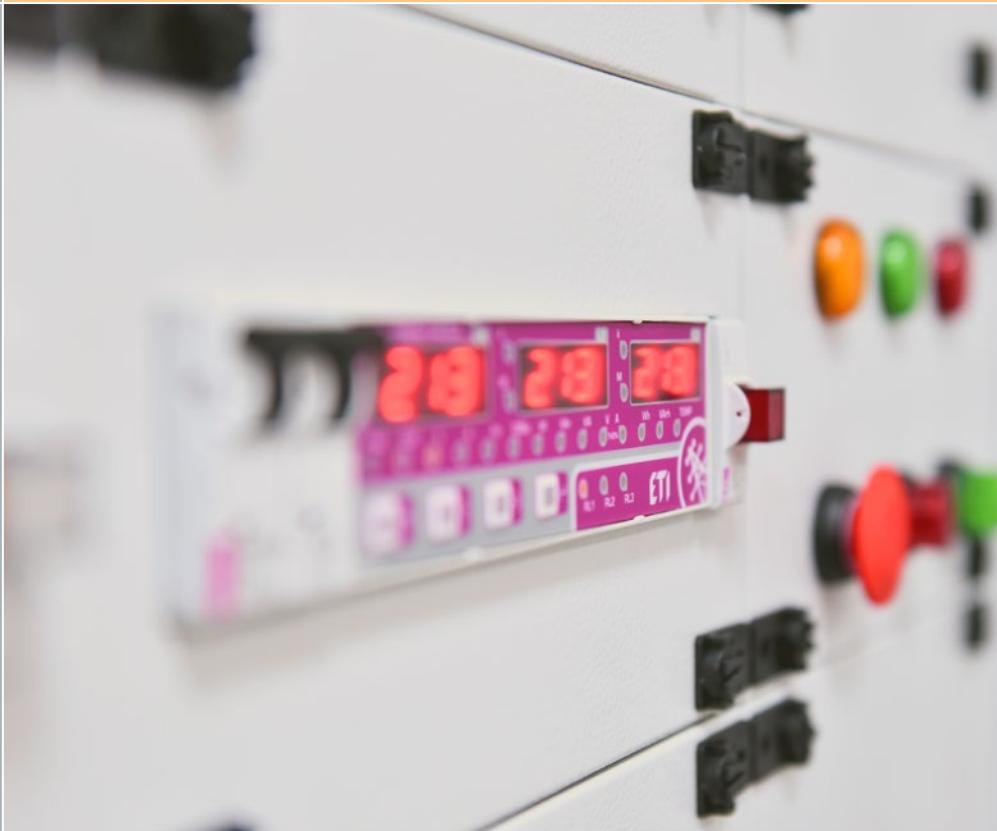


# ETIMETER

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ETIMETER

## NETWORK ANALYZERS



## Network Analyzers

### Network Analyzer END20LRS

END20LRS is distinguished by a high measurement accuracy, legible backlight LCD display and an attractive price in relation to offered measuring functions. It is the ideal tool to control and monitor energy quality parameters and energy consumption in all industry branches, public utilities or in public service buildings.

**Application -** The END20L-RS mains analyser is designed to monitor electrical parameters and quality in three-phase or single-phase low and high voltage networks. The analyser provides accurate measurements of all types of electricity and has a wide range of options for setting the parameters displayed on the screen. The analyser can be connected both directly and via current and voltage transformers. Modbus protocol and pulse output for electricity meters are used for data transfer.

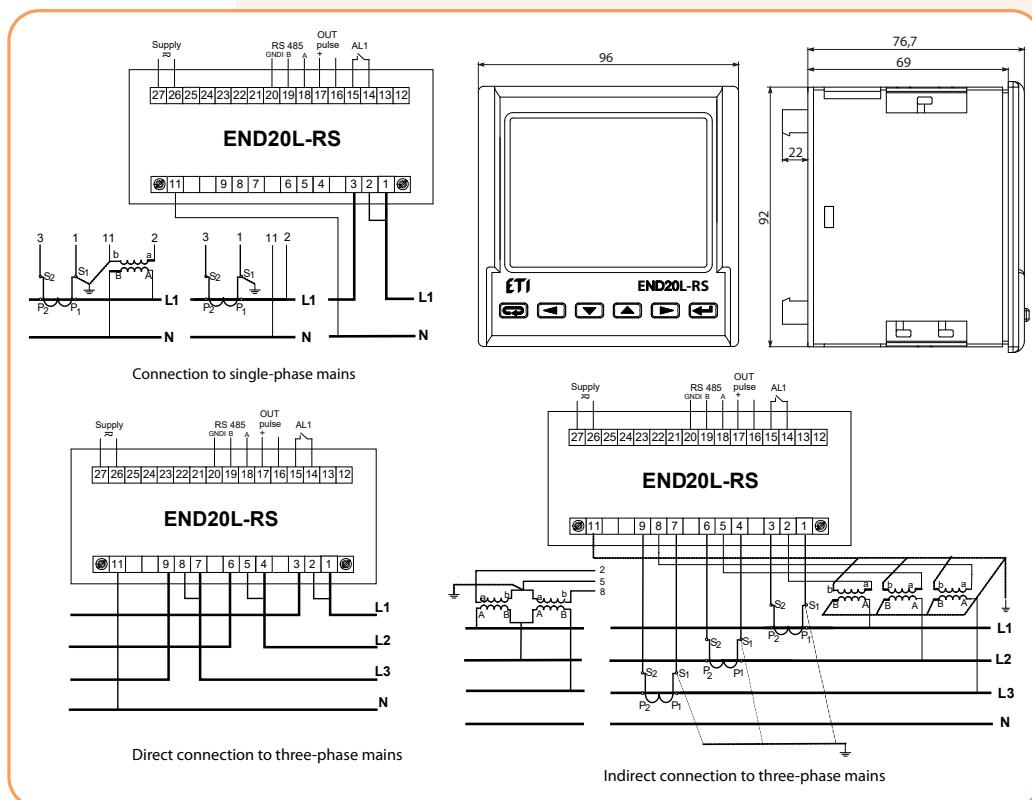


#### Network Analyzer END20LRS

Type	Description	Code	Weight [g]	Packaging [pcs]
END20LRS	Analyzer with RS485 port	004656950	500	1

#### Features and measurements

- power network parameters in 4-wire balanced and unbalanced systems,
- Measurement of current and voltage THD distortion coefficients;
- indications considering values of programmed ratios,
- backlight LCD 3,5" screen,
- digital transmission to the master system through the RS-485 interface (MODBUS RTU).
- protection grade from the frontal side: IP65
- high accuracy class,
- 1 x relay output for alarm and 1x pulse output
- programmable output relay;
- W-WH-VA-VAR-VARH power measurement;
- function for measuring the maximum consumption of each phase;
- password protection



## Network Analyzers

Technical data	
	END20LRS
Power supply voltage	85 - 253V AC / 90 - 300V DC
Measurement voltage phase, AC	2,8 - 276V AC
Measuring voltage linear, AC	5 - 480V AC
Measured current	0,002 - 6000 A
Nominal Frequency	47 - 63 Hz
Maximum power input	6 VA
Maximum current input consumption	0,05 VA
Maximum voltage input consumption	0,05 VA
Relay output	potential-free 1 NO (0,5A, 250V AC)
Counter pulse output	NPN (18-27V, 10-27mA), 1000 - 20000 imp/kW
Communication protocol	RS-485 (Modbus RTU)
Communication speed	4.8 / 9.6 / 19.2 / 38.4 kB
Operating temperature	-25 ... +55 °C
Overvoltage Category	300 V, III
Pollution degree	II
Protection degree	IP65 - front panel; IP20 - from the connection side
Dimensions H x W x D	96 x 96 x 77 mm
Installation opening H x W	92,5 x 92,5 mm
Standards	EN 61010-1, 61326-1, 61000-6-4

## Network Analyzer END25RS and END25ETH

END25RS and END25ETH meters measure important electrical parameters in 3 phase 4 wire, 3 phase 3 wire and 1 phase 2 wire network. It measures electrical parameters like active / reactive / apparent energy , power and all basic parameter. The instrument has two optional outputs. It can be configured as pulse output for energy measurement, limit output, timer function and RTC relay.

END25RS is basic instrument with RS485 interface (MODBUS RTU) and 2 programmable outputs (Potential free, very fast acting relay contacts. Configurable as pulse output which can be used to drive an external counter for energy measurement. Configurable as limit (alarm) switch).

END25ETH is more advanced instrument, with ETHERNET interface (MODBUS TCP/IP), real time clock and data logging (8MB memory).

All devices can be configured and monitored via PC with free econ software.

### Network Analyzer END20LRS

Type	Description	Code	Weight [g]	Packaging [pcs]
END25RS	Analyzer with RS485 port and 2x relay outputs	004656951	400	1
END25ETH	Analyzer with ETHERNET port, RTC and 8MB memory (data logging).	004656952	400	1

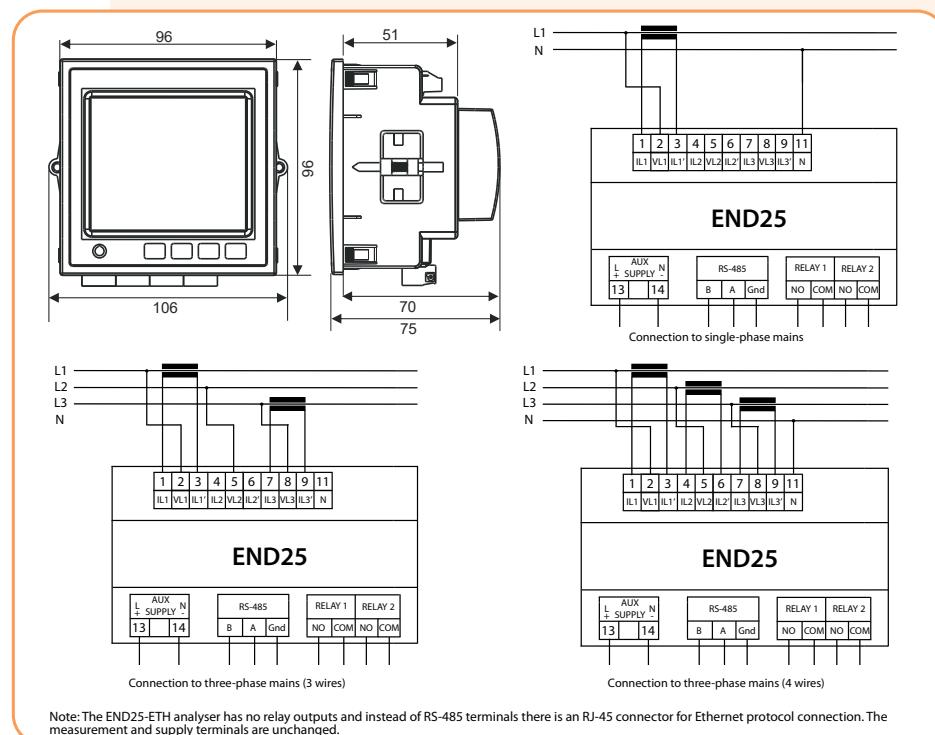
### Features

- Measurement of 85 parameters, THD and harmonics up to 31st for voltage & current
- Fully configurable LCD screen - possibility of programming 28 independent screens
- Two optional outputs (END25RS only). It can be configured as pulse output for energy measurement , limit output and timer function
- RTC - real time clock (END25ETH only)
- Measurement archive – in-built 8MB Flash (END25RS only)
- Data logging for:
  - event logging
  - time based logging
  - load Profile logging
- LCD display with Back-light
- Remote access of measured parameter via RS-485 (Modbus RTU) or through Ethernet interface (Modbus TCP/IP)
- external dimension: 96 x 96m



## Technical data

	END25-RS	END25-ETH
Power supply voltage	100 - 550V AC/DC	
Measurement voltage phase, AC	57,7 - 346,4V AC	
Measuring voltage linear, AC	100 - 600V AC	
Measuring current (primary winding)	1 / 5 A	
Measuring current (secondary winding)	1 - 9999 A	
Nominal Frequency	45 - 65 Hz	
Voltage measuring range	20 - 120 % of $U_n$	
Current measuring range	1 - 120 % of $I_n$	
Maximum current/voltage input consumption	<0,3 VA	
Relay output	potential free, 2 NO (5A, 240V AC)	-
Communication protocol	RS-485 (Modbus RTU)	Ethernet (Modbus TCP/IP)
Communication speed	4.8 / 9.6 / 19.2 / 38.4 / 57,6 kB	-
Operating temperature	-10 ... +60 °C	
Overvoltage Category	III	
Pollution degree	II	
Protection degree	IP54 - front panel; IP20 - from the connection side	
Dimensions H x W x D	96 x 96 x 75 mm	
Installation opening H x W	92 x 92 mm	
Standards	EN 61010-1-2010, 61326-1, 61000-4-3, 60529, 62053	



## Network Analyzers

### Network Analyzer ENA3, ENA3D

#### Application

Three phase network analyzer is intended for measuring electrical parameters of various loads in industry such as voltage, current, power factor ( $\cos \varphi$ ), power (W, VAr, VA), single and total harmonic distortion V-I, work hours, ambient temperature. Available in two versions, ENA3 for door mounting and ENA3D for DIN-rail mounting. Display integrated in device shows parameters for each phase separately. 3 independent programmable contact free output relays can be set up for different alarms. Programming is possible directly on device or with connecting to PC by using communication adapter SCUSB485 and free monitoring software not included in package, available on web.

#### Network Analyzer

Type	Description	Code	Weight [g]	Packaging [pcs]
ENA3	3-phase network analyzer for panel mounting	004656578	760	1/30
ENA3D	3-phase network analyzer for DIN-rail mounting	004656579	630	1/40

Communication adapter SCUSB485 is not included and must be ordered separately under reference code: 004656577

#### Technical data

		ENA3	ENA3D
Supply voltage AC $\pm 10\%$	V ~	3x400 + N, 230 L/N	
Nominal Frequency	Hz	50 - 60 (45 - 65)	
Power consumption (max. AC)	VA	4	
Rated Current ( CT )	A	5/1...50000	
Immunity Time For Microbreakings	ms	< 50ms	
Display Type	-	3 Display - 4 Digit - 7 Segment	
Measuring Type	-	True RMS	
Cos $\varphi$ (L/L)	-	0.00 ... 1.00 $\pm 1\%$	
Voltage (N/Lx)	VA ~	100 ... 280 $\pm 1\%$	
Voltage (L/L)	VA ~	180 ... 490 $\pm 1\%$	
Current (CT)	A	0.05 ... 5.5 $\pm 0.5\%$	
Active Power (Lx)	W	Class 1	
Reactive Power (Lx)	VAr	Class 1	
Apparent Power (Lx)	VA	Class 1	
THD of Volt or Current	%	0 ... 255	
Work Hours	h	0 to 9999 (with multiplier)	
Ambient Temperature	°C	0°C...+60°C ( / °F )	
Working temperature	°C	-20 ... +60	
Storage temperature	°C	-30 ... +70	
Electrical Insulation	kV	4	
Oversupply Category	-	II	
Protection degree	IP	41 Front Cover - 20 Terminal Block	
Pollution degree	-	2	
Relative Humidity w/o cond.	%	95	
Altitude up to	m	2000	
Weight	g	680	550
Dimensions	mm	149 x 149 x 60	157 x 89 x 60
Standards	-	2006/95/EC - Low Voltage, 2004/108/EC - EMC	

#### Advantages

- 3 independent programmable alarm relay outputs (NO)
- Programmable alarm relay (Under-/Oversupply - Overvoltage - Overcurrent - Frequency - Low power factor Cos $\varphi$  - Total harmonic distortion)
- 144x144 panel mounting or 9 modules DIN
- Self-extinguished material UL94 VO

#### Measurements

- Power factor cos $\varphi$  inductive & capacitive (four quadrants)
- Three phase voltage & current
- Power: W - WH - VA - VAR - VARH
- Single and total harmonic distortion (THDs) V/I
- Working hours
- Ambient temperature

#### Communication

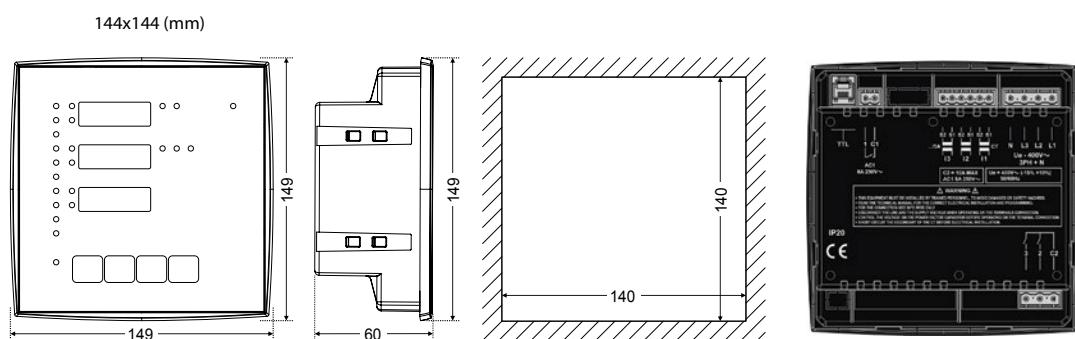
- serial interface: TTL, RJ11 connector
- protocol: Proprietary / MODBUS RTU



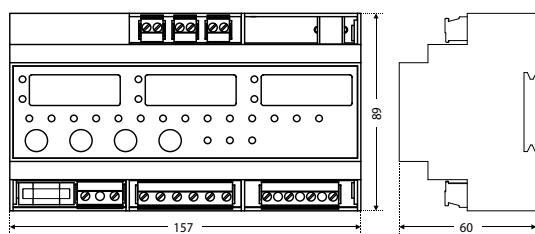
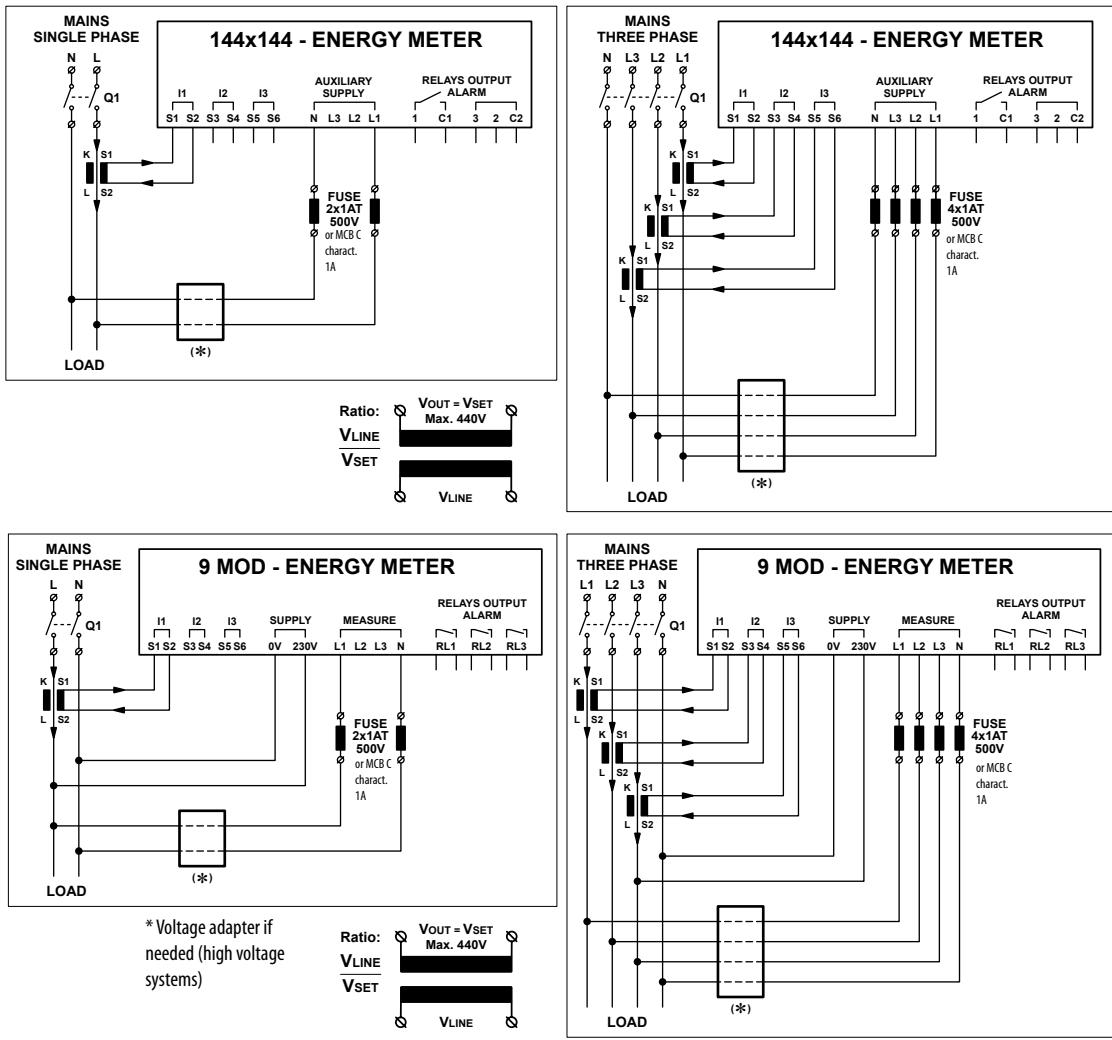
ENA3



ENA3D

**Dimensions**

9 MOD (mm)

**Wiring Diagrams**

## Network Analyzers

### Adapter TTL<>USB<>RS485

Type	Description	Code	Weight [g]	Packaging [pcs]
SCUSB485	Adapter TTL<>USB<>RS485	004656577	390	1/30

Interface converter TTL > USB <> RS485 can be used with ENA3, ENA3D or PFC 8 DB, PFC 12 DB.  
Software(monitoring and programming via PC) and drivers available (free) for Windows on ETI webpage

#### Features

- Self-extinguished material UL94 v0)
- USB and RS-485 serial interface with cables
- Surge protection on RS-485 line
- Connect remote serial device to a PC
- Power and data flow indicator for troubleshooting
- The RS-485 standard supports half-duplex (2 wire)
- Real time transfer ASCII protocol
- Compact size - 2 module - 35mm
- DIN rail mounting EN 50 022

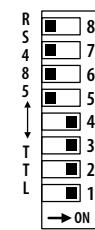
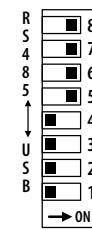
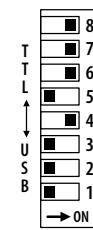
#### RoHS



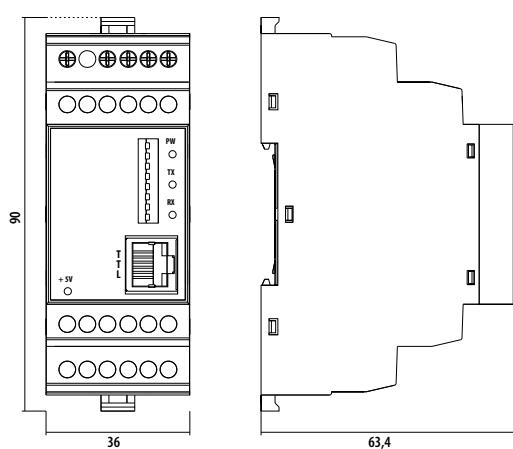
#### Technical data

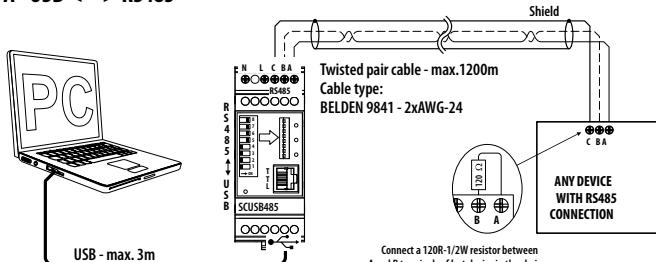
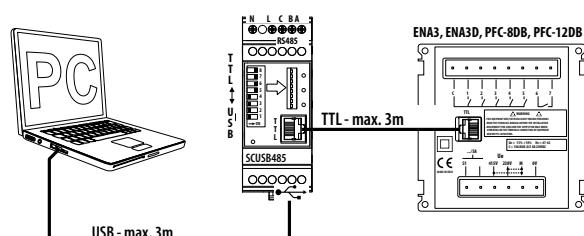
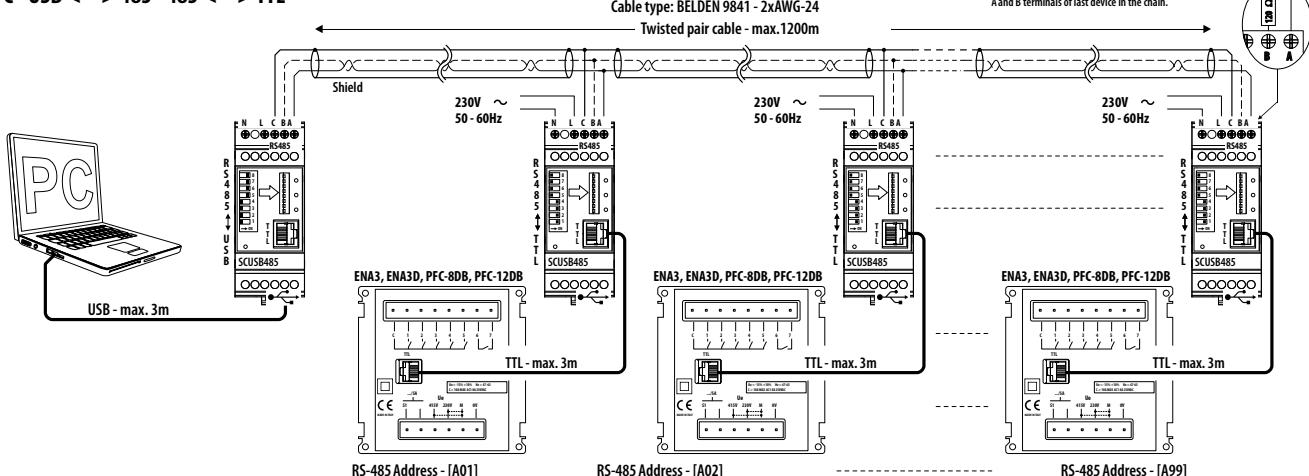
Supply voltage AC -15/+10 %	V ~	230
Nominal Frequency	Hz	50 - 60 (range 47 - 63)
Power consumption (max. AC)	VA	0,5
Serial Interface	-	1 USB + 1 RS-485
Protocol Type	-	Owner - Modbus RTU - ASCII
Baud Rate	kbit/s	≤ 115,2
Max device connection (TTL/RS-485)	V ~	1...99
Working temperature	°C	-10 /+50
Storage temperature	°C	-30 /+70
Electrical Insulation (USB_TTL/RS485)	kV	1
Electrical Insulation (N_L/RS485)	kV	3
Overtoltage Category	-	II
Protection degree	IP	20
Pollution degree	-	2
Relative Humidity w/o cond.	RH %	95
Altitude up to	m	200
Weight	g	95
Dimensions	mm	90 x 36 x 63,4
Standards	-	2006/95/EC, 2004/108/EC

#### DIP-switch configuration



#### Dimensions



**Wiring Diagrams****A - USB <---> RS485****B - USB <---> TTL****C - USB <---> 485 - 485 <---> TTL**

Download Software and Driver on Website: [www.etigroup.eu/support](http://www.etigroup.eu/support)

**Network Analyzer ENA33LCD****Description**

The power line analyser for accurate monitoring of main electrical parameters in three-phase or single-phase networks. The instrument measures continuous voltage and current according to the norm EN 61000-4-30. Thanks to precise measurement and a high sampling rate, it is also ideal for particular measuring points in electrical energy monitoring systems. Integrated communication interface RS485 with Modbus RTU protocol allows using it as a measuring point in SCADA systems.

**Universal Analyzer**

Type	Description	Code	Weight [g]	Packaging [pcs]
ENA33LCD	Panel mounting 96x96	004656910	460	1

## Network Analyzers

**Advantages**

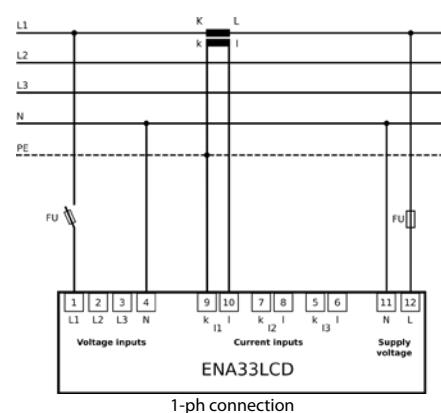
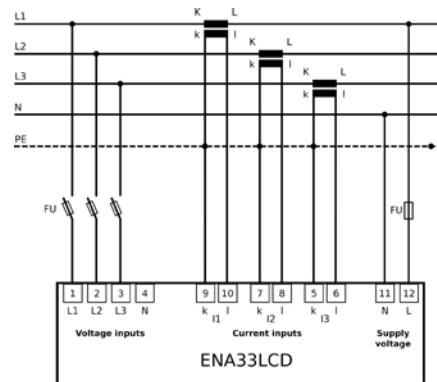
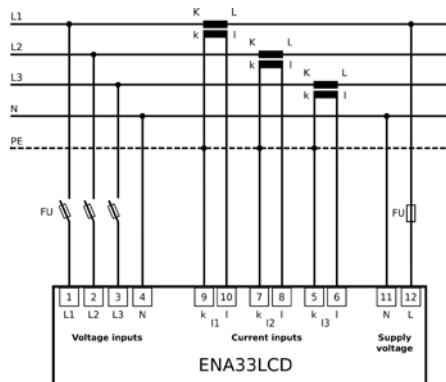
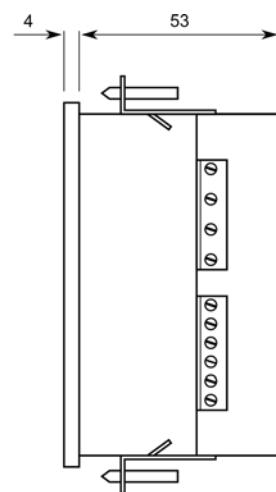
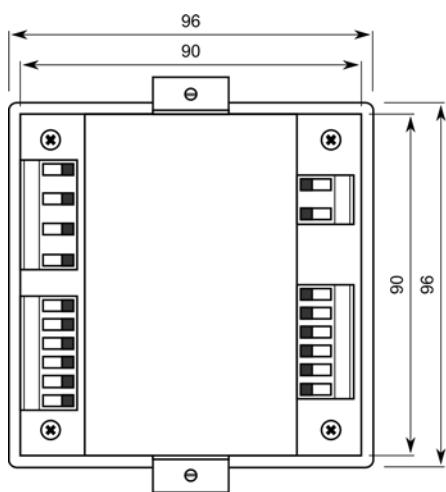
- TN, TT, IT (virtual N) 3 phase networks
- 3 voltage and 3 current inputs
- calculated current of neutral wire
- continual sampling frequency 6,4 kHz
- THD U and THD I measurement
- odd harmonics of U and I till 19th order (L1, L2, L3)
- power factor (L1) and cosφ (L1, L2, L3)
- P+/-, Q+/-, S (L1, L2, L3,  $\Sigma$ )
- E active +/-, E reactive L+/-, E reactive C+/-
- measurement according the standard EN 61000-4-30
- measuring phase-phase voltage from 0 ... 520 VAC
- memory for maximums / minimums of avg values
- memory for recording of last 20 supply voltage interruptions
- real-time clock with supercap backup
- communication interface RS485 with Modbus RTU protocol

**Measured parameters**

Parameter	L1	L2	L3	L1-L2	L2-L3	L3-L1	$\Sigma$ L1-L3	Max	Min	Avg	Measuring range	Displayed range	Accuracy
Phase voltage, L - N	●	●	●				●	●	●	●	10 ... 600 V	0 ... 1 MV	±0.2 %
Line voltage, L - L				●	●	●	●	●	●	●	18 ... 1000 V	0 ... 1 MV	±0.2 %
Frequency	●						●	●	●	●	40 ... 70 Hz	40 ... 70 Hz	10 mHz
Current	●	●	●				●	●	●	●	0.01 ... 6 A	0 ... 1 MA	±0.2 %
cosφ	●	●	●				●	●	●	●	0.01 L ... 0.01 C	0.01L ... 0.01C	±1 %
Power factor	●	●	●				●	●	●	●	0.01 L ... 0.01 C	0.01L ... 0.01C	±1 %
THDU L-N	●	●	●				●	●	●	●	0 ... 999 %	0 ... 999 %	±5 %
THDU L-L				●	●	●	●	●	●	●	0 ... 999 %	0 ... 999 %	±5 %
Under and over deviation L	●	●	●				●	●	●	●			
Under and over deviation L-L	●	●	●				●	●	●	●			
Voltage unbalance u2, u0							●	●	●	●			
THDI	●	●	●				●	●	●	●	0 ... 999 %	0 ... 999 %	±5 %
TDD	●	●	●				●	●	●	●	0 ... 999 %	0 ... 999 %	±5 %
Voltage harm. (up to 40th)	●	●	●								0 ... 999 %	0 ... 999 %	cl. 1
Current harm. (up to 40th)	●	●	●								0 ... 999 %	0 ... 999 %	cl. 1
Voltage, current asymmetry							●	●	●	●	0 ... 100 %	0 ... 100 %	0.3 %
K-factor	●	●	●										
Current unbalance i2, i0							●	●	●	●	0 ... 99.9 %	0 ... 99.9 %	cl. 1
Active power	●	●	●				●	●	●	●	0 ... 15.3 kW	0 ... 999 MW	±0.4 %
Reactive power	●	●	●				●	●	●	●	0 ... 15.3 kvar	0 ... 999 MVar	±0.4 %
Apparent power	●	●	●				●	●	●	●	0 ... 15.3 kVA	0 ... 999 MVA	±0.4 %
Distortion power	●	●	●				●	●	●	●			±0.5 %
Active energy +/-	●	●	●								0 ... 999 GWh	0 ... 999 GWh	cl. 0.5
Reactive ind. energy +/-	●	●	●								0 ... 999 Gvarh	0 ... 999 Gvarh	cl. 2
Reactive cap. energy +/-	●	●	●								0 ... 999 Gvarh	0 ... 999 Gvarh	cl. 2
Temperature											-40 ... +125°C		1°C

**Technical data**

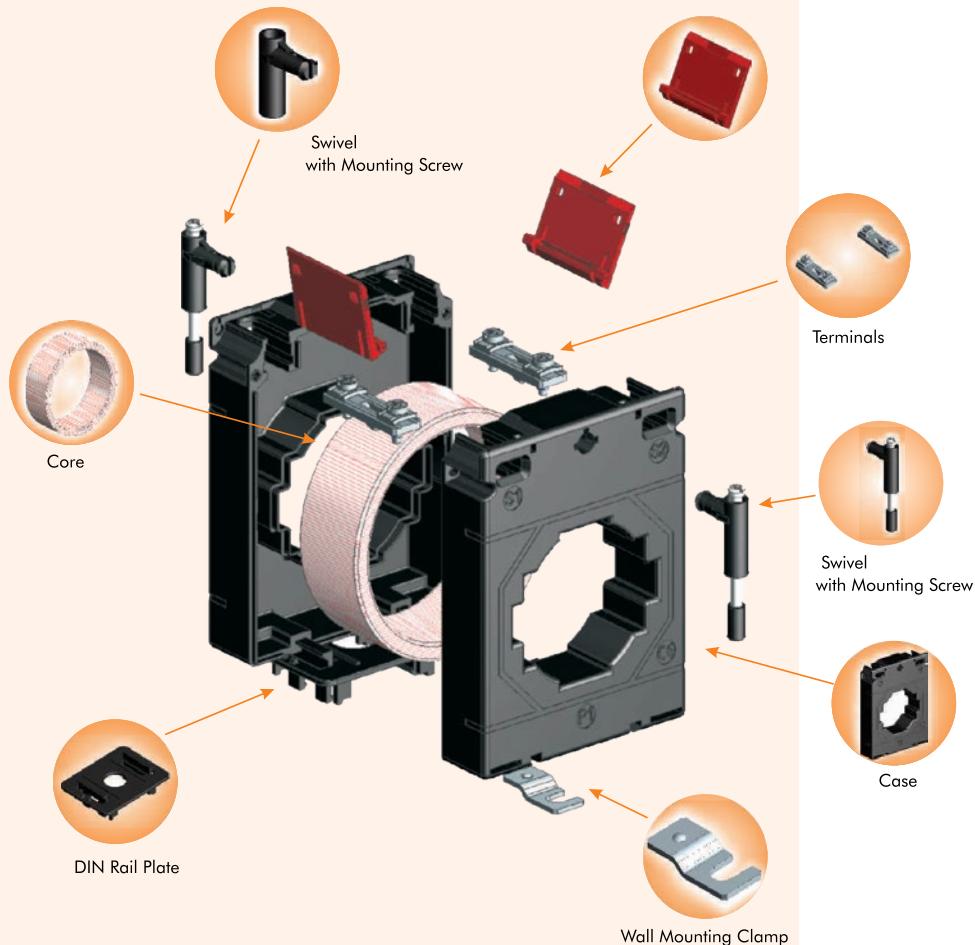
	ENA33LCD	
Supply voltage	VAC	85 ... 265
System frequency	Hz	50 / 60
Current measuring range	A	0.01 ... 8 A (max permanent current 10 A)
Voltage measuring range L - N	VAC	0 ... 600
Power consumption	VA	1,5
Sampling frequency 50/60Hz	kHz	25,6 / 30,72
Number of inputs / outputs	-	/
Primary voltage measuring transformer ratio		1 ... 750000
Primary current measuring transformer ratio		1 ... 10000
Maximum number of registered auxiliary supply power cuts		20
Communication port	-	RS485 insulated
Communication protocol	-	Modbus RTU
Communication speed	kBd	9.6 / 19.2 / 38.4 / 57.6 / 115
Overvoltage Category	V	300, III
Pollution degree	-	II
Protection degree	IP	IP20 rear panel / IP54 front panel
Dimensions H x W x D	mm	90 x 90 x 67
Panel cut-out dimensions	mm	92 x 92
Site depth	mm	90
Standards		EN 61010-1, EN 62586-1, EN 61000-6-2, EN 61000-6-3

**Dimensions**

## Metering Current transformers

## Metering Current transformers

## Advantages of Metering Current transformers



## Applications

- Balanced systems: network analyzers, automatic power factor correction systems (PFCs)

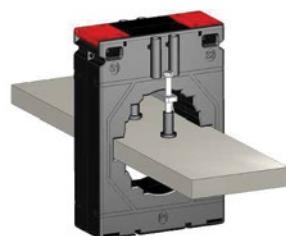
## Features

- Connection terminal with cover (IP20) for universal connection, no fork needed
- Bus bar or din rail mounting, included complete mounting set
- Standards: 61869-2

## Metering Current transformers - Single Phase

Type	Code No.	Primary/ secondary	Power [VA]	Accuracy class	Weight [g]	Packaging [pcs]
CTR-30 50/5 CL.1	004805500	50/5	1,25	1	365	1/63
CTR-30 100/5 CL.0,5	004805504	100/5	1,5	0,5	365	1/63
CTR-30 150/5 CL.0,5	004805507	150/5	3,75	0,5	365	1/63
CTR-30 200/5 CL.0,5	004805508	200/5	5	0,5	365	1/63
CTR-30 250/5 CL.0,5	004805509	250/5	5	0,5	365	1/63
CTR-30 300/5 CL.0,5	004805510	300/5	5	0,5	365	1/63
CTR-30 400/5 CL.0,5	004805511	400/5	7,5	0,5	365	1/63
CTR-30 500/5 CL.0,5	004805512	500/5	10	0,5	365	1/63
CTR-30 600/5 CL.0,5	004805513	600/5	15	0,5	365	1/63





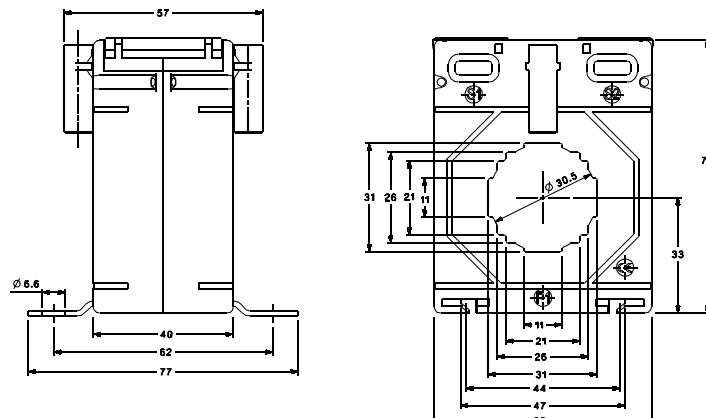
Busbar mounting



Wall mounting

Technical data	
Applicable Standard	IEC 61869, IEC/EN 60044-1, BS 3938
Case	10% glass filled polycarbonate, flame retardant grades classified UL 94V-0
Insulation Class	E (120°C max.)
System voltage	720V max.
Test Voltage	
For Ring (Window) type CT	4kV 50 Hz / 1 min.
For Wound type er	3kV 50Hz / 1 min.
Operating frequency	50Hz or 60Hz Rated Primary rating:- 1A to 7500A
Rated secondary output	5A standard (1A on request)
Ambient temperature	-20°C ... +45°C
Storage temperature	-50°C ... +80°C
Thermal short circuit current (Ith)	60 x In for Busbar type
Dynamic short circuit current (Idyn)	2.5 x Ith

## Dimensions



## Current Transformers (LV Indoor Application)

Accuracy Class	+ / - percentage current (ratio) error at percentage of rated current shown below					+ / - phase displacements at percentage of rated current shown below							
						Minutes				Centiradians			
	5	20	100	120		5	20	100	120	5	20	100	120
0.10	0.40	0.20	0.10	0.10	15	8	5	5	0.45	0.24	0.15	0.15	
0.20	0.75	0.35	0.20	0.20	30	30	10	10	0.90	0.45	0.30	0.30	
0.50	1.50	0.75	0.50	0.50	90	90	30	30	2.70	1.35	0.90	0.90	
1	3	1.5	1	1	180	180	60	60	5.40	2.70	1.80	1.80	

Limits of Current error and phase displacements for measuring current transformers (for special application)

Accuracy Class	+ / - percentage current (ratio) error at percentage of rated current shown below					+ / - phase displacements at percentage of rated current shown below								
						Minutes				Centiradians				
	1	5	20	100	120	1	5	20	100	120	1	5	20	100
0.2S	0.75	0.35	0.20	0.20	0.20	30	15	10	10	10	0.90	0.45	0.30	0.30
0.5S	1.50	0.75	0.50	0.50	0.50	90	45	30	30	30	2.70	1.35	0.90	0.90

Limits of Current error and phase displacements for measuring current transformers (Class 3 and 5)

Accuracy Class	+ / - percentage current (ratio) error at percentage of rated current shown below							
	3	5	3	5	3	5	3	5
3								
5								

Limits of phase displacement are not specified for class 3 and 5.

Limits of current error and phase displacements for Protection Class CT (5P and 10P)