OFF
	OFFLINE	Measurement: ON, transmission: OFF
	Aloha	Reserved for internal use
Accu type	Charging rule for the accu used [1)]	

[1)] The current charging rule is not supported by the E230 hardware platform.

7.2.4 GPRS

SIM tariff

Selected SIM tariff

Chapter 8 Troubleshooting and repair

8.1 General problems

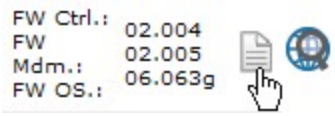
Problem	Cause/solution
Device does not respond (status LED always off).	Check the cable connections (see "Connecting the sensors, actuators and power supply" on page 44)
Communication problems	• Evaluate the status LED blink code (see "Status LED" on page 57). • Load the device log from the EASY PCB E230 or the myDataweb server and use myDatanetDeviceConfig for the evaluation (see "Evaluating the device log" on page 106).
Not all or no data is available on the server	• The connection was interrupted during transmission, which is indicated by a time-out entry in the connection list (see "myDataweb-Server user manual " 206.886). Solution Initiate a ALOHA transmission or wait for the next cyclical transfer. • The assignment of the device and site is not correct (see "Site" on page 69).
Data at universal input is not plausible.	• Check whether the universal input configuration matches the sensor output signal (see "Measurement channels" on page 69). • Check the filter settings of the universal input (see "Measurement channels" on page 69). • The simulation circuits of the developer board were not isolated from the EASY PCB E230 by means of the relevant solder bridges (see "Circuits to simulate the sensors" on page 33).
The measurement value cannot be changed via the potentiometer of the simulation circuits:	• The solder bridges used to isolate the simulation circuits of the developer board from the EASY PCB E230 were opened (see "Circuits to simulate the sensors" on page 33). • The EASY PCB Board for developers is supplied via V_{batt}. The simulation circuits only work if supplied via V_{in}.
No or incomplete data for the modbus register	• Check the cable connections (see "Connecting the sensors, actuators and power supply" on page 44) • Check that a compatible interface (RS232 or RS485) was selected (see "Modbus interface" on page 97). • Check the settings of the load and clamp resistances of dip switch S3 (see "RS485 mode" on page 21). • Ensure that the load resistance of the RS485 driver block of the EASY PCB E230 and one of the load resistances via dip switch S3 have not been activated at the same time.

Problem	Cause/solution
An analogue channel alarm status has not been identified.	Increase the measurement cycle
Alarm status was not transmitted although the data is present.	• Check the alarm settings of the measurement channel • The connection was interrupted during transmission, which is indicated by a time-out entry in the connection list (see "myDataweb-Server user manual " 206.886). Solution Initiate a ALOHA transmission or wait for the next cyclical transfer.
Alarm message was not sent although the alarm was signalled.	• Check the settings of the alarm call plan (see "myDataweb-Server user manual " 206.886). • Check the address data of the alarm call plan (see "myDataweb-Server user manual " 206.886).
Isolated switch contact is not working.	• Disruption to the voltage that is conducted via the isolated switch contact. • The site settings were overwritten by a server-PLC.
Relay K1 does not switch.	• The EASY PCB Board for developers is supplied via V_{batt}. Relay K1 only works if supplied via V_{in}. • Jumper X23 was not set correctly or the solder bridge used to isolate jumper X23 from the "OC" open drain output was opened (see "Output 1: "OC" open drain" on page 32).
Buzzer LS1 does not work.	Jumper X23 was not set correctly or the solder bridge used to isolate jumper X23 from the "OC" open drain output was opened (see "Output 1: "OC" open drain" on page 32).
The value set via the input screen on the myDataweb server is not issued at the output channel.	The site settings were overwritten by a server-PLC.

8.2 Evaluating the device log

8.2.1 Evaluating the device log on the myDataweb server

The last 300 log entries on the myDataweb server can be called up via the button shown below that is located in the measurement device list. As the log entries are sent to the server in the transmission cycle in the same way as the measurement data, only the log entries up to the last server connection are available.



The manual for the server ("myDataweb-Server user manual " 206.886) includes a detailed description of the evaluation of the device log on the myDataweb server.

8.2.2 Evaluating the device log using myDatanetDeviceConfig

The myDatanetDeviceConfig program can be used to read all of the stored log entries, including those that have not yet been transferred to the myDataweb server, directly from the EASY PCB E230 developer package via the USB interface.

A more detailed description about the evaluation of the device log using myDatanetDeviceConfig is included in the user manual for the myDatanetDeviceConfig ("myDatanetDeviceConfig user manual " 206.887).

Chapter 9 Spare parts and accessories

9.1 EASY PCB module

Description	Quantity	Order number
EASY PCB E230	1	300048

9.2 Extension module

Description	Quantity	Order number
myDatalogEASYmbm RS232 SUB-D(f) connection cable	1	206.688

9.3 DC/DC converter for generating the sensor supply V_{sensor}

Description	Quantity	Order number
12V DC/DC converter for EASY PCB E2xx (U:12V, I_{max}:83mA, P_{max}:1W)	1	300091
15V DC/DC converter for EASY PCB E2xx (U:15V, I_{max}:66mA, P_{max}:1W)	1	300092
24V DC/DC converter for EASY PCB E2xx (U:24V, I_{max}:41mA, P_{max}:1W)	1	300093
12V upgrade option for EASY PCB E2xx [1] (U:12V, I_{max}:83mA, P_{max}:1W)	1	300094
15V upgrade option for EASY PCB E2xx [1] (U:15V, I_{max}:83mA, P_{max}:1W)	1	300095
24V upgrade option for EASY PCB E2xx [1] (U:24V, I_{max}:41mA, P_{max}:1W)	1	300096

[1] The corresponding DC/DC converter is installed by the manufacturer if a EASY PCB E230 is ordered with one of these order options.

9.4 Antennas

Description	Quantity	Order number
Magnetic roof antenna SMA	1	300085
Extension for ANT900 SMA	1	206.807

9.5 Power supply

Description	Quantity	Order number
NG24	1	213.814
Snap-on primary plug EU for chargers/power supplies [1)]	1	300027
Snap-on primary plug UK for chargers/power supplies [1)]	1	300028
Snap-on primary plug US for chargers/power supplies [1)]	1	300029
Snap-on primary plug AUS for chargers/power supplies [1)]	1	300030

[1)] Not suitable for the plug-in power supply included in the standard scope of supply of the developer package (300072).

9.6 Adapter

Description	Quantity	Order number
Gender-Changer 9pol. D-Sub male/male	1	206.684

9.7 Cable sets

Description	Quantity	Order number
JST cabel set with open cable ends for EASY PCB E2xx	1	300079
JST cable set JST to JST for EASY PCB E2xx	1	300080

9.8 Other accessories

Description	Quantity	Order number
myDatanet Tool Pen	1	206.646

Chapter 10 Contact information

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