



Electronic energy meter with pulse output

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Electronic energy meters are measuring instruments which are used to determine energy consumption of electrical loads. The meters can either be used for direct connection or for current transformer measurements. Typical areas of application are in the field of energy management for cost centre analysis, as a measurement

value generator for PLC controls or in central building control systems. Electronic meters should be calibrated and sealed for invoicing purposes in order to guarantee continuous accuracy and to protect the meter from misuse or unintended reprogramming.

The ECS series energy meter

Areas of application

Electronic energy meters are mainly used for collecting data of effective and reactive energy consumption. Their standard area of application is in the field of energy management for cost centre analysis. There are various communication possibilities available in order to avoid time-consuming manual readings at site. The effective pulses can be connected via two impulse outputs e.g. DDC, PLC, SCADA systems or the data logger ProData®. In the area of central building control systems the protocols M-Bus, EIB-KNX and Modbus RTU are available through additional communication modules which read the actual meters using an optical interface and which provide the respective value on the field bus through the interface. The selection of additional values such as voltage, current, power, power factor and frequency together with effective and reactive energy are available on the bus cable through the communication modules. For consumption data collection, the ECS meters can also be used as instruments for sub-metering for the UMG 604 through Modbus RTU.



Main features

- Communication modules: Modbus, M-Bus, EIB-KNX
- Direct measurement up to 125A or through current transformer
- 2 tariffs
- With and without MID calibration
- Sealed clamp covers
- Four quadrants measurement
- Measurement values: effective energy, reactive energy, effective power, reactive power
- Class 1

Applications

The electronic energy meters of the ECS series are suitable for the measurement of effective- and reactive-energy consumption. Measurement is laid out for a 1- and 3-phase system with a voltage of L-N 184-276VAC. The current inputs are designed for direct connection or for measurement through current transformers. Installation is undertaken on DIN-rails, whereby the extremely compact construction is of particular value. There are two versions available: a non-calibrated version and a calibrated version (MID). All meters in the ECS series can be sealed. The effective and reactive energy is available in two tariffs and in four quadrants. The accuracy of the meters is class 1 for effective energy and class 2 for reactive energy.

Data collection and recording

All meters store the counter values in non-volatile memories. The meter reading cannot be reset in the calibrated version. In the non-calibrated version the readings can be reset. The current transformer ratio is fixed (5:5) for calibrated meters.

Overview of product variants

Types	ECS1-80	ECS3-80	ECS3-125	ECS3-5
without MID Item number	ECS1-80 (without MID) 14.01.301	ECS3-80 (without MID) 14.01.320	ECS3-125 (without MID) 14.01.330	ECS3-5 (without MID) 14.01.310
with MID Item number	ECS1-80 (MID) 14.01.302	ECS3-80 (MID) 14.01.321	ECS3-125 (MID) 14.01.331	ECS3-5 (MID) 14.01.311

General technical data

Operating voltage	184...276VAC	184...276VAC	184...276VAC	184...276VAC
Dimensions [mm]	W= 36x H= 90x D=70	W= 72 x H= 90 x D= 70	W= 108 x H= 90 x D= 70	W= 72 x H= 90 x D= 70
Width in units	2	4	6	4
Working temperature	-10...+55°C	-10...+55°C (Option -25...+55°C)	-10...+55°C (Option -25...+55°C)	-10...+55°C (Option -25...+55°C)
Storage temperature	-25...+70°C	-25...+70°C	-25...+70°C	-25...+70°C
Protect. class (front/clamps)	IP 51/20	IP 51/20	IP 51/20	IP 51/20
Max connectable conductors	Current 35mm ² Voltage 1.5mm ²	Current 35mm ² Voltage 1.5mm ²	Current 50mm ² Voltage 1.5mm ²	Current 4mm ² Voltage 1.0mm ²

Measurement range

Voltage L-N	184...276VAC	184...276VAC	184...276VAC	184...276VAC
Voltage L-L	-	319...478VAC	319...478VAC	319...478VAC
Current	0,025...80A	0,015...80A	0,020...125A	0,003...6A (.../5A)
Frequency, mains	50Hz	50Hz	50Hz	50Hz
Measurement	1-phase	3-phase	3-phase	3-phase
Measurement mode	Direct	Direct	Direct	CTs

Measurement value

Effective energy	Class 1	Class 1	Class 1	Class 1
Reactive energy	Class 2	Class 2	Class 2	Class 2
4 quadrants	Yes	Yes	Yes	Yes
2 tariffs	Yes	Yes	Yes	Yes
Effect.,reactive-power display	Yes	Yes	Yes	Yes

Periphery

Pulse outputs	2	2	2	2
Pulse value	1000 Imp/kWh	500 Imp/kWh	500 Imp/kWh	1/10/100 Imp/kWh
Pulse length	30 ± 2ms*	50 ± 2ms*	50 ± 2ms*	50 ± 2ms*
Digital input	1	1	1	1

Optional communication modules

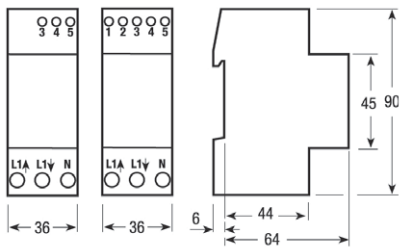
Types		Item number
Modbus RTU / ASCII (Full)	Baud rate: up to 38,4kBaud Applicable parameters: Wh, kvarh, V, A, Hz, cos-phi, kW, kvar	14.01.410 *
M-Bus (Full)	Baud rate: 300...9600Baud Applicable parameters: Wh, kvarh, V, A, Hz, cos-phi, kW, kvar	14.01.411 *
EIB-KNX (Full)	Baud rate: 9600Baud Applicable parameters: Wh, kvarh, V, A, Hz, cos-phi, kW, kvar	14.01.412

* For parameterization and configuration of the Modbus communication modules, an interface converter (eg. K2075) is required.

** For parameterization and configuration of the M-Bus communication modules, a level converter is required.

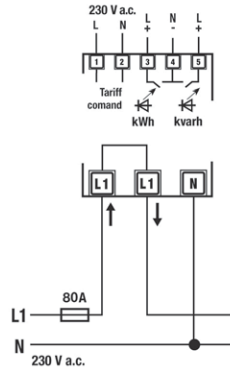
ECS1-80 - single-phase energy meter

Dimensional drawing

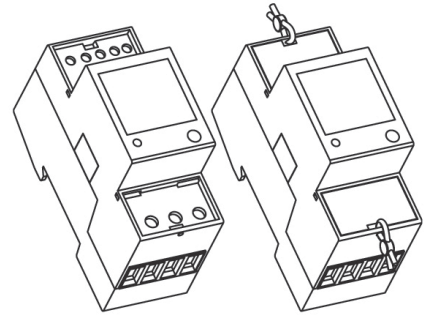


All dimensions in mm.

Circuit diagram

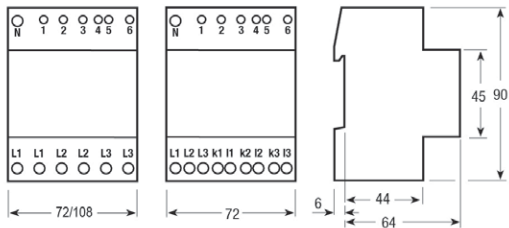


Sealable clamp terminal



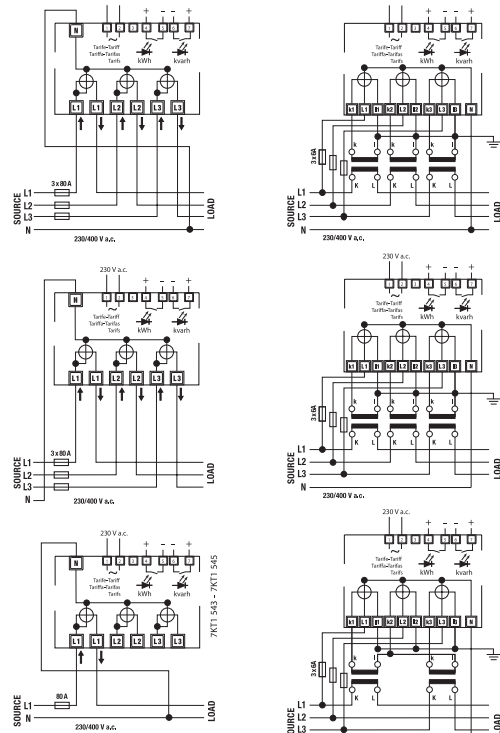
Three-phase energy meter

Dimensional drawing

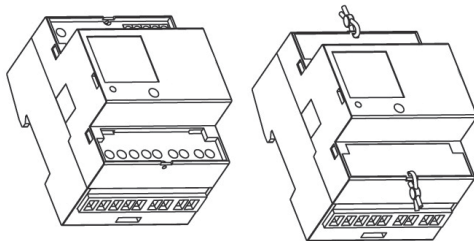


All dimensions in mm.

Circuit diagram



Sealable clamp terminal



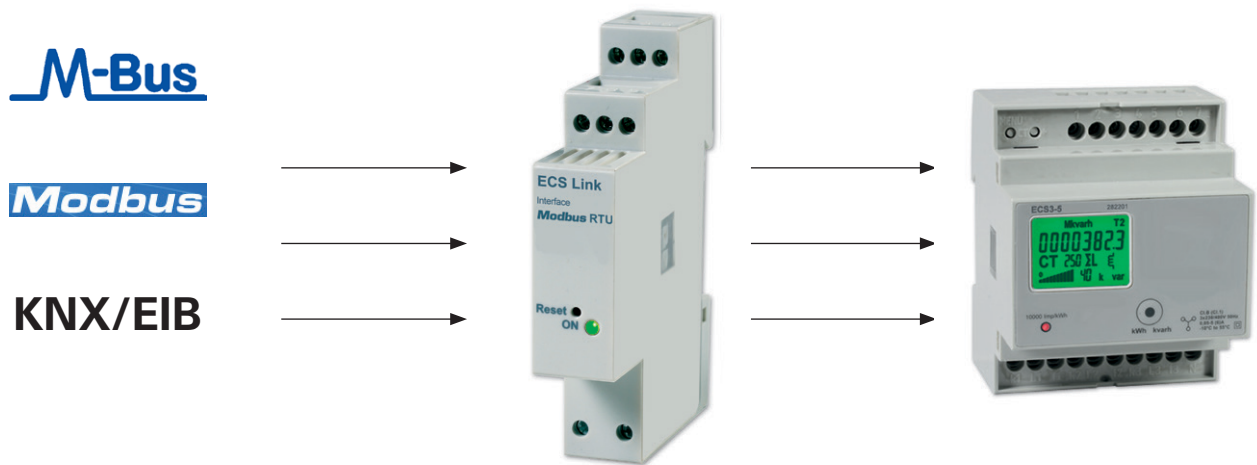
Information for connecting meters with CTs

A 6A fuse on L1 is recommended to protect the cables. Current transformers must not be operated with open clamps because dangerously high voltages can occur. Failure to observe this information can lead to injury to persons and damage to property. Furthermore, CTs can be thermally overloaded.

Communication modules – width is 1 unit for DIN-rails (35mm)

The lateral optical IR-interface and desired communication module allow the power meter to be integrated into the building-services engineering easily and cost-effectively. The simple click-assembly of the communication module

allows the power meter to be expanded with further communication technologies (M-Bus, EIB-KNX, Modbus RTU and LAN).



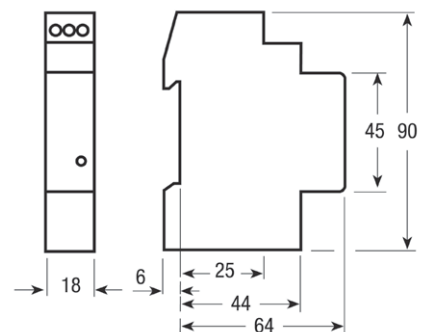
M-Bus module

The M-Bus interface (installation on DIN rail, 1 module wide) allows devices such as power meters to be connected to the M-Bus. The M-Bus is commonly used for the remote reading of power meters and multiple sensors. The interface is powered via the bus itself, which receives

measured quantities from the meter via an IR optical interface. The only electrical connection which must be made is the bus-cable connection (standard telephone cable). The interface may be used for single and three-phase power meters and other measurement devices.



Dimensional drawing



All dimensions in mm.

The ECS series energy meters

Modbus RTU- and ASCII-Modul

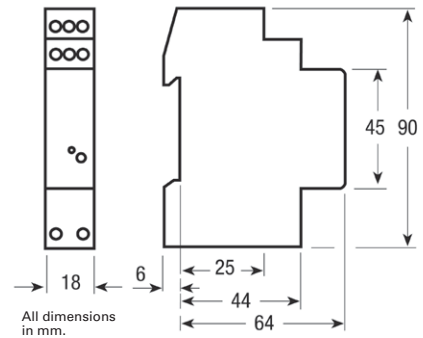
The module may be connected to a remotely-operated station (such as a power meter with IR interface) for transferring values detected via a measurement device over a modbus network.

The data transfer module automatically recognises the connected measurement instrument over the IR interface and is able to transfer all quantities detected by this measurement device.

Modbus



Dimensional drawing

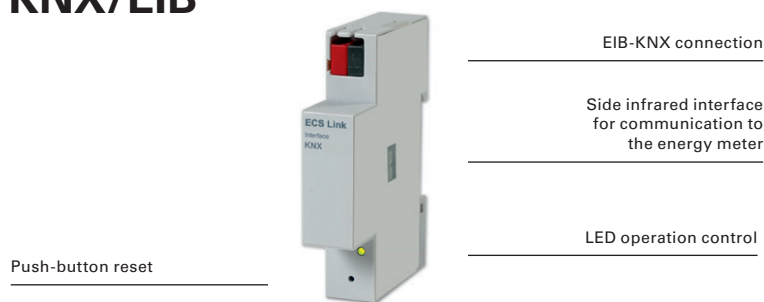


EIB-KNX-Modul

The bus EIB-KNX is commonly used in residential and commercial properties. The interface is powered via the bus line itself, where the existing adjacent IR optical interface

receives measured quantities from the meter. The only electrical connection which must be made is the bus-cable connection.

KNX/EIB



Dimensional drawing

