sifam tinsley
PRECISION INSTRUMENTATION

MULTIFUNCTION METER
ND30
www.sifamtinsley.co.uk

CE

DATASHEET

Issue 1.0



Electrical Safety CAT III

Multifunction Meters

Transducers & Isolators

Temperature Controllers

Converters & Recorders

Digital Panel Meters

Current Transformers

Analogue Panel Meters

Shunts

Digital Multimeters

Clamp Meters

Insulation Testers

ND30

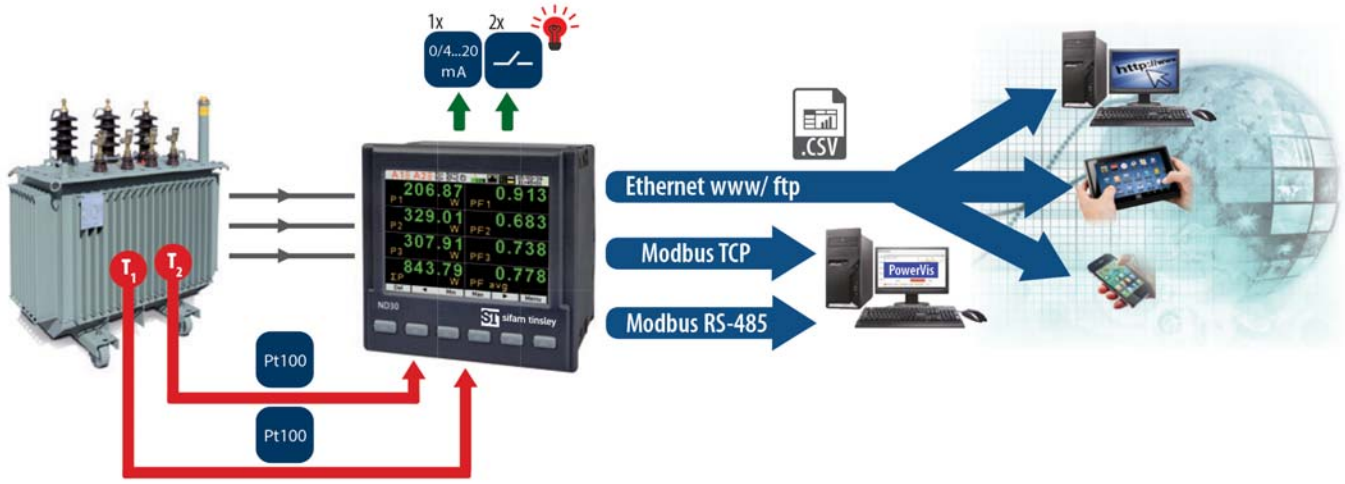
METER OF POWER NETWORK PARAMETERS

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This manual superseded all previous versions – please keep for future reference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: S1, S2, S3
- Active power factors: PF1, PF2, PF3
- Reactive/active power factors: $tg\varphi_1$, $tg\varphi_2$, $tg\varphi_3$
- Active, reactive and apparent 3-phase power: P, Q, S
- Mean 3-phase power factors: PF, $tg\varphi$
- 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 Qi		.. (-)1999.9 Var ..(-)1999.9 MVar (tr_U≠1.tr_I≠1)	•	•	•	•	Class 1
Apparent power Si, average apparent power Sdt		..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 tgφi (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} ...Uh_{50}, and current Ih1 ... Ih50		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...400oC, basic error 0.5 %

Digital Interface

Interface type	Transmission protocol		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

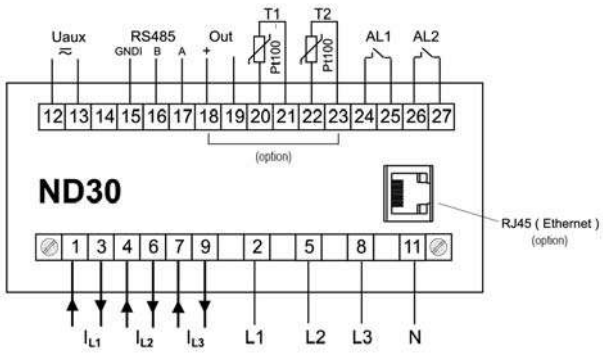
Rated Operating Conditions

Supply voltage	85…253 V a.c. (40…400 Hz) or 90...300 V d.c.	power consumption ≤ 6 VA
Power consumption	in voltage circuit ≤ 0.2 VA	in current circuit ≤ 0.1 VA
Input signal	0...0.1...1.2 In; 0.1...0.2...1.2 Un for current, voltage, PFi, tgji	frequency 45...50...60...65 Hz, sinusoidal (THD ≤ 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	≤ 40…400 A/m d.c.	≤ 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

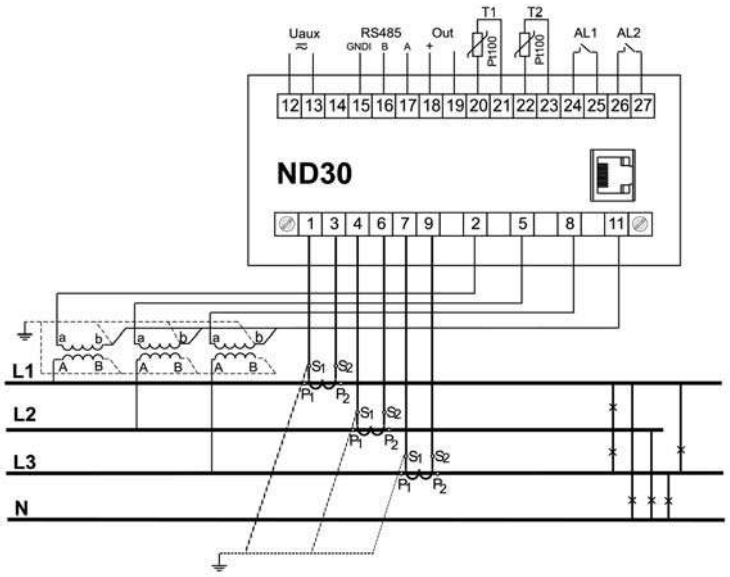
Safety and Compatibility Requirements

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	• 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





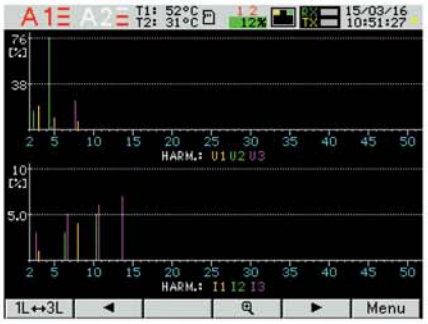


Up to 10 programmable screens
(8 parameters per page);
ability to change colour for all screens.

Available colours for digital indications:







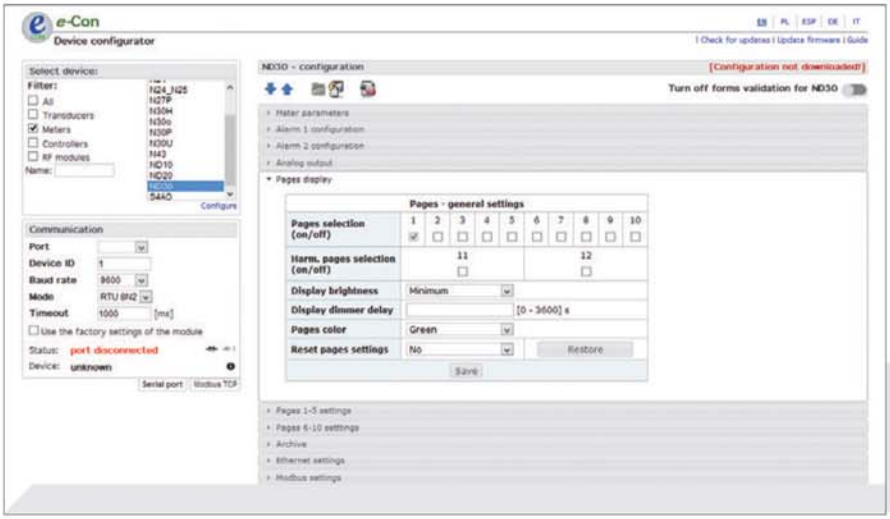
Two screens dedicated to harmonics;
indication of individual harmonic
for voltages and currents (up to 51st);
bargraph presentation for all harmonics
with zoom function.



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.

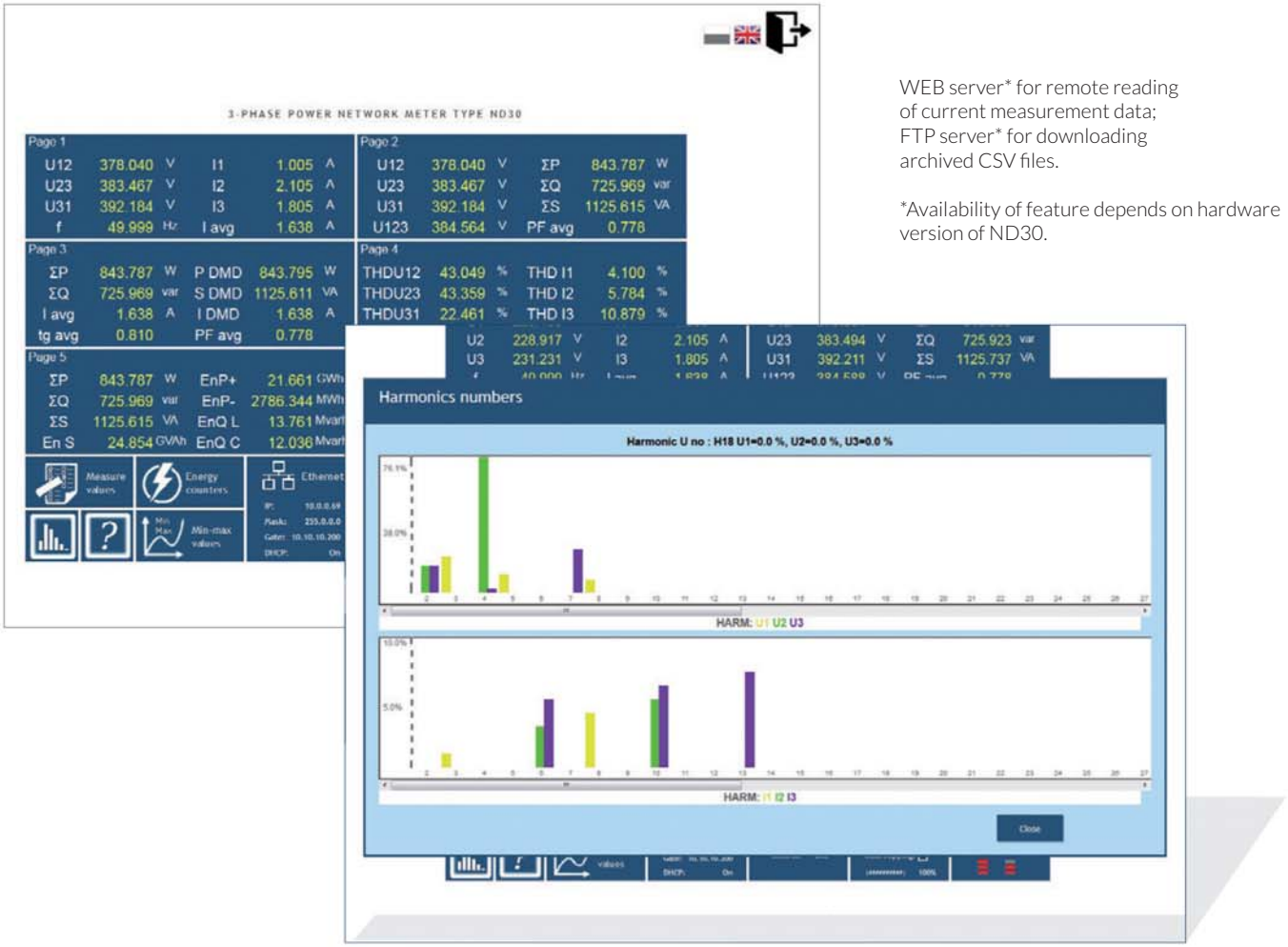
Meter Configuration with Free eCon Software



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

* - after agreeing with the manufacturer

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.

See Also



Contact

Sifam w Instrumentation Ltd

1 Warner Drive
Springwood Industrial Estate
Braintree, Essex
CM7 2YW

Tel: 01376 335271
E-mail: sales@sifamtinsley.com

www.sifamtinsley.co.uk