EM24 W1 01

Energy analyzer

USER MANUAL

Contents

Information property

Safety messages

The following section describes the warnings related to user and device safety included in this document:

NOTICE: *indicates obligations that if not observed may lead to damage to the device.*

CAUTION! Indicates a risky situation which, if not avoided, may cause data loss.

IMPORTANT: provides essential information on completing the task that should not be neglected.

General warnings

This manual is an integral part of the product and accompanies it for its entire working life. It should be consulted for all situations tied to configuration, use and maintenance. For this reason, it should always be accessible to operators.

NOTICE: *no one is authorized to open the analyzer. This operation is reserved exclusively for CARLO GAVAZZI technical service personnel.*
Protection may be impaired if the instrument is used in a manner not specified by the manufacturer.

Service and warranty

This product was specifically developed to be used with the data acquisition systems provided by Kamstrup. In the event of malfunction, fault, requests for information, contact info@kamstrup.dk or +45 89 93 10 00.

Download

This manual	www.productselection.net/MANUALS/UK/EM24_W1_01_im_use.pdf
Installation instruction - EM24	www.productselection.net/MANUALS/UK/EM24_W1_01_im_inst.pdf

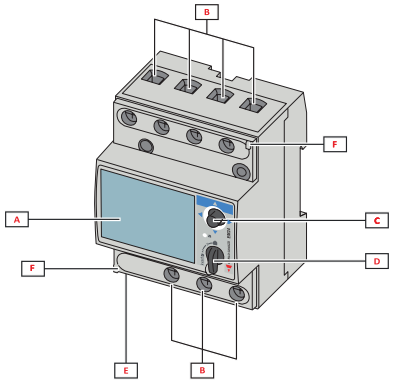
EM24 W1 01

Introduction

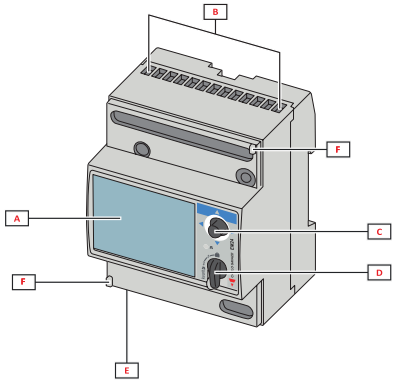
Description

EM24 is an energy analyzer for DIN-rail mounting, with configuration joystick and LCD display.
The direct connection version (AV2) allows to measure up to 65 A, the CT connection version (AV5) allows to measure up to 34875 A by means of current transformers (5 A secondary output).
The wireless M-Bus communication allows to transmit the collected data.

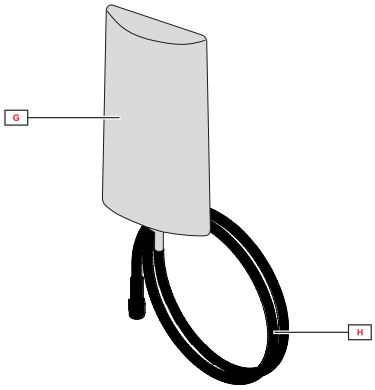
Structure



AV2



AV5



Part	Description
A	LCD display
B	Voltage/current connections
C	Joystick
D	Selector with pin for MID seal (programming block)
E	SMA connector (external antenna version)
F	Pins for MID seal (protection covers included)
G	External antenna for wireless M-Bus communication
H	SMA connector cable (2 m)

EM24 W1 01 use

Interface

Introduction

EM24 is organized in two menus:

- measurement and information menu: pages used to display the measurement pages, information relevant to the programmed parameters and instrument firmware release
- reset menu: pages used to reset partial meters and dmd calculation.

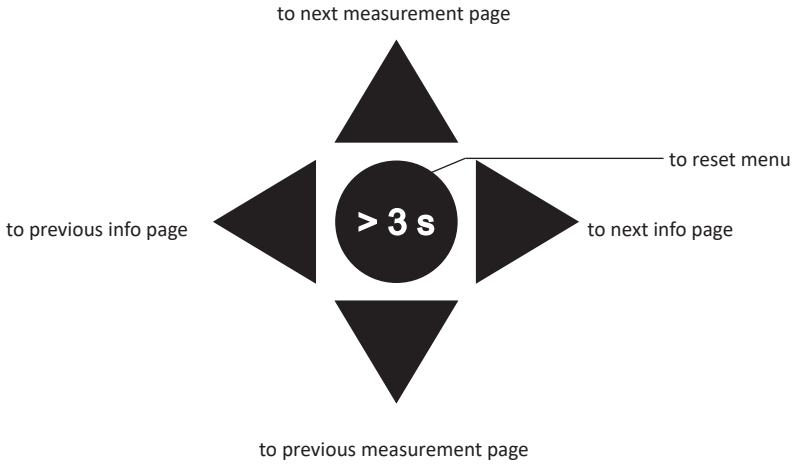
Display

The display is divided into 3 lines.

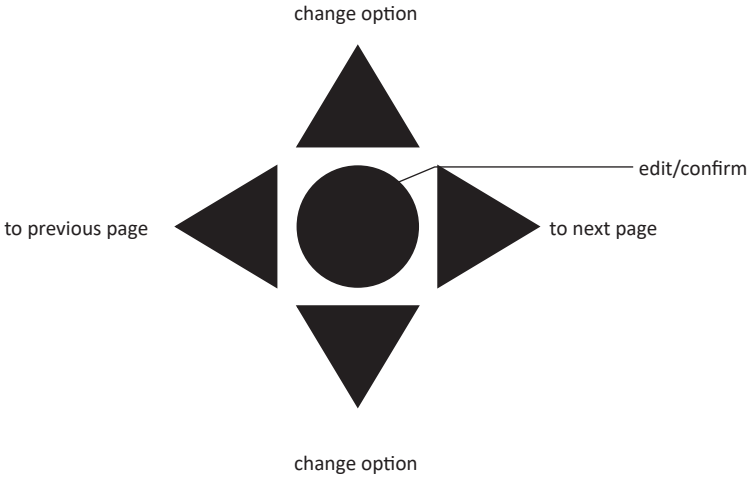
Symbol	Description
	Displaying of phase-to-neutral system voltage
	Displaying of phase-to-phase system voltage
	Displaying of max values
Σ	Displaying of system variables
dmd	Displaying of dmd variables
EEEE	Overflow. ***Note:*** *the DMD calculation, the hour-counter and the energy meters functions are inhibited and the alarm outputs are activated. The indication "EEEE" in a single phase variable automatically implies the overflow condition of the relevant system variable, and the PF indication is forced to "0.000".*

Working with EM24 W1 01

Working with the measurement/info menu



Working with the reset menu



Reset partial meters

Step	Action	Button
1	Power on the energy analyzer	-
2	Press the joystick for at least 3 seconds	
3	In the **PASS?** page, select the correct password (default 0)	
4	Confirm operation	

Step	Action	**Button**
5	Scroll pages until **EnE P.rES**	
6	Enter the editing mode	
7	Select **Yes**	
8	Confirm operation	
9	Scroll pages until **End**	
10	Confirm operation to exit	

Menu description

Measurement menu - measurement pages

The displayed pages depend on the version and settings.

Page	Displayed measurements	Description
1	L1-L2-L3 $V_{LN\Sigma}$ Hz	Phase sequence System phase-neutral voltage Frequency
2	L1-L2-L3 $V_{LL\Sigma}$ Hz	Phase sequence System phase-phase voltage Frequency
3	Tot kWh (+) W_{Σ} dmd W_{Σ} dmd max	Total imported active energy System active power dmd System active power dmd max
4	kWh A dmd max PArt	Active energy Maximum dmd current Partial active energy
5	Tot kvarh (+) VA_{Σ} dmd VA_{Σ} dmd max	Total imported reactive energy System apparent power dmd System apparent power dmd max
6	kvarh VA_{Σ} PArt	Reactive energy System apparent power Partial reactive energy
7	Total kvarh (-) VA_{Σ} dmd VA_{Σ} dmd max	Total exported reactive energy System apparent power dmd System apparent power dmd max
8	Total kWh (-) W_{Σ} dmd W_{Σ} dmd max	Total exported active energy System active power dmd System active power dmd max
9	Hours W_{Σ} PF_{Σ}	Total load operating hours System active power System power factor
10	Hours VAr_{Σ} PF_{Σ}	Total load operating hours System reactive power System power factor
11	var L1 var L2 var L3	Phase 1 reactive power Phase 2 reactive power Phase 3 reactive power
12	VA L1 VA L2 VA L3	Phase 1 apparent power Phase 2 apparent power Phase 3 apparent power
13	PF L1 PF L2 PF L3	Phase 1 power factor Phase 2 power factor Phase 3 power factor
14	W L1 W L2 W L3	Phase 1 active power Phase 2 active power Phase 3 active power
15	A L1 A L2 A L3	Phase 1 current Phase 2 current Phase 3 current
16	V L1-2 V L2-3 V L3-1	Phase 1-phase 2 voltage Phase 2-phase 3 voltage Phase 3-phase 1 voltage
17	V L1 V L2 V L3	Phase 1 voltage Phase 2 voltage Phase 3 voltage

Information Menu

Page	Page title	Information displayed
1	CoMM rEV	Firmware revision (communication)
2	StAtuS	Device status
3	ModE	Transmission mode
4	FrAME	Frame type
5	interVAL	Transmission interval
6	EnCrYPt	Encryption
7	id nuM	Identification number for wireless M-Bus communication
8	CT ratio	CT ratio
9	1P/3Pn (2-3-4-wire)	System Connection (2-3-4-wire)
10	Pulse	LED pulse weight (kWh/kvarh per pulse)
11	ChEcKSuM	FW checksum for MID certification
12	Year	Firmware release Year of production

Reset menu

Page title	Sub-menu	Description	Values	Default value
Cng PASS	-	Change password	From 0 to 9999	0
EnE P.rES		Partial counter reset	no yes	no
rESEt dmd max		Dmd calculation and dmd max reset	no yes	no
End	-	Exit and save	-	-

Essential information

Measurement management

Average value calculation (dmd)

The system calculates the average value of electrical variables in a set integration interval.

Dmd values are available on display only. The dmd interval is automatically set equal to the transmission interval and it is not synchronized with the transmission interval.

Communication

Frames

The frames are packages of messages sent by EM24 containing the variables measured. The variables and their encryption included in the frame are as follows:

Variable	Data Format	Engineering unit	DIF [hex]	VIF [hex]	VIFE#1 [hex]	VIFE#2 [hex]	VIFE#3 [hex]
Total imported active energy	32 bit integer	Wh*100	04	05			
Total imported reactive energy	32 bit integer	kVarh*0.1	04	FB	82	75	
Total exported active energy	32 bit integer	Wh*100	04	85	3C		
Total exported reactive energy	32 bit integer	kVarh*0.1	04	FB	82	F5	3C
Error flag	8 bit integer		01	FD	17		

***Note:** "error flag" is a diagnostic variable used to communicate an overflow condition which makes the measured data invalid:*

Bit								Meaning		Notes
8 [MSb]	7	6	5	4	3	2	1 [LSb]	1P system	3P system	• N.A. (not available): the bit cannot be set because the relevant measurement is not defined, bit = 0. • Frequency out of range is set when occurs an overflow or an under-flow of the frequency measured by measuring module. • In system 3P, monitored voltages are the L-L voltages and not the L-N voltages.
0	0	0	0	0	0	0	0	No error		
0	0	0	0	0	0	0	1	V1N overflow		
0	0	0	0	0	0	1	0	N.A.	V2N overflow	
0	0	0	0	0	1	0	0	N.A.	V3N overflow	
0	0	0	0	1	0	0	0	I1 overflow		
0	0	0	1	0	0	0	0	N.A.	I2 overflow	
0	0	1	0	0	0	0	0	N.A.	I3 overflow	
0	1	0	0	0	0	0	0	Frequency out of range		

Encryption

To ensure data privacy and prevent data access by unauthorized parties, you can enable M-Bus wireless communication data encryption. To read the data use the acquisition system provided by Kamstrup.

Encryption key

The encryption key is uniquely associated with each device. The key is available on the Kamstrup online portal.

Frontal LED

The frontal red LED flashes proportionally to the active imported energy consumption. Any kind of negative (exported) energy will not be managed by the front LED.

Maintenance and disposal

Cleaning

Use a slightly dampened cloth to clean the display. Do not use abrasives or solvents.

Responsibility for disposal

The product must be disposed of at the relative recycling centers specified by the government or local public authorities. Correct disposal and recycling will contribute to the prevention of potentially harmful consequences to the environment and persons.

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