Eastron

SDM630-EV

DIN Rail Smart Meter for Single and Three Phase Electrical Systems

User Manual



- Measures kWh Kvarh, KW, Kvar, KVA, P, F, PF, Hz, dmd, V, A, etc.
- Bi-directional measurement IMP & EXP
- Pulse output
- RS485 Modbus
- Din rail mounting 35mm
- 100A direct connection
- Better than Class 1 / B accuracy

1. Introduction

The SDM630-EV 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-EV 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 RS485 Modbus RTU outputs. Configuration is password protected.

1.2 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.

1.3 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)
- 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

1.4 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)

1.5 Energy Measurements

 Imported active energy
 0 to 999999.99 kWh 0 to 999999.99 kWh

1.8 Interfaces for External Monitoring

Three interfaces are provided:

- 2 RS485 communication channels via protocol remotely.
- Pulse output indicating real-time measured energy.

1.9 Pulse Output

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

1.10 RS485 Output for Modbus RTU

There 2 two channels of RS485 Modbus RTU

For Modbus RTU, the following RS485 communication parameters can be configured from the

- Set-up menu: 1st Modbus Output (configurable):
 - Baud rate 2400, 4800, 9600(default), 19200, 38400 Parity none (default)/odd/even Stop bits 1 or 2
 - RS485 network address nnn 3-digit number, 001 to 247
- 2nd Modbus Pitput (non-configurable): Baud rate 9600 Parity none Stop bits 1 Modbus™ Word order Hi/Lo byte order is set automatically to normal or reverse. It cannot be

configured from the set-up menu.

1.11 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 ±1°C Input frequency 50Hz(MID)

							50 or 60Hz
							(non- MID)
nput	way	vef	orm	n			Sinusoidal (
							factor < 0.00
		~					-

Magnetic field of external original

1.12 Environmen

• Ir

 Operating temperature 	3K6(-25°C to
	+55°C*),Default
	3K7(-40°C to +70°C*)
 Storage temperature 	-40°C to +70°C*
 Relative humidity 	0 to 90%, non-
	condensing
 Altitude 	Up to 2000m
 Warm up time 	5S
 Vibration 	10Hz to 50Hz,
	IEC 60068-2-6, 2g
 Shock 	30g in 3 planes
Maximum operating and storage temp	eratures are in the context o

typical daily and seasonal variation

1.13 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

The pulse output indicates real-time energy measurement. 2 RS485 outputs allows remote monitoring from another display or a computer.

2. Start-up Screens



2.2 Voltage and Current

Each successive pressing of the button selects a new range:

L1:230.0 L2:230.0 L3:230.0	V	Phase to neutral voltages(3p4w)
L1-2: 400.0 L2-3: 400.0 L3-1: 400.0	V	Phase to neutral voltages(3p3w)
L1: 100.00 L2: 100.00 L3: 100.00	A	Current on each phase
N: 100.00	A	Neutral current

2.3 Frequency and Power **Factor and Demand**

Each successive pressing of the button selects a new range:

-		
PF T: 1.000	L1: 1.000 L2: 1.000 L3: 1.000	Power Factor
L1: 100.00 L2: 100.00 L3: 100.00	A Max. Demand	Maximum Current Demand
L1: 69000 L2: 69000 L3: 69000	W Max. Demand	Maximum Power Demand

ach successive pressing of the		button selects
new range.	1	

L1:690000 L2:690000 L3:690000	W	Instantaneous Active Power in W
L1:690000 L2:690000 L3:690000	Var	Instantaneous Reactive Power in VAr
L1:690000 L2:690000 L3:690000	VA	Instantaneous Volt-amps in VA
T: 690000 W T: 690000 Var T: 690000 VA		Total W, VArh, VA

2.5 Energy Measurements

a new range:	
T: 0000000.00 kWh 2021-04-15 T15:50:50.52 +01:00	Total kWh and time will be showed when no charging
T: 0000000.00 kWh C: 0000000.00 kWh	Total kWh and charged kWh will be showed when charging
CSID:2021041500001	CSID Numbers And current
2021-04-15	time will be showed when
T15:50:50.52+01:00	charging
T: 0000000.00 kWh	Total active kWh, import
Imp:0000000.00	active kWh, export active
Exp:0000000.00	kWh
T: 0000000.00 kVarh	Total reactive kWh, import
Imp:0000000.00	reactive kWh, export
Exp:0000000.00	reactive kWh

3.1 Menu Option Selection

1) Use the $M^{(A)}$ and $P^{(V)}$ buttons to select the required item from the menu. Selection does not roll over between bottom and top of list.

2) Press 🖪 👌 to confirm your selection. 3) If an item flashes, then it can be adjusted by the and P buttons. If not, there maybe a further layer 4) Having selected an option from the current layer press to confirm your selection. The SET indicator will appea 5) Having completed a parameter setting, press J/I ➡ to return to a higher menu level. The SET indicator will be removed and you will be able to use the and buttons for further menu selection. 6) On completion of all set-up, press /I... repeatedly until the measurement screen is restored.

3.2 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 buttons. the and

E 📩 to confirm each digit setting. The SET 2) Press indicator appears after the last digit has been set. 3) After setting the last digit, press 1/1 to exit the number setting routine.

3.3 Main set

1.N 1.1Sytem Type 1.2Password 1.3Reset	1ain 3P4W 1000 DMD			
System type	From the Set-up buttons to select will show the cu	here menu, use new and new to the System option. The screen rrently selected system type.		
Password	Use the MA an password option	d PT to choose the change		
Reset	Press to enter the the cursor will ju	ne selection routine. If succeed, mp back to Reset.		
Press to exit the number setting routine and return to the Set-up menu. SET will be removed.				

3.4 Communication set

2.Comr	nunication		
1Addr 2Baud 3Parity	002 9600 NONE		
ddr	From the Set-up buttons to selec	p menu, use 🚺 🔺 and 💽 🍸 ct the Address ID.	
aud	From the Set-up menu, use A and P buttons to select the Baud Rate option.		
arity	From the Set-up buttons to selec	p menu, use 🔟 A and 💽 ct the Parity option.	

3.5 Time set

2.

Е

4.T .1Data .2Time .3DMD	ïme 14-01-30 08-15-14 60	4.Time 4.4ZONE 4.5Backlight	+08 060
Data	From the Set-up in buttons to select Use	menu, use 🔟 🔺 and 📭 the data. e cursor	
Time	From the Set-up in buttons to select Use	menu, use M ^A and P the data. e cursor	
DMD	From the Set-up r buttons to select 8, 10, 15, 20, 30,	menu, use M ^A and P the dmd. Setting options 60	s: 0, 5,
ZONE	From the Set-up i buttons to select t	menu, use and period a	-12~12
Backlight	From the Set-up r buttons to select on,10, 30, 60, 12	menu, use M ^A and P the Backlight. Setting op 0, off	otions:
Use MA and to confirm the	P buttons to sel set-up.	ect the time interval. Pre	ess e 📩

3.6 Record

5.Record CSID:20140130000005

Each successive pressing of the

button selects

ower

a new rai	ige.		
L1:0 L2:0 L3:0	\$90000 \$90000 \$90000	W	Instantaneous Active Power in W
L1: L2: L3:	690000 690000 590000	Var	Instantaneous Reactive Power in VAr
L1:6 L2:6 L3:6	890000 890000 890000	VA	Instantaneous Volt-amp in VA
T: 6 T: 6	90000 W 90000 Var		Total W, VArh, VA

	50 or 60Hz ±2%	
	(non- MID) Sinusoidal (distortion	2.4 Pc
in	factor < 0.005) Terrestrial flux	Each succ a new rang
t	3K6(-25°C to	L1:69

- Exported active energy Imported reactive energy • Exported reactive energy Total active energy
- Total reactive energy

1.6 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 four phase four wire(3p4w) unbalanced. Line frequency measured from L1 voltage or L3 voltage.

1.7 Accuracy

- Voltage
- Current
- Frequency
- Power factor
- Active power (W)
- Reactive power (VAr)
- Apparent power (VA) Active energy (Wh)

 Reactive energy (VArh) • Response time to step input 0.5% of range maximum Class B EN50470-1/3 Class 2 IEC 62053-23 1s, typical, to >99% of final reading, at 50 Hz.

The actual build number changes according to product requirements.

Meter SN: 10000001 Modbus ID: 001 Baudrate: 19200	Meter SN, Modbus ID and baud rate setting
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After a short delay, the screen will display active energy measurements.

2.1 Measurements

The buttons operate as follows



2.6 Set-up

To enter set-up mode, pressing the 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: PASS Err

To exit setting-up mode, press repeatedly until the measurement screen is restored

Setting - Button operation

3 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.

C: 000006wl Record From the Set-up menu, use M A and P buttons to select record data Max.: lastest 10 records Use M A and P buttons to select the time interval.

Warnings

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



lisk of Danger: These instructions contain mportant safety information. Read them before tarting installation or servicing of the equipment





If you have any question, please feel free to contact our sales team. Tel: 0203 758 3494 Email: sales@eastroneurope.com www.eastrongroup.com

0.5% of nominal 0.2% of mid-frequency 1% of unity (0.01) $\pm 1\%$ of range maximum $\pm 1\%$ of range maximum $\pm 1\%$ of range maximum Class 1 IEC 62053-21

0 to 999999.99 kVArh

0 to 999999.99 kVArh

0 to 999999.99 kWh

0 to 999999.99 kVArh

4. Wiring diagram

• Three Phase Three Wires



Three Phase Four Wires



• Single Phase Two Wires



5. Dimensions



6. Wiring Torque

Terminals	x	
COMM/Pulse/2T	0.5~1.5mm²	0.4Nm
Load	4~25mm²	3Nm

7. Access Protection and User Protection



Anti tamper proof seal that once removed will leave a void marking



1.00	Manufacturer
2	Meter type
3	Public key
4	Rated Voltage, current frquency and temperature
5	LED indication for the RS485 interfaces and Impuls-LED
6	One phase connection
7	3-Phase 3 wire connection
8	3-Phase 4 wire connection
9	Double isolation housing
10	Accuracy class according to MID 2014/32/EU
11	National metrology marking and certification number accordig to MessEG and MessEV

8. Messrichtigkeitshinweis

Auflagen für den Verwender im Sinne des § 23 der Mess- und Eichverordnung

Das Mess- und Eichgesetz [MessEG] verpflichtet diejenigen, die im Sinne des Eichrechtes Verwender eines Messgerätes und von Messwerten sind. Dabei gelten folgende Anforderungen. Verwender im Sinne des Eichrechtes sind:

Messgeräteverwender

Person, die im Sinne des § 31 MessEG ein Messgeräteverwender ist

Messwertverwender.

Person, die im Sinne des § 33 MessEG zu den Messwerteverwendern gehört, jedoch ohne selbst Stromlieferant zu sein.

Die Messgeräteverwender trifft die Aufgabe, den Messwertverwendern die Möglichkeit zu verschaffen, sich über die nachfolgend erläuterten Auflagen in Kenntnis zu setzen.

Transparenz der Verwendung

Der Verwender hat für die Stromkunden, bei denen die Geräte verwendet werden, das Zustandekommen der in Rechnung gestellten Arbeitswerte transparent zu machen "Transparent machen" heißt, durch Information die Voraussetzungen für die Stromkunden schaffen, unter Zuhilfenahme eichrechtkonformer Anzeigen der bei ihnen verwendeten Geräte das Zustandekommen der Rechnungsposten in der Stromrechnung nachvollziehen zu können. Insbesondere muss für den Endkunden eindeutig ersichtlich sein, welche der von dem Gerät angezeigten Werte abrechnungsrelevant sind, dass nicht angezeigte Werte nicht für Verrechnungszwecke verwendbar sind und dass angezeigte Werte, die Ergebnisse nicht eichrechtkonformer Funktionen sind, rein informativen Charakter haben und ebenfalls nicht für Verrechnungszwecke verwendet werden können.

Erweitert dazu, gilt in einer Ladeeinrichtung eine Ausnahme. Hier werden nicht alle eichrechtlich relevanten Daten auf dem Display des Zählers angezeigt. Die nicht angezeigten Daten am Zähler müssen entsprechend den PTB-Anforderungen 50.7, Hauptteil, Anhang 1 und Anhang 2 kryptologisch gesichert sein und eine Fernanzeige muss für diesen Zweck bereitgestellt we

Anspruch auf Softwareprogramm zur Rechnungsprüfung für Messwertverwender und Kunden (Display-Software)

Bei den hier genannten Zählern ist diese Voraussetzung erfüllt, sofern eine von der zuständigen Notifizierten Stelle für Modul B freigegebene Display-Software zur Auslesung und Signaturprüfung zur Anwendung kommt. Diese Display-Software wird vom Hersteller der eichrechtkonformen Ladeeinrichtung zur Verfügung gestellt. Die Display-Software realisiert somit eichrechtlich relevante Aufgaben.

Der Stromkunde muss vom Hersteller der eichrechtkonformen Ladeeinrichtung mit den hier genannten und eingebauten Zählern über den Anspruch auf diese Software unterrichtet werden

Begründung: Die Software realisiert Funktionen, die bei herkömmlichen Zählern im Gerät implementiert sind und eichrechtlich relevante Aufgaben erfüllen. Es sind dies insbesondere die Prüfung der Integrität und Authentizität eingelesener Messwertdatensätzen.

Datenübermittlung

Der Messwertverwender oder ein von ihm beauftragter Dritter stellt die mit den Zählern ermittelten Messwerte aktiv dem berechtigten Endverbraucher zur Verfügung. Zum Nachweis der lückenlosen Aufzeichnung und Bereitstellung von Messwertdatensätzen für Abrechnungszwecke werden beim Ladestart- und -stopp immer folgende Informationen übertragen

- Herstellername & Typbezeichnung des Z\u00e4hlers
 Ger\u00e4teeinzelidentifikation (Seriennummer des Z\u00e4hlers)
- Softwareversionsnummer des Zählers
- Laufnummer des Datenpakets ("Paginierung" oder "Sequenz-Nummer") Identifikations-Status: Genereller Status zur Benutzerzuordnung
- Identifikations-Typ: Typ der Identifikationsdaten
- · Identifikations-Data: E-Mobility Authentifikations-ID (Identifikation zum Endkunden) Systemzeit: Datum + Uhrzeit
- Typ der Transaktion (B = Beginn, E = Ende)
- Zählerstand bei der jeweiligen Transaction (inkl. Einheit des Messwertes) für das
- fortlaufende Gesamtenergiebezugszählerregister (1-b:1.8.0), welche nicht zurückgesetzt
- werden. - Anzeige der Stromart
- Error-Flag

Zählerstatus: Zustand des Zählers zum Zeitpunkt der Ablesung

- Signaturalgorithmus + Signaturdaten

Der Zähler gibt den Messwertdatensatz in dem OCMF (Open Charge Metering Format) Datenformat aus

Bei Endverbrauchern, die über keinen Zugriff auf ein geeignetes Fernanzeigegerät mit der Displaysoftware verfügen, können die Zähler für eine Abrechnungsweise gemäß PTB-A 50.7,

3.1.1.3 B) nicht verwendet werden.

Verwendung der Kommunikationsschnittstellen

Die eichrechtlich relevanten signierten Datentelegramme werden über eine RS485-Schnittstelle, welche sich unter einem plombierbaren Klemmendeckel befindet, versendet.

Fehlerstatus-Information

Der Verwender hat dem Stromkunden gegenüber im Fall der Zählerverwendung neben der Bereitstellung der signierten Messdaten auch Klarheit über die Bedeutung der Statusflag-Einträge zu den Messdaten zu schaffen.

9. EU Declaration of Conformity

EU Declaration of Conformity

- We, Zhejiang Eastron Electronic Co LTD
- No.1369, Chengnan Rd. Jiaxing, Zhejiang, 314001, China Ensure and declare that electricity meter types
- - SDM630-EV
- with the measurement rang
- 1. 3 x 230/400V 50Hz, 0.5-10(100)A 400imp/ kWh Are in conformity with the type as described in the EU-type examination certificate
- 0120/ SGS0151
- The fulfillment of the essential requirements set out in Annex I and in the relevant ment specific Annexes has been demonstrated

The electricity meter types described above are in conformity with the relevant Union harmonization legislation and satisfy the appropriate requirements of the Directive 2014/32/EU with the following standards:

EN50470-1:2006, Electricity metering equipment (AC) part 1: General requirements, ns Metering ent (class in (es A, B and C)



After opening of the terminal cover there is risk of contact with electrical parts. Touching electrical parts may lead to damage or death. The meter must only be installed by qualified staff. The skilled staff is aware of this danger.

The meter is installed in accordance with the following procedure:

- Check if that means voltage corresponds to the meter voltage and the measured current is lower than or equal to the maximum meter current. This Information is printed on the nameplate of the meter.
- The energy meter must be installed in accordance with wiring diagram. The terminal cover shall be sealed after installation.
- The display elements is to be checked after connecting the meter. The LED is flushing with a frequency which is proportional to the load current when the load current is greater than the starting current of the meter.

The energy meter is maintenance-free during its lifespan.

Standards.

The SDM630-EV complies with the following standards:

- EN 50470-1: 2006 EN 50470-3: 2006
- PTB-A 20.1, PTB-A 50.7
- WELMEC 7.2

• Designed according to VDE-AR-E-2418-3-100

EN50470-3:2006, Electricity metering equipment (AC) Part 3: Particular requirements-Static meters for active energy (class indexes A, B and C)

This Declaration of Conformity is issued under the sole responsibility of the

Signed on behalf of Zhejiang Eastron Electronic Co., LTD.

国王 Signature:

Date: 2022-07-05 Position: General Manage 浙江东湾电子股份有限公司 ZHEJIANG EASTRON ELECTRONIC CO., LTD.

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