

ekinex

CONTROL YOUR LIVING SPACE

Application Manual



**3-phase MID electricity meter
with KNX communication**

Contents

1	Purpose of the document.....	4
2	Product description	5
2.1	Main characteristics	5
2.2	Technical data.....	6
2.3	Data back-up.....	6
2.4	Marks	6
3	Switching, display and connetion elements.....	7
3.1	Calibration pulse / calibration constant	7
3.2	D0 interface (EN 62056-21)	7
3.3	LCD display.....	7
3.4	Energy Direction	8
3.5	Navigation menu	8
3.5.1	Display language	10
3.5.2	S0 pulse outputs	10
3.5.3	Peak / threshold control	11
3.5.4	Date / time	13
4	Connections.....	13
4.1	KNX bus	13
4.2	Measuring circuits	14
4.3	Control inputs.....	15
4.4	S0 pulse outputs	16
5	Configuration	18
6	Programming and commissioning	18
6.1	Communication objects.....	19
6.2	Error Messages.....	23
6.3	Compliance with Standards and Directives	23
6.4	Warnings.....	24
6.5	Useful information	25
6.6	Disclaimer / exclusion of liability	25

Revision	Modifications	Date
1.0	Emission	27/04/2023
1.1	Technical data updated	02/09/2024

1 Purpose of the document

This manual describes the application details of the 3-phase MID electricity meter with KNX communication.

This document is intended for the system integrator as a description and reference guide for device functionality and application programming. For mechanical and electrical details of the installation device, please refer also to the device's data sheet.

This application manual and the application programmes (.knxprod files) for the ETS configuration environment are available for download at www.ekinex.com.

Document	Filename (## = release)	Versions	Device revision	Latest update
Datasheet	-	-	1.0	04/2023
Application manuale	MAEKME1EMUTP_EN.pdf	-		
Application prograam	APEKME1EMUTP##.knxprod	-		

2 Product description

Ekinex® EK-ME1-...-TP is a three-phase MID meter with KNX communication interface for active (kWh) and reactive (kVArh) energy measurement with bi-directional metering for imported and exported energy, current (A), voltage (V), active power (kW), reactive power (kVAr) and apparent power (kVA), power factor ($\cos \varphi$), network frequency (Hz), minimum and maximum values of U, I and P, maximum active power (kW) over 15 minutes, number of power failures.

The meter is available in two versions:

- code EK-ME1-75D-TP for direct connection up to 75 A and
- code EK-ME1-5TA-TP for connection via 1A and 5A current transformers. For the latter version, the transformation ratio is adjustable on the device up to 4000/1A and 20'000/5A.

The meter has four S0 pulse outputs for the transmission of imported and exported active and reactive energy data, which can alternatively be used for load control functions or for threshold monitoring of a maximum value. The device enables two- or four-rate system management with switching of the active rate via a 230 Vac signal. Protection against manipulation is provided by sealable terminal covers. The device is designed for DIN rail mounting according to EN 60715 inside switchboards and control cabinets.

The device has an integrated communication module to the KNX bus. During operation, the module receives and sends communication telegrams from the KNX bus to/from another KNX device.

2.1 Main characteristics

- Display: graphic 60x30 mm LCD backlit
- Optical interface D0: according to EN 62056-21
- Communication interface: KNX TP
- KNX configuration: via ETS software
- Metrological LED: 10 pulses / Wh
- Pulse output: Opto Power MOSFET S0 for heavy-duty applications, 5-230 Vac or Vdc, max 90 mA
- Pulse setting
 - frequency: 0.001, 0.01, 1, 10, 100, 1000 or 10'000
 - length: from 4 to 250 ms, adjustable in steps of 2 ms
- Connections
 - power supply and voltage: from 0,5 to 16 mm², 2 Nm
 - communication interface: KNX terminal block
- Accuracy class: B (1%)
- Approval: MID (B+D)
- Device housing: modular 5 UM (1 UM = 18 mm)
- Degree of protection: IP51 (housing), IP20 (terminals)
- Dimensions (LxHxD): 90 x 90 x 67 mm
- Weight: 400 g

2.2 Technical data

- Rated voltage U_n : 3x230/400V (+/- 20%)
- Rated frequency f_n : 50Hz, 60 Hz a richiesta
- Environmental class: mechanic: M1, electromagnetic: E1
- Safety class: 2
- EC type testing: CH-MI003-13022

Current

- Direct connection:
(I_{st} , I_{min} , I_{tr} , I_{ref} , I_{max})
0.02 A / 0.25 A / 0.5 A / 5 A / 75 A (5(75))
- Current transformer /5A and /1A:
/5A (I_{st} , I_{min} , I_{tr} , I_{ref} , I_{max})
0.01 A / 0.05 A / 0.25 A / 5 A / 6 A (5(6))

/1A (I_{st} , I_{min} , I_{tr} , I_{ref} , I_{max})
0.002 A / 0.01 A / 0.05 A / 1 A / 1.2 A (1(1.2))

Environmental conditions

- - Operating temperature: -25° C...+55° C
- - Storage temperature: -30° C...+70° C
- - Maximum air humidity: annual average 75%, short period 95%, not condensing

2.3 Data back-up

To prevent data loss in the event of a power failure, all relevant data are stored in the non-volatile EEPROM memory; this occurs when the voltage falls below a defined level. In addition, every 24 hours, all relevant data are automatically saved in the non-volatile EEPROM.

2.4 Marks

- KNX
- CE: the product complies with the Low Voltage Directive (2014/35/EU) and the Electromagnetic Compatibility Directive (2014/30/EU)
- MID (Measurement Instrument Directive) con certificazione B+D. The device is therefore suitable for energy cost allocation and energy management according to UNI CEI EN ISO 50001. EC Test Certificate Number: CH-MI003-13022. Notified body: METAS-Cert (Nr. 1259) Lindenweg 50, CH-3003 Bern-Wabern (Switzerland)

3 Switching, display and connection elements

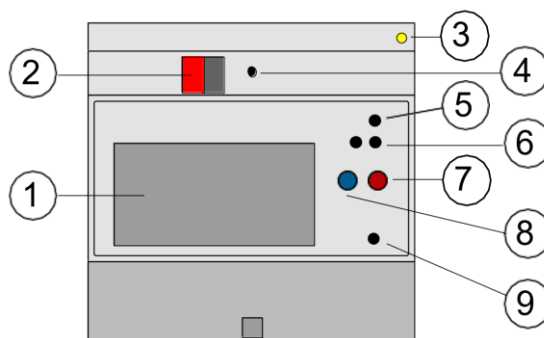


Fig. 1 – Switching, display and connection elements

1) LCD graphic display	6) D0 interface
2) KNX terminal block	7) Button (red) for choice/menu
3) Service button	8) Button (blue) for confirmation or secondary item
4) Programming pushbutton and LED	9) Reactive power LED (10 pulses / varh)
5) Metrological LED (10 pulses / Wh)	

3.1 Calibration pulse / calibration constant

The red metrological LED (5) on the front of the device is proportional to the active energy. The pulse constant is 10 pulses / Wh; the pulse duration is 2 msec. Pulses are sent for the import and export of energy.

3.2 D0 interface (EN 62056-21)

The meter has a D0 optical serial interface (6) compliant with the EN 62056-21 standard. The D0 interface is located on the front, next to the LCD display. The D0 interface can be configured as a bidirectional (mode A or C) or unidirectional (mode D0) communication interface.

3.3 LCD display

The device is equipped with a 60x30 mm backlit LCD graphic display (1) that allows the reading of parameters and settings.

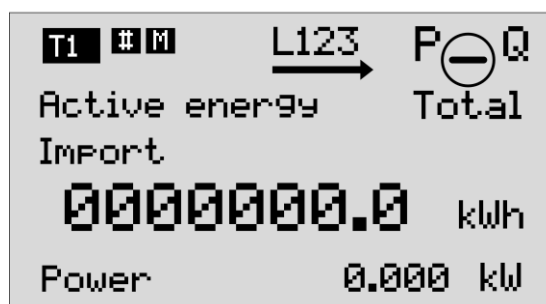


Fig. 2 –LCD graphic display

3.4 Energy Direction

In the upper right corner of the LCD display is the graphic symbol of the current direction of energy flow. The orientation of the directional arrow (bar inscribed in the circumference) provides a qualitative indication of the power components and the quadrant in which the measurement takes place.

Directional arrow	Quadrant and load	
↗	1° quadrant P+ / Q+	
↖	2° quadrant P- / Q+	
↙	3° quadrant P- / Q-	
↘	4° quadrant P+ / Q-	
→	P+ / reactive power Q absent	
←	P- / reactive power Q absent	
↑	Active power P absent / Q+	
↓	Active power P absent / Q-	
-	Active P and reactive Q power absent	

3.5 Navigation menu

Three buttons are available for the menu navigation for displaying measured values and setting parameters:

- **blue button:** jump to the next menu item (active energy, active power, etc.)
- **red button:** access to more information in the menu item (L1, L2 or L3 phase, total, min. / max. values, etc.)
- **yellow button:** service button, on the right side under the red front cover. To save a configuration, press the service button for 5 seconds

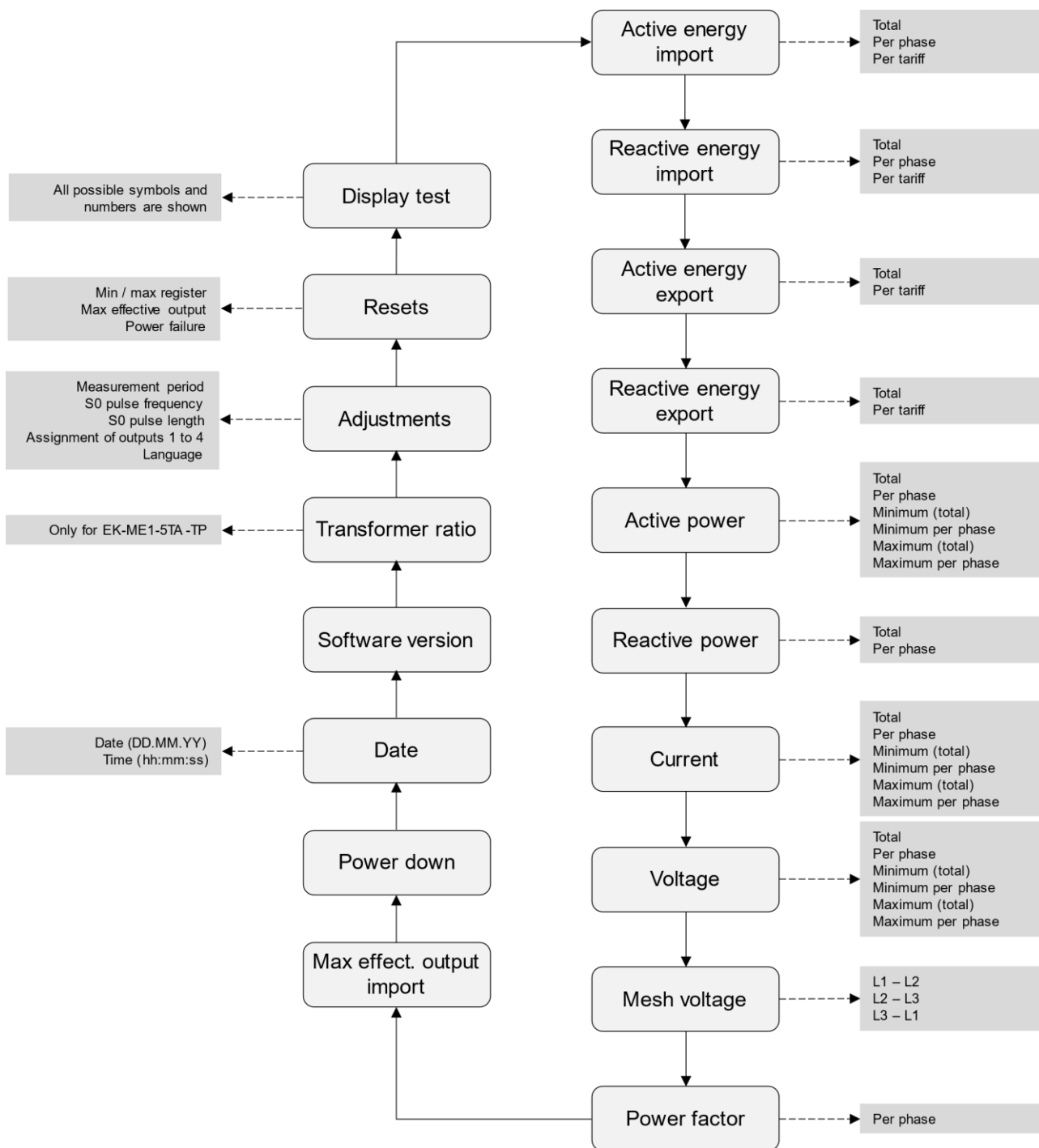


Fig. 3 – Items of the navigation menu

3.5.1 Display language

The display language can be chosen between English and German. To configure the display language:

1. Scroll through the navigation menu with the blue button ● until the item "Adjustments"
2. Press the red button ● until "Language" ("Sprache")
3. Press the service button ● briefly
4. Choose language with the blue button ●
5. Save by pressing the service button ● for 5 s, until the digits no longer flash

3.5.2 Current Transformer Ratio

This option is only available for the version with current transformer connection (EK-ME1-5TA-TP). The current transformer ratio can be adjusted from 5/5 to 20'000/5A and from 1/1 to 4'000/1A.

- Left button (blue) = digit / number change
- Right button (red) = moves on to the next digit / number

Current transformer /5A	Current transformer /1A
AABCC : 5A AA adjustable in steps of 1 B adjustable in steps of 1 CC adjustable in steps of 5	YYYY : 1A Y adjustable in steps of 1

To configure the current transformer ratio:

1. Scroll through the navigation menu with the blue button ● until the item "Transformer ratio"
2. Press the service button ● briefly
3. Adjust the secondary current with the blue button ●
4. Switch to primary current with the red button ●
5. Adjust the first two digits with the blue button ●
6. Move to the next digit with the red button ●
7. Adjust the digit with the blue button ●
8. Move to the next digit with the red button ●
9. Adjust the next two digits with the blue button ●
10. Save by pressing the service button ● for 5 s, until the digits no longer flash

3.5.2 S0 pulse outputs

The four S0 pulse outputs are realised in accordance with the standard EN 62053-31 - Electricity metering equipment (a.c.) - Particular requirements - Part 31: Pulse output devices for electromechanical and electronic meters (two wires only). The frequency and pulse length can be configured using the buttons.

To configure the pulse frequency:

1. Scroll through the navigation menu with the blue button ● until the item “Adjustments”
2. Press the red button ● until “S0 Pulse Rate”
3. Press the service button ● briefly
4. Shift the decimal place with the blue key ●
5. Example 1000.000 = 1000 pulses
6. Save by pressing the service button ● for 5 s, until the digits no longer flash

To configure the pulse length:

1. Scroll through the navigation menu with the blue button ● until the item “Adjustments”
2. Press the red button ● until “S0 Pulse duration”
3. Press the service button ● briefly
4. Set the pulse length with the blue button ●
5. Save by pressing the service button ● for 5 s, until the digits no longer flash

S0 pulse output characteristics

- Opto Power MOSFET 5 – 230 Vac or Vdc, max 90mA
- Pulse frequency for kWh / kvarh 0.001, 0.01, 0.1, 1, 10, 100, 1000, 10'000
- Pulse length adjustable from 4 a 250 milliseconds in steps of 2 ms

Alternatively, outputs can be configured as relay outputs and switched via KNX.

To configure the S0 pulse output as a relay output:

1. Scroll through the navigation menu with the blue button ● until the item “Adjustments”
2. Press the red button ● until “Assignment output X”
3. Press the service button ● briefly
4. Set “Relay Output” with the blue button ●
5. Save by pressing the service button ● for 5 s, until the digits no longer flash

3.5.3 Peak / threshold control

The following threshold values can be chosen for peak control:

- active power
- reactive power
- apparent power
- total current
- current per phase (L1 / L2 / L3)

The factory default settings are:

- threshold: 5.000 kW
- state: not active

Response time / release time

The threshold function can be assigned to any S0 output. The response and release time is adjustable between 0 and 9999 seconds. Please note that:

- response time: time interval until contact switching;
- release time: time interval until the contact is switched after the threshold is no longer exceeded.

To configure the threshold:

1. Scroll through the navigation menu with the blue button ● until the item "Adjustments"
2. Press the red button ● until "Assignment output X"
3. Press the service button ● briefly
4. Set "Threshold" with the blue button ●
5. Save by pressing the service button ● for 5 s, until the digits no longer flash
6. Press the red button ● until "Unit Threshold"
7. Select the desired unit with the blue button ●
8. Go to "Next" with the red button ●
9. Set "Threshold" with the blue button ●
10. Go to the next digit with the red button ●
11. Save by pressing the service button ● for 5 s, until the digits no longer flash
12. Press the red button ● until "Threshold Time till ON"
13. Press the service ● button briefly
14. Set the digit with the blue button ●
15. Go to the next digit with the red button ●
16. Save by pressing the service button ● for 5 s, until the digits no longer flash
17. Press the red button ● until "Threshold Time till OFF"
18. Press the service ● button briefly
19. Set the digit with the blue button ●
20. Go to the next digit with the red button ●
21. Save by pressing the service button ● for 5 s, until the digits no longer flash

3.5.4 Date / time

To configure the date:

1. Scroll through the navigation menu with the blue button ● until the item "Date"
2. Press the service button ● briefly
3. Set the first digit with the blue button ●
4. Go to the next digit with the red button ●
5. Save by pressing the service button ● for 5 s, until the digits no longer flash

To configure the time:

1. Scroll through the navigation menu with the blue button ● until the item "Date"
2. Press the red button ● until "Time"
3. Press the service button ● briefly
4. Set the first digit with the red button ●
5. Go to the next digit with the red button ●
6. Save by pressing the service button ● for 5 s, until the digits no longer flash

4 Connections

4.1 KNX bus

The connection to the KNX bus is made via the terminal plugged into the housing on the front of the device at the top under the red cover. KNX terminal features:

- spring clamping for conductors
- 4 conductor slots for each polarity
- terminal suitable for KNX bus cable with single conductor diameter 0.6...0.8 mm (20 ~ 22AWG)
- recommended conductor stripping approx. 5 mm
- colour coding: red = bus conductor + (positive), black = bus conductor - (negative)

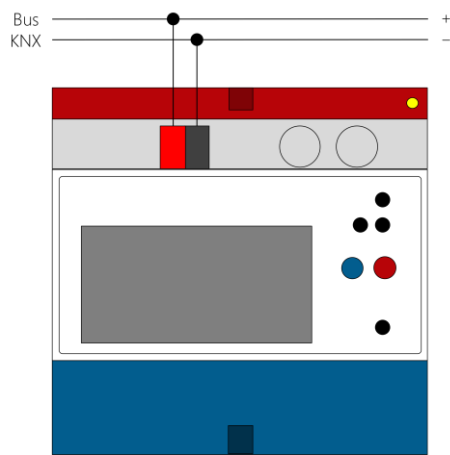
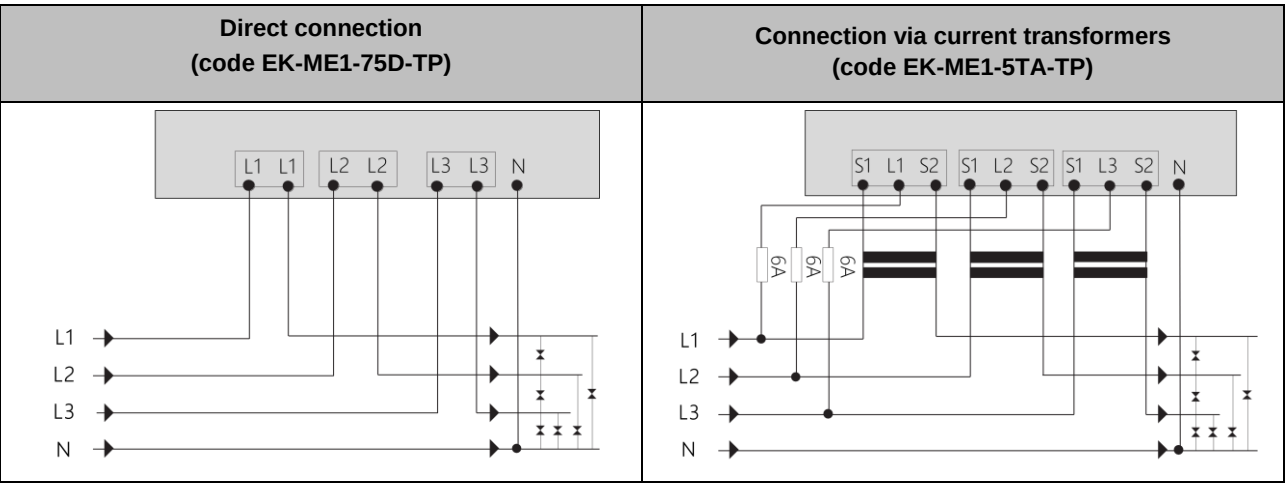


Fig. 4 – Connection of the KNX bus

4.2 Measuring circuits

The connection to the measuring circuits (L1, L2, L3, N wires) is made via the screw terminals located on the front of the device at the bottom under the blue cover.



When connecting the measuring circuits, please observe the table for maximum cross-section and maximum torque.

Wire	Direct connection (max. cross section 35 mm²)	Connection via current transformer (max. cross section 6 mm²)
L1 / L2 / L3 phase	2 - 3 Nm	1,3 – 1,6 Nm
Neutral	2 - 3 Nm	1,3 – 1,6 Nm

4.3 Control inputs

The connection to the control inputs is made via the screw terminals located on the front of the device at the top under the red cover.

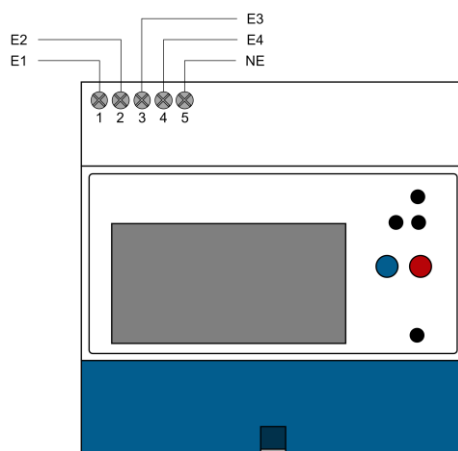


Fig. 5 – Connection of control inputs

Using inputs E1 and E2 to start measurement period

Regardless of configuration with ETS, the measurement period can be activated via a mains voltage control signal (230 Vac). The inputs E1 and E2 are used for this function as per the following table (0 = absence of voltage, 1 = presence of voltage).

Condition	E1 input	E2 input
Normal operation	1	0
Start of the measurement period	0	1

Use of inputs E3 and E4 for tariff changes

The device allows 2- and 4-tariff systems to be managed. The change of tariff occurs when mains voltage (230 Vac) is present on the corresponding terminal; please follow the two tables below (0 = absence of voltage, 1 = presence of voltage).

2-tariff system	E4 input
Tariff 1	0
Tariff 2	1

4-tariff system	E4 input	E3 input
Tariff 1	0	0
Tariff 2	1	0
Tariff 3	0	1
Tariff 4	1	1

4.4 S0 pulse outputs

The four outputs of the device can be used:

- as S0 pulse outputs (according to EN 62053-21) configured via device buttons
- as KNX switching outputs configured with ETS
- as threshold switching outputs, configured with ETS / device buttons

The outputs are factory-configured as follows:

S0 output no. 1 = Imported active energy (terminals: 12 + 13)

S0 output no. 2 = Imported reactive energy (terminals: 10 + 11)

S0 output no. 3 = Exported active energy (terminals: 8 + 9)

S0 output no. 4 = Exported reactive energy (terminals: 6 + 7)

For the connection of inputs and outputs, use conductors with a maximum cross-section of 2.5 mm² with a maximum tightening torque of 0.4 Nm.

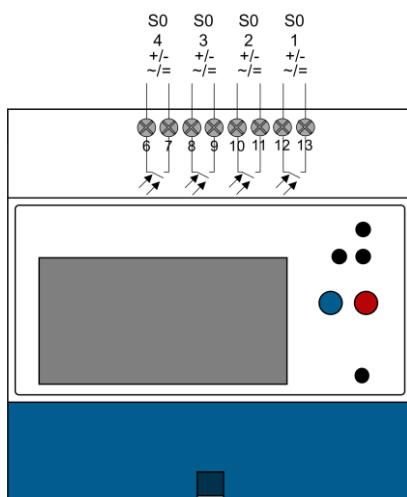


Fig. 5 – Connection of the S0 pulse outputs

Warning!

The device may only be used for electricity metering and may not be used outside the specified technical data.



When installing or replacing the meter, the conductors must be voltage-free (power supply/voltage off). Contact with live components is dangerous! Therefore, the appropriate fuses must be removed and secured.

Nobody must be able to switch on the voltage / power without warning.

Before opening / disconnecting the terminals, short-circuit the secondary circuits of the current transformers. The resulting high voltage on the current transformer is extremely dangerous (danger to life) and could destroy the current transformer.

5 Configuration

The functionality of the device is determined by the settings made via software.

In order to configure the device, the ETS4 software tool (or later versions) and the dedicated application programme for the device (called **APEKME1EMUTP##.knxprod**); the latter can be downloaded from the ekinex website www.ekinex.com.

The application programme allows access within the ETS4 environment for the configuration of all device working parameters. The programme must be loaded into the ETS (alternatively, the whole ekinex® product database can be loaded in a single operation), after which all device specimens of the type considered can be added to the project being defined.

The configurable parameters for the device will be described in detail in the following paragraphs.

The configuration can be, and generally will be, defined completely in off-line mode; the transfer to the device of the configuration set will then take place in the programming phase, described in the next paragraph.



Configuration and programming of KNX devices requires specific knowledge; to acquire this knowledge, it is recommended to attend the appropriate training courses at a KNX Association certified centre.

For more information, please visit www.knx.org.

6 Programming and commissioning

After the device configuration has been defined within the ETS project according to the user's requirements, the following steps are required to carry out programming:

- electrically connect the device, as described in the data sheet, to the KNX bus in the final destination installation or in a reduced installation, which has been specially composed for programming. The installation will in any case contain an interface device to the PC on which the ETS environment is installed;
- apply power to the bus
- activate the programming mode on the device by pressing the appropriate button on the front panel. The programming mode indication LED should light up steadily
- from the ETS environment, start programming (which in the case of initial configuration should include the physical address to be given to the device).

At the end of the programme download, the device automatically returns to operating mode; the programming LED should be off. The device is now programmed and ready for operation in the system.

6.1 Communication objects

Below is the list of the KNX communication objects available in the ETS application program, depending on the choices made when parameterising the device. The order of the list is by object number.

C.O.	Object name	Function / DPT	Size	Flag
0	Serial number	4 Byte / EIS11 12.001	4 Byte	C,T
<i>Via this 4-byte object, the serial number of the meter is transmitted.</i>				
1	Meter number	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With this 4-byte object, the meter number is transmitted.</i>				
2	Status	On / off	1 bit	C,T
<i>With this 1-bit object, the status of the device is transmitted. Communication between the device and the BCU can also be defined.</i>				
3	Read meters	On / off	1 bit	C,W,U
<i>This 1-bit object can be used to query the counter reading.</i>				
4	Active energy A+ tot. (kWh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With this 4-byte object, the total active energy (in kWh) is transmitted.</i>				
5	Active energy A+ tot. (Wh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With this 4-byte object, the total active energy (in Wh) is transmitted.</i>				
6	15min diff. A+ (Wh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With this 4-byte object, the active energy difference of the last quarter-hour is transmitted every 15 minutes.</i>				
7	60min diff. A+ (Wh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With this 4-byte object, the active energy difference of the last hour is transmitted every 60 minutes.</i>				
8	Rel. counter A+ (kWh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With this 4-byte object, the reading (in kWh) of the relative active energy meter is transmitted from the value 0.</i>				
9	Reset rel. counter	On / off	1 bit	C,T,U
<i>With this 1-bit object, the relative active energy meter is reset to the value 0 kWh.</i>				
10	Rel. reverse counter A+ (kWh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With this 4-byte object, the reading (in kWh) of the decreasing relative active energy meter is transmitted.</i>				
11	Set rel. reverse counter	4 Byte / EIS11 12.001	4 Byte	C,W,U
<i>With this 4-byte object, the starting value (in kWh) of the decreasing relative active energy meter is set.</i>				
12	Rel. reverse counter is zero	On / off	1 bit	C,T
<i>With this 1-bit object, a telegram is sent when the decreasing relative counter reaches the value of 0 kWh.</i>				
13	Due day active energy A+ (kWh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With this 4-byte object, the reading (in kWh) of the active energy on the reference date is transmitted (object 14).</i>				
14	Due day date	3 Byte / EIS4 11,001	3 Byte	C,T
<i>With this 3-byte object, the reference date is transmitted.</i>				

C.O.	Object name	Function / DPT	Size	Flag
15	Set due day date	3 Byte / EIS4 11,001	3 Byte	C,W,U
<i>With this 3-byte object, the reference date is set.</i>				
16,18,20,22	T1-T4 active energy A+ tot. (kWh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With these 4-byte objects, the total active energy A+ (in kWh) is transmitted for each of the 4 possible tariffs (T1, T2, T3, T4).</i>				
17,19,21,23	T1-T4 active energy A+ tot. (Wh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With these 4-byte objects, the total active energy A+ (in Wh) is transmitted for each of the 4 possible tariffs (T1, T2, T3, T4).</i>				
24,26,28	Active energy A+ L1,L2,L3 (kWh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With these 4-byte objects, the active energy A+ (in kWh) for each individual phase (L1, L2, L3) is transmitted.</i>				
25,27,29	Active energy A+ L1,L2,L3 (Wh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With these 4-byte objects, the active energy A+ (in Wh) for each individual phase (L1, L2, L3) is transmitted.</i>				
30	Active energy A- tot. (kWh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With this 4-byte object, the total active energy A- (in kWh) is transmitted.</i>				
31	Active energy A- tot. (Wh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With this 4-byte object, the total active energy A- (in Wh) is transmitted.</i>				
32,34,36,38	T1-T4 active energy A- tot. (kWh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With these 4-byte objects, the active energy A- (in kWh) is transmitted for each of the 4 possible tariffs (T1, T2, T3, T4).</i>				
33,35,37,39	T1-T4 active energy A- tot. (Wh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With these 4-byte objects, the total active energy A- (in Wh) is transmitted for each of the 4 possible tariffs (T1, T2, T3, T4).</i>				
40	React. ener. R + tot. (kvarh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With this 4-byte object, the total inductive reactive energy R+ (in kvarh) is transmitted.</i>				
41	React. ener. R+ tot. (varh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With this 4-byte object, the total inductive reactive energy R+ (in varh) is transmitted.</i>				
42,44,46,48	T1-T4 react. ener. R+ tot. (kvarh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With these 4-byte objects, the total inductive reactive energy R+ (in kvarh) is transmitted for each of the 4 possible tariffs (T1, T2, T3, T4).</i>				
43,45,47,49	T1-T4 react. ener. R+ tot. (varh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With these 4-byte objects, the total inductive reactive energy R+ (in varh) is transmitted for each of the 4 possible tariffs (T1, T2, T3, T4).</i>				
50	React. ener. R- tot. (kvarh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With this 4-byte object, the total capacitive reactive energy R- (in kvarh) is transmitted.</i>				
51	React. ener. R- tot. (varh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With this 4-byte object, the total capacitive reactive energy R- (in varh) is transmitted.</i>				
52,54,56,58	T1-T4 react. ener. R- tot. (kvarh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With these 4-byte objects, the total capacitive reactive energy R- (in kvarh) is transmitted for each of the 4 possible tariffs (T1, T2, T3, T4).</i>				

C.O.	Object name	Function / DPT	Size	Flag
53,55,57,59	T1-T4 react. ener. R- tot. (varh)	4 Byte / EIS11 12.001	4 Byte	C,T
<i>With these 4-byte objects, the total capacitive reactive energy R- (in varh) is transmitted for each of the 4 possible tariffs (T1, T2, T3, T4).</i>				
60	Tariff 1 / 2 (,3,4)	On / off	1 bit	C,T
<i>This 1-bit object is used to switch from tariff 1 to tariff 2(3,4).</i>				
61	Tariff number (1..4)	1 Byte / EIS6 5.010	1 Byte	C,T
<i>With this 1-byte object, the current tariff number is transmitted.</i>				
62	Active power P+ tot. (W)	4 Byte / EIS9 14.056	4 Byte	C,T
<i>With this 4-byte object, the total active power P+ (in W) is transmitted.</i>				
63	Upper switch point P+ tot.	On / off	1 bit	C,T
<i>With this 1-bit object, a telegram is transmitted when the set upper switching point P + is exceeded.</i>				
64	Lower switch point P+ tot.	On / off	1 bit	C,T
<i>With this 1-bit object, a telegram is transmitted when the set lower switching point P+ is exceeded.</i>				
65,68,71	Active power P+ L1,L2,L3 (W)	4 Byte / EIS9 14.056	4 Byte	C,T
<i>With these 4-byte objects, the active power P+ (in W) for each individual phase (L1, L2, L3) is transmitted.</i>				
66,69,72	Upper switch point P+ L1,L2,L3	On / off	1 bit	C,T
<i>With these 1-bit objects, a telegram is transmitted when the upper switching point P+ set for each individual phase is exceeded.</i>				
67,70,73	Lower switch point P+ L1,L2,L3	On / off	1 bit	C,T
<i>With these 1-bit objects, a telegram is transmitted when the lower switching point P+ set for each individual phase (L1, L2, L3) is exceeded.</i>				
74	Active power P- tot. (W)	4 Byte / EIS9 14.056	4 Byte	C,T
<i>With this 4-byte object, the total active power P- (in W) is transmitted.</i>				
75	Upper switch point P-tot.	On / off	1 bit	C,T
<i>With this 1-bit object, a telegram is transmitted when the set upper switching point P- is exceeded.</i>				
76	Lower switch point P- tot.	On / off	1 bit	C,T
<i>With this 1-bit object, a telegram is transmitted when the set lower switching point P- is exceeded.</i>				
77,80,83	Active power P- L1,L2,L3 (W)	4 Byte / EIS9 14,056	4 Byte	C,T
<i>With these 4-byte objects, the active power P- (in W) for each individual phase (L1, L2, L3) is transmitted.</i>				
78,81,84	Upper switch point P- L1,L2,L3	On / off	1 bit	C,T
<i>With these 1-bit objects, a telegram is transmitted when the upper switching point P- set for each individual phase (L1, L2, L3) is exceeded.</i>				
79,82,85	Lower switch point P- L1,L2,L3	On / off	1 bit	C,T
<i>With these 1-bit objects, a telegram is transmitted when the lower switching point P- set for each individual phase (L1, L2, L3) is exceeded.</i>				
86	Reactive power Q+ tot. (var)	4 Byte / EIS9 14.056	4 Byte	C,T
<i>With this 4-byte object, the total inductive reactive power Q+ (in var) is transmitted.</i>				
87,88,89	Reactive power a Q+ L1,L2,L3 (var)	4 Byte / EIS9 14.056	4 Byte	C,T
<i>With these 4-byte objects, the inductive reactive power Q+ (in var) for each individual phase (L1, L2, L3) is transmitted.</i>				

C.O.	Object name	Function / DPT	Size	Flag
90	Reactive power Q- tot. (var)	4 Byte / EIS9 14.056	4 Byte	C,T
<i>With this 4-byte object, the total capacitive reactive power Q+ (in var) is transmitted.</i>				
91,92,93	Reactive power Q- L1,L2,L3 (var)	4 Byte / EIS9 14.056	4 Byte	C,T
<i>With these 4-byte objects, the capacitive reactive power Q+ (in var) for each individual phase (L1, L2, L3) is transmitted.</i>				
94,95,96	Voltage U L1,L2,L3 (V)	4 Byte / EIS9 14.028	4 Byte	C,T
<i>With these 4-byte objects, the voltage in V (relative to N) is transmitted for each individual phase (L1, L2, L3).</i>				
97,98,99	Current I L1,L2,L3 (A)	4 Byte / EIS9 14.019	4 Byte	C,T
<i>With these 4-byte objects, the current in A is transmitted for each individual phase (L1, L2, L3).</i>				
100,101,102	Power factor L1,L2,L3	4 Byte / EIS9 14.057	1 Byte	C,T
<i>With these 4-byte objects, the power factor (cosφ) for each individual phase (L1, L2, L3) is transmitted.</i>				
103,104,105,106	Switching output 1,2,3,4 normal	On / off	1 bit	C,T
<i>Using these 1-bit objects, the four switching outputs can be defined. Note that the switching outputs must first be configured in the navigation menu via the buttons on the front of the device. A configuration exclusively with ETS is ineffective.</i>				

C = Communication, T = Transmit, U = Update, W = Write

6.2 Error Messages

If an internal error occurs, an error message is displayed:

- F.F.0(00000000) = No error, meter OK
- F.F.0(xxxxxxx0) = Calibrated meter
- F.F.0(xxxxxxx1) = Meter not calibrated
- F.F.0(xxxxxxx8) = Release of calibration, the meter is calibrated and can be recalibrated
- F.F.0(xxxxxxx9) = Release of calibration, the meter is not calibrated and can be calibrated now

6.3 Compliance with Standards and Directives

The EK-ME1-...-TP electricity meter is a KNX device manufactured by EMU Electronic AG, Jöchlerweg 2, CH-6340 Baar (Switzerland). EMU Electronic AG declares under its sole responsibility that the three-phase static meter EMU Professional, accuracy class B, complies with the requirements of the following directives and standards:

- Directive 2014/32/EU (MID, Measurement Instrument directive) and harmonised
- Standards EN 50470-1:2006 and EN 50470-3:2006

The device has certification MID B+D. EC Test Certificate Number: CH-MI003-13022. Notified body: METAS-Cert (Nr. 1259) Lindenweg 50, CH-3003, Bern-Wabern (Switzerland).



**DECLARATION OF CONFORMITY
DÉCLARATION DE CONFORMITÉ
KONFORMITÄTSERKLÄRUNG**

We
Nous
Wir

EMU Electronic AG, Jöchlerweg 2, 6340 Baar, Switzerland

declare under our sole responsibility that the products
déclarons sous notre seule responsabilité que les produits
erklären in alleiniger Verantwortung, dass die Produkte

EMU Professional / EMU Allrounder, Class B

to which this declaration relates is in conformity with the requirements of the following directives
auxquels se réfèrent cette déclaration, sont conformes aux prescriptions des directives
auf die sich diese Erklärung bezieht, konform sind mit den Anforderungen der Richtlinien

MID 2014 / 32 / EU Europäische Messgeräte Richtlinie

The conformity was assessed in accordance with MID Module B+D and the following harmonised EN-standards
La conformité fut contrôlée selon MID Module B+D et les normes EN-harmonisées
Die Konformität wurde überprüft anhand MID Module B+D und der harmonisierten EN-Normen

EN 50470-1: 2006 Electricity metering equipment (a.c.)
EN 50470-3: 2006 Static meters for active energy (class indexes A, B and C)

Number of EC-type examination certificate. Notified Body
Numero du certificat d'examen type EC. Organisme notifié
Nummer der EG-Baumusterprüfbescheinigung. Benannte Stelle

CH-MI003-13022
METAS-Cert (Nr. 1259), Lindenweg 50, CH-3003, Bern-Wabern

Number of quality system approval certificate. Notified Body
Numero du certificat d'approbation du système de Qualité. Organisme notifié
Nummer des Zertifikates über die Anerkennung des Qualitätsmanagementsystems. Benannte Stelle

METAS-Cert (Nr. 1259), Lindenweg 50, CH-3003, Bern-Wabern

EMU Electronic AG
Jöchlerweg 2, CH-6340 Baar, Switzerland



Hans-Martin Koller, CEO
1 March 2019

EMU Electronic AG
Jöchlerweg 2 | CH-6340 Baar | Switzerland | Phone +41 (0) 41 545 03 00 | Fax +41 (0) 41 545 03 01 | info@emuag.ch | www.emuag.ch

6.4 Warnings

- Installation, electrical connection, configuration and commissioning of the device may only be carried out by qualified personnel
- Before making electrical connections, ensure that the mains voltage is switched off
- The power supply line to which the device is connected must be equipped with an easily accessible isolating device with a contact gap of at least 3 mm
- Opening the housing of the appliance results in immediate termination of the warranty period
- In the event of tampering, compliance with the essential requirements of the applicable directives for which the device was certified is no longer guaranteed
- Defective devices must be sent to the following address:

EKINEX S.p.A. - Via Novara 37, I-28010 Vaprio d'Agogna (NO) Italy

6.5 Useful information

- This application manual is intended for installers, system integrators and system configurators.
- For further information on the product, please contact Ekinex® Technical Support at support@ekinex.com or visit www.ekinex.com.
- ekinex® is a registered trademark of Ekinex S.p.A.
- KNX® and ETS® are registered trademarks of the KNX Association cvba, Brussels

6.6 Disclaimer / exclusion of liability

The choice of energy meter and the determination of the suitability of the type of meter for a particular purpose are the sole responsibility of the purchaser. The manufacturer accepts no liability for this. The data/information contained in catalogues and data sheets are determined by experience and measurements. Liability for damage caused by improper operation or design or a malfunction of the energy meter is excluded. The operator/designer must ensure that incorrect operation and/or design and malfunctions cannot cause further damage. For defects or damage caused by improper use of the energy meter or failure to observe the manual, no guarantee is given.

© EKINEX S.p.A. 2023 - The company reserves the right to make changes to this documentation without prior notice.