

USER'S MANUAL

ORACLE PORTABLE POWER ANALYZER

This document contains the latest technical information about Oracle which is a micro-controller based Power Meter. The unit is tested against latest "MTE" Standard Model PRS400.3 having basic accuracy of 0.02%, traceable up to International Standards derived using appropriate ratio techniques.

The product, Oracle is sophisticated electronic equipment, and the user is advised to read this User's Manual carefully before attempting to install or operate the equipment.

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Introduction

The new Oracle, micro-controller based is the latest innovations of the previous successful Portable Power Quality Analyzer platform. It incorporates newly enhanced key features including a faster 32-bit CPU to support continually evolving capabilities, a complete 16 MB of nonvolatile internal memory and auxiliary power input capabilities.

Power Quality data can be copied from the instrument to PC or Laptop. The standard software utility has been enhanced to fully support the new functionality and is included at no cost with every Oracle sold.

The Oracle records power quality and power flow information simultaneously. The recorded information can be viewed via the inbuilt graphic displays and downloaded to a computer using the USB interface.

Trinity offers a comprehensive line of flexible voltage probes and clamp-on current probes for use with Oracle.

Application

- Energy audits and forecasting
- Load balancing
- Power factor surveys
- Power quality investigations
- Billing verification
- Harmonic surveys & analysis for filter design
- Load profiling Substation monitoring



The Main Features Available in this Model

Comprehensive Measurement:

- All readings are True RMS measurements
- Fast, real-time cycle by cycle measurement, at 128 samples/cycle
- Four quadrant readings (Power and Power Factor)
- Measures Neutral current.
- Min./Max. Values
- KVA and KW Demands (sliding and fixed) including predictive demand with fixed window
- Interruption with Date and Time for 180 Events
- Sag and Swell Value with Date and Time for 180 Events.
- Odd Harmonics up to 29th of individual Voltage, and Current Waveforms including THD
- Measurement of all three voltages - phase to phase and phase to neutral, all three currents, power factors - phase wise and system, Hz, all three powers (KW, KVA & KVAR), phase wise and system, all three energies, Phase angles, Demand and Maximum Demand in KW and KVA with programmable integration period, neutral current, THD for each voltage and current.

Installations & Connections:

- Single model accepts 3P4W, 3P3W and 1P2W connections
- Site selectable 2mA and 300mA CT secondary selection
- User selectable CT and PT Ratio.

Communication:

- USB port for downloading of logged Data
- ON board 16 MB of Memory
- Logs all Min. /Max. Values
- Logs all electrical parameters, real-time and integrated (energies and demands) and harmonics to get complete Energy system snap-shot

Events Logging:

- Programmable four events to be logged for selectable parameters to High or Low
- Date and Time for event loggings with Minimum and Maximum values

Display:

- Easy user interface through Touch Screen
- Graphical color TFT display with 640x480 pixels.

Technical Specifications

True RMS Basic Parameters

Parameter			Mode		
Type	Statistics	Symbol	3P4W	3P3W	1P2W
Voltage (Volts L-N)	Direct Voltage Input : 0 to 300V AC	Vr	√	-	√
	PT Ratio : Freely Programmable up to 220KV	Vy	√		
	Range of Reading Accuracy : 0 to 220KV : 0.5% of Reading	Vb	√		
Voltage (Volts L-L)	Direct Voltage Input : 0 to 510V AC	Vry	√	√	
	PT Ratio : Freely Programmable up to 220KV	Vyb	√	√	
	Range of Reading Accuracy : 0 to 220KV : 1.0% of Reading	Vbr	√	-	
Current (Amps Ir, y, Ib)	Secondary Current Input : 2mA, 300mA	Ir	√	√	√
	CT Ratio : Freely Programmable up to 9999A	Iy	√		
	Range of Reading Accuracy : 0 to 9999A : 0.25% of Reading	Ib	√	√	
Neutral Current	Accuracy : 0.25% of Reading	In	√	-	√
Line Frequency	45 to 55 Hz, Accuracy : 0.3% of Reading	Hz	√	√	√

Power

Parameter			Mode		
Type	Statistics	Symbol	3P4W	3P3W	1P2W
Active Power (P)	Accuracy : 1.0% of Reading (Between 0.5 Lag to 0.8 Lead)	(P) R-Phase	√	√	
		(P) Y-Phase	√		
		(P) B-Phase	√	√	
		System KW	√	√	√
Reactive Power (Q)	Accuracy : 1.5% of Reading (Between 0.5 Lag to 0.8 Lead)	(Q) R-Phase	√	√	
		(Q) Y-Phase	√		
		(Q) B-Phase	√	√	
		System KVAR	√	√	√
Apparent Power (S)	Accuracy : 1.0% of Reading	(S) R-Phase	√		
		(S) Y-Phase	√		
		(S) B-Phase	√		
		System KVA	√	√	√
Power Factor	Accuracy : 1% of Reading ($IPF \geq 0.5$) Range of Reading : 0.05 to 1.00 Lag/Lead	PF R-Phase	√		
		PF Y-Phase	√		
		PF B-Phase	√		
		System PF	√	√	√

Energy

Parameter		Mode		
Type	Statistics	3P4W	3P3W	1P2W
Total Active Energy (KWh)	Range of reading : 0 to 9999999.9 KWh Accuracy : 1.0S as per IS 13779.	√	√	√
Total Reactive Energy (KVARh)	Range of Reading : 0 to 9999999.9 KVARh Accuracy : 1.5% of Reading (Between 0.5 Lag to 0.8 Lead)	√	√	√
Total Apparent Energy (KVAh)	Range of Reading : 0 to 9999999.9 KVAh Accuracy : 1.0% of Reading	√	√	√

Demand

Parameter		Mode		
Statistics	Symbol	3P4W	3P3W	1P2W
Active Power (KW) Demand : Sliding & Fixed Selectable	KW-D	√	√	√
Apparent Power (KVA) Demand : Sliding & Fixed Selectable	KVA-D	√	√	√
Predictive Demand : Fixed Window	PKW, PKVA	√	√	√

Power Quality

Parameter	Mode		
	3P4W	3P3W	1P2W
Harmonics for Voltages(3 rd to 29 th)	√	√	√
Harmonics for Currents(3 rd to 29 th)	√	√	√
THD for each voltage	√	√	√
THD for each current	√	√	√

Miscellaneous

Parameter	Mode		
	3P4W	3P3W	1P2W
Phase angles.	√		
Run time	√	√	√

Input Specification

Supply : Three Phases and Neutral of a 3P4W system/ three phases of a 3P3W system/ single phase of 1P2W

Voltage

Direct Voltage Input : Up to 510V L-L and 300V L-N
PT Ratio : Freely Programmable up to 220KV site selectable.
Range of Reading : 1-220KV
Burden : 0.5VA

Current

Secondary Current
Input : 2mA, 300mA
Range of Reading : 0 – 9999A
Burden : < 1.0VA

Power Supply:

Unit take supply from 3-phase input with an operating range 60 - 480 VAC, 50-60 Hz. An auxiliary supply is also provided for offsite use of the Oracle. It also operates on 80 - 500 VAC and 50-60 Hz.

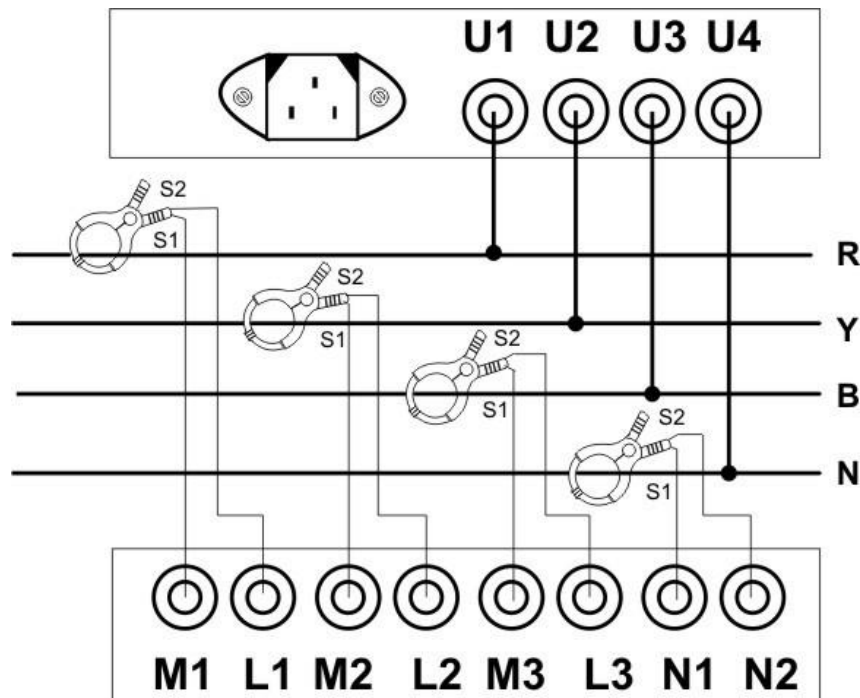
Installation and Commissioning

The Oracle supports three installation modes – 3P4W, 3P3W and 1P2W. The installation processes of these modes are described below:

3P4W Mode Installation

To install and commission the unit, precede the following instructions:

1. Place the unit nearby the three phases connected to EB. Unit does not required external auxiliary supply. It will be powered on from connected 3P4W system.



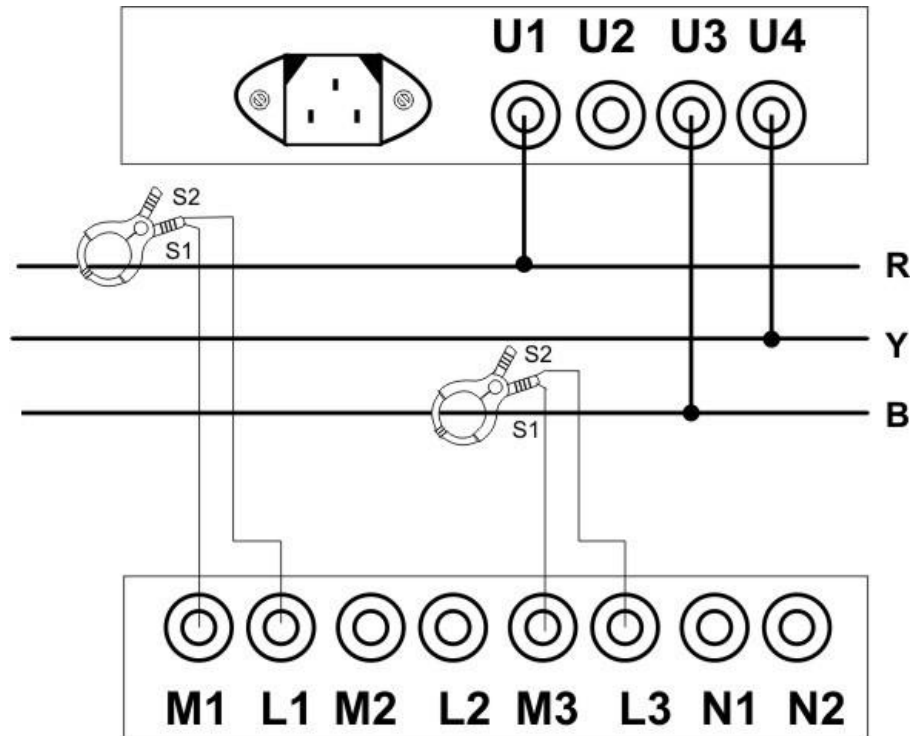
2. Connect the three phases and neutral wire with the sequence being R-Y-B and N to the terminals marked U1, U2, U3 and U4 such as shown above. Make sure that the three phases including neutral wire coming to the unit come through control fuses of 1.0 Amp rating. This will protect the electronics inside from damage due to severe over voltages or phase faults in the system.
3. Connect the two wires from the R-phase Clamp-On CT to the terminals marked M1 & L1 such that S1 from CT goes to M1 on the unit. Connect the two wires from the Y-phase Clamp-On CT to the terminals marked M2 & L2 such that S1 from CT goes to M2 on the unit. Connect the two wires from the B-phase Clamp-On CT to the terminals marked M3 & L3 such that S1 from CT goes to M3 on the unit. Similarly, connect the two wires from the neutral wire Clamp-On CT to the terminals marked N1 & N2 such that S1 from CT goes to N1 on the unit.

4. Switch on the three phases supply. Unit will be powered on from this three Phase supply and then it will display company information for 4 to 5 seconds. After that, the unit will display the first page of Run Mode.
5. If there is no current or little current in the CT circuits, the unit may show PF as 0.999 or 1.000. This will go away as soon as the current builds up in the CURRENT TRANSFORMERS (CTs) above 0.4 % of rated CT.
6. The unit needs to be programmed for the various parameters which are field programmable, and for selecting the various options supported, refer section, '*OPERATIONAL DETAILS*' in the next section.
7. Now, the unit is ready for operation.

3P3W Mode Installation

To install and commission the unit, precede the following instructions:

1. Place the unit nearby the three phases connected to EB. Unit does not required external auxiliary supply. It will be powered on from connected 3P3W system.



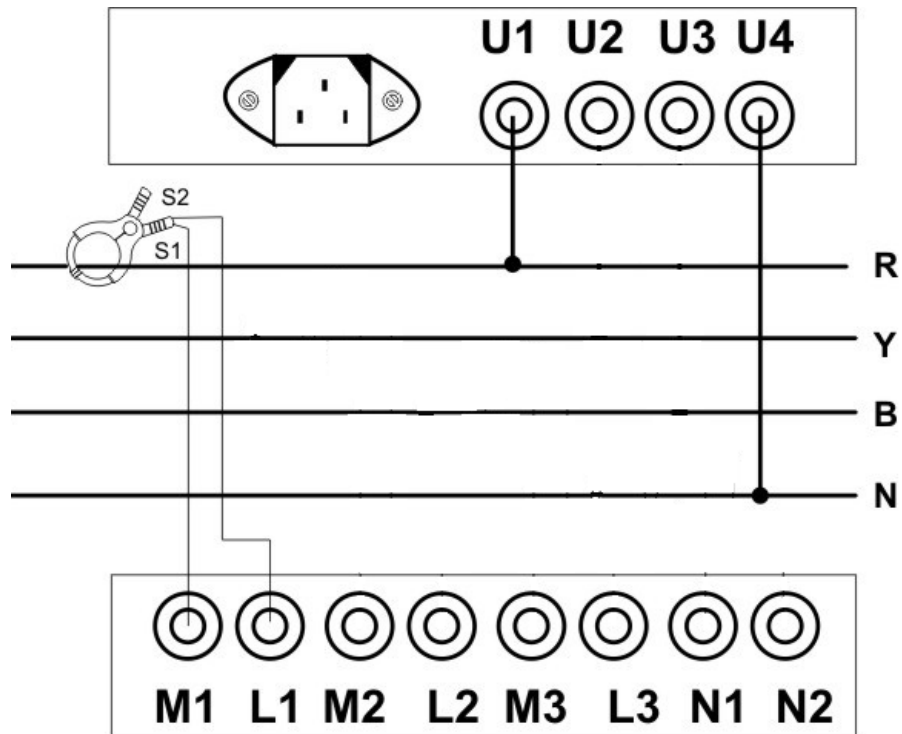
2. Connect the three phases with the phase sequence being R-Y-B to the terminal marked, U1, U4 and U3 such as shown above. Make sure that the three phases coming to the unit come through control fuses of 1.0A rating. This will protect the electronics inside from damage due to severe over voltages or phase faults in the system.
3. Connect the two wires from the R-Phase Clamp-On CT to the terminals marked M1 & L1 such that S1 from CT goes to M1 on the unit. Connect the two wires from the B-phase Clamp-On CT to the terminals marked M3 & L3 such that S1 from CT goes to M3 on the unit.
4. Switch on the three phases supply. Unit will be powered on from this three phase and then it will display company information for 4 to 5 seconds. After that, the unit will display the first page of the Run Mode.
5. If there is no current or little current in the CT circuits, the unit may show PF as 0.999 or 1.000. The unit will show actual PF as soon as the current builds up in the current transformers (CTs), above 0.4 % of rated CT.

6. The unit needs to be programmed for the various parameters which are field programmable, and for selecting the various options supported, refer, '*OPERATIONAL DETAILS*' in the next section.
7. Now, the unit is ready for operation.

1P2W Mode Installation

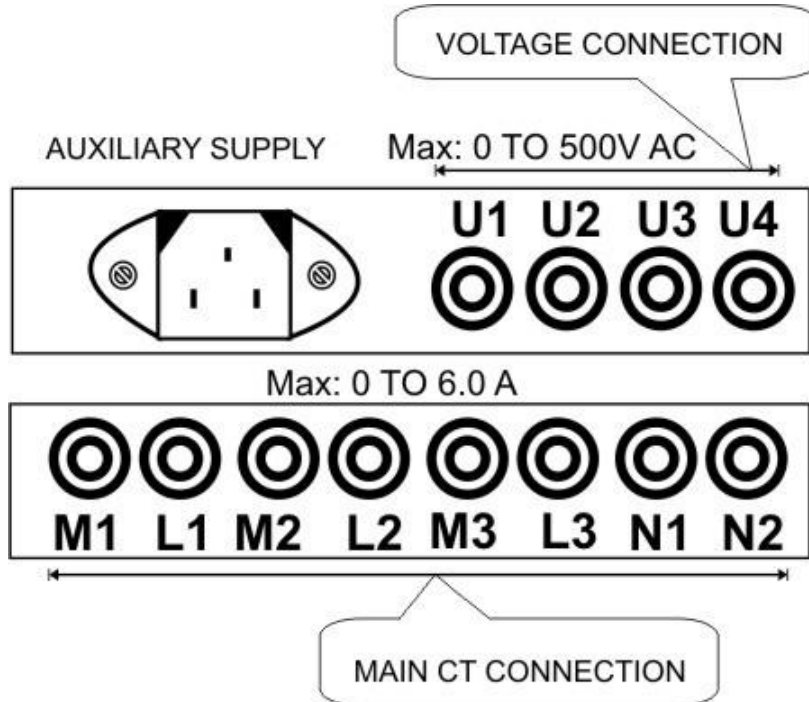
To install and commission the unit, precede the following instructions:

1. Place the unit nearby the single phases connected to EB. Unit does not required external auxiliary supply. It will be powered on from connected 1P2W system.



2. Connect the single phase with the phase sequence being R to the terminal marked, U1 such as shown above. Make sure that the three phases coming to the unit come through control fuses of 1.0A rating. This will protect the electronics inside from damage due to severe over voltages or phase faults in the system.
3. Connect the neutral wire to the terminal marked U4.
4. Connect the two wires from the R-Phase Clamp-On CT to the terminals marked M1 & L1 such that S1 from CT goes to M1 on the unit.
5. Switch on the single phases supply. Unit will be powered on from this single phase and then it will display company information for 4 to 5 seconds. After that, the unit will display the first page of the Run Mode.
6. If there is no current or little current in the CT circuits, the unit may show PF as 0.999 or 1.000. The unit will show actual PF as soon as the current builds up in the current transformers (CTs), above 0.4 % of rated CT.

7. The unit needs to be programmed for the various parameters which are field programmable, and for selecting the various options supported, refer, '*OPERATIONAL DETAILS*' in the next section.
8. Now, the unit is ready for operation.



Connection Scheme

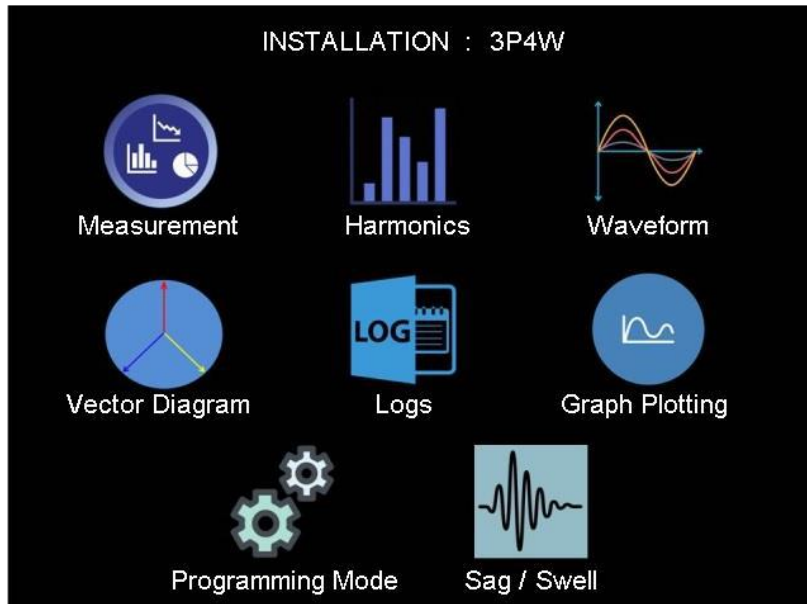
Operational Details

The Portable Power Analyzer, Oracle is a versatile meter with all the features needed to implement for a robust electrical load measurement. It can be configured to analyze most electrical parameters and communication needs and, is also achieved by making field programmable parameters, as possible.

Modes of operation in Oracle:


1. Programming Mode
2. Run Mode(Measurement)
3. Harmonics
4. Waveform
5. Vector Diagram
6. Logs
7. Graph Plotting
8. Sag/Swell

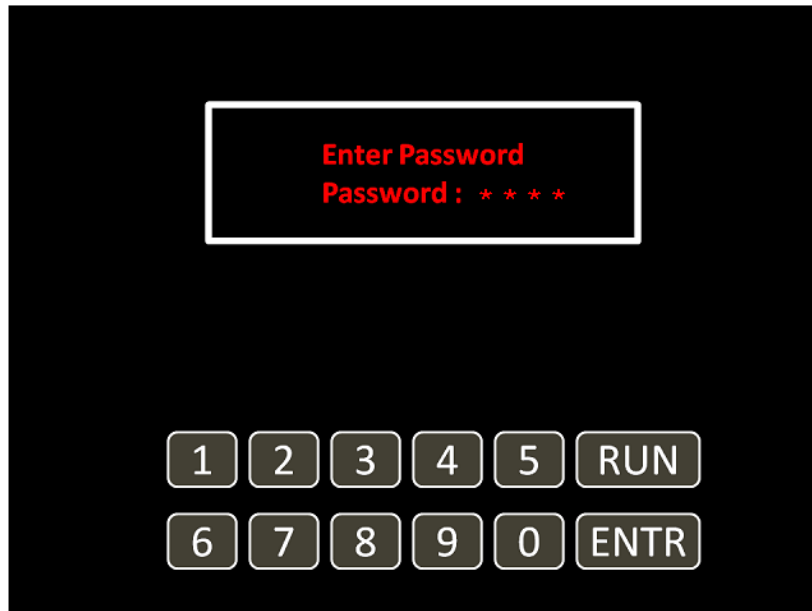
After supplying power (80 VAC - 500 VAC) to the three phases, the unit displays immediately power receiving information such as, ORACLE and TRINITY logo on TFT screen and by default, the display comes into Run Mode such as shown below.





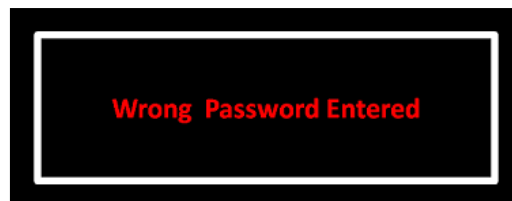
Now, the unit can be operated by touching on any of the icon. Touching the icon shows color changes at that area.


To operate for all the programmable parameters into Programming Mode, precede the following instructions.

- Touch  key above and then, the unit will ask you to enter a password with the keypad provided such as shown below.





1. Enter a four numerical password in the password box by touching the above numerical keys and then, touch  key to enter into Programmable parameters.
2. To exit from password page touch  key to navigate to installation main menu.
3. If entered password is wrong it shows Wrong Password Entered information on display page for 3 sec as shown below & then again shows enter password box.






4. In case, the password is not put into service, just touch  key to ignore the password prompted and then, the unit will prompt the following Programming Mode such as shown.

1st Page programming mode Parameters:

<u>Programming Mode</u>		
No	Settable Parameters	Values
1	Installation	3P4W
2	PT_Primary	240
3	PT_Secondary	110
4	Mains - CT Primary	600
5	Mains - CT Secondary	300 mA
6	NEUTRAL - CT Primary	600
7	NEUTRAL - CT Secondary	300 mA

BACK  

Exit From programming mode touch on BACK key Icon  and unit will reset if any Parameter changed. To change programming mode pages touch  or  icons.

Selecting Installation type

The unit supports 3 types of electrical installation: 3P4W, 3P3W and 1P2W. According to your electrical installation, user should select to either 3P4W or 3P3W or 1P2W.

To select the installation type, precede the following instructions.

1. To program touch on installation type on 3P4W & it shows menu as below.

Programming Mode		
No	Settable Parameters	Values
1	Installation	3P4W
2	PT_Primary	1P2W
3	PT_Secondary	3P3W
4	Mains - CT Primary	3P4W
5	Mains - CT Secondary	300 mA
6	NEUTRAL - CT Primary	600
7	NEUTRAL - CT Secondary	300 mA

BACK ← →

2. Now touch on any of three installation mode to select and save.

Setting PT-Primary and PT-Secondary

Both the PT-Primary and PT-Secondary should be set to give for the actual voltage of PT operated meter. The PT-Primary is freely programmable from 110V to 220000V whereas PT-Secondary is settable from any one of the following voltages: 110V or 240V or 415V.

PT Secondary should be selected at site so as to give the actual voltage in your PT operated meters. The PT Secondary can be selected from 110V or 240V or 415V.

To Program Touch on PT Secondary value, enter value in keyboard and press OK to save. If don't want to change the value then press close button.



Setting Mains CT-Primary and Mains CT-Secondary

The Main CT-Primary and Main CT-Secondary should be set to get actual current of CT operated meters. The CT-Primary is settable from 1 to 9999A and the CT-Secondary is selectable from any one of the following currents: 2mA, 300mA. However, the settable CT secondary is applicable in programming number 27.

In CT selection user selects 2mA that time CT-Secondary can be either 1A or 5A. Elsewhere in case of 300mA CT-Secondary not programmable. Make sure before selection of CT-secondary checkout the value of CT selection which is locate in programming number 27.

No	Settable Parameters	Values
27	CT Selection	300 mA
		2
		300

To retrieve the CT Primary, precede the following instructions.

1. In programming mode touch on **CT Primary** parameters, After touching CT Primary value numeric keyboard appear to enter value.
2. Now enter **CT Primary** value and press **OK** button to save the parameter.
3. After successful setting CT Primary value it appears on the display and user can configure next programmable parameter.

Selecting CT Secondary

CT Secondary should be selected at site so as to give the actual current for CT operated meters. CT Secondary can be selected to either 1A or 5A where CT Selection is set 2mA by user. Otherwise; in case of 300mA CT selection it's not programmable.

To retrieve the CT Secondary, precede the following instructions.

- To program CT Secondary touch on CT Secondary value and menu appear as two options 1 & 5 such as shown below.



- Now touch any of them option **1 or 5** and save the configuration

Setting Neutral-CT Primary and Neutral-CT Secondary

If there is an imbalance load or harmonic distortion in R-Y-B phase, the current flows in neutral wire. Such neutral current can be measured exactly and so the Neutral-CT Primary should be set from 1 to 9999A as well as the Neutral-CT Secondary – 2mA, 300mA. However, the settable Neutral CT secondary is applicable in programming number 27.

To retrieve the Neutral-CT Primary, precede the following instructions.

1. In programming mode touch on **NEUTRAL-CT Primary** parameters, After touching CT Primary value numeric keyboard appear to enter value.
2. Now enter **NEUTRAL-CT Primary** value and press **OK** button to save the parameter.
3. After successful setting **NEUTRAL-CT Primary** value it appears on the display and user can configure next programmable parameter.

Selecting NEUTRAL-CT Secondary

NEUTRAL-CT Secondary should be selected at site so as to give the actual current for CT operated meters. **NEUTRAL-CT Secondary** can be selected to either 1A or 5A where CT Selection is set 2mA by user Otherwise; in case of 300mA CT selection it's not programmable.

To retrieve the **NEUTRAL-CT Secondary**, precede the following instructions.


- To program **NEUTRAL-CT Secondary** touch on CT Secondary value and menu appear as two options 1 & 5 such as shown below.



- Now touch any of them option **1** or **5** and save the configuration.

2nd Page programming mode Parameters:

<u>Programming Mode</u>		
No	Settable Parameters	Values
8	Date	31 / 12 / 2019
9	Time	12 : 59 : 59
10	Log Duration	10
11	Demand Window	SLIDING
12	Demand Interval	15
13	Change Password	* * * *
14	Event Number	1

BACK 

Setting Date and Time

The system date can be set in DD/MM/YY format and the real time can be set in HH:MM:SS format. However, hours are set in the 24 hour format, i.e. 6.00 PM is set as 18:00:00 hours. This date and time will not only represent into system real time but it will also represent into Event Logging.

User can program Date, Month, Year, Hour, Minute, Second individually by touching on that parameter then enter value in keyboard and press **OK** to save.

No	Settable Parameters	Values
8	Date	31 / 12 / 2019
9	Time	12 : 59 : 59

Setting Log Duration

For logging of electrical parameters, the Log Duration is freely programmable from 1 second to 999 seconds. Oracle enables to record most data on its own Non-volatile RAM of which the maximum number in any installation mode are up to **58800** logs. The data is recorded in an FIFO buffer. Once the buffer is full, the oldest data is discarded and the newest data is filled into the buffer. This data can then be downloaded by using a software utility onto a PC record by record through USB port.

To set the above parameter, retrieve the touch onto **Log Duration** by touching display and then, set as before according to your desire with the following display.

No	Settable Parameters	Values
10	Log Duration	10

Selecting Demand Window and Demand Interval

For KW and KVA demand, the calculation method can be selected to either SLIDING or FIXED type. For calculation of KW and KVA demand, the Demand Interval can also be selected to either 15 minutes or 30 minutes.

To select the above parameters, retrieve the touch onto **Demand window** and **Demand Interval** respectively, by touching and then, select as before according to your desire with the following display.

No	Settable Parameters	Values
11	Demand Window	SLIDING
		SLIDING
		FIX
12	Demand Interval	15
		15
		30

Setting a Password

The password is not compulsory for the operation of meter. In case of your meter setting protection, the password can be used. Hence, the unit accepts a four digits password from 1000 to 9999 & 0. To change the programming mode password need to touch on * * * * pattern, then enter value from 1000 to 9999 in keyboard and press ok to save. You can also set 0 as password. The entered password visible in RED color format for 3 sec & then disappears.

To set the above parameter, retrieve the touch onto **Change Password** by touching and then, set as before according to your desire with the following display.

No	Settable Parameters	Values
13	Change Password	* * * *

Event Number

Oracle supports four user defined events to be logged of which any one of the events can be specified to either HIGH or LOW for your required parameter.

3rd Page programming mode Parameters:

Setting Event Parameter, Event Value, Event Seconds, Event On to High or Low:

The minimum and maximum threshold values to be logged for a selected parameter to each 4 events can be described as.

<u>Programming Mode</u>		
No	Settable Parameters	Values
15	Event 1 Parameter	HZ
16	Event 1 Value	50
17	Event 1 Seconds	10
18	Event 1 On	HIGH
19	Back Light On Time	10
20	Reset Energies	NO
21	Reset Demands	NO

At the bottom of the screen, there is a **BACK** button on the left and a double-headed arrow navigation button on the right.

Event Parameter

There are seven parameters for which Event Parameter can be defined to any of the following: average volt (AVG_V), average amps (AVG_I), KW, KVA, KVAR, PF, and HZ.

To set the above parameter, retrieve the touch onto **EVENT PARAMETER** by touching and then, set as before according to your desire with the following display.

No	Settable Parameters	Values
15	Event 1 Parameter	HZ
16	Event 1 Value	PF
17	Event 1 Seconds	KW
18	Event 1 On	KVA
19	Back Light On Time	KVAR
20	Reset Energies	AVG_I
21	Reset Demands	AVG_V

Event Value

The event value is freely programmable from 000001 to **999999**. The event value of PF should be entered with a multiplying factor of 1000, i.e. if the value is to be set to 0.855, 855 are to be entered. In case of HZ, there is no resolution and hence two digits should be entered. e.g. 48 or 49.

Event Seconds

Event Seconds is freely programmable from 001 to **999** seconds for a selected event parameter. e.g. if the event parameter is KW, and event value is 300, the event type is High, and the event seconds is 6, then, if KW exceeds 300 and stays there for 6 seconds or more, then this is considered a valid event, and logged in the event memory.

Event On

The Event On can be selected to **Low** or **High** so that the minimum or maximum system values could be logged.

To program the above events parameters, retrieve the touch onto **Event Number** by touching and then, set as before according to your desire with the following display.

No	Settable Parameters	Values
14	Event Number	1
15	Event 1 Parameter	HZ
16	Event 1 Value	50
17	Event 1 Seconds	10
18	Event 1 On	HIGH

In order to set for all four types of events, after completing event 1, repeat the parameter number from 14 to 18 to specify for all four events. When event number is set to 2, Event 2 will prompt on each above parameters. Likewise, event number 3 and 4 will also prompt. Such four events setting can be viewed in Run Mode page including event LOG and OVERFLOW status.

Setting Back light On Time

This is to determine the On Time of the Back Light of Touch screen Based TFT, in Run Mode. Such parameter is programmable from 5 to 59 seconds. In Run Mode, when user touches the screen, the back light will turn on for the programmed duration. In Programming Mode the back light will always be on.

To program the above parameter, retrieve the touch onto **Back Light On Time** by touching and then, set as before according to your desire such as shown below.


No	Settable Parameters	Values
19	Back Light On Time	10

Resetting Energies

The energies such as KWh, KVAh and KVARh can be reset where the energies become zero if Reset Energies is set to Yes.

To reset the above parameter, retrieve the touch onto **Reset Energies** by touching and then, set as before according to your desire with the following display.

<u>Programming Mode</u>		
No	Settable Parameters	Values
15	Event 1 Parameter	HZ
16	Event 1 Value	50
17	Event 1 Seconds	10
18	Event 1 On	YES
19	Back Light On Time	NO
20	Reset Energies	NO
21	Reset Demands	NO

BACK 

Resetting Demands


The maximum Demand power values such as MD-KW and MD-KVA will be overwritten with the threshold values of KW-D and KVA-D after reset. The date and time of MD-KW and MD-KVA occurrence will also be replaced by the current time and date.

To reset the above parameter, retrieve the touch onto **Reset Demands** by touching and then, reset as before according to your desire with the following display.

No	Settable Parameters	Values
21	Reset Demands	NO

4th Page programming mode Parameters:

<u>Programming Mode</u>		
No	Settable Parameters	Values
22	Reset Logs & Sag,Swell	NO
23	Reset Run Time	NO
24	Reset Events	NO
25	Reset Min/Max	NO
26	Master Reset	NO
27	CT Selection	300 mA
28	Reset Oracle	NO

BACK 


Resetting Logs & Sag, Swell

The previous logged & Sag, Swell data can be reset if Reset Logs is set to Yes.

More understanding about Sag/Swell is mention in next page programming parameter number 32 & 33.

To reset the above parameter, retrieve the touch onto **Reset Logs & Sag, Swell** by and then, reset as before according to your desire with the following display.

<u>Programming Mode</u>		
No	Settable Parameters	Values
22	Reset Logs & Sag,Swell	NO
23	Reset Run Time	YES
24	Reset Events	NO
25	Reset Min/Max	NO
26	Master Reset	NO
27	CT Selection	300 mA
28	Reset Oracle	NO

BACK 

Resetting the Run Time

To reset run time, The Reset Run Time should be set to Yes and then, The Run Time will display 0 H, i.e., 00000:00:00.

To reset the above parameter, retrieve the touch onto **Reset Run Time** by touching and then, reset as before according to your desire with the following display.

No	Settable Parameters	Values
23	Reset Run Time	NO

Resetting Events

The logged data under which four events has been specified for the event occurrence of the user defined parameter can be reset to zero.

To reset the above parameter, retrieve the touch onto **Reset Events** by touching and then, reset as before according to your desire with the following display.

No	Settable Parameters	Values
24	Reset Events	NO

Resetting Minimum/Maximum Values

The Minimum and Maximum parameters values such as average voltage, current, KW, KVA, KVAR, PF and Hz can be reset as zeroes. (Refer Run Mode page)

To reset the above parameter, retrieve the touch onto **Reset Min/Max** by touching and then, reset as before according to your desire with the following display.

No	Settable Parameters	Values
25	Reset Min/Max	NO

Selecting the Master Reset for all the Parameter Values

All the programmable parameters for Reset as defined before can be reset by Master Reset only.

To reset the above parameter, retrieve the touch onto **Master Reset** by touching and then, reset as before according to your desire with the following display.

No	Settable Parameters	Values
26	Master Reset	NO

CT Selection

The CT-Selection is programmable for both Main CT-secondary and Neutral CT-secondary from any one of the following: 2mA, 300mA.

To program the above parameter, retrieve the touch onto **CT Selection** by touching and then, set as before according to your desire such as shown below.

No	Settable Parameters	Values
27	CT Selection	300 mA
		2
		300

Resetting Oracle


The unit can be restarted according to user’s requirement. If **Reset Oracle** is set to Yes, the unit will restart.

To reset the unit, retrieve the touch onto **Reset Oracle** by touching and then, reset as before according to your desire with the following display.

No	Settable Parameters	Values
28	Reset Oracle	NO

5th Page programming mode Parameters:

<u>Programming Mode</u>		
No	Settable Parameters	Values
29	Select Site Location	1
30	Enter Site Location	SITE1
31	Nominal Voltage	230
32	SAG %	10
33	SWELL %	110
34	Interruption %	5
35	Hysteresis	2

BACK 

Selecting Site Location

The unit has user programmable site selection from site 1 to site 10 for data logging in 3P4W, 3P3W and 1P2W. According to user’s desire the site location can also be named with 10 characters.

The site selection is very useful to users for data logging for multiple sites. For example, site1 has two types of electrical installation such as 3P3W and 3P4W. User has logged (say, 340 logs occurred while logging) for site1 of 3P4W installation. If user wants to log for 3P3W also for the same site, just select the installation type and start logging (say, 50 logs occurred while logging). Because, each site contains two excel sheets for both 3P4W and 3P3W. User logs site2 (say, 1342 logs occur while logging) for 3P4W installation only. Now until will show

total logs (340+50+1342=1732) which can be downloaded to a PC using logger utility. Hence the logged data can then be generated to excel sheet for the selected sites. Similarly, user can log for other sites up to site 10.

To select the site location, retrieve the touch onto **Select Site Location** by touching and then, set the desire site from site 1 to site 10 as before with the following display.

No	Settable Parameters	Values
29	Select Site Location	1
30	Enter Site Location	SITE1

Enter Site Location

After selecting the site location, retrieve the touch onto **Enter Site Location** to enter the name of the site location and touch to following display.

Programming Mode

No	Settable Parameters	Values
29	Select Site Location	2
30	Enter Site Location	SITE3
31	Nominal Voltage	170

SITE3-MAIN

Enter the name of the site location by touching alphanumerical keys up to 10 characters. If any entered character is wrong, press DEL key to clear the characters and enter again. After entering the correct name of the site location, press RETURN key to confirm the name that will also return into programming mode.

Setting Nominal Voltage

For the Power Quality Functionality Detection user need to specifies the Nominal RMS Voltage to **ORACLE**. User can be set Nominal Value up to 140000. To program this parameter touch on nominal voltage value, Enter value in keyboard & press **OK** to save.

No	Settable Parameters	Values
31	Nominal Voltage	230

Setting SAG Threshold Percentage

ORACLE Consider Sag Threshold as a Percentage of the Nominal Voltage. ORACLE starts measuring Sag Event below this Threshold. ORACLE log Sag Value, Date & Time and duration. SAG Threshold can be set between 10% to 90%. To program touch on SAG Threshold %, Enter value in keyboard & press OK to save.

No	Settable Parameters	Values
32	SAG %	10

Setting SWELL Threshold Percentage

ORACLE Consider Swell Threshold as a Percentage of the Nominal Voltage. ORACLE starts measuring Swell Event above this Threshold. ORACLE log Swell Value, Date & Time and duration. SWELL Threshold can be set between 110% to 300%.

To program touch on SWELL Threshold %, Enter value in keyboard & press **OK** to save.

No	Settable Parameters	Values
33	SWELL %	110

Setting INTERRUPTION Threshold Percentage

ORACLE consider Interruption threshold as a Percentage of the Nominal Voltage. ORACLE starts measuring Interruption Event below this Threshold. ORACLE log Start Time and Duration of Interruption Event. INTERRUPTION Threshold can be set between 5% to 10%.

To program touch on Interruption Threshold %, Enter value in keyboard & press OK to save.

No	Settable Parameters	Values
34	Interruption %	5

Setting Hysteresis Percentage

Hysteresis is the difference in magnitude between SAG/SWELL/INTERRUPTION Start Threshold and the threshold for the SAG/SWELL/INTERRUPTION Event consider as completed. Hysteresis Value can be set between 2% to 50%.

To program touch on Hysteresis %, Enter value in keyboard & press OK to save.

No	Settable Parameters	Values
35	Hysteresis	2

Note: After Power Up, all phases voltage should be stable (above the Sag threshold and below the Swell Threshold) to start Sag/Swell/Interruption event login.

Example: If Hysteresis set is 2% and SAG Threshold is 90% then ORACLE start measuring Sag Event below the 90% of the nominal Voltage and Sag Event End when Voltage level reach above 92% of the nominal voltage. If Hysteresis set is 2% and SWELL Threshold is 110% then ORACLE start measuring Swell Event above the 110% of the nominal voltage and Swell Event end when Voltage level reach below 108% of the nominal voltage. If Hysteresis set is 2% and Interruption Threshold is 5% then ORACLE start measuring Interruption Event below the 5% of the nominal voltage and Interruption Event end when Voltage level reach above 7% of the nominal voltage.

SAG Event: Suppose Nominal Value is 240V, SAG Threshold is 90% and Hysteresis is 2%. SAG Event start when one of the Phase Voltage goes below the 216V (90%(SAG) of VNOM) and SAG Event Completed when all phase voltage goes above the 220.8V (92%(SAG + HYSTERESIS) of VNOM). ORACLE log Start Time Stamp of SAG Event and Time Duration between SAG Event Start and End. ORACLE also log minimum Voltage SAG value during SAG duration.

SWELL Event: Suppose Nominal Value is 240V, SWELL Threshold is 110% and Hysteresis is 2%. SWELL Event start when one of the Phase Voltage goes above the 264V (110% (SWELL) of VNOM) and SWELL Event Completed when all phase voltage goes below the 259.2V (108% (SWELL- HYSTERESIS) of VNOM).ORACLE log Start Time Stamp of SWELL Event and Time Duration between SWELL Event Start and End. ORACLE also log maximum Voltage SWELL value during SWELL duration.




INTERRUPTION Event: Suppose Nominal Value is 240V, INTERRUPTION Threshold is 5% and Hysteresis is 2%. INTERRUPTION Event start when all Phase Voltage goes below the 12V (5% (INTERRUPTION) of VNOM) and INTERRUPTION Event Completed when one of the phase voltage goes above the 16.8V (7% (INTERRUPTION + HYSTERESIS) of VNOM).ORACLE log Start Time Stamp of INTERRUPTION Event and Time Duration between INTERRUPTION Event Start and End.

ORACLE log Duration in milliseconds for Sag/Swell/Interruption Event. If event continue for more than 60 seconds then log it as 60000 milliseconds.

Run Mode (Measurement)

In Run Mode, the various parameters measured and calculated by the meters are displayed on different page; on a 640x480 touch based TFT display.


All the power values displayed will auto scale from Kilo to Mega, once the value crosses 10,000 e.g., if $KWh \geq 10000.0$, it will show as 10.000 MWh immediately. Oracle plots voltage and current waveforms with R-phase in Red color, Y-phase in yellow color B-phase in blue color. Individually phase wise parameters are also color coded similarly.

Hence, at the top of each page shows the type of installation, date and time stamp whereas at the bottom of the each page shows Run Time in hhhh.mm.ss format and keys such as ,  and  arrows.

Run Mode in 3P4W

The Run Mode pages can be altered by touching **LEFT** and **RIGHT** arrow keys such as shown below:

INSTALLATION : 3P4W				
Date : 31 / 12 / 2019 Time : 12 : 59 : 59				
3P4W	R - Phase	Y - Phase	B - Phase	Unit
VOLTS	240.8	239.85	240	V
AMPS	3.05	3.00	3.10	A
W	73.26	73.26	73.26	K
VAR	0.00	0.00	0.00	M
VA	73.26	73.26	73.26	K
PF	1.000	1.000	1.000	
PF-DSP	0.999	0.999	0.999	
PF-DST	0.999	0.999	0.999	

On the first page, the parameters such as voltages, currents, KW, KVAR, KVA, PF, Displacement PF and Distortion PF show its individual parameter values in R-Phase, Y-Phase, and B-Phase including its Units respectively.

If PT-Ratio (PT-Primary/PT-Secondary)>10.0, the voltage will auto scale to KV. If PF is on lead side, the phase wise PF values will show with a leading minus (-) sign.


INSTALLATION : 3P4W				
Date : 31 / 12 / 2019		Time : 12 : 59 : 59		
VRY	415.20	KV	KW	219.80
VYB	415.20	V	KVA	219.80
VBR	415.19	KV	KVAR	0.00
I - (N)	3.00		KW - D	109
HZ	50.00		KVA - D	220
Sys - PF	0.999			
RUN Time : 00000 : 59 : 59				
15 : 59 PKW : 221.3 PKVA : 221.5				
BACK				

The second page has two columns. First column shows phase to phase three voltages (VRY, VYB, VBR), neutral current I-(N), system frequency (Hz) and system PF. Second column shows system powers (KW, KVA and KVAR) and demand powers (KW-D, KVA-D). At the bottom of the page, it shows predictive demands (PKW, PKVA) which display if Demand Window is selected to Fixed.

INSTALLATION : 3P4W				
Date : 31 / 12 / 2019		Time : 12 : 59 : 59		
MD - KW	109	31 / 12 / 2019	12 : 59 : 59	
MD - KVA	220	31 / 12 / 2019	12 : 59 : 59	
KWh	0.100	START	0.010	
KVAh	0.100		0.015	
KVARh	0.100		0.008	
RUN Time : 65000 : 59 : 59				
BACK				


On the third page, the maximum demand such as MD-KW and MD-KVA show in first and second line with date and time stamp of the maximum demand occurrences. In 3rd line to 5th lines, it shows three energies such as KWh, KVAh and KVARh. After pressing the START button, RED dot on a corner it will start blinking and manual energy RUN start until STOP button pressed. Blinking RED dot means that energy run is started. Manual run time energy will be shown in the side blocks.

INSTALLATION : 3P4W			
Date : 31 / 12 / 2019		Time : 12 : 59 : 59	
Avg. V	120.00	31 / 12 / 2019	12 : 59 : 59
Avg. A	1.50	31 / 12 / 2019	12 : 59 : 59
KW	110.00	31 / 12 / 2019	12 : 59 : 59
KVA	110.00	31 / 12 / 2019	12 : 59 : 59
KVAR	0.00	31 / 12 / 2019	12 : 59 : 59
PF	0.988	31 / 12 / 2019	12 : 59 : 59
HZ	48.96	31 / 12 / 2019	12 : 59 : 59
RUN Time : 65000 : 59 : 59			[Minimum]

BACK 

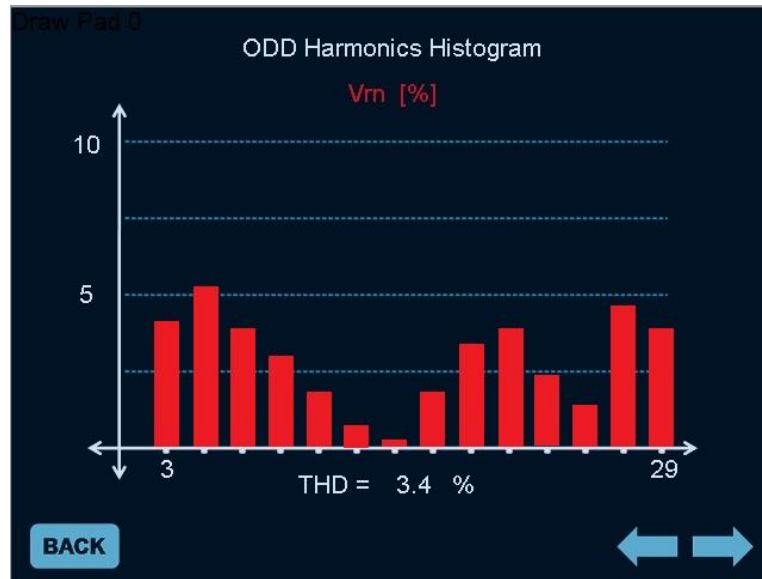
The fourth page shows the system minimum values for average voltage, average current, active power (KW), apparent power (KVA), reactive power (KVAR), PF and Hz with its date and time stamp which indicate the minimum values when to occur. In case of PF with lag side, the date and time of the minimum value will update only when the PF is smaller than the previous PF.

INSTALLATION : 3P4W			
Date : 31 / 12 / 2019		Time : 12 : 59 : 59	
Avg. V	239.96	31 / 12 / 2019	12 : 59 : 59
Avg. A	2.98	31 / 12 / 2019	12 : 59 : 59
KW	218.86	31 / 12 / 2019	12 : 59 : 59
KVA	219.00	31 / 12 / 2019	12 : 59 : 59
KVAR	0.00	31 / 12 / 2019	12 : 59 : 59
PF	0.999	31 / 12 / 2019	12 : 59 : 59
HZ	50.00	31 / 12 / 2019	12 : 59 : 59
RUN Time : 65000 : 59 : 59			[Maximum]

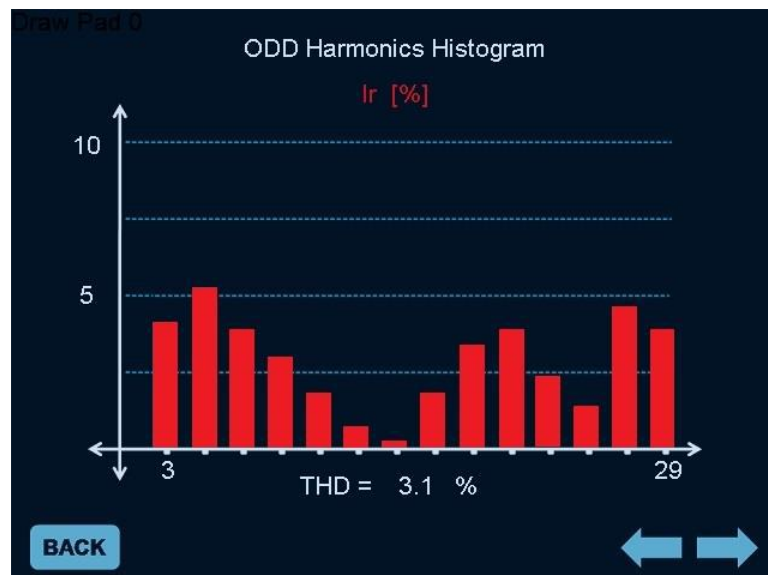
BACK 

The fifth page shows the system maximum values for average voltage, average current, active power (KW), apparent power (KVA), reactive power (KVAR), PF and Hz with its date and time stamp which indicate the maximum values when to occur. In case of PF with lead side, the date and time of the maximum value will update only when the PF is bigger than the previous PF.

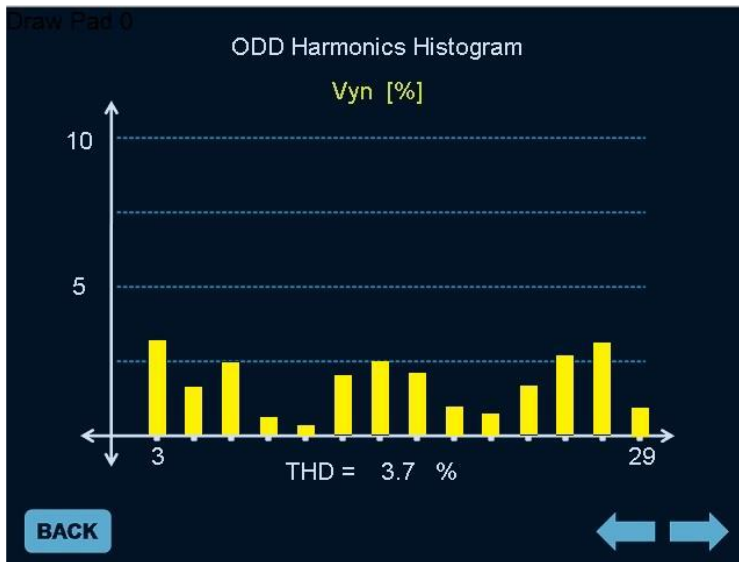
Harmonics Section



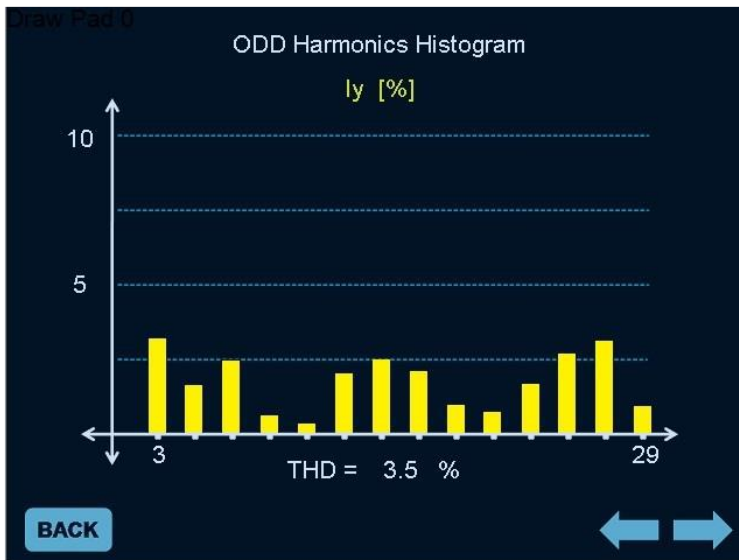
This page shows the odd harmonics histogram for R-Phase voltage (Vrn) in percentage form.



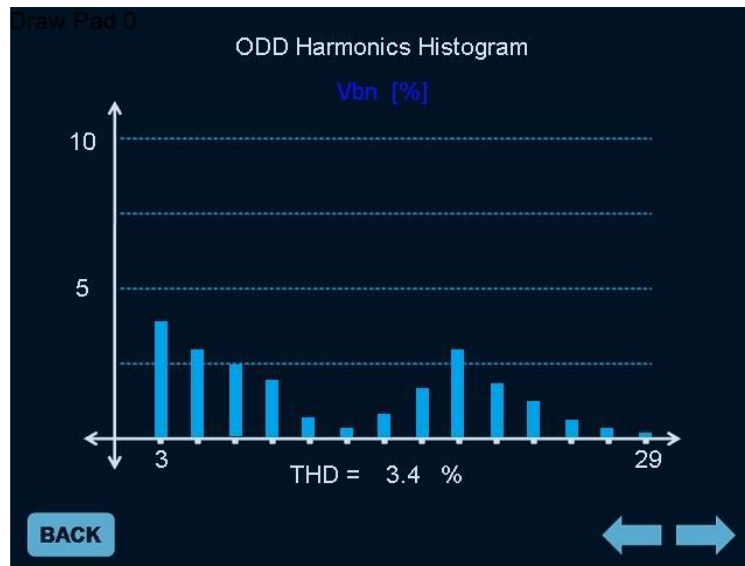
This page shows the odd harmonics histogram for R-Phase current (Ir) in percentage form.



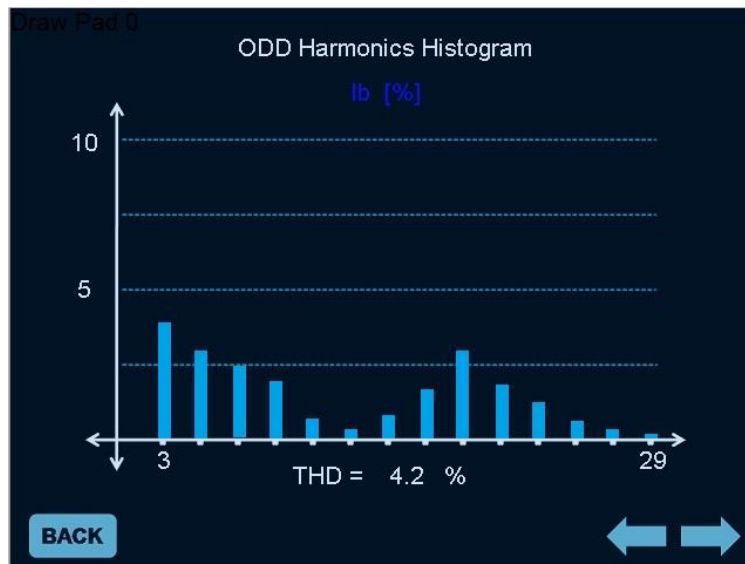
This page shows the Odd Harmonics Histogram for Y-Phase voltage (Vyn) in percentage form.



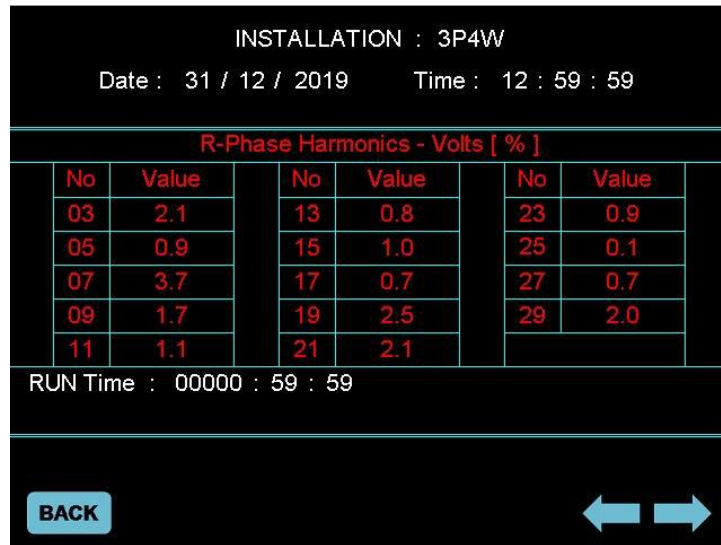
This page shows the Odd Harmonics Histogram for Y-Phase current (Iy) in percentage form.



This page shows the Odd Harmonics Histogram for B-Phase voltage (Vbn) in percentage form.

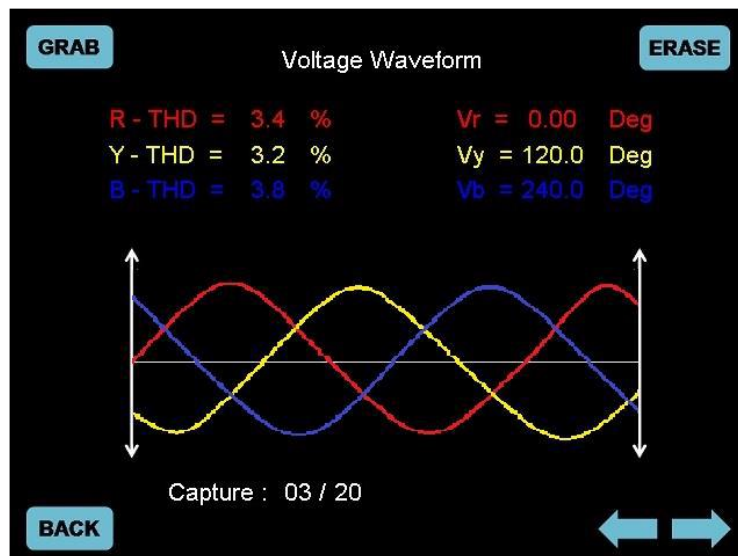


This page shows the Odd Harmonics Histogram for B-Phase current (Ib) in percentage form.



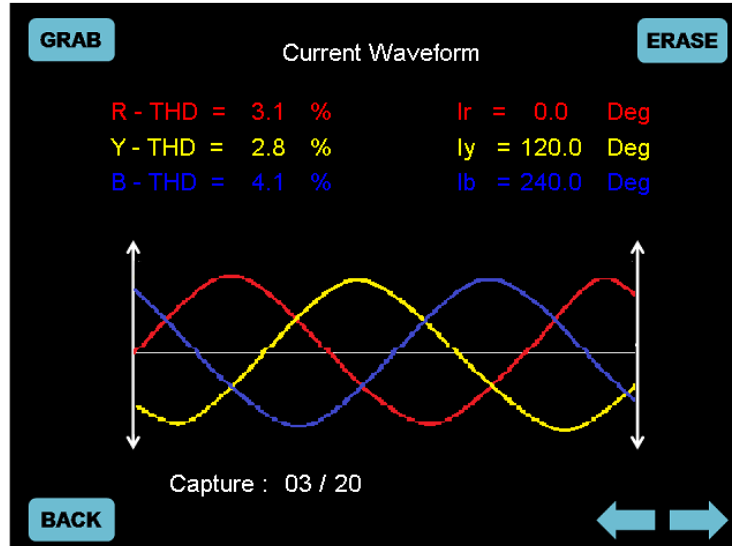
This page shows 3rd to 29th odd Harmonics values for R-phase voltage same for all phase voltages and currents in text format.

Waveform Section



This page shows the Voltage Waveform. Here, user can see if any distortion is occurring in the waveforms due to non-linear loads like rectifiers, UPS drives etc. The same page also indicates that the phase angle with respect to R-Phase voltage, i.e., Vr=0.00 degree shows on top of the screen. Vy=120.00 degree indicates the phase difference (phase angle) between R-phase and Y-phase voltage. Similarly, Vb=240.00 degree indicates that the phase angle between the R-Phase and B- Phase voltage. To capture the waveform touch the **GRAB** button and plot into a Logger 1.4.8 utility. User can delete the captured waveform by pressing **ERASE** button.

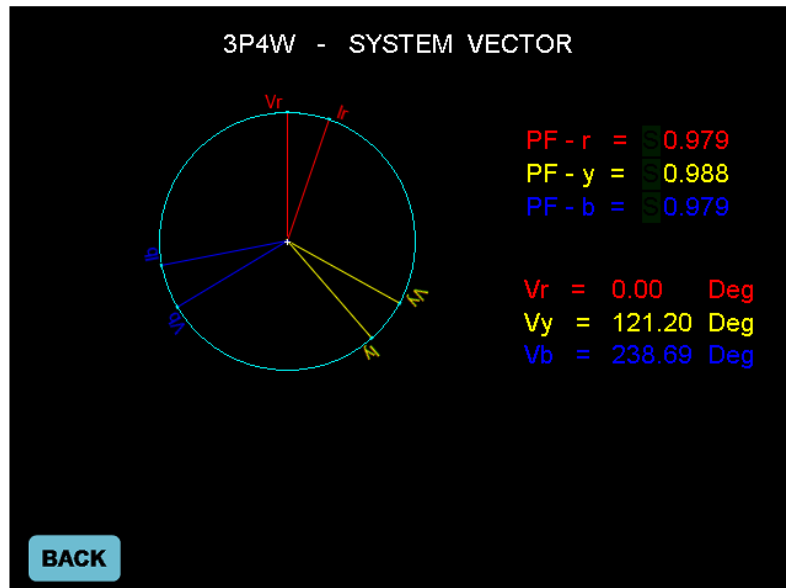
- Capture the system value up to 20 times according to your desire, touch **GRAB** that will show number of captures (i.e., Capture: 03/20). Hence, to erase the capture, click **ERASE** where the Captured value will become decreased (i.e., Capture: 00/20).



This page shows Current Waveforms. The Waveform occurs to non-linear loads like rectifiers, UPS drives etc. The page also indicates phase angle with respect to R-Phase, i.e., I_r=0.00 degree shows on top of the page. I_y=120.00 degree indicates the phase difference (phase angle) between R-Phase and Y-Phase current. Similarly, I_b=240.00 degree indicates the phase angle between R-Phase and B-Phase current. To capture the waveform touch the **GRAB** button and plot into a Logger 1.4.8 utility. User can delete the captured waveform by pressing **ERASE** button.

- Capture the system value up to 20 times according to your desire, touch **GRAB** that will show number of captures (i.e., Capture: 03/20). Hence, to erase the capture, click **ERASE** where the Captured value will become decreased (i.e., Capture: 00/20).

Vector diagram Section



This page shows the vector diagram. The R-Phase voltage vector is used as reference to plot other voltage vectors such as Y-Phase and B-Phase voltage vectors. Hence unit will show Vr=0.00 degree always. Similarly, R-Phase current vector is also used as reference to plot other current vectors such as Y-Phase and B-Phase current vectors. **Using this vector diagram, to ensure that the CT-Terminal connections for phase sequence and polarity are correct or not press center in Vector diagram & all phase voltage, current are aligned with their respective phase if correct otherwise not.**

Log Section

INSTALLATION : 3P4W
 Date : 31 / 12 / 2019 Time : 12 : 59 : 59

TYPES		LOGS	OVERFLOW
System	(SITE - 01)	1732	No
Event - 1	AVG_V	35	No
Event - 2	AVG_I	25	No
Event - 3	KVAR	15	No
Event - 4	KW	17	No

RUN Time : 00000 : 59 : 59

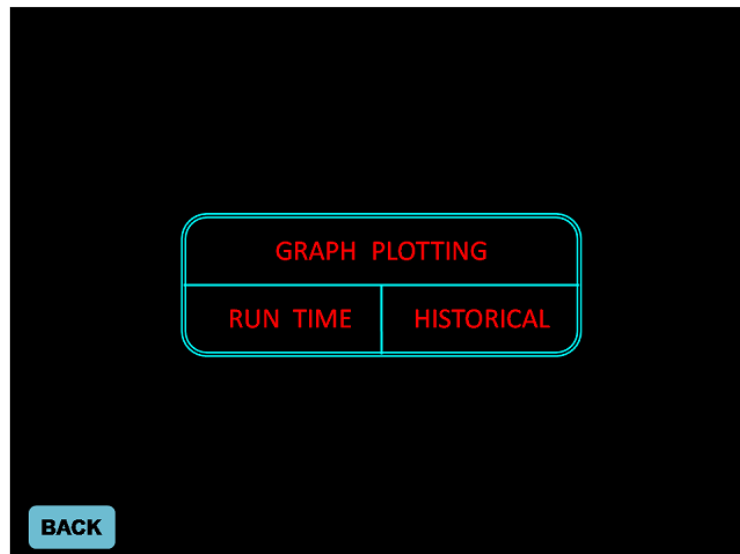
BACK

It shows system logs with the overflow status for low as well as event parameters. The unit takes the snap-shot of the system parameters at interval of log duration. The maximum numbers of such logs are **58800**. After this, the oldest data is discarded and the latest data is logged, and the overflow column shows YES to indicate that such an overflow has occurred.

Next lines show the number of events with respect to defined event parameters, and their respective overflow status. Each of the four events can have forty event occurrences which are stored with their date & time of occurrence. After the 40th occurrence, the oldest occurrence will get replaced with a new one, and the overflow flag will indicate this.

User can see all the event occurrences with date & time stamp only on downloading data to a PC.

Graph Plotting



The above page shows that the Graphs Plotting that user can represent the parameters into graph. There are two types of Graph Plotting such as, Run Time and Historical. Run Time Graph can show the graph for system parameters and hence, the Historical graph can show the graphs of the logged parameters including minimum and maximum value and date & time setting.

Plotting Graph for Run Time

INSTALLATION : 3P4W

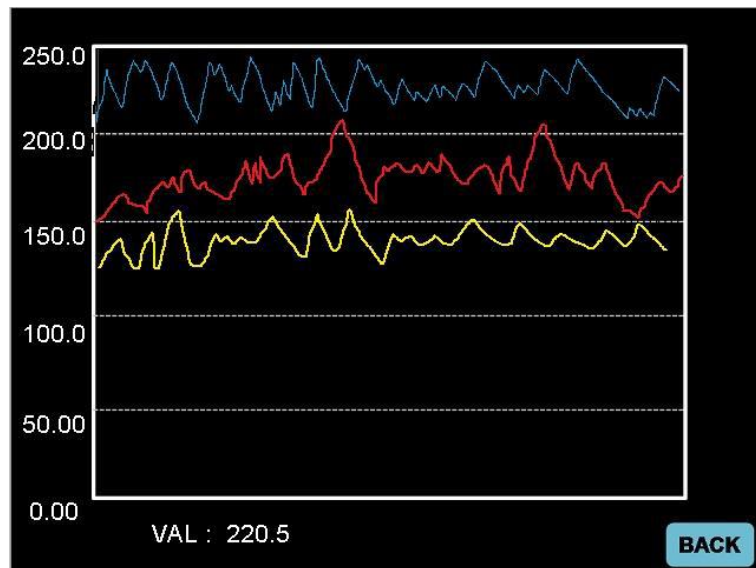
Date : 31 / 12 / 2019 Time : 12 : 59 : 59

RANGE		MIN : 150			
		MAX : 250			
No	Parameter	Graph Plot	No	Parameter	Graph Plot
01	Vrn	Yes / No - N	08	Avg. Amp	Yes / No - N
02	Vyn	Yes / No - Y	09	PFr	Yes / No - N
03	Vbn	Yes / No - N	10	PFy	Yes / No - N
04	Ir	Yes / No - N	11	PFb	Yes / No - N
05	Iy	Yes / No - Y	12	Sys. PF	Yes / No - N
06	Ib	Yes / No - N	13	KWr	Yes / No - N
07	Avg. Volt	Yes / No - N	14	KWy	Yes / No - N

BACK
SHOW
← →

The table shows parameter: **Vrn, Vyn, Vbn, Ir, Iy, Ib, Avg. Volt, Avg. Amp, PFr, PFy, PFb, Sys PF, KWr, KWy, KWb, KVARr, KVAy, KVAb, KVARr, KVARy, KVARb, Sys, KW, Sys. KVA, Sys.KVAR, Sys. Hz, KW & KVA Demand, THD for each phase Voltage & Current.** Now, touch on minimum and maximum to select and change the value by touching the key pad provided, and then touch **OK** to confirm the desired range of min-max value which will return on last parameter selected from the list. To select parameter for graph plotting, you have to touch the section. Touch to change selected parameter graph plotting option. The parameter can be set to “Yes/No” by touching on it. Now the user can see that parameter we have selected function has an indication of ‘Y’. For setting to other parameters, touch **LEFT** or **RIGHT** arrow key to retrieve the parameter and set as mentioned before. The user can be selected maximum up to 5 parameters at a time. But, in case of PF graph plotting, don’t select other parameters with PF.

After selecting the desired parameters, touch **SHOW** so as to plot such as shown below.



Touch in the above rectangular screen that will show the value of the particular coordinate point. To return to the previous menu, touch **BACK** till the GRAPH PLOTTING is displaying.

HISTORICAL Graph

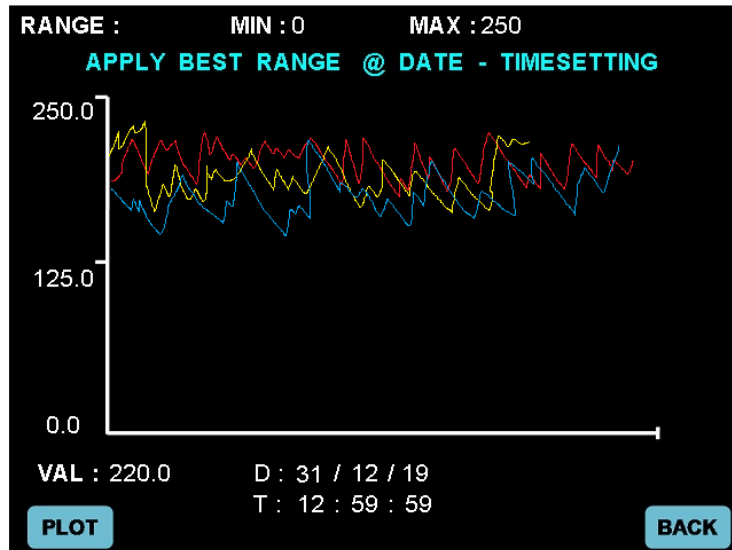
INSTALLATION : 3P4W					
Date : 31 / 12 / 2019			Time : 12 : 59 : 59		
TYPE		DATE		TIME	
START		31 / 12 / 2019		12 : 59 : 59	
END		31 / 12 / 2019		12 : 59 : 59	
No	Parameter	Graph Plot	No	Parameter	Graph Plot
01	Vrn	Yes / No - N	07	PFr	Yes / No - N
02	Vyn	Yes / No - N	08	PFy	Yes / No - N
03	Vbn	Yes / No - N	09	PFb	Yes / No - N
04	Ir	Yes / No - N	10	Sys. KW	Yes / No - N
05	Iy	Yes / No - N	11	Sys. KVA	Yes / No - N
06	Ib	Yes / No - N	12	Sys. KVAR	Yes / No - N

At the bottom of the table, there are buttons for 'BACK', 'SHOW', and a double-headed arrow.

The historical graph shows the graph for logged data for various parameters: **Vrn, Vyn, Vbn, Ir, Iy, Ib, PFr, PFy, PFb, Sys.KW, Sys.KVA, Sys.KVAR, Hz, KW & KVA Demand & THD s for each phase Voltage & Currents.**

To plot the logged value of various parameters, in the previous GRAPH PLOTTING page, touch HISTORICAL to display such as shown above. Set date and time for START, END, and then set the desired parameters such as mentioned in RUN TIME

instruction before. After setting, touch **SHOW** to display page such as shown below. Then touch on **APPLY BEST RANGE @ DATE – TIMESETTING** & then touch on button **PLOT** to plot the desired logged parameters historical graph.



Sag/Swell Section

This section contains the sag/swell & interruption events data.

ORACLE monitors the date of interruption and will show its logs with start date, time and duration. To find other logs data by pressing **U** and **D** key, the capacity of the logs is up to 180.

INTERRUPTION			
	Start Date	Start Time	Duration
1)	16 / 05 / 2020	15 : 01 : 10 : 156	0 : 1 : 422
2)	16 / 05 / 2020	15 : 01 : 10 : 456	0 : 1 : 422
3)	16 / 05 / 2020	15 : 01 : 15 : 254	0 : 1 : 434
4)	16 / 05 / 2020	15 : 01 : 15 : 598	0 : 15 : 35
5)	16 / 05 / 2020	15 : 01 : 16 : 210	0 : 1 : 945
6)	16 / 05 / 2020	15 : 01 : 16 : 586	0 : 1 : 771
7)	16 / 05 / 2020	15 : 01 : 17 : 389	0 : 2 : 167
8)			
9)			
10)			

At the bottom of the table, there are buttons for 'BACK', 'U', 'D', and navigation arrows.

ORACLE monitors the data of Sag/Swell and will show its logs with start date-time, duration and type. To find other logs data by pressing **U** and **D** key. The capacity of logs is up to 180.

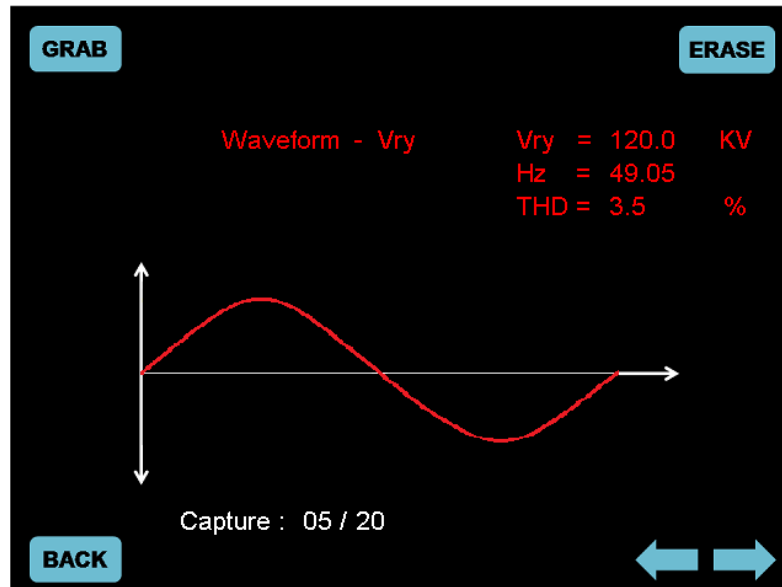
SAG / SWELL				
	Start Date & Time	Duration	Type	Value
1)	16 / 05 / 2020 15 : 01 : 41 : 156	0:4:668	SAG	0.14
2)	16 / 05 / 2020 15 : 01 : 49 : 356	0:4:670	SAG	0.13
3)	16 / 05 / 2020 15 : 01 : 57 : 205	0:4:681	SAG	0.14
4)	16 / 05 / 2020 15 : 02 : 51 : 156	1:0:000	SAG	0.14
5)	16 / 05 / 2020 15 : 05 : 52 : 568	0:5:397	SAG	0.14
6)				
7)				
8)				
9)				
10)				

BACK U D ← →

Run Mode in 3P3W

INSTALLATION : 3P3W				
Date : 31 / 12 / 2019		Time : 12 : 59 : 59		
3P3W	R - Phase	Y - Phase	B - Phase	Unit
VOLTS	220.5	- . --	219.2	V
AMPS	70.3	- . --	71.4	A
W	13.59	- . --	13.72	K
VAR	7.50	- . --	7.52	K
RUN Time : 00000 : 59 : 59				
BACK		← →		

The first page shows the parameters such as voltage, current, active power (KW) and reactive power (KVAR) with its individual phase values including units. Hence, this page is not only similar to Run Mode in 3P4W, but the rest of the pages are also shown similarly.

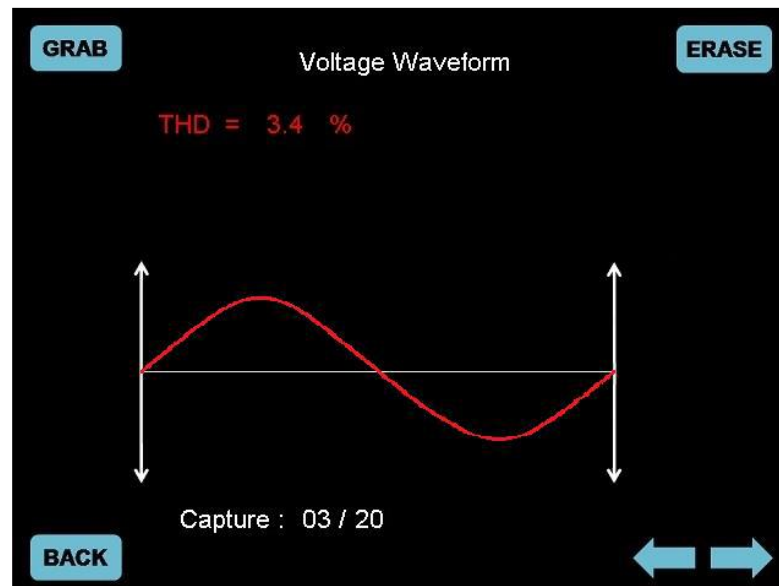


In case of the Waveforms, the phase to phase voltages and currents waveforms are shown such as above. For capturing the waveform, see in the last section, “**Capturing system parameters and representing in a graph**”. **Capture: 05/20** indicates that there are five waveform of voltages and currents captured out of twenty waveforms.

Run Mode in 1P2W

INSTALLATION : 1P2W				
Date : 31 / 12 / 2019		Time : 12 : 59 : 59		
1P2W	R - Phase	Y - Phase	B - Phase	Unit
VOLTS	240.0	- . --	- . --	V
AMPS	300.3	- . --	- . --	A
W	720.1	- . --	- . --	K
VAR	0	- . --	- . --	M
VA	720.2	- . --	- . --	K
PF	1.000	- . --	- . --	
RUN Time : 65000 : 59 : 59				
BACK		← →		

The first page shows the parameters such as voltage, current, active power (KW), apparent power (KVA) and reactive power (KVAR) of single phase value including units. Hence, this page is not only similar to Run Mode in 3P4W, but the rest of the pages are also shown similarly.



In case of the Waveforms, the phase voltage and current waveforms are shown such as above. For capturing the waveform, see in the last section, “Capturing system parameters and representing in a graph”.

Communication

The electrical snapshots logged can give a good idea of the overall behavior of the entire load in an industry by using Logger Setup.exe utility. This option is possible for a user to select **Oracle** which features Event Logs including the time-stamped records of important power system occurrences that can be aligned with corresponding production effects to better understand and optimize energy use and cost.

Data Logging and USB port

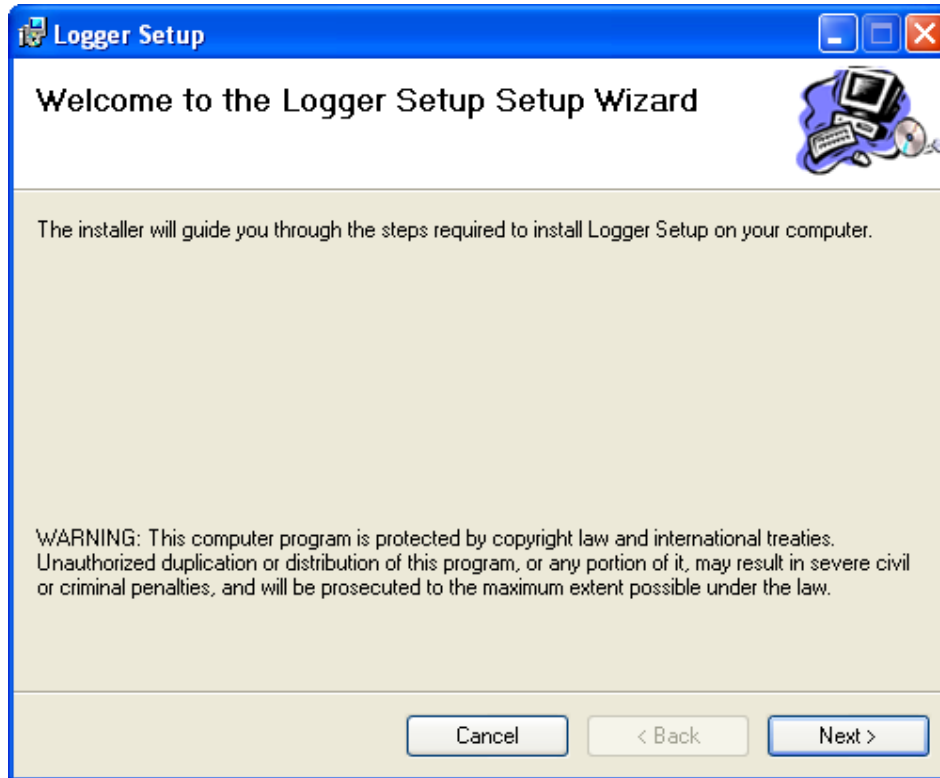
Oracle has a 16 MB non-volatile memory. This memory is used to store the minimum and maximum values of important parameters, four events as defined by the user and the snapshot of the entire electrical system where all instantaneous and integrated parameters along with Harmonic data are saved. Maximum numbers of such electrical snapshots are **58800**.

The log maintains a time-stamped record for various parameters in 3P3W, 3P4W and 1P2W. One can monitor values over a day, a week, a month or any period to record the highest and lowest values of voltage, current, or power factor including Event parameters.

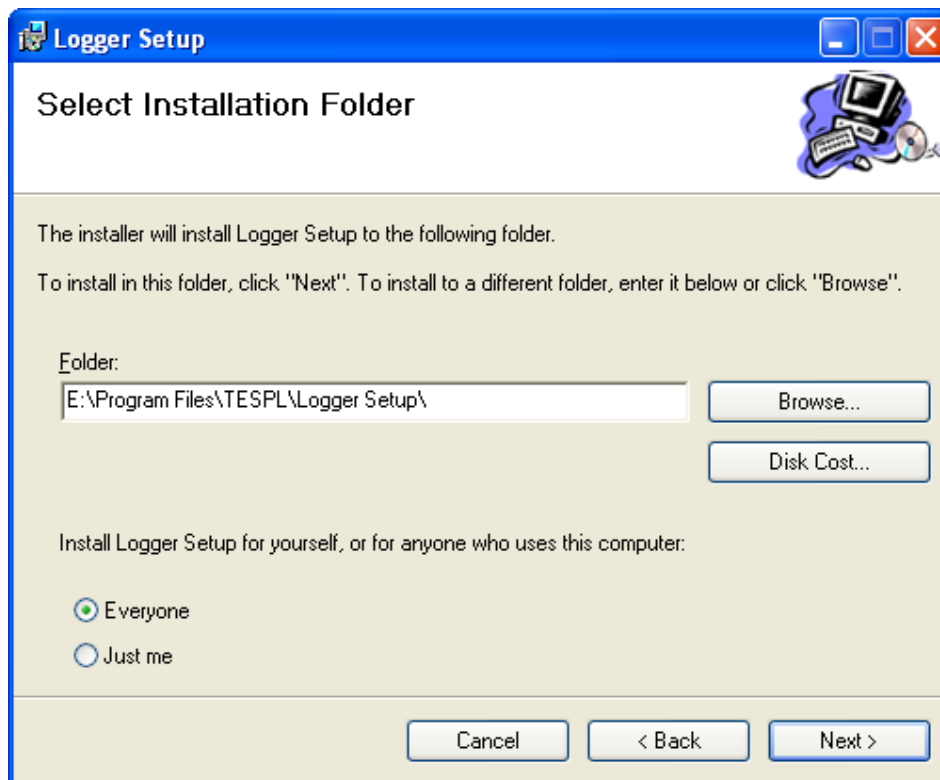
Oracle supports USB 2.0 for downloading logged data. Users are provided a CD for USB software installation along with the purchase of Oracle.

Installing the USB Software

1. Insert the **Logger Setup** CD into the CD-ROM drive of your computer after windows is started.
2. The Logger Setup contains the following: **dotnetfx**, **others**, **Logger Setup** and **setup**. Double-click the **Logger Setup** to install and show the wizard below.



3. To precede the installation, click **Next** and then, the wizard will show the following dialog box for the location.



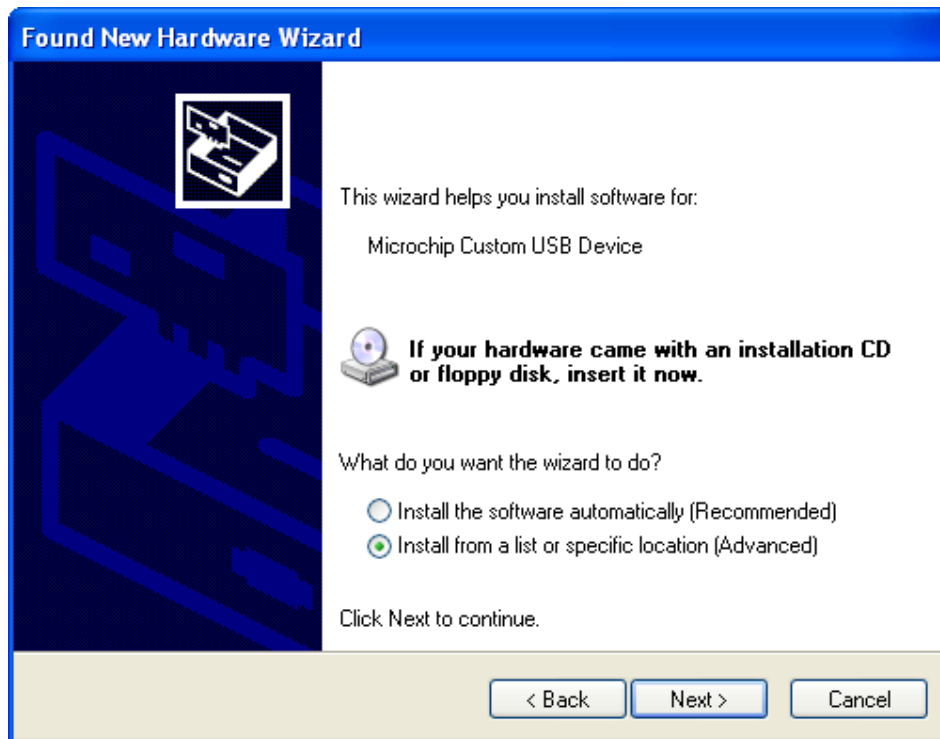
4. Click **Next** to start the installation. Before selecting the location, user can also check the disk space for each drive by clicking **Disk Cost**.
5. To confirm the installation, click **next** in the next wizard and wait for some time while proceeding the installation. After completing the installation, the wizard will ask the Logger Setup has been installed successfully. Now click **Close** to exit the wizard.

Installation of USB driver

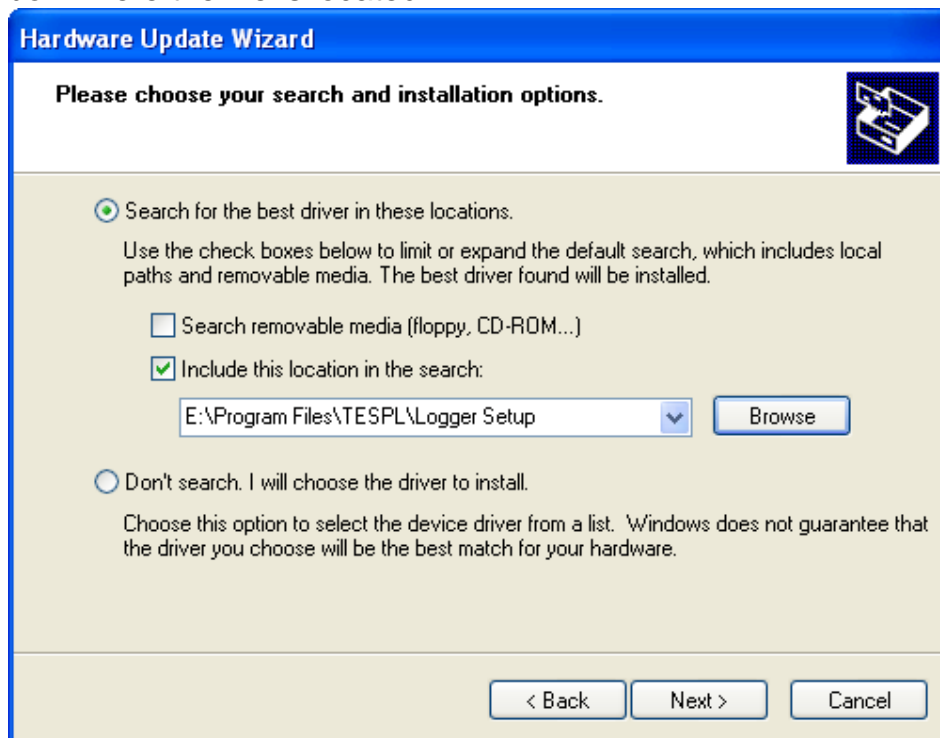
Make sure that the USB cable is connected in between the PC and Oracle. If the USB connection is not all right, remove the USB cable and connect again. If the USB is connected for the first time, the wizard will show with following option.



Select the option, **Yes, This time only** and click **Next** to proceed for the next wizard such as shown below.



The wizard will ask if your hardware comes with an installation CD or floppy disk, insert it now. Select the wizard option, **Installation from a list or specific location** and click **Next** to give the following dialog box where the file is located.



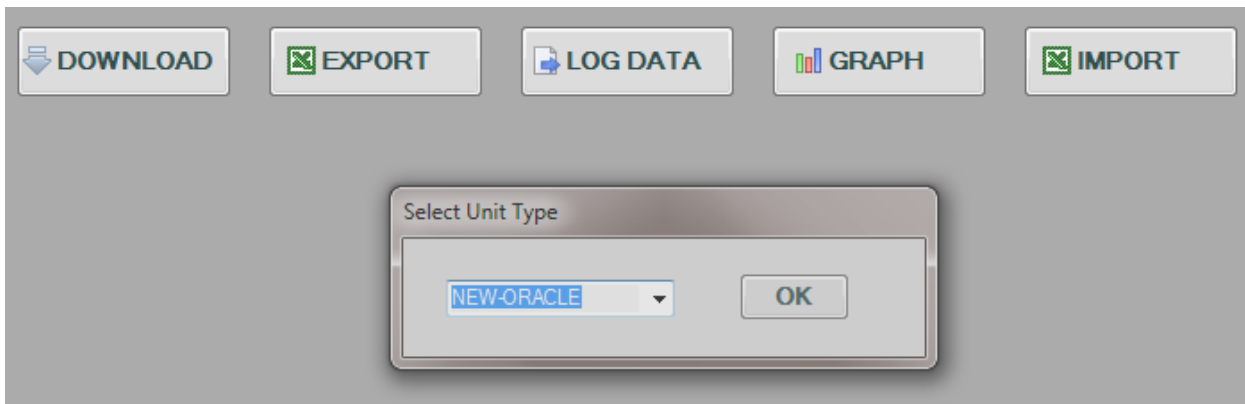
6. Now click **OK**, to complete the wizard.
7. Wait for sometime while completing the wizard and then the wizard will prompt the new hardware gets completed. Now click **Finish** to complete the installation.

Handling Logger Setup

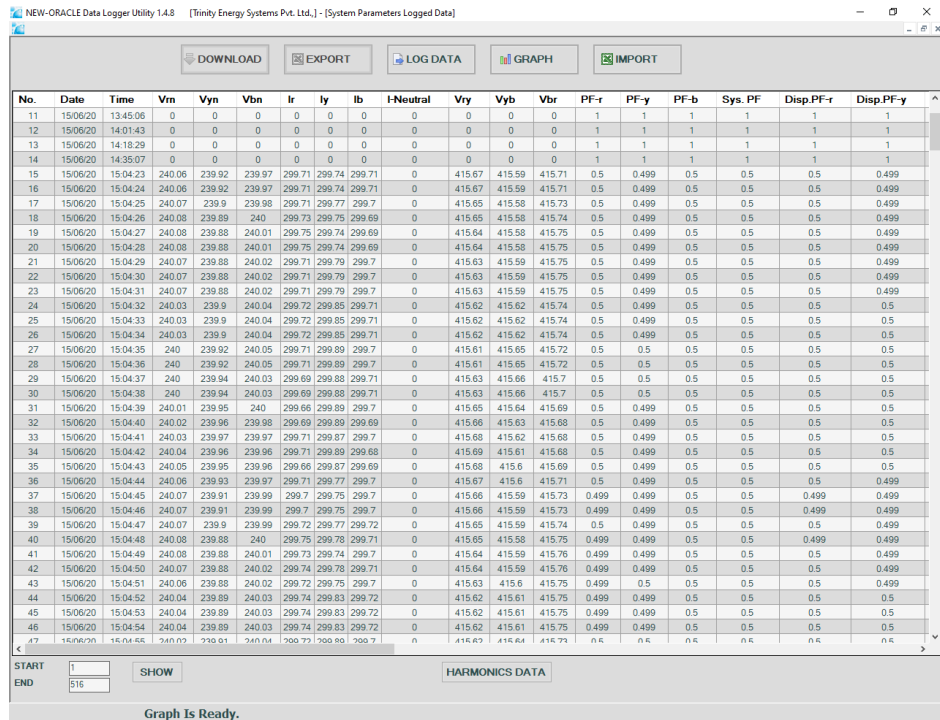
The Logger window consists of the following: Downloading the system data, Exporting the Logged data in to a excel sheet, logged data including harmonic data and graph representation for both the system data and logged data.

Downloading the Logged data

1. Click **Logger 1.4.8** from the location selected while installing. By default the utility will show **Logger 1.4.8** on desktop. Now the Logger will open with the following window.



2. In the unit type list box, select the NEW-ORACLE and click **OK** and **DOWNLOAD** to start downloading the logged data with the following window.
3. At the bottom of the window, select the site with installation type from the SITE name list and click **SHOW** so as to display for all the logged data of selected site such as shown below.



- In this LOG DATA window, click **HARMONICS DATA** at the bottom of the window to open the harmonics data window for all current and voltage.

Exporting the Logged Data including Min/Max Events and Harmonics Data for all sites.

The logged data can also be exported into excel sheet so that the Min-Max & event logs including the Harmonics can also be obtained in it such as shown below.

No.	Date	Time	Vrn	Vyn	Vbn	Ir	Iy	Ib	I-Neutral	Vry	Vyb	Vbr	PF-r	PF-y	PF-b	Sys. PF	Disp. PF	Disp. PF	Disp. PF	Dist. PF	Dist. PF	Dist. PF	KW-r	KW-y	KW-b	
SITE: SITE1TEST																										
3P4W-ORACLE 3.2 USB Based Downloaded Data																										
20	15/06/20	15:04:24	240.06	239.92	239.97	299.71	299.74	299.71	0	415.67	415.59	415.71	0.5	0.499	0.5	0.5	0.5	0.499	0.5	0.999	1	0.999	36	35.9	36	10
21	15/06/20	15:04:25	240.07	239.9	239.98	299.71	299.77	299.7	0	415.65	415.58	415.73	0.5	0.499	0.5	0.5	0.5	0.499	0.5	0.999	1	0.999	36	35.9	36	10
22	15/06/20	15:04:26	240.08	239.89	240	299.73	299.75	299.69	0	415.65	415.58	415.74	0.5	0.499	0.5	0.5	0.5	0.499	0.5	1	1	0.999	36	35.9	36	10
23	15/06/20	15:04:27	240.08	239.88	240.01	299.75	299.74	299.69	0	415.64	415.58	415.75	0.5	0.499	0.5	0.5	0.5	0.499	0.5	1	1	0.999	36	35.9	36	10
24	15/06/20	15:04:28	240.08	239.88	240.01	299.75	299.74	299.69	0	415.64	415.58	415.75	0.5	0.499	0.5	0.5	0.5	0.499	0.5	1	1	0.999	36	35.9	36	10
25	15/06/20	15:04:29	240.07	239.88	240.02	299.71	299.79	299.7	0	415.63	415.59	415.75	0.5	0.499	0.5	0.5	0.5	0.499	0.5	1	1	0.999	36	35.9	36	10
26	15/06/20	15:04:30	240.07	239.88	240.02	299.71	299.79	299.7	0	415.63	415.59	415.75	0.5	0.499	0.5	0.5	0.5	0.499	0.5	1	1	0.999	36	35.9	36	10
27	15/06/20	15:04:31	240.07	239.88	240.02	299.71	299.79	299.7	0	415.63	415.59	415.75	0.5	0.499	0.5	0.5	0.5	0.499	0.5	1	1	0.999	36	35.9	36	10
28	15/06/20	15:04:32	240.03	239.9	240.04	299.72	299.85	299.71	0	415.62	415.62	415.74	0.5	0.499	0.5	0.5	0.5	0.5	0.5	0.999	0.999	0.999	35.9	35.9	36	10
29	15/06/20	15:04:33	240.03	239.9	240.04	299.72	299.85	299.71	0	415.62	415.62	415.74	0.5	0.499	0.5	0.5	0.5	0.5	0.5	0.999	0.999	0.999	35.9	35.9	36	10
30	15/06/20	15:04:34	240.03	239.9	240.04	299.72	299.85	299.71	0	415.62	415.62	415.74	0.5	0.499	0.5	0.5	0.5	0.5	0.5	0.999	0.999	0.999	35.9	35.9	36	10
31	15/06/20	15:04:35	240	239.92	240.05	299.71	299.89	299.7	0	415.61	415.65	415.72	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.999	0.999	0.999	35.9	36	35.9	10
32	15/06/20	15:04:36	240	239.92	240.05	299.71	299.89	299.7	0	415.61	415.65	415.72	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.999	0.999	0.999	35.9	36	35.9	10
33	15/06/20	15:04:37	240	239.94	240.03	299.69	299.88	299.71	0	415.63	415.66	415.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.999	1	0.999	35.9	36	35.9	10
34	15/06/20	15:04:38	240	239.94	240.03	299.69	299.88	299.71	0	415.63	415.66	415.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.999	1	0.999	35.9	36	35.9	10
35	15/06/20	15:04:39	240.01	239.95	240	299.66	299.89	299.7	0	415.65	415.64	415.69	0.5	0.499	0.5	0.5	0.5	0.5	0.5	0.999	1	1	35.9	35.9	35.9	10
36	15/06/20	15:04:40	240.02	239.96	239.98	299.69	299.89	299.69	0	415.66	415.63	415.68	0.5	0.499	0.5	0.5	0.5	0.5	0.5	0.999	1	1	35.9	35.9	35.9	10
37	15/06/20	15:04:41	240.03	239.97	239.97	299.71	299.87	299.7	0	415.68	415.62	415.68	0.5	0.499	0.5	0.5	0.5	0.5	0.5	0.999	1	0.999	35.9	35.9	35.9	10
38	15/06/20	15:04:42	240.04	239.96	239.96	299.71	299.89	299.68	0	415.69	415.61	415.68	0.5	0.499	0.5	0.5	0.5	0.5	0.5	0.999	1	0.999	35.9	35.9	35.9	10
39	15/06/20	15:04:43	240.05	239.95	239.96	299.66	299.87	299.69	0	415.68	415.6	415.69	0.5	0.499	0.5	0.5	0.5	0.5	0.5	0.999	0.999	0.999	35.9	35.9	35.9	10

Graph Representation

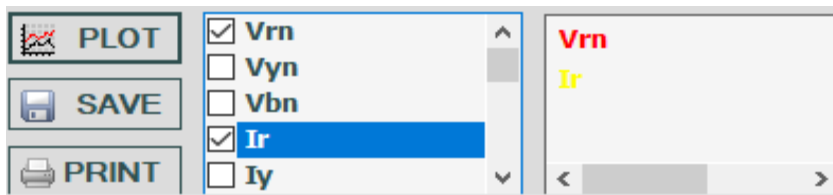
The graph plots for various selected parameters of Logged data as well as system data including harmonics distortion including data and time. Hence, the back ground color, Axis colors and Label colors can also be selectable.

Plotting a Graph for Logged data

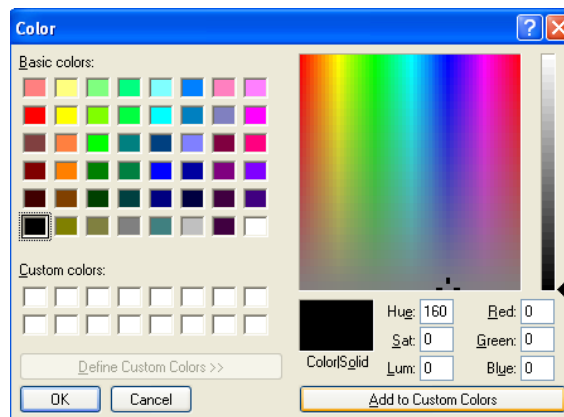
The logged data can be plotted a graph with the selected parameters, data and time.

To plot a graph, precede the following instructions,

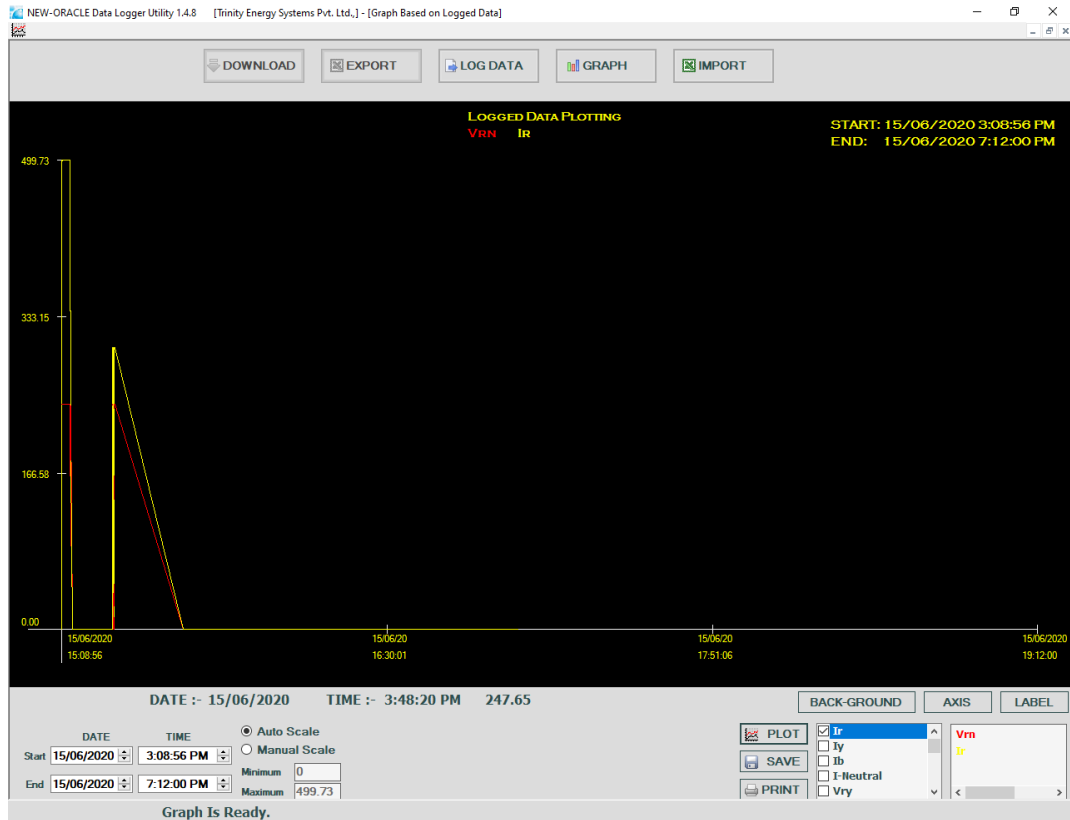
1. At the top of the Logger Windows, click **Graph** to show a graph window.
2. At the bottom of the of the graph window, enter starting date and time in the **Start** box, enter ending date and time in the **End** box under Date and Time. There are two type of Scale such as Auto scale and Manual scale. In case of Auto scale, it is already selected by default. In case of Manual scale, select Manual scale.
3. To select for the parameters to be plotted, double-click on the parameters which will select the check box such as shown below.



4. If the parameters selected are not desired, double-click at right side of the parameters showing in the box which will remove from the list.
5. To change the color of the selected parameters displayed at right side (e.g. Vrn and Ir) double-click on it, and then the color palette will show such as below.



6. Select the desired color and click **Ok**. Now, the selected parameter will plot with the selected color. Similarly, each selected parameter can also be plotted. Before plotting the parameters, the background color, axis color and label color should be specified by clicking **BACK-GROUND**, **AXIS** and **LABEL** so as to represent along with the selected colors.
7. Now, click **PLOT** to plot a graph for the selected parameters such as shown below.



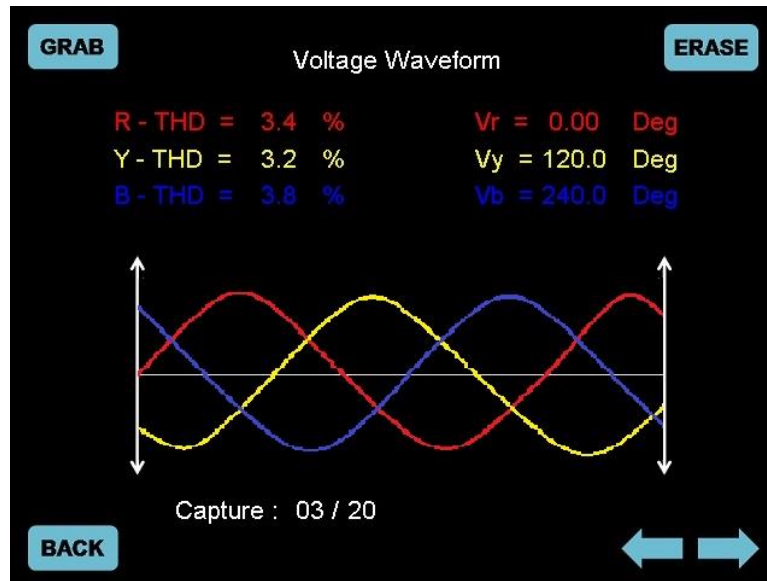
8. The plotted graphs can be saved and printed by clicking **SAVE** and **PRINT** respectively. Hence, to return into previous Logger Windows, click **LOG DATA**.

Capture waveform

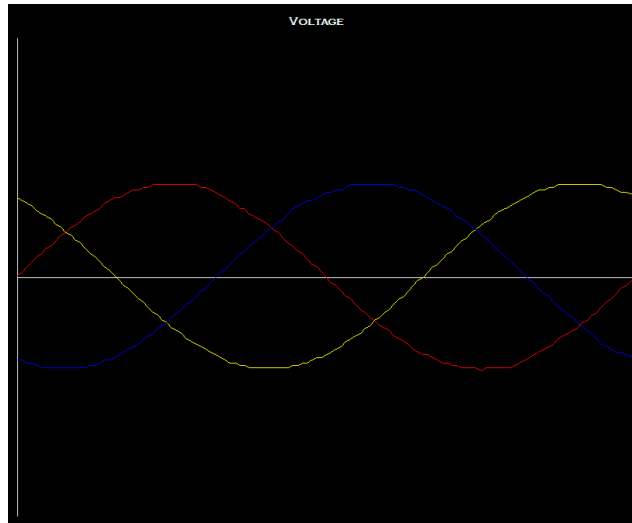
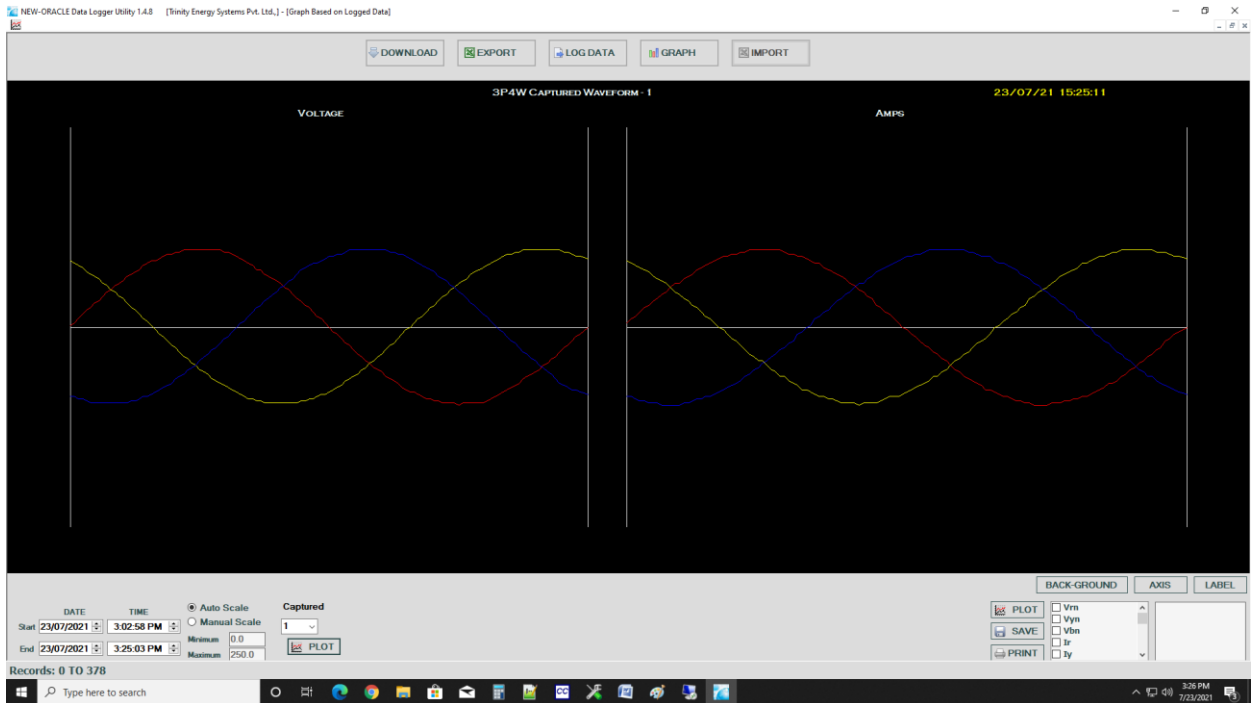
The waveform can be captured for both voltage and current in three phases and represent into a graph.


To plot a waveform of voltage and current, precede the following instructions.

1. In Run Mode, go to waveform section (for all installation modes) of **Oracle 3.2**; touch **GRAB** to capture the system voltage and current.



2. To capture the system value up to 20 times according to your desire, touch **GRAB**. That will show number of captures (i.e., Capture: 03/20). Hence, to erase the capture, click **ERASE** where the Captured value will become decreased (i.e., Capture: 00/20).
3. In the Logger 1.4.8 graph window, click **GRAPH** and select number of capture in the Capture list box, and then, click **PLOT** under Capture. Now, the graph will show with the following window.



4. The above graph representation is only for 3P4W which show such as shown in the Run Mode of Oracle. Similarly, 3P3W & 1P2W will also represent with a single waveform such as shown in the unit. Now if the graph representation is completed, click  to close the window.

P.O No. :

Customer :

Sr. No. :

Result of Test :

Remarks :

Test engineer :

Date :