SIEMENS

2827

SYNERGYR®

Control and Heat Meter Interface

WRI80

Electronic control and heat meter interface. Controls the room temperature by driving a motorized valve, reads heat energy consumption from the connected M-bus heat meter, acquires pulses from third-party devices, stores data and communicates with other SYNERGYR devices via the building bus.

Use

The WRI80 control and heat meter interface is a component of the SYNERGYR Control & Metering System. For use and overview of the SYNERGYR system, refer to Data Sheets 2802 and 2803 (System Overview).

Functions

- Control of the reference room temperature with the QAW… room unit by driving a motorized zone and / or room valve
- Central night setback
- Boost heating and quick setback
- Minimum and maximum limitation of the flow rate
- Release of the zone valve for DHW heating
- Control of an apartment pump
- Frost protection for the apartment
- Periodic pump and valve kick
- Reading the consumption data and measured values from the connected M-bus heat meter
- Acquisition of pulses delivered by a third-party heat meter
- Storage of meter readings on the set days and at the end of the month
- Hours run meter
- Transmission of all relevant data to the central unit
- Indication of operating state with LED

Type summary

Type of device	*Type reference*
Control and heat meter interface	**WRI80**
Conduit box for WRI80	**ALW84**
Address plug set for address numbers 1…16	**PTG1.16**
Address plug set for address numbers 1…32	**PTG1.32**
Address plug set for address numbers 33…64	**PTG1.64**
Address plug set for address numbers 65…96	**PTG1.96**

For suitable mounting kits for heat meters and valves, refer to the system overviews.

Ordering

When ordering, please give type reference **WRI80**.
Address plug sets and additional system components, such as valve, actuator, heat meter, room unit and conduit box must be ordered as separate items.

Delivery

The scope of delivery comprises the WRI80 with ready mounted connecting cable and Mounting Instructions.

Equipment combinations

For each apartment, 1 WRI80, 1 heat meter, 1 actuator (zone valve), 2 AEW2.1 pulse adapters, 2 AEK84 control modules (apartment pump, room valve actuator) and 1 QAW10 or QAW20 room unit can be connected.

Suitable types of heat meters

The following lines of Siemeca™ M-bus heat meters can be used:
- WFM21…
- WFQ21…

For other types of heat meters, please contact us.

Suitable types of valves and actuators

- VVP47… valves with SSP81 actuator
- VVP45… valves with SSB81 actuator

Product documentation

Type of document	*Title*	*Number*
System overview	SYNERGYR® control and billing system For new plant	N2802
System overview	SYNERGYR® control and billing system For service and replacement	N2803
Planning Manual	SYNERGYR® control and billing system Planning Manual	J2841
Operating Manual	SYNERGYR® control and billing system Operating Manual	U2841
Mounting Instructions	SYNERGYR® control and billing system Mounting Instructions	M2827

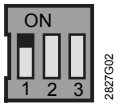
Technical design

Room temperature control

The WRI80 controls the room temperature via a zone valve with a 3-position actuator and, if required, a room valve with 2-position actuator.
DIP switch 1 is used to select the required application.

Comfort application individual room control

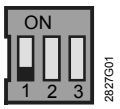
During occupancy times, room temperature control is accomplished via the room valve, and the zone valve remains open.
During nonoccupancy times, central night setback is ensured via the zone valve.



Position for **Comfort** application:
Switch 1 = ON

Eco application reference room control

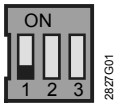
Room temperature control of the reference room always takes place via the zone valve.



Position for **Eco** application:
Switch 1 = OFF (as supplied)

Standard application heat metering

The **Standard** application makes possible heat metering without room temperature control.



Position for **Standard** application:
Switch 1 = OFF (as supplied)

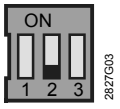
Flow rate limitations

Minimum and maximum limitation of the flow rate is ensured via the zone valve. The limitations can be individually switched on and off.

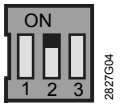
Maximum limitation of the flow rate

Maximum limitation of the flow rate limits the volumetric flow to the apartment to the adjusted maximum value. This ensures that sufficient amounts of heat will be delivered to the other apartments.

Maximum limitation of the flow rate can be activated with DIP switch 2.
It has priority over normal room temperature control.



Position **without** maximum limitation of the flow rate:
Switch 2 = OFF (as supplied)



Position **with** maximum limitation of the flow rate:
Switch 2 = ON

Minimum limitation of the flow rate

Minimum limitation of the flow rate ensures that a minimum flow rate will be maintained although the normal room temperature is reached. This ensures that during occupancy times with the Eco application, floors and radiators (bathrooms, reference room and other rooms without thermostatic radiator valves) will attain a certain temperature level.
Heat generation and circulating pumps must be in operation.
If minimum limitation of the flow rate is set to 0 l/h, it is continuously off.
If activated, minimum limitation of the flow rate leads to higher heat consumption.

DHW charging

The WRI80 receives the request for DHW via a digital input and fully opens the zone valve during the time the request is present.
A short-circuit on the room unit bus has the same effect.
Maximum limitation of the flow rate remains active during the entire charging cycle.

Apartment pump

The WRI80 controls an apartment pump, if present, via an external AEK84 control module. The apartment pump's overrun time is adjustable.

Frost protection for the apartment

The WRI80 features a frost protection function for the apartment.
If the temperature (flow and return temperature of the heat meter, or the room temperature) falls below 3 °C, both the zone and the room valve will be released until all temperatures have exceeded 5 °C again.
If present, the apartment pump will be activated.

Valve kick

If not in operation for a week, both the zone and the room valve will be operated at 10:00 the next morning, to prevent valve seizing.

Pump kick

If present, an apartment pump will operate during the time the valve kick is active (including overrun time). This prevents pump seizing.

Acquisition of heat consumption

All 3 applications (Eco, Comfort and Standard) offer acquisition of heat consumption. Heat consumption acquired by the connected heat meter is transmitted via the M-bus to the WRI80 where it is made available for readout.

Set day values

Set day information is adopted by the heat meter provided the date of the set day agrees with that of the WRI80. Otherwise, the set day information is generated by the WRI80 on the set day at 0:00. The last and last but one set day will be stored.

Monthly values

If available, monthly information will be adopted by the heat meter. Otherwise, monthly information is generated by the WRI80 at the end of the month. The last 12 monthly values will be stored.

Handling pulses from third-party devices

Any type of meter (e.g. gas, water, electricity) can be connected to the WRI80 using one of the following pulse contacts:

- Reed contact
- Reed contact with Namur circuitry

The connection is made via the ALW84 conduit box. The pules are converted to consumption values and stored like heat consumption values (current value, set day values, and monthly values).
If additional meters are used, an AEW2.1 pulse adapter is required. It offers the same storage facilities as the WRI80.

Handling faults

The WRI80 records faults (own faults and faults of the heat meter, room unit and pulse interface). The most severe fault is transmitted to the central unit.

Indication of operating state

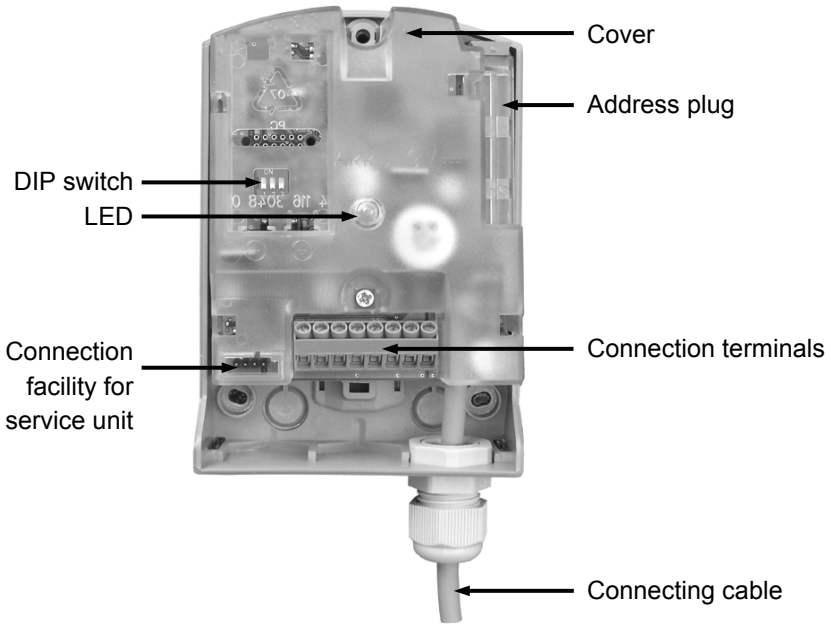
The LED on the front of the WRI80 indicates the operating state:

- LED steady on: Fault
- LED flashes: Normal operation
- LED off: No operating voltage

Mechanical design

The WRI80 consists of base, printed circuit board with electronics and cover.
The base is suited for both wall mounting with screws or DIN rail mounting. To make the electrical wiring, the rear and the underside of the unit have knockout holes for cable entry glands PG11 or rubber grommets.
In addition to the electronics, the printed circuit board with the covering plate carries the connection terminals, the DIP switch, the connecting cable and the connection facility for the service unit. It also accommodates the address plug which is used to mechanically assign the WRI80 a number (address) during commissioning.
The ready fitted connecting cable (1.5 m) is used for connecting the WRI80 to the ALW84 conduit box. It carries the lines for the power supply, the building data bus, the room unit bus, an input for a third-party meter and the control output for the room valve.
The other wiring (M-bus, zone valve actuator, input for DHW request, and control output for the apartment pump) is made via the connection terminals of the WRI80.
Terminal strip: 8 connection terminals for 2 wires each (1.5 mm^2)
The connection terminals are screw terminals.

Basic design



The connection diagram is printed on the inner side of the cover.

Accessories

ALW84 conduit box

The ALW84 conduit box consists of base, terminal block and cover. The mechanical design corresponds to that of the WRI80.
The base has 3 holes for wall mounting. The rear carries the snap-on facility for DIN rail mounting.

Wiring:

- There are 3 knockout holes at the bottom for PG11 cable entry glands or rubber grommets
- The rear has 5 knockout holes for a standard conduit box

Terminal block:

- 5 connection terminals for 4 wires each (1.5 mm^2)
- 3 connection terminals for 2 wires each (1.5 mm^2)

The connection terminals of the ALW84 are spring cage terminals.

ALW84 conduit box

Engineering notes

General

The local regulations for heat metering and electrical installations must be complied with.
AC 24 V operating voltage is delivered by an isolating transformer which powers the entire SYNERGYR plant and which is to be installed near the central unit. The isolating transformer must be sized for the power consumption of all devices powered via the building bus. The transformer must not be earthed on the secondary side. If several buildings are involved, it is recommended to use a separate power supply (AC 24 V) for each building.

Control outputs

To control external components via control outputs R1 and Q1, separate AEK84 control modules are required.

Circulating pump and valves

If all valves are fully closed while the circulating pump runs, and in case there is no pressure control, the whole piping system on the flow side is subjected to the full pump pressure at zero flow rate.
For this reason, to prevent damage to the circulating pump and the zone valve, an overflow valve should be installed at the remotest point of the hydraulic system.
For differential pressure control, it is recommended to use a speed-controlled pump.

Mounting notes

Mounting

Owing to its compact design, the WRI80 can be installed in the apartment's cabinet or in the cable riser.
When choosing the mounting location, the environmental conditions must be taken into consideration.
The WRI80 is suited for mounting on a

- flat surface, such as a wall, or in the control cabinet, or
- DIN rail

Above the WRI80, a free space of at least 50 mm must be observed, enabling the address plug to be fitted.
The WRI80 is supplied complete with Mounting Instructions.

Electrical installation

To simplify wiring between the WRI80 and the conduit box, the 8-core connecting cable is color-coded (refer to "Connection diagram").

Commissioning notes

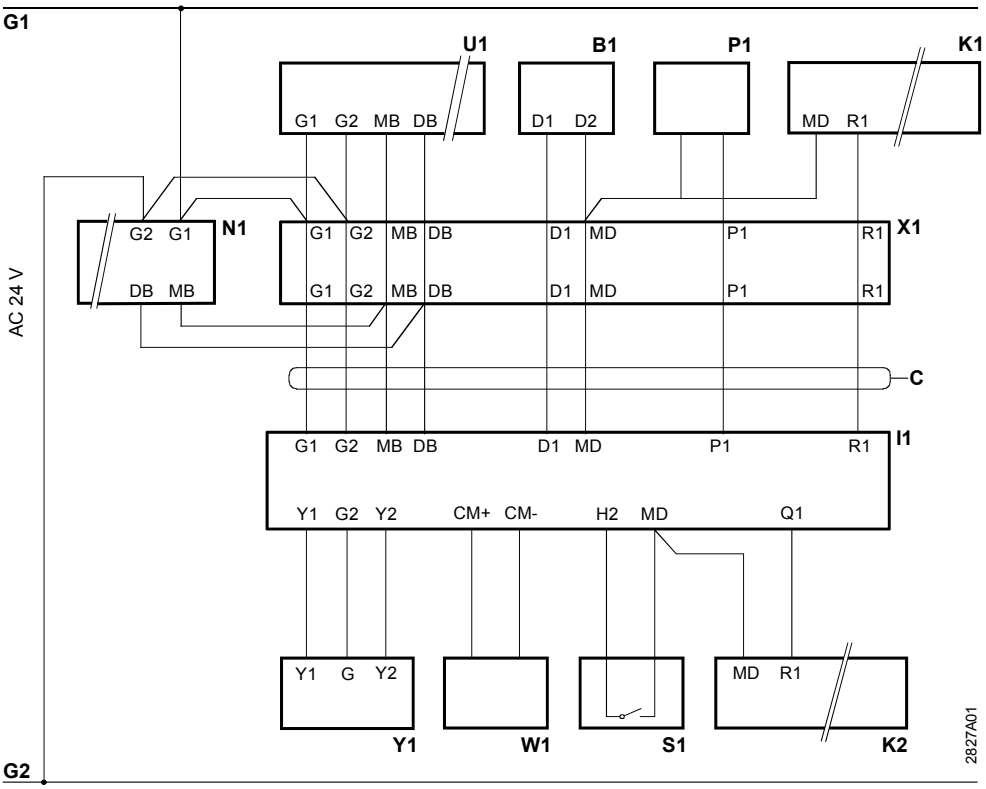
The WRI80 must be parameterized and the address plug fitted by authorized staff (after mounting). This ensures a uniform metering start of the system. After commissioning,

Technical data

General unit data	Operating voltage	SELV / PELV AC 24 V +20 % / –33 %
	Rated voltage	AC 24 V
	Nominal frequency	50 / 60 Hz
	Total power consumption	3.7 VA
	Power consumption WRI80 basic unit	1.9 VA
	Power consumption per control module	0.5 VA
	Power consumption zone valve actuator	0.8 VA
	Perm. ambient temperature	
	Transport and storage	–25…+70 °C
	Operation	0…50 °C
	Perm. ambient humidity	class F to IEC 721
	Weight	0.32 kg
	Length of connecting cable	to conduit box 1.5 m (fixed)
Wiring	Terminals for power supply and extra low-voltage	per terminal (solid wire or stranded wire, twisted or with ferrule) 1 core: 0.5 mm^2…2.5 mm^2 2 cores: 0.5 mm^2…1.5 mm^2 3 cores: not permitted
Safety data	Degree of protection	IP54 to EN 60529
	Safety class	III to EN 60730
Standards	Product standard	EN 60730-1
	Electromagnetic compatibility	
	Immunity (residential)	EN 60730-1
	Emissions (residential)	EN 60730-1
	CE conformity to	
	EMC directive	2004/108/EC
Building data bus	Type	2-wire connection, non-interchangeable
	Baud rate	4800
	Perm. cable length	according to Planning Manual SYNERGYR® J2841D
Room unit bus	Type	2-wire connection, non-interchangeable
	Baud rate	4800
	Perm. cable lengths	copper cable 0.5 mm^2 75 m copper cable 0.75 mm^2 115 m copper cable 1.0 mm^2 125 m
M-bus	Type	2-wire connection, interchangeable, master for 1 heat meter
	Standard	compatible with M-bus heat meter to EN 1434-3 or prEN 13757-2 /-3
	Baud rate	2400
	Perm. cable length	copper cable 0.6 mm dia.,max.100 m

Pulse input (P1) for third-party meters	Type	for potential-free contact, with or without Namur circuitry to DIN 19234
	Max. input frequency	15 Hz
	Min. pulse duration	33 ms
	Perm. cable length	copper cable 0.6 mm dia. max.10 m
Input for DHW request (H2)	Type	for potential-free contact
	Transfer resistance	max. 100 Ω
Control outputs (R1, Q1)	Voltage	DC 0 / 12 V
	Current	max. 25 mA
Output for zone valve actuator (Y1, Y2)	Voltage	AC 0 / 24 V
	Power consumption	max. 5 VA
	Perm. cable length	copper cable 0.6 mm dia. max.10 m

Connection diagram



Devices

B1	QAW… room unit
K1	AEK84 control module for room valve
K2	AEK84 control module for apartment pump
N1	OZW30 central unit
P1	Third-party meter with potential-free pulse contact
U1	AEW2.1 pulse adapter
X1	ALW84 conduit box
I1	WRI80 control and heat meter interface
W1	Heat meter
Y1	Zone valve actuator
S1	Potential-free switching contact
C	Connecting cable

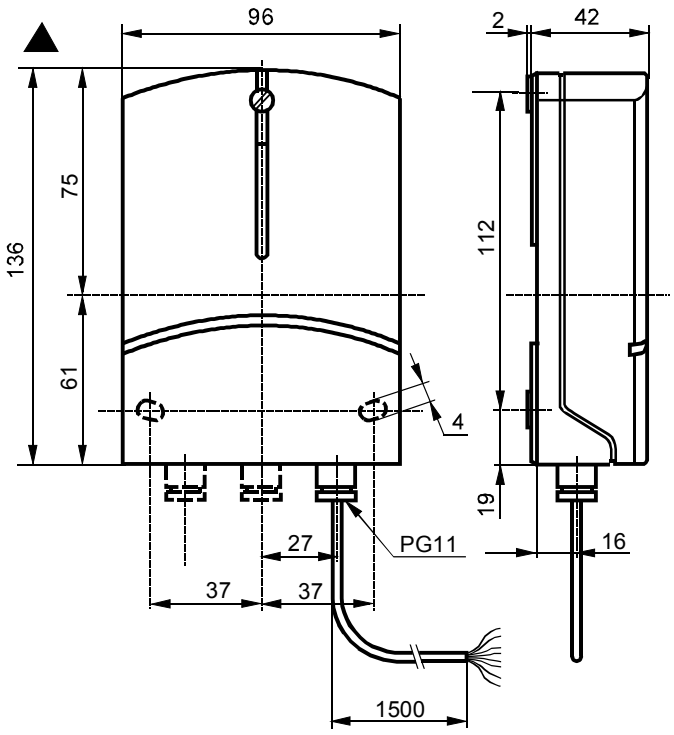
Connecting cable (fixed)

R1	red	Control output 1
G1	white	AC 24 V power supply
G2	brown	AC 24 V power supply
MD	green	Ground
P1	yellow	Input for third-party meter
D1	grey	Room unit data
DB	pink	Building bus data
MB	blue	Building bus ground

Connection terminals

Y1	Control voltage for zone valve actuator OPEN
G2	Reference potential AC 24 V for zone valve actuator
Y2	Control voltage for zone valve actuator CLOSE
CM+	M-bus data
CM–	M-bus ground
H2	Input for DHW request
MD	Ground
Q1	Control output for apartment pump (via AEK84)

Dimensions



Minimum space for fitting the address plug:

▲ = 50 mm

Subject to alteration