TESCO METERING

OPERATIONS MANUAL

METER SITE ANALYZER

PRODUCT:

CATALOG NO. 6330

METER SITE ANALYZER
OPERATIONS MANUAL
CATALOG NO. 6330

TESCO METERING

Revision: 1.1.4

TESCO – The Eastern Specialty Company

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LIMITED WARRANTY & LIMITATION OF LIABILITY

TESCO warrants to the original purchaser that it will correct all defects in material and/or workmanship in the Instrument, test equipment or software covered by this warranty (herein called "PRODUCT"), provided that TESCO is notified of such defect within the warranty period (set forth below) in accordance with paragraph four of this Warranty.

WARRANTY PERIOD. The warranty period shall begin on the date of shipment of the PRODUCT or the date of the issuance of this warranty certificate, whichever is later. If no warranty period is specified below and signed by an authorized DISTRIBUTOR of TESCO, the Warranty Period shall be one (1) year. In no event shall this Warranty remain in effect for more than the stated Warranty Period plus two (2) months after the date of shipment. TESCO's sole obligation and the purchaser's sole remedy under this Warranty is limited to repair or replacement, at TESCO's option, free of charge, F.O.B. TESCO's factory at Bristol, PA of any workmanship and/or part which in TESCO's sole judgment displays evidence of defect. On-site Warranty repairs will be made when in TESCO's judgment the PRODUCT cannot practically be shipped to TESCO's factory. Any modifications, additions or upgrades made to the PRODUCT or control software after this warranty becomes effective shall not extend the term of this warranty.

COVERAGE. The warranty set forth above shall be applicable only if the PRODUCT:

1. Is used for the specific purpose for which it was intended;
2. Is operated in accordance with instructions, if any, supplied by TESCO;
3. Has not been modified, neglected, altered, tampered with, vandalized, abused or misused, or subjected to accident, fire, flood or other casualties;
4. Has not been repaired by unauthorized persons;
5. Has not had its serial number altered, defaced or removed;
6. Has not been connected, installed or adjusted other than in accordance with the instructions, if any, furnished by TESCO.

The warranty set forth herein DOES NOT APPLY to defects resulting from ordinary wear, tear and usage, or any cause, similar or dissimilar, not resulting solely from defective material and/or workmanship.

The Warranty set forth herein shall NOT be effective unless:

1. Notice of defect is given to TESCO by phone, fax, email or mail as soon as the defect is discovered.
2. Notice of defect contains the following information: PRODUCT serial number, PRODUCT model number, date of original installation, and an accurate and complete description of the defect including the exact circumstances leading to the defect.
3. The defective PRODUCT or part is returned only upon authorization from TESCO as evidenced by the issuing of a Return Merchandise Authorization (RMA) number, and that the transportation charges are prepaid (except that TESCO may, at its option, appoint a qualified DISTRIBUTOR to make field inspections of the PRODUCT for which purpose the purchaser shall permit such DISTRIBUTOR to enter upon its premises and examine the PRODUCT).
4. The Return Merchandise Authorization (RMA) number is written on the shipping label and all paperwork defective PRODUCT or part.
5. The defective PRODUCT or part is returned in the original packing or packing approved by TESCO

TESCO is not responsible for drayage charges, damages or labor costs incurred in conjunction with failure, removal, or reinstallation of any PRODUCT, all of which shall be at the purchaser's expense. TESCO is not responsible for special, incidental, or consequential damages, whether resulting from breach of warranty, negligence, or any other reason.

TESCO manufactured parts will be available for a minimum period of at least two years after the manufacture of a PRODUCT has been discontinued.

TESCO will provide original purchaser during the Warranty Period, unlimited telephone consulting time for the purpose of PRODUCT trouble shooting/servicing and for the first thirty (30) days of the Warranty Period, unlimited telephone consulting time for the purpose of PRODUCT/software application.

THE WARRANTY CONTAINED HEREIN IS IN LIEU OF ALL OTHER WARRANTIES AND TESCO MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OR CONDITION, DESIGN, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER MATTER.

No other Warranty, express or implied, is authorized by TESCO, and no DISTRIBUTOR of TESCO or any other person has any authority to amend, extend, modify, enlarge or otherwise alter the foregoing warranty and disclaimers in any way whatsoever, except as provided for in an Extended Limited PRODUCT Warranty Agreement.

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1.0 INTRODUCTION

1.1 Introduction

The most versatile Site Testing tool in a small, lightweight package!

Studies have shown that at transformer-rated sites, the vast majority of issues are related to wiring, CTs, PTs, and other issues. If you want to be sure the customer is billed correctly and you are not losing revenue, you must test the whole site, not just the meter — this is where TESCO's Meter Site Analyzer (Catalog No. 6330) comes in.

- The 6330 revolutionizes meter site testing by providing a small, lightweight package!

It is the most versatile and complete tool for testing the entire functionality of transformer-rated metering installation in a convenient, portable, and lightweight kit. It can perform CT Testing (Ratio, Burden Only, Admittance), Demagnetization, Demand Testing, Customer Load or Phantom Load Testing (5-amp Current Load Box), and more! It has a database for storing test results that you can export to your PC.

Since 1904, customers have trusted TESCO for accuracy and reliability. When you think metering, think TESCO.

CAT. 6330 will be referred as "Site Analyzer" throughout the operational manual.

1.2 Contacting TESCO

For Technical Support or Calibration/Repair, please call 215.228.0500.

You can also send an email to **support@tescometering.com with any questions**.

To view, print, or download the latest manual supplement, visit **www.tescometering.com**.

1.3 General Safety Summary

This manual contains information and warnings that must be observed to ensure safe operation and keep the Site Analyzer in a safe condition. Operation or service in conditions or in a manner other than specified could compromise safety. For the correct and safe use of the site analyzer**, it is essential that both operating and service personnel follow accepted safety procedures in addition to the safety precautions specified**, including proper PPE guidelines.

In this manual, a **WARNING** identifies conditions and actions that pose hazard(s) to the user, while a **CAUTION** identifies conditions and actions that may damage the Site Analyzer or the test equipment.

WARNING 

To avoid electrical shock, personal injury, or fire hazard:

- **The site analyzer must not be switched ON if it is damaged or suspected to be faulty.**
- **Do not operate the site analyzer in wet, condensing, dusty, or explosive gas conditions.**
- **If the equipment is used in a manner not specified in this manual, the protection provided by the Site Analyzer may be impaired.**
- **Whenever it is likely that safety protection has been impaired, the site analyzer must be made inoperative and be secured against any unintended operation. Inform qualified maintenance or repair personnel.**
- **Safety protection is likely to be impaired if, for example, the Site Analyzer displays visible damage or fails to operate normally.**

1.4 Description of Safety-related Icons

ICONS	DESCRIPTION
	Risk of danger. Important information. See manual.
	Hazardous voltage. Risk of electrical shock.

1.5 Product Features

1.5.1 Key Features

- **Voltage Drive:** 50-650V, 920V peak
- **Current Drive:** 0.1-21A, 30A peak
- **Meter Testing (Demand, Timed Run, Timed Register, Energy Delivery)**
- **CT Testing (Ratio, Burden Only, Ratio and Burden, Admittance, Demagnetization)**
- **Meter Accuracy Testing (T. A. is 5 amp)**
- **"Fast Key" Anytime Data (Metrology, Phasor Diagrams, Live Waveforms, Harmonics up to 50th)**

1.5.2 Standard Features

- **GRAPHICAL USER INTERFACE (GUI)**
  Displayed on a 7" 800x480, 1,000 nit color display, readable on direct sunlight
- **ETHERNET CONNECTIVITY**
  100 BaseT with support for: Web Services, Remote Control, Database Access. 7" RJ45 standard (blue) and crossover (red) cables are provided.
- **INTEGRATED CONTROL KEYPAD**
  The keypad is embedded in the front panel.
- **LOAD BOX**
  True three-phase with current of 0-5A with full harmonics.

1.5.3 Standard Unit

These are the standard items included in the package:

- 6330 TESCO Meter Site Analyzer
- Optical pickup (1037-SA) with 9.84 ft. cable, Next Gen compatible
- Battery charger (90W 19VDC output, 85 -264VAC input with 6 ft. cord)

1.5.4 Additional Items

These items are necessary for the unit to fully function and have a few varieties to choose from:

- Jumper Sets
- Current Cable Sets
- Voltage Cable Sets
- Test Clips for Voltage
- Rogowski Coil(s)

1.5.5 Optional Accessories

- SENSORLINK high voltage probe
- 50 ft. extension cables for Rogowski coils
- Diamond Level Support

1.6 General Specifications

1.6.1 Input Characteristics

PARAMETERS	DATA
Supply Frequency	50/60Hz
Power Supply Adaptor Output	19VDC, 4.74A
Power	90W Max.

1.6.2 Dimensions

PARAMETERS	DATA
Height	Lid closed: 6.7” (17.01 cm)
Width	13.9” (35.30 cm)
Depth	18.2” (46.22 cm)
Weight	17.8 lbs (8.07 kg)

1.6.3 Accuracy

PARAMETERS	DATA
Voltage Measurement Accuracy	±0.02%
Current Measurement Accuracy	±0.02%
Phase	±0.005 degrees
Power Measurements Accuracy (Watts / VA / VAR)	±0.04%, ±0.02% typical
Energy Measurements Accuracy (WHrs / VAHrs / VARHrs)	±0.04%, ±0.02% typical
Probe Channels	±0.02%

1.7 About this Operations Manual

This manual provides complete information for setting up and operating the Site Analyzer. This document instructs the user on the following operations of the CAT. 6330:

- Setup
- Front Panel Features
- Graphical User Interface (GUI)
- How to perform tests
- Site analyzer Maintenance

2.0 SETUP

2.1 Introduction

This chapter provides instructions for unpacking and the proper setup for the Site Analyzer. Read this chapter before you operate the Site Analyzer. Instructions for cable connections can be found here.

2.2 Unpacking and Inspection

The Site Analyzer is shipped in a container designed to prevent damage during shipping.

Inspect the Site Analyzer carefully for damage, and immediately report any damage to the shipper. A packing list is included in the packaging. When you unpack the Site Analyzer, check for all the standard equipment listed and check the shipping order for any additional items ordered. Report any shortage to the place of purchase, your distributor, or directly to TESCO.

2.3 Setup and Cooling Considerations

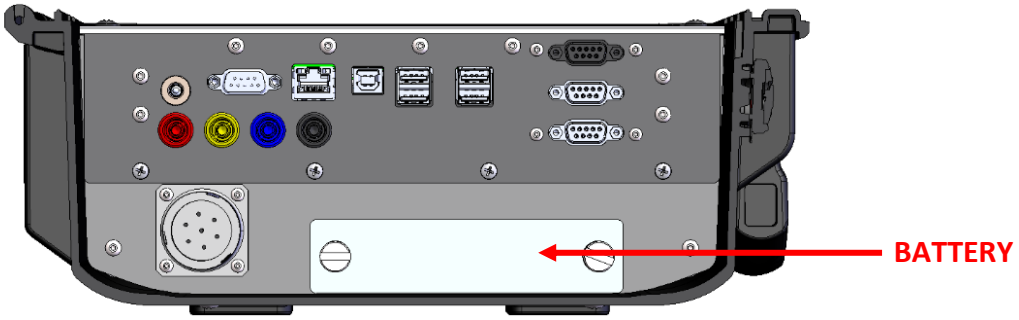
2.3.1 Setup and Placement

The Site Analyzer is a versatile and portable unit that you can easily adapt to your surroundings, on a site or inside the shop. The long cords allow for the placement for a Site Analyzer to be as close or as far from the site as possible.

Make sure to lay the Site Analyzer flat when using, and make sure there is proper ventilation for the fans on the side.

2.4 Main Power Supply

The Site Analyzer is fully battery powered and the battery can be charged in or outside of the unit from AC or DC. The battery can easily be swapped out. Additional chargers are available for purchase from TESCO or your distributor.



WARNING

To avoid electrical shock, personal injury, or fire hazard, connect the factory-supplied three-conductor-line power cord to a properly grounded power outlet.

During test operation, a two-conductor adapter or extension cord MUST NOT be used. This will break the protective ground connection and will affect the measurement accuracy of the Site Analyzer.

The power outlets supplying the Site Analyzer system should be controlled by an emergency switch so that power can be switched off if a hazard arises.

3.0 FUNCTIONALITY

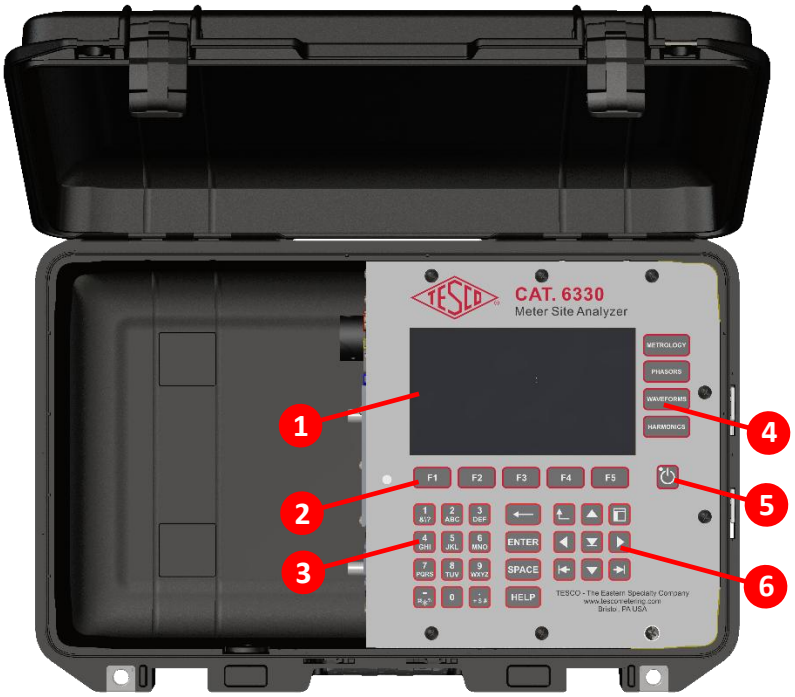
3.1 Introduction

This chapter is a reference for the functions and locations of the Site Analyzer's front panel features and provides brief descriptions of each feature for quick access. **Please read this information before operating the Site Analyzer.** Front panel operating instructions for the Site Analyzer are provided in this chapter.

3.2 Panel Features

Front panel features (controls, displays, indicators) and side panel sections (terminals) are shown in Figure 3.2.1 and Figure 3.2.2 respectively.

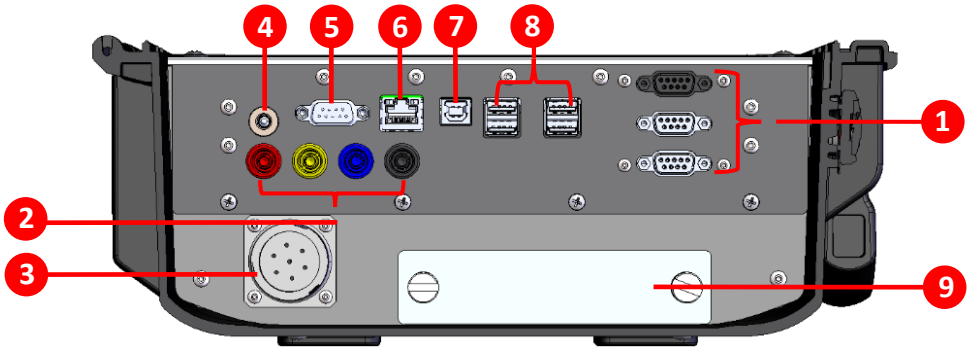
3.2.1 Front Panel



NUMBER	DESCRIPTION
1	LCD screen
2	Function keys
3	Keypad
4	Fast access keys
5	Power button
6	Navigation buttons

Table 3.2.1. CAT. 6330 Front Panel Sections

3.2.2 Side Panel



NUMBER	DESCRIPTION
1	Rogowski Current Probe Terminals
2	Fused Voltage Lead Terminals
3	Current Cable Terminal
4	Battery Charger Input Terminal
5	Optical Pickup Terminal
6	Ethernet Communication
7	USB type-B port
8	USB type-A ports
9	Battery Compartment

Table 3.2.2. CAT. 6330 Side Panel Sections

3.2.3 Front Panel Buttons

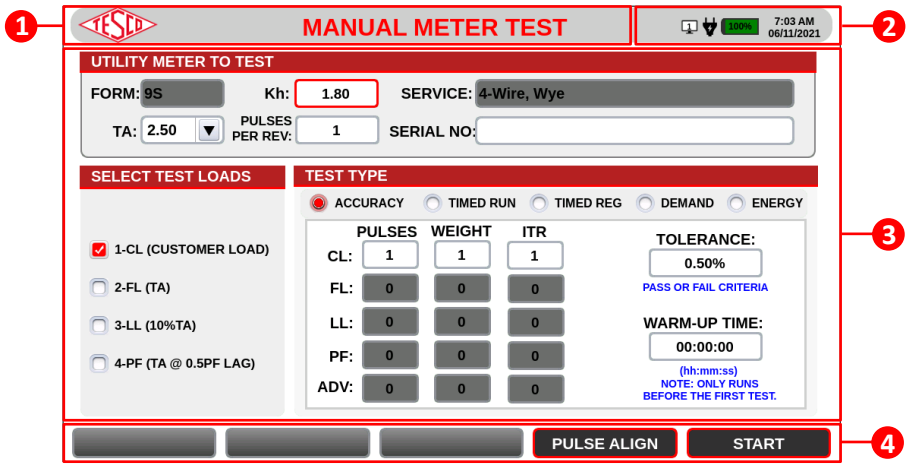
SYMBOL	DESCRIPTION
	• Selects the NEXT or PREVIOUS menu item • Moves the **SELECTED LINE** UP or DOWN • Selects an Item from a dropdown menu
	• Moves the cursor left/right of the current character in text boxes. • Moves the selection left/right of the current selected cell in tables.
	Selects the NEXT or PREVIOUS **TAB** item.
	Moves the focus from one section of the screen to another
METROLOGY	Displays many of the metrology values in tabular form.
PHASORS	Displays a phasor diagram for the active phases. Diagram is continuously updated.
WAVEFORM	Displays live waveforms.
HARMONICS	Displays harmonic analysis up to the 50th.

←	Deletes the previous character.
↵	Returns to the previous screen.
F1 F2 F3 F4 F5	Function keys
⏻	Power button. Hold down to turn the site analyzer on until the LED lights up and wait for a few seconds for the screen to load.
ENTER ▼	Selects a response.
HELP	Provides context-sensitive help.

3.3 The Graphical User Interface (GUI)

3.3.1 GUI Screen Sections

The user interface is divided into four sections. In the screen, any field or button that is grayed out cannot be changed or accessed by the user.



NUMBER	DESCRIPTION
1	Screen Title
2	Status Bar
3	Screen Data
4	Function Buttons

Table 3.3.1. CAT. 6330 GUI Sections

STATUS BAR ICONS

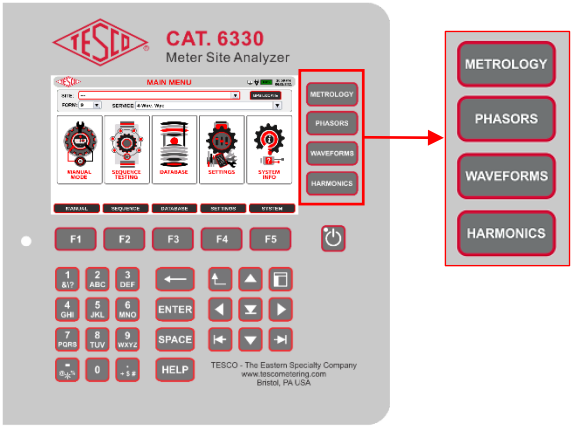
These icons are located at the status bar of the screen. They are indicators of different network connections and temperature levels of the site analyzer.

Green - 60% - 100%; Yellow - 30% - 60%; and Red -<30% (do not use at this level)

ICON	NAME	DESCRIPTION
1	**Wired Connection**	LAN/Ethernet connection is enabled. The number represents the number of users remotely connected to the site analyzer.
	Extremely Hot Temperature	The Site Analyzer's temperature is above 158˚F (70˚C).

	**Charging**	The Site Analyzer is charging.

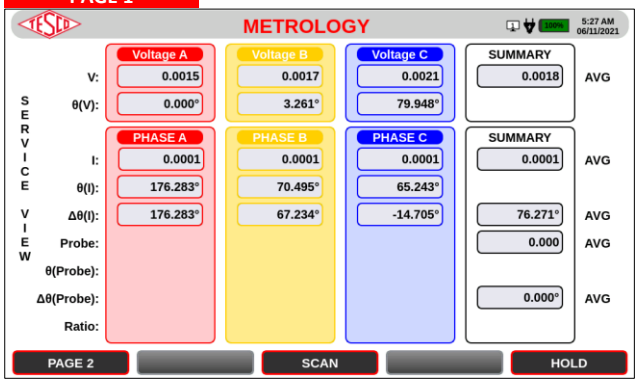
3.3.2 Fast Access Functions

SCREEN	DESCRIPTION
	The “FAST” access buttons provide instant access to various measurements at any time. Pressing one of the buttons brings up the display regardless of what is shown on the screen. Pressing the same button again shows the previous screen. If one FAST display is showing and a second FAST button is pressed, the latter FAST button will then be displayed.

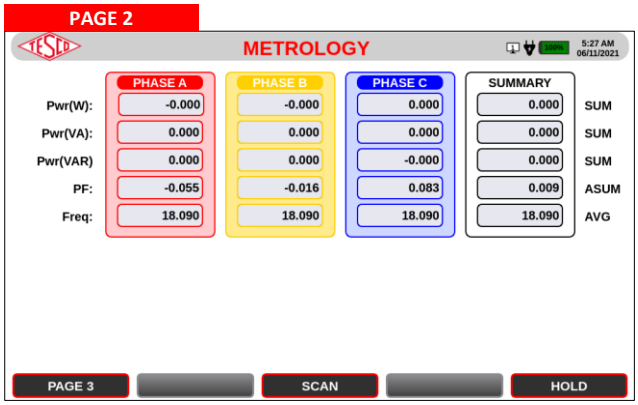
3.3.2a Metrology

SCREEN	DESCRIPTION

PAGE 1



PAGE 2



Displays many of the metrology values in tabular form. If no test is in progress, then the TREND PLOT and RECORD functions are available.

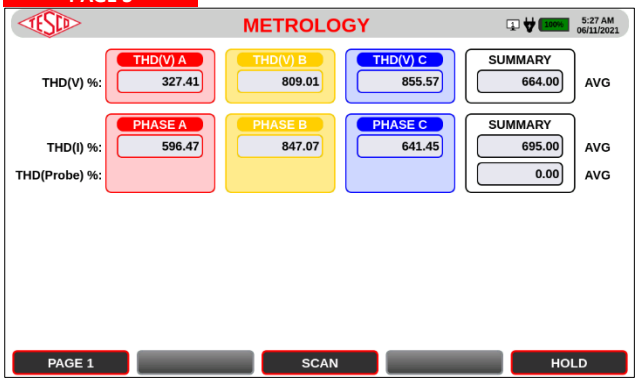
The SEL column is used to select which parameters are used in a TREND PLOT or WAVEFORM RECORDING. Use the arrow keys to navigate through each of the parameter and press ENTER to select/deselect.

FUNCTION KEYS:

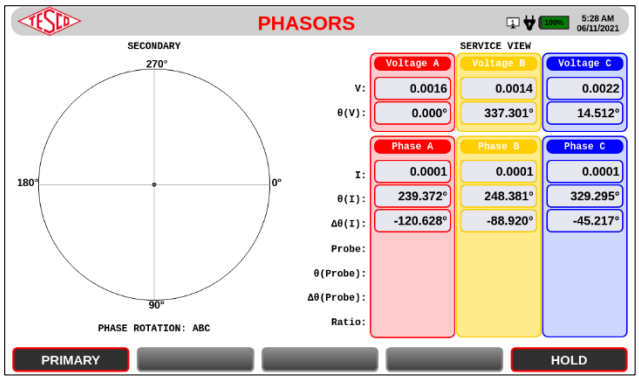
F1	**PAGE N**	Show a certain page of measurements, with N as the page number
F2		
F3	**SCAN**	Voltages and currents are scanned and evaluated to see if they match the site configuration specified.
F4		
F5	**HOLD**	Freeze the data acquisition.
	LIVE	Change to showing live data.

SCREEN	DESCRIPTION

PAGE 3



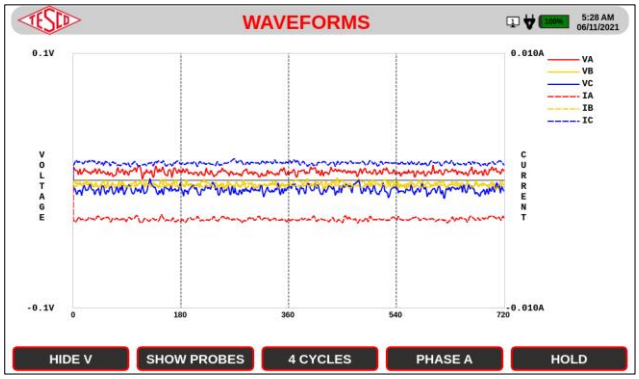
3.3.2b Phasors

SCREEN	DESCRIPTION
	Displays a phasor diagram for the active phases. Diagram is continuously updated.

KEYPAD & FUNCTION KEYS:

F1	PRIMARY	Switch to the primary reading.
	SECONDARY	Switch to the secondary reading.
F2		
F3		
F4		
F5	HOLD	Freeze the data acquisition.
	LIVE	Change to showing live data.

3.3.2c Waveforms

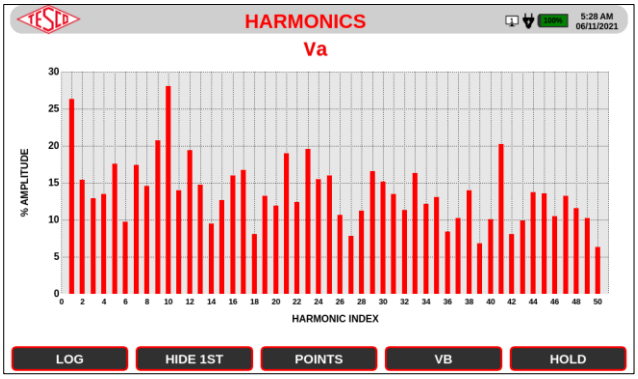
SCREEN	DESCRIPTION
	Displays live waveforms with recording functionality.

KEYPAD & FUNCTION KEYS:

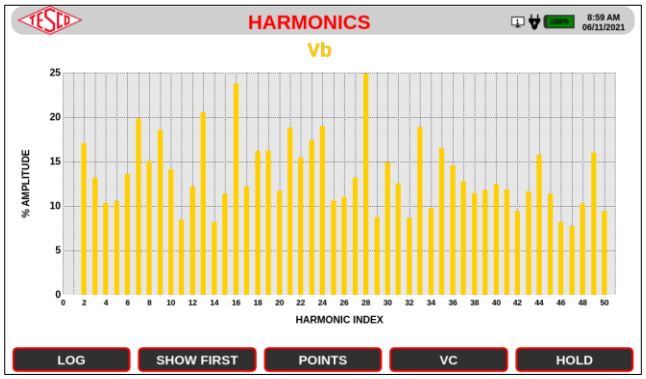
F1	HIDE V	Hide or show the voltage waveforms.
F2	HIDE I	Hide or show the current waveforms.
F3	N CYCLES	Select the number of cycles to be displayed: 1, 2, 4, 8
F4	PHASE A	Shift between ALL, Phase A, Phase B and Phase C.
F5	HOLD	Freeze the data acquisition.
	LIVE	Change to showing live data.

3.3.2d Harmonics

SCREEN	DESCRIPTION



Voltage A, log display with 1st harmonic displayed.



Voltage B, log display with 1st harmonic suppressed.

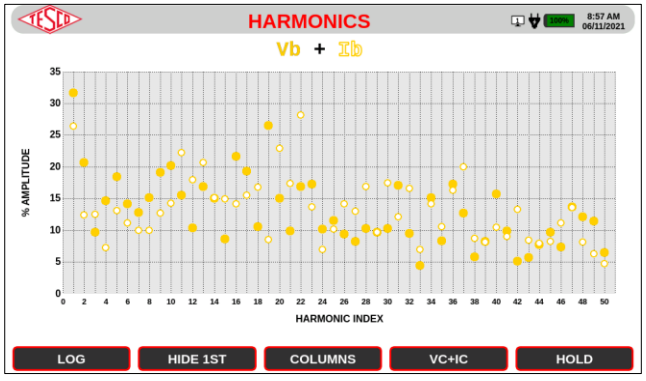
Displays live reading of the harmonics up to the 50th. Data can be represented by columns or points.

NOTE: The phase colors were changed in **3.3.2.4b Colors/Beepers Options.**

KEYPAD & FUNCTION KEYS:

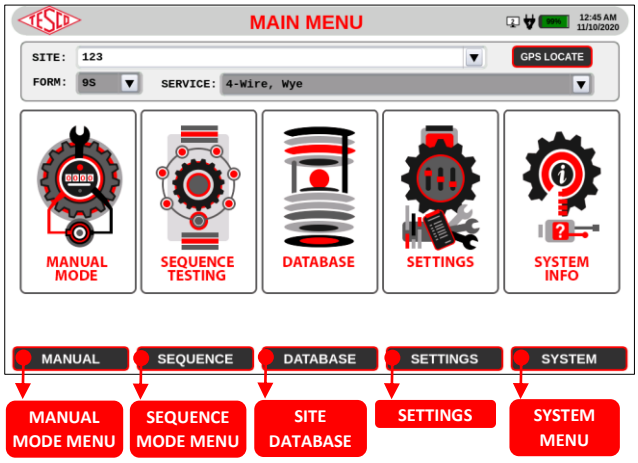
F1	LOG	Change Y axis from linear to log scale.
F2	SHOW FIRST	Show the 1st harmonic (fundamental) so that the display can auto-scale to show more vertical detail.
	HIDE 1ST	Hide the 1st harmonic (fundamental).
F3	POINTS	Change from a Columns display to a Points display.
	COLUMNS	Change from a Points display to a Columns display.
F4	VA	Column mode: Shift between Va, Vb, Vc, Ia, Ib, Ic
	VB	Point mode: Shift between Ia+Va, Ib+Vb, Ic+Vc, Pa, Pb, Pc
F5	HOLD	Freeze the data acquisition.
	LIVE	Change to showing live data.

Press  to return to the previous screen.

SCREEN	DESCRIPTION
	

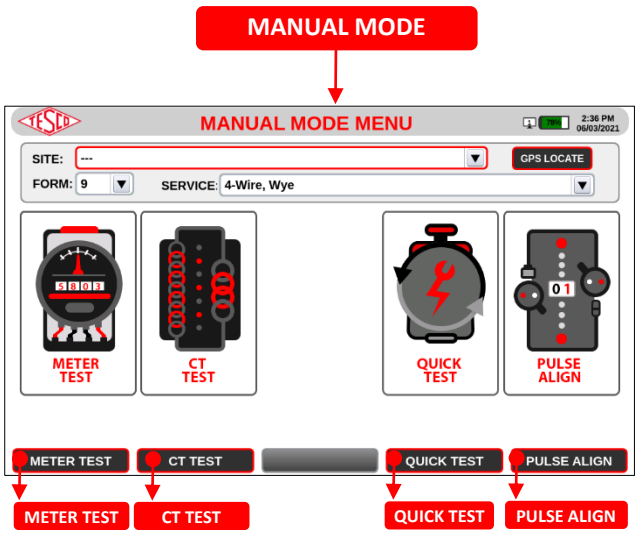
Voltage B and Current B, linear display with 1st harmonic suppressed in "dots" mode.

3.3.3 Main Menu

SCREEN	DESCRIPTION
	The MAIN MENU contains the core functions of the site analyzer. A site can be selected using the SITE dropdown box. Clicking the GPS LOCATE button will narrow the choices for SITE to those at the current GPS location. If only one **site** is found, that **site** will be loaded. If the correct **site** is not found, go to the DATABASE and create a **site** or test in MANUAL mode. If no site is selected, then tests can be performed in MANUAL mode, but data cannot be saved to the results database. **KEYPAD & FUNCTION KEYS:** F1 **MANUAL** – Perform Meter Test, CT Test, or Pulse Alignment Check F2 **SEQUENCE** – Perform a test sequence F3 **DATABASE** – Create/View/Edit information in the database: sites, test results, data library, and test sequences F4 **SETTINGS** – Open the SETTINGS MENU screen F5 **SYSTEM** – Open the SYSTEM MENU screen Press ↵ to return to the previous screen. **DATA** **SITE** – Choose an existing site configuration. **FORM** – Form of the meter. This will be loaded automatically if a site is selected. **SERVICE** – Services/wiring configurations available for selected meter form. This will be loaded automatically if a site is selected.

3.3.3.1 Manual Mode

SCREEN	DESCRIPTION



Manual Mode allows testing without specifying a site or test sequence. If a **site** was selected on the MAIN MENU, then the information on this screen will automatically be filled in. If no SITE was selected, then one can be selected here, or just a meter form and service can be manually set.

KEYPAD & FUNCTION KEYS:

F1	MANUAL	Perform a meter test.
F2	CT TEST	Perform a CT test.
F3		
F4		
F5	PULSE ALIGN	Perform to check pulse alignment. See section **3.3.2.1c Pulse Alignment Check** for more information.

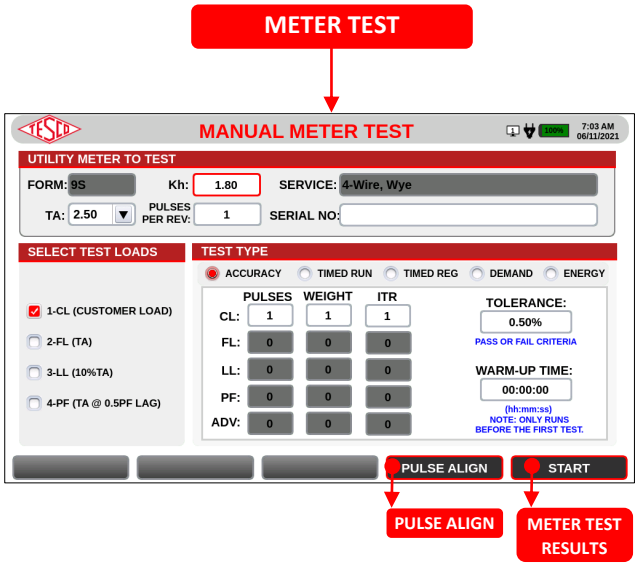
Press ↵ to return to the previous screen.

DATA

SITE	Choose an existing site configuration
FORM	Meter form, will be loaded automatically if site is selected
SERVICE	Services/wiring configurations available for selected meter form. This will be loaded automatically if a site is selected.

3.3.3.1a Meter Test

SCREEN	DESCRIPTION



Perform a meter test to determine the accuracy of the meter under different loads.

FUNCTION KEYS:

F1		
F2		
F3		
F4	PULSE ALIGN	Perform to check pulse alignment. See section **3.3.2.1e Pulse Alignment Check** for more information.
F5	START	Start the manual meter test.

↵ Press to return to the previous screen.

METER PARAMETERS

FORM	Form number of the meter.
Kh	Meter test constant.
SERVICE	Services/wiring configurations available for selected meter form.
TA	Test amp of the meter.
PULSES PER REV	If a meter is configured to generate multiple pulses per Kh, then this is the number of pulses per Kh.
SERIAL NUMBER	Serial number of the meter. This is optional.

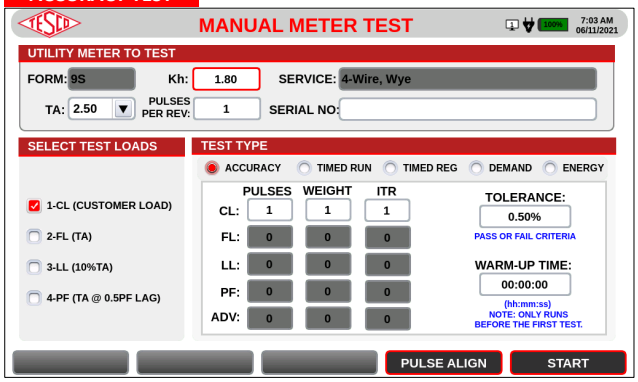
SCREEN	DESCRIPTION

TEST LOADS

Customer voltage is used for all tests.

1-CL (CUSTOMER LOAD)	Uses customer load where the site analyzer is measuring the voltage signal and the current signals from both the potential and the current transformers.
2-FL (TA)	Load box provided current of TA at PF=1.0 is used.
3- LL (10%TA)	Load box provided current of 10% TA at PF=1.0 is used.
4- PF (TA @ 0.5PF LAG)	Load box provided current of TA at PF=0.5 lagging is used.

ACCURACY TEST



TEST TYPE PARAMETERS

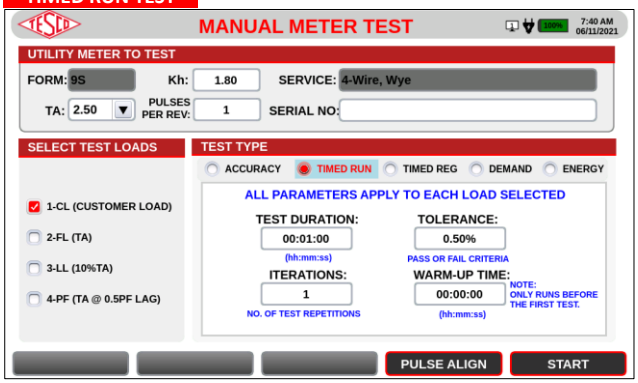
A. ACCURACY TEST

Perform this test to determine a meter's accuracy under one or more load conditions.

PARAMETERS

PULSES	Sets the number of pulses that the test will be run. Different numbers of pulses can be set for different loading conditions.
WEIGHT	When the overall accuracy for the selected test is computed, a weighted average can be performed. To get the weighted average, the WEIGHT is multiplied by the %ERROR and the product summed over all tests. The result is divided by the total weight of tests performed.
ITR	Iteration of the selected test.
TOLERANCE	Tolerance needed for pass/fail criteria.
WARM-UP TIME	Period of time for meter to stabilize prior to test execution.

TIMED RUN TEST



B. TIMED RUN TEST

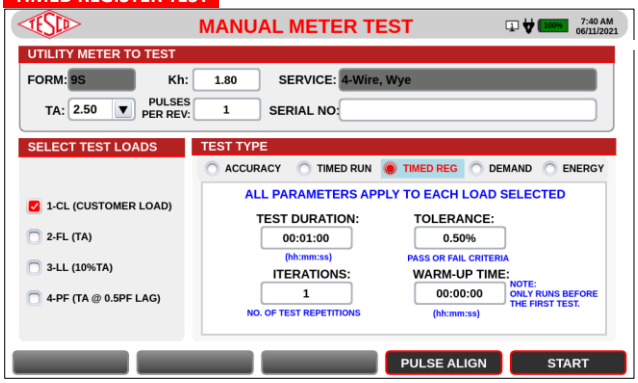
A timed run test is identical to an accuracy test except the minimum time for the test is set. The actual measurement still starts and ends based on the meter pulses.

PARAMETERS

TEST DURATION	Set the test duration.
ITERATIONS	Number of times the test will be repeated
TOLERANCE	Tolerance used for pass/fail criteria.
WARM-UP TIME	Time for meter to stabilize prior to test execution.

SCREEN	**DESCRIPTION**

TIMED REGISTER TEST



C. TIMED REGISTER TEST

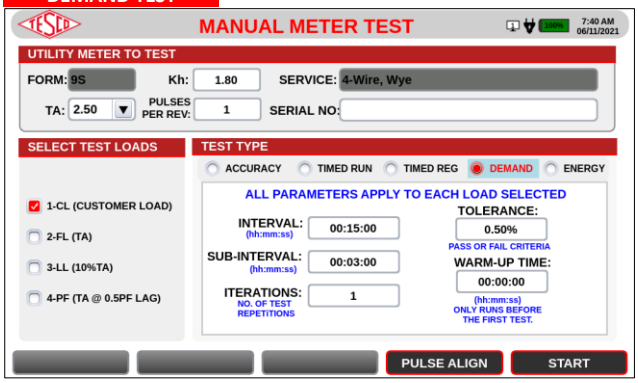
This test prompts the user for the meter's primary register value and runs a test for a predefined duration. Then, it prompts the user again for the meter's primary register value. The system computes the meter's registration using the difference of the two values.

Note: Use caution that the accuracy of the test is not limited by the resolution of the meter readout.

PARAMETERS

TEST DURATION	Set the test duration.
ITERATIONS	Number of times the test will be repeated
TOLERANCE	Tolerance used for pass/fail criteria.
WARM-UP TIME	Time for meter to stabilize prior to test execution.

DEMAND TEST



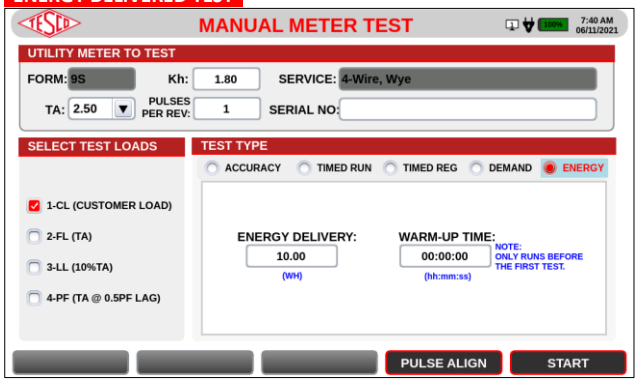
D. DEMAND TEST

The demand interval must be set to the same interval as the meter under test. For this test to work correctly you must be able to reset the demand register of the meter. The meter's demand must continually show the interval demand.

PARAMETERS

INTERVAL	Set the interval of meter.
SUB-INTERVAL	Set the sub-interval for the demand test.
ITERATIONS	Number of times the test will be repeated
TOLERANCE	Tolerance needed for pass/fail criteria.
WARM-UP TIME	Time for meter to stabilize prior to test execution.

ENERGY DELIVERED TEST



E. ENERGY TEST

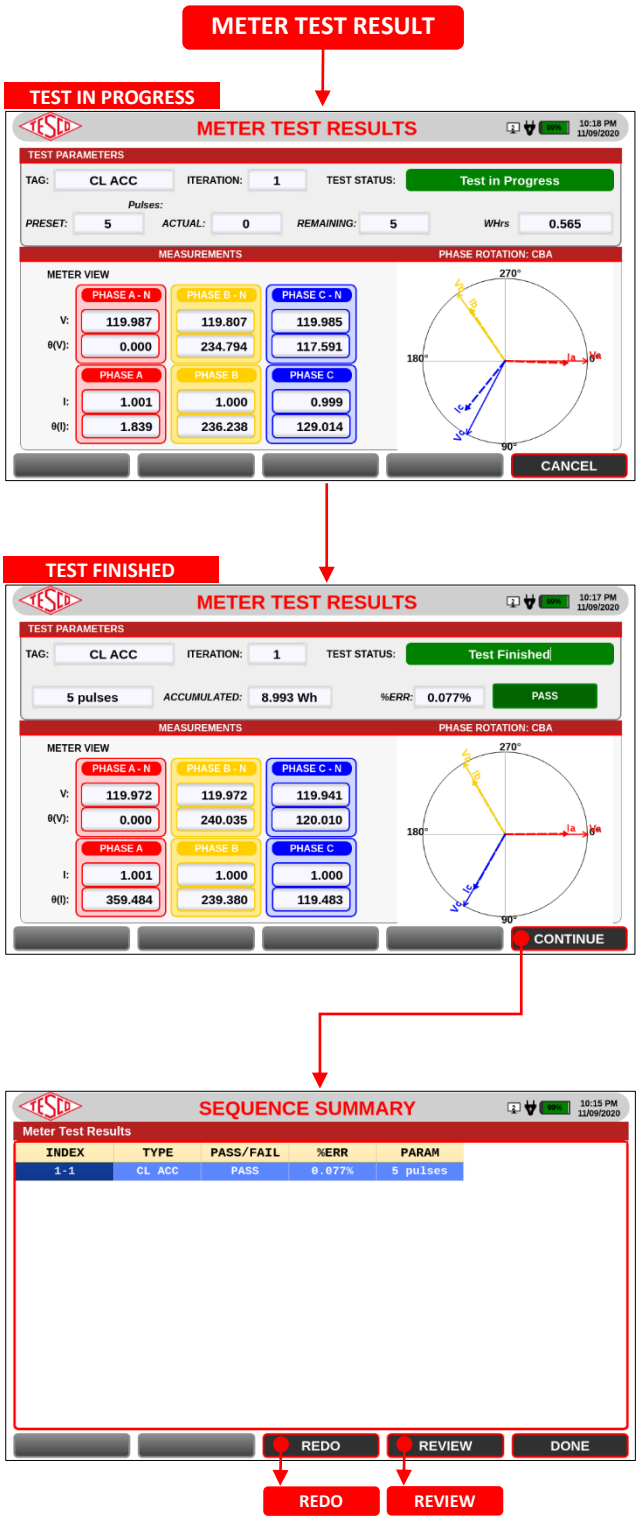
The energy delivered test is similar to the timed register test. The difference is that instead of specifying the time for the test to run we specify the amount of energy to be delivered.

PARAMETERS

ENERGY DELIVERED	Set the amount of energy to be delivered to the meter
WARM-UP TIME	Time for meter to stabilize prior to test execution

3.3.3.1b Meter Test Results

SCREEN	DESCRIPTION



This shows the numerical data and graphical representation of the data, after completing the test. Test results can only be saved when a site was selected.

KEYPAD & FUNCTION KEYS

F1		
F2		
F3		
F4		
F5	**CANCEL**	Cancel the test process and return to: - MANUAL METER TEST SETUP (when performing MANUAL TEST) - TEST SEQUENCE SETUP (when performing SEQUENCE TEST)
	CONTINUE	Proceed to SEQUENCE SUMMARY screen.

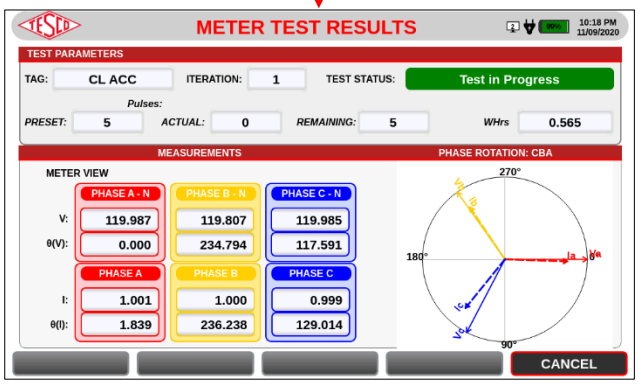
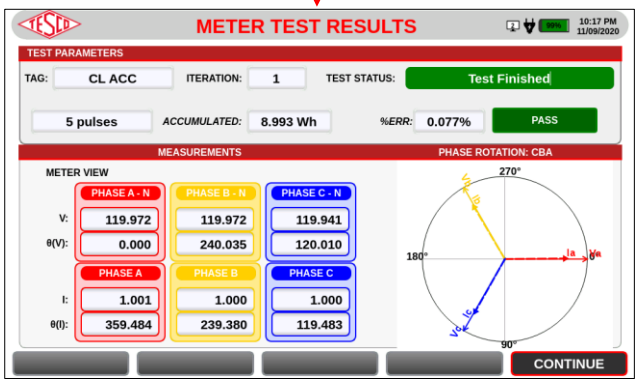
METER TEST PARAMETERS

TAG	Alias or brief description of the test	
ITERATION	Number of test iteration	
TEST STATUS	Status of the test	
PULSES	**Preset**	Pre-defined number of pulses
	Actual	Counted pulses during test
	Remaining	Remaining pulses during and after test

METER TEST RESULTS

PULSES	Total pulses
ACCUMULATED	Accumulated Whrs
%ERROR	Measured percent error
V	Measured voltage
Θ (V)	Measured phase angle
I	Measured current
Θ (I)	Measured phase angle

F1		
F2		
F3	**REDO**	Redo the recently executed test.
F4	**REVIEW**	Review the recently executed test.
F5	**DONE**	Return to Manual Meter Test screen.

SCREEN	DESCRIPTION
REDO  	**REDO THE TEST** This will perform the test again with the same test parameters. Press F5 to cancel the test and proceed to the sequence summary.
REVIEW  	**REVIEW THE TEST** Look back at the test that was recently performed. Press F5 to proceed to the sequence summary.

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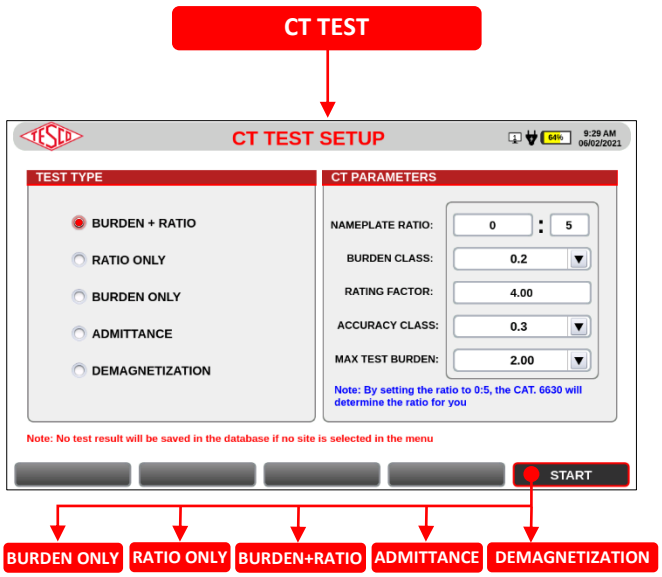
3.3.3.1c CT Testing

SCREEN	DESCRIPTION



CT TEST MODES

The CAT6330 provides a wide range of methods for testing CTs.

BURDEN ONLY TEST	The change in the secondary current is measured as the burden placed on the CT is increased. This test **does not** require a current probe, such as a Rogowski coil, connected to the primary of the transformer.
RATIO ONLY TEST	Both primary and secondary currents are measured with NO additional burden added to the circuits. This test **does** require a current probe, such as a Rogowski coil, connected to the primary of the transformer.
RATIO TEST WITH ADDED BURDEN	The Ratio with Burden test is the most accurate test of the performance of a CT. Both primary and secondary of the CT are simultaneously measured. From these measurements we can calculate many CT parameters such as accuracy class, RCF, ratio error and phase error. This test **does** require a current probe, such as a Rogowski coil, connected to the primary of the transformer.
ADMITTANCE	An admittance test injects a 1,575 Hz signal into the secondary of a CT and measures the response to determine the admittance of the CT. The value you measure depends somewhat on the primary wiring and circuit characteristics. However, these effects do not generally change over time. Therefore, the real value of an admittance test is that one can do the hard job of making a Ratio with Burden test once, and then make an admittance test on the known good site. Later, one can just measure admittance to see if anything on the site has changed.
DEMAGNETIZATION	Demagnetize all CTs.

KEYPAD & FUNCTION KEYS:

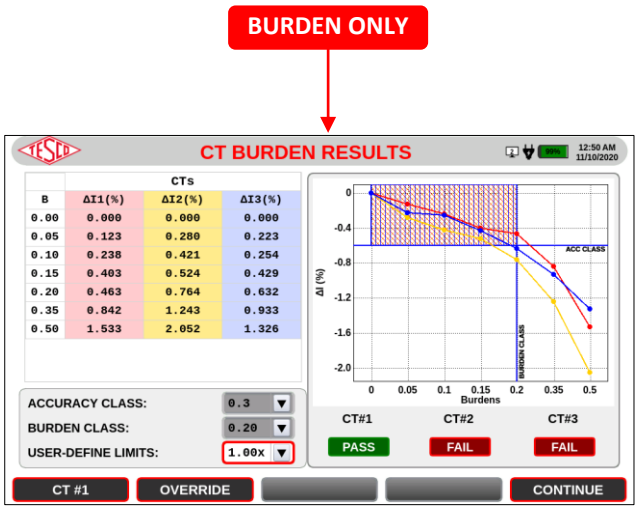
F1		
F2		
F3		
F4		
F5	**START**	Start the selected test type.

Press ⌞ to return to the previous screen.

CT PARAMETERS

NAMEPLATE RATIO	Nameplate ratio of the CT
BURDEN CLASS	Burden class of the CT
RATING FACTOR	Rating factor of the CT
ACCURACY CLASS	Accuracy class of the CT
MAX TEST BURDEN	Max burden allowed for the CT

SCREEN	DESCRIPTION



CT TEST RESULTS

CT test results are presented for Ratio, Burden, Ratio with Burden, and Admittance tests. Soft keys provide many ways of looking at the test data.

Each CT test will **PASS** if:

- Measured current falls within the specified accuracy region (in a Burden Test) or inside the parallelogram (in a Ratio Test) even at low current.

Each CT test will **FAIL** if:

- Current is below minimum or above maximum current of CT.
- Measured current is beyond the specified accuracy region (in a Burden Test) or outside the parallelogram (in a Ratio Test).

CT BURDEN ONLY

Test the CT with a certain burden. The accuracy region covers the area limited by the accuracy class and burden class.

KEYPAD & FUNCTION KEYS:

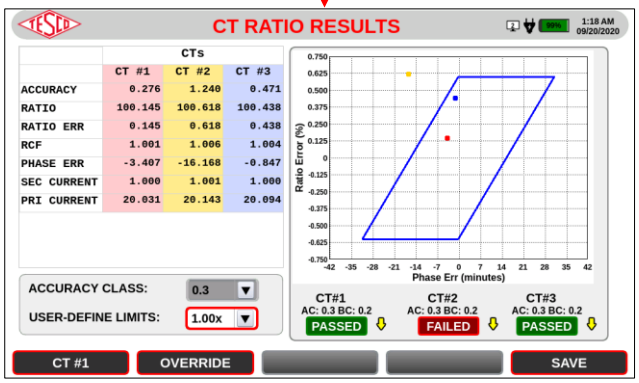
F1	ALL CT #1 CT #2 CT #3	Shift between different display modes. Either one CT at a time or multiple CTs. Only the available CTs are shown.
F2	OVERRIDE	Change the values of Accuracy Class and Burden Class.
F3		
F4		
F5	CONTINUE	Return to CT Test Setup.

DATA

B	Burden resistance
ΔI1	Measured current in CT#1
ΔI2	Measured current in CT#2
ΔI3	Measured current in CT#3
ACCURACY CLASS	Accuracy class of CT
BURDEN CLASS	Burden class of CT
USER-DEFINE LIMITS	Extended range of accuracy class

SCREEN	DESCRIPTION

RATIO ONLY



CT RATIO ONLY

The ratio only test measures the complete set of CT parameters and displays them in numeric and graphical form. The data is also displayed on the IEEE accuracy parallelogram. CTs which meet the requirements of their accuracy class will be represented by points inside the parallelogram. The size of the parallelogram is adjusted appropriately based on the current through the CT.

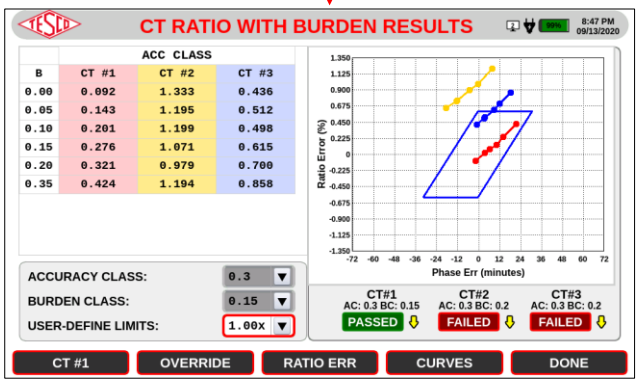
DATA

ACCURACY	Measured accuracy
RATIO	Nameplate ratio
RATIO ERR	Ratio error
RCF	Ratio correction factor
PHASE ERR	Phases error
SEC CURRENT	Secondary current
PRI CURRENT	Primary current
ACCURACY CLASS	Accuracy class of CT
USER-DEFINE LIMITS	Extended range of accuracy class

KEYPAD & FUNCTION KEYS:

F1	**ALL** **CT #1** **CT #2** **CT #3**	Shift between different display modes. Either one CT at a time or multiple CTs. Only the available CTs are shown.
F2	**OVERRIDE**	Allows the user to override the values of Accuracy Class and Burden Class provided in the setup screen.
F3		
F4		
F5	**DONE** **SAVE**	Return to CT Test Setup.

BURDEN+RATIO



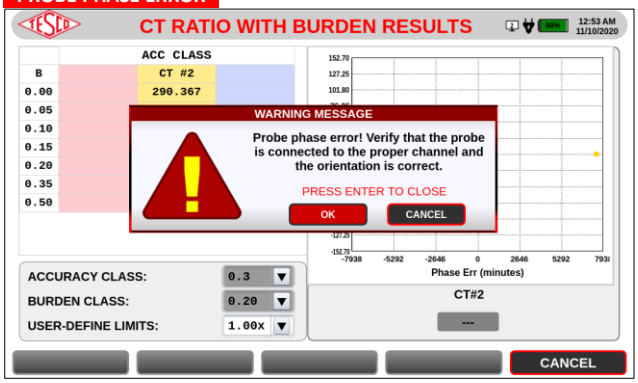
CT RATIO WITH BURDEN

This test is performed just like the burden only test except the ratio of primary to secondary current times 5 is s
hown.

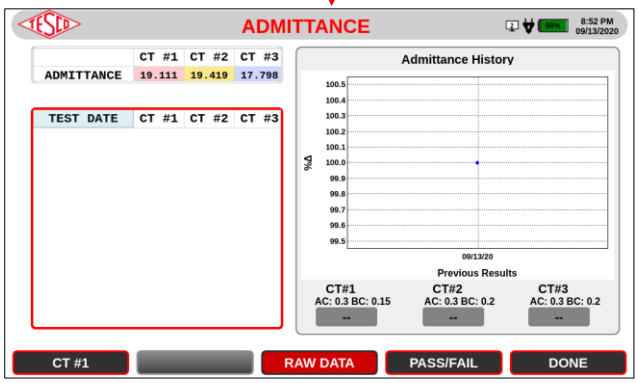
KEYPAD & FUNCTION KEYS:

F1	**ALL** **CT #N**	Shift between different display modes, either one CT at a time or multiple CTs. N is the number of CT, which is up to a maximum of three (3) CTs.
F2	**OVERRIDE**	Allow overriding the values of the accuracy class and burden class selected in the setup.
F3	**RATIO ERR**	Shift between different test results: • Accuracy Class • RCF (Ratio Correction Factor) • Ratio Error • Phase Error (') • Ratio • ΔI (%) • Secondary Current • Primary Current
F4	**CURVES**	Label changes depending on what view you are in. In CURVES view, it

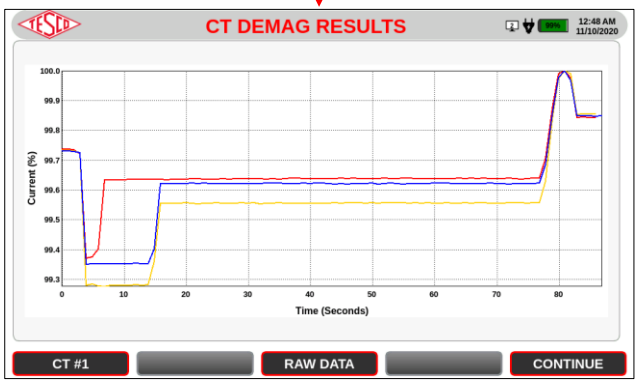
PROBE PHASE ERROR



ADMITTANCE



DEMAGNETIZATION



		shows PARALLELOGRAM and changes to PARALLELOGRAM plot when pressed.
F5	DONE SAVE	DONE or SAVE will be available depending on whether a site has been selected.

DATA

B	Burden resistance
ΔI (%)	Measured current
ACCURACY CLASS	Accuracy class of CT
BURDEN CLASS	Burden class of CT
USER-DEFINE LIMITS	Extended range of accuracy class

ADMITTANCE TEST

An admittance test injects a signal into the secondary of a CT and measures the response to determine the admittance of the CT. The user can manually PASS/FAIL a CT based on the user's standard.

KEYPAD & FUNCTION KEYS

F1	ALL CT #N	Shift between different display modes, either one CT at a time or multiple CTs. N is the number of CT, which is up to a maximum of three (3) CTs.
F2		
F3	RAW DATA	Show numerical/actual data.
F4	PASS/FAIL	Manually PASS/ FAIL a CT or all CTs.
F5	DONE	Return to CT Test Setup.

TEST PARAMETERS

TEST DATE	Date and time when test was performed
CT #N	Show test result of CT #N, where N is the CT number

DEMAGNETIZATION TEST

Demagnetize all CTs. Current transformer demagnetization is done by gradually increasing the secondary resistance from low to high then from high to low at a consistent rate.

KEYPAD & FUNCTION KEYS

F1	ALL CT #N	Shift between different display modes, either one CT at a time or multiple CTs. N is the number of CT, which is up to a maximum of three (3) CTs.
F2		
F3	RAW DATA	Show numerical/actual data.
F4		
F5	CONTINUE	Returns to CT TEST SETUP screen.

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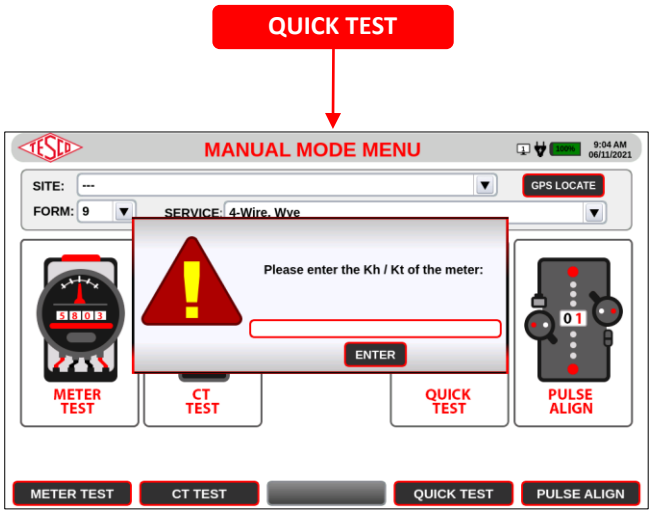
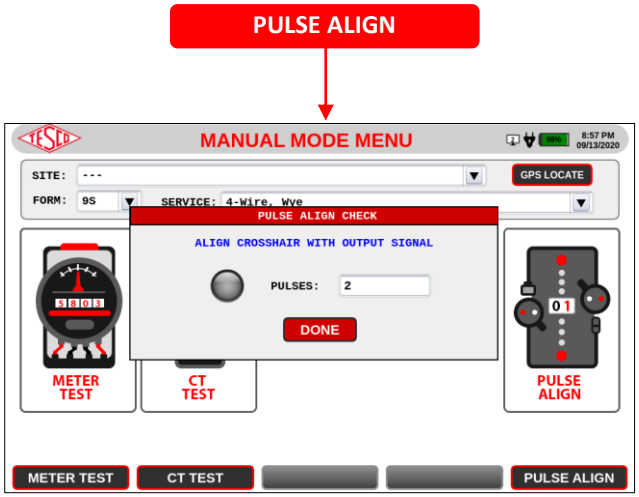
3.3.3.1d Quick Test

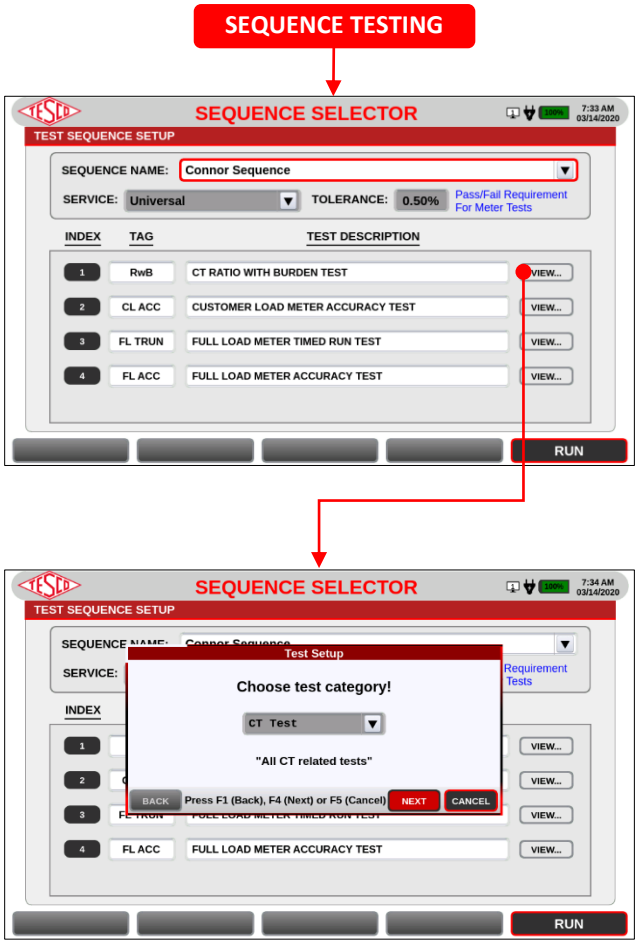
SCREEN	DESCRIPTION
	Perform a quick test, with Full Load Accuracy Test set as the default test. Enter the Kh/Kt of the meter. Press or to select the ENTER, and press

3.3.3.1e Pulse Alignment Check

SCREEN	DESCRIPTION
	This will apply voltage and current to the meter so that the optical probe can be aligned with the meter's pulse output. Before performing a pulse alignment check, make sure that the optical pickup (1037-SA) is attached to the meter. **FUNCTION KEYS** **DONE** — Close the pop-up screen **DATA** **PULSES** — Pulse count

3.3.3.2 Sequence Testing

SCREEN	DESCRIPTION



Sequence testing is performed when there is more than one type of test to execute. In this test, a sequence must be selected and

To know how to perform a Sequence Test, proceed to section **4.3 Sequence Test.**

KEYPAD & FUNCTION KEYS

F1		
F2		
F3		
F4		
F5	**RUN**	Start sequence testing.

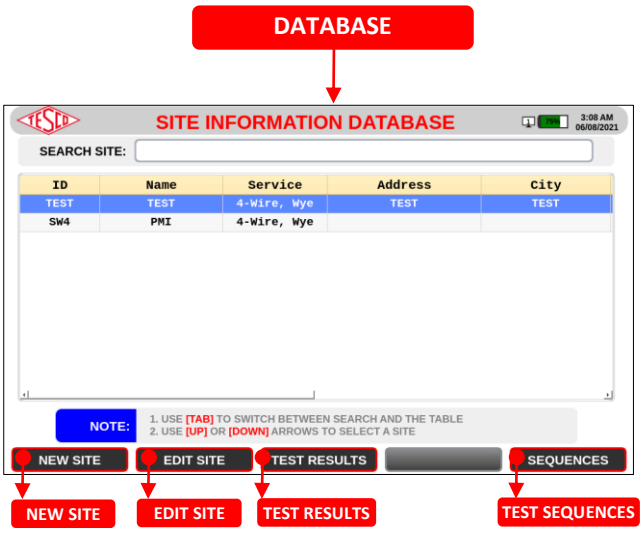
DATA

All data is taken from the SITE data records. A SITE must be selected before a TEST SEQUENCE can be run. All boxes on this form are read-only except SEQUENCE and the ENA fields.

SEQUENCE NAME	Sequences available for selected meter form and service.
TOLERANCE	Tolerance for the pass or fail criteria.
TA	Test amps (RMS of a full load test).
SERVICE	Services/wiring configurations available for selected meter form.
ENA	Toggle to select or deselect a test.
TAG	Alias or brief description of the test.
TEST DESCRIPTION	Type of test available for the sequence.

3.3.3.3 Database

SCREEN	DESCRIPTION



This contains information on sites registered in the Site Analyzer. The user can create a new site and edit an existing record. Aside from the site, the user can also create and edit Meter, CT, and Customer information per site.

The database also shows test results from Meter and CT tests. Do note that these test results were able to be saved because a site was selected prior to performing the test. To edit a site or view the test results, a site must be selected first.

KEYPAD & FUNCTION KEYS:

F1	**NEW SITE**	Create new site information. This also includes creating and editing information on site, meter, CT, and customer.
F2	**EDIT SITE**	Edit information of a site, meter, CT, and customer. This will be enabled once a site is selected.
F3	**TEST RESULTS**	View test results on meter and CT tests. This will be enabled once a site is selected.
F4		
F5	**SEQUENCES**	View/Create/Edit test sequences.

Press ↵ to return to the previous screen.

DATA

SEARCH SITE	Enter characters to search for a site
SITE ID	ID of site
SITE NAME	Name of site
DESCRIPTION	Description about site
CUSTOMER	Choose customer
ADDRESS 1	Location of site
ADDRESS 2	Location of site
CITY	City where site is located
STATE/PROVINCE	State/Province where site is located
ZIPCODE	Zip code of the local address
COUNTRY	Country where site is located
GPS	Automatically fill in using GPS Locate
NOTES	Additional information about the site
SELECTED SITE	Displays name of the selected site to edit

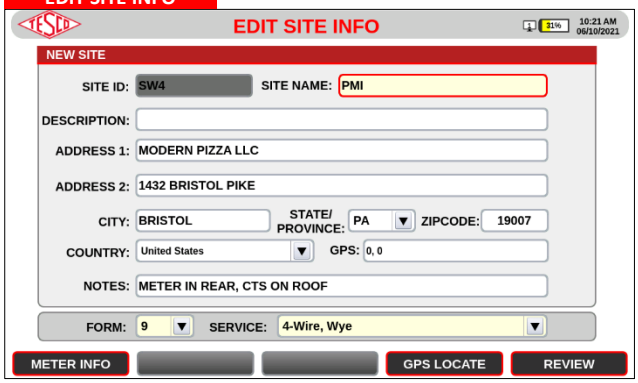
3.3.3.3a Add/Edit Site

SCREEN	DESCRIPTION

NEW SITE

NEW SITE INFO

EDIT SITE INFO



NEW/EDIT SITE

Create new site information. Fill out the information and save it in the database. If the site info is for editing, the fields will be filled with pre-saved information of that site and the user can make changes.

KEYPAD & FUNCTION KEYS:

F1		
F2		
F3		
F4	GPS LOCATE	Obtain GPS coordinates of the Site Analyzer.
F5	REVIEW	Review the changes made for the Site Info, Meter Info, CT Info, and Customers Info.

Press ⌐ to return to the previous screen.

REVIEW PAGE

Review the edits made or the new inputs for the site, meter, CT, and customer information. After reviewing, press F5 to save the information.

KEYPAD & FUNCTION KEYS:

F1	EDIT	Return to editing information on the Site, Meter, CT, and Customers.
F2		
F3		
F4		
F5	SAVE	Save the edits made or the new inputs for the site, meter, CT, and customer information.

Press ⌐ to return to the previous screen.

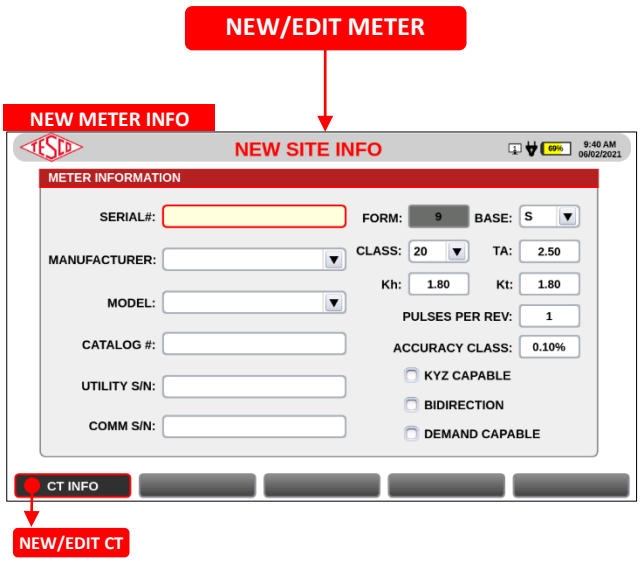
DATA

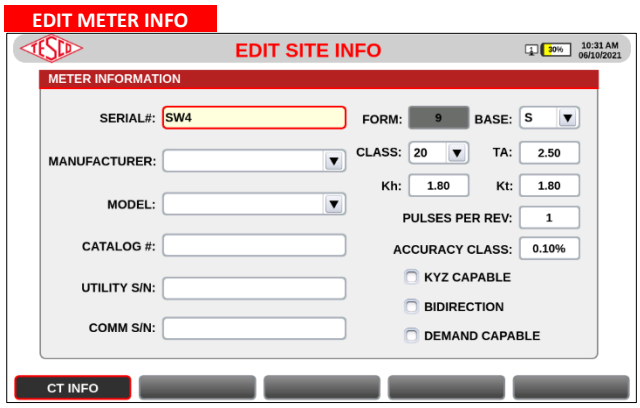
SITE ID	ID of site
SITE NAME	Name of site
DESCRIPTION	Description about site
CUSTOMER	Choose customer
ADDRESS 1	Location of site
ADDRESS 2	Location of site
CITY	City where site is located
STATE/PROVINCE	State/Province where site is located
ZIPCODE	Zip code of the local address
COUNTRY	Country where site is located
GPS	Automatically fill in using GPS Locate
NOTES	Additional information about the site
FORM	Meter form associated with the site.
SERVICE	Service and CT/PT configuration.

Note: Highlighted data indicate required parameters.

3.3.3.3b Add/Edit Meter

SCREEN	DESCRIPTION





Create new meter information. Fill out the information and save it in the database. If the existing meter info is for editing, the fields will be filled with pre-saved information of that meter and the user can make changes.

KEYPAD & FUNCTION KEYS:

F1	CT INFO	Open the NEW CT screen to create new CT information
F2		
F3	CUSTOMER	Open the CUSTOMERS screen to view, edit, and create customer information
F4		
F5		

Press ↵ to return to the previous screen.

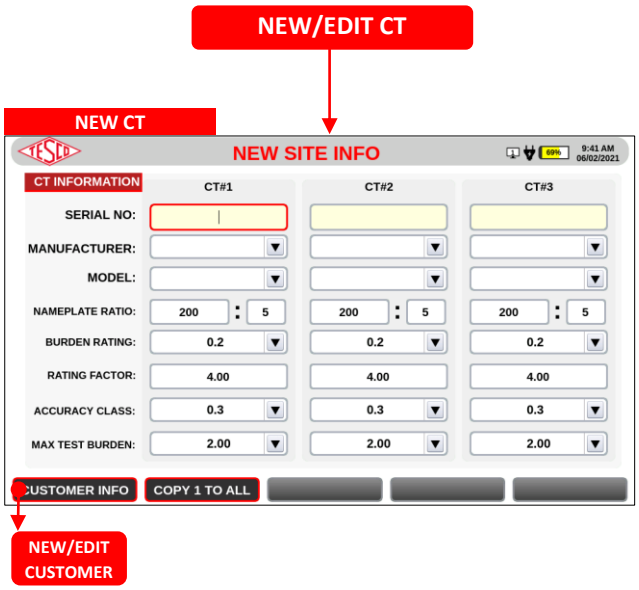
DATA

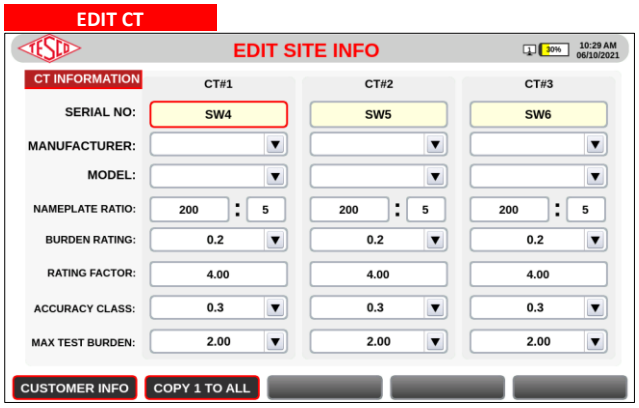
SERIAL #	Serial number of the meter
MANUFACTURER	Manufacturer's name
MODEL	Model number of the meter
CATALOG #	Catalog # of the meter
UTILITY S/N	Serial number provided by Utility (if applicable)
COMM S/N	Serial number of communication device (if applicable)
FORM	Form number of the meter (auto-populates the default Kh in the Kh field)
BASE	Meter base (S, K, A, etc…)
CLASS	Meter class (determines maximum current and auto-populates the default test amps in TA field)
TA	Test Amps (RMS of a full load test)
Kh	Meter Constant (Watt hours per revolution of disk)
Kt	Meter Test Constant (Watt hours per pulse) Kt = Kh / Pulses per revolution
PULSES PER REV	Number of pulses in every revolution of the disk. Integer >= 1
ACCURACY CLASS	Accuracy class of the meter
KYZ CAPABLE	Select if meter has KYZ functionality
BIDERCTION	Select if meter has bidirectionality functionality
DEMAND CAPABLE	Select if meter is capable of demand testing

Note: Highlighted data indicate required parameters.

3.3.3.3c Add/Edit CT

SCREEN	DESCRIPTION





NEW CT

Create new CT information. Fill out and save it in the database. A maximum of three (3) CTs can be added at a time. If the existing CT info is for editing, the fields will be filled with pre-saved information of that CT and the user can make changes and save them.

KEYPAD & FUNCTION KEYS:

F1	CUSTOMER INFO	View/Edit existing customers and add new entries.
F2	COPY 1 TO ALL	Copy information (except serial number) from CT #1 to other CTs.
F3		
F4		
F5		

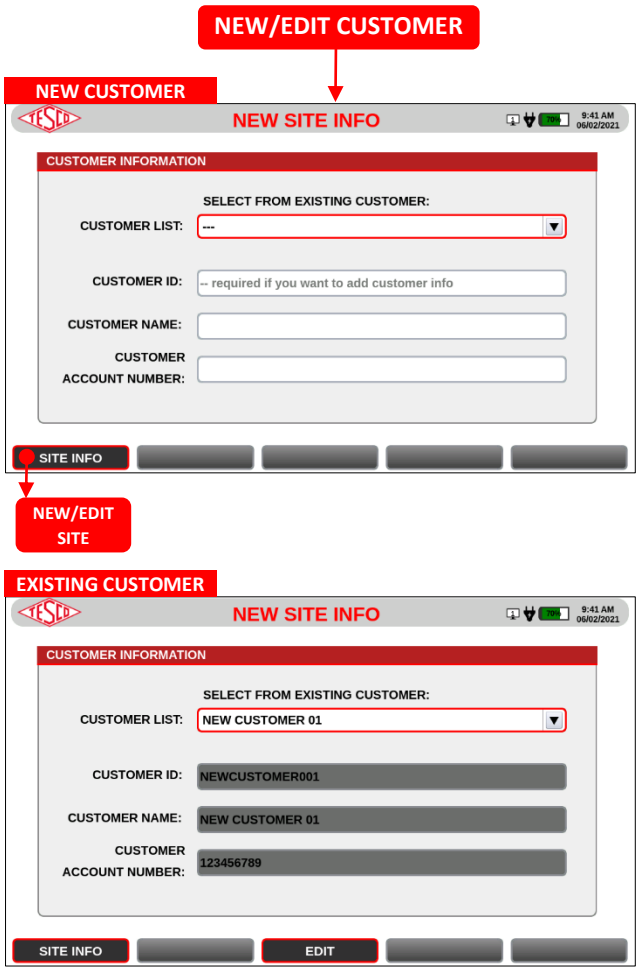
Press ↵ to return to the previous screen.

DATA

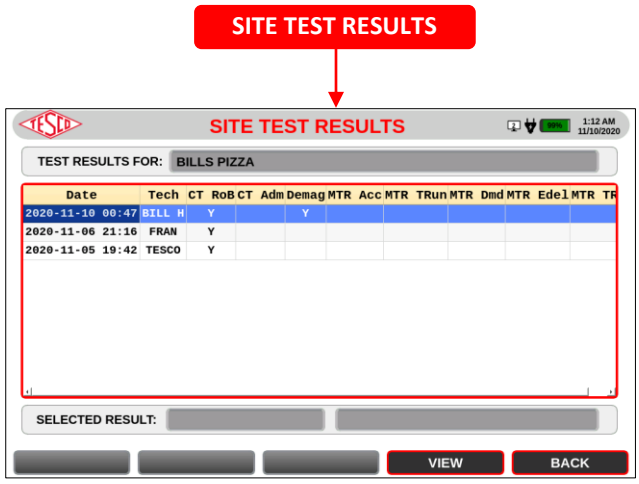
SERIAL NO	Serial number of the meter
MANUFACTURER	Manufacturer's name
MODEL	Model number of the meter
BURDEN RATING	Burden rating of the CT
NAMEPLATE RATIO	Ratio of primary to secondary current
RATING FACTOR	Rating factor of the CT
ACCURACY CLASS	Accuracy class of the CT
MAX TEST BURDEN	Maximum amount of burden

Note: Highlighted data indicate required parameters.

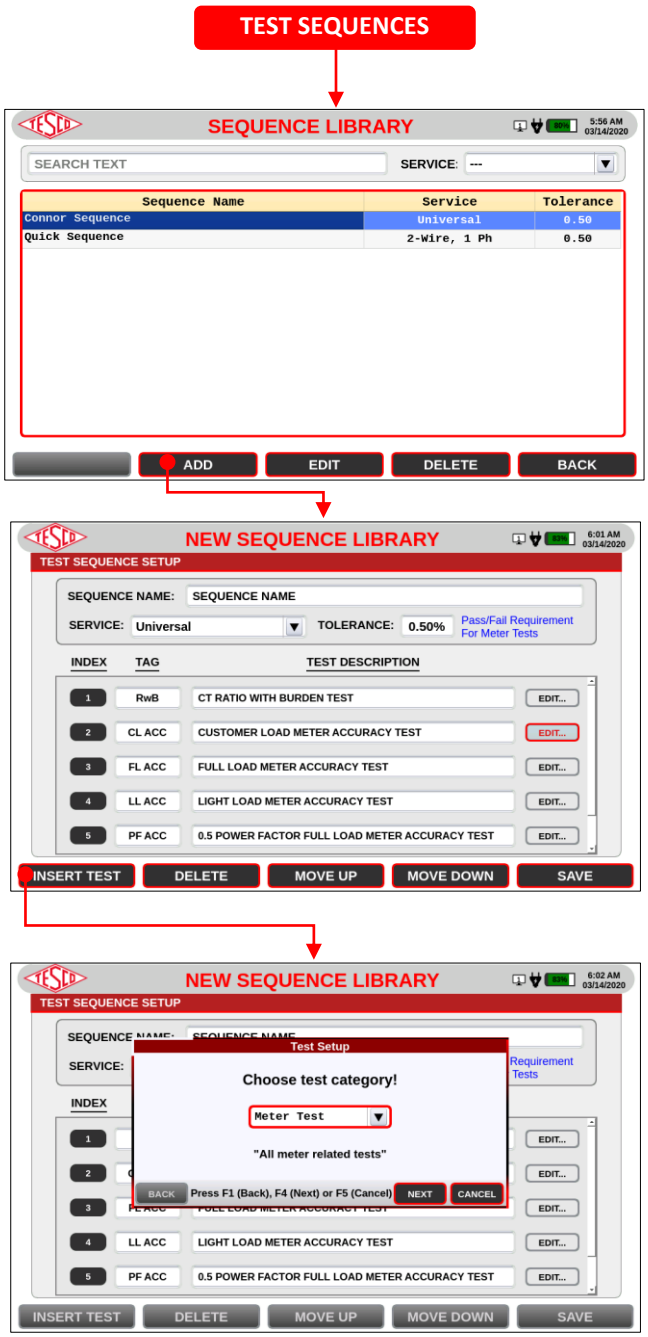
3.3.3.3d New/Edit Customer

SCREEN	DESCRIPTION
	Create new customer information. Fill out the information and save it in the database. If the customer info is for editing, the fields will be filled with pre-saved information of that customer and the user can make changes. To save the changes, press F1 to return to the New or Edit Site Info page and press **KEYPAD & FUNCTION KEYS:** F1 — SITE INFO — Return to the New or Edit Site Info page. F2 — F3 — F4 — EDIT — Edit existing customer information. Information that are grayed out will be enabled for editing. F5 — Press ↵ to return to the previous screen. **DATA** **CUSTOMER LIST** — List of existing customers **CUSTOMER ID** — ID of customer. This is required if the user wants to add customer information. **CUSTOMER NAME** — Name of customer **CUSTOMER ACCOUNT NUMBER** — Account number of customers

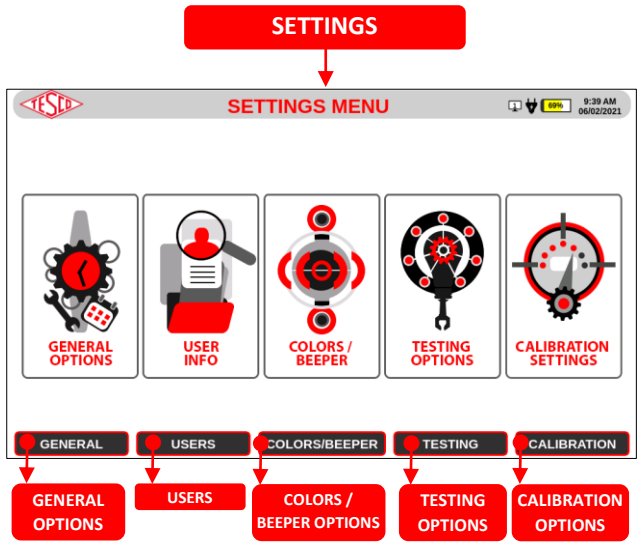
3.3.3.3e Test Results

SCREEN	DESCRIPTION
	All of the test results for the selected site are displayed and organized by test session. The display indicates which test types are included in a particular test session. Use the ▲ and ▼ buttons to scroll to a site and press ENTER to select. Press VIEW to view the data in summary form. **KEYPAD & FUNCTION KEYS:** F1 — F2 — F3 — F4 — VIEW — View details of selected test result. F5 — BACK — Return to the SITE INFORMATION DATABASE screen. Press ↵ to return to the previous screen.

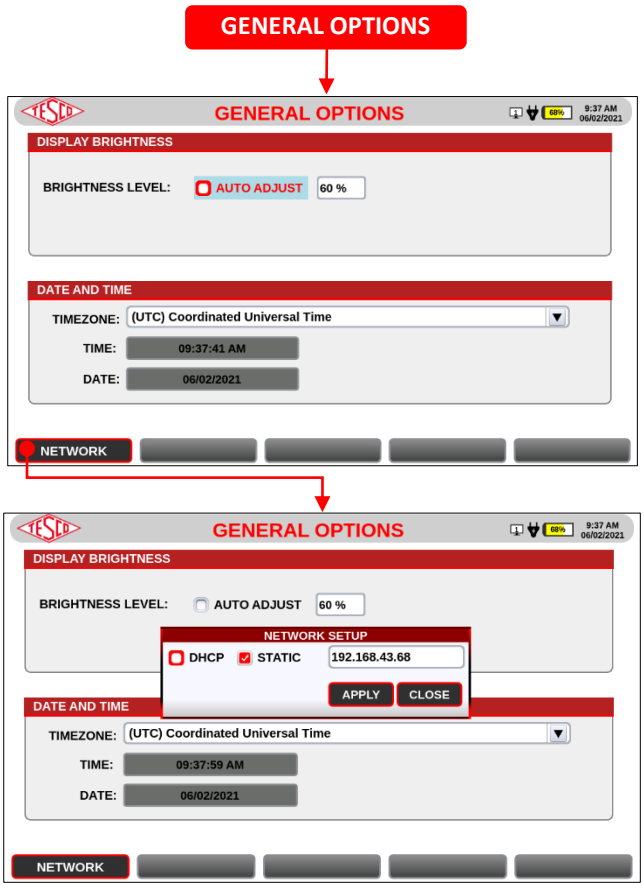
3.3.3.3f Add/Edit Sequences

SCREEN	DESCRIPTION
	Add, edit, and delete test sequences. This allows the user a certain level of customization in the sequence. In adding or editing a test sequence, the user can re-arrange the tests with the MOVE DOWN and MOVE UP buttons. **KEYPAD & FUNCTION KEYS:** F1 — F2 — ADD — Add new test sequence. F3 — EDIT — Edit a test sequence. F4 — DELETE — Delete a test sequence. F5 — BACK — Return to previous screen. Press ↵ to return to the previous screen. **ADD NEW SEQUENCE** To add or insert a new test in the sequence, press ⇥ until the table of the sequences is selected. Once the table is selected, press F1 to insert a test. This will lead to a series of popups that will act as a guide to set up the sequence. **KEYPAD & FUNCTION KEYS:** F1 — INSERT TEST — Insert a new test in the sequence. F2 — DELETE — Delete the selected test. F3 — MOVE UP — Move up the F4 — MOVE DOWN — Delete a test sequence. F5 — SAVE — Return to previous screen. Press ↵ to return to the previous screen.

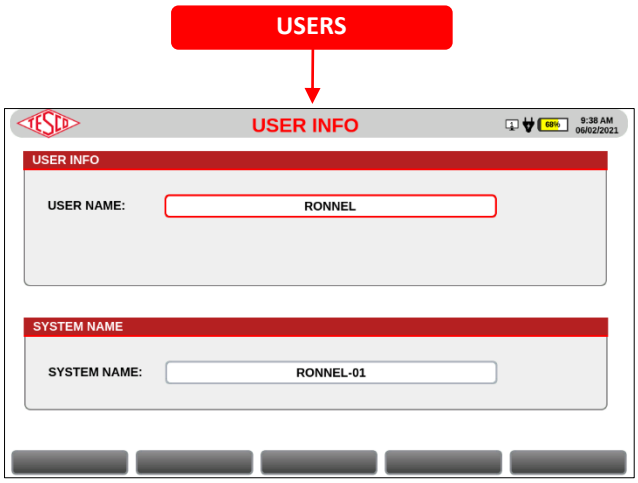
3.3.3.4 Settings

SCREEN	DESCRIPTION
	Change or update the options and settings for the site analyzer. **KEYPAD & FUNCTION KEYS:** F1 **GENERAL** – Adjust screen brightness options and select method of assigning IP address. F2 **USERS** – View name of user or technician. F3 **COLORS/BEEPER** – Change phase color assignments. F4 **TESTING** – Set global testing options. F5 Press ⌞ to return to the previous screen.

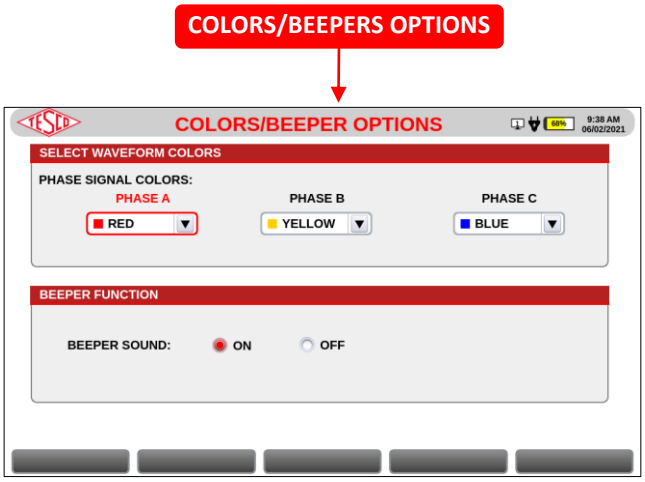
3.3.3.4a General Options

SCREEN	DESCRIPTION
	Set the brightness level of the screen. The user can also select the auto-adjust option where the brightness level will be automatically adjusted according to the ambient light in the surroundings. **KEYPAD & FUNCTION KEYS:** F1 **NETWORK** – Shows a pop-up that allows changing the network settings. F2 F3 F4 F5 **DATA** **BRIGHTNESS LEVEL** – Manually set the brightness level of the screen. The user can choose to auto-adjust the brightness level or set a certain level for it. **TIMEZONE** – Select a timezone for the site analyzer. The time and date are automatically updated once a timezone is selected. **IP ADDRESS** – **DHCP**: Select for IP address assigned by the network; **STATIC**: Select for IP address specified by the user ⌞ Press to return to the previous screen.

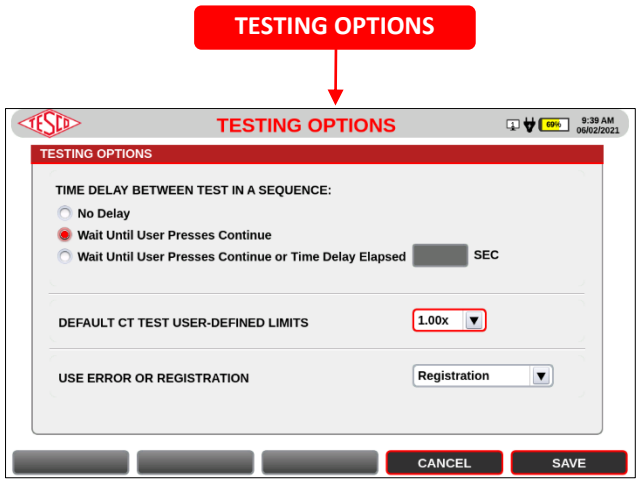
3.3.3.4b Users

SCREEN	DESCRIPTION
	Set the name of the user (or technician) and the system. The username will be shown in the main menu after bootup. **DATA** **USER NAME** — This could be the technician's name or any user for that matter. **SYSTEM NAME** — This could be any name that the owner or user of the site analyzer will set.

3.3.3.4c Colors/Beepers Options

SCREEN	DESCRIPTION
	Choose colors for displaying each phase's data in the system. All phase color coding and plots are affected. **KEYPAD & FUNCTION KEYS:** F1 F2 F3 F4 F5 — SAVE — This is enabled/shown when there are changes in the options. This saves the changes made. Press ⌐ to return to the previous screen. **DATA** **PHASE SIGNAL COLORS** — Choose signal colors for Phase A, B, and C. **BEEPER SOUND** — **ON** — Select to turn on beeper sound **BEEPER SOUND** — **OFF** — Select to turn off beeper sound

3.3.3.4d Testing Options

SCREEN	DESCRIPTION
	Set an option whether to define a delay between tests in a sequence; wait until a user presses continue; or have no delay at all and have the succeeding tests execute immediately. The user can also set the default defined limits for CT testing.

KEYPAD & FUNCTION KEYS:

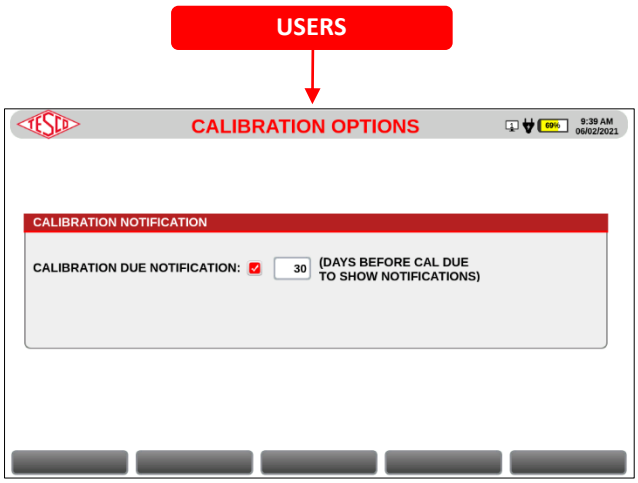
F1		
F2		
F3		
F4	CANCEL	This is enabled/shown when there are changes in the options. This cancels the changes made.
F5	SAVE	This is enabled/shown when there are changes in the options. This saves the changes made.

Press ↵ to return to the previous screen.

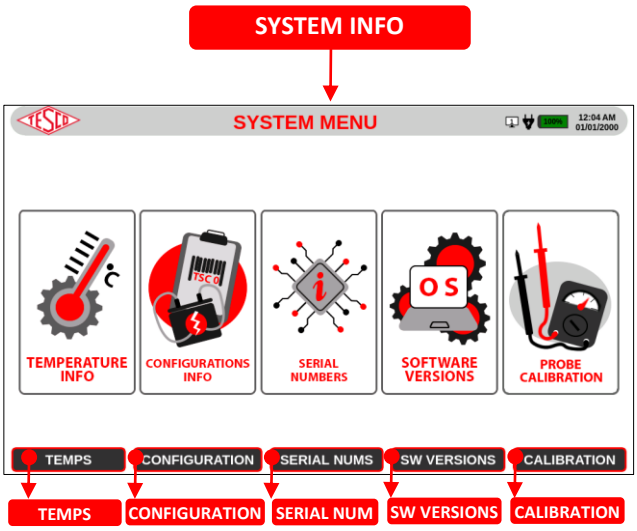
DATA

DEFAULT USER DEFINED LIMITS	Select the default user-defined limits for all the CT tests.
USER ERROR OR REGISTRATION	

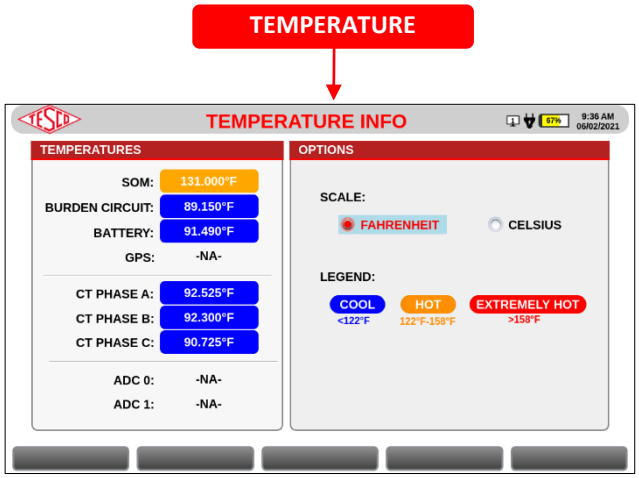
3.3.3.4e Calibration Options

SCREEN	DESCRIPTION
	Enable or disable notification for calibration due. If enabled, the user can set the number of days before calibration due to show notification. Any changes in the value or setting are automatically saved.

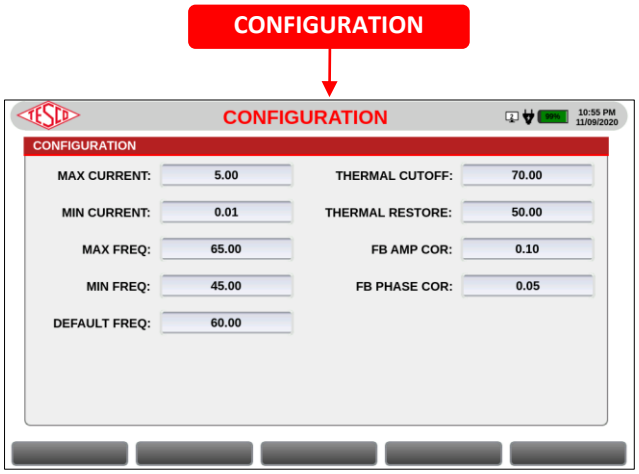
3.3.3.5 System Information

SCREEN	DESCRIPTION
	This is the menu to view information on the temperature, configurations, serial numbers, software versions, and calibration of the system. **KEYPAD & FUNCTION KEYS:** F1 **TEMPS** – Check the temperature of the circuit, CTs, and battery. F2 **CONFIGURATION** – View configurations for current, frequency, thermal, and feedback settings. F3 **SERIAL NUMS** – View serial numbers of the system's PC boards. F4 **SW VERSIONS** – View detailed information on the software. F5 **CALIBRATION** Press ↵ to return to the previous screen.

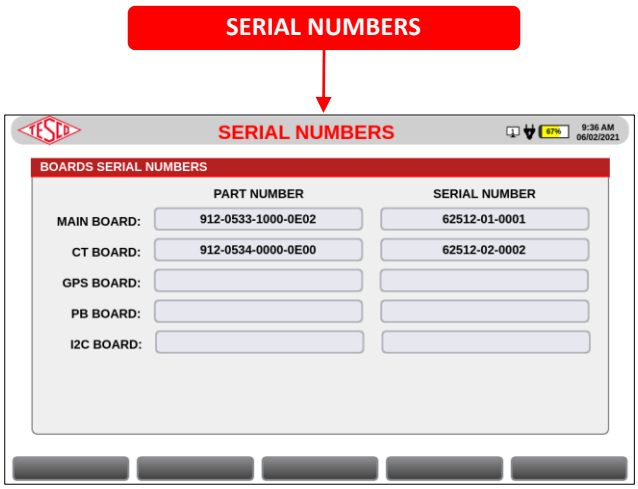
3.3.3.5a Temperature

SCREEN	DESCRIPTION
	View information on the temperature of the site analyzer. **DATA** **TEMPERATURES**: **SOM** – Temperature of SOM; **BURDEN CIRCUIT** – Temperature of burden circuit; **CT PHASE A** – Temperature of CT Phase A; **CT PHASE B** – Temperature of CT Phase B; **CT PHASE C** – Temperature of CT Phase C **SHOW EXTREME TEMP. SCREEN INDICATOR** – This will enable changing the color of the temperature indictor into red when the Site Analyzer's temperature is beyond 158˚F or 70˚C. **Default temperature is in **Fahrenheit (˚F)**.* Press ↵ to return to the previous screen.

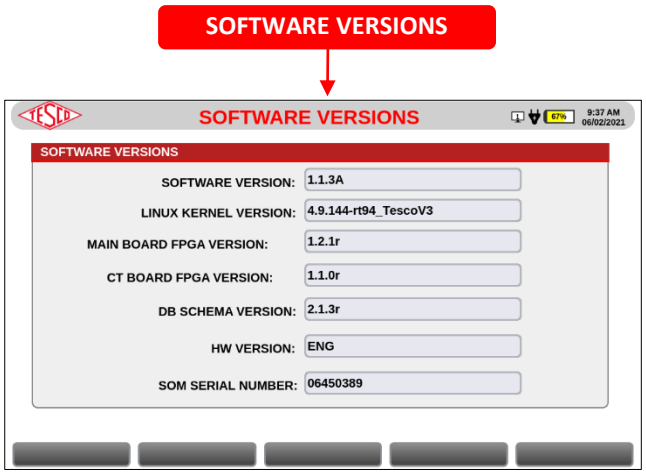
3.3.3.5b Configuration

SCREEN	DESCRIPTION
	View information on the standard and load box. **DATA** **MAX CURRENT** – Maximum current for the load box **MIN CURRENT** – Minimum current for the load box **MAX FREQ** – Maximum frequency for the load box **MIN FREQ** – Minimum frequency for the load box **THERMAL CUTOFF** – Thermal cutoff **THERMAL RESTORE** – Thermal restore **FB AMP COR** – Feedback amplitude correction **FB PHASE COR** – Feedback phase correction **MODEL** – Model number/name of the site analyzer **SERIAL NUM** – Serial number of the site analyzer **DATE** – Date of the latest metrology calibration on the site analyzer Press ⌞ to return to the previous screen.

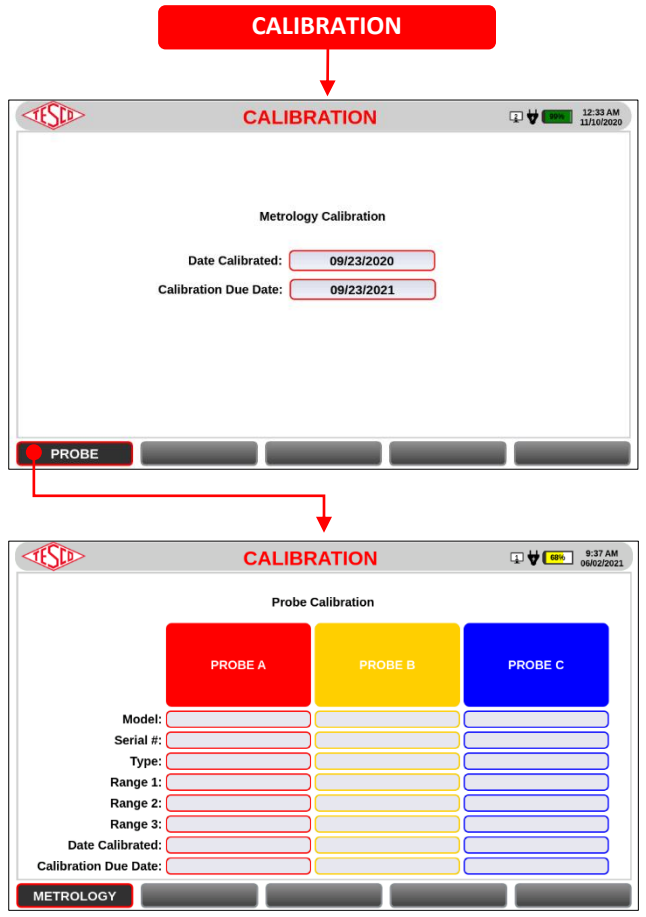
3.3.3.5c Serial Numbers

SCREEN	DESCRIPTION
	This contains the serial numbers of the controllers. **DATA** **PART NUMBER** – Part number of the listed boards **SERIAL NUMBER** – Serial number of the listed boards Press ⌞ to return to the previous screen.

3.3.3.5d Software Versions

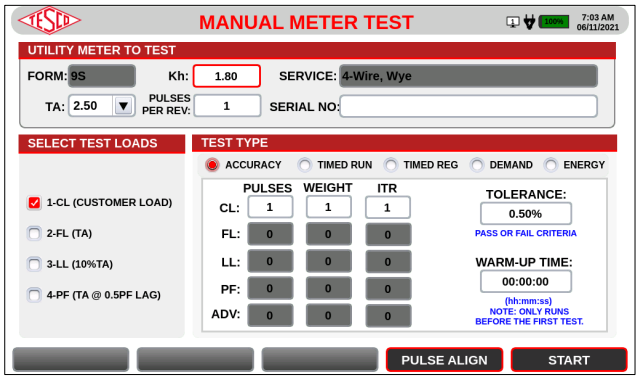
SCREEN	DESCRIPTION
	View information on the Linux operating system. **DATA** **SOFTWARE VERSION** — Software version on the site analyzer **LINUX KERNEL VERSION** — Linux kernel version of the software **MAIN BOARD FPGA VERSION** — Software version of the FPGA main board **CT BOARD FPGA VERSION** — Software version of the FPGA CT board **DB SCHEMA VERSION** — Database version **HW VERSION** — Hardware version **SOM SERIAL NUMBER** — Serial number of SOM Press ⌞ to return to the previous screen.

3.3.3.5e Calibration

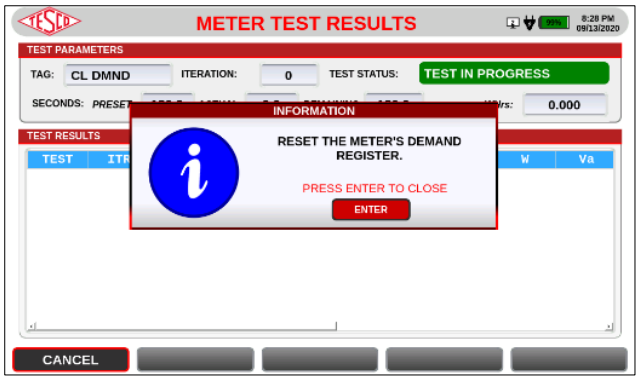
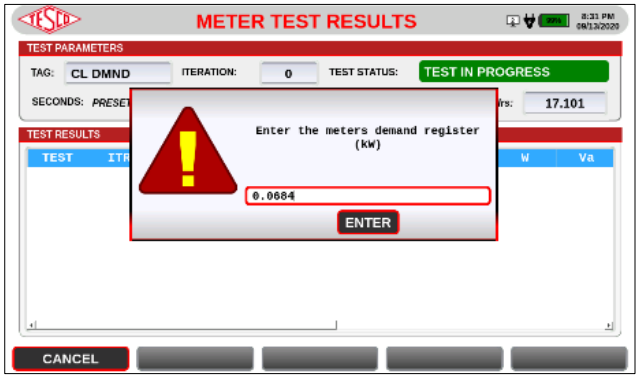
SCREEN	DESCRIPTION
	View calibration details of the site analyzer. Should the site analyzer need recalibration, please contact TESCO. Contact details are found in section **1.2 Contacting TESCO**. **DATA** **DATE CALIBRATED** — Date when the site analyzer was last calibrated. **CALIBRATION DUE DATE** — Due date indicating when the site analyzer should be recalibrated. **KEYPAD & FUNCTION KEYS:** F1 — PROBE / METROLOGY — Switch between showing probe or metrology calibration details. F2 F3 F4 F5 Press ⌞ to return to the previous screen. ***Probe Calibration*** Information can be obtained only if the probes are connected. **DATA** **MODEL** — Probe model **SERIAL #** — Probe serial number **TYPE** — Probe type **RANGE 1** — Probe range **RANGE 2** — Probe range **RANGE 3** — Probe range

4.0 CONFIGURATIONS

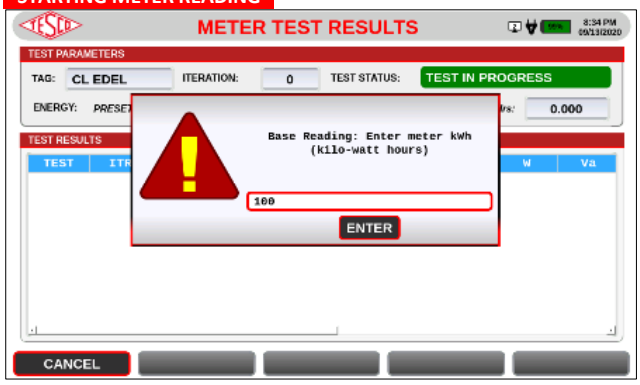
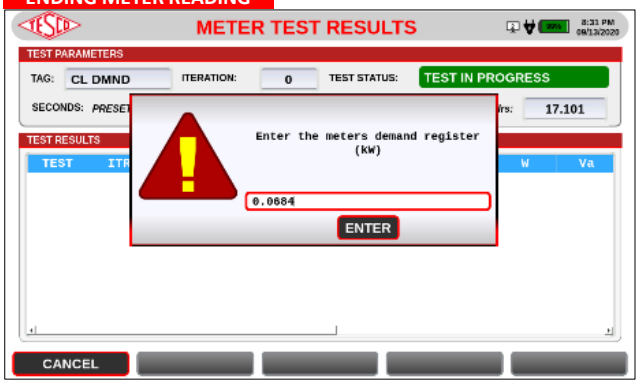
4.1 Meter Test

SCREEN	DESCRIPTION
	**HOW TO PERFORM METER TEST:** **1.** If a site was preselected, the test parameters will be automatically filled in. Otherwise, manually input the parameters and select the test load and test type. **2.** If an optical probe is attached to the meter, the meter's pulse output can be aligned by pressing F3 [PULSE ALIGN]. It will display the Pulse Alignment Check screen. **3.** Once everything is set, press F4 [START] to start the test. **4.** Depending on the test type, a pop-up will appear to ask the user to enter a certain value. For example, in the Demand Test, a user will be asked to enter the meter's demand register (kW) to continue with the test. **5.** The test will end with the test results shown.

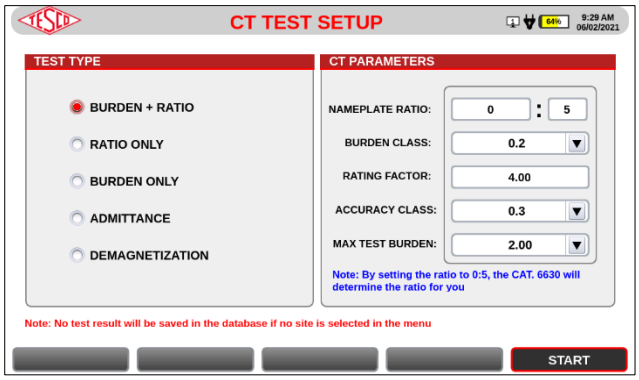
4.1.1 Demand Test

SCREEN	DESCRIPTION
	**HOW TO PERFORM DEMAND METER TEST:** 1. Press F4 [START]. 2. Reset the demand register in the meter. 3. The Site Analyzer will deliver current to the meter for one sub-interval. 4. Read the meter's demand register and enter the value. 5. The Site Analyzer will compute the full interval demand and calculate the registration.
	

4.1.2 Energy Test

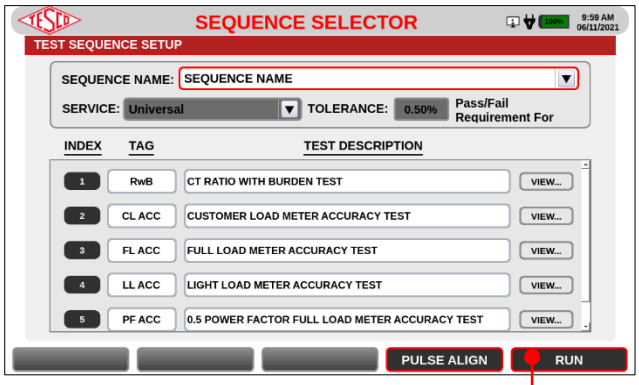
SCREEN	DESCRIPTION
STARTING METER READING  **ENDING METER READING** 	**HOW TO PERFORM ENERGY METER TEST:** 1. Press F4 [START]. 2. Enter meter kWh and press the ENTER button. 3. Enter the meters demand register (kW) and press the ENTER button.

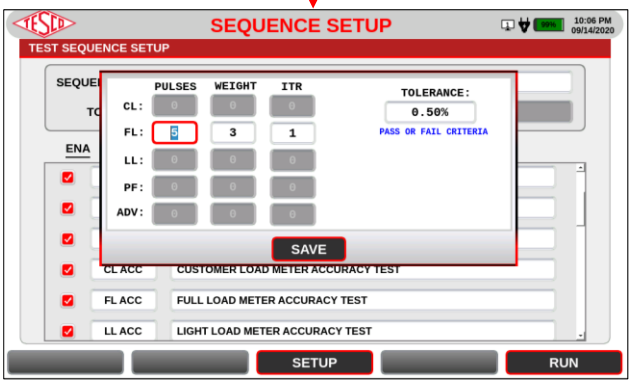
4.2 CT Test

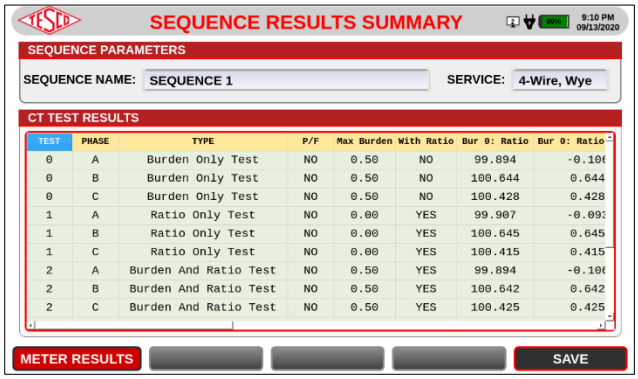
SCREEN	DESCRIPTION
	**HOW TO PERFORM A CT TEST:** **1.** Select a CT Test type: • Burden Only • Ratio Only • Ratio with Added Burden • Admittance **2.** After selecting a CT Test Type, enter CT information. If all CTs have the same information, press F2 [COPY 1 TO ALL] to copy the information (except serial number) from CT #1 to the other CTs. **3.** If a site was selected, the fields will be automatically filled in. **4.** Optional: Demagnetize the CTs by pressing F1 [DEMAG]. This will perform Demag Test to return the CT accuracy to its normal state. **5.** Once everything is set, press F5 [START] to start the CT Test. **6.** Live results will be shown on the CT Test Results screen, and the data plotting will vary depending on the selected test type.

4.3 Sequence Test

SCREEN	DESCRIPTION







HOW TO PERFORM SEQUENCE TESTING:

1. Select a site in the Main Menu. This is required before Sequence Setup can be accessed.
2. Set the Sequence Name and Tolerance for the pass or fail criteria. The TA and Service can't be changed as they were already configured in the chosen site.
3. Select the tests that will be included in the sequence. Press ⏮ or ⏭ to go to the list and press the tab buttons or navigation buttons to move to each test.
4. Press ENTER to select or deselect a test. Tests that will not be included in the sequence are grayed out.
5. If any of the meter test is included, press F3 [SETUP] to configure. This is only available for meter tests.
6. When everything is set, press F5 [RUN] to start the sequence test. This will show the live reading of the results for the first test in the sequence, which in this case is Site Scan.
7. Once the test is completed, press F5 [CONTINUE] to proceed to the next test in the sequence.
   Note: This setting can be changed (refer to section 3.3.3.4d **Testing Options**) where the sequence can have no delays or have a defined duration of the delay before proceeding to the next test.
8. If the test needs to be canceled, press F1 [CANCEL]. This will cancel the whole sequence test and will proceed to the Sequence Setup screen.
9. Once the whole sequence is finished, it will show the Sequence Results Summary screen. Press F1 [METER RESULTS / CT RESULTS] to switch between CT Test Results and Meter Test results.
10. Press F5 [SAVE] to save the test results. View them again later by going to the Main Menu > Database.

5.0 MAINTENANCE

5.1 Introduction

Most of the maintenance will be handled by the technical team from TESCO. The user can, however, perform the basic maintenance routine of cleaning the meter site analyzer's external surface.

5.2 Cleaning the Site Analyzer's External Surface

Clean the exterior of the Site Analyzer using a soft cloth slightly dampened with either water or a non-abrasive mild cleaning solution that is not harmful to plastics.

CAUTION 

Do not use hydrocarbons or chlorinated solvents for cleaning. They can damage the plastic materials used in the Site Analyzer.

5.3 Repair / Parts Replacement / Recalibration

For the Site Analyzer's repair, parts replacement, and recalibration, directly contact TESCO through phone or email. See section **1.2 Contacting TESCO** for contact details. TESCO recommends recalibration on an annual basis. Further details can be found on the Calibration Certificate provided with your Site Analyzer.