

Babylon **Uranus XMP**
Building automation (GA)

**XMP-GA modules
Installation
manual**



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1 Safety remarks

This documentation contains all necessary information for installation of the **XMP-GA-BOX and XMP-GA-Modules**. The documentation is directed on qualified personal with expert knowledge in electrical installations.

During operation of the **XMP-GA-BOX or XMP-GA-Modules** certain components of the devices carry dangerous voltage. Please pay attention on that. Disregarding the safety guidelines of this documentation can occur serious personal injuries and also material damage.

The installation and setup of the devices should be done by instructed personnel.

For error-free regular operation the safety-technical aspects, professional mounting and maintenance of the device is important.

Wiring of the **XMP-GA-BOX** and the **XMP-GA-Modules** connected on it the corresponding VDE instructions have to be considered. An adequate distance to high voltage or high-frequency wires of other electrical devices must be guaranteed.

2 General

The flexible building automation modules offer the optimal solution during the planning of automation systems of any magnitudes. By arbitrary adding on each other the input and output modules the projects can be realized in very easy and fast manner. Subsequent project enlargements can be transformed without any problems.

The free scaleable substation **XMP-GA-BOX** is used for the control of up to 16 arbitrary selectable input and/or output modules (**XMP-GA modules**) with up to 192 datapoints or up to individual room controller **XMP-IRC**. The application memory is large enough to control up to 7 air conditioning devices.

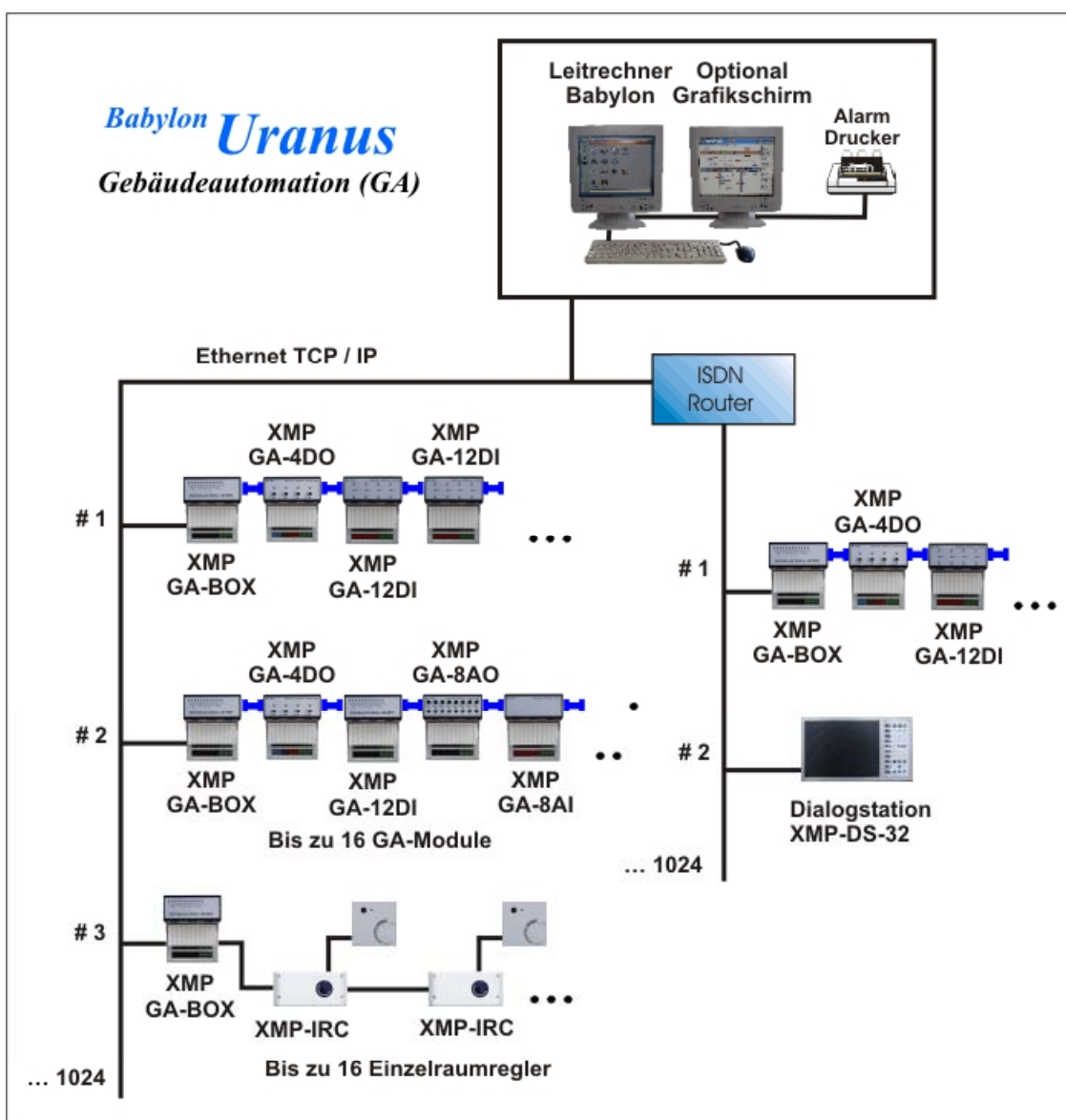


Fig. 1: System overview of the building automation modules XMP-GA

3 Installation principle

The decentral controller **XMP-GA-BOX** and the input/ output modules **XMP-GA modules** are plugged onto module sockets which must be fixed on a mounting rail.

The connection socket is equipped with spring clamps which simplify the connection of sensors and positioning elements. Because of the modular structure it is possible to remove individual input or output modules without disturbing the function of the other modules.

Integrated disconnecting clamps allow the interruption of single inputs/outputs during commissioning or maintenance of the installation.

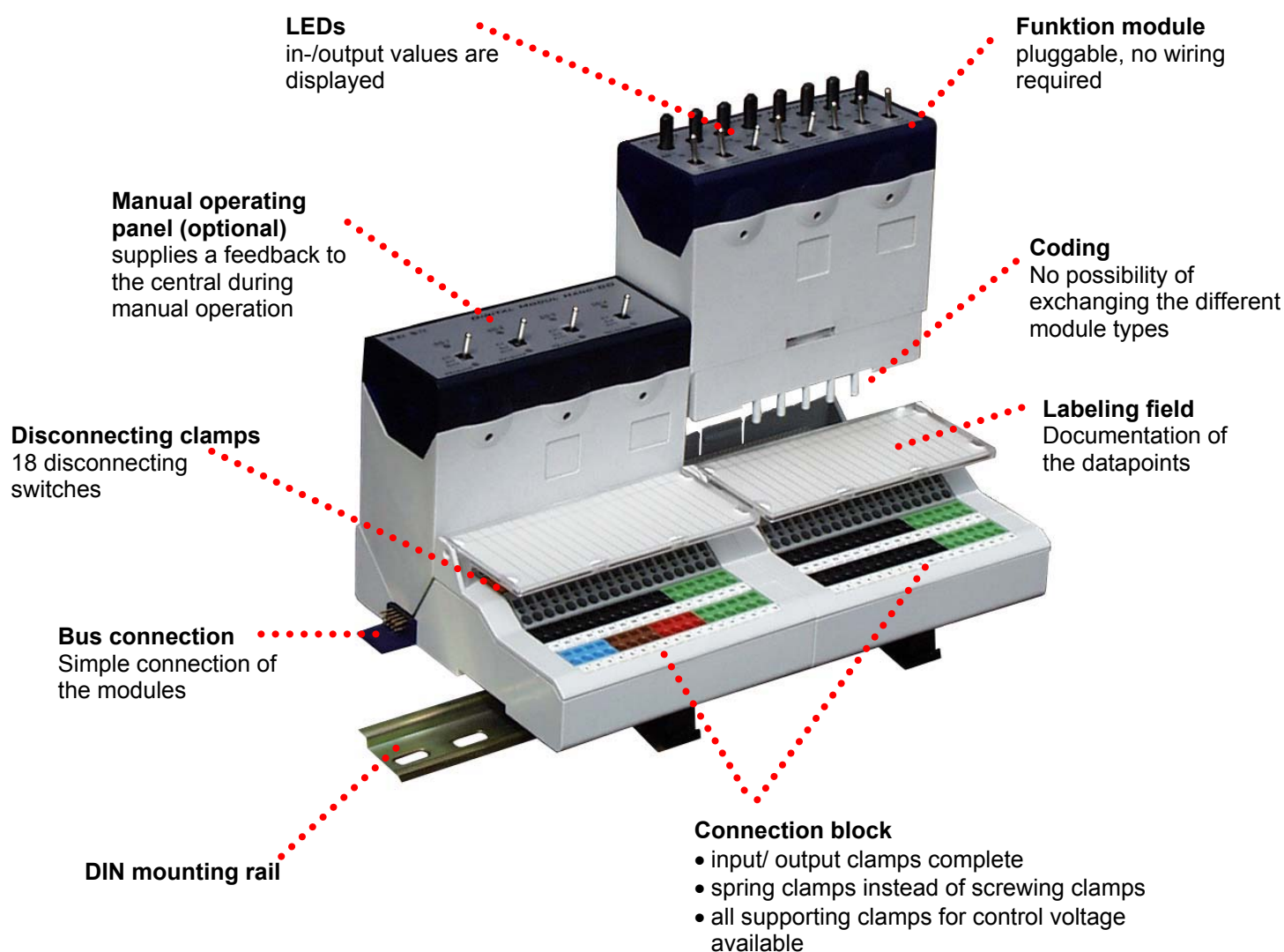


Fig. 2: Installation of the building automation modules XMP-GA

4 The substation XMP-GA BOX

Technical data	
	
Dimensions (Casing):	length: 135 mm, width: 114.5 mm, height: 150 mm.
Voltage supply:	24 V AC ± 5% (alternating voltage)
Current consumption:	max. 100 mA for 24 V AC in idle motion (without connected GA modules)
Power consumption:	Approx. 2 W in idle motion (without connected GA modules)
Interface GA modules:	RS485 9600 Baud asynchronous
Interface host computer:	10 Mbit Ethernet TCP/IP protocol
Processor:	NEC 70320 (V25), 16 bit word length, 7.4 MHz clock frequency, CMOS design
Data memory:	512 kB SRAM
Program memory:	1024 kB flash EPROM
Clock:	Realtime clock 4Bit parallel I/O, battery buffered
Battery:	Lithium battery 3,0 V with socket Power supply for memory and clock in case of power failure for at least 6 months; The battery should be exchanged every 3-5 years.

Environment conditions:	During operation: 0 to 50°C (32 to 122°F) Storage: -40 to 70°C (-40 to 158°F) 5 - 95% relative humidity, non-condensing
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4.1 First commissioning of the XMP-GA-BOX

The **XMP-GA BOX** is equipped with light-emitting diodes for diagnosis and status displays of the device.

After powering-on the device all LEDs are switched on for about 2 seconds. Afterwards the XMP-GA box firmware will perform some basic tests.

1. The processor tests itself.
2. The flash Eprom is tested.
3. The RAM is tested for possibly defective memory positions.

If all tests are finished with positive results the **XMP-GA-BOX** will change into operation state.

Meaning of the light-emitting diodes during operation state

During operation state the four red light-emitting diodes **WATCHDOG**, **CLOCK**, **IO-SCAN** and **CONTROL** blink periodically.

The green light-emitting diode **IP-STATUS** blinks fast (approx. 5 times per second).

The light-emitting diode **MODUL TX** and **MODUL RX** indicate the data transfer via the serial interface between **XMP-GA BOX** and the GA modules.

- **MODUL TX** → data are transmitted from the XMP-GA BOX to the GA modules
- **MODUL RX** → data are received by the XMP-GA BOX

The LEDs **IP-STATUS**, **IP-CONFIG**, **IP-TX** and **IP-RX** indicate the data transfer of the Ethernet interface (host computer interface).

- **IP-STATUS** → the blink frequency indicates whether an IP address is stored
- **IP-CONFIG** → parameters are received by the XMP-GA BOX
- **IP-TX** → data are transmitted from the XMP-GA BOX to the host computer
- **IP-RX (D21)** → data are received by the hostcomputer

4.2 Connection of the XMP-GA BOX to the host computer

The communication between the **XMP-GA BOX** and the host computer is realized by a standard LAN network (TCP/IP protocol). This kind of installation is already available in a majority of buildings – conditioned by the use of computer connections.

The **XMP-GA BOX** has a world-wide unique MAC address. At the front-side it is equipped with a standard RJ45 connection socket for network cable.



Fig. 3: Connection socket of the XMP-GA BOX

Typical distances between network participants:

RG 58 cable	Up to 100m cable length
RG-8/RG-11 cable	Up to 500m cable length

4.3 Setting the hardware address of the XMP-GA BOX

On the backside of the XMP-GA-BOX are three dip-switch blocks (SW1 ... SW3).

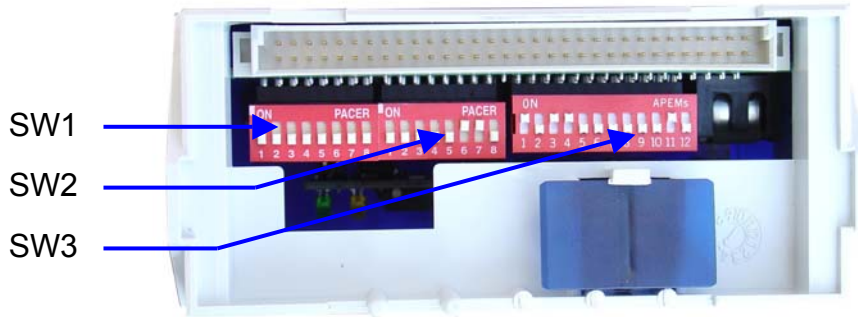


Fig. 4: Backside of the controlling component of the the XMP-GA BOX

All switches of the dip-switch block SW1 as well as the switches 1 and 2 of the dip-switch block SW2 can be used for setting the hardware address of the **XMP-GA BOX**.

HINT:

Up to 1024 addresses are possible.

Examples :

Hardware address 0	SW1 : switch 1 to 8 = OFF SW2 : switch 1 and 2 = OFF
Hardware address 5	SW1 : switch 1 = ON SW1 : switch 2 = OFF SW1 : switch 3 = ON SW1 : switch 4 to 8 = OFF SW2 : switch 1 and 2 = OFF

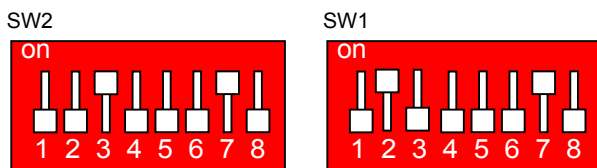


Fig. 5: Hardware address 580

HINT:

To get the correct dip-switch settings for higher hardware addresses it is meaningful to use the scientific calculator (Windows accessories). Here it is possible to convert the address into a binary switch setting.

4.4 Setting the IP network address of the XMP-GA BOX :

In delivery status the **XMP-GA BOX** has no IP address. After power-on the green light-emitting diode **IP-STATUS** blinks approx. **5 times per second** (fast).

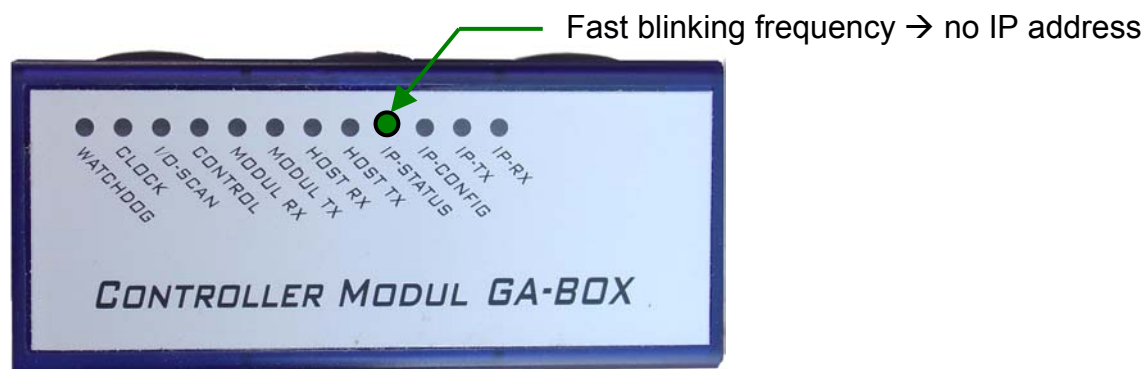


Fig. 6: Light-emitting diodes of the XMP-GA BOX without IP address

For setting the IP address the BABYLON utility program **U3SIP.EXE** must be activated (**U3SIP.EXE** belongs to the scope of delivery of the BABYLON basis software CD).

The command input must be realized as follows:

U3SIP [hardware address of the XMP-GA BOX] [TCP/IP address in the network]

Example:

The **XMP-GA BOX** with the hardware address **4** shall get the IP-Adresse **129.0.0.108** within the network.

Command → U3SIP 4 129.0.0.108

HINT:

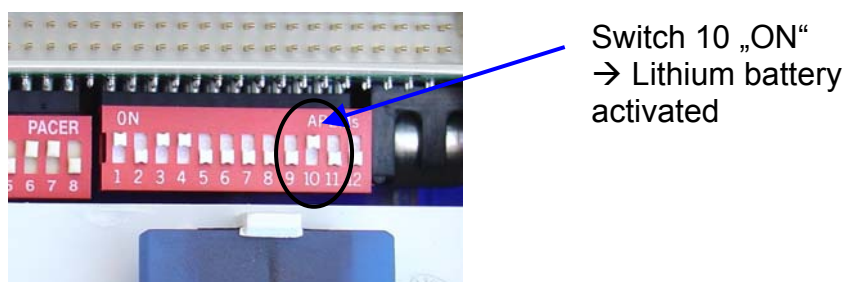
After successful setting of the IP address the blinking frequency of the light-emitting diode **IP-Status** will be reduced on about **2 times per second**.

4.5 Activating of the battery (buffering of memory data)

In delivery status the Lithium battery is separated from the circuit.

For activating the battery the switch 10 of the dip-switch block SW3 must be set on "ON" before powering-on the **XMP-GA Box**.

The battery supplies the RAM memory and the real-time clock in case of power failure for about 6 months. The **XMP-GA BOX** supervises the charge condition of the battery permanently and releases an alarm in case of an battery voltage falldown below 2.6 Volts (see also BS attribute)



Switch 10 „ON“
→ Lithium battery
activated

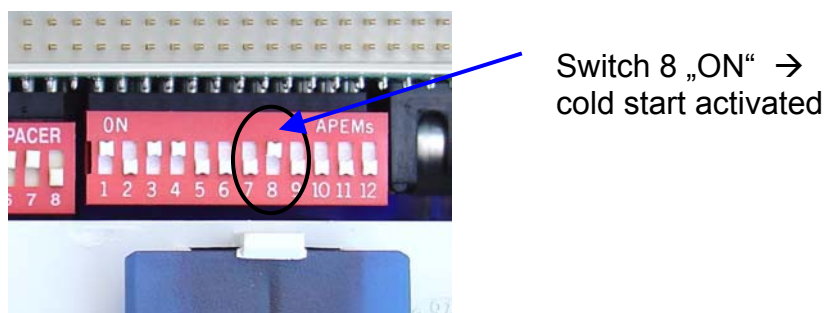
Fig. 7: Activation of the XMP-GA BOX battery

HINT:

The battery must be exchanged every 3-5 years.

4.6 Performing a cold start (deletion of the memory)

After powering-on the XMP-GA BOX a deletion of the RAM memory (cold start) will be realized if **switch 8** of the dip-switch block SW3 is set.



Switch 8 „ON“ →
cold start activated

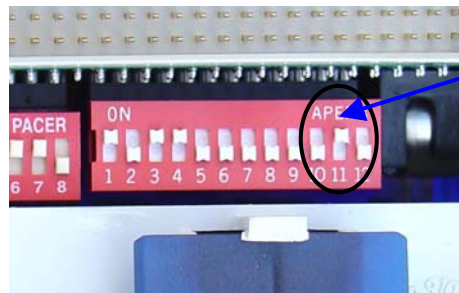
Fig. 8: Activation of a cold start of the the XMP-GA BOX

HINT:

After cold start all downloaded settings and the VIPS programs will be lost.

4.7 Setting the termination resistor

By setting the switch 11 of the dip-switch block SW3 on „ON“ it is possible to integrate an termination resistor parallel to the data line (GA module interface). In case of long bus lines the insertion of a termination resistor amplifies the signal current and so can effect a better transmission.



Switch 11 „ON“ →
termination resistor
integrated

Fig. 9: Setting the termination resistor

5 The XMP-GA modules

Technical data



Dimensions (Casing):	length: 135 mm, width: 114.5 mm, height: 150 mm.
Voltage supply:	24 V AC \pm 5% (alternating voltage)
Current consumption:	max. 100 mA for 24 V AC in idle motion
Power consumption:	Approx. 2 W (in dependence of the external wiring max. 10 W)
Interface GA modules:	RS485 9600 Baud asynchronous
Processor:	ATMEL AT89C51, 8 bit word length, 11.0592 MHz clock frequency, CMOS design
Relays on the DO module:	Maximum switching current 1A for 250V AC voltage, 1A for 30 V DC voltage
Environment conditions:	During operation: 0 to 50°C (32 to 122°F) Storage: -40 to 70°C (- 40 to 158°F) 5 - 95% relative humidity, non-condensing

5.1 Connection of the GA modules to the XMP-GA BOX

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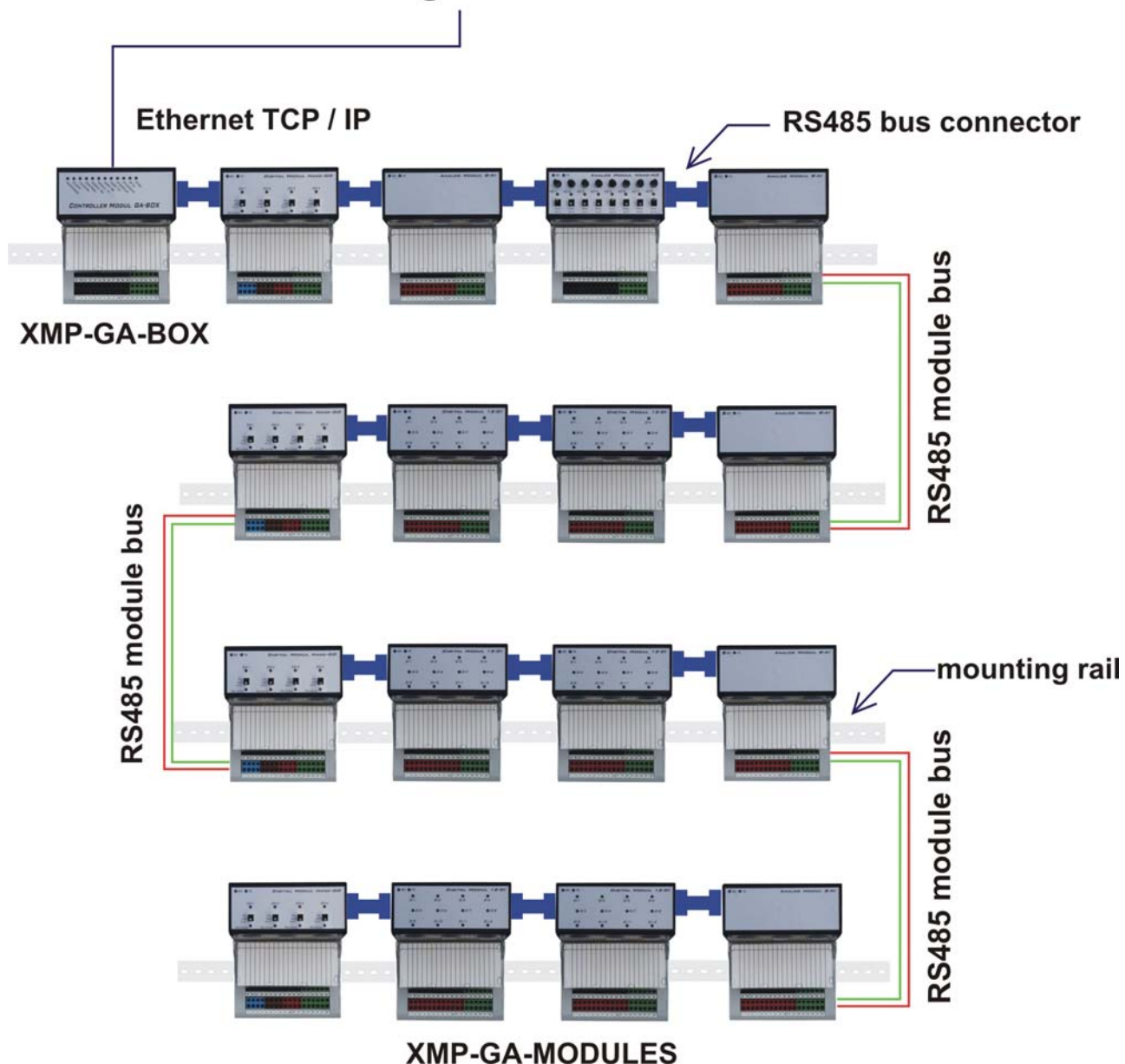


Fig. 10: XMP-GA Box with 16 XMP-GA modules connected

5.2 Connection of the RS485 module bus

Normally, the **XMP-GA modules** are connected to the **XMP-GA BOX** using the RS485 bus connector supplied.

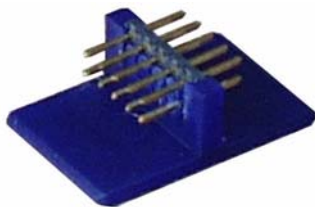


Fig. 11: RS485 bus connector

In delivery state this connector is mounted on the backside of the module head off all **XMP-GA modules**. For connection it must be placed into the connection socket at the side.

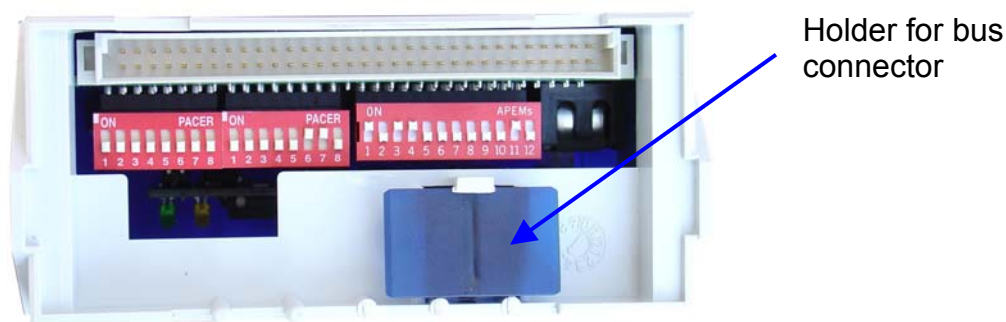


Fig. 12: Backside of the GA module in delivery state

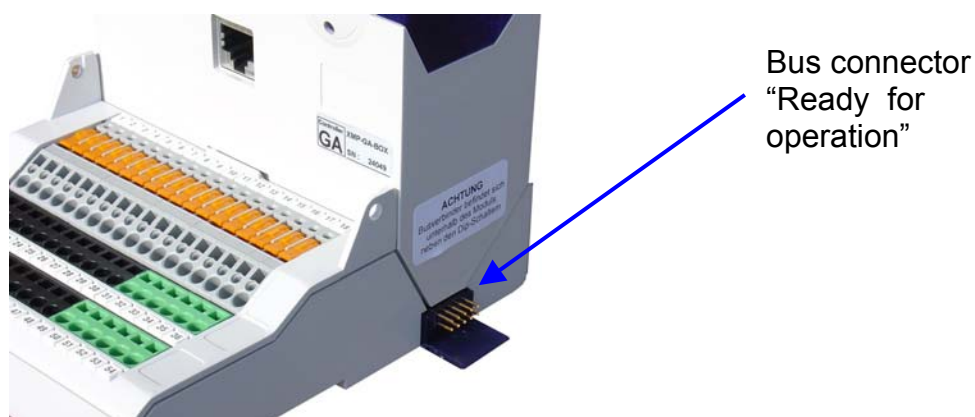


Fig. 13: Bus connector installed at the side of the module for further module connections

For the transition between two mounting rows or for connection to other switch cabinets the connection between the **XMP-GA modules** can be realized with the help of cables (Y-STY or better). The connection occurs at the **clamps 13 and 14**.

HINT:

For the connection of the field signal and controlling lines only shielded twisted paired installation cables (example: Y-STY or better) are allowed.
The total cable length between the GA modules must not be more than 1500 m.

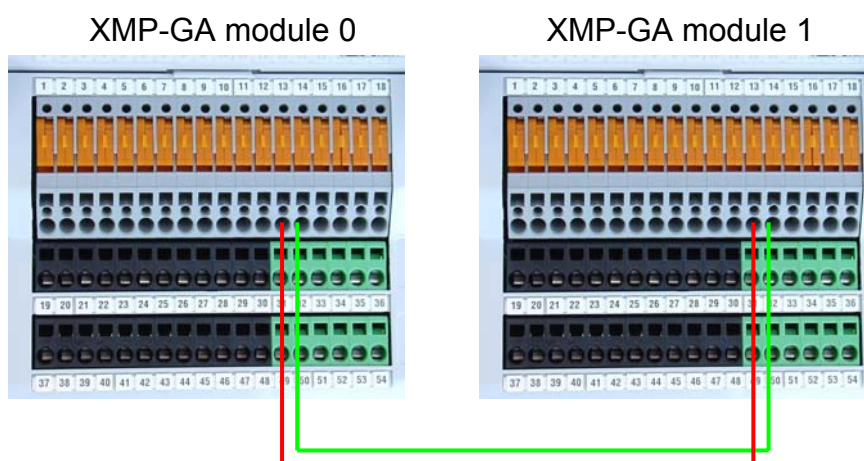


Fig. 14: Module connection using installation cable (clamp 13 and 14)

5.3 Voltage supply

The voltage supply of the **XMP-GA modules** has to be realized always by installation cable. The connection occurs via clamps 15, 16, 17 and 18. During wiring pay attention on it, that the main fuse of the power source is strong enough for all participants of the line.

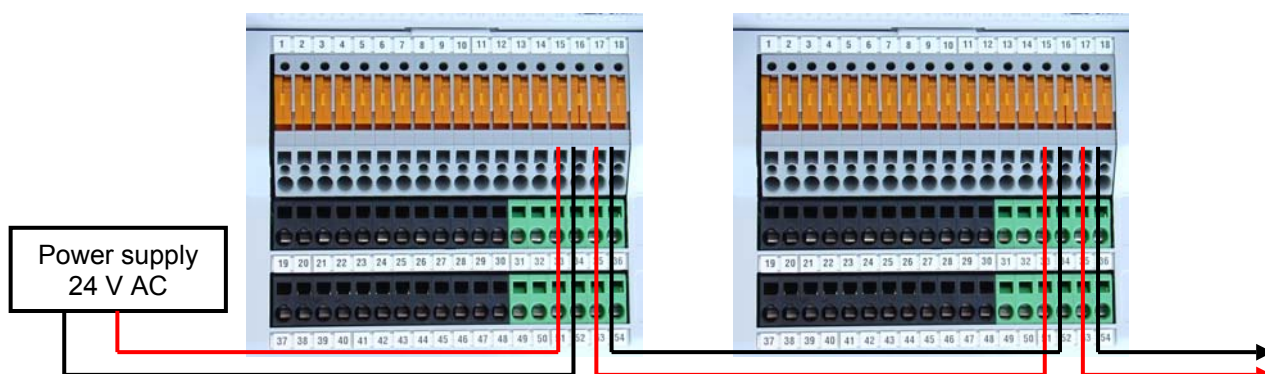


Fig. 15: Voltage supply of the GA modules (clamp 15, 16 and clamp 17, 18)

HINT:

When connecting devices, which require own power-supply, (e.g. active sensores, valves) the supply voltage of those devices has to be separated galvanically from the power-supply of the XMP-GA-Modules, when using AC-power-supply.

5.4 Setting the hardware address of the XMP-GA modules

The addressing of the **XMP-GA modules** allows an unique assignment of all participants connected to the bus and thus, of the physical datapoints.

The setting of the module address has to be realized before mounting by means of dip-switches at the bottom side of each module.

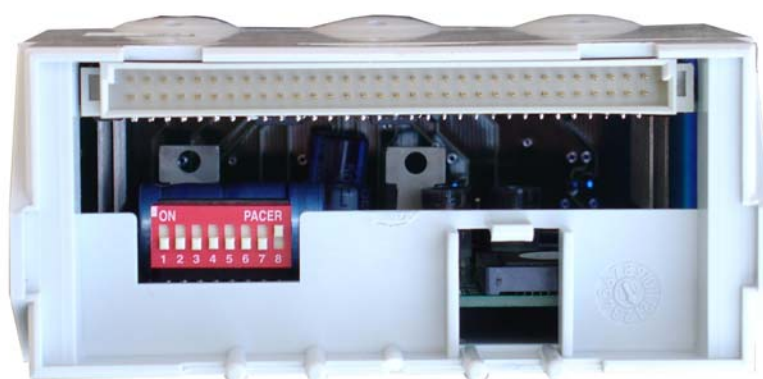


Fig. 16: Module housing bottom side of the XMP-GA modules

The first four switches are used for setting the hardware address of the module.

Examples:

Dip-switch block SW1	Switch 1	Switch 2	Switch 3	Switch 4
Address 0	OFF	OFF	OFF	OFF
Address 1	ON	OFF	OFF	OFF
Address 2	OFF	ON	OFF	OFF
Address 3	ON	ON	OFF	OFF
Address 15 (max)	ON	ON	ON	ON

HINT:

The switches 4 to 8 of the dip-switch block SW1 are set factory provided and must not be displaced by the user.

6 The XMP-GA-12-DI module

The **XMP-GA-12-DI module** is equipped with 12 binary inputs and is used for the connection of passive or active terminal devices (e.g., supervision of contacts, event counting, operating-hour counting with maintenance alarm, etc.).



Fig. 17: XMP-GA-12-DI module

6.1 Displays and operating elements of the XMP-GA-12-DI module

For each of the twelve binary inputs a red light-emitting diode is assigned. The corresponding diode lightens after setting the input (voltage input $> 5V$) and goes out after deactivating the input (0V).

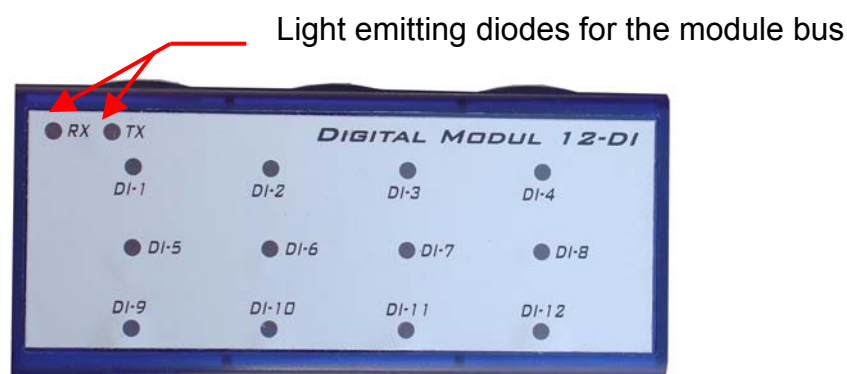


Fig. 18: Module cover of the XMP-GA-12-DI module

6.2 Terminal occupancy of the XMP-GA-12-DI module

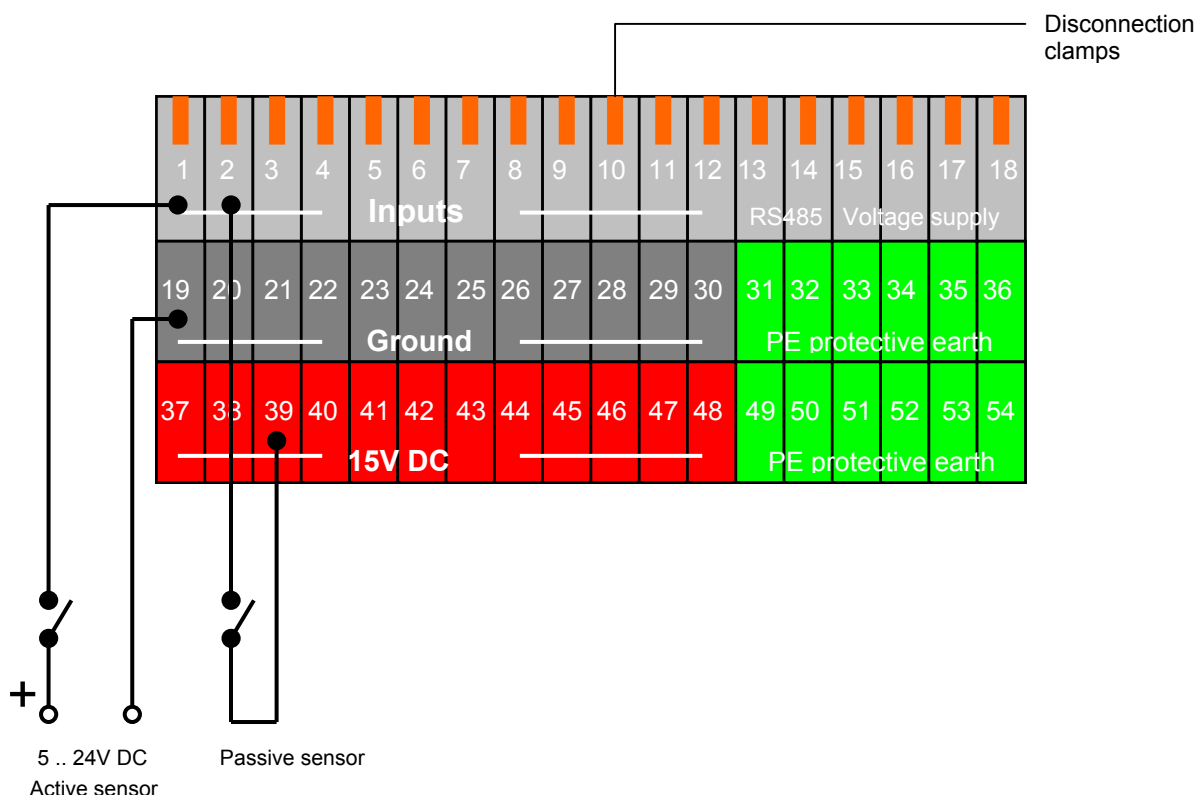


Fig. 19: Connection scheme of the XMP-GA-12-DI

Binary input	Terminal clamps (active sensor)	Terminal clamps (passive sensor)
DI 1	1 and 19	1 and 37
DI 2	2 and 20	2 and 38
DI 3	3 and 21	3 and 39
DI 4	4 and 22	4 and 40
DI 5	5 and 23	5 and 41
DI 6	6 and 24	6 and 42
DI 7	7 and 25	7 and 43
DI 8	8 and 26	8 and 44
DI 9	9 and 27	9 and 45
DI 10	10 and 28	10 and 46
DI 11	11 and 29	11 and 47
DI 12	12 and 30	12 and 48

HINT:

In case of passive sensors the cable length must not be more than 300m (2x2x0.8).

7 The XMP-GA-4-DO module / XMP-GA-HAND-DO module

The **XMP-GA-4-DO module** is equipped with 4 binary outputs and 4 binary feedback inputs and is used for controlling of active and passive positioning elements and drives.



Fig. 20: XMP-GA-4-DO module

7.1 Displays and operating elements of the XMP-GA-4-DO module

For each of the four binary outputs a red light-emitting diode is assigned. It lightens with activation of the corresponding relay output and goes out after deactivation.

In addition there are four light-emitting diodes designated with „Meldung“ on the DO module.

These are assigned to the four binary inputs on the DO module that can be used as feedbacks. The LEDs lighten with activation of the corresponding input and go out, if there is no voltage at the input.

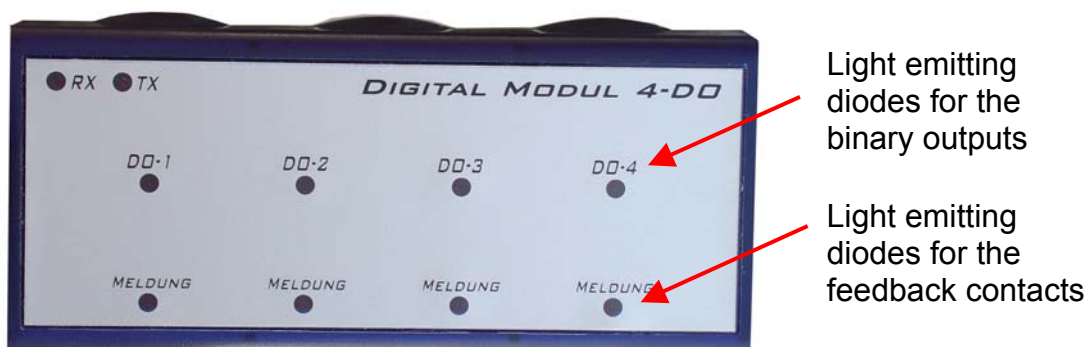


Fig. 21: Module cover of the XMP-GA-4-DO module

Optionally, the XMP-GA-4-DO module can be equipped with a manual operating panel. With this module (XMP-GA-HAND-DO) it is possible to oversteer the output values manually. In the switch position AUTO the output status is system controlled.



Fig. 22: Module cover of the XMP-GA-HAND-DO module

7.2 Settings for the binary outputs of the XMP-GA-4-DO

The four outputs of the XMP-GA-4-DO module can be set potentialfree or voltage-carrying by means of the dip-switch blocks SW2 and SW3:

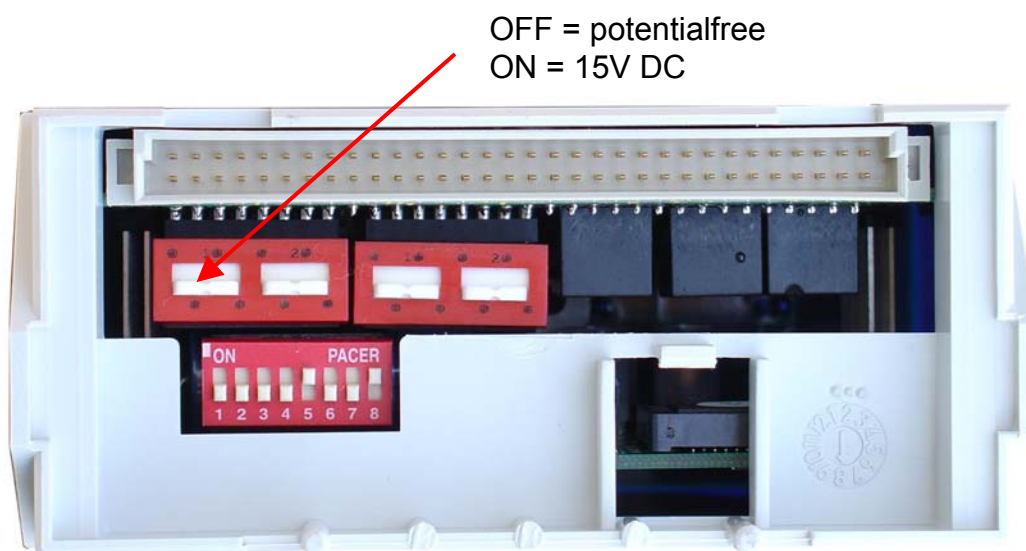


Fig. 23: Bottom side of the XMP-GA-4-DO module

7.3 Terminal occupancy of the XMP-GA-4-DO module

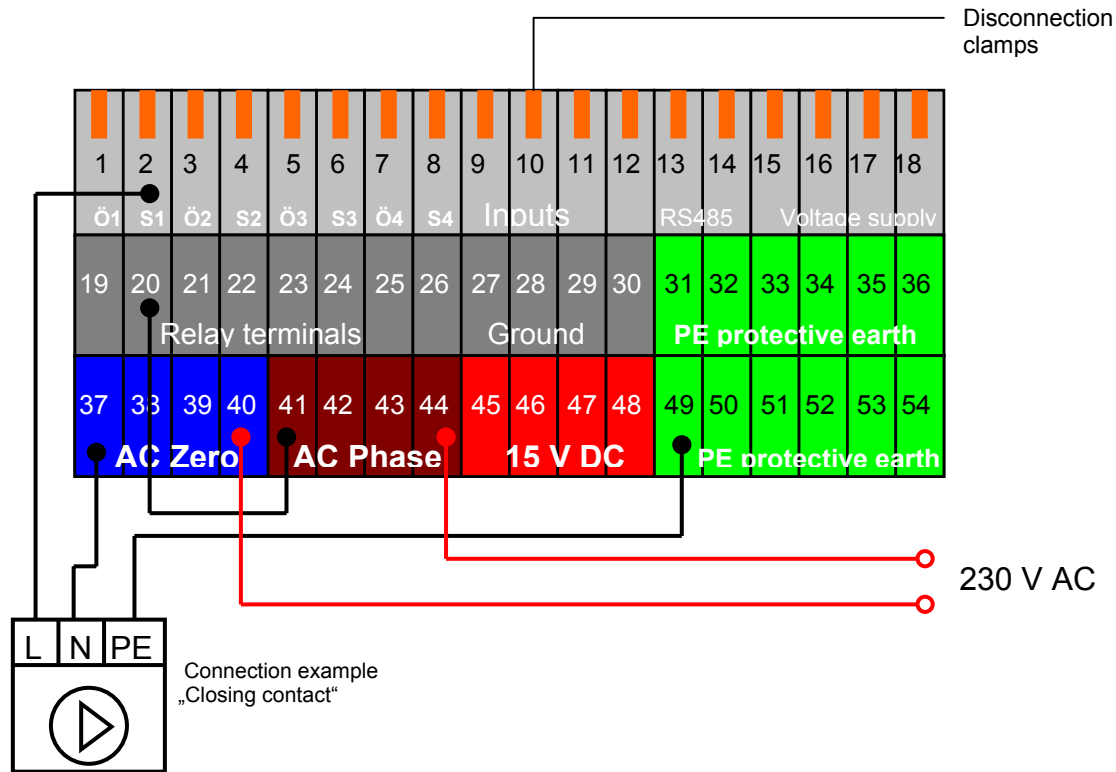


Fig. 24: Connection scheme of the XMP-GA-4 DO

Feedback inputs	Terminal clamps (active sensor)	Terminal clamps (passive sensor)
feedback 1	9 and 27	9 and 45
feedback 2	10 and 28	10 and 46
feedback 3	11 and 29	11 and 47
feedback 4	12 and 30	12 and 48

Binary outputs	Terminal clamps „Opening contact“	Terminal clamps „Closing contact“
DO 1	1 and 19	2 and 20
DO 2	3 and 21	4 and 22
DO 3	5 and 23	6 and 24
DO 4	7 and 25	8 and 26

HINT:

In case of passive sensors the cable length must not be more than 300m (2x2x0.8).

8 The XMP-GA-8-AI module

The XMP-GA-8-AI module is equipped with 8 analog inputs (0..10 V; 0..20mA; 4..20mA). It is used for the connection of passive or active analog terminal devices like, e.g., temperature sensors (PT100, PT1000, NI1000), humidity or pressure sensors.



Fig. 25: XMP-GA-8-AI module

8.1 Displays and operating elements of the XMP-GA-8AI modules

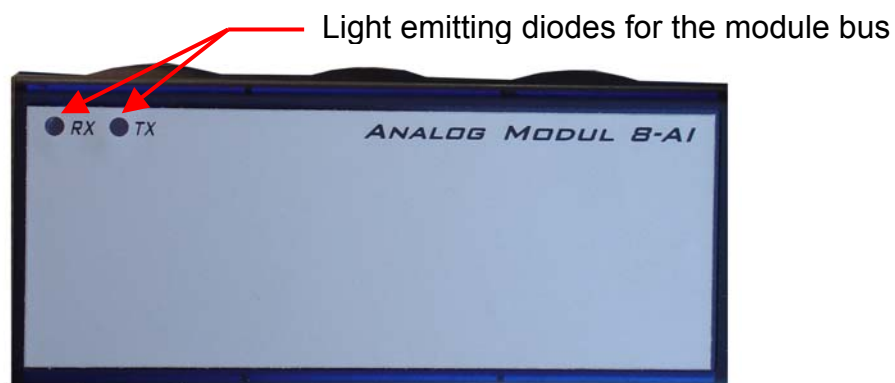


Fig. 26: Module cover of the XMP-GA-8-AI module

8.2 Setting of the analog inputs of the XMP-GA-8-AI

The eight analog inputs of the XMP-GA-8-AI module can be configured as current input or as voltage input by means of the micro dip-switch block SW2.

The input range for the voltage input is 0-10V DC.

For the current inputs a range of 0-20 mA and 4-20 mA (by software) can be selected.

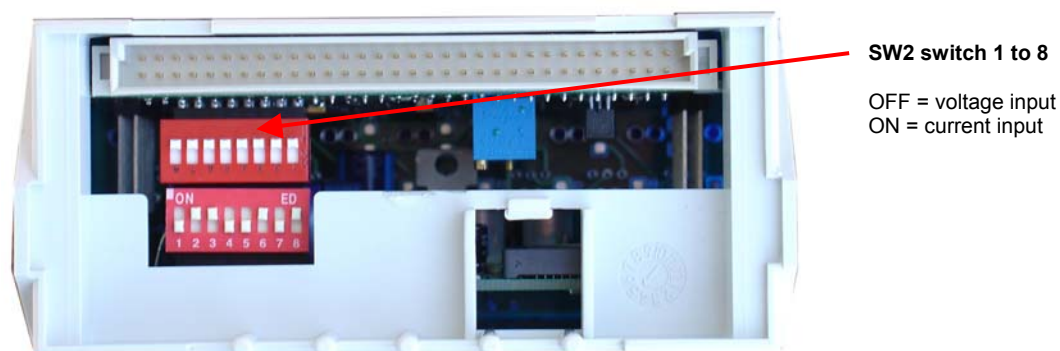


Fig. 27: Bottom side of the XMP-GA-8-AI module

HINT:

When connecting active sensors and using alternating current for power supply of the XMP-GA-Modules and the active sensors, the supply voltage of the modules has to be galvanically separated from the supply voltage of the active sensors.

8.3 Terminal occupancy of the XMP-GA-8-AI module

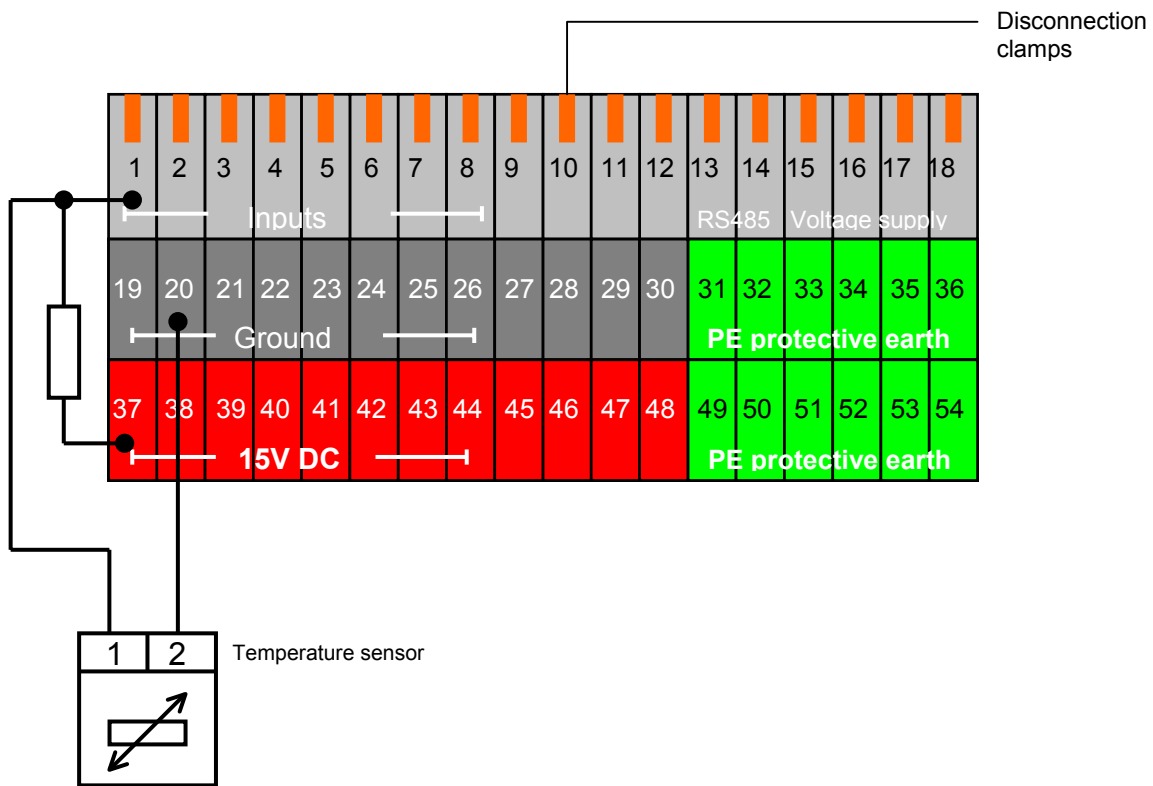


Fig. 28: Connection scheme of the XMP-GA-8 AI

Analog input	Terminal clamps (active sensor)	Terminal clamps (passive sensor)
AI 1	1 and 19	1 and 37
AI 2	2 and 20	2 and 38
AI 3	3 and 21	3 and 39
AI 4	4 and 22	4 and 40
AI 5	5 and 23	5 and 41
AI 6	6 and 24	6 and 42
AI 7	7 and 25	7 and 43
AI 8	8 and 26	8 and 44

HINT:

In case of passive sensors the cable length must not be more than 300m (2x2x0.8).

9 The XMP-GA-8-AO module / XMP-GA-HAND-AO module

The XMP-GA-8-AO module is equipped with 8 analog voltage outputs (0..10 V) and is used for controlling of valves and ventilation flaps, for P-, PI-, PD- or PID regulations or cascade regulations (linkage between two or more PID controllers).



Fig. 29: XMP-GA-8 AO module

9.1 Displays and operating elements of the XMP-GA-8 AO module

For each of the eight analog outputs a light-emitting diode is assigned. The lightening intensity of the corresponding LED is an indicator for the output value.

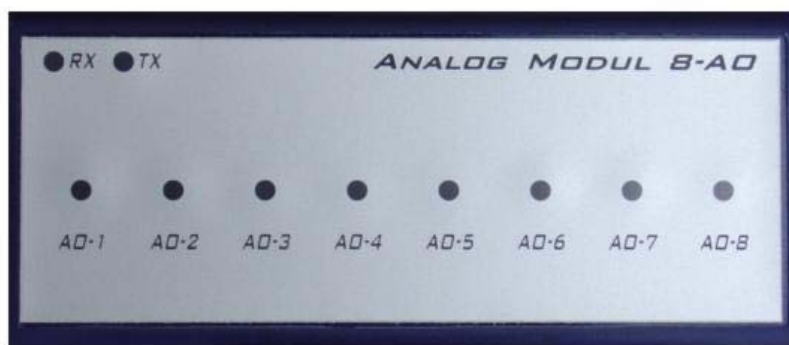


Fig. 30: Module cover of the XMP-GA-8 AO module

Optionally, the XMP-GA-8 AO module can be equipped with a manual operating panel. With this module (XMP-GA-HAND-AO) it is possible to oversteer the output values

manually. In the switch position AUTO the output state transmitted by the system will be effective. In the switch position HAND the output values can be adjusted by means of the potentiometers.



Fig. 31: Module cover of the XMP-GA-HAND-AO module

9.2 Terminal occupancy of the XMP-GA-8-AO module

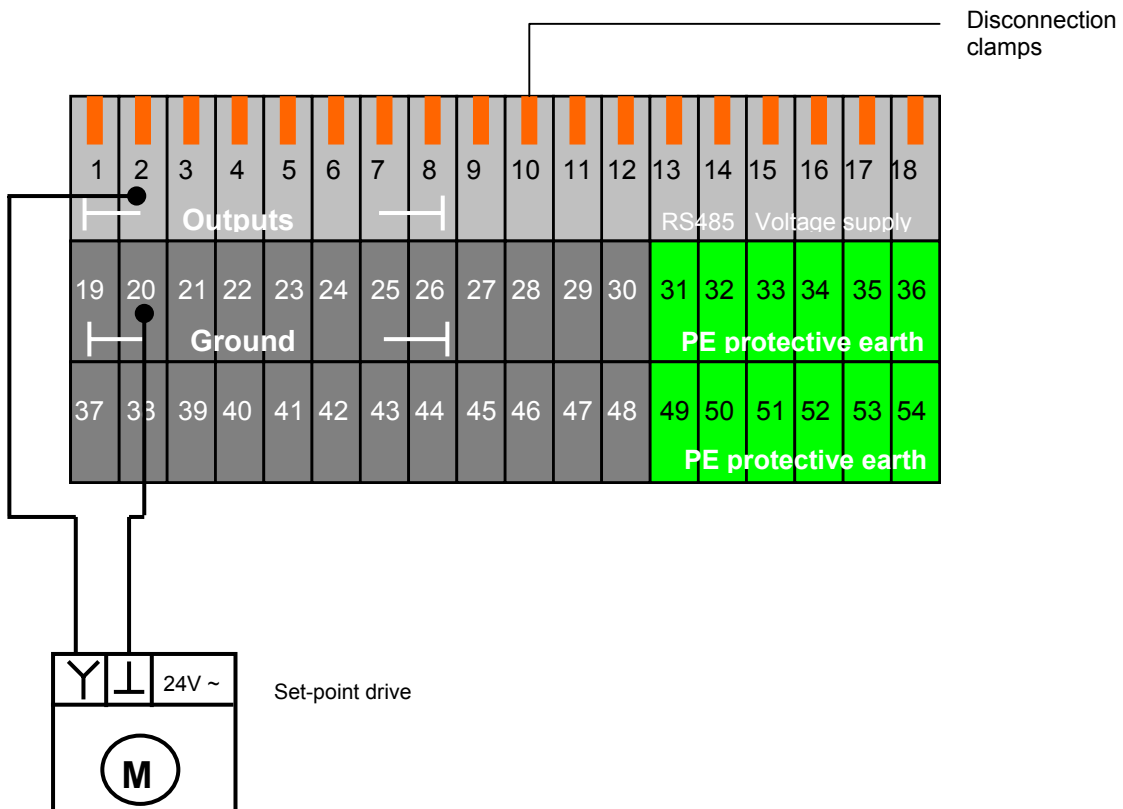


Fig. 32: Connection scheme of the XMP-GA-8AO

Analog output	Terminal clamps
AO 1	1 and 19
AO 2	2 and 20
AO 3	3 and 21
AO 4	4 and 22
AO 5	5 and 23
AO 6	6 and 24
AO 7	7 and 25
AO 8	8 and 26

HINT:

When connecting actuators (e.g. valves) and using alternating current for power supply of the XMP-GA-Modules and the actuators, the supply voltage of the modules has to be galvanically separated from the supply voltage of the actuators.

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