



DATASHEET

Issue 1.0



Multifunction Meters

Transducers & Isolators

Temperature Controllers

Converters & Recorders

Digital Panel Meters

Current Transformers

Analogue Panel Meters

Shunts

Digital Multimeters

Clamp Meters

Insulation Testers

ND30

METER OF POWER NETWORK PARAMETERS

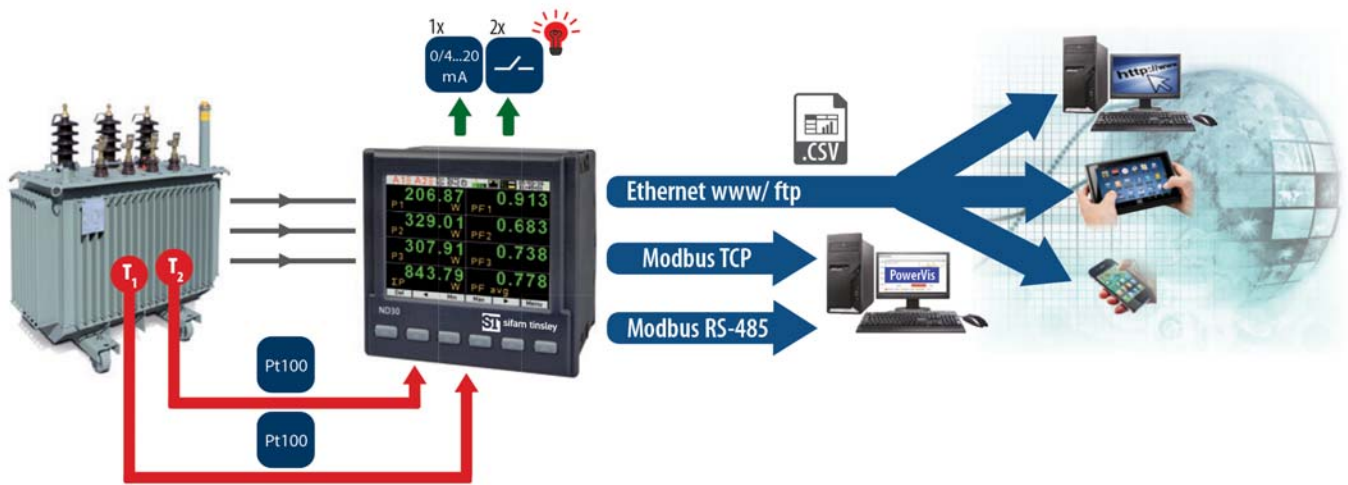
Features

- Measurement and recording of 54 power network parameters, including current and voltage harmonics up to 51st
- User programmable system types, 1-phase 2-wire or 3-phase 3 or 4-wire balanced and unbalanced
- Graphical colour display: LCD TFT 3,5", 320 x 240 pixels, fully configurable by a user
- Indications include the values of programmed ratios
- Memory of minimum and maximum values
- Programmable VT and CT ratio for Medium and Low Voltage applications
- 2 programmable configurable alarm outputs
- Optional: analogue output 0/4...20 mA and 2 PT 100 inputs (eg. for measurement of transformer temperature)
- Data archiving in the internal memory 8 GB (optional)
- Digital output RS-485 - MODBUS protocol
- Modern and user-friendly Ethernet interface 10/100 BASE-T (optional):
protocol: MODBUS TCP/IP, HTTP, FTP
services: www server, ftp server, DHCP client
- Free Configuration and monitoring software available (1 meter license)
- Battery backup RTC
- Protection grade from the front window: IP65
- Overall dimensions: 96 x 96 x 77 mm.

SUBJECT TO CHANGE WITHOUT NOTICE

This manual superseded all previous versions – please keep for future reference

Example of Application



Measurement and Visualization of Power Network Parameters

- Phase voltages: U_1, U_2, U_3
- Phase-to-phase voltages: U_{12}, U_{23}, U_{31}
- Phase currents i_1, i_2, i_3
- Active phase powers: P_1, P_2, P_3
- Reactive phase powers: Q_1, Q_2, Q_3
- Apparent phase powers: S_1, S_2, S_3
- Active power factors: PF1, PF2, PF3
- Reactive/active power factors: $tg\phi_1, tg\phi_2, tg\phi_3$
- Active, reactive and apparent 3-phase power: P, Q, S
- Mean 3-phase power factors: PF, $tg\phi$
- Frequency f
- Mean 3-phase voltage: U_s
- Mean phase-to-phase voltage: U_{mf}
- Mean 3-phase current: i_s
- 15, 30, 60 minutes' mean active power: P_{demand}
- Mean apparent power S_{demand}
- Average current i_{demand}
- Active, reactive and apparent 3-phase energy: EnP, EnQ, EnS
- Active, reactive and apparent energy from external counter: EnPE
- Total harmonic content coefficients for phase voltages and currents $THD_{U1}, THD_{U2}, THD_{U3}, THD_{i1}, THD_{i2}, THD_{i3}$ and for 3-phase voltages and currents THD_U, THD_i
- Harmonics for current and phase voltage up to 51 st!
- Temperature (2 x Pt100 input)

Features

Inputs

Outputs

Galvanic Isolation

Technical Data - Measuring Range

Measured value	Measuring range	L1	L2	L3	Σ	Class (*) / Basic error (*) class relative to the measured value acc. to EN61557-12
Current 1/5 A 1 A~ 5 A~	0.010 ..0.100..1.200 A (tr _I =1) 0.050 ..0.500.. 6.000 A (tr _I =1) ...20.00 kA (tr _I ≠1)	•	•	•		Class 0.2
Voltage L-N 57.7 V~ 230 V~ 400 V~	5.7..11.5 ..70.0 V (tr _U =1) 23.0..46 .. 276.0 V (tr _U =1) 40.0..80 .. 480.0 V (tr _U =1) ...480.0 kV (tr _U ≠1)	•	•	•		Class 0.2
Voltage L-L 100 V~ 400 V~ 690 V~	10.0 ..20..120.0 V (tr _U =1) 40.0..80 .. 480.0 V (tr _U =1) 69.0..138 .. 830.0 V (tr _U =1) ...830.0 kV (tr _U ≠1)	•	•	•		Class 0.5
Active power P _i , average active power P _{dt}	..(-)1999.9 W ..(-)1999.9 MW (tr _U ≠1, tr _I ≠1)	•	•	•	•	Class 0.5
Reactive power Q _i	..(-)1999.9 Var ..(-)1999.9 MVar (tr _U ≠1, tr _I ≠1)	•	•	•	•	Class 1
Apparent power S _i , average apparent power S _{dt}	..1999.9 VA ..1999.9 MVA (tr _U ≠1, tr _I ≠1)	•	•	•	•	Class 0.5
Active energy EnP (imported or exported)	..(-)1999.9 Wh ..(-)1999.9 MWh (tr _U ≠1, tr _I ≠1)				•	Class 0.5
Reactive energy EnQ (inductive or capacitive)	..(-)1999.9 Varh ..(-)1999.9 MVarh (tr _U ≠1, tr _I ≠1)				•	Class 1
Apparent energy EnS	.. 1999.9 VAh ..1999.9 MVAh (tr _U ≠1, tr _I ≠1)				•	Class 0.5
Active power factor PFI	-1.00 ..0 ..1.00	•	•	•	•	± 0.01 of basic error
Coefficient tgφ _i (ratio of reactive power to active power)	-1.20 ..0 ..1.20	•	•	•	•	± 0.01 of basic error
Frequency f	45.00..65.00 Hz				•	Class 0.1
Total harmonic distortion of voltage THDU and current THDI	0.0 ..100.0 %	•	•	•	•	Class 5 50 / 60 Hz
Amplitudes of the voltage U _{h1} ... U _{h50} , and current I _{h1} ... I _{h50}	0.0 ..100.0 %	•	•	•		Class 5 50 / 60 Hz

 tr_I, tr_U – ratio of current and voltage transformer

Inputs

Input type	Properties
Input Pt100 (T1, T2) - option	2 x Pt100, 2-wire, -50...400°C, basic error 0.5 %

Digital Interface

Interface type	Transmission protocol	Address	Baud rate
RS-485	Modbus RTU 8N2,8E1,8O1,8N1	Address 1..247	baud rate: 4.8, 9.6, 19.2 38.4, 57.6, 115.2 kbit/s
Ethernet 10/100 Base-T -option	Modbus TCP,HTTP,FTP		WWW server, FTP server, DHCP client

External Features

Readout field	graphic colour display LCD TFT 3,5" , 320 x 240 pixels	
Overall dimensions	96 x 96 x 77 mm	mounting hole 92.5 x 92.5 mm
Weight	0.3 kg	
Protection grade	from frontal side: IP65	from terminal side: IP20

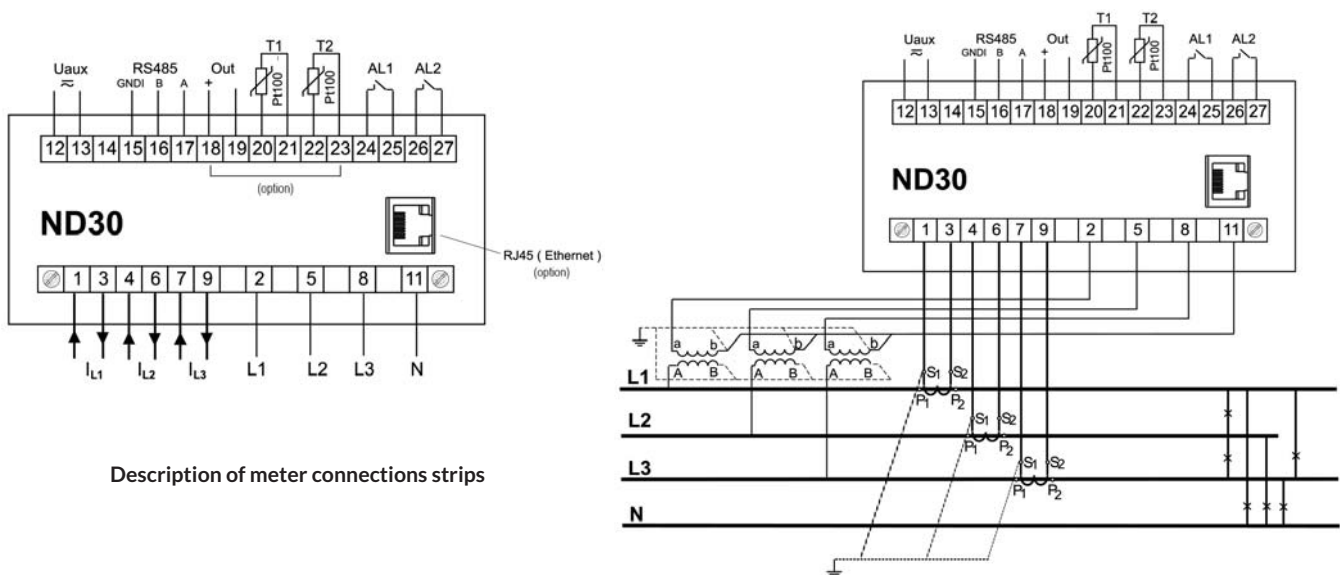
Rated Operating Conditions

Supply voltage	85...253 V a.c. (40...400 Hz) or 90...300 V d.c.	power consumption \leq 6 VA
Power consumption	in voltage circuit \leq 0.2 VA	in current circuit \leq 0.1 VA
Input signal	0...0.1...1.2 In; 0.1...0.2...1.2 Un for current, voltage, PFi, tgj	frequency 45...50...60...65 Hz, sinusoidal (THD \leq 8%)
Power factor	-1...0...1	
Preheating time	5 min.	
Ambient temperature	-10...23...55°C, class K55 acc. to EN61557-12	
Humidity	0...40...65...95%	without condensation
Operating position	any	
External magnetic field	\leq 40...400 A/m d.c.	\leq 3 A/m a.c. 50/60 Hz
Short-term overload	voltage input: 2 Un (5 sec.)	current input 50 A (1 sec.)
Admissible crest factor	current: 2	voltage: 2
Additional error (in % of the intrinsic error)	from ambient temperature change: $<$ 50% / 10°C	

Safety and Compatibility Requirements

Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Isolation insured by the casing	double	acc. to EN 61010-1
Isolation between circuits	basic	acc. to EN 61010-1
Pollution level	2	acc. to EN 61010-1
Installation category	III	acc. to EN 61010-1
Maximal phase-to-earth voltage	<ul style="list-style-type: none"> for supply circuit and relay outputs 300 V for measuring input 500 V for circuits of RS-485, Ethernet, pulse input and output, analogue outputs: 50 V 	acc. to EN 61010-1
Altitude a.s.l.	$<$ 2000 m	

Connection Diagrams



Description of meter connections strips

Indirect measurement in 4-wire network - connection of input signals

Displaying of Measurement Parameters



Up to 10 programmable screens (8 parameters per page); ability to change colour for all screens.

Available colours for digital indications:



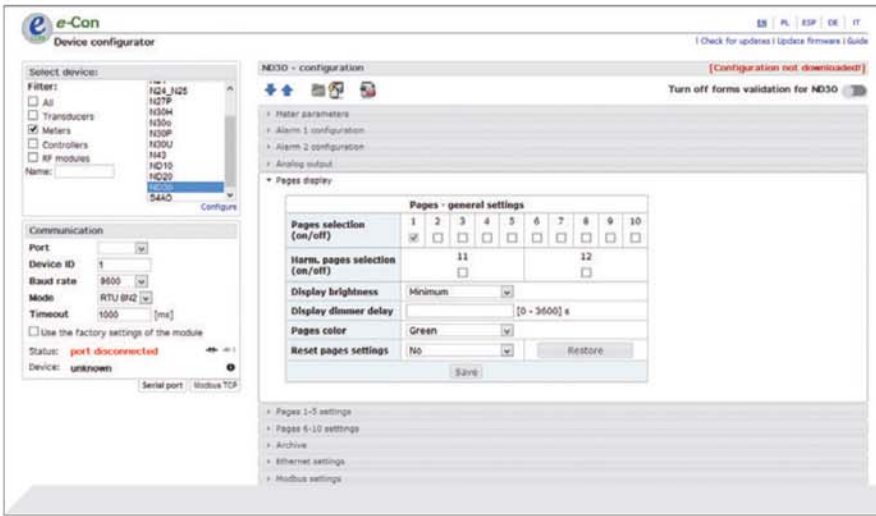
Two screens dedicated to harmonics; indication of individual harmonic for voltages and currents (up to 51st); bargraph presentation for all harmonics with zoom function.



Easy to use and intuitive menu; information bar with status of: phase sequence, alarm outputs, temperature measurements*, archiving and memory*, Ethernet* and RS-485 interfaces, time and date.

*Availability of feature depends on hardware version of ND30.

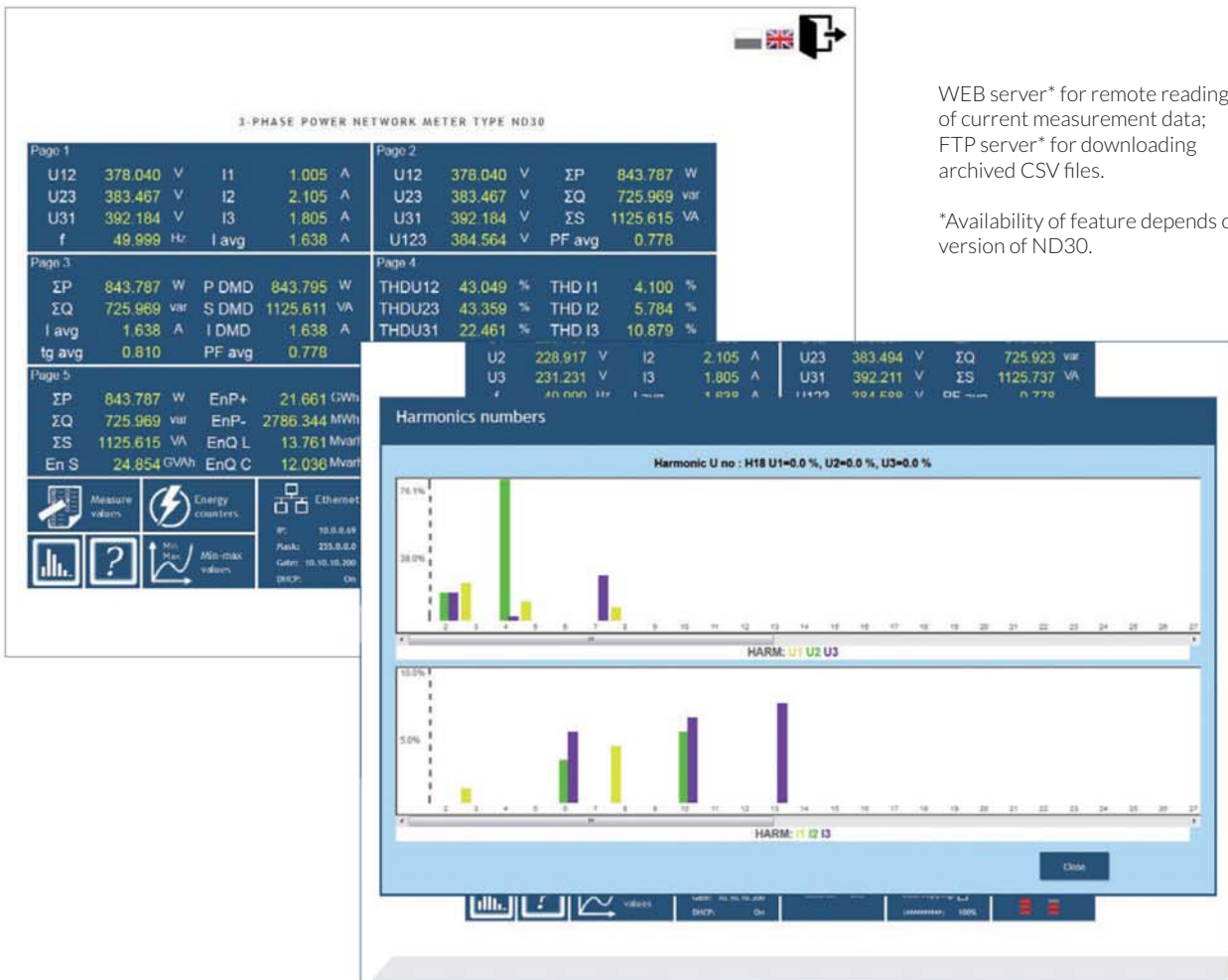
Meter Configuration with Free eCon Software



Ability to configure and update ND30 with free eCon software (via RS-485 or Ethernet* interface).

*Availability of feature depends on hardware version of ND30.

Remote Readout of Parameters Through Ethernet: WWW, SERVER, FTP



WEB server* for remote reading of current measurement data; FTP server* for downloading archived CSV files.

*Availability of feature depends on hardware version of ND30.

Ordering	ND30 -	X	X	X	XX	X	X
Input voltage (phase/phase-to-phase) un:							
3 x 57.7/ 100 V, 3x 230/ 400 V		1					
3 x 110/ 190 V, 3 x 400/ 690 V		2					
Additional outputs /inputs:							
2 relays			1				
2 relays, 1 analogue output, 2 inputs PT100			2				
Interface:							
RS-485				1			
RS-485 and Ethernet, internal memory				2			
Version:							
standard					00		
custom-made*					XX		
Language:							
English						U	
other*						X	
Acceptance tests:							
without extra quality requirements							0
with an extra quality inspection certificate							1
acc. to customer's request							X

EXAMPLE OF ORDER:

 The code **ND30 - 1 2 2 00 E 0** means:

ND30 - meter ND30

1 - input voltage 3 x 57.7/ 100 V, 3x 230/ 400 V

2 - 2 relays, 1 analogue output, 2 inputs PT100

2 - RS-485 and Ethernet, internal memory

00 - standard version

U - user's manual in English

0 - without additional quality requirements.

* - after agreeing with the manufacturer

See Also


ND40 - power network analyzer/ recorder

RE92 - dual loop controller

P30U - universal transducer of temperature and standard signals

KS31 - Digital synchronizing unit

N43 - rail mounted 3-phase power network meter

P43 - 3-phase transducer of power network parameters

ND1 - analyser of network parameters

Current transformers from 5 A up to 6 kA

Free **eCON** software

Contact

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