GOSSEN METRAWATT

SMARTCONTROL | ECS
Energy Control System

3-349-435-03
11/5.19

- Acquisition of energy and consumption data, temperatures, switching statuses and process quantities
- Error message management, continuous comparison of characteristic values and indication of errors via switching output, e-mail or SMS
- Peak load management in combinations with switching outputs
- Timer programs and switching of relays after the occurrence of predefined events
- Calculation of mean values and integrals, as well as heating and cooling quantities
- 8 + 24 digital inputs, active or passive (standard: 8, input/output module for 24 channels: 24)
- 8 analog inputs, 0 ... 20 mA, 0 ... 10 V
- 8 temperature inputs for PT1000 platinum sensors
- 2 + 4 switching outputs, semiconductor relays, max. 40 V=/~, max. 1 A (standard: 2, input/output module for 24 channels: 4)
- 2 analog outputs (input/output module for 24 channels)
- Interfaces RS232 (M-Bus/PRG, Field 1, Field 2), RS485 (Modbus, Field1, Field2), Ethernet, LON
- SMARTCONTROL manager configuration and data read-out software included

Application

The multitalented SMARTCONTROL expands the Energy Control System (ECS), which is widespread in industry and building technology.
It unites energy and consumption data logging for a wide variety of media with load management and error messaging functions. It can be used autonomously, or together with Energy Management Control (EMC) software within the ECS. Both solutions contribute to sustained conservation of valuable resources and reduced energy costs.

Versatile Data Collector

SMARTCONTROL features 8 analog inputs, 8 digital inputs and 8 temperature inputs for PT1000 sensors in the standard version.
This means that nearly all:

- Meter readings (current, gas, water, heat, air, etc.)
- Temperatures (outside, inside, inlet and return temperature, etc.)
- Statuses (burner and pump on-times etc.)
- Analog signals (signal converters, measuring transducers etc.)

can be acquired.
Bus compatible measuring instruments and energy meters can be connected via Modbus or M-Bus with an optional, external level converter.
The standard version can be expanded with the input/output module for 24 channels or with the LON interface module.

Convenient Programming and Visualization

The various SMARTCONTROL parameters and functions are defined by means of the SMARTCONTROL manager and its graphic programming interface. Linking the inputs to calculations, logic functions and timer programs, as well as relay, SMS and e-mail outputs, is particularly easy. Acquired channel data can also be read out, visualized in tables or in graphic representations, and exported in CSV or BMP format.

Universal Communication

SMARTCONTROL is equipped with Ethernet TCP/IP, by means of which it is integrated into existing infrastructures. Networking several stations is also possible with the Modbus TCP variant.
An OPC server is available for trouble-free connection to process control and building management systems.

Memory

The internal 2 MB flash ring-buffer can be expanded by installing a 4 GB microSD card. Expanding memory capacity is recommended in particular for large networks, short device read-out cycles and infrequent or no remote read-out.

SMARTCONTROL | ECS
Energy Control System

Technical Data

System Data

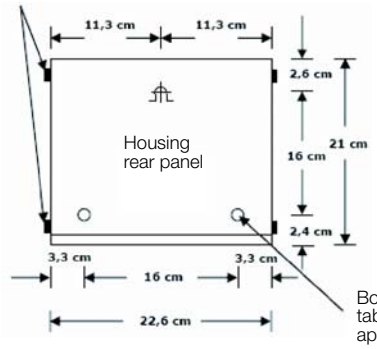
Memory capacity	2 MB flash ring buffer
Memory expansion	Internal card slot for microSD card, optional 4 GB microSD card, formatting via the SMARTCONTROL manager
Storage rules	Cyclical or based on conditions
Calculations	Mean value generation, heating and cooling quantities, timer programs, limit value monitoring, calculator, integral value generation
Programming	Each channel separately, graphic programming using function blocks with the SMARTCONTROL manager
Time	Battery-backed real-time clock
System monitoring	Watchdog timer
Control keys	F1, reset on the system PCB

SMARTCONTROL Standard

Housing material	Steel sheet metal
Dimensions	226 x 210 x 70 mm
Mounting	Screw mounted
Protection	IP 20
Weight	1.5 kg
Mains power	SMARTCONTROL can be operated with 12 ... 24 V DC. Power consumption*: – Basic PCB < 2.5 W – Expansion for LON interface module: additionally max. 1 W – Expansion for input/output module for 24 channels: additionally max. 10 W Input: 100 ... 240 V AC, 50 ... 60 Hz Output: 12 V DC Option: External power pack (primary switched mode) Z301U
Operating conditions	5 ... 50 °C, no condensation
Real Time Clock Battery	
Lithium cell (replaceable without the use of tools and data loss)	CR 2032 3 V; for the preservation of time and date
Permanent operation	Replacement every 5 years
Non-operating time/ lengthy storage periods	Replacement every 2 years

* Meter readings are saved to the ring buffer and, if plugged in, to the SD card as well, thus preventing loss in the event of a power failure.

Housing screw



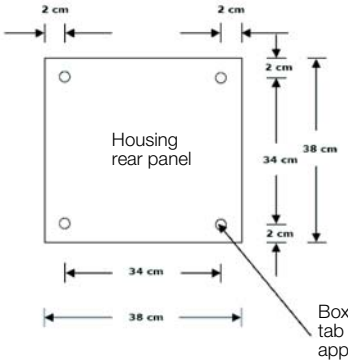
The box must be securely mounted with 3 suitable screws and anchors, depending upon substrate and material.

Box mounting tab diameter: approx. 5 mm

SMARTCONTROL IP 65 Control Cabinet Variant

Housing material	Steel sheet metal
Dimensions	380 x 380 x 210 mm
Mounting	Screw mounted
Protection	IP 65 when correctly mounted
Weight	10 kg
Mains power	Built-in power pack, Power consumption*: < 2.5 W Input: 100 ... 240 V AC, 50/60 Hz Output: 12 or 24 V DC depending upon variant
Operating conditions	5 ... 50 °C, no condensation

* The actual power consumption depends on the efficiency of the power pack and on other connected sensors and devices.



The box must be securely mounted with 4 suitable screws and anchors, depending upon substrate and material.

Box mounting tab diameter: approx. 8.2 mm

SMARTCONTROL – Input/Output Module for 24 Channels

Dimensions	216 x 96 mm
Power consumption	approx. 10 W

SMARTCONTROL – LON Interface Module

Dimensions	128 x 56 mm
Power consumption	approx. 1 W

Inputs

Analog Inputs

Quantity	8 (A0 ... A7)
Measuring Range	0 ... 1 V, 0 ... 5 V, 0 ... 10 V, 0 ... 20 mA or 4 ... 20 mA V or mA can be selected with the help of an internal jumper (JP1)
Internal resistance	Voltage measurement: 200 kOhm Current measurement: 249 Ohm
Accuracy	typical ±0.05 V
Electrical isolation	Common ground, no electrical isolation, no connection to frame ground, SMARTCONTROL may be subjected to external voltage
Recording frequency	Max. 1/s
Protection circuitry	Suppressor diodes for voltage peaks
Resolution	12 bit A-D converter
Function	Connection of measuring transducers such as pressure, humidity and temperature sensors etc.
Alternative circuits	If switching outputs K1 and K2 are used, analog inputs A6 and A7 cannot be used because they are connected to the same terminals.

Digital Inputs – Standard

Quantity	8 (IS0 ... IS7)
Operating mode	Active, passive, selectable via internal jumper (JP2)
Contact load (reed)	15 mA with an input voltage of 12 or 24 V=
Active signal	Min. 12 mA, max. 24 V=, min. 12 V
Electrical isolation	Active operating mode: electrically isolated Passive operating mode: not electrically isolated
Edge slope	Any
Debouncing	Digital filter, 5 ms
Pulse sequence	At least 10 ms / 10 ms (0/1)
Frequency	Max. 50 Hz
Detection method	Interrupt
Cable length	Max. 200 m
Storage of meter readings	Every 15 minutes
Maximum meter reading	9999 9999, 9999 99
Resolution	0.0000 01
Recording frequency	Max. 1/s
Units	M-Bus protocol
Inputs which can be setup as pulse inputs	8, e.g. meter with pulse input
Inputs which can be setup as status inputs	8, e.g. door contact, motion detector
Inputs which can be setup as tariff inputs	3 (IS1, IS3 and IS5), the respective upstream inputs (IS0, IS2, IS4) are counted.
Inputs which can be setup as synchronization inputs	1 (IS7), the clock is synchronized to the next quarter hour.
Optical pulse display	LED on the PCB
Function	Meter or status output, for example current, gas, water and heat meters, as well as door and window contacts.

Digital Inputs – SMARTCONTROL Input/Output Module for 24 Channels

Number	max. 24 (DI0 ... DI23)
Alternative circuits	As an alternative to the digital inputs (DI18 ... DI21), the switching output can be plugged on via jumper As an alternative to the digital inputs (DI22 ... DI23), the analog output can be plugged on via jumper
For technical data, see Digital Inputs - Standard	

Temperature Inputs (PT1000)

Quantity	8 (T0 ... T7)
Input quantity	PT1000 platinum sensor with 2-wire connection
Measuring range	–50 ... +170° C
Accuracy	Better than ±0.5° C (depending upon sensor DIN class)
Calibration	At the factory, 0 and 100° C ... ±0.05° C
Protection circuitry	Suppressor diodes for voltage peaks
Resolution	Better than 0.05 K
Recording frequency	Max. 1/s

Accuracy classes for platinum temperature sensors:

Class A: dT = ±(0.15° C + 0.002 x T)

Class B: dT = ±(0.30° C + 0.005 x T)

Class 1/3 B: dT = ±1/3 x (0.30° C + 0.005 x T)

General Wiring Instructions

The following points must be observed in order to achieve high measuring accuracy:

- Use shielded cables only. If possible, connect the shield to a separate ground contact. A separate contact is provided to this end in the housing of the SMARTCONTROL IP 65 variant.
- Keep cables as short as possible, and attach ferrite beads to both cable ends.
- Use large cable cross-sections of at least 0.8 square mm.
- *It at all possible, do not lay parallel to cables which conduct heavy current!*

Overvoltage Protection

All analog and temperature inputs are protected with suppressor diodes against overvoltage – which may occur, for example, in the event of distant lightening or due to electrostatic discharge. Ideal overvoltage protection can only be assured by means of lightning protection for the entire system laid out in accordance with applicable standards.

Outputs

Switching Output (semiconductor relays) – Standard

Quantity	2, up to 2 analog inputs can be reconfigured to relay outputs (jumper series JP6)
Switching element	Semiconductor relay (photo MOS)
Variant	Electrically isolated
Switching voltage	Max. 40 V=/~, no inductive loads
Switching current	Max. 1 A
Function	Control via program, timer, peak load management
Alternative circuit	If analog inputs A6 and A7 are used, switching inputs K1 and K2 cannot be used because they are connected to the same terminals.

Switching Output – SMARTCONTROL Input/Output Module for 24 Channels

Quantity	max. 4
Switching element	Semiconductor relay (PhotoMOS)
Variant	Electrically isolated (normally open floating contact)
Switching voltage	max. 40 V=/~, no inductive loads
Switching current	max. 1 A
Function	Control via program, timer, peak load management
Alternative circuit	As an alternative to the digital inputs (DI18 ... DI21), the switching output can be plugged on via jumper

Analog Output – SMARTCONTROL Input/Output Module for 24 Channels

Quantity	max. 2
Variant	Common ground
Switching voltage	0 ... 10 V can be plugged on via jumper Output voltage for operating mode 0 ... 20 mA: Voltage supply SMARTCONTROL basic device
Switching current	0/4 ... 20 mA can be plugged on via jumper max. output current for operating mode 0 ... 10 V: 25 mA
Alternative circuit	As an alternative to the digital inputs (DI22 ... DI23), the analog output can be plugged on via jumper
Accuracy	typical ±0.05 V
Frequency	max. 1 Hz
Resolution	12 bit A-D converter

Backup Battery – SMARTCONTROL Input/Output Module for 24 Channels

Lithium cell (replaceable without the use of tools and data loss)	CR 2032 3 V; maintains meter readings in the event of power failure
Permanent operation	Replacement every 5 years
Non-operating time/lengthy storage periods	Replacement every 2 years

Interfaces

RS 232 Interface (M-Bus)

Protocol	M bus per EN 1434-3
Baud rate	300, 2400 or 9600 baud
Number of users	Max. 250
Function	Read-out of energy and consumption meters with M-Bus interface. socket module for external M-Bus level converter is required (accessory PW80).

RS 232 Interface (field 1)

Connection	Not simultaneously with RS 485 (Modbus)
Baud rate	2400, 4800, 9600 or 19200 baud
Function	Control of fieldbus devices with RS 232 interface or external interface converter for other bus systems

RS 232 Interface (field 2)

Function	Control of fieldbus devices with RS 232 interface or external interface converter for other bus systems

Ethernet Interface

Protocol	TCP/IP
Transmission speed	10 / 100 Mbit
IP address	Static or dynamic via DHCP server, default setting: 192.168.130.190
Security	Protected with selectable password. Second password for read access only.
Function	Read-out and parameters configuration of SMARTCONTROL

RS 485 Interface (Modbus)

Protocol	Connection of Modbus devices and devices compatible with the ASCII protocol
Bus termination	Internal 220 Ohm, can be activated with jumper
Connection	Not simultaneously with RS 232 (field 1)
Number of users	Max. 32
Function	Control of fieldbus devices with RS 485 interface and Modbus protocol, e.g. GMC-I Messtechnik GmbH A2000 power meter

Two RS485/1 & RS485/2 interfaces (Modbus) (as of SMARTCONTROL V3)

Protocol	Connection of Modbus devices and devices compatible with the ASCII protocol
Bus termination	Internal, 110 Ohm, can be activated with jumper
Connection	Not simultaneously with RS 232 (field 1)
Number of users	Max. 250
Function	Control of fieldbus devices with RS 485 interface and Modbus protocol, e.g. GMC-I Messtechnik GmbH A2000 power meter

LON Interface (LON Interface Module)

Quantity	1 (FTT-10, twisted 2-wire conductor)
Connection elements	Plug connector with screw terminal (up to 63 users per station, as from version 3.1 128 users)
Operating mode	LonTalk protocol (CSMA)
Topology	free wiring ≤ 500 m bus, terminated ≤ 2700 m (cable type: Belden 85102; 1.3 mm dia. 28 Ω/Km)
Transmission speed	78 kbps
Status display	1 LED LON active

Modem Slot

Operating voltage	3.3 V or 5.0 V, can be selected with jumper
Connector socket	RJ45, pin assignments selectable via jumper
Function	Insertion of an analog, ISDN, GSM or Bluetooth modem from our range of accessory products

Expansion port for SMARTCONTROL

- for expansion with the 24 channel input/output module
- for expansion of the interface module to include LON

Software

SMARTCONTROL Manager

The SMARTCONTROL manager is included with SMARTCONTROL, and provides all of following functions:

- Configuration of SMARTCONTROL
- Graphic programming of all functions such as timer programs, calculator, relays, power calculation, links, network, Modbus, M-Bus, field, calibration etc.
- Graphic display or read-out of data in ASCII format.
- Communication DLL (Windows COM technology) for easy integration into COM compatible Windows applications (e.g. Excel)

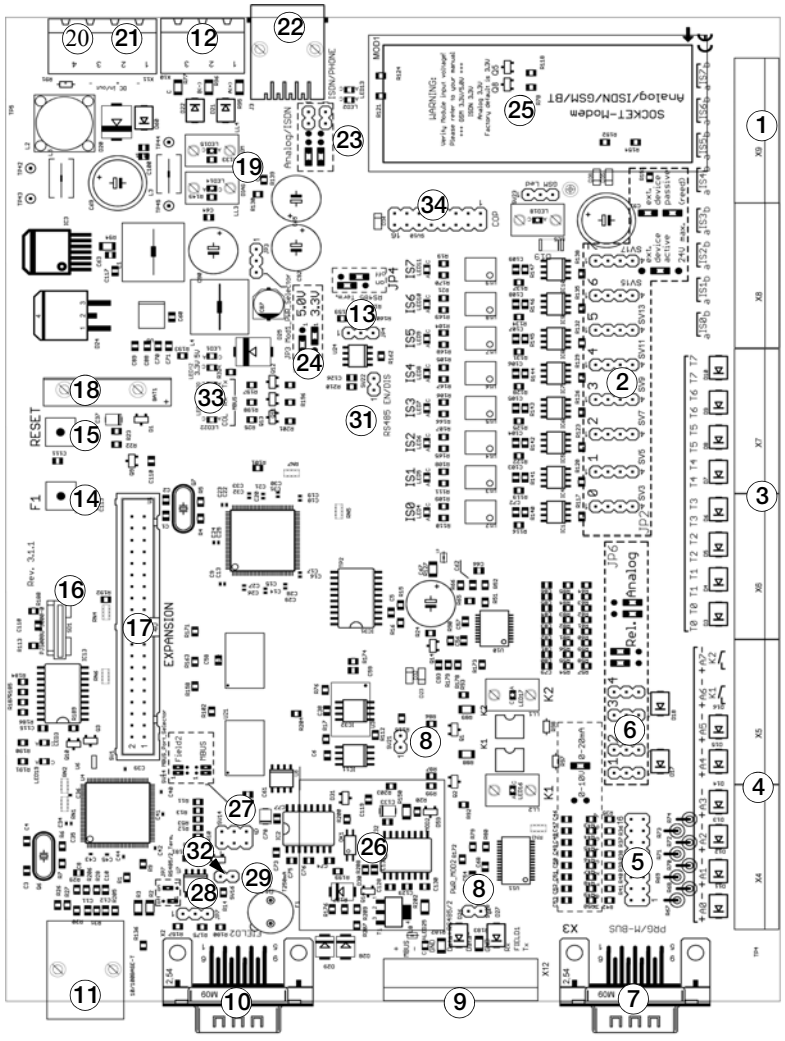
SMARTCONTROL OPC Server (optional)

Supports the “data access custom interface” as of version 3.0. SMARTCONTROL can be integrated into any building management system with OPC client function via the OPC server. TCP/IP is used for communication.

Electrical Connection and Configuration of SMARTCONTROL Standard

Detailed information is included in the installation instructions.

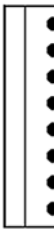
Connections Overview



1 8 digital inputs: pulse/status/tariff
2 Jumper JP2: digital inputs (active/passive signal)
3 8 temperature inputs: Pt1000
4 6 analog inputs, 2 relay inputs or 2 additional analog inputs
5 Jumper JP1: analog measurement (0 ... 10 V / 10 ... 20 mA)
6 JP6 jumper: A6/A7 as analog input or as K1/K2 relay output
7 M-Bus via level converter / RS232 programming
8 System jumper
9 Terminal strip (MBUS, RS485/2, Field1)
10 Interface: Field2 (RS232), parallel to (9) RS485/2
11 Interface: RJ45 Ethernet (10/100MBit), TCP/IP
12 Interface: RS485/1 parallel to (9) Field1
13 JP4 jumper: RS485/1 termination
14 Key: F1
15 Key: reset
16 Slot for microSD card
17 Option: expansion PCB, LON (Z301V) and/or IO24 (Z301W)
Prerequisite: basic PCB, rev. 2.3x see (31)
18 Battery for real-time clock (RTC)
19 LEDs: DIAG / COM
20 Input: 12 to 24 V DC power supply
21 Output: 12 to 24 V DC power supply
22 Connection: analog cable / ISDN cable
23 JP5 jumper: analog or ISDN phone output occupied
24 JP3 jumper: adjust voltage at GSM module
25 Module socket: analog/ISDN/GSM/Bluetooth
26 Card slot for MBUS module (optional)
27 SV14: MBUS port selector (MBUS/Field2)
28 JP7 jumper: RS485/2 termination
29 Card slot for fuse, MBUS module (250 mA delay fuse)
30 SV23: GSM LED selection
31 Basic PCB revision label
32 RS485/2 receive enable/disable
33 LED display, MBUS module (**col**lision/RX/Tx)
34 COP (reserved)

Figure 1: SMARTCONTROL – Basic PCB Rev. V3

Terminal Strip Pin Assignments (9)

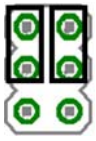


MBUS+
MBUS–: MBUS network connection
GND: system ground
RS485/2: connection of 2nd RS485 interface, A (Data+),B (Data-)
GND: system ground
FIELD1 Connection of RS232 Field1 interface, Rx, Tx

MBUS Port Selector SV14 (27)

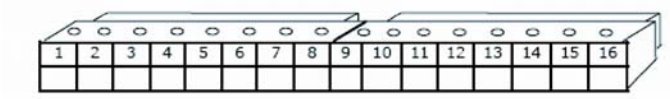
These two jumpers can be used to select via which interface the optional MBUS module will communicate. Either MBUS (7) or Field2 (10) can be selected.

SV14, selection of the MBUS interface



SV14, selection of the Field2 interface

Analog inputs

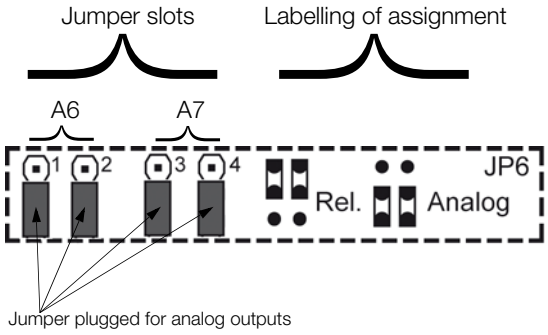


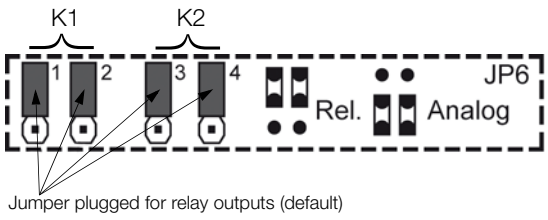
+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−
Analog Input A0		Analog Input A1		Analog Input A2		Analog Input A3		Analog Input A4		Analog Input A5		Analog Input A6 or Relay Output K1 (jumper 6)		Analog Input A7 or Relay Output K2 (jumper 6)	

\+ = Measuring signal
− = All eight inputs have a common ground which also functions as the negative terminal. They are not electrically isolated.

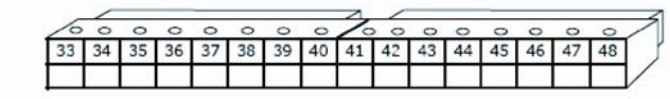
Measuring range selection: 0 ... 10 V (default) or 0 ... 20 mA via JP1 (item 5 in *figure 1*).

Configuration as analog inputs A6 and A7 or relay outputs K1 and K2 (default) via JP6 (item 27 in *figure 1*).





Digital Inputs

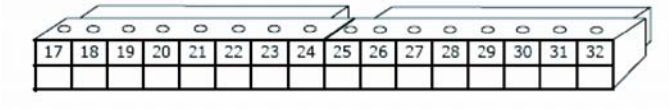


a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b
Digital Input IS0		Digital Input IS1		Digital Input IS2		Digital Input IS3		Digital Input IS4		Digital Input IS5		Digital Input IS6		Digital Input IS7	

Set signal type or operating mode to active or passive (default) via JP2 (item 2 in *figure 1*).
Polarity is determined by the jumper setting, and must be correct!

"Active" jumper setting	"Passive" jumper setting
ext. device active 24V max.	ext. device passive (reed)
Terminal a = pulse input / status + Terminal b = pulse input / status –	Terminal a = contact – / GND Terminal b = contact + / open collector
Connection of, for example, pulse generators with their own 12 ... 24 V power supply / output signal, load capacity of at least 15 mA	Connection of, for example, pulse generators with reed contact with a load capacity of at least 15 mA for contact / open collector
*** Electrical isolation ***	GND/earth Connected to each other *** No electrical isolation ***

Temperature Inputs

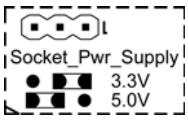


Temp. Input T0	Temp. Input T1	Temp. Input T2	Temp. Input T3	Temp. Input T4	Temp. Input T5	Temp. Input T6	Temp. Input T7

Connection is laid out for PT1000 sensors with 2-wire connection.

Communication

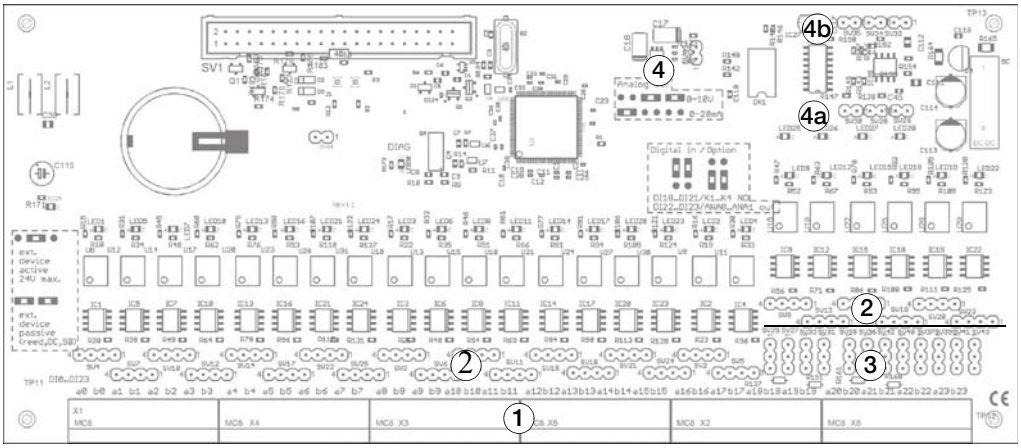
Operating voltage for the optional GSM socket module: 3.3 V (default) or 5 V, depending upon type, with JP3 (item 24 in *figure 1*).



Caution: An incorrect voltage setting may result in damage to the socket module!

Electrical Connection and Configuration of the 24 Channel Input/Output Module

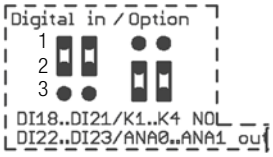
More detailed information is provided in the operating instructions.



1 Digital inputs DI0 to DI23; The terminals for the digital inputs, for example DI0, are designated a0 and b0.

2 Jumper: active or passive digital input operating mode

3 Jumper SV29/SV27, SV33/SV31, SV38/SV36, SV42/SV40
Ports DI18 (a18/b18) to DI21 (a21/b21) are selectable as:
– 4 digital inputs (jumper plugged onto 1-2).
or
– 4 digital switching outputs K1 ... K4 (jumper plugged onto 2-3)



Jumper SV37/SV39 and SV41/SV43
Ports DI22 and DI23 are selectable as:
– 2 digital inputs (jumper plugged onto 1-2)
– 2 analog outputs ANA0 and ANA1 (jumper plugged onto 2-3)

4 Marking of jumper position for the respective function of the analog outputs

4a Jumper: ANA0 -> SV28, SV26 plugged in (see fig.): 0 ... 10 V output

4a Jumper: ANA0 -> SV30, SV28, SV26 not plugged in: 0 ... 20 mA output

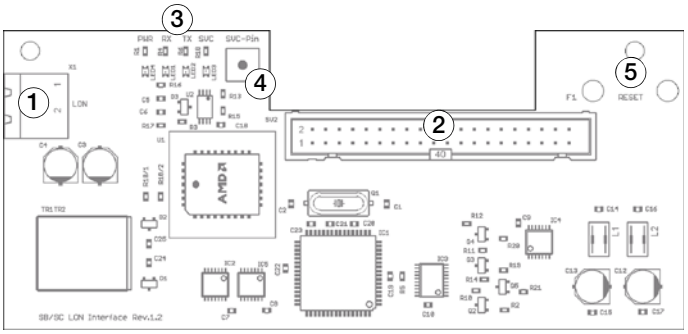
4b Jumper: ANA1 -> SV34, SV32 plugged in (see fig.): 0 ... 10 V output

4b Jumper: ANA1 -> SV35, SV34, SV32 not plugged in: 0 ... 20 mA output

Figure 2 SMARTCONTROL with IO24 Expansion PCB

Electrical Connection and Configuration of the Interface Module Expansion for LON

More detailed information is provided in the operating instructions.



1 2-pole LON terminal for establishing a connection with the LON network by means of the included 2-pole mating plug with screw terminal.

2 SV2 transfer plug of the SMARTCONTROL PCB expansion port for connecting the add-on modules (e.g. LON interface module).

3 LED PWR (green) -> indicates that power is supplied to the LON interface module.
LED RX and TX (green) -> indicates the communication between LON network and LON interface.
LED SVC (yellow) -> service LED. LED does not light up during regular operation.

4 SVC Pin -> key for transmitting the neuron ID to the LON network. The SVC LED lights up as long as the SVC pin key is pressed.

5 The drilled holes F1 and RESET allow for the activation of keys of identical name on the expansion PCB.

Figure 3 SMARTCONTROL with LON Expansion PCB

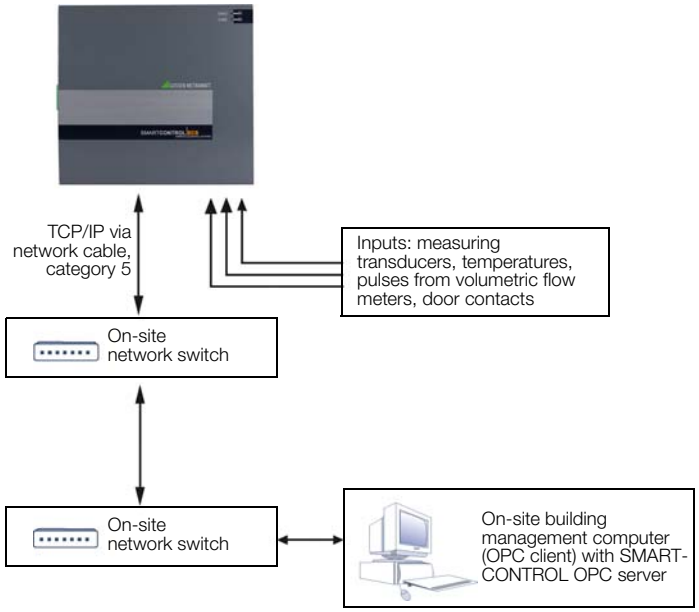
Applications

The following examples point out possible application variants. The specifications, wiring instructions, overvoltage protection, connections and configurations listed in the technical data must be adhered to during layout and setup. Measuring transducers, temperature sensors, cables and options are not included with SMARTCONTROL.

Application 1 – connection to building system via OPC server

- Analog inputs A0 to A3: 4 measuring transducers for temperature, 0 to 10 V
- Analog inputs A4 to A7: used for 4 door contact statuses
- Digital inputs D0 to D3: 4 volumetric flow meters with pulse input for cooling circuits, together with temperature inputs T0 to T7: 4 inlet and 4 return temperatures for calculating cooling quantities (SMARTCONTROL)
- Digital inputs D4 to D7: 4 water meters with pulse input
- Data read-out via network connection
- Connection to existing building system via OPC server (optional)

Overview (schematic)



Order Information

Type	Designation	Article No.
SMARTCONTROL	Standard version, auxiliary voltage 24 V DC, Ethernet crossover cable, screwdriver, wire mounting tool, installation instructions, manual and SMARTCONTROL manager on CD	U300A
SMARTCONTROL IP 65 / 24V=	IP 65 control cabinet version with built-in 24 V= power pack, Ethernet crossover cable, screwdriver, installation instructions, manual and SMARTCONTROL manager on CD	U300C
SMARTCONTROL with IO24	Same as standard version, but additionally **with input/ output module for 24 channels**	U300D
SMARTCONTROL with LON	Same as standard version, but additionally **with LON interface module**	U300E
SMARTCONTROL with IO24 and LON	Same as standard version, but additionally **with input/ output module for 24 digital channels and LON interface module**	U300F
SMARTCONTROL + Modbus TCP	Same as standard version, but additionally **with Modbus TCP expansion**	U300G
External power pack	100 ... 240 V AC / 24 V DC / 24 W	Z301U

Accessories

Expansions

Type	Designation	Art. No.
LON expansion set	LON expansion card for subsequent installation in U200A, U200C or U200D Requirement: – SMARTCONTROL basic PCB from rev. 2.3x onwards (position of marking see page 5)	Z301V
IO24 expansion set	IO24 expansion card for subsequent installation in U200A, U200C or U200E Requirement: SMARTCONTROL basic PCB from rev. 2.3x onwards (position of marking see page 5)	Z301W
Modbus TCP expansion set	Modbus TCP expansion card Prerequisite: SMARTCONTROL, basic PCB as of rev. 3.x	Z302O

M-bus Accessories

Type	Designation	Art. No.
PW80	M-Bus level converter, socket module for 80 M-Bus terminal devices and SMARTCONTROL, including contact protection, only with SMARTCONTROL rev. 3.x	Z301Y
Pulse transformer	M-bus pulse transformer for conversion of 2 pulse signals to M-bus, can only be used in combination with M-Bus level converter	Z301K

Sensor Accessories

Type	Designation	Art. No.
PT1000 sleeve sensor	Temperature sensor, PT1000 sleeve sensor, measuring range: -50 to +180° C, 1.5 m silicon cable, V2A sleeve with 5.5 mm diameter.	on request
PT1000 room temperature	PT1000 temperature sensor for room temperature with housing	on request
PT1000 outdoor temperature	PT1000 temperature sensor with radiation protection for outdoor temperature, with housing (IP 65)	on request
PT1000 clip-on sensor	Temperature sensor, PT1000 clip-on sensor	on request
Room humidity / temperature sensor	Humidity and temperature sensor with 0 ... 10 V or 4 ... 20 mA output, working range for relative humidity: 0 ... 99%, for temperature: 0 ... +50° C, supply voltage: 15 ... 35 V=	on request
CO2 room sensor	CO2 (carbon dioxide) sensor with 0 ... 10 V output, non-dispersive infrared (NDIR) measuring method, measuring range: 0 ... 2000 ppm, accuracy: ±30 ppm, long-term drift (12 months): ±10 ppm, supply power: 24 V AC/DC ±20%, power consumption: < 1 W	on request

Software Accessories

Type	Designation	Art. No.
OPC server	OPC server for SMARTCONTROL, limited to five devices and one PC. Larger applications upon request.	Z301S
Additional license for OPC Server	1 additional license for SMARTCONTROL OPC Server	Z302A

SMART**CONTROL** | ECS
Energy Control System

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