

ND1 - ANALYSER AND RECORDER OF 3-PHASE POWER NETWORK PARAMETERS WITH TOUCH SCREEN



The ND1 analyser of electrical energy parameter quality is an up-to-date device allowing the user to **check quality parameters of the delivered electrical energy**. It also allows **verification of line interferences** in the internal network.

The analyser is a programmable digital instrument destined for the measurement of parameters in 3 or 4-wire, three-phase, balance or unbalanced power networks with the simultaneous display of measured quantities. It enables the **costs control and optimization of the operation of power engineering electronics devices, systems and industrial installations**.

Main features:

- measurement of over **300 parameters** of power network,
- **LCD TFT 5.7" colour touch-screen, 320x240px**,
- data archiving on **CompactFlash card** – memory up to **4 GB**,
- web server,
- interfaces: **RS485 Modbus Slave, Modbus TCP Slave, Ethernet 10 Base-T and USB**,
- **IP 65** protection from the frontal side,
- fullfills **EN 50160** regulation (quality of energy in supply systems),
- configurable value and event recording,
- cooperation with CT and VT,
- inputs: - Voltage: **57,7/100 V** or **230/400 V**, Current: **1 A** or **5 A**,
- **12 binary inputs**.
- outputs: **6 alarm relays, 4 analogue outputs, pulse output**.
- user friendly interface based on Windows® CE

IP65!



Measurement, visualization and recording of over 300 parameters of 3-phase balanced and unbalanced network:

- phase voltages U_1, U_2, U_3 and line currents I_1, I_2, I_3
- phase-to-phase voltages U_{12}, U_{23}, U_{31}
- phase active powers P_1, P_2, P_3
- phase reactive powers Q_1, Q_2, Q_3
- phase apparent powers S_1, S_2, S_3
- phase active power factors PF_1, PF_2, PF_3
- phase reactive/active power factors t_1, t_2, t_3
- mean 3-phase phase-to-phase voltage U_s, U_{mf}
- current of neutral wire! and mean 3-phase current I_s
- 3-phase active, reactive and apparent powers P, Q, S
- mean three-phase power factors $PF, tg\phi$
- frequency f and **frequency deviations**
- 15-minutes' mean active power **PAV**
- 3-phase active, reactive & apparent energy **EnP, EnQ, EnS**
- active, reactive and apparent energy from an external counter **EnPz, EnQz, EnSz**
- **THD** for phase voltages and currents
- **harmonics** of phase currents and voltages **up to the 51st!**
- **voltage drops, decays and peaks!**
- break-time logging!



Many forms of data display:

- linear charts,
 - digital displays,
 - analogue view,
 - harmonics charts,
 - bargraphs,
 - vectorial diagrams,
 - tables.
- (manual switching or automatic loop between screens).

5 devices in 1:



3-phase analyser



3-phase transducer



**recorder/
data logger**



web server



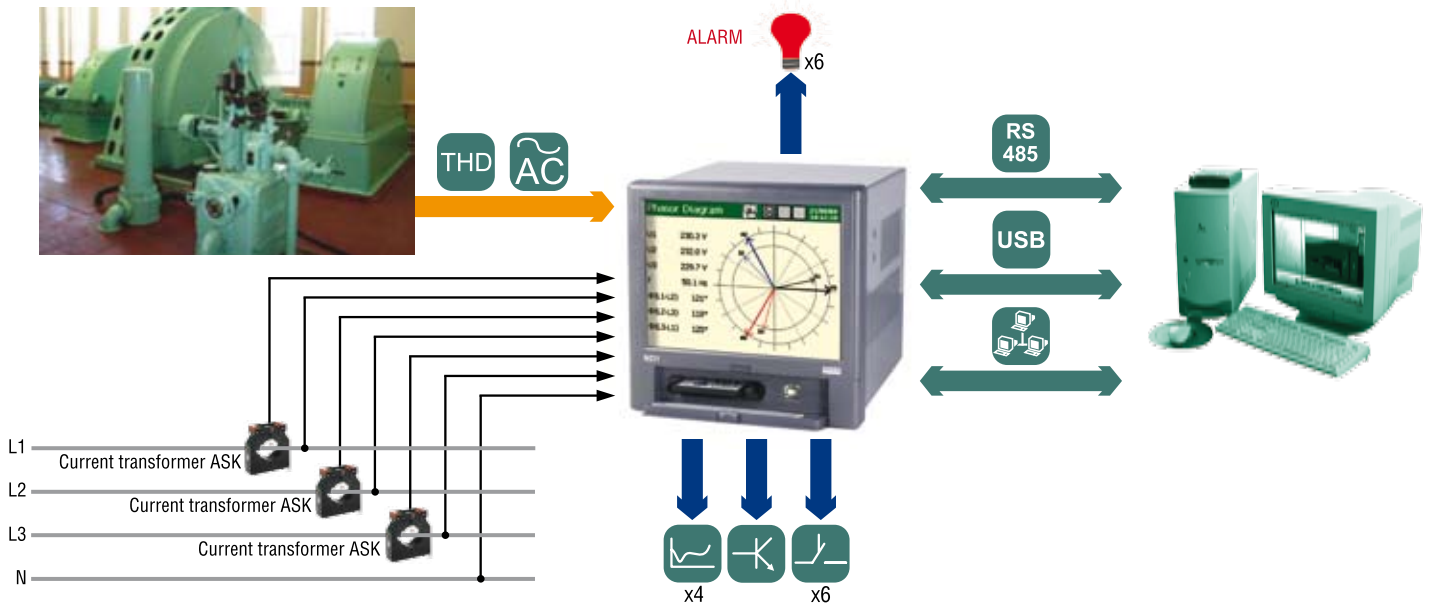
controller



ND1

EXAMPLE OF APPLICATIONS

Measurement, monitoring and recording of network parameters and energy of the 3-phase machine



TECHNICAL SPECIFICATIONS

Inputs

- Voltage: 57,7/100 V or 230/400 V
- Current: 1 A or 5 A
- Network configuration: 3-phase, 3-wire or 4-wire balance or unbalanced
- 12 binary inputs: control signal 0..5/24 Vdc switching frequency up to 50 Hz

Outputs

- Analog outputs: current: 4 galvanically isolated output signal 0..5 mA, 0..20 mA or 4..20 mA voltage: 4 galvanically isolated output signal 0..5 V, 1..5 V
- Alarms: 6 programmable electromagnetic relays contact voltage / load current: ≤ 250 Va.c. / 1 A, ≤ 30 Vd.c. / 1 A
- Interfaces: RS485 (Modbus Slave), baud rate: 300..256000, Transmission mode: ASCII/RTU USB V.1.1, USB-G socket, Ethernet: 10 Base-T, RJ45 socket, Modbus Slave TCP/IP
- Object supplies: 2 x 24 Vd.c. / 30 mA

General parameters

- Graphical touch-screen: TFT LCD 5,7", 320x240px
- Internal RAM memory: 6MB
- External memory: CompactFlash card up to 4GB
- Power consumption: <30VA
- Complies with EN 50160 standard (quality of energy in supply systems)
- Casing Protection grade from: frontal side: IP65 acc. to EN 60529 terminal side: IP20 acc. to EN 60529

Nominal operating conditions

- Work & storage temperature: 0..23..50 °C
- Relative humidity: <75%, no condensation
- Supply: 85..230 Va.c./d.c., 40..400 Hz
- Reaction to supply decay: data and meter state are preserved, the meter continues normal operation after supply recovery
- Short duration overload: 2 Un (max.1000 V), 10 In
- Dimensions: 144x144x155 mm
- Safety of service: acc. to EN 61010-1, basic isolation - installation category: II, pollution level: 2
- Phase-to-earth working voltage: - RS-485, USB interfaces 50 V - measuring system, relays and supply 500 V

Measuring ranges

- Voltage U: 57,7/100 V or 230/400 V ($K_u=1$), for $K_u \neq 1$: 400 kV, - basic error: $\pm 0.2\%$
- Current I: 1 A or 5 A ($K_i=1$), for $K_i \neq 1$: 20 kA $\pm 0.2\%$ - basic error: $\pm 0.2\%$
- Active power P: 0,0..(-)999.9 W, for $K_u \neq 1$, $K_i \neq 1$: (-)999.9 MW - basic error: $\pm 0.5\%$
- Active energy EnP: 0,0..(-)999.9 Wh, for $K_u \neq 1$, $K_i \neq 1$: (-)999.9 MWh - basic error: $\pm 0.5\%$
- Apparent power S: 0,0..(-)999.9 VA, for $K_u \neq 1$, $K_i \neq 1$: 999.9 MVA - basic error: $\pm 0.5\%$
- Apparent energy EnS: 0,0..(-)999.9 VAh, for $K_u \neq 1$, $K_i \neq 1$: 999.9 MVAh - basic error: $\pm 0.5\%$
- Reactive power Q: 0,0..(-)999.9 VAR, for $K_u \neq 1$, $K_i \neq 1$: 999.9 MVar - basic error: $\pm 0.5\%$
- Reactive energy EnQ: 0,0..(-)999.9 VARh, for $K_u \neq 1$, $K_i \neq 1$: 999.9 MVarh - basic error: $\pm 0.5\%$
- Active power factor Pfi: -1.00..0.00..1.00, basic error: $\pm 0.5\%$
- Factor tg ϕ : -9.999...0...9.999, basic error: $\pm 1\%$
- Frequency f: 45.00...70.00Hz, basic error: $\pm 0.1\%$
- THD U, THD I, Harmonics U, I (up to 51): 0.2 H 200%

COME AND SEE US!

We also offer: analog meters, digital meters, large-size displays, power network parameter analysers, measuring transducers, industrial process controllers, recorders, power controllers, solid state relays, elements of integration systems, synchronizing units, electronic watt-hour meters, shunts.

PLEASE CONTACT US:

Export Sales Department: email: export@lumel.com.pl, tel: +48 68 32 95 -302, (or: -321, -233, -139, -305), fax: +48 68 32 40 091

WWW.LUMEL.COM.PL