SDM630-Mbus V2

DIN Rail Smart Meter for Single and Three Phase Electrical Systems

- Measures kWh Kvarh, KW, Kvar, KVA, P, F, PF, Hz, dmd, V, A, etc.
- Bi-directional measurement IMP & EXP
- Two pulse outputs
- Mbus
- Din rail mounting 35mm
- 100A direct connection
- Better than Class 1 / B accuracy

USER MANUAL

2016 V1.2

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Introduction

The SDM630-Mbus V2 measures and displays the characteristics of single phase two wires (1p2w), three phase three wires (3p3w,) and three phase four wires(3p4w) supplies, including voltage, frequency, current, power ,active and reactive energy, imported or exported. Energy is measured in terms of kWh, kVArh. Maximum demand current can be measured over preset periods of up to 60 minutes. In order to measure energy, the unit requires voltage and current inputs in addition to the supply required to power the product.

SDM630-Mbus V2 supports max. 100A direct connection, saves the cost and avoid the trouble to connect external CTs, giving the unit a cost-effective and easy operation. Built-in interfaces provides pulse and Mbus outputs. Configuration is password protected.

Unit Characteristics

The Unit can measure and display:

- Line voltage and THD% (total harmonic distortion) of all phases
- Line Frequency
- Currents, Current demands and current THD% of all phases
- Power, maximum power demand and power factor
- Active energy imported and exported
- Reactive energy imported and exported

The unit has password-protected set-up screens for:

- Changing password
- Supply system selection 1p2w, 3p3w,3p4w
- Demand Interval Time(DIT)
- Reset for demand measurements
- Pulse output duration

Two pulse output indicates real-time energy measurement. An RS485 output allows remote monitoring from another display or a computer.

Mbus

This uses an MBus port with EN13753-3 protocol to provide a means of remotely monitoring and controlling the Unit.

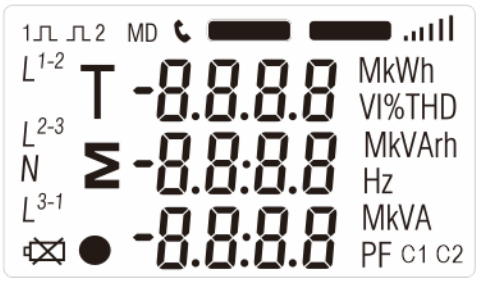
Set-up screens are provided for setting up the MBus port.

Pulse output

This provides two pulse outputs that clock up measured active and reactive energy. The constant of pulse output 2 for active energy is 400imp/kWh (unconfigurable), its width is fixed at 100ms.

The default constant of configurable pulse output 1 is 400imp/kWh, default pulse width is 100ms.The configurable pulse output 1 can be set from the set-up menu.

Start-up Screens

1		The first screen lights up all display segments and can be used as a display check
2		The second screen indicates the firmware installed in the unit and its build number.
3		The interface performs a self-test and indicates the result if the test passes.

After a short delay, the screen will display active energy measurements.

Measurements

The buttons operate as follows:

1		Selects the Voltage and Current display screens In Set-up Mode, this is the “Left” or “Back” button.
2		Select the Frequency and Power factor display screens In Set-up Mode, this is the “Up” button
3		Select the Power display screens In Set-up Mode, this is the “Down” button
4		Select the Energy display screens In Set-up mode, this is the “Enter” or “Right” button

Voltage and Current

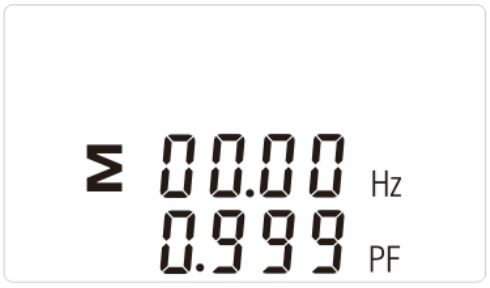
Each successive pressing of the U/I button selects a new range:

1-1		Phase to neutral voltages(3p4w)
1-2		Phase to neutral voltages(3p3w)
2		Current on each phase
3-1		Phase to neutral voltage THD%(3p4w)
3-2		Phase to neutral voltage THD%(3p3w)

4		Current THD% for each phase

Frequency and Power factor and Demand

Each successive pressing of the M button selects a new range:

1		Frequency and Power Factor (total)
2		Power Factor of each phase
3		Maximum Power Demand
4		Maximum Current Demand

Power

Each successive pressing of the P button select a new range:

1		Instantaneous Active Power in kW
2		Instantaneous Reactive Power in kVAr
3		Instantaneous Volt-amps in KVA
4		Total kW, kVArh, kVA

Energy Measurements

Each successive pressing of the E button selects a new range:

1-1		Imported active energy in kWh

1-2		Exported active energy in kWh
2-1		Imported reactive energy in kVArh
2-2		Exported reactive energy in kVArh
3-1		Total active energy in kWh
3-2		Total reactive energy in kVArh

Set-up

To enter set-up mode, pressing the E button for 3 seconds, until the password screen appears.

Setting up is password-protected so you must enter the correct password (default '1000') before processing. If an incorrect password is entered, the display will show: Err

To exit setting-up mode, press U/I ESC repeatedly until the measurement screen is restored.

Set-up Entry Methods

Some menu items, such as password, require a four-digit number entry while others, such as supply system, require selection from a number of menu options.

Menu Option Selection

1) Use the M and P buttons to select the required item from the menu. Selection does not roll over between bottom and top of list

2) Press E to confirm your selection

3) If an item flashes, then it can be adjusted by the M and P buttons. If not, there maybe a further layer.

4) Having selected an option from the current layer, press E to confirm your selection. The SET indicator will appear.

5) Having completed a parameter setting, press U/I ESC to return to a higher menu level. The SET indicator will be removed and you will be able to use the M and P buttons for further menu selection.

6) On completion of all set-up, press U/I ESC repeatedly until the measurement screen is restored.

Number Entry Procedure

When setting up the unit, some screens require the entering of a number. In particular, on entry to the setting up section, a password must be entered. Digits are set individually, from left to right. The procedure is as follows:

1) The current digit to be set flashes and is set using the M and P buttons

2) Press E to confirm each digit setting. The SET indicator appears after the last digit has been set.

3) After setting the last digit, press U/I ESC to exit the number setting routine. The SET indicator will be removed.

Change password

1		Use the M and P to choose the change password option
2-1		Press the E to enter the change password routine. The new password screen will appear with the first digit flashing
2-2		Use M and P to set the first digit and press E to confirm your selection. The next digit will flash.

2-3		Repeat the procedure for the remaining three digits
2-4		After setting the last digit, SET will show.
Press U/I ESC to exit the number setting routine and return to the Set-up menu. SET will be removed		

DIT Demand Integration Time

This sets the period in minutes over which the current and power readings are integrated for maximum demand measurement. The options are: 0, 5, 8, 10, 15, 20, 30, 60 minutes

1		From the set-up menu, use M and P buttons to select the DIT option. The screen will show the currently selected integration time.
2-1		Press E to enter the selection routine. The current time interval will flash
2-2		Use M and P buttons to select the time required.

2-3		Press E to confirm the selection. SET indicator will appear.
Press U/I BSC to exit the DIT selection routine and return to the menu.		

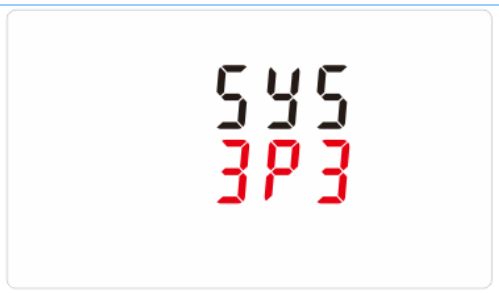
Backlit set-up

1		**The backlit lasting time is settable** **Default lasting time is 60minutes** **For example, if it's set as 5, the backlit will be off in 5minutes from the last time operation on the meter.**
2		Press E to enter the selection routine. The current time interval will flash **The options can be:** **0(always on),5,10,30,60,120minutes**
Use M and P buttons to select the time required. Press E to confirm the set-up,		

Supply System

Use this section to set the type of power supply being monitored.

1		From the Set-up menu, use M and P buttons to select the System option. The screen will show the currently selected power supply.

2-1		Press E to enter the selection routine. The current selection will flash
2-2		Use M and P buttons to select the required system option: 1P2(W),3P3(W) ,3P4(W)
2-3		Press E to confirm the selection. SET indicator will appear.
Press U/I ESC to exit the system selection routine and return to the menu. SET will disappear and you will be returned to the main Set-up Menu		

Pulse output

This option allows you to configure the pulse output 1. The output can be set to provide a pulse for a defined amount of energy active or reactive.

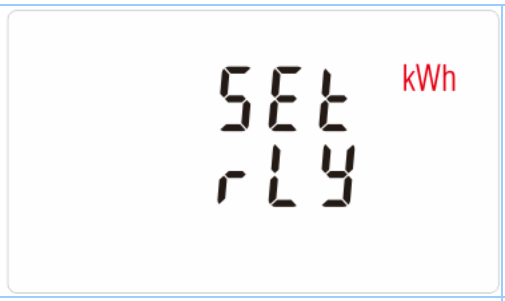
Use this section to set up the pulse output for:

Total kWh/ Total kVArh

Import kWh/Export kWh

Import KVArh/Export KVArh

1		From the Set-up menu, use M and P buttons to select the Pulse output option.

2-1		Press E to enter the selection routine. The unit symbol will flash.
2-2		Use M and P buttons to choose kWh or kVArh.
On completion of the entry procedure, press E to confirm the setting and press U/I ESC to return to the main set up menu.		

Pulse rate

Use this to set the energy represented by each pulse. Rate can be set to 1 pulse per dFt/0.01/0.1/1/10/100kWh/kVArh.

(It shows 1 impulse = 10kWh/kVArh)

1		From the Set-up menu, use M and P buttons to select the Pulse Rate option.
2		Press E to enter the selection routine. The current setting will flash. Note: When it's dFt, it means 2.5Wh/VArh

Use M and P buttons to choose pulse rate. On completion of the entry procedure, press E to confirm the setting and press U/I ESC to return to the main set up menu.

Pulse Duration

The energy monitored can be active or reactive and the pulse width can be selected as 200, 100(default) or 60ms.

(It shows pulse width of 200ms)

1-1		From the Set-up menu, use M and P buttons to select the Pulse width option.
1-2		Press E to enter the selection routine. The current setting will flash.

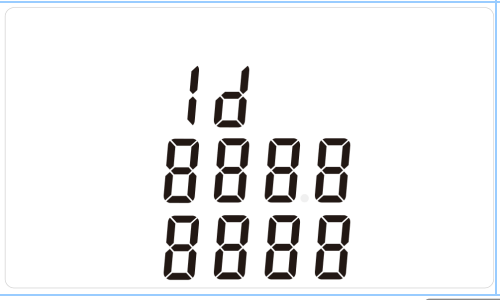
Use M and P buttons to choose pulse width. On Completion of the entry procedure, press E to confirm the setting and press U/I ESC to return to the main set up menu.

Communication

There is a Mbus port can be used for communication using Mbus protocol. For Mbus communication, parameters are selected from Front panel.

RS485 Address

(The range is from 001 to 250)

1		From the Set-up menu, use M and P buttons to select the Address ID
2-1		Press E button to enter the selection routine. The current setting will be flashing.
2-2		Use M and P buttons to choose Modbus Address(001 to 250)
2-3		Mbus secondary address It ranges from 00 00 00 01 to 99 99 99 99

On completion of the entry procedure, press E button to confirm the setting and press

U/I ESC button to return the main set-up menu.

Baud Rate

1		From the Set-up menu, use M and P buttons to select the Baud Rate option.
2-1		Press E to enter the selection routine. The current setting will flash.
2-2		Use M and P buttons to choose Baud rate 0.3k, 0.6k, 1.2k, 2.4k, 4.8k, 9.6k Default is 2.4k
On completion of the entry procedure, press E to confirm the setting and press U/I ESC to return to the main set up menu.		

Parity

1		From the Set-up menu, use M and P buttons to select the Parity option.

2-1		Press E to enter the selection routine. The current setting will flash.
2-2		Use M and P buttons to choose Parity (EVEN / ODD / NONE)
On Completion of the entry procedure, press E to confirm the setting and press U/I ESC to return to the main set up menu.		

Stop bits

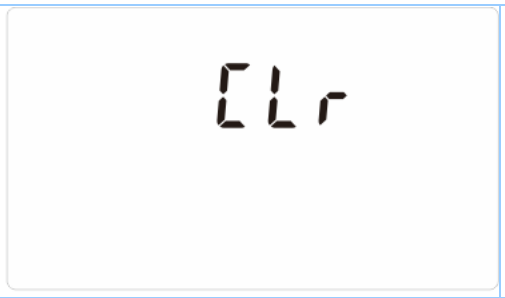
1		From the Set-up menu, use M and P buttons to select the Stop Bit option.
2-1		Press E to enter the selection routine. The current setting will flash.
2-2		Use M and P buttons to choose Stop Bit (2 or 1)
On completion of the entry procedure, press E to confirm the setting and press		

U/I ESC to return to the main set up menu.

Note: Default is 1, and only when the parity is NONE that the stop bit can be changed to 2.

CLR

The meter provides a function to reset the maximum demand value of current and power.

1		From the Set-up menu, use M and P buttons to select the reset option.
2		Press E to enter the selection routine. The MD will flash.
Press E to confirm the setting and press U/I ESC to return to the main set up menu.		

Specifications

Measured Parameters

The unit can monitor and display the following parameters of a single phase two wire(1p2w), three phase three wire(3p3w) or four phase four wire(3p4w) supply.

Voltage and Current

Phase to neutral voltages 100 to 289V a.c. (not for 3p3w supplies)

Voltages between phases 173 to 500V a.c. (3p supplies only)

Basic current (Ib): 10A

Max current : 100A

Min. Current: 5% of Ib

Starting current: 0.4% of Ib

Percentage total voltage harmonic distortion (THD%) for each phase to N (not for 3p3w supplies)

Percentage voltage THD% between phases (three phase supplies only)

Current THD% for each phase

Power factor and Frequency and Max. Demand

Frequency in Hz

Instantaneous power:

Power 0 to 99999 W

Reactive Power 0 to 99999 VAr

Volt-amps 0 to 99999 VA

Maximum demanded power since last Demand reset Power factor

Maximum neutral demand current, since the last Demand reset (for 3p4w supply only)

Energy Measurements

- Imported active energy 0 to 999999.99 kWh
- Exported active energy 0 to 999999.99 kWh
- Imported reactive energy 0 to 999999.99 kVArh
- Exported reactive energy 0 to 999999.99 kVArh
- Total active energy 0 to 999999.99 kWh
- Total reactive energy 0 to 999999.99 kVArh

Measured Inputs

Voltage inputs through 4-way fixed connector with 25mm^2 stranded wire capacity. single phase two wire(1p2w), three phase three wire(3p3w) or four phase four wire(3p4w) unbalanced. Line frequency measured from L1 voltage or L3 voltage.

Accuracy

Voltage	0·5% of range maximum
Current	0·5% of nominal
Frequency	0·2% of mid-frequency
Power factor	1% of unity (0.01)
Active power (W)	±1% of range maximum
Reactive power (VAr)	±2% of range maximum
Apparent power (VA)	±1% of range maximum
Active energy (Wh)	Class 1 IEC 62053-21
Reactive energy (VARh)	±2% of range maximum
Total harmonic distortion	1% up to 19st harmonic
Temperature co-efficient	Voltage and current = 0.013%/°C typical Active energy = 0·018%/°C, typical
Response time to step input	1s, typical, to >99% of final reading, at 50 Hz.

Interfaces for External Monitoring

Three interfaces are provided:

- an MBus communication channel that can be programmed for MBus EN13757-3 protocol
- an Pulse output(Pulse 1) indicating real-time measured energy.(configurable)
- an Pulse output(Pulse 2) 400imp/kWh

The Modbus configuration (Baud rate etc.) and the pulse output assignments (kW/kVArh, import/export etc.) are configured through the Set-up screens.

Pulse Output

The unit provides two pulse outputs. Both pulse outputs are passive type.

Pulse output 1 is configurable. The pulse output can be set to generate pulses to represent total / import/export kWh or kVarh.

The pulse constant can be set to generate 1 pulse per:

dFt = 2.5 Wh/VArh

0.01 = 10 Wh/VArh

0.1 = 100 Wh/VArh

1 = 1 kWh/kVArh

10 = 10 kWh/kVArh

100 = 100 kWh/kVArh

Pulse width: 200/100/60ms

Pulse output 2 is non-configurable. It is fixed up with active kWh. The constant is 400imp/kWh.

MBus Output for EN_13757-3

For MBus **EN13757-3**, the following MBus communication parameters can be configured from the Set-up menu:

Baud rate 300, 600, 1200, 2400, 4800, 9600

Parity none (default)/odd/even

Stop bits 1 or 2

MBus network primary address *nnn* – 3-digit number, 001 to 250

MBus network secondary address 00 00 00 01 to 99 99 99 99(The secondary address can not be setted directly on meter, but can be done via Mbus communication)

Reference Conditions of Influence Quantities

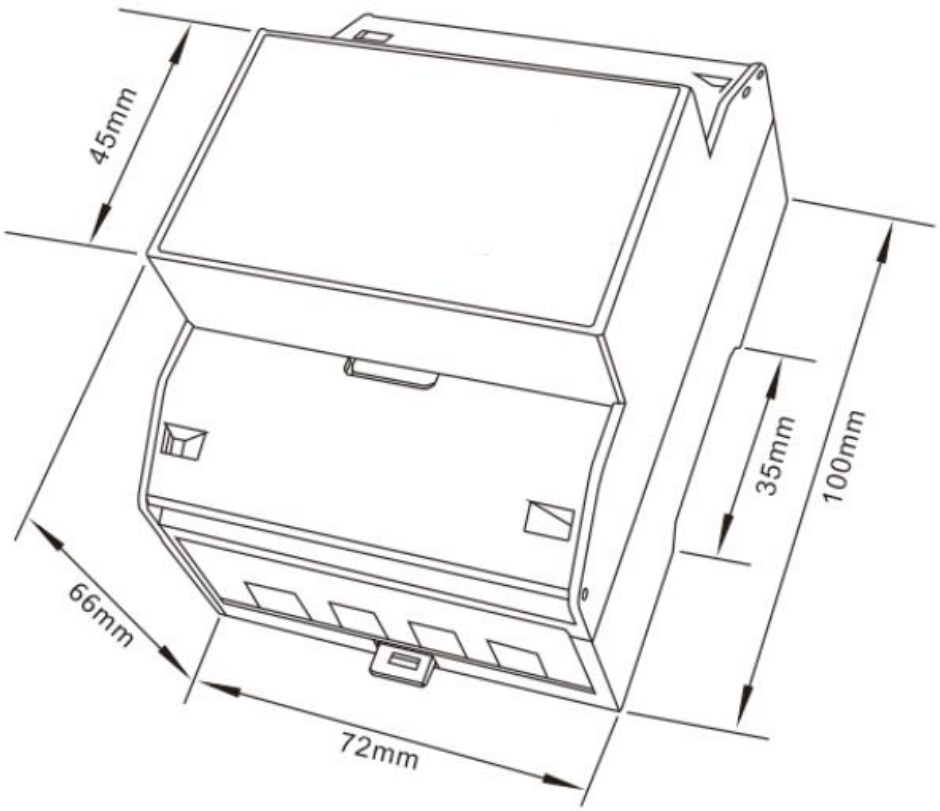
Influence Quantities are variables that affect measurement errors to a minor degree. Accuracy is verified under nominal value (within the specified tolerance) of these conditions.

- Ambient temperature 23°C ±2°C
- Input frequency 50Hz/60Hz ±2%
- Input waveform Sinusoidal (distortion factor < 0·005)
- Magnetic field of external origin Terrestrial flux

Environment

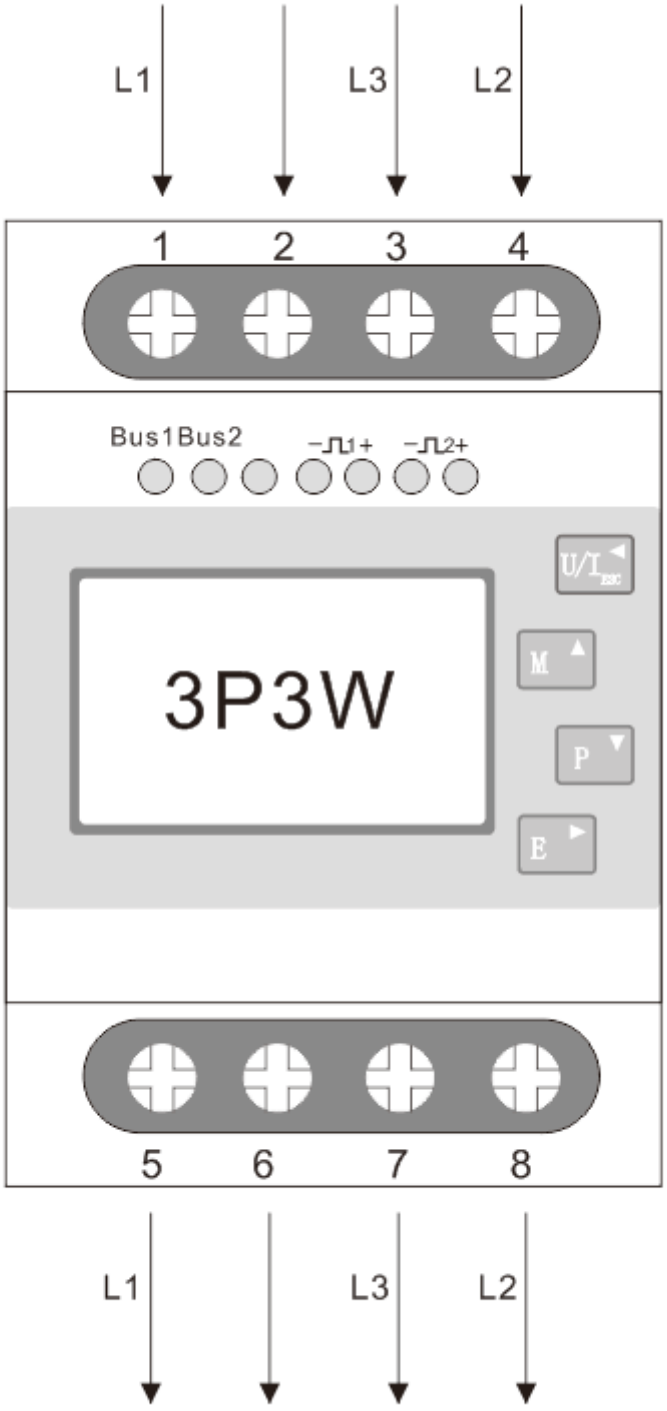
- Operating temperature -25°C to +55°C*
- Storage temperature -40°C to +70°C*
- Relative humidity 0 to 90%, non-condensing
- Altitude Up to 2000m
- Warm up time 10s
- Vibration 10Hz to 50Hz, IEC 60068-2-6, 2g

Dimensions

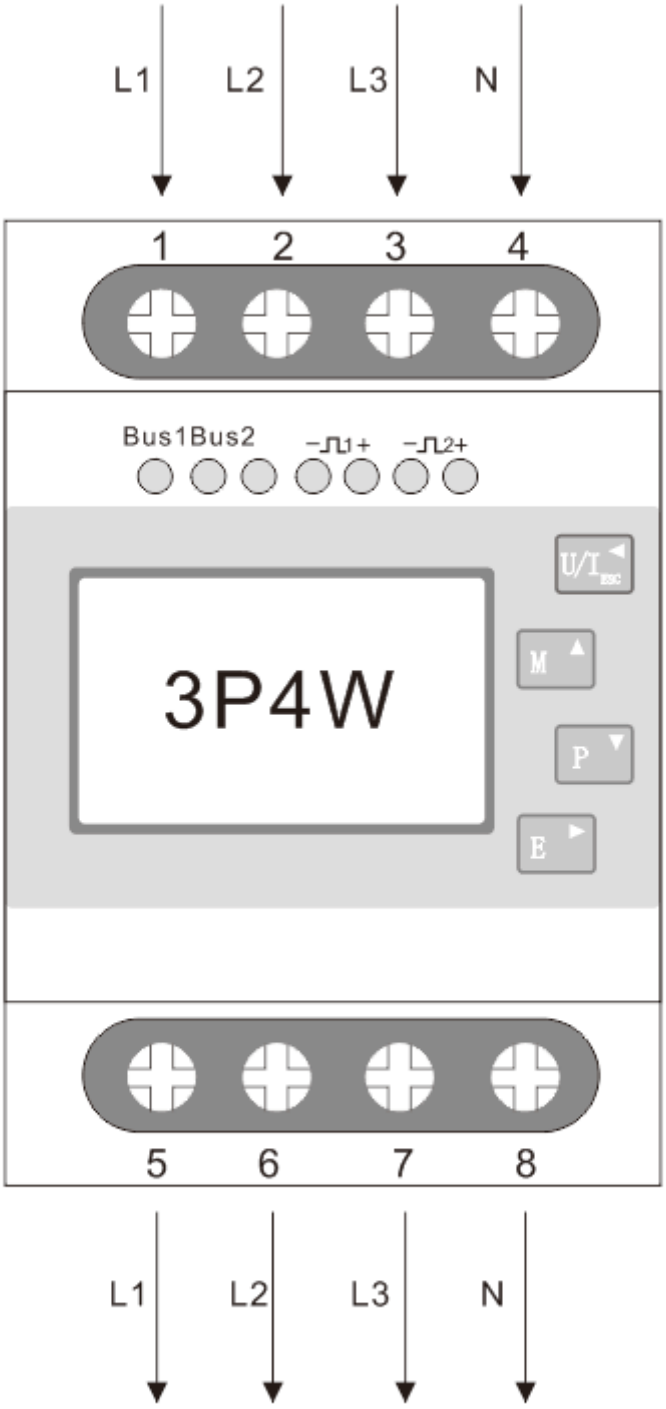


Wiring diagram

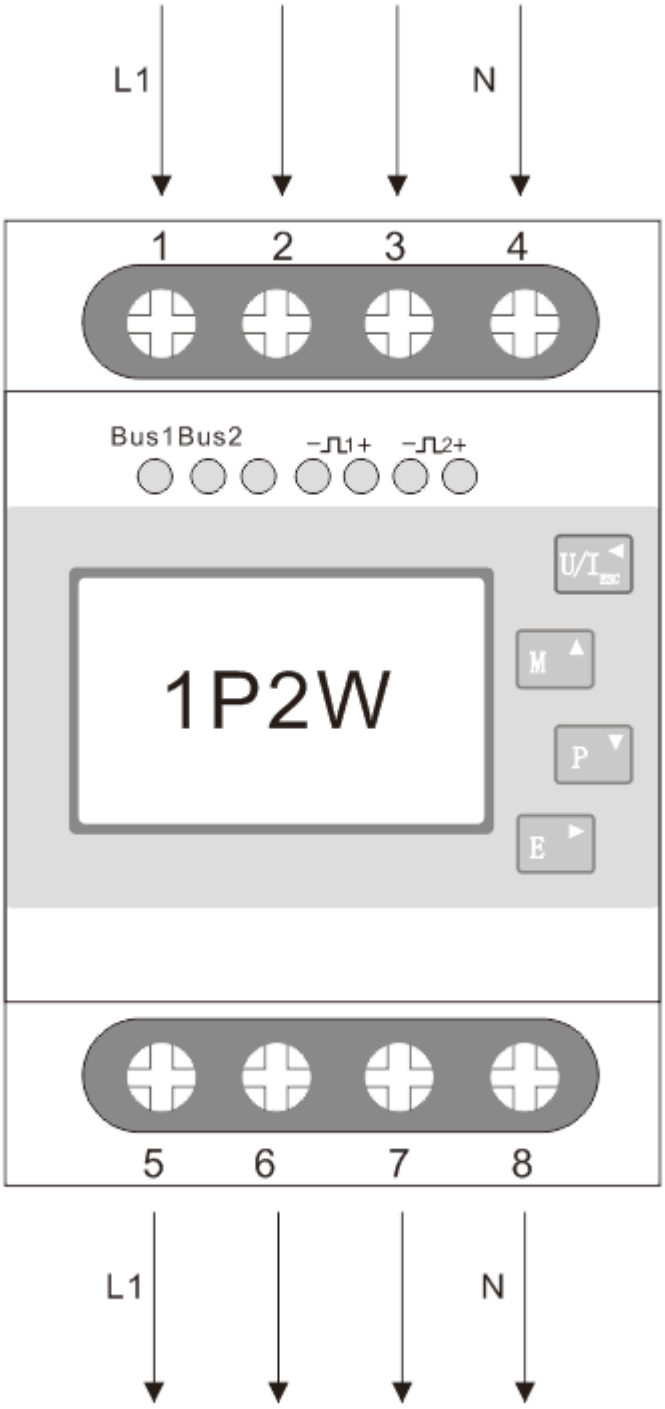
- Three Phase Three Wires：



- Three Phase Four Wires：



- Single Phase two Wires：



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SDM630 MBUS protocol V1.1

1. Initialization slave

Format:

Start	C Field	A Field	Check Sum	Stop
10	40	XX	CS	16

XX=1 to FF

The address field serves to address the recipient in the calling direction, and to identify the sender of information in the receiving direction. The size of this field is one Byte, and can therefore take values from 0 to 255. The addresses 1 to 250 can be allocated to the individual slaves, up to a maximum of 250.Unconfigured slaves are given the address 0 at manufacture, and as a rule are allocated one of these addresses when connected to the M-Bus. The addresses254 (FE) and 255 (FF) are used to transmit information to all participants (Broadcast). With address 255 none of the slaves reply, and with address 254 all slaves reply with their own addresses. The latter case naturally results in collisions when two or more slaves are connected, and should only be used for test purposes. The address 253 (FD) indicates that the addressing has been performed in the Network Layer instead of Data Link Layer, The FD used when using The second level address. The remaining addresses 251 and 252 have been kept for future applications.

1.1 How to initialize a meter which you don't know the address

Master to slave: 10 40 fe 3e 16

Slave to master:e5 (success)

1.2 Remove the secondary address matching symbol of all the meters on BUS.

Master to slave: 10 40 fd 3d 16

Slave: No answer

1.3 How to initialize all meters on the bus line by using FF as broadcast address

Master to slave: 10 40 ff 3f 16

Slave: No answer

1.4 How to Initialize a Slave with specific address

Example: Address 01

Master to slave : 10 40 01 41 16

Slave to master: e5

2. How to Set Baut rate

2.1 Point to point baud-rate setting command format (Control Frame)

Start	L Field	L Field	Start	C Field	A Field	CI Field	Check Sum	Stop
68H	03	03	68H	53/73	Addr	b8~bd	CS	16

L Field------Byte length

C Field--------Control Field, Function Field

A Field --------Address Field

CI Field --------control information field
Check Sum------The Check Sum is calculated from the arithmetical sum of the data mentioned above, without taking carry digits into account.
B8-------300
B9-------600
BA-------1200
BB-------2400
BC-------4800
BD-------9600

Example: (Meter address is 01)
(1) How to change Baud rate to 2400bps
Master to slave: 68 03 03 68 53 01 BB 0F 16
Slave to master: E5
(2) How to change Baud rate to 9600
Master to slave: 68 03 03 68 53 01 BD 11 16
Slave to master: E5

2.2 How to use Broadcast command to set baud rate

Format:

Start	L Field	L Field	Start	C Field	A Field	CI Field	Check Sum	Stop
68H	03	03	68H	53/73	ff	b8~bd	CS	16

Slave to master: no answer
B8-------300
B9-------600
BA-------1200
BB-------2400
BC-------4800
BD-------9600

Example:
Change all the meters' baud rate to 2400bps
Master to slave:： 68 03 03 68 53 **ff** bb 0d 16
Slave to Master: No answer

3. How to Set primary address

3.1 How to set the address of a Slave to 01

Format:

Start	L Field	L Field	Start	C Field	A Field	CI Field	DIF	VIF	Address Data	Check Sum	Stop
68H	06	06	68H	53/73	fe	51	01	7A	XX	CS	16

Example：
Master to slave: 68 06 06 68 53 fe 51 01 7a **01** 1e 16
Slave to master: e5

3.2 How to use Broadcast Command to set primary address to 01

Master to slave: 68 06 06 68 53 **ff** 51 01 7a **01** 1f 16

Start	L Field	L Field	Start	C Field	A Field	CI Field	DIF	VIF	Address Data	Check Sum	Stop
68H	06	06	68H	53/73	ff	51	01	7A	XX	CS	16

Slave : no answer

3.3 How to change Address from 01 to 02

Format

Start	L Field	L Field	Start	C Field	A Field	CI Field	DIF	VIF	Address Data	Check Sum	Stop
68H	06	06	68H	53/73	XX	51	01	7A	YY	CS	16

XX--current primary Address
YY--new primary address
Master to slave: 68 06 06 68 73 **01** 51 01 7A **02** 42 16
Slave to master: e5

3.4 How to set primary address to 01 by using secondary address

For example: secondary address: 12345678
Step1 Initialize the slave
Master to slave ： 10 40 ff 3f 16
Slave to master：no answer

Step2 Check the secondary address. After receiving the command, the Slave will check if the secondary address in the command is same with its secondary address or not.
Maseter to slave: 68 0B 0B 68 73 **FD** 52 **78 56 34 12** FF FF FF FF D2 16
FD--- the primary Address used when you use secondary address to read data.
78 56 34 12 ---the meter's secondary address is 12 34 56 78
Master to slave: e5 (success)

Step3 Change the primary address to 01
Master to slave: 68 06 06 68 73 FD 51 01 7A **01** 3D
01---- new primary address
Slave to master: e5

4. Set the complete identification of the slave
(ID=12345678, Man=4024h (PAD), Gen=1, Med=02 (energy))

Start	L Field	L Field	Start	C Field	A Field	CI Field	DIF	VIF	Identification No	Manufact-urer ID	Generati-on	Medium	Check Sum	Stop

68H	0D	0D	68H	53/73	addr	51	07	79	4 byte	2 byte	1 byte	1 byte	CS	16

For example: (Meter address is 01)
Master to slave: 68 0D 0D 68 53 01 51 07 79 78 56 34 12 24 40 01 02 A0 16
Slave to master: e5

5. How to read out of Energy information

5.1 Use primary address 01 to read Energy information

Format:
Master to slave: 10 7B/5B adr cs 16
Slave to master: Variable data structure
Example: 10 7B 01 7C 16

5.2 How to read out a meter's Energy information by using broadcast address 254 (FE)

Master to slave: 10 7b/5b fe cs 16
Slave to master: Variable data structure
Example: 10 5B FE 59 16

5.3 How to read out the meter's Energy information by using secondary Address

For example: Secondary address: 12 34 56 78

Step1 initialize the slave
Master to slave: 10 40 ff 3f 16
Slave to master: No answer

Step2 Check the secondary address. After receiving the command, the Slave will check if the secondary address in the command is same with its secondary address or not.

Master to slave: 68 0b 0b 68 73 fd 52 78 56 34 12 FF FF FF FF d2 16
Slave to master: E5

Step3 Read the Energy information
Master to slave: 10 7b fd 78 16
Slave to master:
DIF=====Coding of t e Data Information Field
VIF=====Codes for Value Information Field

bytes	Parameters	data structure	Notice
4	header telegram	68 5d 5d 68	eader of RSP_UD telegram
3		08 A 72	C field =08 address A CI field 72
4		78 65 34 21	Identification number =12345678
2		24 40	Manufacturer ID 4024
1		01	Generation 1
1		02	Energy Meter
1		55	ACCESS NO
1		00	STATUS
2		00 00	Signature

6	Current total active energy	0C	DIF: 8digit BCD ， Current Value
		04	VIF: 10w (0.01Kw)
		78 56 34 12	123456.78kwh
7	Current import active energy (Readout is “0” if there is no this function)	0C	DIF: 8digit BCDFIE，Current Value
		04	VIF: 10w (0.01Kw)
		78 56 34 12	123456.78kwh
7	Current export active energy (Readout is “0” if there is no this function)	0C	DIF: 8digit BCDFIE Current Value
		04	VIF: 10w (0.01Kw)
		78 56 34 12	123456.78kwh
6	Current resettable total active energy (Readout is “0” if there is no this function)	0C	DIF: 8digit BCD ， Current Value
		04	VIF: 10w (0.01Kw)
		78 56 34 12	123456.78kwh
7	Current resettable import active energy	0C	DIF: 8digit BCDFIE，Current Value
		04	VIF: 10w (0.01Kw)
		78 56 34 12	123456.78kwh
7	Current resettable export active energy	0C	DIF: 8digit BCDFIE，Current Value
		04	VIF: 10w (0.01Kw)
		78 56 34 12	123456.78kwh
7	Current total reactive energy	0C	DIF: 8digit BCD ， Current Value
		FD	VIF: fd
		3A	VIFE: dimensionless / no VIF
		78 56 34 12	123456.78kVarh
8	Current import reactive energy	0C	DIF: 8digit BCDFIE，Current Value
		FD	VIF: fd
		3A	VIFE: dimensionless / no VIF
		78 56 34 12	123456.78kVarh
8	Current export reactive energy	8C	DIF: 8digit BCDFIE Current Value
		FD	VIF: fd
		3A	VIFE: dimensionless / no VIF
		78 56 34 12	123456.78kVarh
7	Current total resettable reactive energy (Readout is “0” if there is no this function)	0C	DIF: 8digit BCD ， Current Value
		FD	VIF: fd
		3A	VIFE: dimensionless / no VIF
		78 56 34 12	123456.78kVarh
8	Current resettable import reactive energy (Readout is “0” if there is no this function)	0C	DIF: 8digit BCDFIE，Current Value
		FD	VIF: fd
		3A	VIFE: dimensionless / no VIF
		78 56 34 12	123456.78kVar
8	Current resettable export reactive energy (Readout is “0” if there is no this function)	0C	DIF: 8digit BCDFIE，Current Value
		FD	VIF: fd
		3A	VIFE: dimensionless / no VIF
		78 56 34 12	123456.78kVar
1	CHECK SUM	CS	
1	End	16	

6. Read out of instantaneous electrical information

The instantaneous electrical information includes:

V，I，P ，Q，S，PF，Hz ect. MD

6.1 How to read instantaneous electrical information by using primary address:

Start	L Field	L Field	Start	C Field	A Field	CI Field	C eck Sum	Stop
68	3	3	68	53/73	XX	B1	CS	16

Master to slave: 68 03 03 68 53 XX b1 CS 16
Slave to master: Variable data structure (instantaneous electrical information)
If the primary address is 01 then XX=01

6.2 How to use Secondary Address to read out the instantaneous electrical information

Step1 Initialization slave
Master to slave: 10 40 ff 3f 16
Slave to master： No answer

Step2 Check the secondary address. After receiving the command, the Slave will check if the secondary address in
the command is same with its secondary address or not.
Master to slave: 68 0b 0b 68 73 fd 52 78 56 34 12 ff ff ff ff d2 16
Slave to master: E5

Step3 Use Secondary Address to read out the instantaneous electrical information
Master to slave: 68 03 03 68 53 fd b1 01 16
Slave to master: Variable data structure

bytes		data structure	Notice
4	eader telegram	68 90 90 68	eader of RSP_UD telegram
3		08 A 72	C field =08 address A CI field 72
4		78 65 34 21	Identification number =12345678
2		24 40	Manufacturer ID 4024
1		01	Generation 1
1		02	Energy Meter
1		55	ACCESS NO
1		00	STATUS
2		00 00	Signature
6	L1 Voltage	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47	VIFE: 0.01V
		56 34 12	1234.56V
6	L2 Voltage	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47	VIFE: 0.01V
		56 34 12	1234.56V
6	L3 Voltage	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47	VIFE: 0.01V
		56 34 12	1234.56V
6	L1-L2 Voltage	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47	VIFE: 0.01V
		56 34 12	1234.56V
6	L2-L3 Voltage	0b	DIF: 6digit BCD

		Fd	VIF:fd
		47	VIFE: 0.01V
		56 34 12	1234.56V
6	L3-L1 Voltage	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47	VIFE: 0.01V
		56 34 12	1234.56V
6	L1 current	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59	VIFE: 1mA(xxx.xxxA)
		56 34 12	123456mA(123.456A)
6	L2 current	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59	VIFE: 1mA(xxx.xxxA)
		56 34 12	123456mA(123.456A)
6	L3 current	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59	VIFE: 1mA(xxx.xxxA)
		56 34 12	123456mA(123.456A)
6	N current	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59	VIFE: 1mA(xxx.xxxA)
		56 34 12	123456mA(123.456A)
5	total active power	0b	DIF: 6digit BCD
		2a	VIF:0.1W(xx.xxxxkw)
		56 34 12	12345.6w(12.3456kw)
5	L1 active power	0b	DIF: 6digit BCD
		2a	VIF:0.1W(xx.xxxxkw)
		56 34 12	12345.6w(12.3456kw)
5	L2 active power	0b	DIF: 6digit BCD
		2a	VIF:0.1W(xx.xxxxkw)
		56 34 12	12345.6w(12.3456kw)
5	L3 active power	0b	DIF: 6digit BCD
		2a	VIF:0.1W(xx.xxxxkw)
		56 34 12	12345.6w(12.3456kw)
6	total reactive power	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		56 34 12	12345.6w(12.3456kw)
6	L1 reactive power	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		56 34 12	12345.6w(12.3456kw)
6	L2 reactive power	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		56 34 12	12345.6w(12.3456kw)
6	L3 reactive power	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		56 34 12	12345.6w(12.3456kw)
5	Total power factor	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 05	0.500

5	A power factor	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 05	0.500
5	B power factor	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 05	0.500
5	C power factor	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 05	0.500
5	Frequency	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 50	50.00 z
1	End	CS	
1		16	

7. How to read password

Start	L Field	L Field	Start	C Field	A Field	CI Field	C eck Sum	Stop
68	3	3	68	11	addr	03	CS	16

Master to Slave：68 03 03 68 11 addr 03 cs 16
Slave to Master：68 05 05 68 11 addr 03 password H password L cs 16

7.1 Change to a new Password

Start	L Field	L Field	Start	C Field	A Field	CI Field	Data		C eck Sum	Stop
68	5	5	68	11	addr	04	Password	Password L	CS	16

Master to Slave：68 05 05 68 11 addr 04 password H password L cs 16
Slave to Master：E5

8. How to reset all resettable energy data

Start	L Field	L Field	Start	C Field	A Field	CI Field	C eck Sum	Stop
68	3	3	68	11	addr	0d	CS	16

For example: addr: 01
Master to Slave：68 03 03 68 11 01 0d 1f 16
Slave to Master：e5

9. Set Demand interval、slide time、Display time、LED time

Send：68 09 09 68 53 FE 51 30 01 60 01 05 06 3F 16

Start	L	L	Start	C	A	CI	DIF	VIF	data	Check	Stop

	Field	Field		Field	Field	Field				Sum	
68H	09	09	68H	53/73	FE	51	30	01	Demand interval、slide time、Display time、LED time Display time=0 ： the display does not scroll automatically. LED time=0 :Backlight always on min-min-s-min 4 bytes	cs	16

Example: (Meter address is 01)

Master to Slave：68 09 09 68 53 FE 51 30 01 60 01 05 06 3F 16

Slave to Master：E5

10. Read Demand interval、slide time、Display time、LED time

Start	L Field	L Field	Start	C Field	A Field	CI Field	DIF	VIF	Check Sum	Stop
68H	05	05	68H	53/73	FE	51	30	81	cs	16

Example: (Meter address is 01)

Master to Slave：68 05 05 68 53 FE 51 30 81 53 16

Slave to Master：E5

Bytes	Parameters	Data structure	Notice
4	eader telegram	68 16 16 68	eader of RSP_UD telegram
3		08 A 72	C field =08 address A CI field 72
4		78 65 34 21	Identification number =12345678
2		24 40	Manufacturer ID 4024
1		01	Generation 1
1		02	Energy Meter
1		55	ACCESS NO
1		00	STATUS
2		00 00	Signature
7	Demand interval、slide time、Display time、LED time	0a	DIF: 30digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		15010610	Demand interval: 15 min slide time: 01min Display time: 06s LED time: 10s
1	CHECK SUM	CS	
1	End	16	

11. Read the measurement mode

Start	L Field	L Field	Start	C Field	A Field	CI Field	Check Sum	Stop
68	03	03	68	11	addr	09	CS	16

Example: (Meter address is 01)

Master to Slave: 68 03 03 68 11 **01** 09 1b 16
Slave to Master: 68 04 04 68 11 01 09 **01** 1c 16
The red-lighted **01** represents the measurement mode
01means Active energy
02means Active energy+Reactive energy
03emans Active energy- Reactive energy

12. Set up the measurement mode

Start	L Field	L Field	Start	C Field	A Field	CI Field	data	Check Sum	Stop
68	04	04	68	11	addr	**0A**	01/02/03	CS	16

Example: (Meter address is 01)
Master to Slave: 68 04 04 68 11 01 0A **01** 1c 16
Slave to Master: e5
The red-lighted **01** represents the measurement mode
01 means Active energy
02 means Active energy+Reactive energy
03 means Active energy- Reactive energy

13. Read the output mode of Pulse 1

Start	L Field	L Field	Start	C Field	A Field	CI Field	Check Sum	Stop
68	03	03	68	11	addr	10	CS	16

Example: (Meter address is 01)
Master to Slave: 68 03 03 68 11 01 10 22 16
Slave to Master: 68 04 04 68 11 01 10 **01** 23 16
The red-lighted **01** represents the output mode of Pulse1
01: Import active energy,
02: Import + export active energy,
04: Export active energy (default).
05: Import reactive energy,
06: Import + export reactive energy,
08: Export reactive energy,

14. Set up the output mode of Pulse 1

Start	L Field	L Field	Start	C Field	A Field	CI Field	data	Check Sum	Stop
68	08	08	68	11	addr	11	01/02/04/05/06/08	CS	16

Example: (Meter address is 01)
Master to Slave: 68 04 04 68 11 01 11 **01** 24 16
Slave to Master: e5

The red-lighted **01** represents the output mode of Pulse1
01: Import active energy,
02: Import + export active energy,
04: Export active energy, (default).
05: Import reactive energy,
06: Import + export reactive energy,
08: Export reactive energy,

15. Read the constant of Pulse 1

Start	L Field	L Field	Start	C Field	A Field	CI Field	Check Sum	Stop
68	03	03	68	11	addr	12	CS	16

Example: (Meter address is 01)
Master to Slave: 68 03 03 68 11 01 12 24 16
Slave to Master: 68 04 04 68 11 01 10 **00** 22 16
The red-lighted **00** represents the constant of Pulse1
00: 0.0025kwh (kvarh) / imp (default)
01: 0.01kwh (kvarh) / imp
02: 0.1kwh (kvarh) / imp
03: 1kwh (kvarh) / imp
04: 10kwh (kvarh) / imp
05: 100kwh (kvarh) / imp

16. Set up the constant of Pulse 1

Start	L Field	L Field	Start	C Field	A Field	CI Field	data	Check Sum	Stop
68	08	08	68	11	addr	11	00/01/02/03 /04/05	CS	16

Example: (Meter address is 01)
Master to Slave: 68 04 04 68 11 01 13 **00** 25 16
Slave to Master: e5
The red-lighted **00** represents the constant of Pulse1
00: 0.0025kwh (kvarh) / imp (default)
01: 0.01kwh (kvarh) / imp
02: 0.1kwh (kvarh) / imp
03: 1kwh (kvarh) / imp
04: 10kwh (kvarh) / imp
05: 100kwh (kvarh) / imp

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