S.A DE CONSTRUCCIONES INDUSTRIALES

DIRECT CONNECTION THREE PHASE ELECTRICITY METER MID CERTIFICATED TCIDL - MID

INSTRUCTIONS MANUAL

CE This equipment meets the requirements of the European directive for safety and EMC. It's the responsibility of the installer ensure the continuity of the implementation of these directives in the rest of the installation.

INDEX:

1. Introduction

The TCIDL – MID is a three phases four wire electricity meter with infrared and RS485 communications. This meter complies with the standard EN 50470 – 1/3 for accuracy class B active energy and class 2 for reactive energy. Its size is four din rail modules.

It is intended for Mechanical environment M1 and Electromagnetic environment E2 in accordance with the 2014/32/EU directive.

This meter is also a network analyser, measuring other parameters of a three phase line. The measured values can be shown on display or transmitted through the communication ports.

2. Working

2.1. Measurement

The TCIDL – MID measures the active energy per phase and total, positive and negative, and have four tariff. It has also a resettable counter.

Maximum demand calculation.

Possibility of holiday and weekend tariff.

It measures also the rest of the parameters of a three phase line, voltage, current, active reactive and apparent power, power factor, frequency; one of them are available on display and communications and other only through communications.

IR communication complies with EN 62056 protocol, and RS485 communication uses the MODBUS protocol.

2.2. Display

The TCIDL – MID shows on display the total energy, tariff energy, the voltage of the three phases, the current of the three phases, the active and apparent power total and per phase, the power factor per phase and global, the frequency, the output pulse value, the configuration, the resettable meter. There is a table with all the parameters in this manual.

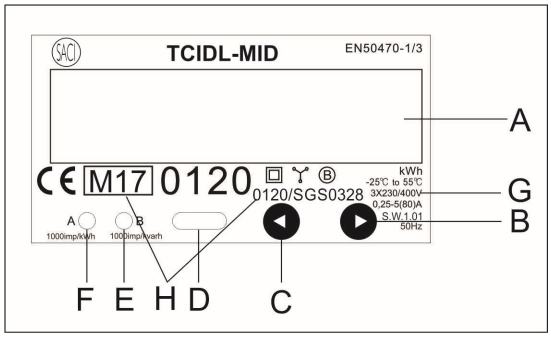
2.3. Keys

There are two keys, all the available parameters on display can be displayed by pressing the buttons.

2.4. Pulse output

The pulse output value can be set by communication between 1000 / 100 /10 / 1 kWh

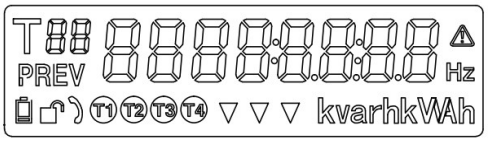
3.- Front panel description



A Display LCD.
B Forward key.
C Backward key.
D IR port.
E Reactive energy verification led diode.
F Active energy verification led Diode.
G Ratings
H MID references

4. Display

4.1. Contents of the LCD display.



4.2. Parameters show non the LCD display

Present tariff rate

Indication of parameter shown.

Frequency magnitude

Rest of magnitudes

Page	Content	Unit	Symbol	Format
1	Date			XX-XX-XX
2	Time			XX:XX:XX
3	Total active energy	kWh		6+2 000000.00
4	T1 Active energy tariff	kWh	T01	6+2 000000.00
5	T2 Active energy tariff	kWh	T02	6+2 000000.00
6	T3 Active energy tariff	kWh	T03	6+2 000000.00
7	T4 Active energy tariff	kWh	T04	6+2 000000.00
8	Total reactive energy	kVarh		6+2 000000.00
9	T1 Reactive energy tariff	kvarh	T11	6+2 000000.00
10	T2 Reactive energy tariff	kvarh	T12	6+2 000000.00
11	T3 Reactive energy tariff	kvarh	T13	6+2 000000.00
12	T4 Reactive energy tariff	kvarh	T14	6+2 000000.00
13	L1 Voltage	V	L1	3+1 000.0
14	L2 Voltage	V	L2	3+1 000.0
15	L3 Voltage	V	L3	3+1 000.0
16	L1 Current	A	L1	4+2 0000.00
17	L2 Current	A	L2	4+2 0000.00
18	L3 Current	A	L3	4+2 0000.00
19	Total active power	kW		5+3 00000.000
20	L1 Active power	kW	L1	5+3 00000.000
21	L2 Active power	kW	L2	5+3 00000.000
22	L3 Active power	kW	L3	5+3 00000.000
23	Total apparent power	kVA		5+3 00000.000
24	L1 apparent power	kVA	L1	5+3 00000.000
25	L2 apparent power	kVA	L2	5+3 00000.000
26	L3 apparent power	kVA	L3	5+3 00000.000
27	Global cos ϕ			1+2 0.00
28	L1 cos ϕ		L1	1+2 0.00
29	L2 cos ϕ		L2	1+2 0.00
30	L3 cos ϕ		L3	1+2 0.00
31	Frequency	Hz		2+2 00.00
32	T1 Maximum demand	kW	T-1	6+2 000000.00
33	T2 Maximum demand	kW	T-2	6+2 000000.00
34	T3 Maximum demand	kW	T-3	6+2 000000.00
35	T4 Maximum demand	kW	T-4	6+2 000000.00
36	Resettable active energy counter	kWh		000000.00
37	Active status word			S 11 111
38	Display Scholl time		1-30s	Lcd-t 05
39	Pulse output value			S0 1000
40	Measuring mode			COdE 01
41	Serial number / IR address			12345678
42	MODBUS ID			Id 255
43	MODBUS baud rate			bd 9600
44	Software version			U 1.01

Push down the clip under the bottom of the meter for a gear, see fig. 1 and fig.2;

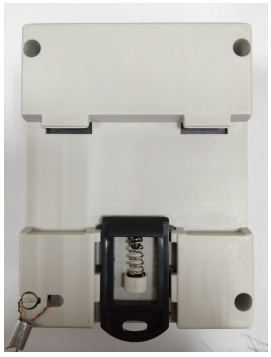


fig 1

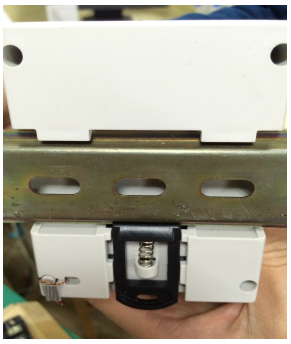


fig. 2

8.- Technical Features

Voltage:	3 x 230 /400 V
Measurement range	± 20 %
Current:	0,25 – 5 (80) A
Measurement range	from 0 to 100 % Imax.
Starting current	20 mA
Frequency	50 Hz
Burden	<10 VA, 2 W

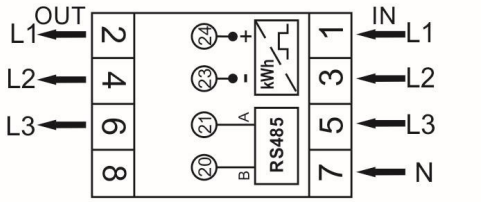
Pulse output:

Number of outputs:	1 for active energy. Type SO (DIN 43864) by Optocoupler.
Isolation	3 kV, 1 min.
Current	< 20 mA
Voltage	< 24 V C.C.
Pulse width	> 50 ms
Pulse value	programmable

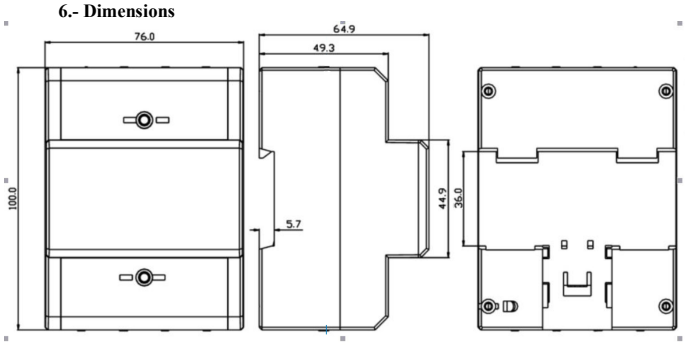
Generals:

Accuracy :	
Active energy	Class B EN50470 – 1
Reactive energy	Class 2 EN62053 – 23
Other parameters	Class 0,5
Verification constant	1000 Imp / kWh, 1000 Imp / kvarh
Temperature range	-25 – 55 ºC
Relative humidity. Annual average	85%

5.- Wiring diagram



6.- Dimensions



Height 100 mm
Width 76 mm
Depth 65 mm

7. Installation

The meter must be installed and serviced only by qualified personnel.

During installation, if it comes across severe strike or falling, which causes obvious damage trace, don't install it or turn it on. Please contact us in time.
Before leaving our factory, all the meters have been checked out and lead sealed, they can be installed directly.

Meters should be installed indoors or outdoors cabinet. The wall which is installed should be firm and fireproof, besides, no corrosive gas in the air.
Meters should be installed according to the wiring diagram on terminal box. When inserting, using copper wire or copper connector will be better.

Case material	ABS, UL94 V0
Modular box. 4 modules	(70 mm)
Terminals	Sealable
Screw terminals	
Maximum wire section:	
Main terminals	25 mm2
Pulse and communications	0,750 mm2

EU Regulation 2023/1542 concerning batteries and waste batteries requires that, from 18 February 2027, all products placed on the market incorporating portable batteries shall ensure that those batteries are readily removable and replaceable by the end-user at any time during the lifetime of the product. This requirement does not apply to this equipment (TCIDL-MID) as it falls within the exceptions set out in Article 11(3) of Regulation (EU) 2023/1542, as clarified in Commission Notice C/2025/214, since it is a product whose main function is to collect and supply data and the purpose of the battery is to maintain the integrity of that data.

S.A. DE CONSTRUCCIONES INDUSTRIALES
C/Aragoneses, 15. 28108 Alcobendas. Madrid. Spain.
Tel. : 34 - 91 – 519.02.45 Fax. : 34 - 91 - 416.96.46
http://www.saci.ese-mail : saci@saci.es

SACI reserve the right to modify any specification without notice Ver 02 20.03.18

S.A DE CONSTRUCCIONES INDUSTRIALES

DIRECT CONNECTION THREE PHASE ELECTRICITY METER

MID CERTIFICATED

TCIDL - MID

RS485 USER MANUAL

Serial port configuration.
The TCIDL – MID is equipped with a RS485 serial port. Contacts 20 (B or L-) and 21 (A or L+) under top wire cover.
The transmission format is 8E1, eight bits, with even parity and one stop bit.
Baud rate can be set at 1200 bd, 2400 bd, 4800 bd and 9600 bd, default value is 9600.

Transmission data through RS485 port
The protocol used is MODBUS RTU.
The readings are made by code 0x03. Write command can be 0x06 and 0x10

Memory map:

Addr.	R/W	Wcode	bytes	description	format	
0x00	R		4	Serial number	BDC	format (1)
0x02	R/W	0x06	2	ID	binary	format (2)
0x03	R/W	0x06	2	Baud rate	binary	
0x04	R		4	Software version	float	format (3)
0x06	R		4	Hardware version	float	
0x09	R/W	0x10	4	S.O. output	float	
0x0c	R/W	0x06	2	Holiday-weekend profile	binary	high weekend low holiday
0x0d	R/W	0x06	2	Display cycle time	binary	
0x0e	R		4	L1 voltage	float	
0x10	R		4	L2 voltage	float	
0x12	R		4	L3 voltage	float	
0x14	R		4	Frequency	float	
0x16	R		4	L1 current	float	
0x18	R		4	L2 current	float	
0x1a	R		4	L3 current	float	
0x1c	R		4	Total active power	float	
0x1e	R		4	L1 active power	float	
0x20	R		4	L2 active power	float	
0x22	R		4	L3 active power	float	
0x24	R		4	Total reactive power	float	
0x26	R		4	L1 reactive power	float	
0x28	R		4	L2 reactive power	float	
0x2a	R		4	L3 reactive power	float	
0x2c	R		4	Total apparent power	float	
0x2e	R		4	L1 apparent power	float	
0x30	R		4	L2 apparent power	float	
0x32	R		4	L3 apparent power	float	
0x34	R		4	Power factor	float	
0x36	R		4	L1 power factor	float	
0x38	R		4	L2 power factor	float	
0x3a	R		4	L3 power factor	float	
0x3c	R/W	0x10	8	Time label	bcd	format (4)

System energy registers

Addr.	R/W	bytes	description	format
0x0108	R	4	Import active energy	float
0x0110	R	4	Export active energy	float
0x0120	R	4	Import reactive energy	float
0x0128	R	4	Export reactive energy	float

Phase energy register

Addr.	R/W	bytes	description	format
0x010a	R	4	L1 import active energy	float
0x010c	R	4	L2 import active energy	float
0x010e	R	4	L3 import active energy	float
0x0112	R	4	L1 export active energy	float
0x0114	R	4	L2 export active energy	float
0x0116	R	4	L3 export active energy	float
0x0122	R	4	L1 import reactive energy	float
0x0124	R	4	L2 import reactive energy	float
0x0126	R	4	L3 import reactive energy	float
0x012a	R	4	L1 export reactive energy	float
0x012c	R	4	L2 export reactive energy	float
0x012e	R	4	L3 export reactive energy	float

Tariff energy register

Addr.	R/W	bytes	description	format
0x0132	R	4	T1 import active energy	float
0x0134	R	4	T1 export active energy	float
0x0138	R	4	T1 import reactive energy	float
0x013a	R	4	T1 export reactive energy	float
0x013e	R	4	T2 import active energy	float
0x0140	R	4	T2 export active energy	float
0x0144	R	4	T2 import reactive energy	float
0x0146	R	4	T2 export reactive energy	float
0x014a	R	4	T3 import active energy	float
0x014c	R	4	T3 export active energy	float
0x0150	R	4	T3 import reactive energy	float
0x0152	R	4	T3 export reactive energy	float
0x0156	R	4	T4 import active energy	float
0x0158	R	4	T4 export active energy	float
0x015c	R	4	T4 import reactive energy	float
0x015e	R	4	T4 export reactive energy	float

Daily tariff profile

8 x (Start hour, start minute, tariff rate)

Addr.	R/W	bytes	description	format	
0x0300	R/W	0x0c	Daily tariff profile 1	bcd	format (5)
0x030c	R/W	0x0c	Daily tariff profile 2	bcd	
0x0318	R/W	0x0c	Daily tariff profile 3	bcd	
0x0324	R/W	0x0c	Daily tariff profile 4	bcd	
0x0330	R/W	0x0c	Daily tariff profile 5	bcd	
0x033c	R/W	0x0c	Daily tariff profile 6	bcd	
0x0348	R/W	0x0c	Daily tariff profile 7	bcd	
0x0354	R/W	0x0c	Daily tariff profile 8	bcd	
0x0360	0x0c	Seasons		bcd	format (6)

Data formats

(1) Serial number.
Register 0 high byte bcd * 1000000
Register 0 low byte bcd * 10000
Register 1 high byte bcd * 100
Register 1 low byte bcd
Example in hex code:
➔ 01 03 00 00 00 02 c4 0b
← 01 03 04 17 00 00 11 3f 8b
Received data 17 00 00 11
Serial number 17 * 1000000+ 00*10000+00*100+11 = 17000011

(2) Binary.
Example baud rate
➔ 01 03 00 03 00 01 74 0a
← 01 03 04 25 80 a3 74
Received data 25 80
0x2580 = 9600

(3) Float.
Example L1 voltage.
IEEE floating point
➔ 01 03 00 0e 00 02 a5 c8
← 01 03 04 43 62 66 66 e5 e3
Received data 43 62 66 66
Seee eeee emmm mmmm mmmm mmmm mmmm mmmm
0100 0011 0110 0010 0110 0110 0110 0110 = 226,4 V

(4) Time label
BCD
➔ 01 03 00 3c 00 04 84 05
← 01 03 08 21 05 13 04 22 03 18 00 00 18
Received data 21 05 13 04 22 03 18 00
Second 21; minute 5; hour 13; week day 4 (Thursday); day 22; month 3; year 18.

(5) Daily profile
BCD
Eight periods, star hour, start minute, tariff rate.
Example profile 2
➔ 01 03 03 0c 00 0c 85 88
← 01 03 18 00 00 03 08 00 02 10 00 01 14 00 02 00 00 00 00 00 00 00 00 00 00 00 00 00 39 09
From 00:00 tariff rate 3
From 08:00 tariff rate 2
From 10:00 tariff rate 1
From 14:00 tariff rate 2
Rest unused

(6) Season
BCD
Eight seasons, start month, start day, daily tariff profile
Example
➔ 01 03 03 60 00 0c 45 95
← 01 03 18 01 01 01 03 25 02 10 28 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 76 d5
First season from 01-01 daily tariff profile 1
Second season from 03-25th daily profile 2
Third season from 10-28th daily profile 1
Rest unused

Tariff period configuration
TCIDL – MID is a four-tariff meter. The tariff periods are configured through seasons and daily profiles. Up to eight seasons and up to eight daily profiles can be configured. Each season has a star date, month and day, and its daily profile.
Each daily profile can have eight periods, with star time, hour and minute and its tariff rate.
Example:
April 4th at 05:30 the tariff rate will be 3; at 12:00 the tariff rate will be 1; at 17:00 the tariff rate will be 2
Season 2 (from 03-25th) then daily profile 2
At 05:30 first period (from 00:00) tariff rate 3
At 12:00 third period (from 10:00) tariff rate 1
At 17:00 fourth period (from 14:00) tariff rate 2
For the weekend days a different profile can be programmed.

S.A. DE CONSTRUCCIONES INDUSTRIALES
C/Aragoneses, 15. 28108 Alcobendas. Madrid. Spain.
Tel. : 34 - 91 – 519.02.45 Fax. : 34 - 91 - 416.96.46
http://www.saci.es
e-mail : saci@saci.es