PROGRAMMING GUIDE

POWER NAVIGATOR / eNAVIGATOR

PN 77xx / EN 84xx Series

ELMEASURE

Possibilities...Infinite

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www.elmeasure.com

Product & features at glance :

This Manual is applicable for the Models: **EN84XX and PN77XX** where XX indicates software variants without any change in hardware construction and may be replaced by any two digit number from 00 to 99.Throughout this manual, the following methods are used to highlight important information:

NOTE : Describes important considerations related to a device setup, feature or application.

CAUTION : Alerts you to a condition which could potentially cause damage to the device or other external equipment.

WARNING or DANGER: Warns you to avoid such conditions that could potentially cause serious personal injury and/or damage to equipment.

Preventive Measures :

- **Fuse:** To avoid the possibility of short circuit, use a slow blow fuse that has a rating (current and type) that is specified. When replacing a fuse, turn OFF the power and unplug the power cord. Never short the fuse holder.
- **Do Not Operate in an Explosive Atmosphere:** Do not operate the instrument in the presence of flammable liquids or vapors. Operation in such environments pose a safety hazard.
- **Do Not Remove Covers:** The cover should be removed by ElMeasure's qualified personnel only. Opening the cover is dangerous, because some areas inside the instrument have high voltages.
- **External Connection:** Securely connect the protective grounding before connecting to the product under measurement or to an external control unit. If you come in contact with circuit, make sure to turn OFF

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PG/ENP/R06/0114

1. FEATURES

- STAR (Wye)/ DELTA/1 Phase Programmable
- Universal Auxiliary (80V AC/DC-300 VAC/DC) supply with fluctuations
- PT ratio / CT ratio programmable including CT secondary
- "OLD" Register for storing Cleared Energy and Load hours
- 6 digit 4 Rows LED/Graphical LCD(7 digit 4 Row) display with Auto scaling & Auto Scrolling
- Universal Voltage Input: 50 - 550 VAC (for UL 50 - 520 VAC) Line-Line with fluctuations
- Current Secondary Input (0.05A to 5A)with overload of 20%
- Two Energy readings in single page
- User configurable (Editable) password
- Clearance & Creepage distance meets IEC 61010 standard
- Compact size and Weight
- Dynamic communication (user selectable parameter sequence of register map)
- Multi-port communication (optional 2 maximum)

2. UNIQUE FEATURES

- True RMS measurements
- Simultaneous sampling of volts & amps
- Best parameters grouping /bright displays
- High/ low V, A, Hz, W, VA, VAr, PF value storage
- Data memory optional. (982080 records for 1 parameter)
- Upgradable to higher versions
- Auto-scaling of kilo, mega & giga decimal point
- Analog Output(0-20mA) or (4-20mA) optional
- THD Measurement
- Individual Harmonics display upto 31st level
- 2 Programmable Parameters (only for PN series)
- Phase wise Voltage and Current waveforms (only for PN series)

Precautionary Measures to be taken while Wiring the Circuit:

- ❑ Turn OFF the power to the circuit, when wiring the circuit. Connecting or removing measurement cables while the power is turned ON is dangerous.
- ❑ Take special caution not to wire a current measurement circuit to the voltage input terminal or vice-versa.
- ❑ Strip the insulation cover of the measurement cable so that when it is wired to the input terminal, the conductive parts (bare wires) do not protrude from the terminal. It is recommended to use appropriate pre lug after crimping the wire. Also, make sure to fasten the input terminal screws securely so that the cable does not come loose.
- ❑ Use cables with safety terminals that cover the conductive parts for connecting to the voltage input terminals. Using a terminal with bare conductive parts is dangerous if the terminal comes loose.
- ❑ After connecting the measurement cable, attach the current input protection cover for your safety. Make sure that the conductive parts are not exposed from the protection cover.
- ❑ Use the suitable star screw driver and apply optimum torque to prevent damage to the meter terminals.

⚠ CAUTION : During normal operation of this instrument, hazardous voltages are present at the rear terminals, which can cause severe injury or death. These voltages are present throughout the potential transformer (PT), current transformer (CT) auxiliary supply, communication & Input / Output terminal. Installation, disconnection or removal of the meter should be carried out only by qualified, properly trained personnel, after de-energizing connected circuits. Improper installation, including improper wiring and/or improper grounding will void ElMeasure's warranty.

3. WIRING DIAGRAM

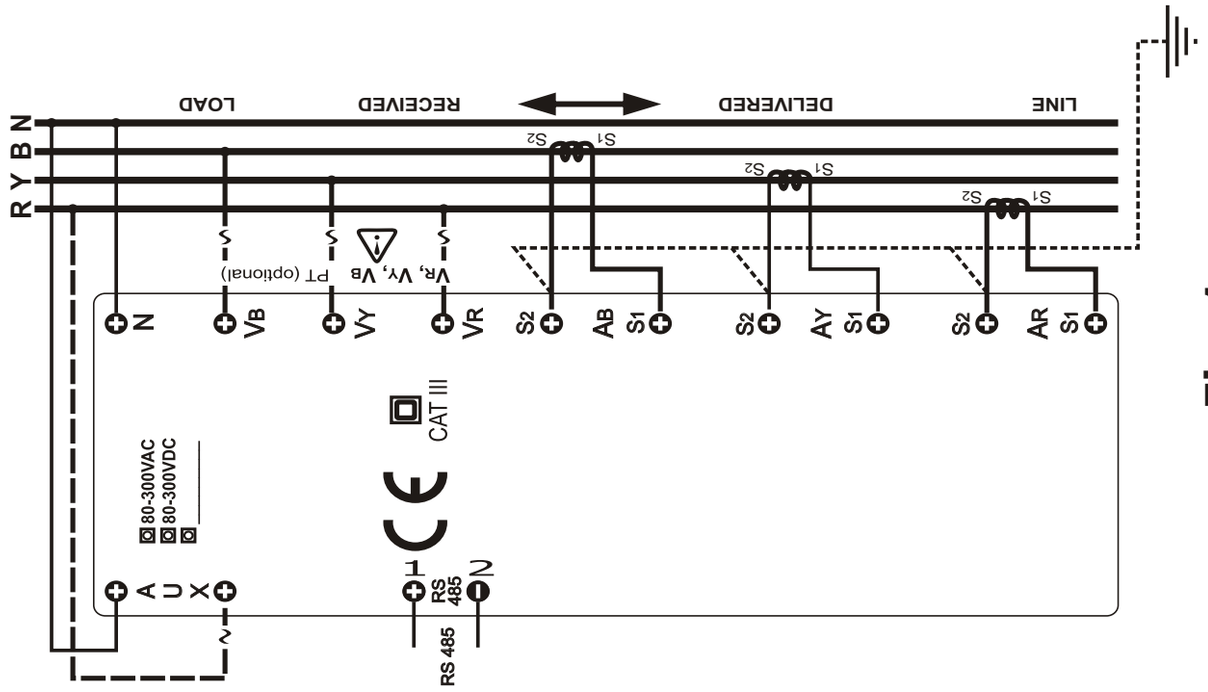


Fig. 1
Star Connection(3E)
3 Phase 4 Wire system

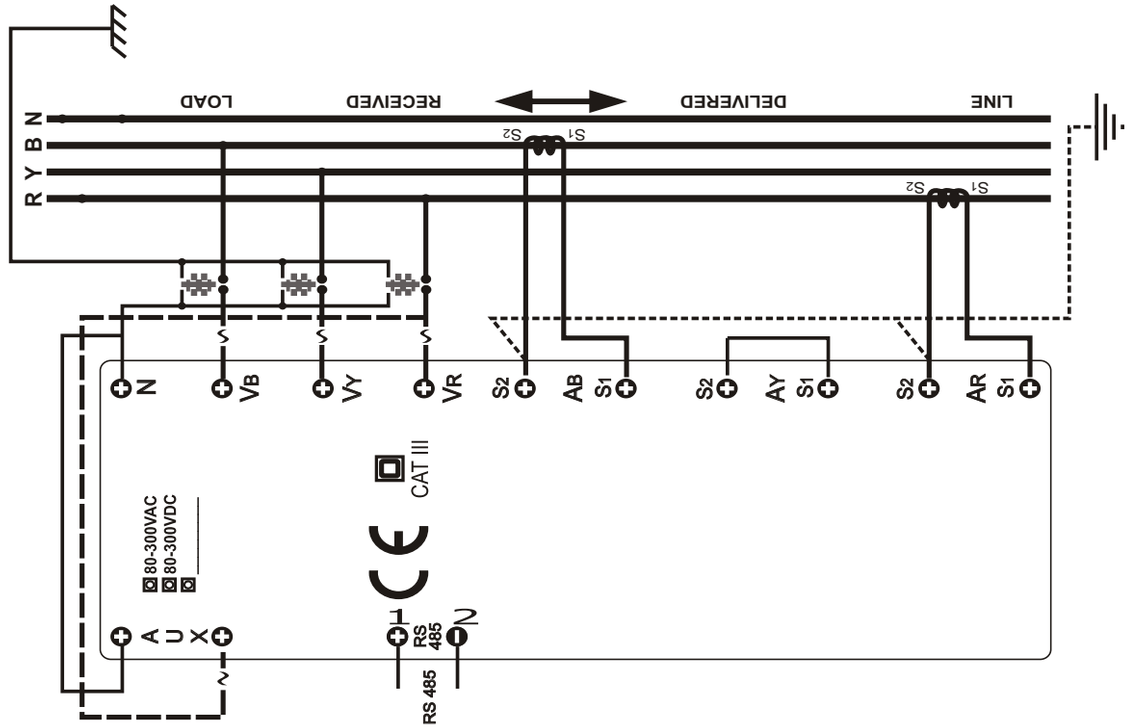


Fig. 2
Delta Connection (2E)
3 Phase 3 Wire system

Note: Wiring should be in accordance with the National Electrical Code and/or the Canadian Electrical Code, Part I.

WIRING DIAGRAM EXTERNAL CT

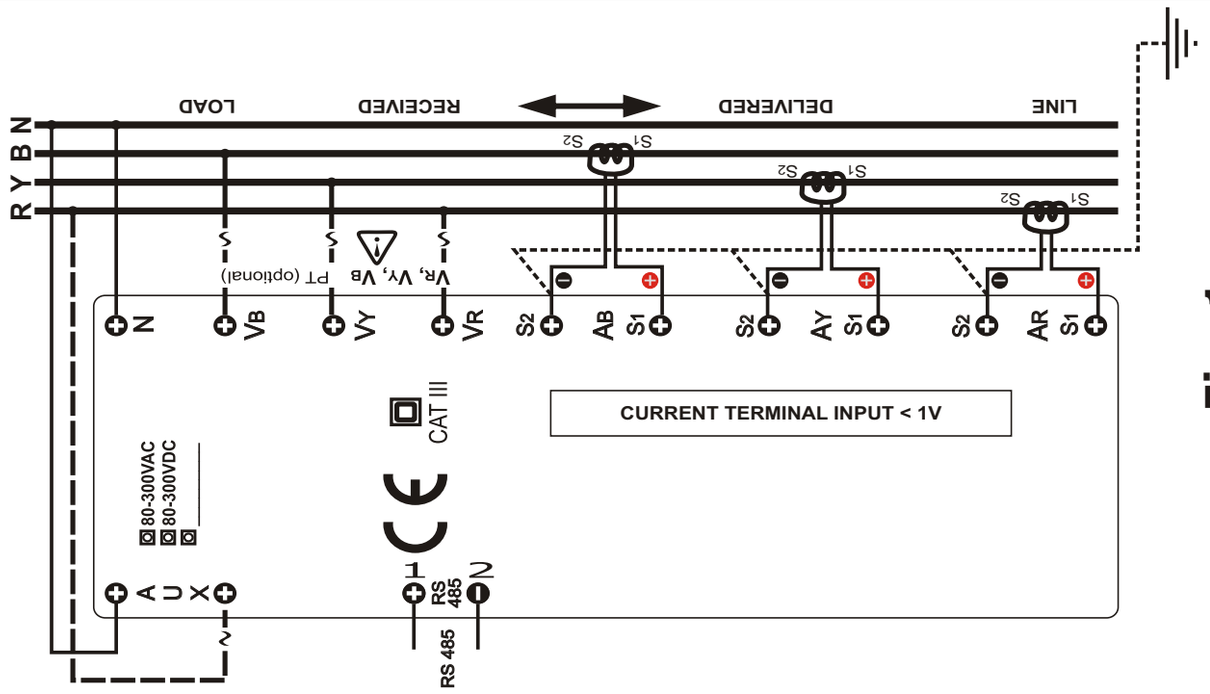


Fig. 1
Star Connection(3E)
3 Phase 4 Wire system

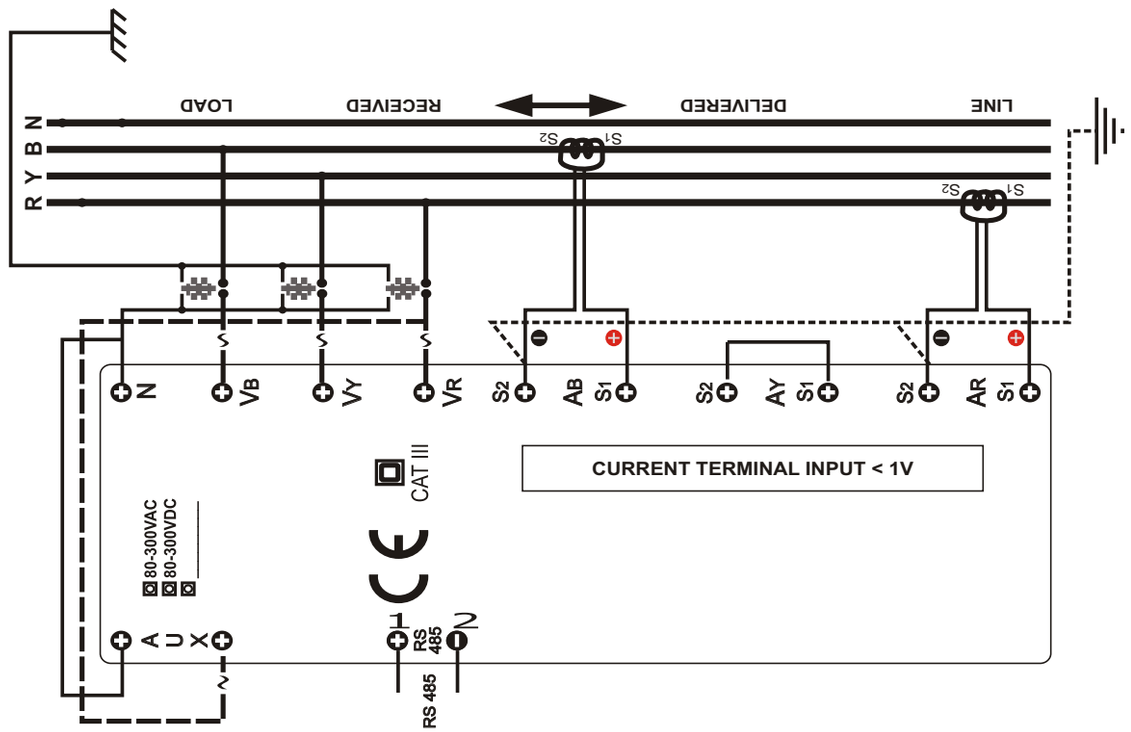


Fig. 2
Delta Connection (2E)
3 Phase 3 Wire system

Note: Wiring should be in accordance with the National Electrical Code and/or the Canadian Electrical Code, Part I.

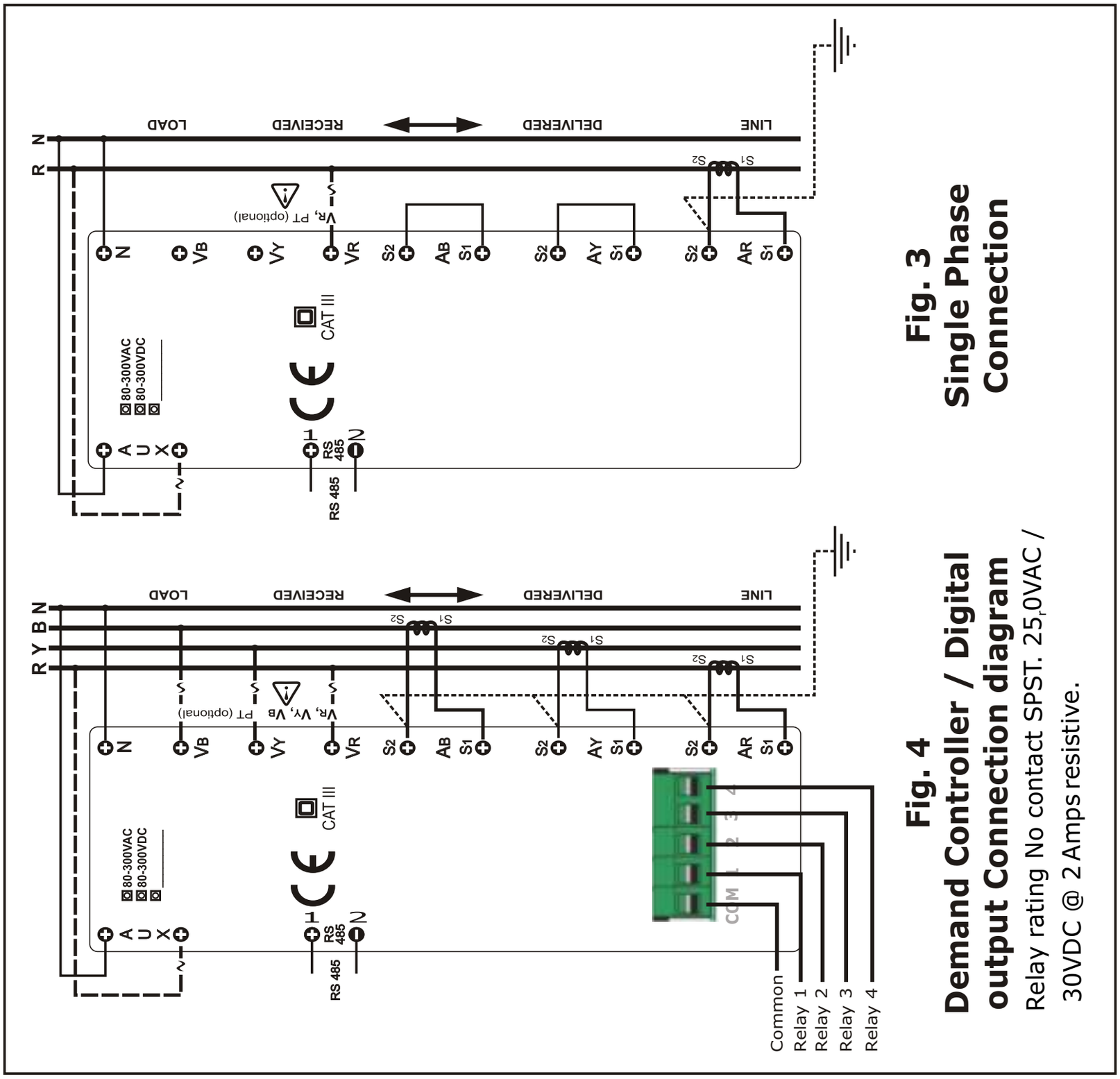


Fig. 3
Single Phase Connection

Fig. 4
Demand Controller / Digital output Connection diagram
Relay rating No contact SPST. 25$_r$0VAC / 30VDC @ 2 Amps resistive.

N6.8ote: For DC Aux Voltage, +/- ve can be connected anyway.

4. KEY FUNCTIONS

Key	In SET (Programming) mode	In RUN (Measurement) mode
RIGHT/ Energy	To select the value and to accept the value	To scroll energy pages to look at different parameters
UP/Power	To edit the value/ system types upward in edit mode and scroll through the parameters	To scroll power pages to look at different parameters
DOWN/ Basic	To edit the value/ system types downward in edit mode and scroll through the parameters	To scroll basic pages to look at different parameters
OPTION	Jumps to save Page	To see the desired option (if any)

5. LED INDICATIONS:

5.1 Indications for eNavigator & Power Navigator

LED status	Display status	Meaning
K – ON	K	Kilo
M – ON	M	Mega
K & **M** – ON	G	Giga
K & **M** – OFF	without K, M & G	Direct reading
Minus (**-**) ON	L	Lag/Delivered
Minus **(-)** OFF	C	Lead

LED status	Meaning
I/O **1** – ON	Relay status Safe Limit (low limit)/default / step1
I/O **2** – ON	Relay status Forecast demand >Hi.L1 / step2
I/O **3** – ON	Relay status Rising demand >Hi.L2 / step3
I/O **4** – ON	Relay status Rising demand >Hi.L1 / step4
⎍⎍/**T1**–Blink	Pulse LED
◯))) – ON	Communication ON

6. DISPLAY OF PARAMETERS:

6.1 Display of Parameters for eNavigator & Power Navigator

DISPLAY	Meaning
LL /LL	Voltage line to line
Ln /Ln	Voltage line to Neutral
ry /ry	Voltage RY Phase
yb /yb	Voltage YB Phase
br /br	Voltage BR Phase
A /A	Current Average
F /F	Frequency
An /An	Neutral Current
rPn /RPM	Revolution Per Minute (RPM)
U.Ph.ANG	Voltage Phase Angle
A.Ph.ANG	Current Phase Angle
Un.bAL.U	Unbalance Voltage
Un.bAL.A	Unbalance Current
U.thd	Voltage THD

DISPLAY	Meaning
Ah	Amps average received
A.thd	Amps THD
A.thd03	Amps THD Phasewise upto 31st level
t.FACt.U.	K-Factor V
t.FACt.A	K-Factor A
Wt	Watts Total
UA	Total VA
Ur	Total VAR
PF	Power Factor
Wh	Active Energy Received
UAh	Apparent Energy
UArh.L	Reactive Inductive Energy
UArh.C	Reactive Capacitive Energy
AUG	Average
Ld.Hr	Load Hour
L	Lagging Power Factor

DISPLAY	Meaning
Intr	Number of Interrupts
U.thd03	Voltage THD Phasewise upto 31st level
On.Hr	On Hour
O	Old
CLr	Clear
rd	Rising Demand
Fd	Forecast Demand
md	Maximum Demand
AL	Additional Load
Et	Elapse Time
Hi	High Level of Parameter
Lo	Low Level of Parameter
b	Baud Rate
d	Delivered
c	Leading Power Factor

Conversions of alphabets used m (M) u (W) k (K)

7. ENTERING CONFIGURATION (SETUP) MODE

To configure the setup parameters in EN/PN series of meters through front panel keys, the following steps can be followed. For display readings refer block for EN, Square bracket for PN series.

Step	Actions	Display Reads	Range/Options/ Comments
1	Press RIGHT & UP keys together to enter SETUP	SEtUP [SETUP]	
2	Press DOWN key	Row 1 PASSwd [PASWD] Row 2: 0000 with first digit "**0**" blinking.	Password page is displayed
3	Press UP key once to increment the first digit to "1"	PASSWORD=1000 (default/factory set).	If any other password is already set, press up and down key to set the correct password

Step	Actions	Display Reads	Range/Options/ Comments
4	Press RIGHT key four times to accept the password.	Row 1: ELEmnt [ELEMNT] Row 2: StAr [STAR] Displays last programmed system type	Element: Defines the power system configuration. Options: STAR / DELTA/ 1.Phase
5	Press RIGHT key to select required system type	Row 1: Element Row 2: Blinks StAr/dELtA/1 Phase	
6	Press UP/DOWN key to select required system type	Row 1: Element Row 2: StAr/dELtA/ 1 Phase	(selected system mode blinks)

CAUTION:

1. **To dismantle the meter remove the fuse from the voltage connections and Auxiliary connection. Short the external links for CT (S1 to S2).**
2. **For Delta/HT connection do not connect Neutral.**

Step	Actions	Display Reads	Range/Options/ Comments
7	Press RIGHT key to accept	Row 1: Element Row 2: selected system type stabilizes	
8	Press DOWN key	Row 1 : PtPri [Pt.Pri.] Row 2 : **415.0**	PT Primary: (415.0 -default/ factory set)
9	Press RIGHT key to set the PT primary value	Row 1 : PT Primary Row 2 : **4**15.0 First digit blinking	Value can be edited using UP/DOWN key.
10	Press RIGHT key to accept the edited value for first digit.	Row 1 : PT Primary Row 2 : Second digit blinking, can be edited using UP/DOWN key. Press RIGHT key to accept the edited value. Continue the same method till fourth digit.	Program Range for PT Primary : 100V to 999kV

***NOTE*: If value set is above this limit, display returns to the maximum PT sec value acceptable.**

Step	Actions	Display Reads	Range/Options/ Comments
11	Press RIGHT key	Row 1: PT Primary Row 2 : Decimal point blinking. Can be set at appropriate location using UP/DOWN key. Ascertain the correct scale (Kilo/Mega/Giga) is selected. Press RIGHT key to accept the edited value.	Eg: To set 11.00kV Set first four digits (1100) as explained above press UP/DOWN key to place decimal point at appropriate location. Letter K/M will indicate the Kilo/Mega. In PN series G indicate for Giga. In EN/TM M & K LED will glow for Giga
12	Press DOWN key	Row 1: PT.SEC [Pt.Sec.] Row 2 : 415.0 (Follow the procedure as described in steps 9 to 11)	PT Secondary Range: 50V to 550V

DANGER : PT secondary circuits are capable of generating lethal voltages and currents with their primary circuit energized. Standard safety precautions should be followed while performing any installation or service on the device (e.g. removing PT fuses, etc.)

CAUTION : PTs are required for delta systems

Step	Actions	Display Reads	Range/Options/ Comments
13	Press DOWN key	Row 1: CT.Pri [Ct.Pri.] Row 2 : 5.000 (Repeat steps 9 to 11 to change the settings)	CT Primary Range: 0.5A to 99kA
14	Press DOWN key	Row 1: CT.SEC [Ct.Sec.] Row 2 : 5.000 (Repeat steps 9 to 11)	CT Secondary Range: 0.5A to 6A
15	Press DOWN key	Row 1: UA.SEL [VA.SEL.] Row 2: UEC.HAr [UEC.HAr]	Method of VA Selection: Arithmetic / Vector harmonics / Vector

CAUTION : Do not connect ground to the shield at both ends of a segment. Doing so allows ground loop currents to flow in the shield, inducing noise in the communication cable.

CAUTION : before wiring, de-energize the PT secondary by opening the circuit or removing the secondary fuse. Do not short the PT secondary. All wiring must confirm to any applicable local electrical codes/ engineering practices.

Step	Actions	Display Reads	Range/Options/ Comments
16	Press DOWN key (Only for PN series)	Row 1: PARAM1 Row 2: WAttS (Default: Watts)	Options: WATTS/ FREQ/A/VLL/VA/PF Option can be edited using RIGHT & UP/DOWN keys.
17	Press DOWN key (Only for PN Series)	Row 1: PARAM2 Row 2: PF (Default: PF)	
18	Press DOWN key	Row 1: bAUd [BAUD] Row 2: xxxx (Default: 9600)	Baud Rate: Communication speed defines the baud rate. Option :1200, 2400, 4800, 9600, 19.20k
19	Press DOWN key	Row 1: PArity [PARITY] Row 2: EUEn (Even)	Internal communication error check Option : EVEn /odd/no(no parity)
20	Press DOWN key	Row 1: dEU.Id [DEV.Id] Row 2: 1.000	Defines the (ID) communications identification number. Option: 1-247

Note: For Second Row Data can be edited using RIGHT & UP/DOWN Keys

NOTE: For detailed Programming guide with options refer www.elmeasure.com

Step	Actions	Display Reads	Range/Options/ Comments
21	Press DOWN key	Row 1: POLES [POLES] Row 2: 4.000	No. of Poles Option : 1 to 28 (For rpm)
22	Press DOWN key	Row 1: rEU.LOC [REV.LOC] Row 2: no [no.]	Reverse Lock. Option: NO/YES. If YES blocks energy accumulation in case the CT polarity reverse.
23	Press DOWN key	Row 1: PASYd [PASWD] Row 2: ---	Range: 1000 -9999. If password is forgotten the meter has to be reset and recalibrated at Elecon factory only.

CAUTION: Memorize the password. Use the same password for next time. Instrument will reject other passwords.

WARNING : When using a modem interface between the host computer and any remote device(s), ensure that the host computer is not used to set the BAUD RATE parameter of any selected device outside the working range of the modem. Doing so will cause that meter to cease communicating. Re-establishing communication with that meter is possible through performing the following:

1. **Reset the baud rate of the remote device from its front panel to a value within the working range of the modem.**
2. **Set the computer to communicate at the baud rate at which the remote device has been set to communicate.**

Step	Actions	Display Reads	Range/Options/ Comments
24	Press DOWN key	Row 1: EnERGY [ENERGY] Row 2: rESOLU [RESOLU]	Energy value format i.e., the energy accumulated in the meter to be displayed in resolution or counter format. Option: resolution/ counter
25	Press DOWN key	Row 1: StArt.A [START.A] Row 2: 0.400	Starting current value to be displayed in the meter Range: (0.2% to 10% of full scale)
26	Press DOWN key	Row 1: dISP.U.t (DISP.U.R] Row 2: 1.000	Update time for Displaying parameter. Range: 1 to 5 seconds.
27	Press DOWN key	Row 1: Auto.t [Auto.T] Row 2: 5.000	Display increment during auto scroll. Range: 1 to 10 seconds.
28	Press DOWN key	Row 1: POP.ON.t [POP.ON.T] Row 2: 250.0	Pulse width defined for pulse output occurrence. Range: 50 to 500m Sec.

Note: For Second Row Data can be edited using RIGHT & UP/DOWN Keys

Step	Actions	Display Reads	Range/Options/ Comments
29	Press DOWN key	Row 1: AO.1.PAr [AO.1.PAR] Row 2: disable [DISABL]	Analog Output 1 parameter Option :VLL/ A/ FrEq/Watts/PF/VA
30	Press DOWN key	Row 1: AO.1.oFS [AO.1.OFS] Row 2: 0.t.20mA	Analog Output 1 OFFSET Option :0.t.20mA or 4.t.20mA
31	Press DOWN key	Row 1: AO.2.PAr [AO.2.PAR] Row 2: disable [DISABL]	Analog Output 2 parameters Option :VLL/ A/ FrEq/Watts/PF/VA
32	Press DOWN key	Row 1: AO.2.oFS [AO.2.OFS] Row 2: 0.t.20mA	Analog Output 2 OFFSET Option : 0.t.20mA or 4.t.20mA
33	Press DOWN key (Only for PN series)	Row 1: [PWR.SAV] Row 2: [DISABL]	Defines Power Save of the LCD back light Option: ENABLE/ DISABLE
34	Press DOWN key	Row 1: byt.Ord [bYt.Ord] Row 2: FLOAt	Byte order Option: FLOAt/biG. End/LitLE.E

Step	Actions	Display Reads	Range/Options/ Comments
35	Press DOWN key	Row 1: SAVE [SAVE] Row 2: n blinking. Row 1 : xxxxLL Row 2 : xxxxLn Row 3 : xxxx A Row 4 : xxxx F	If "n"(no) is selected then Meter enters into Measurement mode without memorizing any edited Values in the setup

Once the required parameter is programmed press the DOWN key continuously till it reaches SAVE page OR press the OPTIONS key to reach SAVE page directly.

7.1 The List of parameters can be configured and the range is given below

Sl.No.	Parameter	Default setup	Range
1	Connection mode	**STAR**	STAR/ DELTA/ 1.Phase
2	PT Primary	**415.0**	100V- 999kV
3	PT Secondary	**415.0**	50V - 550V
4	CT Primary	**5.000**	0.5A - 99kA
5	CT Secondary	**5.000**	0.5A - 6A

Sl.No.	Parameter	Default setup	Range
6	VA selection	**VEC.HAr**	Arith (Arithmetic)/ Uector/ Uec.H (vector harmonics)
7	Programmable Parameter-1	**Watts**	WATTS/FREQ/A/ VLL/VA/PF
8	Programmable Parameter-2	**PF**	PF /FREQ/A/VLL/ VA/ WATTS
9	Baud rate	**9600**	1200 to 19.2K
10	Parity	**Even**	Even/ Odd/ no
11	Device Id	**1.000**	1.000 to 247.0
12	No of Poles	**4.000**	1.000 to 28.00
13	Reverse lock	**No**	Yes/no
14	Password	**1000**	1000 to 9999
15	Energy	**Resolution**	Resolution/Counter
16	Starting Current	**0.400**	0.2 to 10 % of full scale
17	Display update time	**1.000**	1 to 5 seconds
18	Display autoscroll time	**5.000**	1 to 10 seconds

For detailed Programming guide with Options refer www.elmeasure.com

Sl.No.	Parameter	Default setup	Range
19	Pulse out put on time	**250.0**	50 to 500 milliseconds
20	Analog Output 1 parameter	**diSAbL**	VLL/ A/Freq/Watts /PF/VA
21	Analog Output 1 Offset	**0.t.20mA**	0.t.20mA/ 4.t.20mA
22	Analog Output 2 parameter	**diSAbL**	VLL/ A/Freq/Watts /PF/VA
23	Analog Output 2 Offset	**0.t.20mA**	0.t.20mA/ 4.t.20mA
24	Power Save Mode	**Disable**	Disable / Enable
25	Byte order	**FLOAt**	FLOAt/biG.End/ LitLE.E

8. Enabling and disabling of Auto scrolling:

Enabling auto scrolling: Press **UP/DOWN** key continuously for 5 seconds or until display shows **EnAbLE Auto.Sc** for scrolling.

Disabling auto scrolling: Press any key (RIGHT/ UP/ DOWN/ OPTION), display show **dISAbL Auto.Sc** and returns to normal mode.

9. CLEARING PARAMETERS

To Clear parameters from the front panel, Press UP and DOWN Keys together, and 'CLEAR' is shown on the display. Enter the Password (Default password is 1000. Set up and clear has the same password) and it will display "CLr.Int". Press UP / DOWN Key for selecting **CLr.Int** (Clear Integrator)/**CLr.Hi.L** (Clear max. or min value of the parameter)/**CLr.Md** (Clear max. demand). Once the parameter to be cleared is selected it will prompt to '**y**' (yes) or '**n**' (no) confirm. Press UP and DOWN key for changing 'y' or 'n' and Press the RIGHT key to do the operation. User can return to display mode at any time by again pressing OPTIONS button.

CAUTIONS : Once the data is cleared (except energy) the value will not be retained.

10. MULTIPLICATION FACTOR

Energy Display programmable for counter based or Resolution based

Multiplication factor for counter based energy mode							
• Full Scale kW $\sqrt{3}$ V Pri LL x A Pri / 1000	0.4 to 4.0	4.01 to 40	40.1 to 400	400.1 to 4,000	4Mega to 40 M	40 M to 400 M	400 M to 4000 M
• Multiplication Factor:	0.01	0.1	1.0	10	100	1000	10000
• Unit of display	KWH			MWH			GWH

Energy Reset: 999999kVAh x Multiplication Factor

11. APPLICATION

It is a common phenomenon that the equipments/motors often break down in any industry due to various reasons. Typically, the reasons could be poor incoming power quality, improper/ floated earthing, Process defects, loose connections in current route, poor safety measures, unskilled operators, natural calamities (lightening, flood) etc., The damages due to natural calamities is very hard to control by human beings.

Demand Management

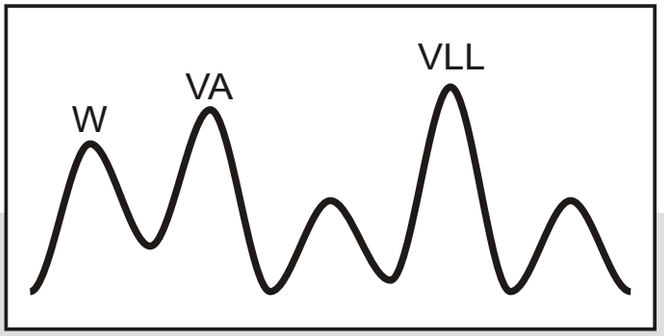
Monitoring - helps to visualise of the demand profile during a billing cycle. Demand peaks with date & time can be identified in the meter as well as ElMeasure's ElNet software. The events can be studied and related with the production events such as starting of furnace or a large motor etc., and helps to decide on switching/staggering of loads etc.

Control - Enables user to program the threshold values of max demand and initiate ALARM/ CUT-OFF when the Forecast Demand/ Present Demand/ Max Demand surpasses the threshold values. This will help the user from exceeding the sanctioned demand and avoid causing a trip or paying huge penalty.

Additional Load - By this feature the user shall be able to decide to transfer the exact quantum of load from EB to DG or vice versa for economic power.

High Low Event Recording for V,A,Hz,VA,W,VAr,PF

Protection of 3 phase system against single phasing, low & high voltage, over load, highly lagging and leading PF, Hz etc. EN/PN can trap such events for future reference.



Identify & record unbalance voltage and currents and helps the user to identify the root cause. Unbalance over-burdens the electrical system and affects in the form of over loading of cables, motors and switchgear.

PF Management

Lower the Avg PF higher the system inefficiency. So this enables the user to maintain a healthy PF level. The Digital output features can be used to initiate alarm when the Avg PF crosses the user programmed threshold values (Lead/ Lag).

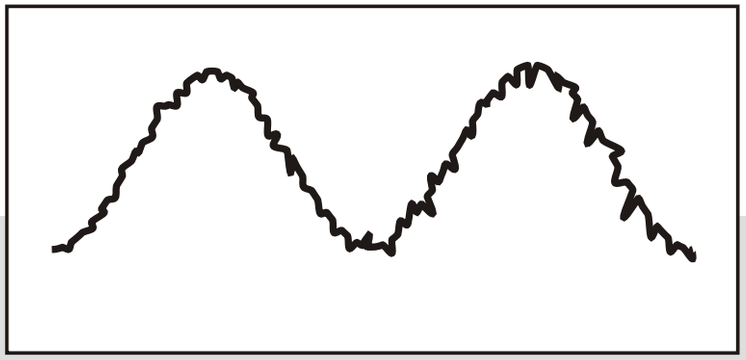
Data Logging with Time Stamp

The information is needed in all types of businesses to determine performance, quality, efficiency, cost reduction, fuel consumption

monitoring and many other critical factors. This feature provides important and accurate data for analysis.

Harmonics up to 31st level and THD

Presence of THD will urge the user to identify the polluting loads and take necessary action to mitigate harmonics thru' an appropriate harmonic filter and save energy and also to improve plant & equipments efficiency.



Monitors Basic, Power & Energy Parameters

Provides the complete spectrum of Electrical system and help study of load pattern.

Power Quality Check/Management

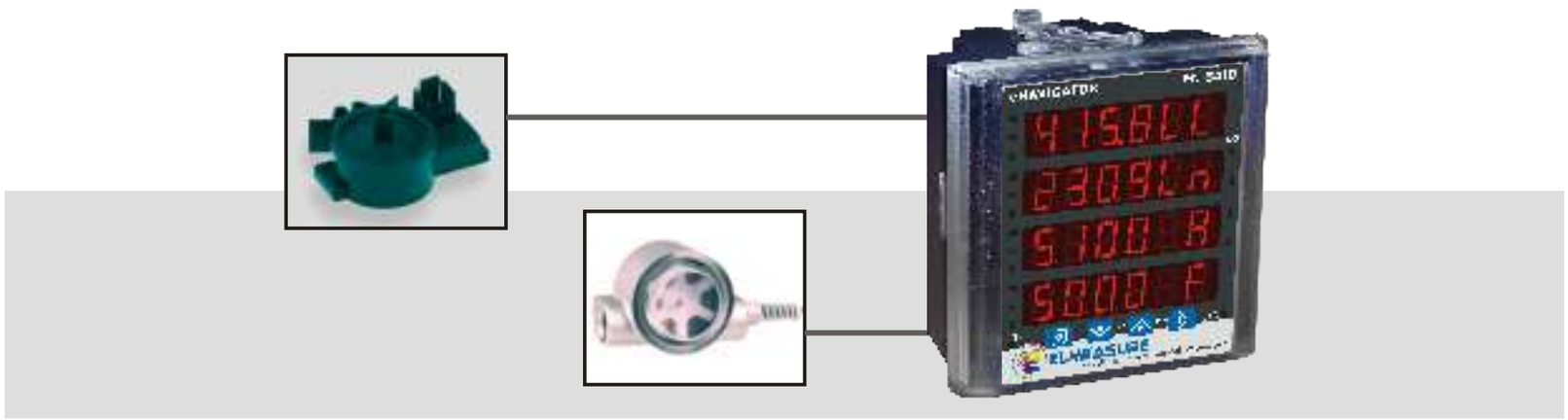
Monitoring phase angle will help the user to identify the causes such as deterioration in the distribution transformers, cables & cable termination, presence of harmonics etc.

Process Integration

Integration of process parameters such as temperature, Oil level, RPM, Pressure etc. giving greater flexibility to monitor them along with electrical parameters.

Control Features

4 user defined potential free Digital Output based on threshold setting for protection relay for any of Under/Over VLL, A, Hz Over (W, VA, Wh) Under (PF), Phase reversal, Single Phase, with programmable trip time to protect the equipments from electrical abnormalities.



Cross Verification of Electricity Billing

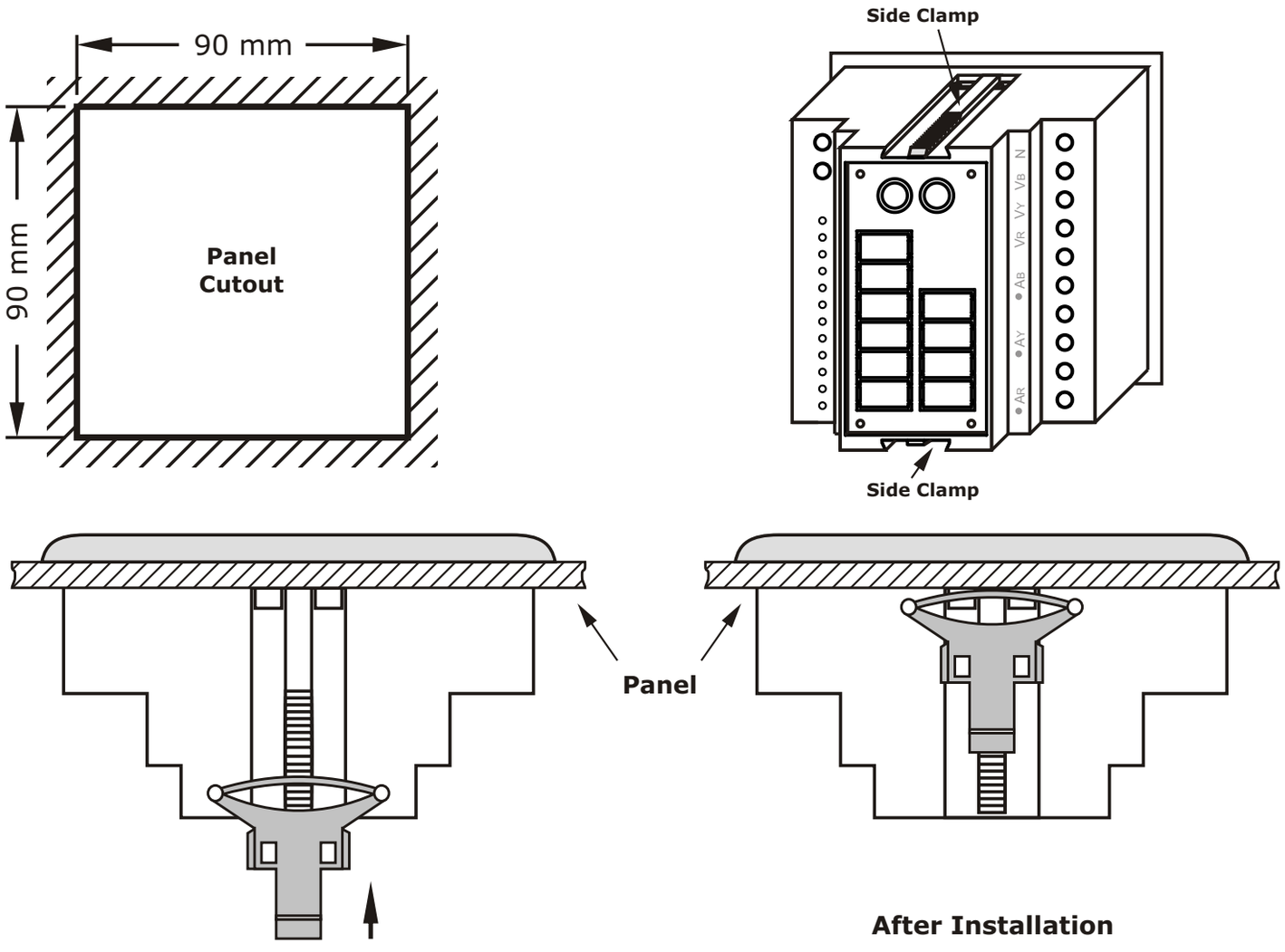
EN/PN will help the user to cross verify with the tariff meter and initiate suitable action if the values have a wide disparity.

12. TECHNICAL SPECIFICATIONS

Parameter	Range
Accuracy	Class 1 (Default) IEC 61036, CBIP 88, Class 0.5, 0.2 (Option)
Sensing/ Measurement	True RMS, 1 Sec update time 4 Quadrant Power & Energy (RD Option)
Input voltage Measurement Range Programmable Range Burden External Fuse Rating	4 Voltage inputs (VR, VY, VB, N) 50 to 520 VLL / 28 to 300 VLN Nominal,45-65Hz Primary 100V to 999 kV. Secondary 50V to 550VLL 0.2VA Max. Per phase 200 mA *
Input Current Measurement Range Programmable Range Overload Burden	Current inputs (AR, AY, AB) 0.05A to 5A Primary 0.5A to 99 kA Secondary 0.5A to 6A With overload of 20% 0.2VA Max. per phase
Auxiliary Supply (Control Power) Burden External Fuse Rating	80V AC- 300V AC, 40-70Hz 80V DC- 300V DC (Default) 5VA Max & CAT II * AXIAL, Voltage Rating VAC:250V; Fuse Current:**200mA;** Breaking Capacity:10kA @ 125VAC; Fuse Size:5mm x 20mm; Blow Characteristic:Slow Blow; Body Material:Glass
CT PT Ratio Max	2000 MVA Programmable
Protection Class	3

Parameter	Range
Display Resolution	**EN:** LED display - 4 Rows (10mm height), 4 digits for Instantaneous, 6 digits for Integrated **PN:** LCD display - 8 Rows 4 digits for Instantaneous, 7 digits for Integrated
Humidity	5% to 95% non condensing
Pollution Degree	2 (As per IEC 61010)
Altitude	Below 2000 mts
Insulation	Double Insulation (As per IEC 61010-1)
Ingress Protection	IP 51 As per IEC 60529
Operating Temperature	-10^{O}C to + 55^{O}C (14^{O}F - 131^{O}F)
Storage Temperature	-25^{O}C to +70^{O}C (-13^{O}F - 158^{O}F)
Measurement Category	CAT III (As per IEC 61010)
Wire Gauge (Connecting wires)	12-14 swg (2.6 to 2.0mm^2) Factory wiring only. 2.5mm^2 crimp terminals(U cut Lugs) with max strip length of 4mm. Insulated or Bare shall be used. Torque 1N-m
Communication Baud rate Isolation	RS 485 serial channel connection Industry standard Modbus RTU protocol (RS232 optional) 1200 bps to 19200 bps (preferred 9600 bps) 2000 volts AC isolation for 1 minute between communication and other circuits.
Dimension Bezel	96 x 96 mm - Depth 55mm behind bezel
Panel Cutout	90^{+2}_{-0} X 90^{+2}_{-0} mm

Mounting : The front bezel of the basic model is molded plastic. Bezel dimensions is 96x96mm. Depth 55mm behind the bezel.



CAUTION : Installations should include a disconnecting device, like a switch or circuit breaker, with clear markings . The disconnecting device should be placed within the reach of the equipment and the operator and it should meet requirements of IEC 60947-1 & IEC 60947-3.

TROUBLESHOOTING

Due to programming error, site conditions, some problems can cause the Meter malfunction. The fault symptoms and their remedial action for correction is given below.

1. If the display does not turn ON:

a) Check that there is at least 80 volts available to the power supply (L and N connections) on the Aux supply terminals. If the above steps do not solve the problem, Contact ElMeasure or your local ElMeasure representative and report the problem and results of the test.

2. If the voltage or current readings are incorrect:

a) Check that the Connection mode (star/delta) is properly programmed.

b) Check that the voltage and current ratios are properly set.

c) Check the output of the CT's and PT's being used.

3. If the kW or Power Factor readings are incorrect but voltage and current readings are correct:

a) Make sure that the phase relationship between voltage and current inputs are correct by comparing the wiring with the appropriate wiring diagram.

b) CT reversal can be observed by either seeing the phase wise kW. Negative kW is shown where the current polarity is reversed, need to be corrected. Model where kW information is not available, you may check Amps Phase angle.

4. If RS-485 communication does not work:

a) Check that the baud rate of the host computer/PLC is the same as Meter.

b) Check that the device ID of the meter are unique and should not replicate.

c) Check all communications wiring is complete.

d) Check that the number of data bits is set to 8, with one stop bit and even parity.

If the symptom persists after performing the specified steps, or if the symptom is not listed above, contact your local ElMeasure representative or the technical support / customer support department.

For service center (internal):

Connector J7,J8,J9,J10,J11,J13 are used for internal calibration only.

WARRANTY AND REGISTRATION

Every product of ElMeasure is warranted for 18 months from the date of invoice for the defects in materials and workmanship when products are used in normal specified conditions. The warranty is void to the product which has been damaged due to improper installation, improper handling, improper connections, neglect, misuse, accident, and abnormal conditions of operation and natural calamities or acts of god. Any attempt of dismantling and unauthorized repair or modifications shall also render the warranty null & void.

1. Failure of products during warranty In India

Customer shall report the failure to the nearest ElMeasure contact point or dealer at the earliest once noticed. ElMeasure shall replace the product failed due to workmanship or defects in materials against receipt of failed product. Burnt, blown, damaged products are not covered under warranty and hence no replacements shall be given.

In the event of product un-available for replacement at ElMeasure or dealer, same shall be arranged at the earliest. Replacement of product is solely at the discretion of dealer or the ElMeasure representative who receive the failed product.

ElMeasure SE may on a case to case basis, recommend for the advance replacement of product mentioning the reasons and justifications for doing so. Sales Manager shall approve advance replacement in genuine cases. The defective product shall be collected and sent to ElMeasure factory within 30 calendar days. Non compliance shall result in debiting cost of the product to the Customer.

Burnt, abused, damaged products shall be forwarded to ElMeasure's Service Center at Bangalore for investigation, transportation pre-paid. Upon investigation, If found the rectification is possible, an estimation for servicing is sent to the customer. Rectification shall be done on receipt of approval for the charges with advance payment only.

2. Failure of products outside warranty In India

The defective products shall be forwarded to ElMeasure Service Center at Bangalore for rectification, transportation pre-paid. Upon investigation, estimation for servicing is sent to the customer. Rectification shall be done on receipt of approval for the charges with advance payment only.

ElMeasure, as a policy, do not provide replacement for the products outside warranty.

For Distributor / Dealer's use only

Seal

Invoice No.: Date:

Elecon Measurements

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