QNA 500

New generation of modular power quality analyzers

Energy efficiency technology

QNA 500

New generation of modular power quality analyzers

The best e3 solution (electrical energy efficiency)

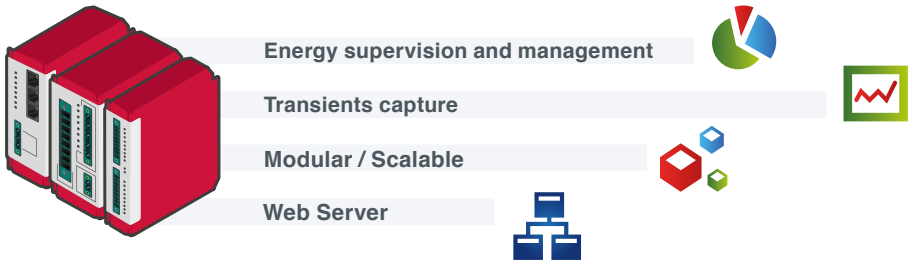
We help you to reduce costs of breakdowns and faults and increase your productivity.

The quality of the electrical supply in the facilities is a key factor in achieving productivity targets set by any company. Besides having a constant and stable power supply, it is important to monitor and to proceed in case something unexpected happens. A problem with the electric supply can set off a chain of events in an industry (or in the power distribution lines) that may lead to considerable economic losses.

CIRCUTOR has developed a new modular system of **CIRCUTOR** for supervising and controlling electrical facilities. **QNA 500** is the first product that **CIRCUTOR** has launched in the market for providing industries and utilities with the means to measure and analyze the power quality.

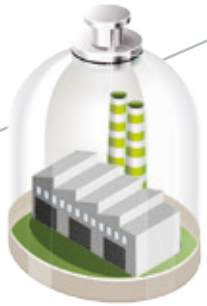
QNA 500 is designed to supervise the electric installation and problems relating to electric power quality so as to control production processes and manage incidents. It is easily integrated into SCADA applications and interacts with market PLCs, and so can form part of more global data acquisition systems and report information at any time to users that require it.

When using the **QNA 500** along with **CIRCUTOR PowerStudio** software, the user can create customised reports for assessing the correct running of the electric installation, with the possibility of applying standards such as the **EN-50160**, event tables **CBEMA**, **UNIPEDE** and others. By automating this information, the user can display the most important data needed for the relevant analysis with just one click .

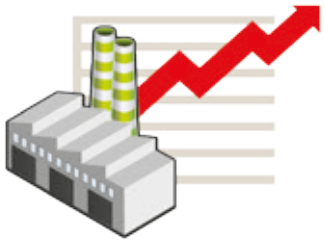


The new tool **for increasing productivity**

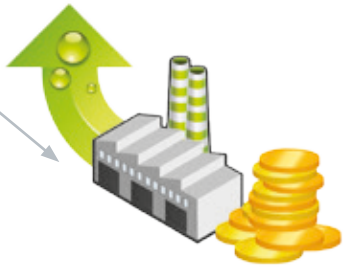
QNA500 helps you to achieve electric consumption objectives to fulfil requirements set by the **ISO Standard / EN 50001** for energy management systems (**EMS**) while simultaneously reducing energy costs.



Preventive measure for electric problems



Improved productivity



Improved energy efficiency. Achieves cost and time savings

Main **features**

- Logs the main electrical parameters, disturbances, and transients
- Accuracy when measuring and analysing the installation
- Real time monitoring and supervision
- Incident log
- Customisable transients capture
- Modular and scalable Expandable up to 5 modules (measurement, input and outputs, etc.)
- Alarms and reports
- Central information management
- Integrated web server & webMail
- Distributed intelligence (Smart Grids)
- Data hub: Multi-port, multi-protocol and multi-access
- Assembly on DIN rail or panel base

* For more information consult the CIRCUTOR EMS Solutions catalogue

QNA 500

New generation of modular power quality analyzers

System

BASE

Base module. Connected modules switch.

Power supply and 3 communications ports:
RS232+ RS485 + ETHERNET

+

QNA 500

Power quality analyzers

Voltage and current measurement and management of all electrical parameters.

+

8iO

Load and alarm control

Management of 8 digital inputs and 8 digital outputs for: **centralisation of impulses, alarm management and load control.**

Several alarm setup combinations:

- Electric variables
- Digital values (several I / O)
- Time variables
- Quality events
- Arithmetical combinations (AND, OR, etc.)

MAXIMUM INTELLIGENCE

Every module is SMART

- CPU
- Memory
- Ethernet
- Processing and distributed decision making

EXPANDABLE system

- Interconnection of several power quality analyzers
- Connection of additional modules
- Remote updating via FTP and WEB

Over 500 parameters

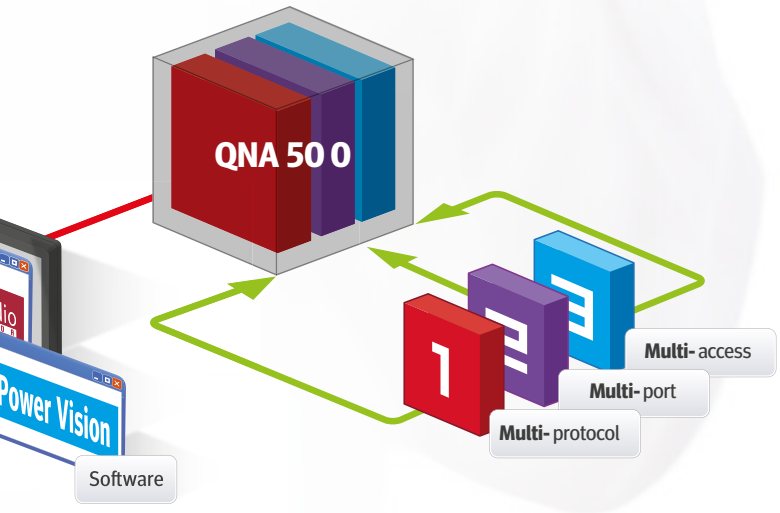
- Voltage and current measurement
- Active and reactive power
- Maximum demand
- Energy (4 quadrants)
- THD and harmonics
- Interharmonics
- Flicker
- Imbalance
- Events and transients

Total supervision

- 5 voltage channels
- 5 current channels
- 2GB internal memory
- Centralisation of energy pulses
- Load management
- Analysis in accordance with EN50160

Transients capture

- 512 simultaneous samples/cycle per channel
- Disturbance detection and logging (>39µs)
- Configurable triggers (pre and post trigger)
- Detection by wave variation and by RMS value



Equipped with **MULTIFIT** system

New **CIRCUTOR** system consisting of 3 important cores:

1. **MULTI-PROTOCOL**
   Modbus/RTU. Modbus/TCP, Web, ZMODEM, COMTRADE
2. **MULTIPORT**
   RS-232, RS-485 and ETHERNET
3. **MULTI-ACCESS**
   WEB server
   FTP server

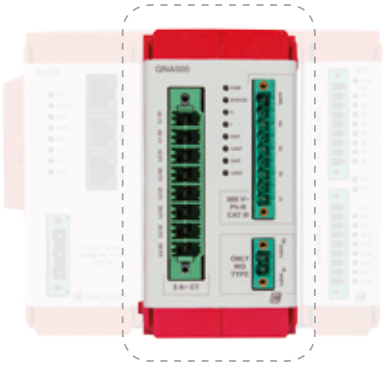
QNA 500

QNA500

Modular power quality analyzer

QNA500 is a modular power quality analyzer designed to measure and record the main electrical parameters and transient disturbances. The measurement is taken as a true effective value (TRMS) by 5 AC voltage inputs and 5 AC current inputs. (4 via current transformers /5 A and 1 earth leakage current input via earth leakage transformers).

With the **CIRCUTOR PowerStudio SCADA** software, the user can configure customised reports to assess the correct running of the electric installation, and can apply standards such as the **EN-50160**, event tables **CBEMA**, **UNIPEDE** and others. By automating this information, the user can display the most important data needed for the relevant analysis with just one click .



SNTP time synchronisation (1 ms resolution)

Measurement in accordance with IEC 61000-4-30, class A and class S

- 24 bit A/D transducer
- Measurement of 5 voltage channels (3P + N + G) and 5 current channels (3P + N + Id)
- 512 simultaneous samples/cycle per channel
- Internal battery to guarantee operating without power supply

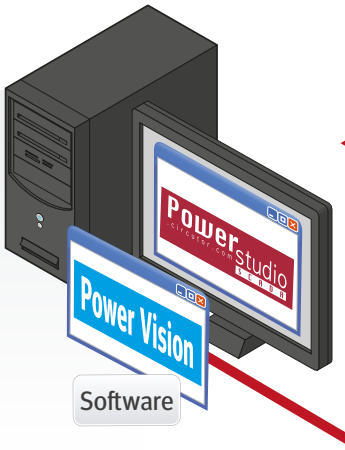
Communications

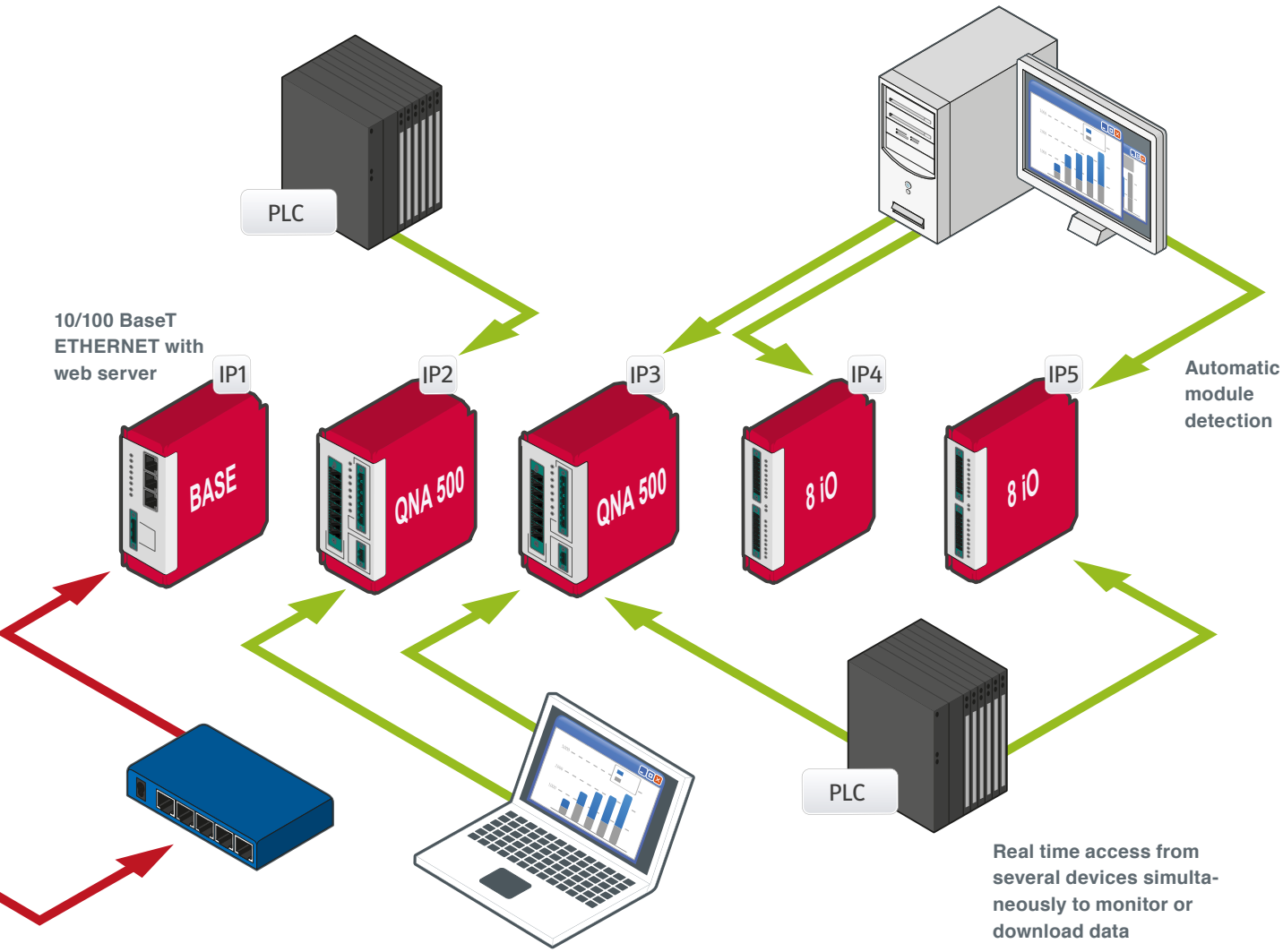
Multi-ports and Multi-communications

Based on a multi-ports and multi-communications system that enables integration of the modules into any SCADA platform while other users have real time access for monitoring or downloading information stored in the memory.

Other access interface

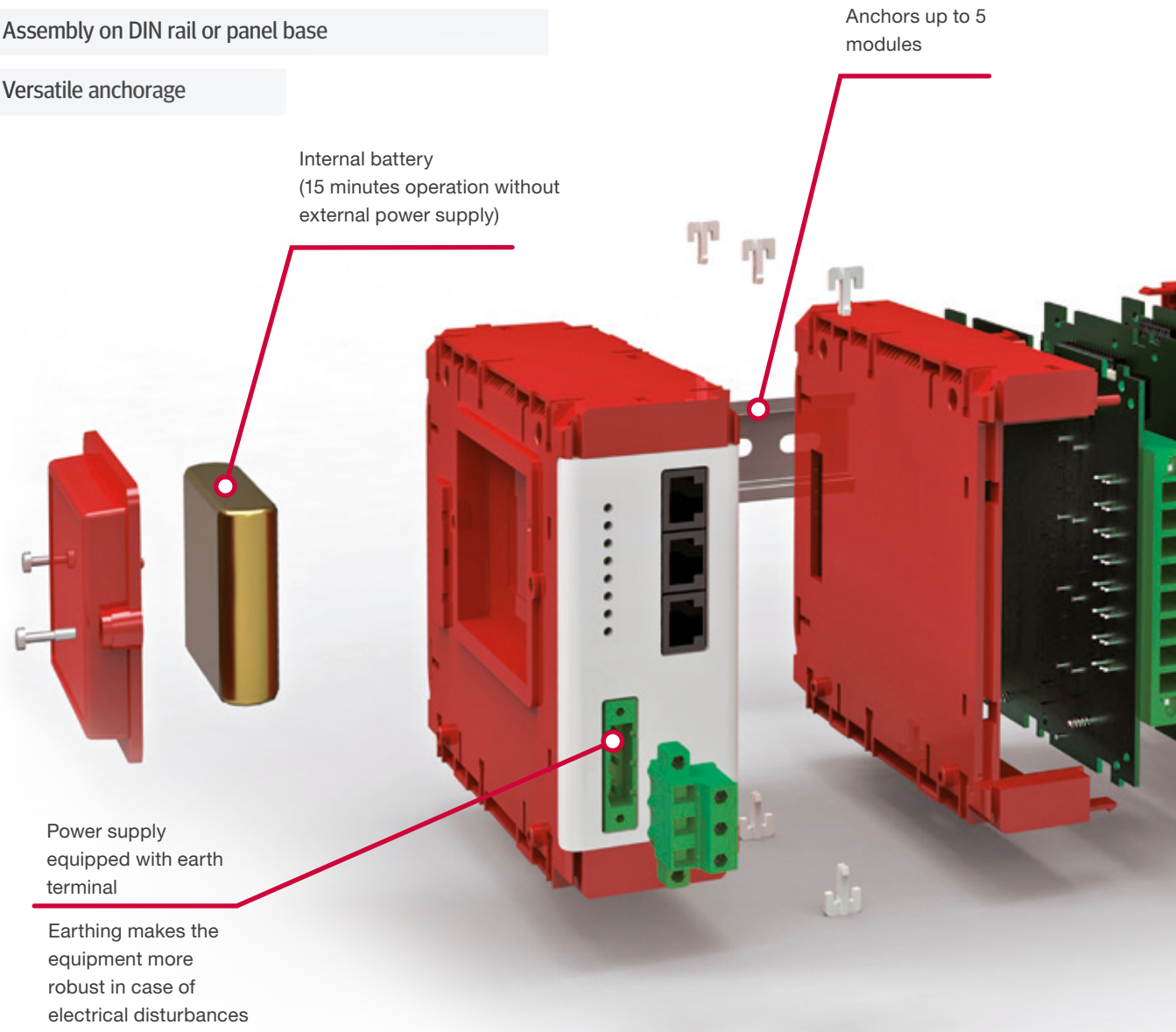
- User from computer
- PLC
- MODBUS RTU
- MODBUS TCP
- ZMODEM
- CIRBUS
- FTP
- Web Server
- XML (for configuration)




PLC
10/100 BaseT
ETHERNET with
web server
IP1
IP2
IP3
IP4
IP5
BASE
QNA 500
QNA 500
8 iO
8 iO
Automatic
module
detection
PLC
Real time access from
several devices simulta-
neously to monitor or
download data

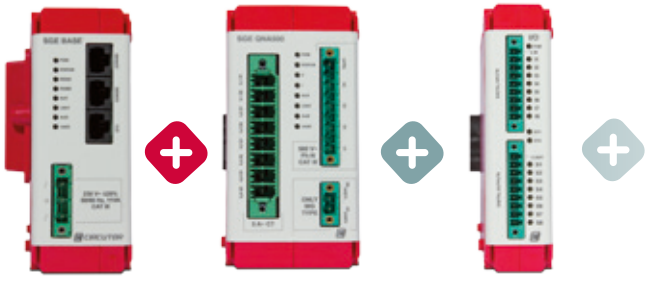
Smart design

- Assembly on DIN rail or panel base
- Versatile anchorage



Modular and **Scalable**

- Expandable up to 5 modules (measurement, input and outputs, etc.)
- Independent modules (distributed intelligence)
- Independent IP addresses
- Combinable functions (electrical measurement + energy automaton + power control)



Base **QNA 500** **8iO** Expandable

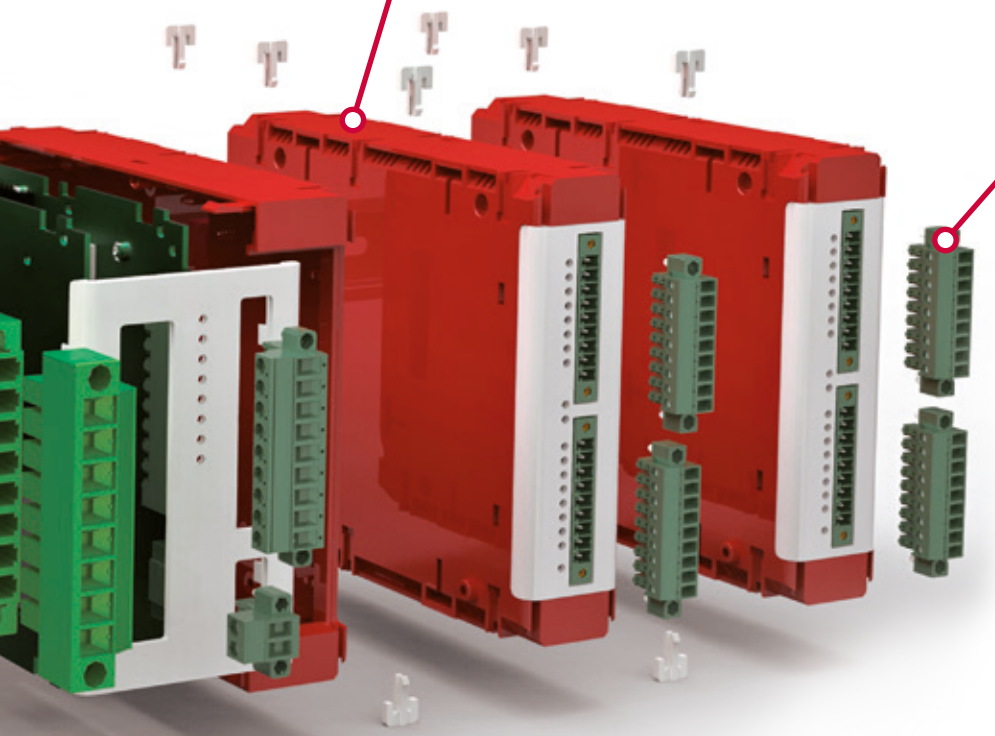
SMART concept.

TOTAL autonomy
in each model

High electrical
resistance
connectors

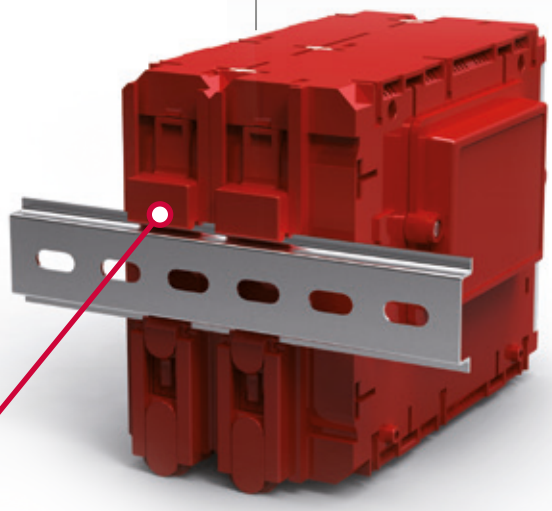
CE

UL



Other features

- Cable section <4 mm² for current measurement
- Light indicators to facilitate correct installation
- Integrated earth connection



RoHS

- **CIRCUTOR,** also complies with other certifications such as the **RoHS, for management of restricted substance management**

ROBUST fastening
Inter-changeable on
DIN rail or panel base

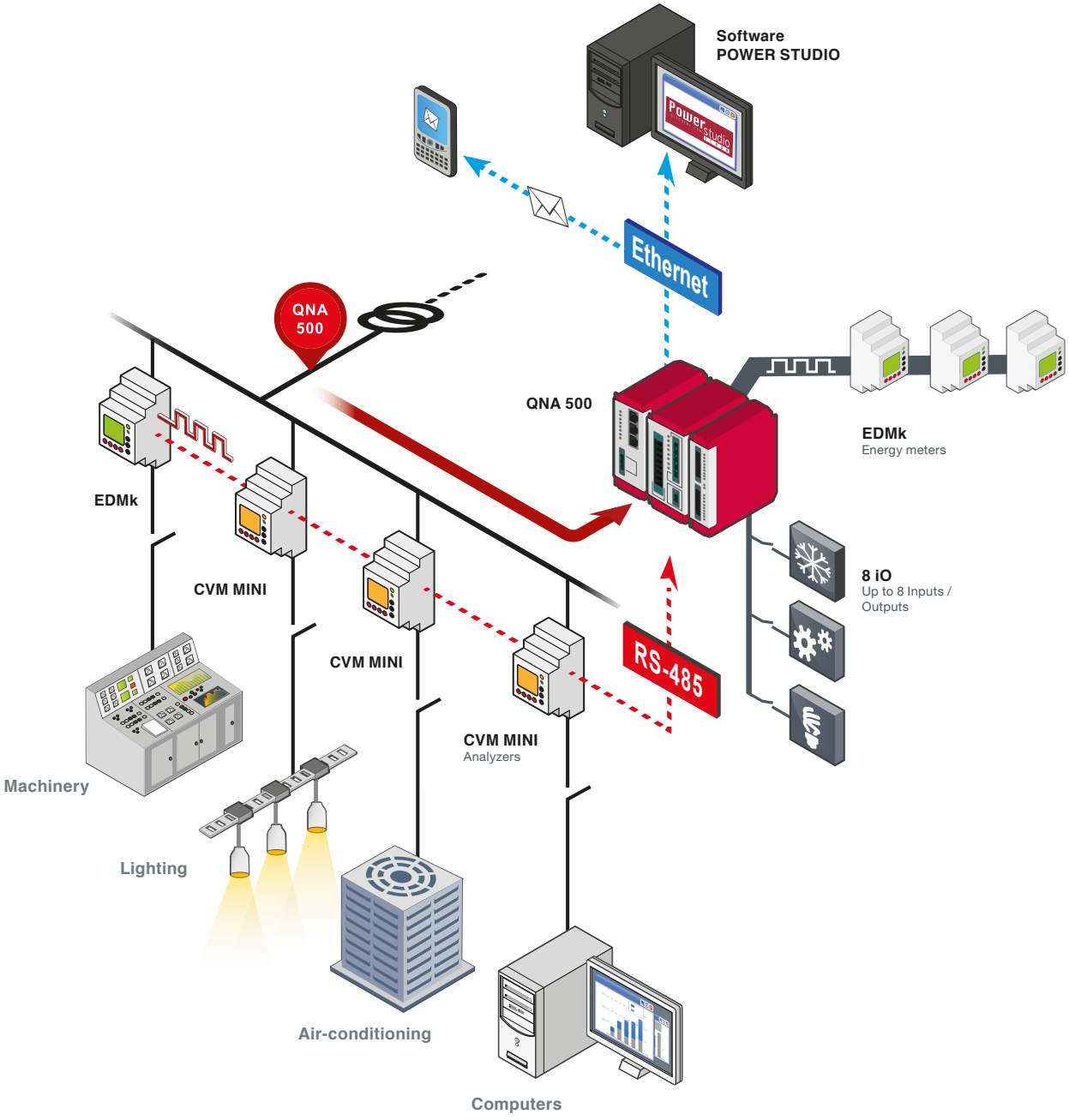
e up to 5 modules

Survey and control of power quality

Supervision and control of power quality

- Measurement of all electrical parameters (accuracy 0.2%)
- Detailed analysis of any electrical problem
- Centralisation of partial energy consumption
- Communications gateway with other devices
- Disturbances capture (pre-post trigger configurable)

- Measurement of power and energy (accuracy 0.2%)
- Record of MAX and MIN values with date and time
- Measurement of leakage current of the installation
- Stop-start control of other electrical loads to limit electrical consumption or control production processes.
- E-mail alarms



Supervision

- Measurement of the electrical installation
- Incident analysis
- Real time monitoring and decision making

Control

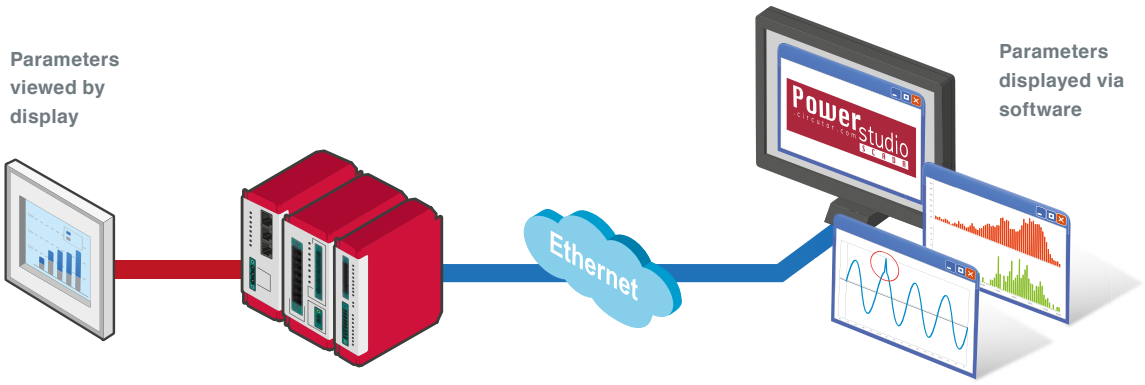
- Load connection / disconnection
- Alarms
- Centralisation of energy consumption

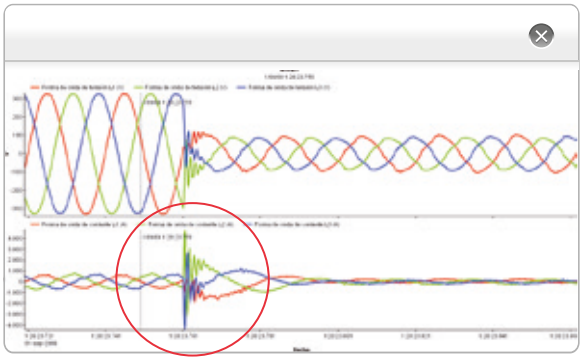
Solution

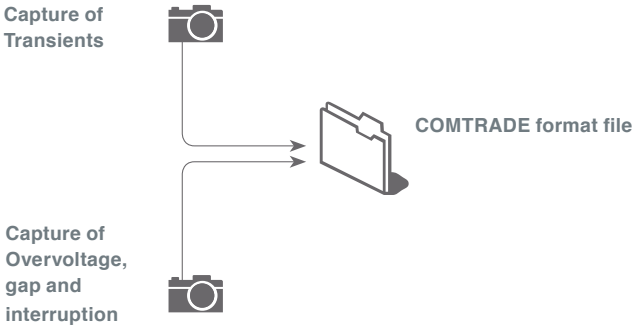
- Adaptation of protection elements
- PF Improvement
- Harmonic filtering

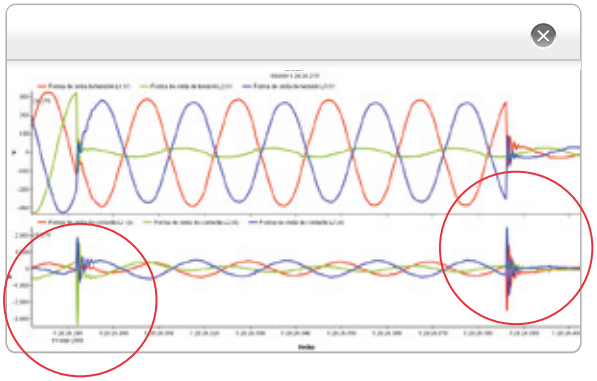
Capture of waveforms in voltage and current (screenshot)

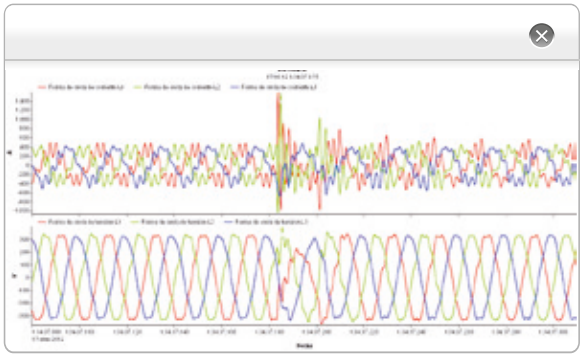
- Detection of transients (voltage and current) (>39 µs)
- Analysis of resets in machines and fast network switching
- 512 simultaneous samples/cycle per channel
- Log of 60 continuous cycles per event
- Analysis in accordance with CBEMA / ITIC curve.
  Detects if electronic equipments have been affected.







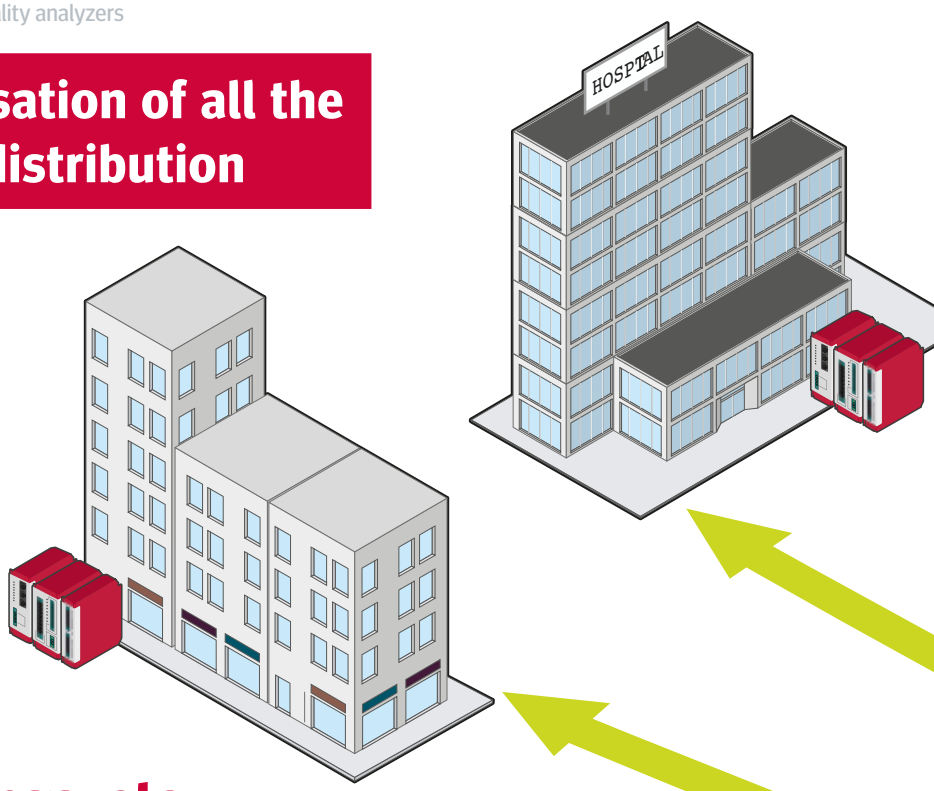




Analysis and optimisation of all the stages in electrical distribution

Applications

QNA 500 is designed to supervise the electrical installation and the problems related to the electrical power quality, in generation, transmision, distribution and consumption of electric energy in industrial and tertiary sectors



Banks, office buildings, etc.

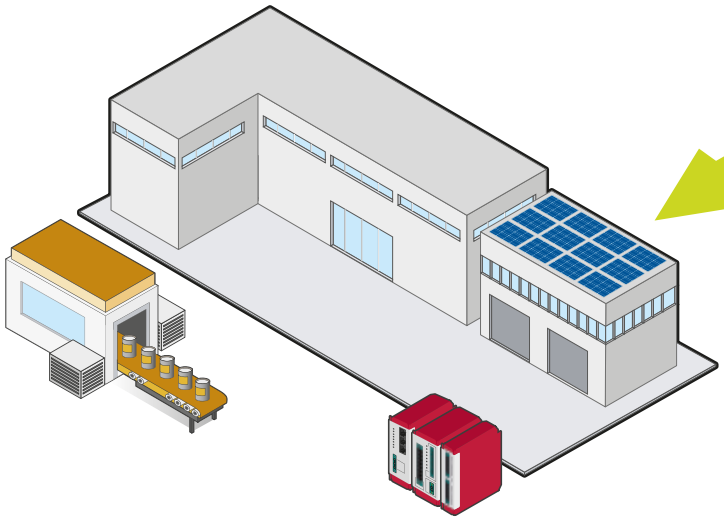
Problems:
- Fast load variations from HVAC and lifts
- Voltage peaks
- Power supply blackout

Consequence:
- Critical equipment breakdown (computers, medical equipment, etc.)

Improvements:
- Preventive maintenance and predictive failure analysis
- Operational stability

Preventive maintenance

- Breakdown and event assessment
- Pre-warning of incidents
- Saves on costs due to production stoppages

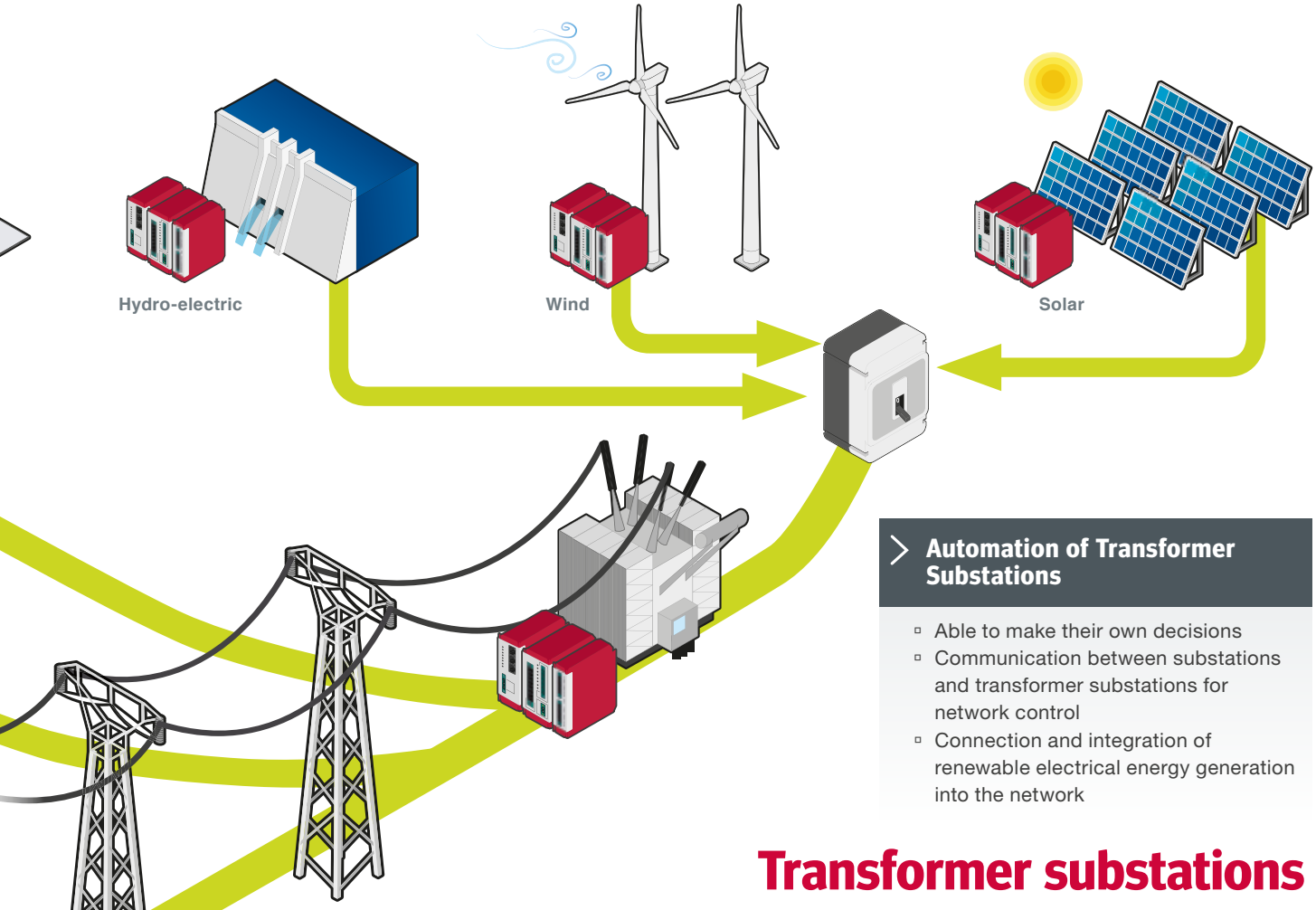


Industry

Problems:
- Connection of heavy loads for short periods
- Unbalanced loads
- Low power factor

Consequences:
- Power supply failures
- Production stoppages
- Damaged products (raw materials or process equipment)
- Penalties for excess power consumption

Improvements:
- Production improvement (saves on costs linked to poor electrical quality)
- Improved preventive maintenance tasks
- Unwanted tripping of protections



Automation of Transformer Substations

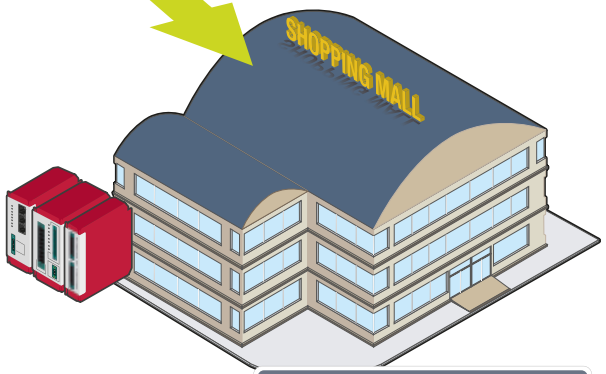
- Able to make their own decisions
- Communication between substations and transformer substations for network control
- Connection and integration of renewable electrical energy generation into the network

Transformer substations

Problems:
- Neutral displacement
- Voltage drops and current peaks
- Inadequate electrical protection adjustment
- Transformer saturation

Consequence:
- Electronic equipment failures
- Electric supply cuts shutdown
- Premature equipment ageing

Improvements:
- Improves the continuity of the electric supply
- Improves maintenance of protection and lines
- Detection of abnormal loads and transformers with excess demand



Shopping and leisure centres, etc.

Problems:
- High power consumption with high distortion
- Unexpected breakdowns
- Low power factor

Consequence:
- High costs of power stoppages
- Unnecessary power excess
- Inefficient use of the installation
- Penalties for excess power consumption

Improvements:
- Release of power to expand loads
- Costs savings through energy availability

QNA 500

Modular power quality analyzer

QNA 500 is designed to supervise the electric installation and problems relating to electric power quality so as to control production processes and manage incidents. It is easily integrated into SCADA applications and interacts with market PLCs, and so can form part of more global data acquisition systems and report information at any time to users that require it.

Its modularity and the addition of **8iO** modules enable the user to also control energy consumption, switch or load statuses, alarm sending, and even connection/disconnection of loads according to configurable conditions.

This standard determines the measurement methods for each electric power quality parameter in order to achieve reliable, replicable and comparable results. It also determines the accuracy, bandwidth and set of minimum parameters.
Therefore, it makes it easier for technicians to accurately choose an instrument for analysing power quality.

Class A
This is the most accurate measurement level and should be used when accurate measurements are necessary. This could include contractual applications, verifying compliance with standards, dispute resolutions, etc.

Class B
Less accuracy is required from the measurement. This is suitable for tracking the power quality in an installation, such as for carrying out statistical studies.

Module QNA500
Modular power quality analyzer

8iO

Module controller with 8 digital inputs and 8 digital outputs

8iO is a controller device with 8 programmable digital inputs and the same number of digital outputs (transistor or relay). It includes an integrated WEB server that allows all required configurations. The digital inputs can count the pulses sent by other devices (e.g. energy, gas or water meters), as well as logging the change of status of external relays (e.g. MCB or PLC). The digital outputs enable alarms, energy pulses and even remote control functions to be configured.

Being one more module in the **MULTIFIT** system means that several **8iO** modules can be connected together (up to 4) or with other modules (e.g. **QNA500**) expanding the product's functions.

8iO module
Device with 8 digital inputs and 8 digital outputs

Models

Type	Accuracy (power)	Class	Harmonics and THD	Events	Waveform capture (transients)	Inputs – Outputs	Impulse centralisation	RS-232, RS-485, Ethernet	Load control / WEB Server / Mail Server	Memory (GB)	Code
K-QNA500	0,5	S	50	•	•	–	–	•	•	4	**Q20911**
K-QNA500 8I0	0,5	S	50	•	•	8 in / 8 out digital	•	•	•	4	**Q20912**
K-QNA500 8I0R	0,5	S	50	•	•	8 in / 8 out relay	•	•	•	4	**Q20913**
K-QNA500-A	0,2	A	50	•	•	–	–	•	•	4	**Q20931**
K-QNA500-A 8I0	0,2	A	50	•	•	8 in / 8 out digital	•	•	•	4	**Q20932**
K-QNA500-A 8I0R	0,2	A	50	•	•	8 in / 8 out relay	•	•	•	4	**Q20933**

Each QNA500 is based on a BASE module (power supply) + Measure module + Auxiliary modules (according to type)
Compatible with PowerStudio 4.02

Technical features

QNA500

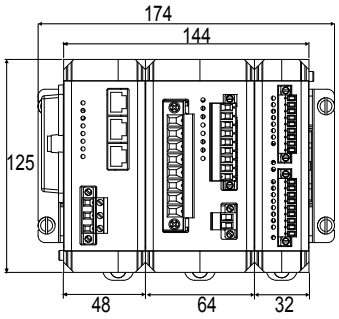
Type	Class A	Class S
Auxiliary power supply (BASE)		
Power supply voltage	90 - 300 V_{ac} / 130 -300 V $_{dc}$	
Frequency	50 ... 60 Hz	
Consumption	7 W / 11 VA (**BASE**) 4 W / 5 VA (**QNA500**) 6 W / 10 VA (**8iO**)	
Environment		
Operating temperature	-10...+60 °C	
Relative humidity	0..95 % RH	
Installation category	CAT III (1000 V)	
Contamination level	CAT 2 IEC-61010	
Protection degree	IP 41	
Auxiliary power supply by battery (BASE)		
Type	Removable battery	
Battery life	15 minutes of continuous operation (**QNA500**) 1 minute of continuous operation (**8iO**)	
Voltage measurement (QNA500)		
Measurement circuit	3 or 4 wires	
Measurement range	0 ... 500 V_{p-n} / 0 ... 866 V_{f-f}	
Other voltages	Through the measuring transformers	
Maximum continuous voltage:	1500 $V_{ac\ (f-f)}$	
maximum instantaneous voltage:	1.2/50 µS (8/20 µS) 6 kV	
Frequency	42.5 ... 69 Hz	
Sampling frequency	512 samples/cycle	
Current measurement (QNA500)		
Measurement range	1 ... 120 % I_n (I_n = 5 A)	
Maximum current	120 % of I_n (for I_n = 5 A, I_{max} = 6 A) permanent, 100 A t < 1 s	
Sampling frequency	512 samples/cycle	
Leakage current measurement (ID) (QNA500)		
Measurement range	0 ... 3 A	
Maximum current	3 A	
Sampling frequency	64 samples/cycle	
Accuracy	**Class A**	**Class S**
Voltage (measurement in accordance with IEC-61000-4-30)	0.1 %	0.2 %
Current (measurement in accordance with IEC-61000-4-30)	0.1 %	0.2 %
Power and Energy (IEC-62053-22)	0.2 %	0.5 %
Imbalance	± 0.15 %	
Flicker	in accordance with IEC -61000-4-15	
Harmonics	in accordance with IEC -61000-4-7	
Memory	2 Gb (Micro SD card)	
Processor		
Sampling frequency	512 samples/cycle	
A/D converter	24 bits	
Communications protocols	MODBUS/RTU, MODBUS/TCP, FTP, HTTP, SNTP, ZMODEM	
Speeds	Up to 10 Mbits	

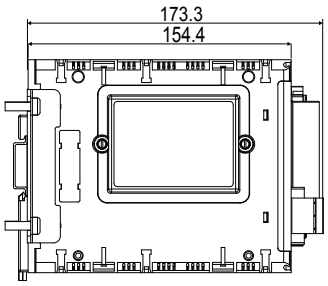
Connection	
Maximum cross-section of the cable	2.5 mm² (power supply) (**QNA500**) (**8iO**)
	2.5 mm² (voltage measurement)
	4 mm² (Current measurement)
	2.5 mm² (earth leakage current measurement)
	1 mm² (inputs / outputs) (**QNA500**) (**8iO**)

8iO

Digital inputs (8iO)	
Working voltage	12 - 18 V_{dc}
Pulse weight	Configurable
Electrical consumption (per input)	2.5 mW
Digital outputs (8iO)	
Type	Optocoupled
Working voltage	250 V
Working current	130 mA
Pulse weight	Configurable multiples of 10ms
Digital outputs per relay (8iOR)	
Type	Relay
Rated voltage	250 V $_{ac}$ 30 V $_{dc}$
Nominal current	6 A

Dimensions





QNA 500

New generation of module power quality analyzers

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