Pixsys®
ELECTRONICS
www.pixsys.net

Signal Converters
Overview

Programmable by RFID /NFC
No wiring required!

DIN B head / DIN rail converter

Programmable input
Galvanical isolation
DIN rail version including customized linearization

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Programming tools

Main features

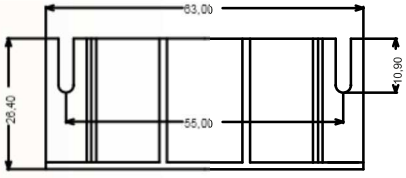
				
	2000.35.010	**2000.35.015**	**2000.35.016**	**2000.35.017**
Box	23 mm, Ø 45 mm		DIN43880 1 module - 18 x 90 x 64	
Current output	4..20 mA loop power (2 wires), operating range 6-32 V DC			
Connection	Screw pins		Screw pins	
Mounting	DIN/B head		Din-Rail mounted	
Operating temperature	-40+85 °C, Humidity 30..90 RH%			
Material	Nylon (PA66)		Box: polycarbonate V0; Front panel: silicon V0	
Weight	Approx 30 g		Approx 30 g	
Sealing	IP 20		IP 20	
Conformity	CE, EN 61000-6-4, EN 61000-6-2, UL		CE, EN 61000-6-4, EN 61000-6-2	
Set-up	Programmable by RFid (NFC)		Programmable by RFid (NFC)	
RFID - NFC (USB Programmer cod. 2000.35.012)	●		●	
"My Pixsys" NFC APP for Android	GET IT ON Google Play		GET IT ON Google Play	
"ATEX" version ATEX II 1 G EX IA IIC T3 ...T6 GA ATEX II 1 D EX IA IIIC T86...200°C DA ATEX I M1 EX IA I T150°C MA	**2000.35.030**	**2000.35.031**	○	

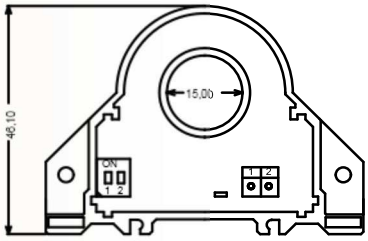
Technical data

Selectable analogue input	PT100 (2/3/4 wires), Ni100, PT1000	PT100 (2/3/4 wires), Ni100, TC K-S-R-J-T-N-B-E		0..20 mA, 4..20 mA, 0..10 V, 10 Ω..200 KΩ
Digital Input	○	○	Button for calibration functions	
Isolation	○	Galvanic isolation input/output		
Output resolution	1µA		1µA	
Range output	Over F.S. + 5°C, Under F.S. - 5°C		Over F.S. + 5°C, Under F.S. - 5°C	
Failure output	Selectable 21,5mA or 3,8mA		Selectable 21,5mA or 3,8mA	
Current output protection	30 mA approx.		30 mA approx.	
Rejection	50-60 Hz		50-60 Hz	
Max transmission error	Greater between 0,1% f.s. or 0,2°C		Greater between 0,1% f.s. or 0,2°C	
Sampling/Response time	300ms / approx. 600 ms		300ms / approx. 600 ms	
Cable resistance	Max 20Ω		Max 20Ω	
Temperature coefficient	< 100 ppm		< 100 ppm	

Current Transformer AC/DC TRMS Loop Powered 2000.35.013

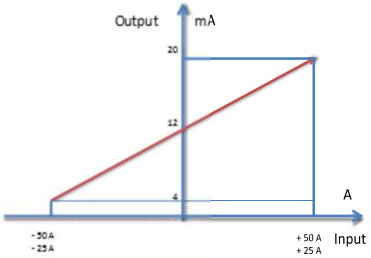
The **2000.35.013** is a AC/DC current transformer, galvanically isolated from the measuring circuit. The device is in the function and appearance very similar to a standard active TA, however, able to measure the DC component and **AC TRMS** (True RMS). The transformer is powered 4-20mA current loop and therefore does not require a direct power supply. It 's the first Hall's effect current transformer loop-powered with **0.5% accuracy** on the market.



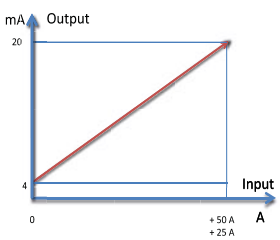


POWER SUPPLY	Passive loop powered, 11 .. 30V, Protections against polarity reversal and overtemperature.
ABSORPTION	Less then 3,5mA
PROTECTION INDEX	IP20
ACCURACY	0,5% F.S.
RESOLUTION	12 bit
TEMPERATURE COEFFICIENT	< 200 ppm/°C
WORKING TEMPERATURE	-15 .. +65°
STORAGE TEMPERATURE	-40°C .. +85°C
RESPONSE TIME	1000 ms
TYPE OF MEASURE	**TRMS (True RMS)**
RANGE	**50 Arms or 25 Arms** dip-switch setting, bipolar (+/- 50A DC o +/-25A DC)
OUTPUT	**4 .. 20 mA**
BAND WIDTH AT -3dB	DC or 20 .. 2000 Hz
ISOLATION	3kV on bare wire
OVERLOAD	2k A pulse, 300 A continuos
CREST FACTOR	2
HYSTERESIS	0,15% f.s.
HUMIDITY	10 .. 90% not condensing
ALTITUDE	Up to 2000 m s.l.m.
WEIGHT	72 gr
FILLING	Epoxy Resins
BOX MATERIAL	PBT, gray
MOUNTING	Screw predisposition for vertical / horizontal mounting, DIN Rail clips (included) for vertical / horizontal mounting
TERMINAL	Removable terminals 5,08mm
DIP-SWITCH	2 poles
LED	N°1 yellow (Power on)
STANDARDS CE	EN61000-6-4/2007-01; EN64000-6-2/2006-10 ; EN61010-1/2001
DIMENSIONS	46,1x 63x 26,4 mm (terminal excluded)

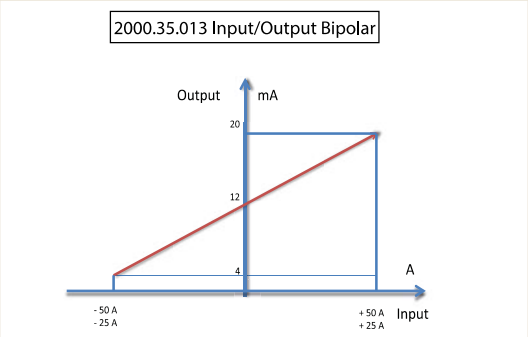
2000.35.013 Input/Output Bipolar

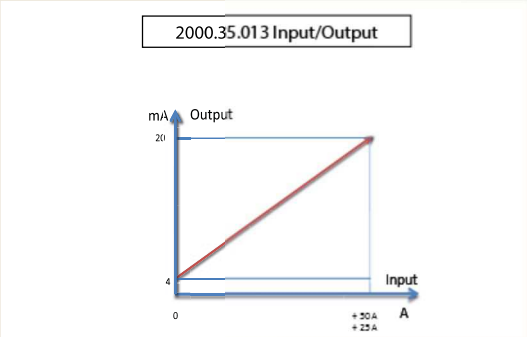


2000.35.013 Input/Output



Current Transformer AC/DC TRMS Loop Powered 2000.35.013





The 2000.35.013 has two dip-switches through which you can set the scale to 25 or 50A and select the monopolar or bipolar (see charts), the yellow led near the terminal will indicate the presence of the power supply.
Any changes made by dip-switch required to switch off the power supply. It's a safety condition in order to prevent any manumission on the device.

MOUNTING:
The current transformer 2000.35.013 can be mounted in any position (see photo below), horizontal or vertical mounting, horizontal or vertical through the two hooks for DIN rail included in the box.

Dip-Switch table:

DESCRIPTION	1	2
MONOPOLAR (TRMS)		0
BIPOLAR (MEAN VALUE)		1
50 A	0	
25 A	1	

CAUTION: magnetic fields of high intensity can vary the values measured by the transformer. Avoid installation near permanent magnets, electromagnets or iron masses that induce strong changes in the magnetic field. If any irregularity recommend reorient or move the transformer in the area most appropriate.

DIN RAIL MOUNTING INSTRUCTIONS:
To mount the hooks on 2000.35.013. If you want to mount horizontally, use the flexibility of hook to catch into prepared by pressing the center of the clip (fig. 1).

For vertical mounting, slide the hooks into the slots, external holding the two tabs on the clip (fig. 2).

For mounting on DIN rail horizontally, once hooked on the bottom, push with both hands as shown in fig. 3.

For vertical mounting on DIN rail, once hooked on the bottom, push with both hands on the hooks as shown in fig. 4.

To release from DIN rail, use a screwdriver and lever up to release the fins (fig. 5 or fig. 6).

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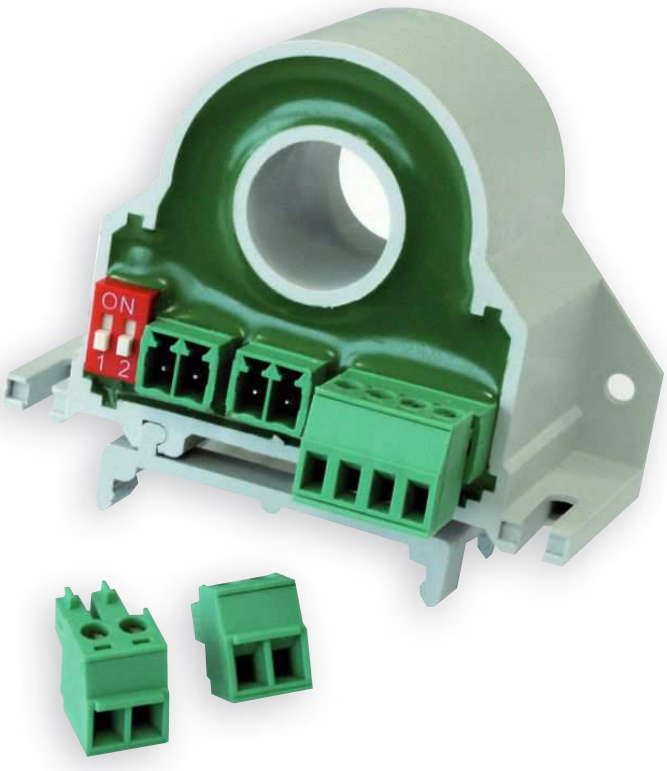
2000.35.021
Energy Meter



User manual / Manuale d'uso

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Sommario

Introduction

Thank you for choosing a Pixsys Energy Meter.
The 2000.35.021 is a **Single-phase Power Meter** able to measure the TRMS AC/DC Current and Voltage. On the RS485 Modbus following measuring units are available: Irms, Vrms, Watt, Var, Va, Vpk, Ipk, Frequency, Cosφ, Energy bidirectional and THD. The device is fully configurable by RS485, DIN rail mounting, 4kV galvanic isolation for Voltage input.

1 Safety guide lines

Read carefully the safety guidelines and programming instructions contained in this manual before using/connecting the device. Disconnect power supply before proceeding to hardware settings or electrical wirings. Only qualified personnel should be allowed to use the device and/or service it and in accordance to technical data and environmental conditions listed in this manual. Do not dispose electric tools together with household waste material. In observance European Directive 2002/96/EC on waste electrical and electronic equipment and its implementation in accordance with national law, electric tools that have reached the end of their life must be collected separately and returned to an environmentally compatible recycling facility.

2 Model identification

Power supply 9..30 V DC

2000.35.021	Power / Energy Meter Single Phase AC/DC TRMS - RS485 Modbus

3 Technical data

3.1 Main features

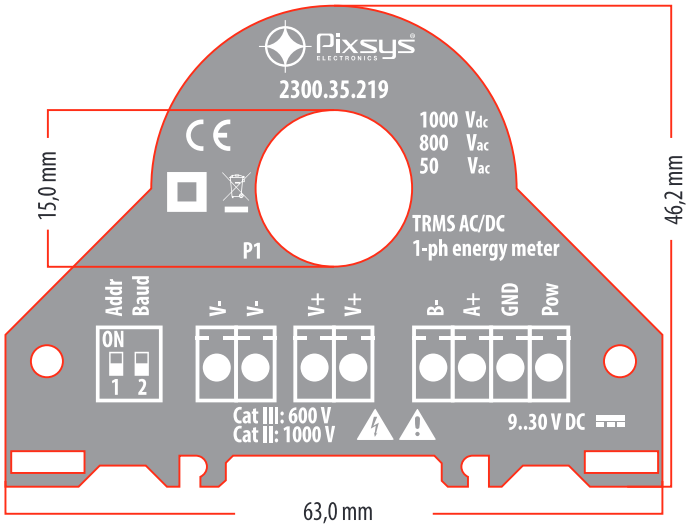
- TRMS Measure, THD available
- 0,5 % Accuracy
- RS485 Modbus integrated
- Bidirectional Energy metering
- DIN rail mounting in both side
- OEM's design, low cost
- Fully configurable by free interface software EnergyMeter-Programmer
- Bootloader for updating firmware

3.2 Hardware and software features

Power supply	9..30 V DC, Protection against polarity reversal and overtemperature
Absorption	1,3 W
Protection index	IP20
Accuracy	Voltage, Current, Active Power, Reactive Power, Apparent

	power: < 0,5% F.S. Frequency: +/- 0,1 Hz Energy: +/- 1% of reading Vpeak, I peak: +/- 5% f.s.
Measurement	Irms, Vrms, Watt, Var, Va, Vpk, Ipk, Frequency, Cosφ, Energy bidirectional, THD
Temperature coefficient	< 200 ppm/°C
Working temperature	-15..+65°C
Storage temperature	-40°C.. +85°C
Type of measure	TRMS or DC
Range	Current: Up to 50 A AC/DC Voltage: up to 800 V AC or 1000V DC RS485 customize setting with free interface software EnergyMeter-Programmer
Crest factor	1,8 (on current measurement)
Output	RS485 Modbus RTU
Working frequency	DC or 1..400 Hz
Sampling rate	11k Samples per Second
Input impedence	1 M ohm +/-1%
Isolation	3 kV on bare wire for Current measure, 4 kV for Voltage measure (reinforced insulation to power supply and serial output)
Hysteresis	0,15% f.s.
Humidity	10..90% not condensing
Altitude	Up to 2000 m s.l.m.
Weight	80 g.
Filling	Epoxy Resins
Box material	PBT, grey
Mounting	Screw predisposition for vertical/horizontal mounting, DIN rail clips (included) for vertical/horizontal mounting.
Terminals	Removable terminals 3,5mm, n°1 4 poles, n°2 2 poles
Dip-switch	2 poles
Led	N°1 yellow, Power on fixed, data communication blinking
Standards CE	EN61000-6-4/2006 + A1 2011; EN64000-6-2/2005; EN61010-1/2010
Overvoltage category	Cat III up to 600V; Cat II up to 1000V
Dimensions	46,1x 63x 26,4 mm (terminal excluded)

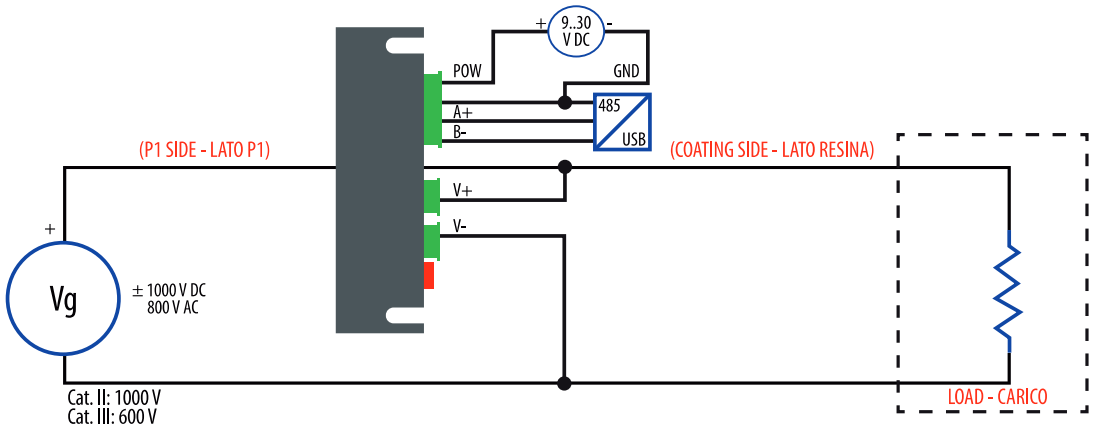
4 Dimensions and Installation



5 Electrical wirings

Although this controller was designed to resist electromagnetic interferences in industrial environments, please observe following safety guidelines:

- Separate the control line from the power wires.
- Avoid proximity of remote control switches, electromagnetic contactors, powerful engines and in all instances use specific filters.
- Avoid proximity of power groups, especially those with phase control.



6 Mounting

The Power Meter 2000.35.021 can be mounted in any position (see photo below), horizontal or vertical mounting, horizontal or vertical through the two hooks for DIN rail included in the box.

7 Configuration

Using a serial link RS485-USB you can connect the 2000.35.021 with the interface program EnergyMeter-Programmer. This software allows to set the Modbus address, baudrate, delay, the TV and TA ratio, to modify a filter in order to have fastest responce time instead of a more stable measurement (filter range from 1-speed to 5-accuracy). You can download the EnergyMeter-Programmer free of charge from Download Area on our website www.pixsys.net.
A second way to program the 2000.35.021 is by using the Modbus Register Map directly.

7.1 Remarks

- Modbus connections: A+ and B- as per Modbus RTU standards;
- Modbus Register reference: with reference to the logical address, for ex. 40010, corresponds to physical address n°9 as per Modbus RTU standard;
- Modbus functions supported: 3 (Read multiple registers, max 100), 6 (Write single), 16 (Write multiple).
- Any change made by dip-switch requires to switch off the power supply

Energy storage data on flash memory: 4,5 years minimum, 45 years typical
Minimum Current measurement offset: 100mA
Minimum Power measurement offset: 1 W
Measurement refresh: every 50 cycles or 1 second (the faster), programmable by EnergyMeter-Programmer

If you want to set the device by EnergyMeter-Programmer set the dips to 0. If you want to set by RS485 directly, set the first dip to 1 (up) then use the second dip for baudrate setting (0 for 9600 or 1 for 38400). After the settings, please save the configuration by the COMMAND register, then switch off the power supply: Before switching on the power supply set the dips to 0.

Dip-switch settings	1	2
All setting from EEPROM	0	0
Set Address 1- Baud 9600	1	0
Set Address 1 -Baud 38400	1	1

8 EnergyMeter-Programmer

The free interface program EnergyMeter-Programmer is the fastest way to configure the device. The changes made to the program act on the register of the 2000.35.021.
To restore the default configuration, just press the button FACTORY DEFAULT.

Type of measure	Allows the selection of the measure RMS or DC only to define the sign (positive or negative) of reading
Save on energy flash	It is possible to activate the saving of the counters directly on the device's flash memory
Report of transformation	In case you would use the TA and / or TV, you can define the transformation ratio for the current input and voltage input, the default ratio is 1:1
Filter	Allows to insert a filter on reading in order to get more speed in responding (value 1) or a more stable and accurate measurement (value 5). By default the value is set to 2. You can choose between intermediate values already set or manually enter the desired filter by choosing the CUSTOM option from the menu. In this case, you can set the following parameters: filtering in DC, filtering in AC (default value 5), Frequency measurement on Current channel

CAUTION: Magnetic fields of high intensity can vary the values measured by the transformer. Avoid installation near permanent magnets, electromagnets or iron masses that induce strong changes in the magnetic field. If any irregularity, to reorient or move the transformer in the area most appropriate.

9 Modbus Register Map

See paragraph 9, page 15.

Notes / Updates