EMM.630 100A SERIES on Din Rail Energy Met



DIN RAIL SMART METER FOR SINGLE AND THREE PHASE **ELECTRICAL SYSTEMS**

UserManual V1.0

1.Introduction

This document provides operating, maintenance and installation instructions. These units measure and display the characteristics of single phase two wires (1p2w), three phase three wires (3p3w) and three phase four wires (3p4w) networks. The measuring parameters include voltage (V), frequency (Hz),current (A),power (kW/kVa/kVar),import, export and total Energy (kWh/kVarh).The units can also measure Maximum demand current and power, this is measured over preset periods of up to 60 minutes.

These units are max 100A direction operated and do not need to connect with external current transformers (CT).Built-in pulse. RS485 Modbus RTU/Mbus outputs.Configuration is password protected

1.1 Unit Characteristics

The EMM.630 100A series meters have five models: EMM.630-Pulse, EMM.630-Standard, EMM.630, EMM630-Mbus.EMM.630-MT.

Model	Measurement	Output	Tariff
EMM.630-Pulse	kWh/kVarh,kW/kVar,kVA, P,F,PF,dmd,V,A,THD,etc.	pulse	no
EMM.630-Stand	akoWh/kVarh	pulse/Modbus	no
EMM.630	kWh/kVarh,kW/kVar,kVA, P,F,PF,dmd,V,A,THD,etc.	pulse/Modbus	no
EMM.630-Mbus	kWh/kVarh,kW/kVar,kVA, P,F,PF,dmd,V,A,THD,etc.	pulse/Mbus	no
EMM.630-MT	kWh/kVarh,kW/kVar,kVA, P,F,PF,dmd,V,A,THD,etc.	pulse/Modbus	4 tariffs 10 segments

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

1.2 RS485 Serial–Modbus RTU *Not for EMM630-Pulse and EMM630Mbus

RS485 serial port with Modbus RTU protocol to provide a means of remotely monitoring and controlling the Unit.Set-up screens are provided for setting up the RS485 port.

1.3 Mbus

*For EMM630-Mbus only This uses an MBus port with EN13757-3 protocol to provide a means of remotely monitoring and controlling the Unit. screens are provided for setting up the RS485 port. Set-up screens are provided for setting up the MBus port.

1.4 Pulse output

Two pulse outputs that pulse 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

2.Start Up Screens

$ \begin{array}{c} \text{II. } \text{I.2. } \text{ MD } & \text{ (MPOR) } \text{ (XPOR) } \text{ (III)} \\ \text{L}^{1/2} & \textbf{T} & \textbf{-8.8.8.8.9} & \text{MkWh} \\ \text{L}^{23} & \textbf{\Sigma} & \textbf{-8.8.8.8.9} & \text{MkWAhh} \\ \text{N} & \textbf{\Sigma} & \textbf{-8.8.8.8.9} & \text{MkVA} \\ \text{K}^{2/3} & \textbf{-8.8.8.8.9} & \text{MkVA} \\ \text{K}^{2} & \textbf{\odot} & \textbf{-8.8.8.8.9} & \text{PF C1 C2} \end{array} $	The first screen lights up all display segments and can be used as a display check.
50FE 1.302 2014	Software version information
1058 8858 8855	The interface performs a self-test and indicates the result if the test passes.

3.1 Voltage and Current

*Not for EMM.630-Standard. Each successive press of th



3.2 Frequency and Power Factor and Demand *Not for EMM.630-Standard Each successive press of the HD/A button selects a new range:

Frequency and Power **≥ 00.00** Hz Factor (total). **0.999** PF E 0.999 Power Factor of each L² <u>0</u>999 phase L3 0.999 PF 0.000 ^{kw} Maximum Power Demand. Σ Ľ 0.000 Maximum Current L² Demand. L³ 0.000

3.3 Power

*Not for EMM.630-Standard Each successive press of the P button select a new range:

L ¹ 0.000 ^{kw} L ² 0.000 L ³ 0.000	Instantaneous Active Power in kW.
L ¹ L ² L ³ D.D D D D.D D D D.D D D	Instantaneous Reactive Power in kVar.
" nnnn	7
L ² 0.000 L ³ 0.000 KV	Instantaneous Volt-Amps in KVA.

3.4 Energy Measurements

Each successive press of the E button selects a new range



T / 0000 ^{kVArh} 00.00	Tari ff1 reactive energy Tari ff2 reactive energy Tari ff3 reactive energy Tari ff4 reactive energy *For EMM.630-MT only
0000 ≥ 00.00 ^{kVArh}	Total reactive energy
487E 5000 0 10 1	date Year/month/day. 1st,Jan,2000 (default) *For EMM.630-MT only
T (NNE 00:02 -15	Time Hour/minute/second Example:00:02:16 *For EMM.630-MT only

*The parameters of date and time can only be setted via RS485

4.Set Up

To enter set-up mode, press the EL button for 3 seconds, until the password screen appears



To exit setting-up mode, press $\bigvee_{k=1}^{k}$ repeatedly until the measurement screen is restored

4.1 Set-up Entry Methods

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

4.1.1 Menu Option Selection

- 1. Use the $\frac{MD}{PF/HZ}$ and \mathbf{p}^{\vee} buttons to scroll through the different options of the set up menu.
- 2. Press 🗈 to confirm your selection
- 3. If an item flashes, then it can be adjusted by the $\frac{MD}{PE/12}$ and ▶ V buttons.
- 4. Having selected an option from the current layer, press to confirm your selection. The SET indicator will appear
- 5. Having completed a parameter setting, press **V**/A[<] to return to a higher menu level. The SET indicator will be removed and you will be able to use the $\frac{1}{PPHZ}$ and $\frac{1}{P}$ buttons for further menu selection.
- 6. On completion of all setting-up, press V/A repeatedly until the measurement screen is restored

4.1.2 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 and P buttons
- 2. Press 🛃 to confirm each digit setting. The SET indicator appears after the last digit has been set.
- 3. After setting the last digit, press to exit the number setting routine. The SET indicator will be removed.

4.2 Change Password

582 PRSS 1000	Use the $\frac{VD}{PPAR}$ and P to choose the change password option.
582	Press the to enter the change password routine.

582 d 12 10	From the set-up menu, use Print and P buttons to select the DIT option. The screen will show the currently selected integration time.
582 312 10	Press E: to enter the selection routine. The current time interval will flash.
585 875	Use w/ A and P buttons to select the time required.
581 871 20	Press E to confirm the selection. SET indicator will appear.

Press VAT to exit the DIT selection routine and return to the menu.

4.4 Supply System

The unit has a default setting of 3Phase 4wire (3P4). Use this section to set the type of electrical system



Press $\frac{V/\Lambda^{\triangleleft}}{ESG}$ 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

4.5 Backlit set-up

Backlit lasting time is settable, default lasting time is 60 minutes

588 LP 60	If it's setted as 5,the backlit will be o ffin 5 minutes if there is no more further operation.
588 60 50	Press to enter the selection routine. The current time interval will flash The options are: 0(always on)/5/10/30/60/120

Press MD/A and P to select the time interval. Then press to confirm the set-up.

4.6 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: Toal kWh/Total kVarh Import kWh/Export kWh Import KVarh/Export KVarh

SEŁ ^{KWh} rly	From the set-up menu, use p_{phac}^{A} and p buttons to select the Pulse output option.
SEL ^{KWh} rly	Press E to enter the selection routine. The unit symbol will flash.
SEE rly ^{kVArh}	Use yot A penar and P buttons to choose kWh or kVarh.

*After a short delay, the screen will display active energy interface as follows



3.Measurements

The buttons operate as follows



Selects the Voltage and Current display screens. In Set-up Mode, this is the "Left" or "Back" button.



Select the Frequency and Power factor display screens. In Set-up Mode, this is the "Up" button.



Select the Power display screens. In Setup Mode, this is the "Down" button.



Select the Energy display screens. In Setup mode, this is the "Enter" or "Right" button.

0000 ^(KROK) 00.00	Export active energy in kWh.
T / ^{KWh} 0000 00.00	Tariff 1 active energy Tariff 2 active energy Tariff 3 active energy Tariff 4 active energy *For EMM630-MT only
0000 ^{kWh} ≥ 03.14	Total active energy in kWh.
OOOO OOOO OOOO kvArh	Import reactive energy
EXPORT 0000 00.00 KVArh	Export reactive energy



Set-up menu. SET will be removed

4.3 DIT Demand Integration Time *Not for EMM.630-Standard

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. On completion of the entry procedure, press the setting and press $\frac{1}{100}$ to return to the main set up menu.

Warnings

Important Safety Information is contained in the Maintenance section. Familiarize yourself with this information before attempting installation or other procedures. Symbols used in this document:



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



(It shows 1 pulse = 10kWh/kVarh)



Use MD/A and P buttons to choose pulse rate.

On completion of the entry procedure, press the setting and press main to return to the main set up menu.

4.6.2 Pulse Duration The pulse width can be selected as 200 (non-MID version meters only), 100 (default) or 60ms.



(It shows pulse width of 100ms)



Use MD_{PFMZ}^{A} and P buttons to choose pulse width.

On completion of the entry procedure press the setting and press to return to the main set up menu.

4.7 Communication

selected from front panel.

*Not for EMM.630-Pulse There is RS485Mbus port can be used for communication Modbus RTU protocol. For Modbus RTU, parameters are

4.7.1 RS485 Address

*For EMM.630-MT/-Standard/-Modbus only



4.7.3 Baud Rate



On completion of the entry procedure, press 💽 to confirm the setting and press 11 to return to the main set up menu.

4.7.4 Parity



On completion of the entry procedure, press the setting and press $\frac{V/A}{EEC}$ to return to the main set up menu.

4.7.5 Stop bits



On completion of the entry procedure, press the setting and press $\frac{V/A^{\triangleleft}}{E_{EC}}$ to return to the main set up menu.

4.8 CLR *Not for EMM.630-Standard

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



Press E to confirm the setting and press to return to the main set up menu.

5.Specifications

5.1 Measured Parameters

The unit can monitor and display the following parameters of a

5.1.3 Energy Measurements

 Import active energy 	0 to 999999.99 kWh
 Export reactive energy 	0 to 999999.99 kVarh
 Import active energy 	0 to 999999.99 kWh
 Export reactive energy 	0 to 999999.99 kVarh
 Total active energy 	0 to 999999.99 kWh
 Total reactive energy 	0 to 999999.99 kVarh

5.2 Measured Inputs

Voltage inputs through 4-way fixed connector with 25mm² stranded wire capacity. single phase two wire (1p2w), three phase three wire (3p3w) or three phase four wire (3p4w) unbalanced. Line frequency measured from L1 voltage or L3 voltage

5.3 Interfaces for External Monitoring

Three interfaces are provided

- RS485/Mbus communication channel that can be programmed via protocol remotely. (not for EMM630-Pulse)
- · Pulse output (pulse1) indicating real-time measured energy. (configurable)
- Pulse output (pulse2) 400imp/kWh (not configurable)

The Modbus/Mbus configuration (baud rate etc) and the pulse relay output assignments (kW/kVarh, import/export etc) are configured through the set-up screens.

5.3.1 Pulse Output

The pulse output can be set to generate pulses to represent kWh or kVarh.

Rate can be set to generate 1 pulse per:

dFt (default) = 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 200/100/60 ms. Pulse output 2 is non-configurable. It is fixed up with active kWh. Its constant is 400imp/kWh.

5.3.2 RS485/Mbus Output for Modbus RTU

*For EMM.630-MT/-Modbus/-Standard only For Modbus RTU, the following RS485 communication parameters can be configured from the set-up menu: Baud rate 2400, 4800, 9600, 19200, 38400 Parity none / odd / even RS485 network address nnn - 3-digit number, 001 to 247

For Mbus, the following communication parameters Mbus network primary address nnn - 3-digit number,001 to 250

-	
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)	\pm 1% of range maximum
Reactive power (VAr)	\pm 1% of range maximum
 Apparent power (VA) 	\pm 1% of range maximum
Active energy (Wh) Reactive energy (VARh)	Class 1 IEC 62053-21 Class B EN50470-3 \pm 1% of range maximum
Response time to step input	1s, typical, to >99% of final reading, at 50 Hz.

5.5 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. 23°C ± 2°C

Input frequency	
Input waveform	

 Magnetic field of external origin Terrestrial flux

5.6 Environment

-25°C to +55°C* Operating temperature -40°C to +70°C Storage temperature

50 Hz(MID) 50 or 60Hz ±2%(non-MID)

Sinusoidal (distortion

factor < 0.005)

6.Dimensions



7Wiring diagram



7.1 single phase two wires





7.3 three phase four wires



Stop bits 1 or 2 *For EMM.630-Mbus only

can be configured from the set-up menu: Baud rate 300,600,2400, 4800, 9600 Parity none/ odd / even Stop bits 1 or 2 Mbus network secondary address 00 00 00 00 to 99 99 99 99

*If the Modbus/Mbus protocol document is required, please contact us for it.

5.4 Accuracy	
- Valtaga	

• voltage	0.5
Current	0.5
Frequency	0.2
Power factor	1%
Active power (W)	±1
Reactive power (VAr)	±1
 Apparent power (VA) 	±1
Active energy (Wh)	Cla

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On completion of the entry procedure, press 📘 button to confirm the setting and press WAS button to return the main set-up menu.

4.7.2 Mbus address *For EMM.630-Mbus only



On completion of the entry procedure, press the setting and press to return to the main set up menu. single phase two wire (1p2w), three phase three wire (3p3w) or three phase four wire (3p4w) system.

5.1.1 Voltage and Current

*Not for EMM 630-Standard

- Phase to neutral voltages 100 to 289V a.c. (not for 3p3w supplies).
- Voltages between phases 173 to 500V a.c. (3p supplies only).
- · 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

5.1.2 Power factor and Frequency and Max. Demand *Not for EMM.630-Standard

- · 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 three phase supplies only)

Relative humidity	0 to 95%, non- condensing
Altitude	Up to 3000m
Warm up time	1 minute
Vibration	10Hz to 50Hz, IEC 60068-2-6, 2g
Shock	30g in 3 planes

* Maximum operating and storage temperatures are in the context of typical daily and seasonal variation.

5.7 Mechanics

- DIN rail dimensions Mounting Sealing Materia
- per DIN 43880 DIN rail (DIN 43880) IP51 (indoor) Self-extinguishing UI94 V-0

76 x 94.5 mm (WxH)

5.8 Declaration of Conformity(for the MID approved version meter only)

The fulfilment of the essential requirements set out in Annex I and in the relevant instrument-specific Annexes has been demonstrated. We declare under our sole responsibility as the manufacturer that the poly phase multifuntion electrical meter "EMM.630" correspond to the production model described in the EU-type examination certificate and to the requirements of the Directive 2014/32/EU EC type examination certificate number 0120/SGS0359. Identification number of the NB0598 SGS Fimko Finland The object described above is in conformity with the relevant Union harmonization legislation.

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RoHS

CE