# ND20 METER OF NETWORK PARAMETERS

ADEL INSTRUMENTATION


- Measurement of power network parameters in 2,3 or 4- wire balanced and unbalanced systems.
- High accuracy class.
- Indications considering values of programmed ratios.
- Harmonics of voltages and currents (selectively).
- THD factors for currents and voltages.
- Profile of 15, 30, 60-minutes' power (9000 measurements).
- Watt-hour meter for the selected harmonic.
- Backlit LCD 3.5" screen.
- Protection grade from the frontal side: IP65.
- Digital transmission to the master system through the RS-485 interface (MODBUS).
- Configurable analog, alarm and pulse outputs (energy).
- Configuration of displayed pages.

## FEATURES:

Program · RTC · Password protection · MODBUS · IP65 · THD · HARM · P,Q,C,L · Meas. of energy harmonics · PAord

## INPUT:

AE

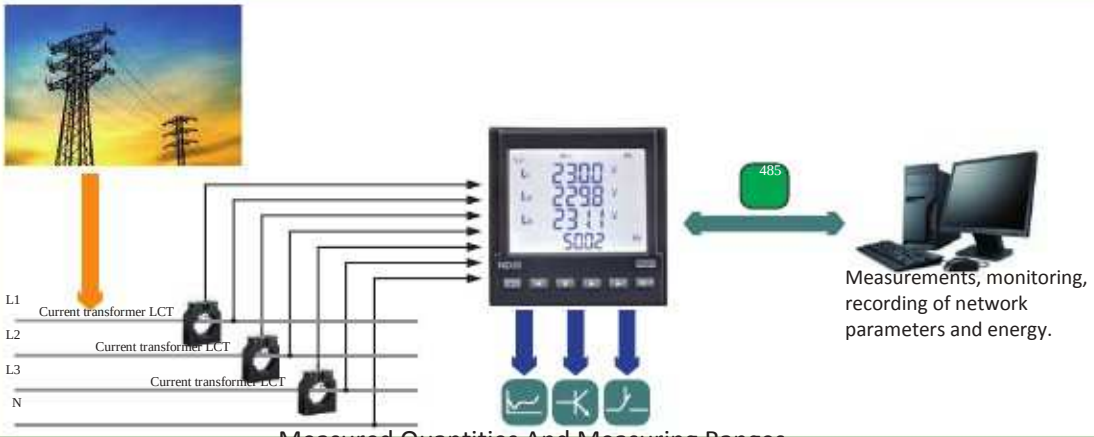
## OUTPUTS:

0/4..20 mA · RS 485

## GALVANIC ISOLATION:

Supply · RS 485

## Example of Application




## Measured Quantities And Measuring Ranges

| Measured value | | Indication range* | Measuring range | L1 | L2 | L3 | | Basic error |
|---|---|---|---|---|---|---|---|---|
| Current In | 1A | 0.00 ... 12 kA | 0.002 ... 1.200 A~ | | | | | |
| | 5A | 0.00 ... 60 kA | 0.010 ... 6.000 A~ | □ | □ | □ | | ±0.2% r |
| Voltage L-N | | | | | | | | |
| | 57,7 V | 0.0 ... 280 kV | 2.8 ... 70.0 V~ | □ | □ | □ | | ±0.2% r |
| | 230 V | 0.0 ... 1.104 MV | 11.5 ... 276 V~ | | | | | |
| Voltage L-L | | | | | | | | |
| | 100 V | 0.0 ... 480 kV | 5 ... 120 V~ | □ | □ | □ | | ±0.5% r |
| | 400 V | 0.0 ... 1.92 MV | 20 ... 480 V~ | | | | | |
| Frequency | | 47.0 ... 63.0 Hz | 47.0 ... 63.0 Hz | □ | □ | □ | | ±0.2% mv |
| Active power | | -9999 MW ... 0.00 W ... 9999 MW | -1.65 kW ... 1.4 W ... 1.65 kW | □ | □ | □ | □ | ±0.5% r |
| Reactive power | | -9999 Mvar ... 0.00 var ... 9999 Mvar | -1.65 kvar ... 1.4 var ... 1.65 kvar | □ | □ | □ | □ | ±0.5% r |
| Apparent power | | 0.00 VA ... 9999 MVA | 1.4 VA ... 1.65 kVA | □ | □ | □ | □ | ±0.5% r |
| Power factor PF | | -1 ... 0... 1 | -1 ... 0 ... 1 | □ | □ | □ | □ | ±1% r |
| Tangent □ | | -1.2...0...1.2 | -1.2 ... 0 ... 1.2 | □ | □ | □ | □ | ±1% r |
| Cosinus □ | | -1... 1 | -1 ... 1 | □ | □ | □ | □ | ±1% r |
| □ | | -180 ... 180 | -180 ... 180 | □ | □ | □ | | ±0.5% r |
| Imported active energy | | 0 ... 99 999 999.9 kWh | | | | | □ | ±0.5% r |
| Exported active energy | | 0 ... 99 999 999.9 kWh | | | | | □ | ±0.5% r |
| Reactive inductive energy | | 0 ... 99 999 999.9 kvarh | | | | | □ | ±0.5% |
| Reactive capacitive energy | | 0 ... 99 999 999.9 kvarh | | | | | □ | ±0.5% |
| | | | | | | | | ±5% |

* Depending on the set tr_U ratio (ratio of the voltage transformer: 0.1...4000.0) and tr_I ratio (ratio of the current transformer: 1...10000)
r - of the rangemv - of the measured value

## Outputs

| Kind of output | Properties |
|---|---|
| | |
| Analog output | • 1 programmable current output 0/4...20 mA |
| Relay output | • programmable relay output, normally open voltageless contacts, load capacity 250 V~/0.5 A~ |
| Pulse output of active or reactive energy | • 1 OC type, passive |

ADEL INSTRUMENTION
28 Rue de Stalingrad
38300 BOURGOIN JALLIEU
Tél : 04 74 93 06 37
contact @adel-instrumentation.fr
www.adel-instrumentation.fr

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## Digital Interface

| Interface type | Transmission protocol | Mode | Baud rate |
|---|---|---|---|
| RS-485 | MODBUS RTU | 8N2, 8E1, 8O1, 8N1 | 4.8; 9.6; 19.2; 38.4 kbit/s |

## External Features

| | | |
|---|---|---|
| Readout field | LCD 3.5” screen, specialized, monochro-matic with backlit | |
| Weight | < 0.3 kg | |
| Overall dimensions | 96 □ 96 □ 77 mm | panel cut-out: 92.5$^{+0.6}$ □ 92.5$^{+0.6}$ mm |
| Protection grade (acc. to EN 60529) | from frontal side: IP65 | from terminal side: IP20 |

## Rated Operating Conditions

| | | |
|---|---|---|
| Supply voltage | 85...253 V a.c., 90...300 V d.c.,<br>20...40 V a.c., 20...60 V d.c. | |
| Temperature | ambient: -25...23...55°C | storage: -30...70°C |
| Relative humidity | 25...95% | inadmissible condensation |
| Operating position | any | |
| External magnetic field | 0...40...400 A/m | |
| Short duration overload (1 s) | voltage input: 2Un (max. 1000 V) | |
| | | current input: 10 In |
| Power consumption | - in the supply circuit □ 6 VA,<br>- in the voltage and current circuits □ 0.05 VA | |

## Safety and Compatibility Requirements

| | | |
|---|---|---|
| Electromagnetic compatibility | noise immunity | acc. to EN 61000-6-2 |
| | noise emissions | acc. to EN 61000-6-4 |
| Safety requirements | | acc. to EN 61010-1 |

## ELECTRIC CONNECTIONS

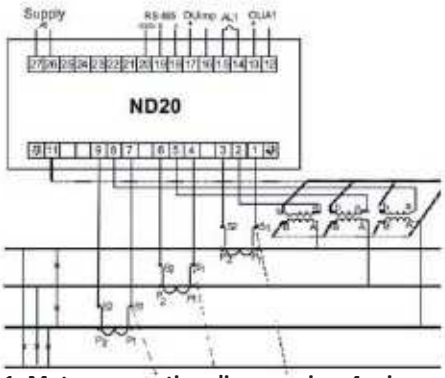


**Fig 1. Meter connection diagrams in a 4-wire network.**

**Connections:**
- direct, semi-indirect and indirect one-phase measurement,
- direct measurement in a 3-wire network,
- semi-indirect measurement in a 3-wire network,
- indirect measurement with the use of 3 current transfor-mers and 2 or 3 voltage transformers in a 3-wire network,
- direct measurement in a 4-wire network,
- semi-indirect measurement in a 4-wire network,
- indirect measurement with the use of 3 current transformers and 2 or 3 voltage transformers in a 4-wire network

## Ordering

| ANALYSER OF NETWORK PARAMETER ND20 - X | X | X | X XX X | | X |
|---|---|---|---|---|---|
| **Current input In:** | | | | | |
| 1 A (X/1) | **1** | | | | |
| 5 A (X/5) | **2** | | | | |
| **Voltage input (phase/ phase-to-phase) Un:** | | | | | |
| 3 x 57.7/100 V | | | | | |
| 3 x 230/400 V | **1** | | | | |
| **Analog current output:** | **2** | | | | |
| without analog output | | **0** | | | |
| with programmable output 0(4) ... 20 mA | | **1** | | | |
| **Supply voltage:** | | | | | |
| 85...253 V a.c., 90...300 V d.c. | | | | | |
| 20...40 V a.c., 20...60 V d.c. | | | **1** | | |
| **Version:** | | | | | |
| standard | | | **2** | | |
| custom-made* | | | | | |
| **Language:** | | | | | |
| Polish | | | **00** | | |
| English | | | **XX** | | |
| other* | | | | | |
| **Acceptance tests:** | | | | **P** | |
| without extra quality requirements | | | | **E** | |
| with an extra quality inspection certificate | | | | **X** | |
| acc. to customer’s request* | | | | | **0** |
| | | | | | **1** |
| | | | | | **X** |

**EXAMPLE OF ORDER:**

The code **ND20 - 2 2 1 1 00 E 0** means:
- **ND20** - meter of network parameters of ND20 type
- **2** - current input: 5A (X/5)
- **2** - input voltage (phase/phase-to-phase) Un = 3 x 230 V/ 400 V
- **1** - with programmable analog output
- **1** - supply voltage: 85...253 V a.c./ 90...300 V d.c.
- **00** - standard version
- **E** - all descriptions and user's manual in English
- **0** - without extra quality requirements.

* - after agreeing with the manufacturer

**SEE ALSO:**

LPConfig

Current transformers.

P43 - three-phase transducer of power network parameters.


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38300 BOURGOIN JALLIEU
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contact @adel-instrumentation.fr
www.adel-instrumentation.fr