



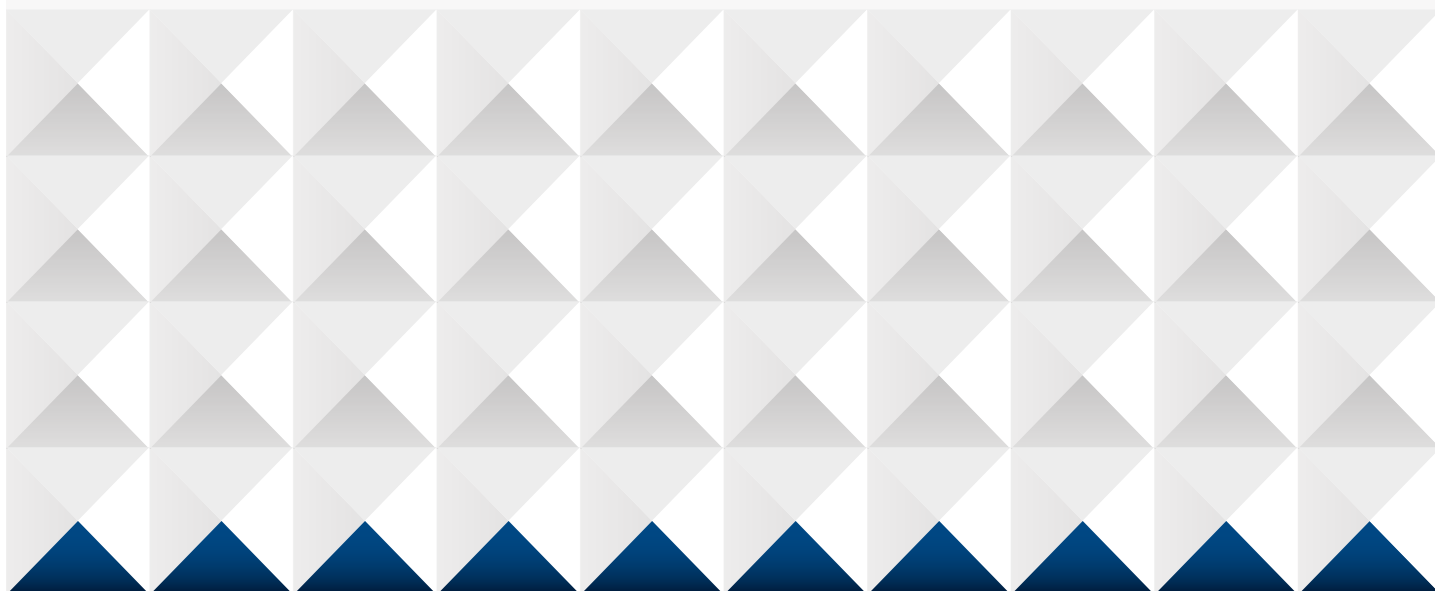
METERING INSTRUMENTS

 **control** elettronica
ITALIAN DESIGN



Metering instruments

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THREE-PHASE ENERGY METERS

Certification obtained: EAC
Compliant with standards: EN 62053-21, EN 62053-21, EN 62052-11, EN 50022



See dimensions and wiring diagrams
at the end of chapter

EMC-3b



EMC-D3b



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMC-3b	<ul style="list-style-type: none">Digital meter for three-phase with or without neutralConnection by CT /5AFlush mount 96x96mm housing2 programmable pulses outputs1 programmable digital input	110-230-400 VAC	3M C12P	1	0,500
		20÷60 VAC/DC	3M C12N		
		90÷250 VAC/DC	3M C12S		
EMC-D3b	<ul style="list-style-type: none">Digital meter for three-phase with or without neutralConnection by CT /5AModular housing, 6 module2 programmable pulses outputs	400 VAC	3M C11P	1	0,500
		20÷60 VAC/DC	3M C11N		
		90÷250 VAC/DC	3M C11S		
DESCRIPTION			ORDER CODE		
OPTIONS	CURRENT INPUTS				
	Connection by CT /1A.		1 A	-	-
	Insulated ammeter inputs with internal CTs		T		
	Insulated ammeter inputs with compact prewired CTs		TT		
	COMMUNICATION PORTS				
	Opto-isolated RS485 port with communication protocol Modbus-RTU		485	-	-

GENERAL CHARACTERISTICS

The energy meters are digital meters/analyzers of electric energy for systems with connection by CT.

OPERATIONAL CHARACTERISTICS

- LED 7+1 digit count
- Connection by CT
- Active energy measurement and accuracy: Class 1 (62053-22)
- LED with pulse emission for consumption indication
- Clearable partial energy measurements
- 1 programmable digital input
- 2 programmable pulses outputs
- RS485 interface, Modbus-RTU protocol
- Modular housing, 6 module (EMC-D3b only)
- Flush mount 96x96mm housing (EMC-3b only)
- Degree of protection: IP52 on front; IP20 at terminals.

Multi-measurements:

- Total and partial active energy
- Total and partial reactive energy
- Total and partial apparent energy
- Voltage
- Current
- Active, reactive and apparent power
- Power factor
- Frequency

Certification obtained: **MID**

Compliant with standards: **EN61326-1, EN55011 Class A, EN50470-1/3, EN50470-1/3, EN62053-21, EN62053-23, DIRECTIVE 2014/32/EU, EN62052-31, EN61010**





EMM-4L-96-MID



EMM-D4-MID
EMM-D4-MID-100



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMM-4L-96-MID	<ul style="list-style-type: none"> Icon LCD Connection by CT /5A Flush mount 96x96mm housing Active energy: Class B (EN50470-1/3) Pulses output RS485 port 	85...270 VAC 50/60 Hz	4EMM4L96MID	1	0,230
EMM-D4-MID	<ul style="list-style-type: none"> Icon LCD Modular housing, 4 module Connection by CT /5A Active energy: Class B (EN50470-3) Metrological LED RS485 port 	85...270 VAC 50/60 Hz	4EMMD4MID	1	0,210
EMM-D4-MID-100	<ul style="list-style-type: none"> Icon LCD Modular housing, 4 module 100A direct connection Active energy: Class B (EN50470-3) Metrological LED RS485 port 	85...270 VAC 50/60 Hz	4EMMD4MID100	1	0,210

GENERAL CHARACTERISTICS

The digital multimeters in the MID approved versions are mandatory in Europe for commercial transactions between producers and consumers of electricity, for measuring electricity consumption in three-phase systems with direct insertion or via CT.

They are made in a built-in container (96x96x50mm) with reduced depth and in a modular container (4 modules). The main features of these multimeters are the wide power supply range, the high accuracy in measuring the values, integrated RS485 communication port and pulse output.

Main measurements:

- Voltage: phase, line and system values
- Current: phase, line and system values
- Power: apparent, active and reactive phase and total values
- P.F.: Power Factor per phase and total
- Frequency
- Total harmonic distortion (THD) of voltage and current values
- Energy meters for active, reactive, apparent
- MAX-MIN-MAX DEMAND value functions
- Phase sequence indication


OPERATIONAL CHARACTERISTICS

- Auxiliary supply voltage range: 85...270 VAC 50/60 Hz
- Voltage measurement range: 100...240 VAC (L-N); 173...415 VAC (L-L)
- Usage in medium and high voltage systems with voltage transformers
- Frequency measurement range 45...65Hz
- Connection by CT /5A (EMM-4L-96-MID and EMM-D4-MID only)
- 100A direct connection (EMM-D4-MID-100 only)
- True RMS measurements: for voltage and current
- Measurement accuracy:
 - Voltage: $\pm 0,5\%$ f.s.
 - Current: $\pm 0,5\%$ f.s.
 - Power: 1% f.s.
 - Frequency: 0,2% f.s.
 - Active energy: Class B (EN50470-1/3)
 - Reactive energy: Class 2 (EN62053-23)
- RS485 interface, Modbus-RTU protocol
- Flush mount 96x96x50mm housing (EMM-4L-96-MID only)
- Modular housing, 4 module (EMM-D4-MID and EMM-D4-MID-100 only)
- Sealable terminal blocks, standard supplied
- Degree of protection: IP54 on front; IP20 at terminals
- Degree of protection: IP51 on front; IP20 at terminals (EMM-D4-MID and EMM-D4-MID-100 only)

DATA CONCENTRATOR



Certification obtained: **EAC**

Compliant with standards: **EN 61010-1, EN 61000-6-2, EN 61000-6-3**

 See dimensions and wiring diagrams at the end of chapter

EML-16



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	INPUTS VOLTAGE	ORDER CODE	PCS 	WT 
EML-16	<ul style="list-style-type: none"> Data concentrator for general use Graphic LCD display With 16 programmable digital inputs for data collection or pulse count Modular housing, 6 module 2 programmable outputs Opto-isolated RS485 port 	90÷250 VAC/DC	24 VAC/DC	3ML11S	1	0,500
		20÷60 VAC/DC	24 VAC/DC	3ML11N		
		90÷250 VAC/DC	48 VAC/DC	3ML12S		
		20÷60 VAC/DC	48 VAC/DC	3ML12N		
		90÷250 VAC/DC	115 VAC/DC	3ML13S		
		20÷60 VAC/DC	115 VAC/DC	3ML13N		
		90÷250 VAC/DC	230 VAC/DC	3ML14S		
		20÷60 VAC/DC	230 VAC/DC	3ML14N		
EML-16-Eth	<ul style="list-style-type: none"> Data concentrator for general use Graphic LCD display With 16 programmable digital inputs for data collection or pulse count Modular housing, 6 module 2 programmable outputs Opto-isolated RS485 port Ethernet port with Modbus TCP-IP 	90÷250 VAC/DC	24 VAC/DC	3ML21S	1	0,500
		20÷60 VAC/DC	24 VAC/DC	3ML21N		
		90÷250 VAC/DC	48 VAC/DC	3ML22S		
		20÷60 VAC/DC	48 VAC/DC	3ML22N		
		90÷250 VAC/DC	115 VAC/DC	3ML23S		
		20÷60 VAC/DC	115 VAC/DC	3ML23N		
		90÷250 VAC/DC	230 VAC/DC	3ML24S		
		20÷60 VAC/DC	230 VAC/DC	3ML24N		

GENERAL CHARACTERISTICS

EML-16 is equipped with 16 inputs that allow the network connection of devices without communication as long as they are equipped with at least one pulse output.

It's able to count the pulses coming from the outputs of the energy, water, gas, etc. meters. All data are shown on the display or via the integrated RS485 port. With the programmable functions it is possible to determine the average of instantaneous quantities such as power, production rate, flow rate of water, gas, etc.

OPERATIONAL CHARACTERISTICS

- Backlight graphic LCD display
- 16 programmable digital inputs
- Built-in RS485 communication port
- Modbus-RTU and TCP communication protocol
- Clearable total and partial energy counters for each channel
- Programmable general counters
- Calculation of derivative average values
- Mathematical operations among counters
- 2 digital outputs
- Data storage, clock-calendar (RTC) for data logging
- Modular housing, 6 module
- Degree of protection: IP40 on front; IP20 at terminals

DATA CONCENTRATOR

Certification obtained: EAC
Compliant with standards: EN 61010-1, EN 61000-6-2, EN 61000-6-3

See dimensions and wiring diagrams at the end of chapter



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS	WT
EML-16 DC	<ul style="list-style-type: none">• Data concentrator in combination with power meters such as EMT-1C• 2 opto-isolated RS485 ports• Modular housing, 6 module	90÷250 VAC/DC	3ML20V	1	0,500
		20÷60 VAC/DC	3ML20J		
EML-16-DC-Eth	<ul style="list-style-type: none">• Data concentrator in combination with power meters such as EMT-1C• Opto-isolated RS485 port• Modular housing, 6 module• Ethernet port with Modbus TCP-IP	90÷250 VAC/DC	3ML21V	1	0,500
		20÷60 VAC/DC	3ML21J		

GENERAL CHARACTERISTICS

The **EML-16 DC data concentrator** is a device that expands the potential of use of the EMT-1C series single-phase network analyzers family by providing a data collection function and interface to remote monitoring systems.

The **EML-16 DC** can find numerous applications such as, the measurement of consumption from meters of different types, the measurement of production, etc.

All data are shown on the display or via the integrated RS485 port.

OPERATIONAL CHARACTERISTICS

- Backlight graphic LCD display
- Management of 16 EMT-1C single-phase network analyzers
- LED for communication diagnostics
- Parameter display:
 - voltage, current and active power
 - active energy: total, imported, exported
 - maximum values: voltage, current and active power
- Built-in RS485 communication port
- Modbus-RTU and TCP communication protocol
- Modular housing, 6 module
- Degree of protection: IP40 on front; IP20 at terminals



REMOTE DISPLAY

Certification obtained: EAC - RINA
Compliant with standards: EN 61000-6-2, EN 61000-6-4, EN 61010-1

See dimensions and wiring diagrams
at the end of chapter

RDU-L



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
RDU-L	<ul style="list-style-type: none">Remote display in combination with measurement transducersColour LCD displayOpto-isolated RS485 port	90÷250 VAC/DC	3RLS000000000	1	0,450
		20÷60 VAC/VDC	3RLS010000000		
DESCRIPTION			ORDER CODE		
OPTIONS	Inputs and outputs				
	2 digital outputs		2D0	-	-
	4 digital outputs		4D0		
	2 digital inputs		2DI		
	4 digital inputs		4DI		
	2 analogue outputs		2A0		
	4 analogue outputs		4A0		
	Communication ports				
	2 opto-isolated RS485 ports with communication protocol Modbus-RTU		485	-	-
	Ethernet port with communication protocol Modbus-TCP		Eth		

GENERAL CHARACTERISTICS

The RDU-L is a remote display unit consisting of a color TFT display and an interface that allows connection to remote acquisition/command units. The purpose is to provide an operator interface to devices that are normally without or limited, such as the EMS-D6 power transducer.

The RDU-L automatically adapts to the base unit to which it is connected, presenting the graphic display pages and commands as required by the base unit. On the back it is equipped with a connector through which the connection to the base unit can be made.


The housing is compatible for flush mount 96x96mm housing. Thanks to its expansion bus, the RDU-L can be expanded with additional modules.

The modules supported by the RDU-L are divided into the following categories: communication modules, digital I/O modules, analog I/O modules.

REMOTE DISPLAY



Certification obtained: **EAC - RINA**

Compliant with standards: **EN 61000-6-2, EN 61000-6-4, EN 61010-1**

 See dimensions and wiring diagrams at the end of chapter

RDU



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
RDU	<ul style="list-style-type: none"> • Remote display in combination with measurement transducers • Color LCD display • Opto-isolated RS485 port 	90÷250 VAC/DC	3RDU0000000010	1	0,450
		20÷60 VAC/VDC	3RDU0100000010		
RDU-Eth	<ul style="list-style-type: none"> • Remote display in combination with measurement transducers • Color LCD display • Ethernet port with Modbus TCP-IP 	90÷250 VAC/DC	3RDU0000010010	1	0,450
		20÷60 VAC/VDC	3RDU0100010010		
RDU-485-Eth	<ul style="list-style-type: none"> • Remote display in combination with measurement transducers • Color LCD display • 2 opto-isolated RS485 ports • Ethernet port with Modbus TCP-IP 	90÷250 VAC/DC	3RDU0000020010	1	0,450
		20÷60 VAC/VDC	3RDU0100020010		

GENERAL CHARACTERISTICS

The RDU is a remote display unit consisting of a color TFT display and an interface that allows connection to remote acquisition / command units. The purpose is to provide an operator interface to devices that are normally without or limited, such as the EMS-D6 power transducer.


The RDU automatically adapts to the base unit to which it is connected, presenting the graphic display pages and commands as required by the base unit. On the back it is equipped with a connector through which the connection to the base unit can be made.

The enclosure is compatible with panel cutouts intended for 96x96mm housing with reduced depth.

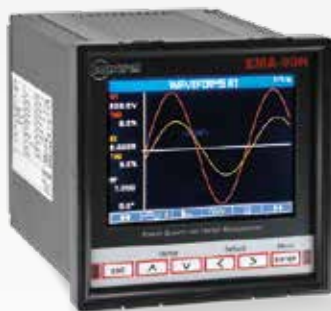
FLUSH-MOUNT AND MODULAR NETWORK ANALYZERS



Certification obtained: **EAC, RINA**

Compliant with standards: **EN 61010-1, EN 61000-6-2, EN 61000-6-3**

 See dimensions and wiring diagrams at the end of chapter

EMA-90N



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMA-90N	• Color LCD display • Rated input current: by external CT 5A or 1A • Active energy: Class 1 (EN 62053-21) • Multilanguage graphic interface • 2 digital outputs • RS485 port	90÷250 VAC/DC	3EMAN0000000000	1	0,450
		20÷60 VAC/DC	3EMAN0100000000		
EMA-90NH	• Color LCD display • Rated input current: by external CT 5A or 1A • Active energy: Class 1 (EN 62053-21) • Multilanguage graphic interface • 2 digital outputs • RS485 port Harmonic analysis of voltage and current up to the 63° order	90÷250 VAC/DC	3EMAN0000000010		
		20÷60 VAC/DC	3EMAN0100000010		
DESCRIPTION			ORDER CODE		
OPTIONS	Current Inputs				
	Current measurement through pre-wired compact CTs		TTA	-	-
	Current measurement by CT with 333mV output		333mV		
	Current measurement through Rogowski coils		R		
	Neutral measurement input		N		
	Differential current input		DIFF		
	Measurement accuracy				
	Class 0,5s (IEC/EN 62053-22)		0.5s	-	-
	Class 0,2s (IEC/EN 62053-22)		0.2s		
	Inputs and outputs				
	4 digital inputs and 2 digital outputs		4DI/2DO	-	-
	2 digital inputs and 6 digital outputs		2DI/6DO		
	8 digital outputs		8DO		
	8 digital inputs		8DI		
	4 analog inputs		4AI		
	4 digital outputs and 4 analog outputs		4DO/4AO		
	4 digital outputs and 2 analog outputs		4DO/2AO		
	Communication ports				
	Opto-isolated RS485 port Modbus-RTU		485	-	-
	Ethernet port with Modbus TCP/IP		Eth		
	Profibus-DP interface		PF		
	M-Bus interface		M-Bus		
	Ethernet interface with Webserver function		EthWeb		
	Ethernet-RS485 gateway function		EthWeb/S		
	IEC61850 interface protocol substations		IEC61850		

GENERAL CHARACTERISTICS

The **EMA-90N network analyzers** are able to display electrical measurements with high accuracy on the color LCD display, allowing you to control the power distribution network. They are made in a built-in container (96x96mm). They are high performance analyzers intended to provide accurate measurements. They allow you to check the power distribution network, to detect power problems that can compromise its quality and availability. The main features of these multimeters are the wide power supply range, the high accuracy in the measurement of the values and the expandability, which allow the device to be adapted to multiple applications.

The graphic interface, available in 7 languages (English, Italian, French, German, Spanish, Polish, Swedish) is designed to facilitate the consultation of available data, including:


- Voltage: phase, line and system values
- Current: phase values (neutral current calculated or measured)
- Measurements on 4 quadrants
- Power: apparent, active and reactive phase and total values

- P.F. per phase and total
- Cosφ per phase and total
- Frequency
- Maximum value (MAX), minimum value (MIN) and average value (AVG) function for all measurements
- Peak values (max demand)
- Asymmetry of voltage, current
- Total harmonic distortion (THD): voltage and current
- Waveform analysis of voltage, current
- Harmonic analysis of voltage and current up to the 63° order
- Active, reactive, apparent energy meters (partial and total with programmable tariff functions)
- Pulse counter for general use (only with expansion)
- Basic analysis of energy quality

FLUSH-MOUNT AND MODULAR NETWORK ANALYZERS



Certification obtained: **EAC**

Compliant with standards: **EN 61010-1, EN 61000-6-2, EN 61000-6-3**

 See dimensions and wiring diagrams at the end of chapter

EMA-11N



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMA-11N	<ul style="list-style-type: none">• Color LCD display• Rated input current: by external CT 5A or 1A• Active energy: Class 1 (EN 62053-21)• Multilanguage graphic interface• 2 digital outputs• RS485 por	90÷250 VAC/DC	3MA1N0000000000	1	0,450
		20÷60 VAC/DC	3MA1N0100000000		
EMA-11NH	<ul style="list-style-type: none">• Color LCD display• Rated input current: by external CT 5A or 1A• Active energy: Class 1 (EN 62053-21)• Multilanguage graphic interface• 2 digital outputs• RS485 port• Harmonic analysis of voltage and current up to the 63° order	90÷250 VAC/DC	3MA1N0000000010		
		20÷60 VAC/DC	3MA1N0100000010		
DESCRIPTION			ORDER CODE		
OPTIONS	Current Inputs				
	Current measurement through pre-wired compact CTs		TTA	-	-
	Current measurement through Rogowski coils		R		
	Neutral measurement input		N		
	Measurement accuracy				
	Class 0,5s (IEC/EN 62053-22)		0.5s	-	-
	Class 0,2s (IEC/EN 62053-22)		0.2s		
	Inputs and outputs				
	2 digital inputs and 2 digital outputs		2DI/2DO	-	-
	2 digital outputs and 2 analog outputs		2DO/2AO		
	2 digital outputs and 4 analog outputs		2DO/4AO		
	2 digital outputs, 2 digital inputs and 4 analog outputs		2DO/2DI/4AO		
	Communication ports				
	Opto-isolated RS485 port Modbus-RTU		485	-	-
	Ethernet port with Modbus TCP/IP		Eth		
	Profibus-DP interface		PF		
	M-Bus interface		M-Bus		


OPERATIONAL CHARACTERISTICS

- Voltage measurement range: 20...690 VAC L-L 30...400 VAC L-N
- Usage in medium and high voltage systems with voltage transformers
- Rated input current: with external CT, 5A or 1A
- Current reading through Rogowski coils (option)
- Current measurement through pre-wired compact CTs (option)
- Frequency measurement range: 45...65Hz
- True RMS measurements for voltage and current values
- Continuous (gapless) sampling 128 samples/period
- Measurements update 200ms
- High accuracy
- Historical graphs of voltages and currents, power load curves, energy consumption
- Non-volatile memory for data and event storage
- Modbus-RTU and Modbus-TCP communication protocol
- Programming and remote control via software
- Flush mount 144x144mm housing
- Degree of protection: IP65 on front; IP20 at terminals.

FLUSH-MOUNT AND MODULAR NETWORK ANALYZERS



Certification obtained: **EAC, RINA**

Compliant with standards: **EN 61000-6-2, EN 61000-6-4, EN 61010-1**

 See dimensions and wiring diagrams at the end of chapter

EMA-D6



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMA-D6	• Colour LCD display • Rated input current: by external CT 5A or 1A • Active energy: Class 1 (EN 62053-21) • Multilanguage graphic interface • 2 digital outputs • RS485 port	90÷250 VAC/DC	3MADN0004000000	1	0,200
		20÷60 VAC / 24÷85 VDC	3MADN0104000000		
EMA-D6H	• Colour LCD display • Rated input current: by external CT 5A or 1A • Active energy: Class 1 (EN 62053-21) • Multilanguage graphic interface • 2 digital outputs • RS485 port • Harmonic analysis of voltage and current up to the 63 rd order	90÷250 VAC/DC	3MADN0004000010		
		20÷60 VAC / 24÷85 VDC	3MADN0104000010		
DESCRIPTION			ORDER CODE		
OPTIONS	Current Inputs				
	Current measurement through pre-wired compact CTs		TTA	-	-
	Current measurement by CT with 333mV output		333mV		
	Current measurement through Rogowski coils		R		
	Neutral measurement input		N		
	Differential current input		DIFF		
	Measurement accuracy				
	Class 0,5s (IEC/EN 62053-22)		0.5s	-	-
	Class 0,2s (IEC/EN 62053-22)		0.2s		
	Inputs and outputs				
	2 digital inptups and 2 digital outputs		2DI/2DO	-	-
	2 digital outputs		2DO		
	4 digital outputs		4DO		
	4 digital inptups		4DI		
	Communication ports				
	Opto-isolated RS485 port Modbus-RTU		485	-	-
	Ethernet port with Modbus TCP/IP		Eth		

GENERAL CHARACTERISTICS

The **EMA-D6 network analyzers** are made in a modular 6-module container and are equipped with a backlit color graphic LCD display which gives these modular instruments the ability to view all the electrical parameters of the system in a clear, intuitive and flexible way. The high accuracy of the measurements combined with their extreme compactness makes them the ideal solution for any type of application. The graphic interface, available in 7 languages (English, Italian, French, German, Spanish, Polish, Swedish), is designed to facilitate the consultation of available data, including:

- Voltage (phase, phase-to-phase and system)
- Phase current (measured or calculated neutral current)
- Measurements on 4 quadrants
- Power (active, reactive and apparent phase and total power)
- P.F. (phase and total)
- $\cos\phi$ (phase and total)
- Frequency
- Maximum (MAX), minimum (MIN) and average(AVERAGE) of all measured values
- Peak power/current (max demand)
- Asymmetry of voltage, current
- Total harmonic distortion (THD) of voltages and currents
- Waveform analysis of voltage and current
- Voltage and current harmonic analysis up to the 63rd order
- Active, reactive, apparent energy meters (partial and total with programmable tariff functions)
- Basic analysis of energy quality


OPERATIONAL CHARACTERISTICS

- Voltage measurement range: 52...690 VAC L-L 30...400 VAC L-N
- Can be used in medium and high voltage systems using TV
- Nominal input current: 5A or 1A with an external current transformer
- Current measurement through rogowski coils (option)
- Current measurement through pre-wired compact CTs (option)
- Current measurement by CT with 333mV output (option)
- Frequency measurement range: 45...65Hz
- True RMS measurements for voltage and current values
- Continuous (gapless) sampling 128 samples/period
- Measurements update 200ms
- High accuracy
- Historical graphs of voltages and currents, power load curves, energy consumption
- Non-volatile memory for data and event storage
- Modbus-RTU and Modbus-TCP communication protocol
- Programming and remote control via software
- Modular housing, 6 module
- Degree of protection: IP40 on front; IP20 at terminals.

FLUSH-MOUNT AND MODULAR POWER ANALYZERS



Certification obtained: **EAC**

Compliant with standards: **EN61326-1, EN55011 Class A, EN50470-1/3, EN50470-1/3, EN62053-21, EN62053-23 DIRECTIVE 2014/32/EU, EN62052-31, EN61010**

 See dimensions and wiring diagrams at the end of chapter

EMU-3ea



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMU-3ea	<ul style="list-style-type: none"> • Network analyzer with universal current inputs • Modular housing, 1 module • Active energy: Class 0.5s (EN 62053-22) • RS485 port • Digital output 	10÷40VDC / 19÷28VAC	3MU22J	1	0,060
EMU-3ea/h	<ul style="list-style-type: none"> • Network analyzer with universal current inputs • Modular housing, 1 module • Active energy: Class 0.5s (EN 62053-22) • RS485 port • Digital output • Harmonic analysis of voltage and current up to the 63° order 	10÷40VDC / 19÷28VAC	3MU23J		

GENERAL CHARACTERISTICS

The **EMU-3ea network analyzer** was developed in the modular container, 1U (17.5mm) for DIN rail. It supports universal current input (CT with secondary 1A or 5A, 0...333mV and Rogowski coils). The integrated static output allows you to bring the status of a threshold or an alarm to the output. Equipped with an RS485 port with Modbus-RTU protocol to allow integration into supervisory systems.

Main measurements:

- Voltage: phase, line and system values
- Current: phase values (neutral current measured or calculated)
- Measurements on 4 quadrants
- Power: apparent, active and reactive phase and total values
- P.F.: Power Factor per phase and total
- Cosφ per phase and total
- Frequency
- MAX-MIN-AVERAGE value functions for all measurements
- Maximum demand of power and current values
- Total harmonic distortion (THD) of voltage and current values
- Harmonic analysis of voltage and current up to 63° order (EMU-3ea/h only)
- Inter-harmonic analysis of voltage and current up to 63° order (EMU-3ea/h only)
- Energy meters for active, reactive, apparent per phase and total
- Basic analysis of energy quality (EMU-3ea/h only)


OPERATIONAL CHARACTERISTICS

- Diagnostics LED indicates correct communication
- Nominal input current: 5A or 1A with an external current transformer
- Current measurement through Rogowski coils
- Current measurement by CT with 333mV output
- Frequency measurement range: 45...65Hz
- True RMS measurements for voltage and current values
- Accuracy:
 - voltage: ±0,5% f.s
 - current: ±0,5% f.s
 - power: ±0,5% f.s.
 - frequency: ±0,1%
 - active energy: Class 0,5s (EN 62053-22)
 - reactive energy: Class 0,5s (EN 62053-24)
- Sampling: 6400 samples/s @ 50Hz
7280 samples/s @ 60Hz
- RS485 port
- Communication protocol Modbus-RTU
- Programming and remote control via software
- Modular housing, 1 module
- Degree of protection: IP20

FLUSH-MOUNT AND MODULAR POWER ANALYZERS

Certification obtained: **EAC**

Compliant with standards: **EN61000-6-4/2006 + A1 2011, EN64000-6-2/2005, EN61010-1/2010**



 See dimensions and wiring diagrams at the end of chapter

EMT-1C/50



EMT-1C/300



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMT-1C/50	<ul style="list-style-type: none"> Single-phase power analyzer Modular housing Ø15mm Voltage up to 800 VAC or 1000 VDC Current up to 50A AC/DC RS485 port 	9÷30VDC	3MT82B	1	0,072
EMT-1C/300	<ul style="list-style-type: none"> Single-phase power analyzer Modular housing Ø33mm Voltage up to 800 VAC or 1000 VDC Current up to 300A AC / 400A DC RS485 port 	9÷30VDC	3MT86B	1	0,370
EMT-1C/50 LV	<ul style="list-style-type: none"> Single-phase power analyzer Modular housing Ø15mm Voltage up to 80 VAC or 100 VDC Current up to 50A AC/DC RS485 port 	9÷30VDC	3MT83B	1	0,072
EMT-1C/300 LV	<ul style="list-style-type: none"> Single-phase power analyzer Modular housing Ø33mm Voltage up to 80 VAC or 100 VDC Current up to 300A AC / 400A DC RS485 port 	9÷30VDC	3MT84B	1	0,370

GENERAL CHARACTERISTICS

The **EMT-1C** is a **single-phase network** analyzer capable of measuring TRMS current and AC/DC voltage. The device can be configured via the RS485 port. Fitted for mounting on DIN bar.

The main measures are:

- Voltage
- Current
- Power (active, reactive and apparent power)
- $\cos\phi$
- Frequency
- Maximum value (MAX), minimum value (MIN) function
- Peak values (max demand)
- Active energy meters (total, imported and exported)


OPERATIONAL CHARACTERISTICS

- Diagnostics LED indicates correct communication
- Voltage measurement range:
 - up to 800 VAC or 1000 VDC (EMT-1C... only)
 - up to 80 VAC or 100 VDC (EMT-1C LV... only)
- Current measurement range:
 - up to 50A AC/DC (EMT-1C/50 only)
 - up to 300A AC, 400A DC (EMT-1C/300 only)
- Frequency measurement range: DC or 1...400Hz
- True RMS measurements for voltage and current values
- Accuracy:
 - voltage: $\pm 0,5\%$ f.s
 - current: $\pm 0,5\%$ f.s
 - power: $\pm 0,5\%$ f.s
 - frequency: $\pm 0,1\%$
 - active energy: $\pm 1\%$
- Sampling: 11000 samples/s
- RS485 port
- Communication protocol Modbus-RTU
- Programming and remote control via software
- Modular housing
- Degree of protection: IP20

UNIVERSAL CURRENT ANALYZER



Certification obtained: **EAC**

Compliant with standards: **EN61000-6-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61010-1**

 See dimensions and wiring diagrams at the end of chapter

EMU-2it



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMU-2it	<ul style="list-style-type: none"> AC / DC current analyzer with universal input Modular housing, 1 module RS485 port Analog output 0...10V or 0/4...20mA 	10÷40VDC / 19÷28VAC	3MU11B	1	0,060
EMU-2it/h	<ul style="list-style-type: none"> AC / DC current analyzer with universal input Modular housing, 1 module RS485 port Analog output 0...10V or 0/4...20mA Harmonic analysis of voltage and current up to the 63° order 	10÷40VDC / 19÷28VAC	3MU12B		

GENERAL CHARACTERISTICS

The EMU-2it current analyzer was developed in the modular container, 1U (17.5mm) for DIN rail. It supports universal current input (CT with secondary 1A or 5A, 0...333mV, ± 1 or 10Vpk, 100mA AC/DC, Rogowski probes, HALL sensors).

The integrated static output allows you to bring the status of a threshold, an alarm, etc. to the output. It also has an analogue output 0/4...20mA or 0...10V and a temperature input.

The EMU-2it is equipped with an RS485 interface with Modbus protocol to allow integration into supervisory systems.

The main measures are:

- Current (RMS, AC, DC)
- Crest factor
- Frequency
- MAX-MIN-AVERAGE value functions for all measurements
- Peak values (max demand)
- Total harmonic distortion (THD) of current values
- Harmonic analysis of voltage and current up to 63° order (EMU-2it/h only)

OPERATIONAL CHARACTERISTICS

- Diagnostics LED indicates correct communication
- Nominal input current: 5A or 1A with an external current transformer
- Current measurement through Rogowski coils
- Current measurement by CT with 333mV output
- Current measurement by HALL sensor
- Frequency measurement range: 45...65Hz
- True RMS measurements for current values
- Accuracy:
 - Current: ±0.5% f.s
- Sampling: 6400 samples/s @ 50Hz
7280 samples/s @ 60Hz
- Input for PT100 or NTC temperature probe
- RS485 port
- Communication protocol Modbus-RTU
- Programming and remote control via software
- Modular housing
- Degree of protection: IP20

CURRENT ANALYZER

Certification obtained: EAC
Compliant with standards: EN61000-6-4/2006 + A1 2011, EN64000-6-2/2005, EN61010-1/2010

See dimensions and wiring diagrams
at the end of chapter



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS	WT
TTC-V-485/50	<ul style="list-style-type: none">• AC/DC current transformer• Modular housing• Ø15mm• Current up to 50A AC/DC• RS485 port• 0...10V analog output	12÷30VDC	3MT81B	1	0,072
TTC-V-485/300	<ul style="list-style-type: none">• AC/DC current transformer• Modular housing• Ø33mm• Current up to 300A AC/DC• RS485 port• 0...10V analog output	21÷30VDC	3MT85B	1	0,370
TTC-I/50	<ul style="list-style-type: none">• AC/DC current transformer• Modular housing• Ø15mm• Current up to 50A AC/DC• RS485 port• 4...20mA analog output	Passive current loop	3MT80B	1	0,072
TTC-I/300	<ul style="list-style-type: none">• AC/DC current transformer• Modular housing• Ø33mm• Current up to 300A AC/DC• RS485 port• 4...20mA analog output	Passive current loop	3MT87B	1	0,072

GENERAL CHARACTERISTICS

The TTC-V and TTC-I are AC and DC current transformers, galvanically isolated from the measurement circuit. The devices are in function and appearance quite similar to a standard active CT, however capable of measuring the DC and AC component TRMS.

The TTC-V transformer is equipped with an RS485 port and an analog output 0...10V, while the TTC-I only has an analog output 4...20mA.

Fitted for mounting on DIN bar.

The main measures are:

- Current
- Maximum value (MAX), minimum value (MIN) function


OPERATIONAL CHARACTERISTICS

- Diagnostics LED indicates correct communication
- Current measurement range:
 - Up to 50A AC/DC (TTC-V/50 and TTC-I/50 only)
 - Up to 300A AC, 400A DC (TTC-V/300 and TTC-I/300 only)
- True RMS measurements for current values
- Accuracy:
 - current: ±0,5% f.s
- RS485 port (TTC-V only)
- Communication protocol Modbus-RTU
- Analog output 0...10V (TTC-V only)
- Analog output 4...20mA (TTC-I only)
- Programming and remote control via software
- Modular housing
- Degree of protection: IP20

FLUSH-MOUNT AND MODULAR POWER METERS



Certification obtained: **EAC, RINA**

Compliant with standards: **EN 61010-1, EN 61000-6-2, EN 61000-6-3**

 See dimensions and wiring diagrams at the end of chapter

EMS-96



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMS-96	• Color LCD display • Rated input current: by external CT 5A or 1A • Active energy: Class 1 (EN 62053-21) • Multilanguage graphic interface • 2 digital outputs • RS485 port	90÷250 VAC/DC	3EMS0000000000	1	0,450
		20÷60 VAC/DC	3EMS0100000000		
EMS-96H	• Color LCD display • Rated input current: by external CT 5A or 1A • Active energy: Class 1 (EN 62053-21) • Multilanguage graphic interface • 2 digital outputs • RS485 port • Harmonic analysis of voltage and current up to the 21° order	90÷250 VAC/DC	3EMS0000000010		
		20÷60 VAC/DC	3EMS0100000010		
DESCRIPTION			ORDER CODE		
OPTIONS	Current Inputs				
	Current measurement through pre-wired compact CTs		TTA	-	-
	Current measurement by CT with 333mV output		333mV		
	Current measurement through Rogowski coils		R		
	Neutral measurement input		N		
	Measurement accuracy				
	Class 0,5s (IEC/EN 62053-22)		0.5s	-	-
	Class 0,2s (IEC/EN 62053-22)		0.2s		
	Inputs and outputs				
	4 digital inputs and 2 digital outputs		4DI/4DO	-	-
	2 digital inputs and 6 digital outputs		2DI/6DO		
	8 digital outputs		8DO		
	8 digital inputs and 2 digital outputs		8DI/2DO		
	4 analog inputs		4AI		
	4 digital outputs and 4 analog outputs		4DO/4AO		
	4 digital outputs and 2 analog outputs		4DO/2AO		
	Communication ports				
	Opto-isolated RS485 port Modbus-RTU		485	-	-
	Ethernet port with Modbus TCP/IP		Eth		
	Profibus-DP interface		PF		
	M-Bus interface		M-Bus		
	Ethernet interface with Webserver function		EthWeb		
	Ethernet-RS485 gateway function		EthWeb/S		
	IEC61850 interface protocol substations		IEC61850		

GENERAL CHARACTERISTICS

The **EMS-96 digital multimeters** are able to display electrical measurements with high accuracy on the large LCD display, allowing you to control the energy distribution network. They're made in a built-in container (96x96mm) with the possibility of expansion that allow them to adapt to multiple applications. The graphic interface, available in 7 languages (English, Italian, French, German, Spanish, Polish, Swedish), is designed to facilitate the consultation of available data, including:


- Voltage (phase, phase-to-phase and system)
- Phase current (measured or calculated neutral current)
- Measurements on 4 quadrants
- Power (active, reactive and apparent phase and total power)
- P.F. (phase and total)
- Cosφ (phase and total)
- Frequency
- Maximum (MAX), minimum (MIN) and average(AVERAGE) of all measured values
- Peak power/current (max demand)
- Asymmetry of voltage, current
- Total harmonic distortion (THD) of voltages and currents
- Voltage and current harmonic analysis up to the 21st order
- Active, reactive, apparent energy meters (partial and total with programmable tariff functions)
- Basic analysis of energy quality

OPERATIONAL CHARACTERISTICS

- Voltage measurement range: 20...690 VAC L-L 30...400 VAC L-N
- Usage in medium and high voltage systems with voltage transformers
- Rated input current: with external CT, 5A or 1A
- Current reading through Rogowski coils (option)
- Current measurement through pre-wired compact CTs (option)
- Current measurement by CT with 333mV output (option)
- Frequency measurement range: 45...65Hz
- True RMS measurements for voltage and current values
- Measurements update 1s
- High accuracy
- Historical graphs of voltages and currents, power load curves, energy consumption
- Non-volatile memory for data and event storage
- Modbus-RTU and Modbus-TCP communication protocol
- Programming and remote control via software
- Flush mount 96x96mm housing
- Degree of protection: IP65 on front; IP20 at terminals

FLUSH-MOUNT AND MODULAR POWER METERS

Certification obtained: **EAC**
Compliant with standards: **EN61326-1, EN55011 Class A, EN61000-, EN62053-21, EN62053-23, EN61010-1, EN62053-31**

 See dimensions and wiring diagrams at the end of chapter

EMM-4L-96



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMM-4L-96	<ul style="list-style-type: none">• Backlit LCD icon display• Rated input current: by external CT 5A, 1A• RS485 port• Pulse output• Measurements update 1 second	100...240 VAC -15%...+12% 50/60Hz	3ME22S	1	0,320

GENERAL CHARACTERISTICS

The **EMM-4L-96 digital multimeters** are able to display electrical measurements with high accuracy on the large LCD display, allowing you to control the power distribution network. They are made in a built-in container (96x96mm) with reduced depth. The main features of these multimeters are the wide power supply range, the high accuracy in measuring the values, integrated RS485 communication port.

The main measurement parameters are:

- Voltage (phase, line and system voltages)
- Phase current (measured neutral current)
- Power (active, reactive and apparent phase and total powers)
- P.F. (power factor of each phase and total)
- Frequency
- Total harmonic distortion (THD voltages and currents)
- Active, reactive, apparent energy meters (total, per phase)
- Maximum value (MAX), minimum value (MIN) and MAX DEMAND function
- Phase sequence indication


OPERATIONAL CHARACTERISTICS

- Rated auxiliary power supply voltage: 100...240 VAC -15% ...+ 12% 50/60Hz
- Voltage measurement range: 10...300 VAC (L-N) 19...519 VAC (L-L)
- Possibility of use in medium and high voltage systems via TV
- Rated input current: 1A, 5A
- Frequency measurement range 45 ... 65Hz
- True RMS measurements (TRMS)
- Measurement accuracy:
 - voltages: $\pm 0.5\%$ full scale
 - current: $\pm 0.5\%$ full scale
 - power: 1% full scale
 - frequency: $\pm 0.1\%$
 - active energy: Class 1
 - reactive energy: Class 1
 - apparent energy: Class 1
- Modbus-RTU communication protocol
- Flush mount 96x96x50mm housing
- Degree of protection: IP54 on the front, IP20 on the terminals
- kWh pulse output
- High definition backlit LCD display
- Automatic or manual scrolling of pages
- Programmable voltage and current transformer ratio

FLUSH-MOUNT AND MODULAR POWER METERS



Certification obtained: **EAC, RINA**

Compliant with standards: **EN 61000-6-2, EN 61000-6-4, EN 61010-1**

 See dimensions and wiring diagrams at the end of chapter

EMS-D6



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMS-D6	<ul style="list-style-type: none">• LCD display• Rated input current: by external CT 5A or 1A• Active energy: Class 1 (EN 62053-21)• Multilanguage interface• 2 digital outputs• RS485 port	90÷250 VAC/DC	3MSDS0004000000	1	0,200
		20÷60 VAC / 24÷85 VDC	3MSDS0104000000		
EMS-D6H	<ul style="list-style-type: none">• LCD display• Rated input current: by external CT 5A or 1A• Active energy: Class 1 (EN 62053-21)• Multilanguage interface• 2 digital outputs• RS485 port• Harmonic analysis of voltage and current up to the 21° order	90÷250 VAC/DC	3MSDS0004000010		
		20÷60 VAC / 24÷85 VDC	3MSDS0104000010		
DESCRIPTION			ORDER CODE		
OPTIONS	Current Inputs				
	Current measurement through pre-wired compact CTs		TTA	-	-
	Current measurement by CT with 333mV output		333mV		
	Current measurement through Rogowski coils		R		
	Neutral measurement input		N		
	Differential current input		DIFF		
	Measurement accuracy				
	Class 0,5s (IEC/EN 62053-22)		0.5s	-	-
	Class 0,2s (IEC/EN 62053-22)		0.2s		
	Inputs and outputs				
	2 digital outputs		2D0		
	4 digital outputs		4D0		
	Communication ports				
	Opto-isolated RS485 port Modbus-RTU		485	-	-
	Ethernet port with Modbus TCP/IP		Eth		

GENERAL CHARACTERISTICS

The **EMS-D6 digital multimeters** are made in a modular 6-module housing and are equipped with a backlit graphic LCD display that allows you to view all the electrical quantities of the system. The high accuracy of the measurements combined with their extreme compactness makes them the ideal solution for any type of application.

The main measurement parameters are:

- Voltage (phase, phase-to-phase and system)
- Phase current (measured or calculated neutral current)
- Measurements on 4 quadrants
- Power (active, reactive and apparent phase and total power)
- P.F. (phase and total)
- Cosφ (phase and total)
- Frequency
- Maximum (MAX), minimum (MIN) and average(AVERAGE) of all measured values
- Peak power/current (max demand)
- Asymmetry of voltage, current
- Total harmonic distortion (THD) of voltages and currents
- Voltage and current harmonic analysis up to the 21st order
- Active, reactive, apparent energy meters (partial and total with programmable tariff functions)

OPERATIONAL CHARACTERISTICS

- Voltage measurement range: 52...690 VAC L-L 30...400 VAC L-N
- Can be used in medium and high voltage systems using TV
- Nominal input current: 5A or 1A with an external current transformer
- Current measurement through rogowski coils (option)
- Current measurement through pre-wired compact CTs (option)
- Current measurement by CT with 333mV output (option)
- Frequency measurement range: 45...65Hz
- True RMS measurements for voltage and current values
- Measurements update 1s
- High accuracy
- Modbus-RTU and Modbus-TCP communication protocol
- Programming and remote control via software
- Modular housing, 6 module
- Degree of protection: IP40 on front; IP20 at terminals

FLUSH-MOUNT AND MODULAR POWER METERS

Certification obtained: EAC
Compliant with standards: EN 61000-6-2, EN 61000-6-4, EN 61010-1

See dimensions and wiring diagrams at the end of chapter



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS	WT
EMS-D3-485	<ul style="list-style-type: none">• LCD display• Modular housing, 3 module• Rated input current: by external CT 5A or 1A• Active energy: Class 1• Multilanguage interface• 2 digital outputs• RS485 port	230 VAC	3MS52G	1	0,200
		115 VAC	3MS52E		
		24÷230 VAC/DC	3MS52Y		
EMS-D3-TT-485	<ul style="list-style-type: none">• LCD display• Modular housing, 3 module• Current measurement through pre-wired compact CTs• Active energy: Class 1• Multilanguage interface• 2 digital outputs• RS485 port	230 VAC	3MS521G	1	0,200
		115 VAC	3MS521E		
		24÷230 VAC/DC	3MS521Y		
EMS-D3	<ul style="list-style-type: none">• LCD display• Modular housing, 3 module• Rated input current: by external CT 5A or 1A• Active energy: Class 1• Multilanguage interface• 2 digital outputs	230 VAC	3MS51G	1	0,200
		115 VAC	3MS51E		
		24÷230 VAC/DC	3MS51Y		
EMS-D3-TT	<ul style="list-style-type: none">• LCD display• Modular housing, 3 module• Current measurement through pre-wired compact CTs• Active energy: Class 1• Multilanguage interface• 2 digital outputs	230 VAC	3MS511G	1	0,200
		115 VAC	3MS511E		
		24÷230 VAC/DC	3MS511Y		
ACCESSORY	<ul style="list-style-type: none">• 72x72mm flush-mount adapter	-	3EDA02	1	-

GENERAL CHARACTERISTICS

The EMS-D3 digital multimeters are made in a 3-module modular housing and are equipped with a backlit graphic LCD display that allows you to view all the electrical quantities of the system. The high accuracy of the measurements combined with its extreme compactness makes it the ideal solution for any type of application.

The main measurement parameters are:

- Voltage (phase, line and system voltages)
- Phase current (calculated or measured neutral current)
- Measurements on 4 quadrants
- Power (active, reactive and apparent phase and total)
- P.F. (phase and total)
- Cosφ (phase and total)
- Frequency
- Maximum value (MAX) and average value (AVG) function
- Peak values (max demand)
- Total harmonic distortion (THD) of voltages and currents
- Active, reactive, apparent phase and total energy meters


OPERATIONAL CHARACTERISTICS

- Voltage measurement range: 52...690 VAC L-L | 30...400 VAC L-N
- Can be used in medium and high voltage systems using TV
- Nominal input current: 5A or 1A with an external current transformer
- Current measurements through pre-wired compact CTs (TT or TTA series sensors) (option)
- Frequency measurement range: 50 / 60Hz
- True RMS measurements (TRMS)
- 500ms measurement update
- Digital outputs (output function: alarm or pulses)
- Modbus-RTU communication protocol
- Programming and remote control via software
- Modular housing, 3 module
- Degree of protection: IP40 on front; IP20 at terminals

FLUSH-MOUNT LED MEASURING INSTRUMENTS



Certification obtained: **EAC**

Compliant with standards: **EN 61010-1, EN 61000-6-2, EN 61000-6-3**

 See dimensions and wiring diagrams at the end of chapter

EMM-4h



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMM-4h	<ul style="list-style-type: none">• Compact dimensions 96x96 mm• 4 LED displays for excellent readability• Easy installation and configuration• True RMS measurements (TRMS)• Storage of maximum, average and maximum demand	110-230-400 VAC	3MH10P	1	0,450
		20÷60 VAC/DC	3MH10N		
		90÷250 VAC/DC	3MH10S		
EMM-4hp	<ul style="list-style-type: none">• Compact dimensions 96x96 mm• 4 LED displays for excellent readability• Easy installation and configuration• True RMS measurements (TRMS)• Storage of maximum, average and maximum demand• 2 digital outputs	110-230-400 VAC	3MH11P		
		20÷60 VAC/DC	3MH11N		
		90÷250 VAC/DC	3MH11S		
DESCRIPTION			ORDER CODE		
OPTIONS	Current Inputs				
	Current measurement through pre-wired compact CTs		TT	-	-
	Neutral measurement input		N		
	Isolated amperometric inputs with internal CT		T		
	Current inputs for CT .. /1A		1A		
	Voltage Inputs				
	Voltage measurement range: 20...660 VAC L-L		HV	-	-
	Inputs and outputs				
	1 digital inputs		DI	-	-
	1 analog output 0/4. . . 20mA		A		
	Measurements				
	Bidirectional energy meters		M	-	-
	Communication ports				
	Opto-isolated RS485 port Modbus-RTU		485	-	-
	Ethernet port with Web server and Modbus TCP/IP		PF		
	Profibus-DP interface		M-Bus		
	M-Bus interface		Eth		
	IEC61850 interface protocol substations		IEC61850		

GENERAL CHARACTERISTICS

The **EMM... digital multimeters** are made in flush-mounted housing. They perform reliable measurements even in critical conditions. The availability of the total hour meter function makes them interesting for the control panels of generators. The wide availability and accuracy of measurements make these multimeters a winning technical-economic alternative to traditional analog measuring instruments.

The EMM digital multimeters display 47 electrical quantities:

- Voltage (line and total)
- Current (phase and total)
- Power (active, reactive, apparent phase and total)
- $\cos\phi$ (phase and total)
- Frequency
- Maximum instantaneous values of voltage and current, active power, reactive power and apparent power
- Peak values (max demand)
- Average value (AVG) for powers and currents
- Hour counter
- Active, reactive and apparent energy meters (partial and total with programmable tariff functions)
- Bidirectional active and reactive energy meters


OPERATIONAL CHARACTERISTICS

- Voltage measurement range: 20...500VAC L-L 20...290VAC L-N
- Current measurement range: 0,02...5A
- Operating frequency range: 45...65Hz
- Programmable CT ratio: 1,0...2000
- Accuracy: Voltage: $\pm 0,5\% \pm 1$ digit
Current: $\pm 0,5\% \pm 1$ digit
Frequency: $\pm 0,5\% \pm 1$ digit
Active energy: Class 2
- Total hour meter
- Max and AVG measurement storage
- True RMS measurements
- RS485 port
- Modbus-RTU communication protocol
- 2 pulses outputs
- Housing: flush-mount 96x96mm
- Degree of protection: IP65 on front; IP20 at terminal

FLUSH-MOUNT LED MEASURING INSTRUMENTS



Certification obtained: **EAC**

Compliant with standards: **EN 61000-6-2, EN 61000-6-4, EN 61010-1**

 See dimensions and wiring diagrams at the end of chapter

ELM-4



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
ELM-4	<ul style="list-style-type: none">• Housing: flush-mount 96x96mm• LED display• Control circuit via external toroid (up to 4)• True RMS measurements (TRMS)• Maximum / average values	110-230-400 VAC	3MS10P	1	0,450
		20÷60 VAC/DC	3MS10N		
		90÷250 VAC/DC	3MS10S		
ELM-4P	<ul style="list-style-type: none">• Housing: flush-mount 96x96mm• LED display• Control circuit via external toroid (up to 4)• True RMS measurements (TRMS)• Maximum / average values• 2 digital outputs	110-230-400 VAC	3MS101P		
		20÷60 VAC/DC	3MS101N		
		90÷250 VAC/DC	3MS101S		
DESCRIPTION			ORDER CODE		
OPTIONS	Current Inputs				
	Current inputs for CT ../1A		1A	-	-
	Current inputs for CT ../5A		5A		
	1÷999 mA		0-1A		
	0,05÷5 A		0-5A		
	0,50÷50 A		0-50A		
	Inputs and outputs				
	1 analog output 0/4. . . 20mA		A	-	-
	Communication ports				
	Opto-isolated RS485 port Modbus-RTU		485	-	-

GENERAL CHARACTERISTICS

Ammeter for measuring residual or residual currents (up to four at the same time) using a suitable external toroidal reducer or for measuring line currents (possibly even lines separated from each other) using special external CTs.

The main measurement parameters are:

- Current (phase)
- Differential currents
- Maximum instantaneous current measurement
- Peak values (max demand) for current measurement
- Average value (AVG) for current measurement


OPERATIONAL CHARACTERISTICS

- Current measurement range:
 - input 0-1A: 1÷999 mA
 - input 0-5A: 0,05÷5 A
 - input 0-50A: 0,50÷50 A
 - input CT.../1A: 1÷999 mA
 - input CT.../5A: 0,05÷5 A
- Accuracy: Current: $\pm 0,5\% \pm 1$ digit
- Max and AVG measurement storage
- RS485 port
- Modbus-RTU communication protocol
- 2 pulses outputs
- Housing: flush-mount 96x96mm
- Degree of protection: IP65 on front; IP20 at terminal

FLUSH-MOUNT LED MEASURING INSTRUMENTS

Certification obtained: **EAC**

Compliant with standards: **EN 61010-1, EN 61000-6-2, EN 61000-6-3**



 See dimensions and wiring diagrams at the end of chapter

EMM-R4h



EMM-μ4h



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMM-R4h	<ul style="list-style-type: none">• Housing: flush-mount 96x96mm with reduced depth• Self-powered by phases• 4 LED displays for optimal viewing• Easy installation and configuration• True RMS measurement• Max, AVG, max demand measurement storage	400 VAC (from phases L2-L3)	3M H30U	1	0,440
		230 VAC (from phases L2-L3)	3M H30G		
		110 VAC (from phases L2-L3)	3M H30E		
EMM-μ4h	<ul style="list-style-type: none">• Housing: flush-mount 72x72mm• Self-powered by phases• 4 LED displays for optimal viewing• Easy installation and configuration• True RMS measurement• Max, AVG, max demand measurement storage	400 VAC (from phases L2-L3)	3M H40U	1	0,440
		230 VAC (from phases L2-L3)	3M H40G		
		110 VAC (from phases L2-L3)	3M H40E		
DESCRIPTION			ORDER CODE		
OPTIONS	Current Inputse				
	Current measurement through pre-wired compact CTs		TT	-	-
	Isolated amperometric inputs with internal CT		T		
	Current inputs for CT ../1A		1A		
	Measurements				
	Bidirectional energy meters		M	-	-
	Communication ports				
Opto-isolated RS485 port Modbus-RTU		485	-	-	

GENERAL CHARACTERISTICS

The **EMM... digital multimeters** are made in 72x72mm and 96x96mm flush-mounted housing with reduced depth. The TRMS measurements allow correct operation even in critical conditions.

The main measurement parameters are:

- Voltage (line and total)
- Current (phase and total)
- Power (active, reactive, apparent phase and total)
- Cosφ (phase and total)
- Frequency
- Maximum instantaneous values of voltage and current, active power, reactive power and apparent power
- Peak values (max demand)
- Average value (AVG) for powers and currents
- Hour counter
- Active, reactive and apparent energy meters (partial and total with programmable tariff functions)
- Bidirectional active and reactive energy meters


OPERATIONAL CHARACTERISTICS

- Self-powered by phases
- Voltage measurement range: 20...500VAC L-L 20...290VAC L-N
- Current measurement range: 0,02...5A
- Operating frequency range: 45...65Hz
- Accuracy: Voltage: $\pm 0,5\% \pm 1$ digit
Current: $\pm 0,5\% \pm 1$ digit
Frequency: $\pm 0,5\% \pm 1$ digit
Active energy: Class 2
- Total hour meter
- Max and AVG measurement storage
- True RMS measurements
- RS485 port
- Modbus-RTU communication protocol
- 2 pulses outputs
- Housing: flush-mount 96x96mm with reduced depth (EMM-R4h only)
- Housing: flush-mount 72x72mm (EMM-μ4h only)
- Degree of protection: IP65 on front; IP20 at terminal

MODULAR LED MEASURING INSTRUMENTS

Certification obtained: **EAC**

Compliant with standards: **EN 61010-1, EN 61000-6-2, EN 61000-6-3**



 See dimensions and wiring diagrams at the end of chapter

EMM-D4h



EMM-μD3h



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMM-D4h	<ul style="list-style-type: none">• Modular housing, 6 module• 4 LED displays for optimal viewing• Easy installation and configuration• True RMS measurement• Max, AVG, max demand measurement storage	110-230-400 VAC	3MH20P	1	0,450
		20÷60 VAC / 24÷72 VDC	3MH20N		
		80÷230 VAC / 90÷250 VDC	3MH20S		
EMM-D4hp	<ul style="list-style-type: none">• Modular housing, 6 module• 4 LED displays for optimal viewing• Easy installation and configuration• True RMS measurement• Max, AVG, max demand measurement storage• 2 digital outputs	110-230-400 VAC	3MH21P		
		20÷60 VAC / 24÷72 VDC	3MH21N		
		80÷230 VAC / 90÷250 VDC	3MH21S		
EMM-μD3h	<ul style="list-style-type: none">• Modular housing, 3 module• 4 LED displays for optimal viewing• Easy installation and configuration• True RMS measurement• Max, AVG, max demand measurement storage	230 VAC	3MH010G	1	0,300
		110 VAC	3MH010E		
		400 VAC	3MH010U		
EMM-μD3hp	<ul style="list-style-type: none">• Modular housing, 3 module• 4 LED displays for optimal viewing• Easy installation and configuration• True RMS measurement• Max, AVG, max demand measurement storage• 2 digital outputs	230 VAC	3MH011G		
		110 VAC	3MH011E		
		400 VAC	3MH011U		
DESCRIPTION			ORDER CODE		
OPTIONS	Current Inputs				
	Current measurement through pre-wired compact CTs		TT	-	-
	Neutral measurement input		N		
	Isolated amperometric inputs with internal CT		T		
	Current inputs for CT ../1A		1A		
	Inputs and outputs				
	1 digital output (EMM-D4h only)		DI		
	1 analog output 0/4 . . . 20mA (EMM-D4h only)		A		
	Measurements				
	Bidirectional energy meters		M	-	-
	Communication ports				
	Opto-isolated RS485 port Modbus-RTU		485	-	-
	Ethernet port with Web server and Modbus TCP/IP (EMM-D4h only)		Eth		

GENERAL CHARACTERISTICS

The **EMM-D... digital multimeters** are made in DIN modular housing, 3 and 6 module. The TRMS measurements allow correct operation even in critical conditions.

The main measurement parameters are:

- Voltage (line and total)
- Current (phase and total)
- Power (active, reactive, apparent phase and total)
- $\cos\phi$ (phase and total)
- Frequency
- Maximum instantaneous values of voltage and current, active power, reactive power and apparent power
- Peak values (max demand)
- Average value (AVG) for powers and currents
- Hour counter
- Active, reactive and apparent energy meters (partial and total with programmable tariff functions)
- Bidirectional active and reactive energy meters


OPERATIONAL CHARACTERISTICS

- Voltage measurement range: 20...500VAC L-L 20...290VAC L-N
- Current measurement range: 0,02...5A
- Operating frequency range: 45...65Hz
- Programmable CT ratio: 1,0...2000
- Accuracy: Voltage: $\pm 0,5\% \pm 1$ digit
Current: $\pm 0,5\% \pm 1$ digit
Frequency: $\pm 0,5\% \pm 1$ digit
Active energy: Class 2
- Total hour meter
- Max and AVG measurement storage
- True RMS measurements
- RS485 port
- Modbus-RTU communication protocol
- 2 pulses outputs
- Modular housing, 3 module (EMM-μD3h only)
- Modular housing, 6 module (EMM-D4h only)
- Degree of protection: IP65 on front; IP20 at terminal

VOLTMETER AND AMMETER

Certification obtained: **EAC**

Compliant with standards: **EN 61010-1, EN 61000-6-2, EN 61000-6-3**



 See dimensions and wiring diagrams at the end of chapter

EMM-μ3-VA



EMM-R3-VA



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMM-μ3-VA	<ul style="list-style-type: none">• Flush-mount housing, 72x72 mm• Self-powered by phases• 3 LED displays for optimal viewing• Easy installation and configuration• True RMS measurement	400 VAC (from phases L2-L3)	3MV02U	1	0,300
		230 VAC (from phases L2-L3)	3MV02G		
		110 VAC (from phases L2-L3)	3MV02E		
EMM-μ3-VA-p	<ul style="list-style-type: none">• Flush-mount housing, 72x72 mm• Self-powered by phases• 3 LED displays for optimal viewing• Easy installation and configuration• True RMS measurement• 2 digital outputs	400 VAC (from phases L2-L3)	3MV22U		
		230 VAC (from phases L2-L3)	3MV22G		
		110 VAC (from phases L2-L3)	3MV22E		
EMM-R3-VA	<ul style="list-style-type: none">• Flush-mount housing, 96x96 mm• Self-powered by phases• 3 LED displays for optimal viewing• Easy installation and configuration• True RMS measurement	400 VAC (from phases L2-L3)	3MV01U	1	0,450
		230 VAC (from phases L2-L3)	3MV01G		
		110 VAC (from phases L2-L3N)	3MV01E		
EMM-R3-VA-p	<ul style="list-style-type: none">• Flush-mount housing, 96x96 mm• Self-powered by phases• 3 LED displays for optimal viewing• Easy installation and configuration• True RMS measurement• 2 digital outputs	400 VAC (from phases L2-L3)	3MV12U		
		230 VAC (from phases L2-L3)	3MV12G		
		110 VAC (from phases L2-L3)	3MV12E		
DESCRIPTION			ORDER CODE		
OPTIONS	Current Inputs				
	Current measurement through pre-wired compact CTs		TT	-	-
	Isolated amperometric inputs with internal CT		T		
	Current inputs for CT ../1A		1A		
	Measurements				
	Frequency range up to 400Hz		400Hz	-	-
	Communication ports				
Opto-isolated RS485 port Modbus-RTU		485	-	-	

GENERAL CHARACTERISTICS

The **EMM-... VA digital multimeters** are manufactured in 72x72mm and 96x96mm flush-mounted housing. The measurements made in TRMS (True Root Mean Square / True RMS value) allow correct operation even in critical conditions.

The main measurement parameters are:

- Voltage (line and system voltages)
- Current (phase and system currents)
- Frequency (frequency of the measured voltage)
- Maximum instantaneous values of voltage and current
- Peak values (max demand)
- Average value (AVG) for voltages and currents
- Hour counter
- Phase sequence

OPERATIONAL CHARACTERISTICS

- Auxiliary power supply taken phase-phase
- Voltage measurement range: 20...500VAC L-L 20...290VAC L-N
- Current measurement range: 0.02...5A
- Operating frequency range: 45...65Hz
- Programmable CT ratio: 1,0...2000
- Accuracy Voltage: $\pm 0.5\% \pm 1$ digit
- Accuracy Current: $\pm 0.5\% \pm 1$ digit
- Accuracy Frequency: $\pm 0.5\% \pm 1$ digit
- Total hour counter
- Max and AVG measurement storage
- True RMS measurements
- RS485 port
- 2 pulses outputs
- Housing: flush-mount 96x96mm (EMM-R3VA only)
- Housing: flush-mount 72x72mm (EMM-μ3VA only)
- Degree of protection: IP65 on front; IP20 at terminal



VOLTMETER AND AMMETER

Certification obtained: EAC
Compliant with standards: EN 61010-1, EN 61000-6-2, EN 61000-6-3

See dimensions and wiring diagrams
at the end of chapter

EMM-μD3VA



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMM-μD3VA	<ul style="list-style-type: none">• Modular housing, 3 module• 3 LED displays for optimal viewing• Easy installation and configuration• True RMS measurement	230 VAC	3MV03G	1	0,300
		110 VAC	3MV03E		
		400 VAC	3MV03U		
EMM-μD3VA-p	<ul style="list-style-type: none">• Modular housing, 3 module• 3 LED displays for optimal viewing• Easy installation and configuration• True RMS measurement• 2 digital outputs	230 VAC	3MV031G	1	0,300
		110 VAC	3MV031E		
		400 VAC	3MV031U		
DESCRIPTION			ORDER CODE		
OPTIONS	Current Inputs				
	Isolated amperometric inputs with internal CT		T	-	-
	Current inputs for CT ../1A		1A		
	Current measurement through pre-wired compact CTs		TT	-	-

GENERAL CHARACTERISTICS

The EMM-... VA digital multimeters are made in a modular 6-module housing. The measurements made in TRMS (True Root Mean Square / true effective value) allow correct operation even in critical conditions.

The main measurement parameters are:

- Voltage (line and total)
- Current (phase and total)
- Frequency (frequency of the measured voltage)
- Maximum instantaneous values of voltage and current
- Peak values (max demand)
- Average value (AVG) for voltages and currents
- Hour counter


OPERATIONAL CHARACTERISTICS

- Voltage measurement range: 20...500VAC L-L 20...290VAC L-N
- Current measurement range: 0,02...5A
- Operating frequency range: 45...65Hz
- Programmable CT ratio: 1,0...2000
- Accuracy: ±0,5% ±1 digit
- Max and AVG measurement storage
- True RMS measurement
- Modular housing, 3 module
- Degree of protection: IP65 on front; IP20 at terminal

FLUSH-MOUNT LED MEASURING INSTRUMENTS FOR DC NETWORKS

Certification obtained: **EAC**

Compliant with standards: **EN 61010-1, EN 61000-6-2, EN 61000-6-3**



 See dimensions and wiring diagrams at the end of chapter

EMM-4dc



EMM-4d2c



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMM-4dc	<ul style="list-style-type: none">• Compact dimensions 96x96 mm• 4 LED displays for excellent readability• Easy installation and configuration• Max, AVG, max demand measurement storage	110-230-400 VAC	-	1	0,440
		20÷60 VAC / 24÷72 VDC	-		
		80÷230 VAC / 90÷250 VDC	-		
EMM-4dc-p	<ul style="list-style-type: none">• Compact dimensions 96x96 mm• 4 LED displays for excellent readability• Easy installation and configuration• Max, AVG, max demand measurement storage• 2 digital outputs	110-230-400 VAC	-	1	0,440
		20÷60 VAC / 24÷72 VDC	-		
		80÷230 VAC / 90÷250 VDC	-		
EMM-4d2c	<ul style="list-style-type: none">• Compact dimensions 96x96 mm• 4 LED displays for excellent readability• Easy installation and configuration• Only voltage and current measurements• Max, AVG, max demand measurement storage	110-230-400 VAC	-	1	0,440
		20÷60 VAC / 24÷72 VDC	-		
		80÷230 VAC / 90÷250 VDC	-		
EMM-4d2c-p	<ul style="list-style-type: none">• Compact dimensions 96x96 mm• 4 LED displays for excellent readability• Easy installation and configuration• Only voltage and current measurements• Max, AVG, max demand measurement storage• 2 digital outputs	110-230-400 VAC	-	1	0,440
		20÷60 VAC / 24÷72 VDC	-		
		80÷230 VAC / 90÷250 VDC	-		
DESCRIPTION			ORDER CODE		
OPTIONS	Current Inputs				
	Current measurement through pre-wired compact CTs		TT	-	-
	Isolated amperometric inputs with internal CT		T		
	Current inputs for CT ..1A		1A		
	Current inputs for HALL sensors		HE		
	Voltage inputs				
	Voltage inputs 500 VDC		HV	-	-
	Inputs and outputs				
	2 digital inputs		DI	-	-
	1 analog output 0/4...20mA		A		
	2 analogue outputs 0/4...20mA		2A		
	Communication ports				
	Opto-isolated RS485 port Modbus-RTU		485	-	-
	Profibus-DP interface		PF		
	M-Bus interface		M-Bus		
	Ethernet port with Web server and Modbus TCP/IP		Eth		

GENERAL CHARACTERISTICS

The digital multimeters of the **EMM -... dc series** are able to visualize the electrical measurements with accuracy on the display, allowing to control direct current networks. The voltage input is directly connected to the line, while the current input is derived from shunts (60 or 150 mV) or from sensors with HALL effect in voltage (0 ... 4 / 10V) or in current (0/4 ... 20mA). The wide availability and accuracy of measurements make these multimeters a winning technical-economic alternative to traditional analog measuring instruments.

The main measurement parameters are:

- Voltage / • Current
- Active power (EMM-4dc only) / • Temperature
- Maximum instantaneous values of voltage and current, active power, temperature
- Peak peaks (max demand) / • average value (AVG) • Totalizer hour counter (EMM-4dc only)
- Active energy meters (partial and total) (EMM-4dc only)


OPERATIONAL CHARACTERISTICS

- Voltage measurement range: 5...200VDC fase-fase 20...290VAC fase-neutro
- Voltage measurement range: 5...500VAC (HV option)
- Current measurement range: 0,4...20mA (TA effetto HALL)
- Shunt measurement range: 1...60/150mV
- Programmable CT ratio: 1,0...2000
- Accuracy Voltage: $\pm 0,5\% \pm 1$ digit
- Accuracy Current: $\pm 0,5\% \pm 1$ digit
- Accuracy Active energy: $\pm 1\%$
- 2 digital outputs
- RS485 port
- Modbus-RTU communication protocol
- Housing: flush-mount 96x96mm
- Degree of protection: IP65 on front; IP20 at terminal

ACCESSORIES

CONVERTER

Certification obtained: **EAC**
Compliant with standards: **EN 61010-1, EN 61000-6-2, EN 61000-6-3**

 See dimensions and wiring diagrams
at the end of chapter


GENERAL FEATURES

The EMI-10L converter allows you to interface n "Slave" devices connected on an RS485 network with a "Master" equipped with an Ethernet port:

- Power LED, Ethernet diagnostics, RS485
- Programming via web interface
- Multimaster up to 4 connections
- 2 RS485 serial ports




EMI-10L

TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMI-10L	<ul style="list-style-type: none">• RS485/Ethernet converter• Modular DIN housing, 3 module• Modbus TCP / Modbus RTU conversion	230 VAC	3IC52G	1	0,440
		110 VAC	3IC52V		
		20÷60 VAC/DC	3IC52J		

CONVERTER

Certification obtained: **EAC**
Compliant with standards: **EN 61010-1, EN 61000-6-2, EN 61000-6-3**

 See dimensions and wiring diagrams
at the end of chapter

GENERAL FEATURES

The EMI-5s gateway allows to interface "Slave" devices connected on an RS485 network with a "Master" via Profibus DP network.

- Diagnostic LED
- Backlit LCD display
- Multimaster up to 4 connections




EMI-5s

TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMI-5s	<ul style="list-style-type: none">• RS485/Profibus DP converter• Modular DIN housing, 3 module• Modbus RTU / Profibus DP VO conversion	24÷230 VAC/DC	3IC74S	1	0,168

CONVERTER

Certification obtained: **EAC**
Compliant with standards: **EN 61000-6-4 / N 64000-6-2 / EN 61010-1 / EN 60742**

 See dimensions and wiring diagrams
at the end of chapter

GENERAL FEATURES

The EMI-1P-USB is a 2.5kV galvanically isolated RS485 / USB serial converter, it uses an FTDI USB chip.
This device will allow you to connect securely to all "Slave" devices on the RS485 serial port.




EMI-1P-USB

TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
EMI-1P-USB	RS485 / USB converter	Da PC 5V @ 100mA	3IC18	1	0,100

ACCESSORIES



PROTECTION COVERS

 See dimensions and wiring diagrams at the end of chapter


GENERAL CHARACTERISTICS

When a higher front IP protection degree is needed, the covers can be installed on the corresponding devices and also provide a sealing feature.



TYPE		ORDER CODE	PCS 	WT 
Protection cover	• IP65 96 x 48 mm	CAL 96x48	1	0,048
	• IP65 72 x 72 mm	CAL 72x72	1	0,070
	• IP65 96 x 96 mm	CAL 96x96	1	0,077

POWER SUPPLY

 See dimensions and wiring diagrams at the end of chapter


GENERAL CHARACTERISTICS

- Universal input power supply
- Protections: Short circuit / Overload / Over voltage
- Ultra slim design with 17.5mm (1SU width)
- Isolation class II
- LED indicator for power on
- No load power consumption<0.3W
- DC output voltage adjustable
- Working temperature:-30~+70 C



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
Power supply	<ul style="list-style-type: none"> • LED indicator for power on • Ultra slim design with 17.5mm (1SU width) • Voltage adj. range: 21.6÷29V • Current range: 0÷0.63A • Rated power: 15.2W 	85÷264 VAC 120÷370 VDC	AL15W24VDCHD	1	0,078

POWER SUPPLY

 See dimensions and wiring diagrams at the end of chapter

GENERAL CHARACTERISTICS

- Universal input power supply
- Protections: Short circuit / Overload / Over voltage
- Ultra slim design with 35mm (2SU width)
- Isolation class II
- LED indicator for power on
- No load power consumption<0.3W
- DC output voltage adjustable
- Working temperature:-30~+70 C



TYPE		RATED AUXILIARY SUPPLY VOLTAGE	ORDER CODE	PCS 	WT 
Power supply	<ul style="list-style-type: none"> • LED indicator for power on • Modular DIN housing, 3 module • Voltage adj. range: 21.6÷29V • Current range: 0÷1.5A • Rated power: 36W 	85÷264 VAC 120÷370 VDC	AL60W24VDCHD	1	0,300

COMPACT PREWIRED SPLIT AND SOLID CORE

Certification obtained:
Compliant with standards:



TYPE		PRIMARY CURRENT	MEASURE RANGE	HOLE Ø (mm)	ORDER CODE	PCS	WT
TTA	<ul style="list-style-type: none"> Split-core Cable supplied as standard, length 1 m 	50A	0,3÷70A	10	TTA50	3	0,200
		100A	0,6÷130A	16	TTA100	3	0,250
		200A	0,2÷250A	24	TTA200	3	0,250
TT	<ul style="list-style-type: none"> Solid-core Cable supplied as standard, length 15 cm 	10A	0,1÷15A	9	TT10	3	0,100
		50A	0,3÷70A	9	TT50	3	0,100
		100A	0,6÷130A	19	TT100	3	0,130

GENERAL CHARACTERISTICS

The TT .. or TTA .. measuring current transformers (CTs) are mounted in an electrical system to reduce the line current to a secondary value compatible with the amperometric inputs of digital multimeters or network analyzers.

They're class 0.5 or 1 measuring current transformers without primary winding and are normally used for high primary current values starting from 10A. Thanks to their very compact size and easy mounting, these sensors can be easily used in critical and space-constrained applications.

The TTA openable current sensors ..., facilitate installation and reduce the costs of a possible shutdown of the system.

OPERATIONAL CHARACTERISTICS

- Operating frequency: 50...60Hz (TT only)
- Operating frequency: 50...400Hz (TTA only)
- Overload withstand: 120% I_{pn}
- Rated insulation voltage U_i: 2.5kV for 1 minute
- Ambient conditions:
 - Operating temperature: -25...+50°C
 - Storage temperature: -40...+80°C
 - Relative humidity, not condensing: 90%

ROGOWSKI COILS

Compliant with standards: : 2014/35/EU (Low Voltage), EN61010-1



TYPE		COIL LENGTH (mm)	EXTERNAL COIL DIAMETER (mm)	MAX CONDUCTOR DIAMETER (mm)	ORDER CODE	PCS	WT
Rogowski coils	Note: different cable lengths and external coil diameter available on request.	250	92	68	CRC250100AC052M	1	0,130
		400	139	115	CRC400100AC052M	1	0,130
		600	203	179	CRC600100AC052M	1	0,160
		900	299	275	CRC900100AC052M	1	0,200

GENERAL CHARACTERISTICS

The Rogowski sensor is a measuring device for alternating currents.

Unlike current sensors with ferromagnetic core, the linearity of the Rogowski sensor makes it particularly suitable for measuring large currents.

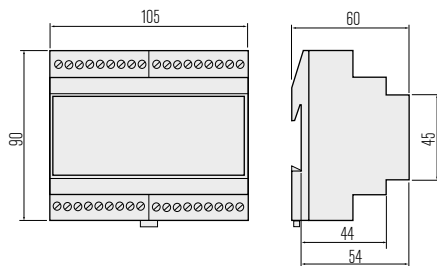
CRC sensors do not require an external integrator because the measurement processing is entirely managed by the measurement device. They can be connected to network analyzers. The range of flexible CRC sensors is specially designed for existing installations limited by stringent integration constraints or with high intensity currents. The absence of a ferromagnetic core makes the Rogowski sensor linear even in the presence of large currents.

OPERATIONAL CHARACTERISTICS

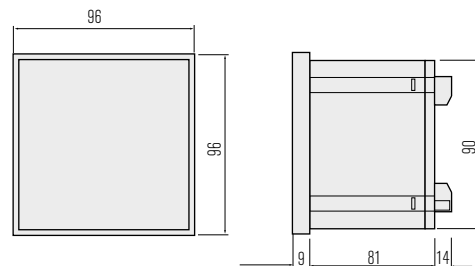
- Primary current 20 ÷ 4000A
- 100 mV / kA @ 50 Hz output signal
- Operating frequency 45 - 65 Hz
- Accuracy ± 0.5%
- Linearity ± 0.2%
- Coil and connection cable: thermoplastic rubber, self-extinguishing grade V-0 (UL 94)
- Insulation voltage 7.4kV for 1 minute
- Degree of protection: IP52
- Environmental conditions:
 - Operating temperature: -20 ... + 70 ° C
 - Storage temperature: -20 ... + 70 ° C

ENERGY METERS

EMC-D3b

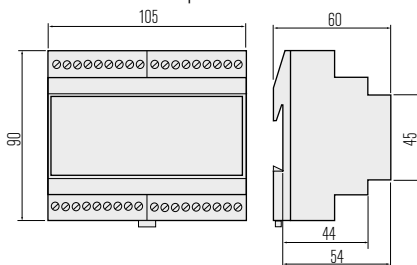


EMC-3b

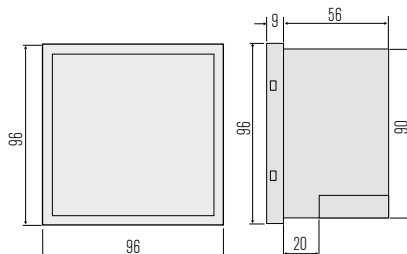


DATA CONCENTRATOR, REMOTE DISPLAY

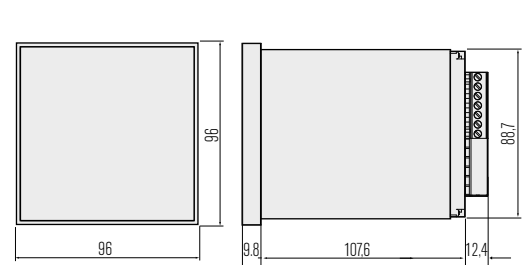
EML-16 | EML-16-DC



RDU

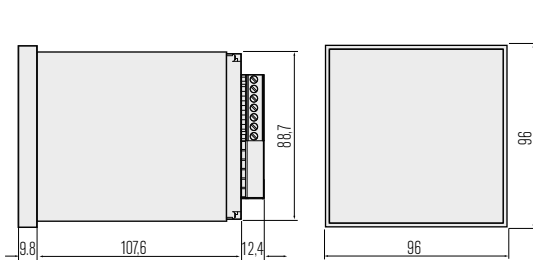


RDU-L

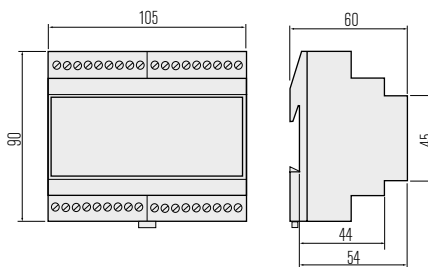


NETWORK ANALYZERS, POWER METERS, VOLTMETERS AND AMMETERS

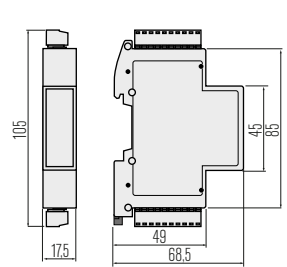
EMA-90N | EMS-96



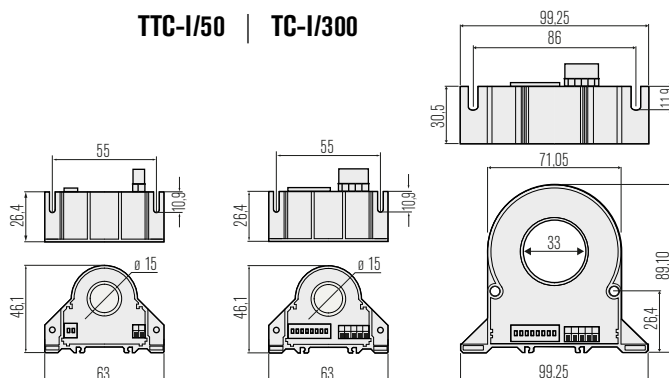
EMS-D6 | EMA-D6



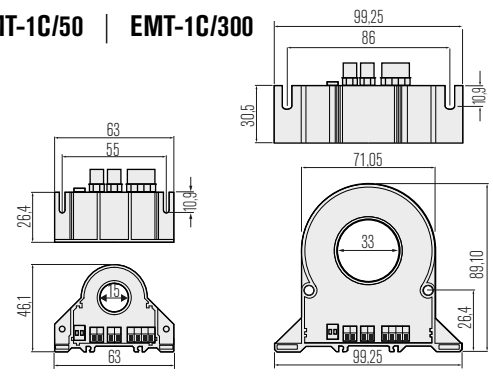
EMU-3ea | EMU-2it



TTC-I/50 | TC-I/300

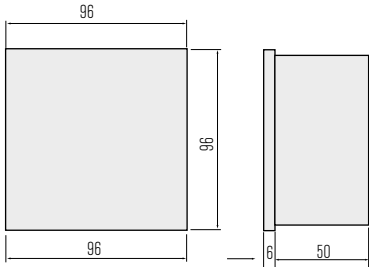


EMT-1C/50 | EMT-1C/300

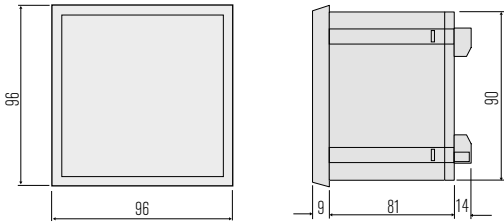


NETWORK ANALYZERS, POWER METERS, VOLTMETERS AND AMMETERS

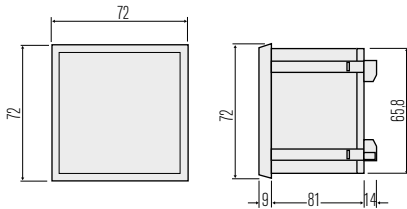
EMM-4L-96 | EMM-4L-96-MID



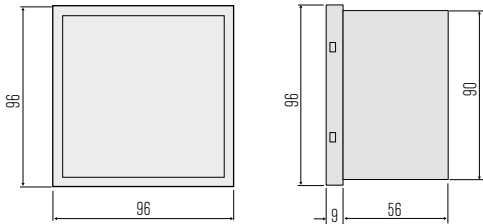
EMM-4h | ELM-4 | EMM-4dc | EMM-4d2c



EMM-μ4h | EMM-μ3VA

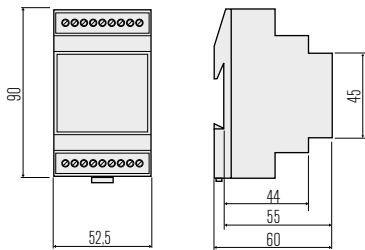


RDU | EMM-R4h | EMM-R3VA



CONVERTERS, GATEWAY

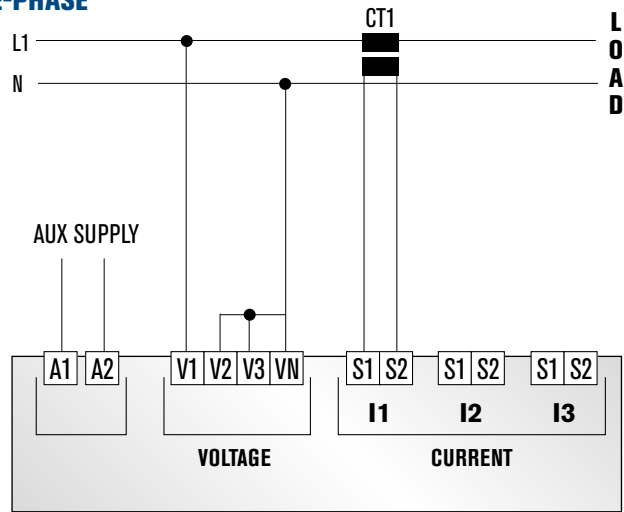
EMI-10L | EMI-5s



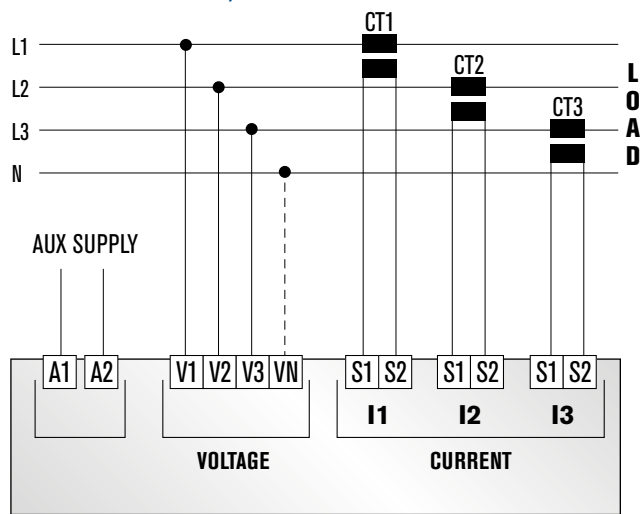
NETWORK ANALYZERS, POWER METERS, ENERGY METERS

EMC-D3b | EMC-3b | EMS-D3 | EMU-3ea | EMM-4h | EMM-D4h | EMM-μD3h | EMM-μ3VA

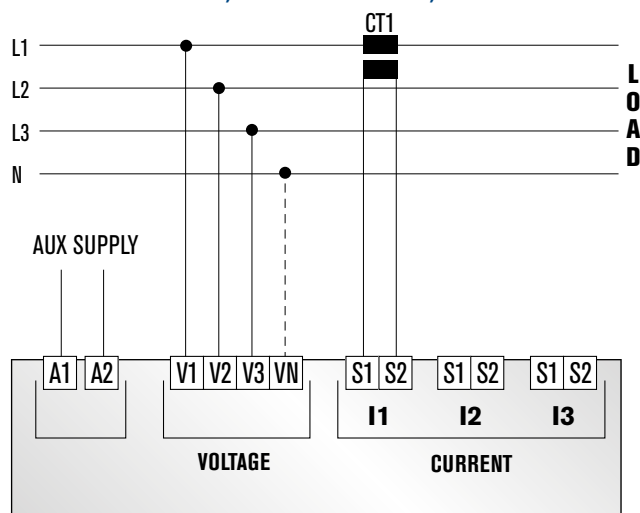
SINGLE-PHASE



THREE-PHASE MEASURING, WITH OR WITHOUT NEUTRAL



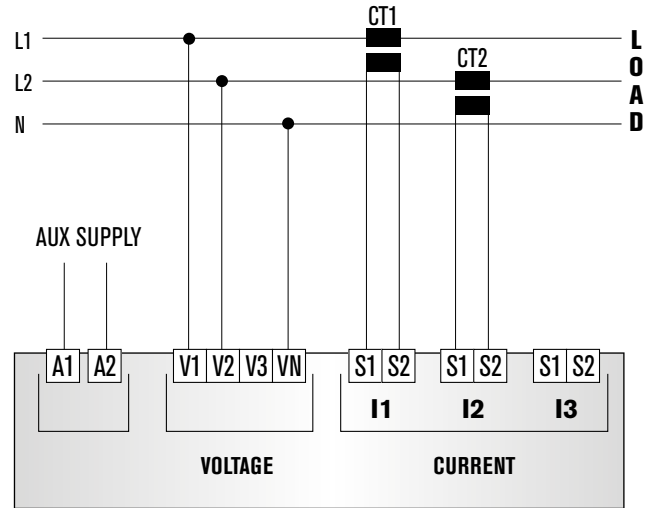
THREE-PHASE MEASURING, BALANCED LOAD, WITH OR WITHOUT NEUTRAL



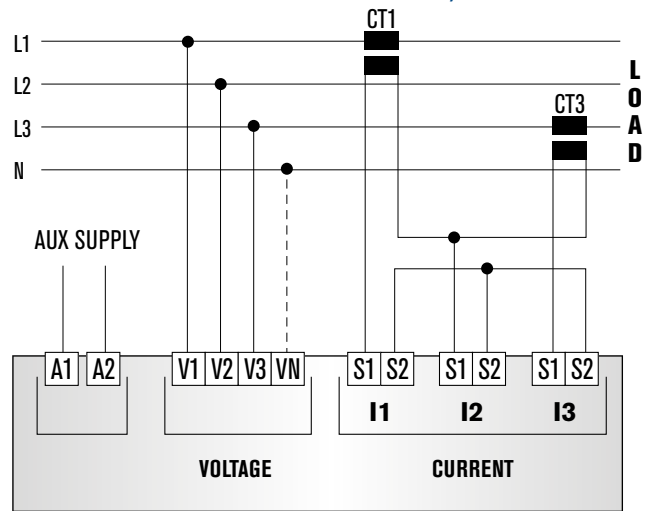
NETWORK ANALYZERS, POWER METERS, ENERGY METERS

EMC-D3b | EMC-3b | EMS-D3 | EMU-3ea | EMM-4h | EMM-D4h | EMM-μD3h | EMM-μ3VA

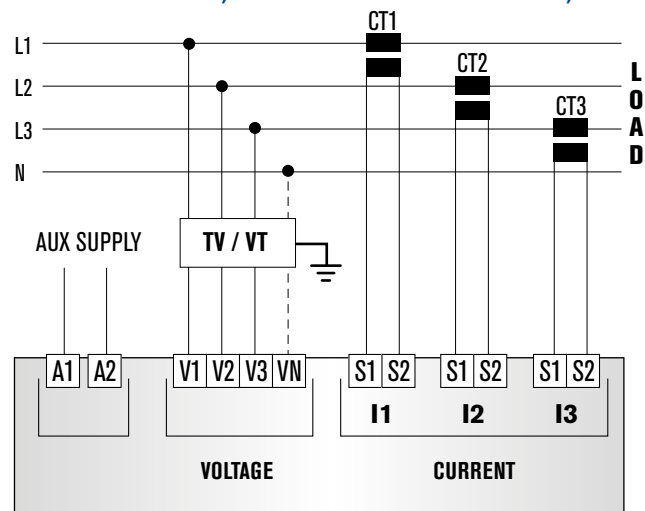
2-PHASE



THREE-PHASE MEASURING WITHOUT NEUTRAL, ARON CONNECTION



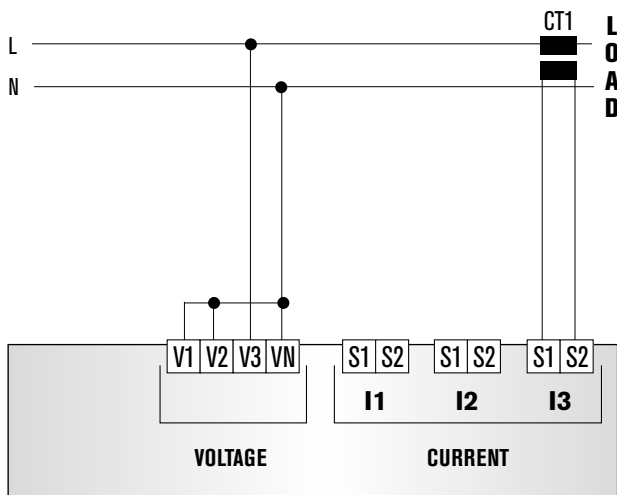
THREE-PHASE MEASURING, WITH OR WITHOUT NEUTRAL, WITH VOLTAGE TRANSFORMERS



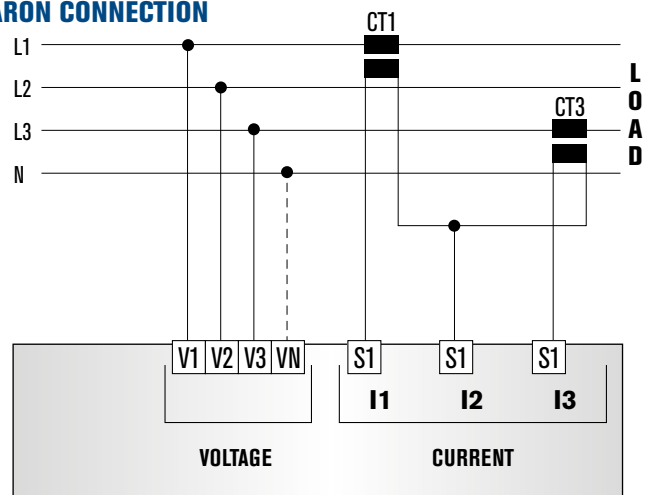
POWER METERS, VOLTMETERS AND AMMETERS (SELF-POWERED BY THE PHASES)

EMM-R4h | EMM-μ4h | EMM-R3VA | EMM-μ3VA

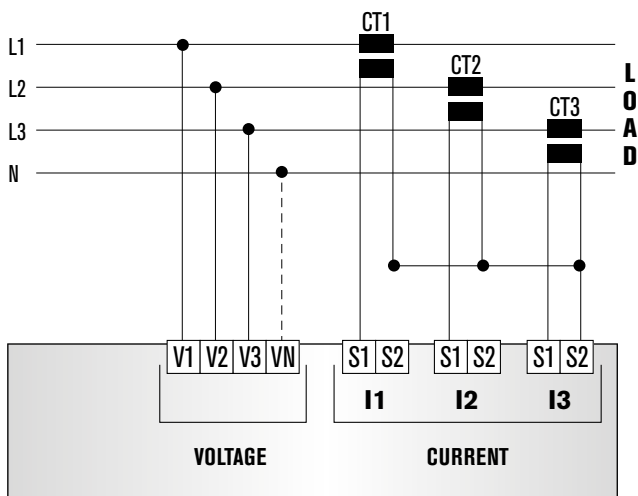
SINGLE-PHASE



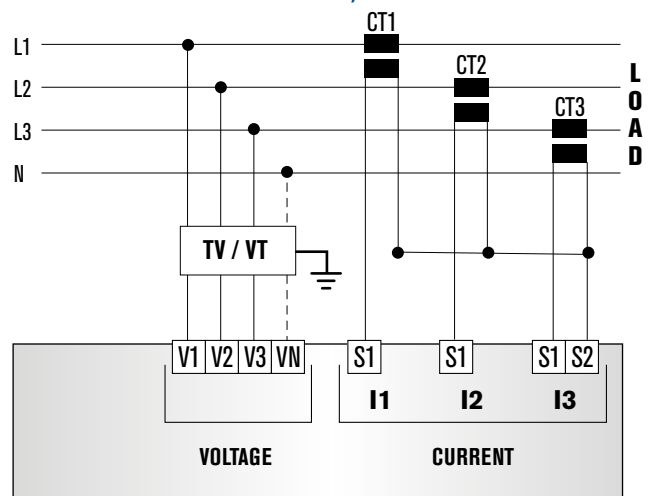
THREE-PHASE MEASURING WITHOUT NEUTRAL, ARON CONNECTION



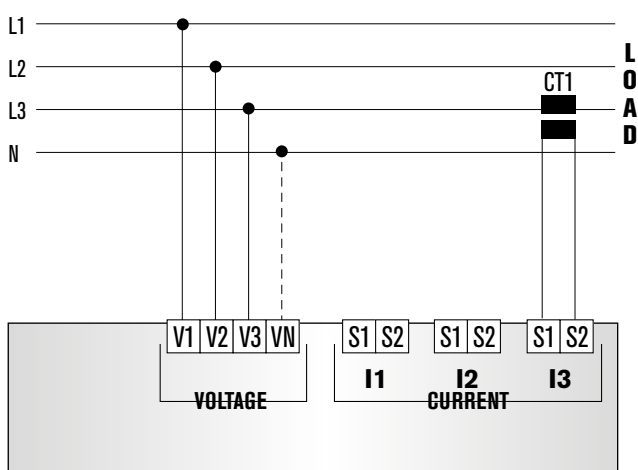
THREE-PHASE MEASURING, WITH OR WITHOUT NEUTRAL



THREE-PHASE MEASURING WITHOUT NEUTRAL, WITH VOLTAGE TRANSFORMERS, ARON CONNECTION



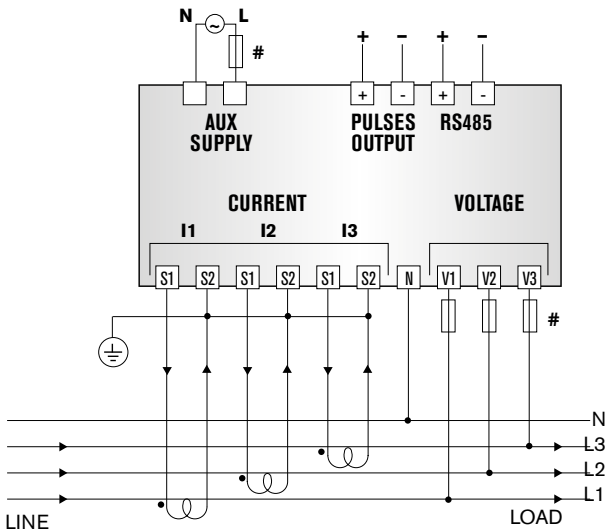
THREE-PHASE MEASURING, BALANCED LOAD, WITH OR WITHOUT NEUTRAL



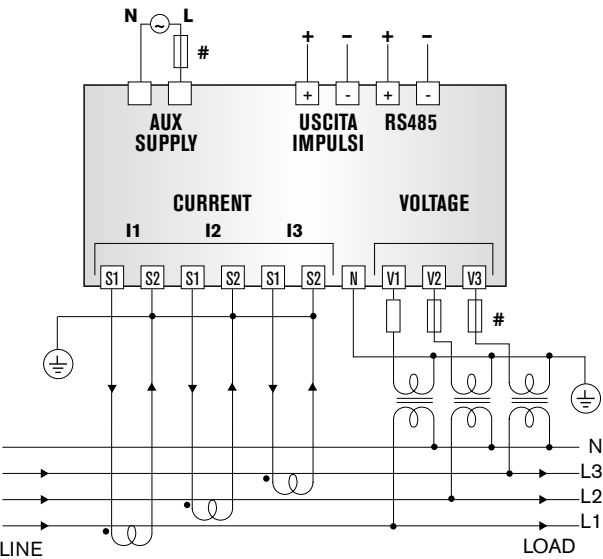
POWER METERS, MID CERTIFIED

EMM-4L-96-MID | EMM-D4-MID

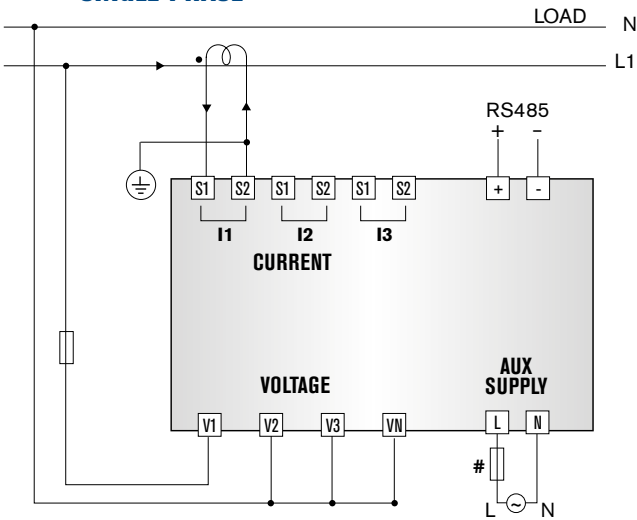
THREE-PHASE MEASURING, WITH NEUTRAL, WITH THREE CURRENT TRANSFORMERS



THREE-PHASE MEASURING, WITH NEUTRAL, WITH VOLTAGE TRANSFORMERS, WITH THREE CURRENT TRANSFORMERS,



SINGLE-PHASE



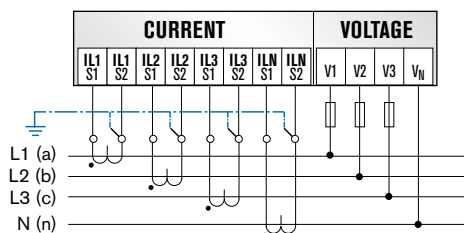
NETWORK ANALYZERS

EMA-90N | EMA-11N | EMA-D6 | EMS-96 | EMS-D6

1

Three-phase measuring, four conductors, unbalanced load, without voltage transformers, with current transformers.

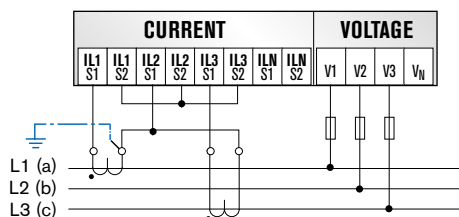
Connection type 3PH-4W



2

Three-phase measuring, three conductors, unbalanced load, without voltage transformers, with two current transformers. (ARON)

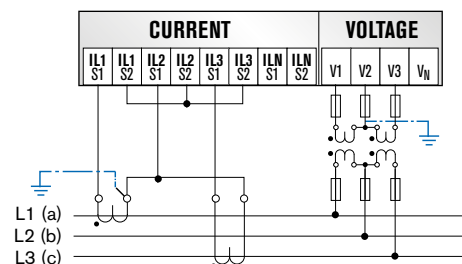
Connection type ARON



3

Three-phase measuring, three conductors, unbalanced load, with voltage transformers, with two current transformers. (ARON)

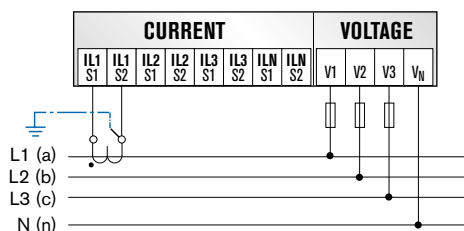
Connection type ARON



4

Three-phase measuring, three conductors, balanced load, without voltage transformers, with one current transformer.

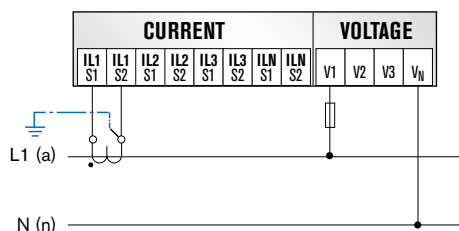
Connection type 3PH BAL



5

Single-phase measuring, two conductors, without voltage transformers, with one current transformer.

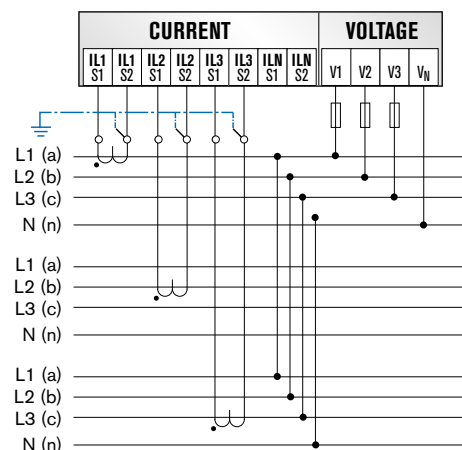
Connection type 1PH



6

Three-phase measuring, four conductors, balanced multiple loads, with three current transformers.

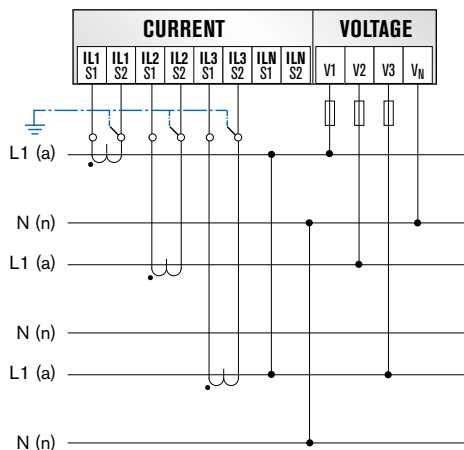
Connection type 3PH ML BAL



7

Single-phase measuring, two conductors, without voltage transformers, with one current transformer.

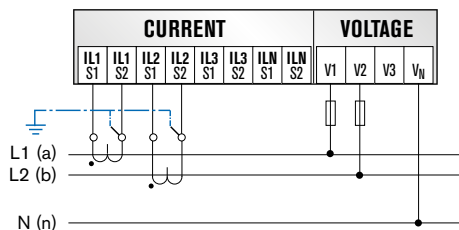
Connection type 1PH ML



8

Two-phase measuring, three conductors, unbalanced loads, without voltage transformers, with two current transformers.

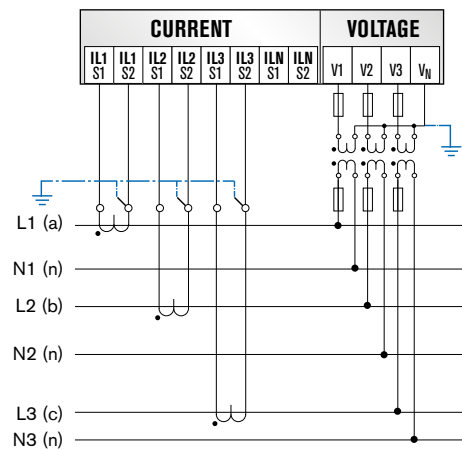
Connection type 2PH 3W



9

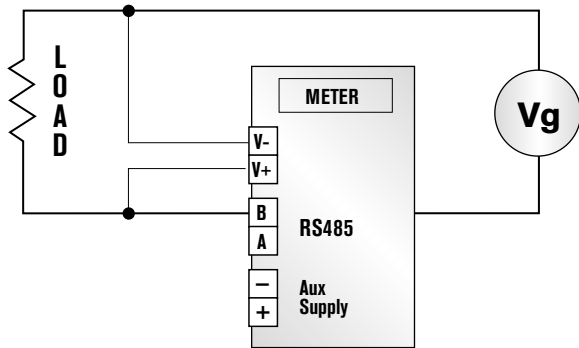
Single-phase measuring, two conductors, with voltage transformers, with three current transformer.

Connection type 3X1PH



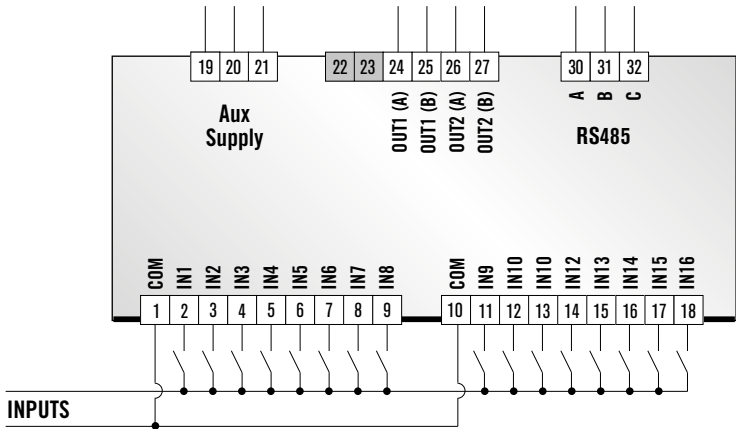
NETWORK ANALYZERS

EMT-1C/50 | EMT-1C/300



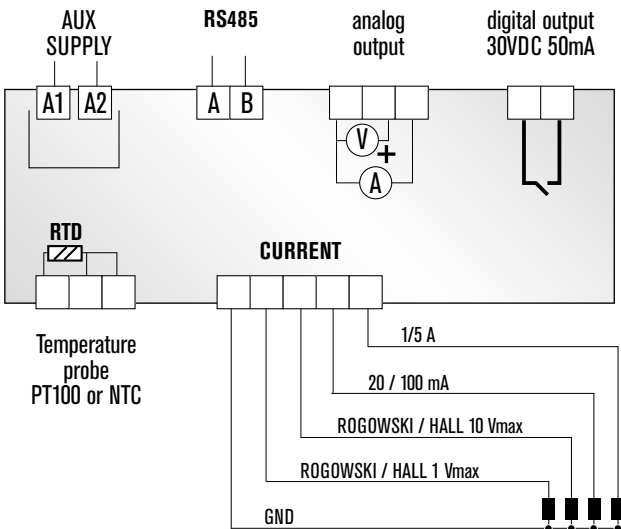
DATA CONCENTRATOR

EML-16

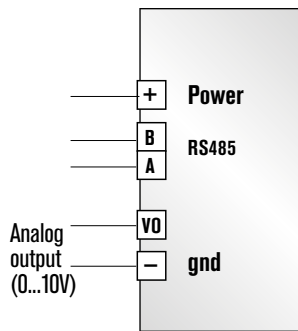


CURRENT ANALYZERS

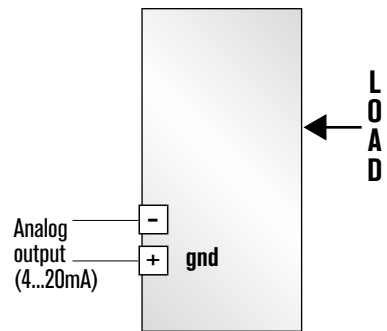
EMU-2it



TTC-V



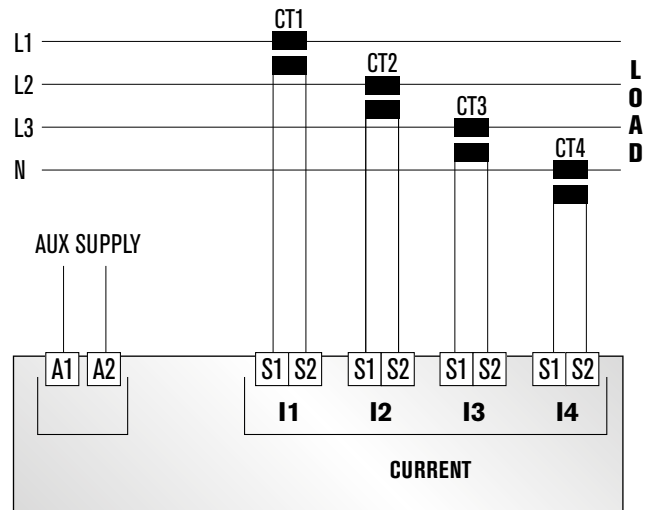
TTC-I



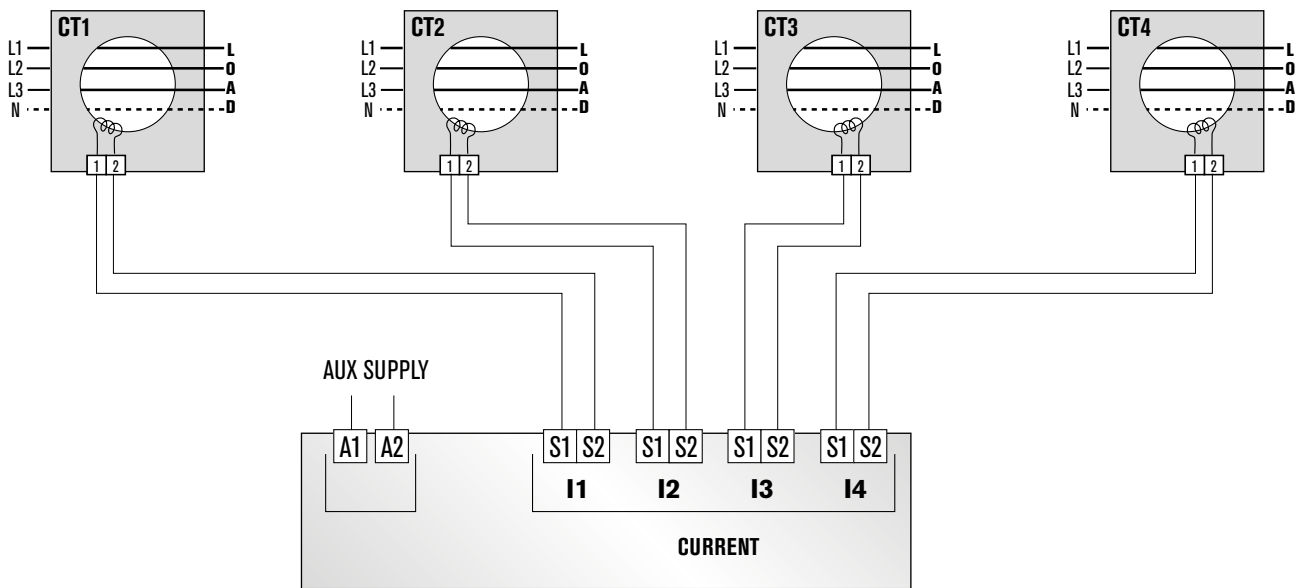
CURRENT ANALYZERS

ELM-4

CURRENT INPUTS VIA EXTERNAL CT



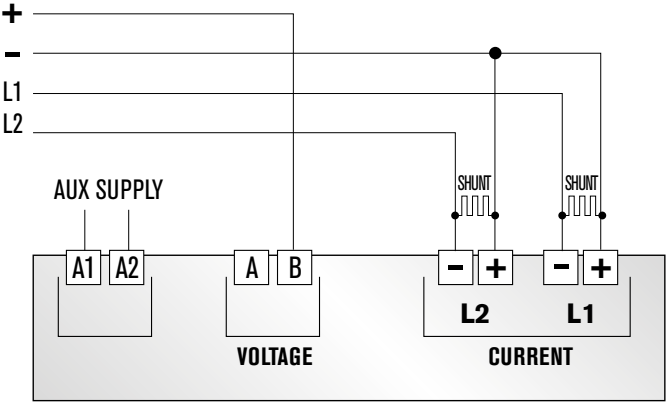
DIFFERENTIAL CURRENT INPUTS



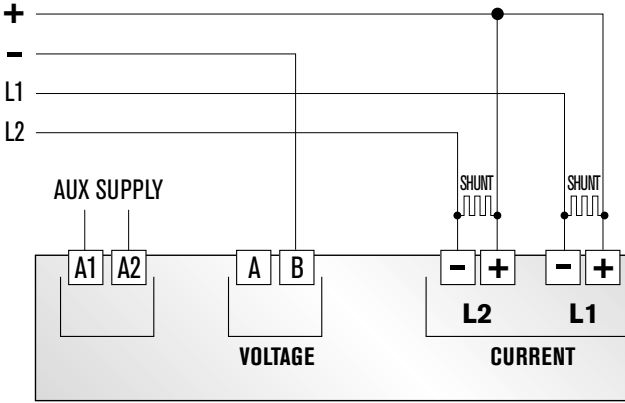
POWER METERS FOR DC NETWORKS

EMM-4DC | EMM-2d4c

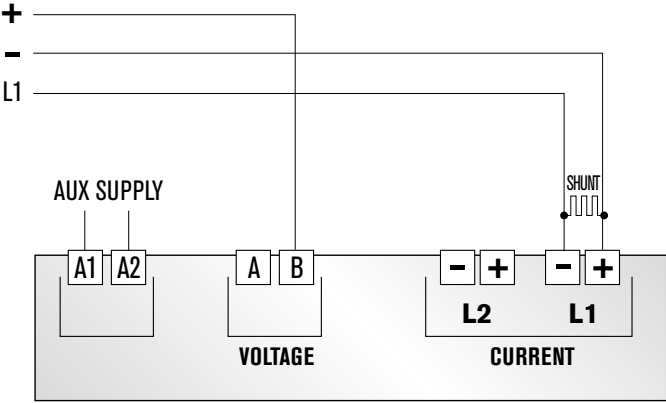
2 SHUNT INPUTS / NEGATIVE COMMON



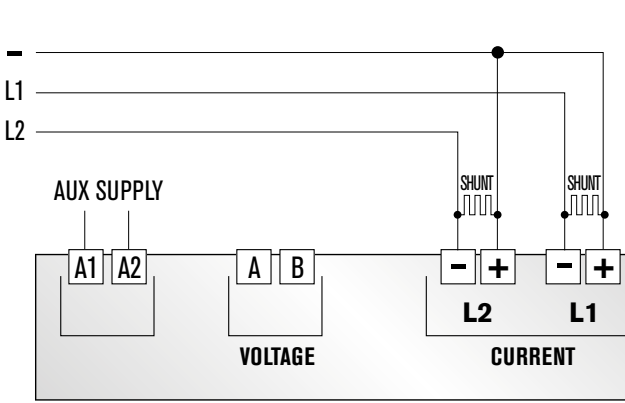
2 SHUNT INPUTS / POSITIVE COMMON



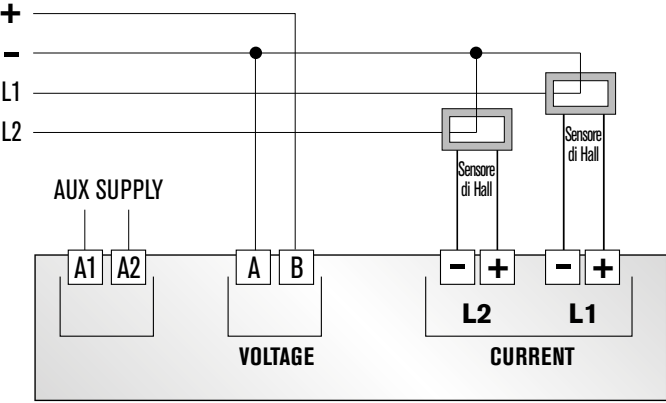
1 SHUNT INPUT / NEGATIVE COMMON



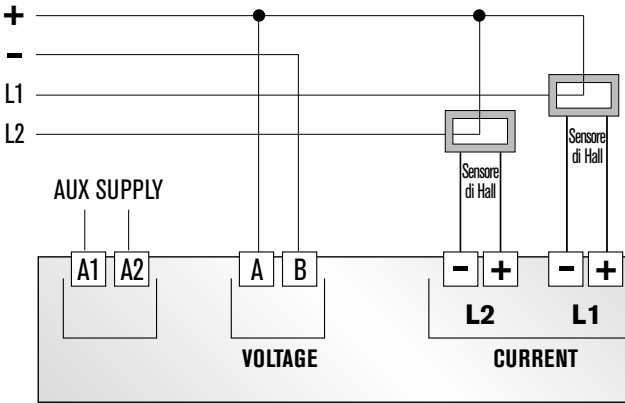
ONLY SHUNT INPUTS



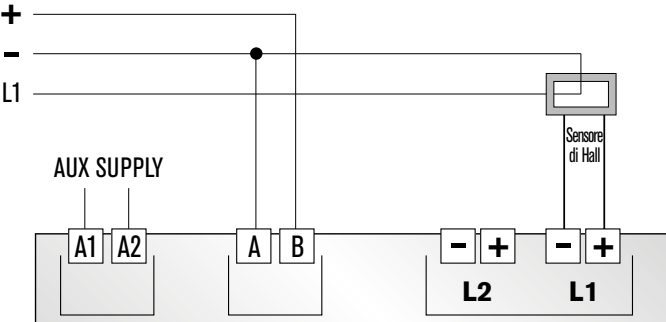
HALL SENSOR INPUTS / NEGATIVE COMMON

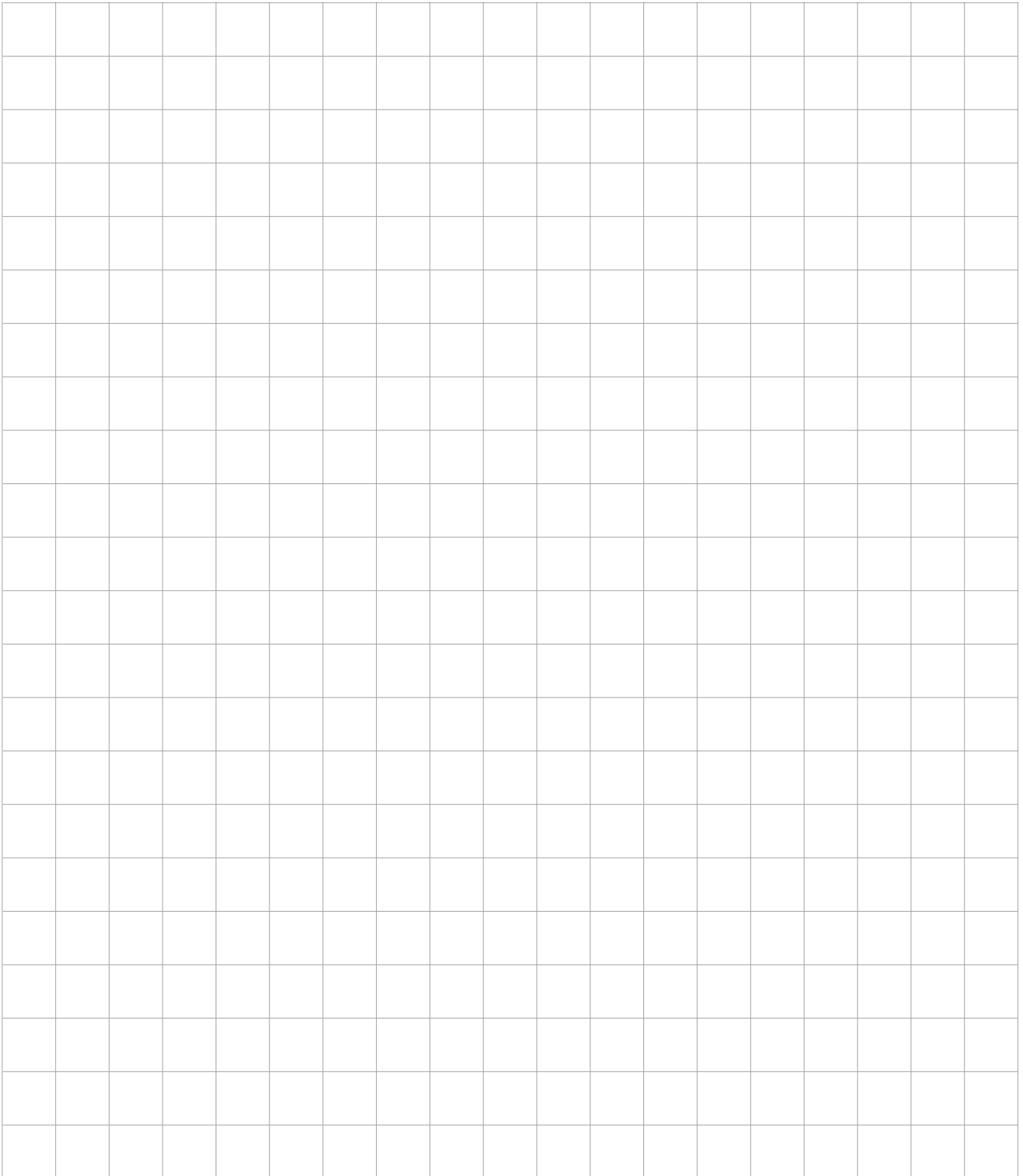
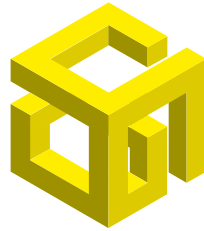


HALL SENSOR INPUTS / POSITIVE COMMON



1 HALL SENSOR INPUT / NEGATIVE COMMON





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