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User's Guide

MIV Application for the PQPro™

Transformer Type and Self-Contained Meter Installation Verification



MIV User's Guide

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Introduction

The MIV is an application that runs on CANDURA's Power Quality Analyzer, the ***PQPro™***. Please refer to the ***PQPro™*** User's Guide for specific information about the ***PQPro™***.

The MIV application can be used in either Standalone Mode or Wireless Mode.

Standalone Mode:
In this mode, MIV tests are performed from the front panel of the ***PQPro™***. All collected data are saved on a removable memory card. This data is opened by the MIV software to generate PDF report. Please refer to the section 'MIV Standalone Mode' for more details.

Wireless Mode:
In this mode, MIV tests are performed from the MIV software. All collected data are transmitted in real time from the ***PQPro™*** to a computer via wireless or Wifi connection, depending on the interface installed in the ***PQPro™***. During the test, the MIV software can control additional features that are not accessible in Standalone mode.

MIV Firmware

The MIV firmware (MV) is loaded into the ***PQPro™*** by inserting the MIV firmware card into the ***PQPro™*** card socket and turning on the ***PQPro™.*** Once the firmware has been loaded the message "UPLOAD SUCCESSFUL PLEASE REMOVE THE CARD" will appear for a short time before the ***PQPro™*** automatically powers down. Remove the MIV firmware card and turn on the ***PQPro™.*** Note that the ***PQPro™*** will automatically power down after a few minutes if there is no external power (either from V1 or an AC/DC power supply) and no wireless communications. The MIV firmware does not need to be loaded again unless another application has been loaded, such as PQ (Power Quality) or CW (extended Continuous waveform) firmware.

PQPro™ Connections

Voltage and current channels 1,2 and 3 are used for measuring on the secondary side of the PTs and CTs. Channel 4 voltage is connected to the output of the Pulse Interface and channel 4 current is used for primary current measurement (CT Ratio test).

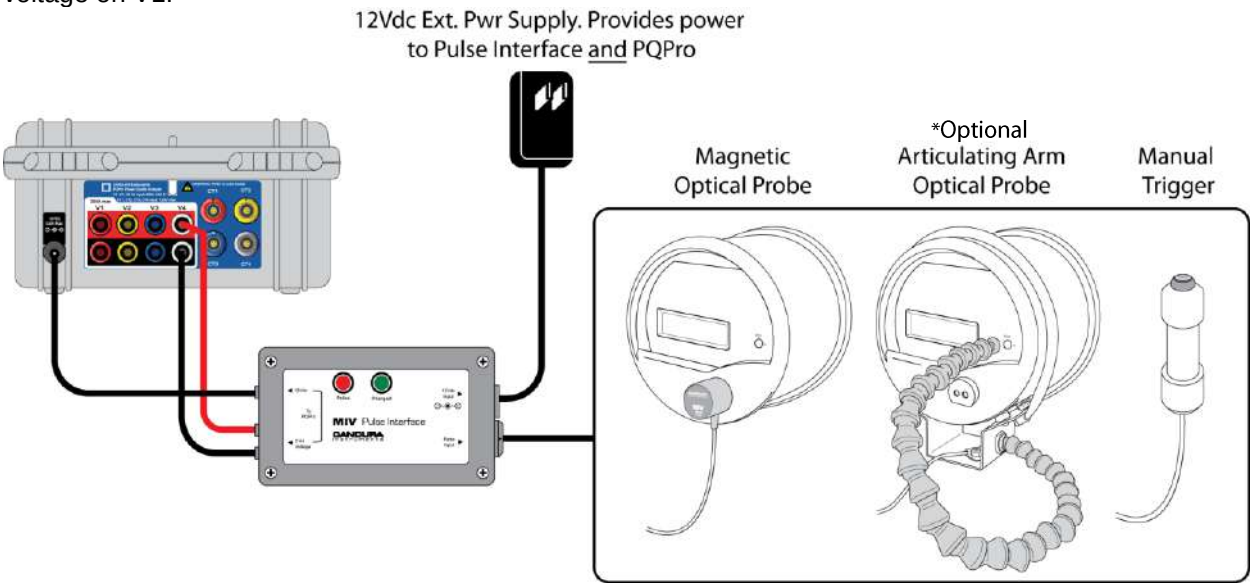
For secondary current measurement there are 10A clamp on CTs and 5A CTs wired to CT test block plugs. For better accuracy the 5A CTs should be used. While convenient the 10A clamp on CTs can introduce errors due to rust or dirt on the exposed metal core. The 10A clamp on CT should also be positioned so that it is not near voltages greater than 120V as it is susceptible to EMI.

The voltage inputs to the ***PQPro™*** are differential inputs. For the MIV application the lower voltage inputs for channels 1, 2 and 3 must all be connected together using the supplied jumpers. For most connection types these will then be connected to neutral. For the Delta or 2 Element connection these will be connected to phase B.

Pulse Interface & Optical Probes

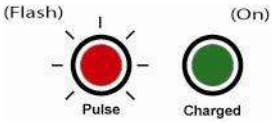
The Pulse Interface has an internal (not user replaceable) rechargeable battery. A fully charged battery will last up to a week under normal usage. When in use it is advisable to charge the battery for 12 hours every week by connecting it to the 12Vdc external power supply. The battery cannot be overcharged and may be left on charge indefinitely.

If a wall outlet is accessible while in use, both Pulse Interface and ***PQPro™*** can be powered directly by the 12Vdc external power supply as shown in diagram below. If a wall outlet is not available the Pulse Interface will be powered by its internal battery and the ***PQPro™*** will be powered from the measured voltage on V1.



Two accessories are included for capturing meter pulses: Magnetic Optical Probe and Manual Trigger. The Articulating Arm Optical Probe is optional. Only one can be connected to the Pulse Interface at a time, and when connected, the green LED will illuminate indicating that the battery has enough capacity to convert the pulses into electrical signals for the ***PQPro™***. If the green LED does not illuminate then the internal battery should be recharged.

There is a red LED that flashes every time a pulse is received.



Note: To prevent battery discharge, disconnect Pulse Input when not in use.

To use the Articulating Arm Optical Probe, secure it on the meter using the rubber strap and move the articulated arm so that the end of the arm is as close as possible to the infrared emitter of the meter. When it is positioned correctly there will be a short pulse on the red LED while the meter generates a pulse.

The Magnetic Optical Probe uses the infrared communications port of the meter. This probe can only be used for the pulse pickup and cannot be used for general communications. Some meters must be configured specifically to output Kh pulses on the communication port. For information on pulse output on the meter communications port please refer to the meter manufacturer's manual.

MIV Remote Handheld Interface (RHI)

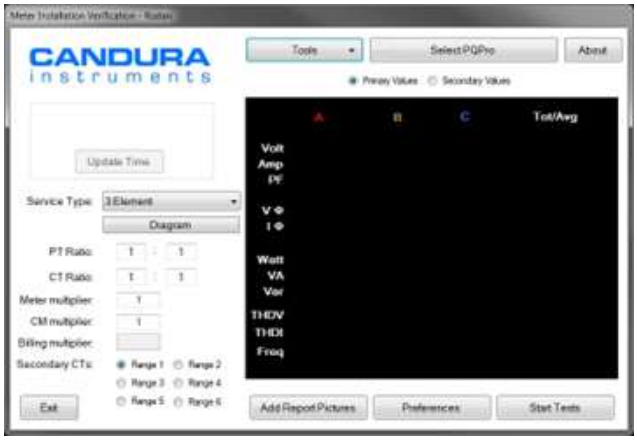
The MIV software can be run on any Windows computer that has a wireless comm or Wifi interface. CANDURA can supply a Rugged Handheld Interface (RHI) that is stand alone and does not need to be under care and control of a company's IT department.



Windows power saving mode such as Sleep mode and Auto-Shutoff are disabled by default. Please remember to shut down Windows properly when not in use.

The RHI is a tablet with customized Windows 10 ® configuration. It is set up with two user accounts. One account is the 'Administrator' account and is password protected. It has full access to the tablet resources. The other account is the 'User' account that is not password protected and only has access to three programs: MIV software, ***PV II***™, and Shutdown. On start up the 'User' account is launched.

The meter installation verification test is controlled by the MIV software. When the software is started the MIV Status Screen will be displayed.



Status Screen

The 'Status Screen' is the first screen upon opening the software. There are a few settings that the user must setup before advancing to the meter installation verification tests.

1. Click 'Select PQPro' to establish a wireless connection with the ***PQPro™***.



The user can choose the connection type in Preference setting based on the hardware option installed inside the ***PQPro™***. If the user also has 'Auto-connect' enabled in Preferences setting, then the same button will say "Connect to PQPro-XXXXX" instead and clicking on it will immediately connect to the indicated ***PQPro™***.

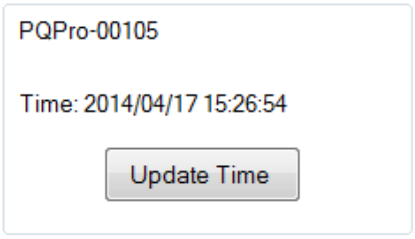
After clicking 'Select PQPro', a device list will appear. Click 'Discover' to populate the list with active ***PQPro™*** serial number (sometimes this might need to be repeated twice). The ***PQPro™*** should be turned on and within range (20 to 100 feet depending on the computer's Wifi / wireless range). Select the appropriate serial number then click 'Connect'.

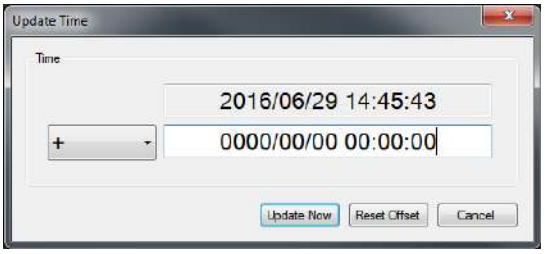


Previously connected ***PQPro™*** that are stored in Windows device cache can be removed from the list by clicking 'Remove'.

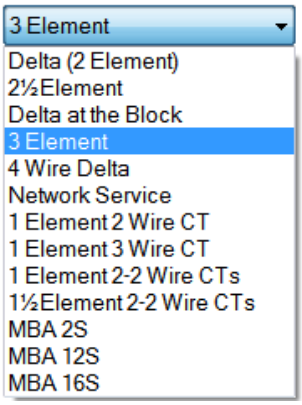
MIV Software – Status Screen

2. Once connection is established the time on the screen will be continuously updated. The user may elect to synchronize the ***PQPro™*** to the meter time by clicking on "Update Time". Time is adjusted by adding or subtracting a time offset.





3. The user can change the Service Type from a drop down list:

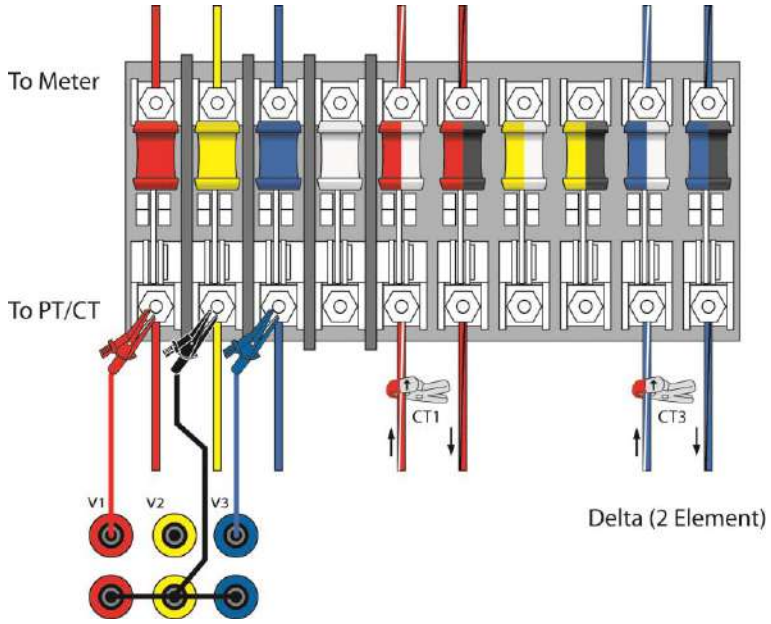


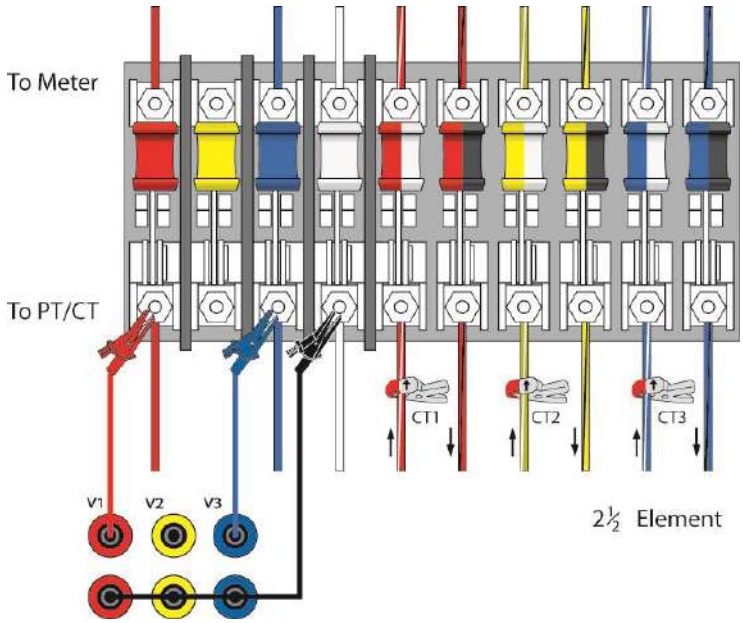
For self-contained metering an MBA adaptor must be used with the ***PQPro™***. Note that the MBA-2S configuration is for a 4 jaw meter and the lead from the back of the MBA must be connected to neutral.

For 2S meter sockets with limited access it may not be possible to connect the neutral lead. For these situations the 1 ½ Element configuration can be used with the following considerations:

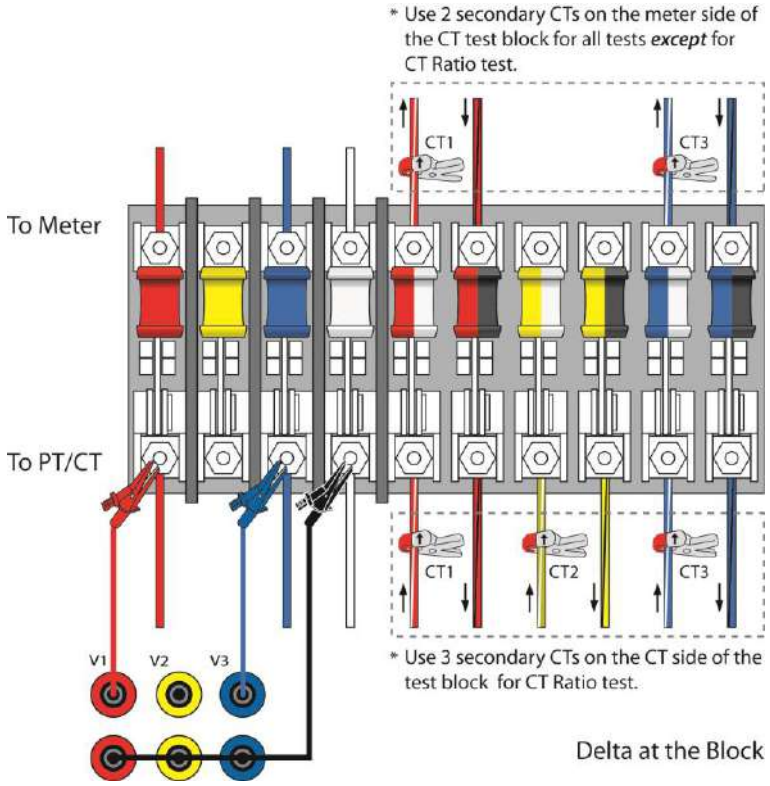
- MBA red voltage lead to V1 red input, MBA yellow voltage lead to V1 black input
- MBA red current lead to CT1 (red) input using standard 2 pin to 4 pin adaptor
- MBA yellow current lead to CT2 (yellow) input using "1.5E – MBA2S" 2 pin to 4 pin adaptor
- value used in Pulse Test for Meter Kh must be double the meter rating
- results for Interval Billing test will be double the meter values

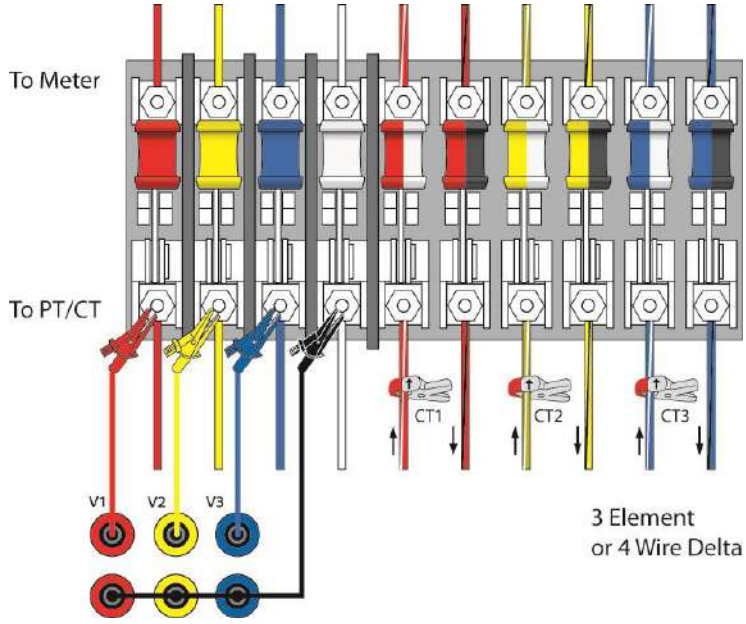
Service Type Diagrams



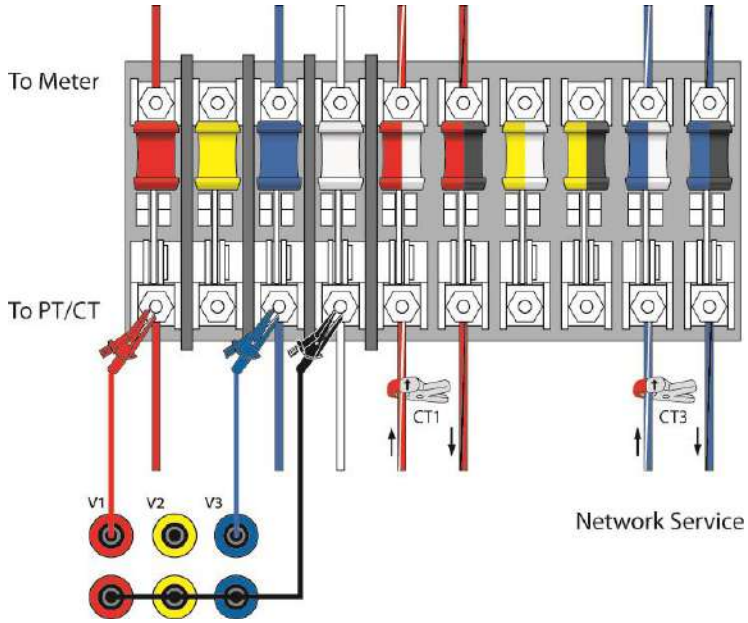


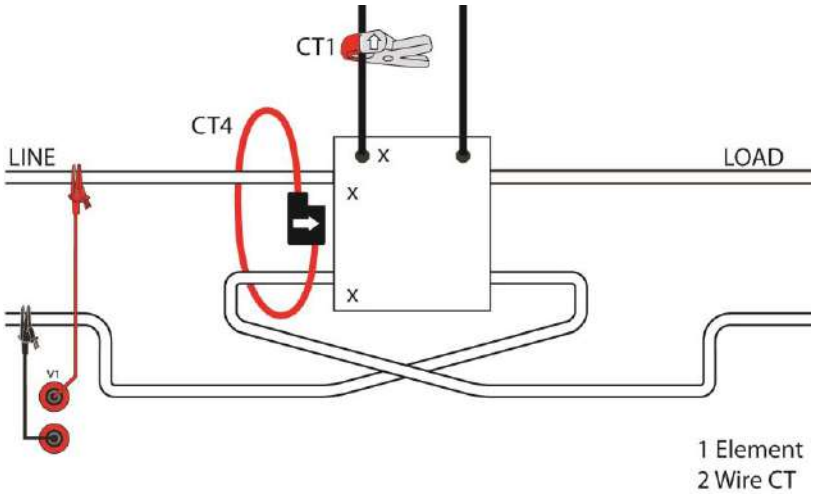
MIV Software – Status Screen – Service Type Diagrams

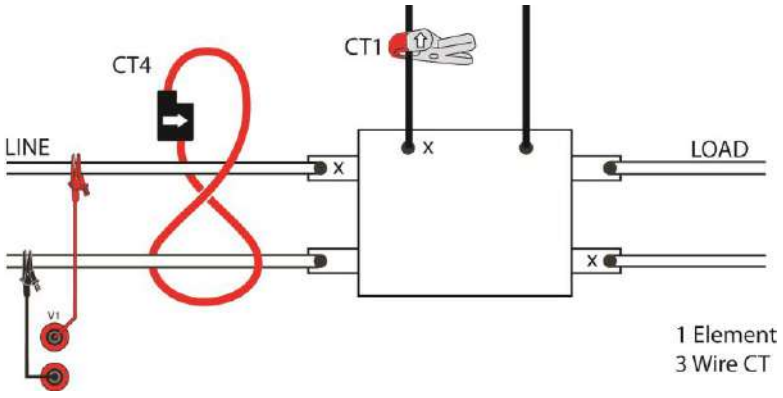




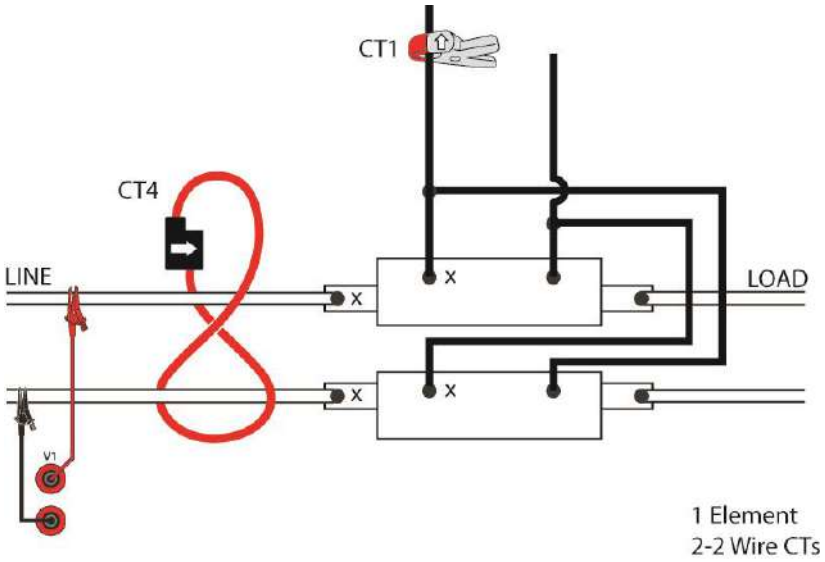
MIV Software – Status Screen – Service Type Diagrams

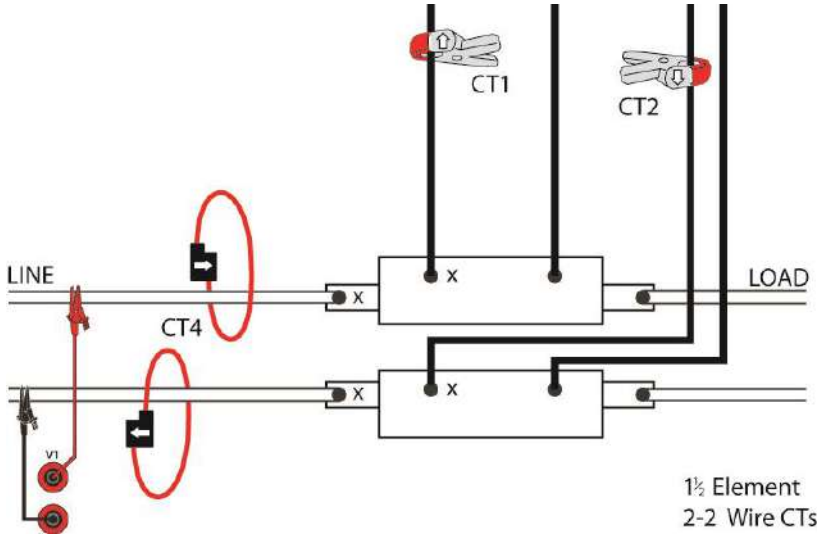






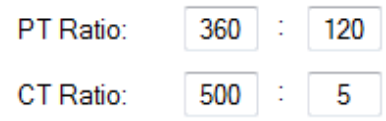
MIV Software – Status Screen – Service Type Diagrams



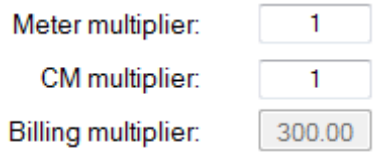


MIV Software – Status Screen

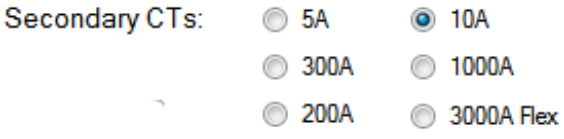
4. The user may enter PT and CT ratios. The ratios can be applied to the real time readings on the Status Screen depending on the 'Primary Values / Secondary Values' selection (see #7 below).



5. The user may enter Meter multiplier and CM multiplier. The Billing multiplier will be updated based on these multipliers times the PT and CT ratios.



6. The user can select an appropriate range of the Secondary CTs.



7. The user may choose to see the status screen data as either Primary or Secondary Values.

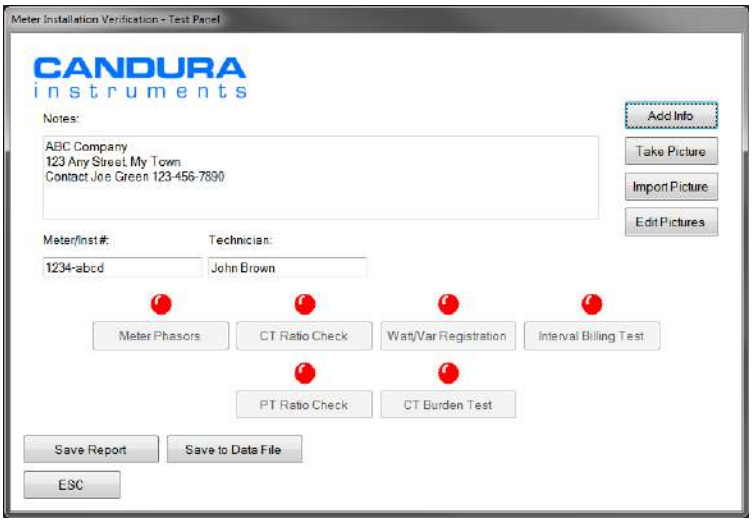


8. To advance to the next stage click on the 'Start Tests' button.



Test Panel

Upon clicking 'Start Test' button in Status screen, the user is now at Test Panel.

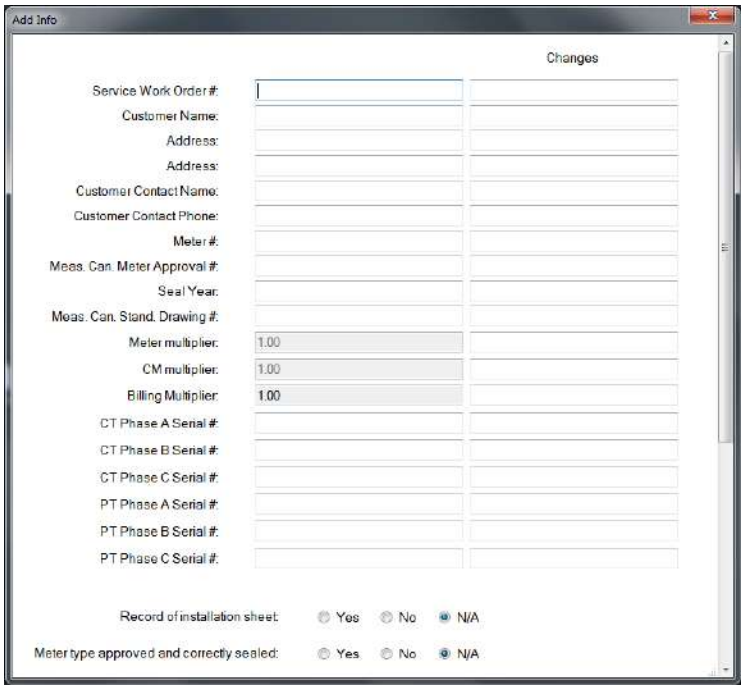


In Test Panel, the user can add meter and site information in texts and pictures.

1. **Notes** can be anything that the user would like to save with the test report. Only 3 lines of notes can be entered and saved in the report.

2. **Meter/Inst #** can be any combination of alpha numeric characters. The character string entered will be used as the default file name for the report however the user can change this name before saving the report if desired.

3. **Technician** name will be saved in the report.



Add Info

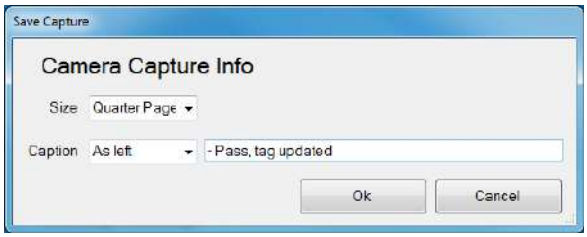
User can add additional information by clicking 'Add Info' button. If this page has no entries on any of the fields it will not be included in the report.

MIV Software – Test Panel

Take Picture

User can take multiple pictures and add them to the report with RHI's built-in webcam, or a camera device that is installed on their computer. Click 'Take Picture' button then select 'Size' and add 'Caption' before picture is saved. User can also import a picture from a graphics file (bmp, gif, jpg, or png formats).



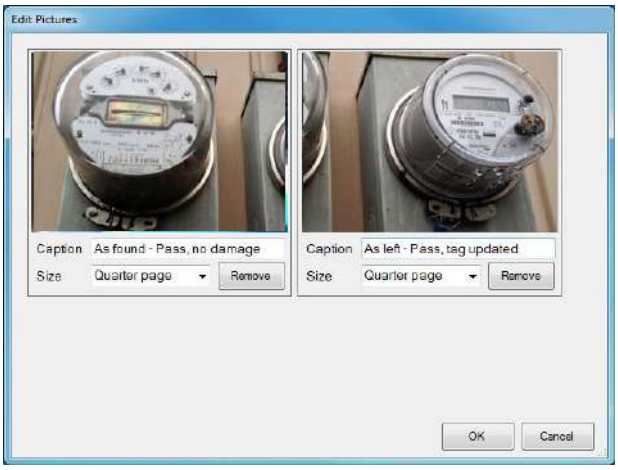


Import Pictures

User can open an existing graphic file (bmp, gif, jpg, or png formats).

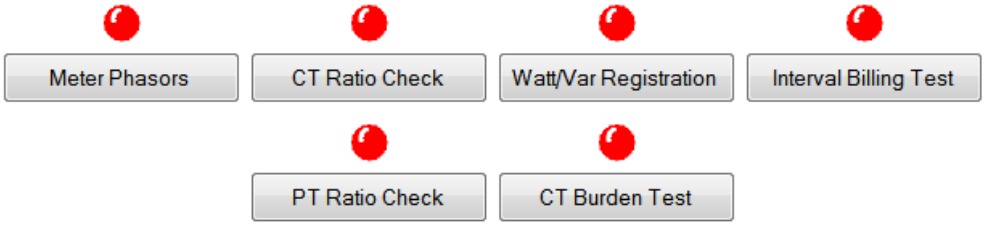
Edit Pictures

User can edit pictures that were saved by clicking 'Edit Pictures'.



MIV Software – Test Panel

There are 6 different tests that can be performed, shown as test selection buttons with a red “LED” on top of each one:



The red LED indicates the test has not been performed and saved and the green LED indicates that the test has been completed and saved.

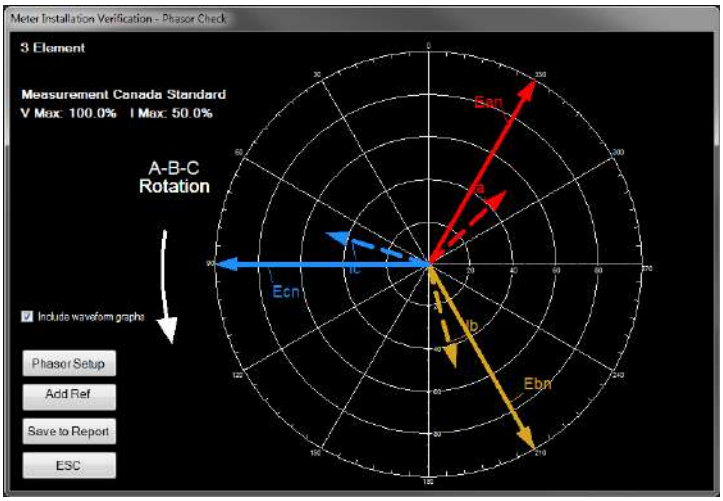
Meter Phasors

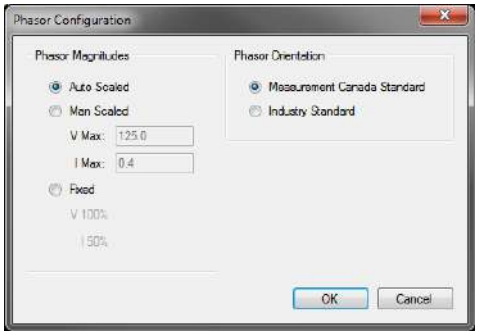
Meter Phasors shows the vectors for the selected Service Type. These vectors can be presented using the Measurement Canada standard orientation or a general Industry Standard orientation. The relative orientation of the vectors is the same the only difference is where Phase A is located. The vector magnitudes can be displayed proportional to their RMS values with user defined scaling or with a fixed magnitude where the voltage vector magnitudes are 100% and the current vector magnitudes are 50%. The selections are accessed from the Phasor Setup button.

The user can overlay a set of reference vectors (at unity Power Factor) to check the connection using the ‘add Ref’ button..

The user can choose to download and include waveforms as part of the report by checking ‘Include waveform graphs’. When this is checked, waveforms will be downloaded and saved after the user clicks the ‘Save to Report’ button.

The real time data in the report is updated when the phasor diagram is saved.

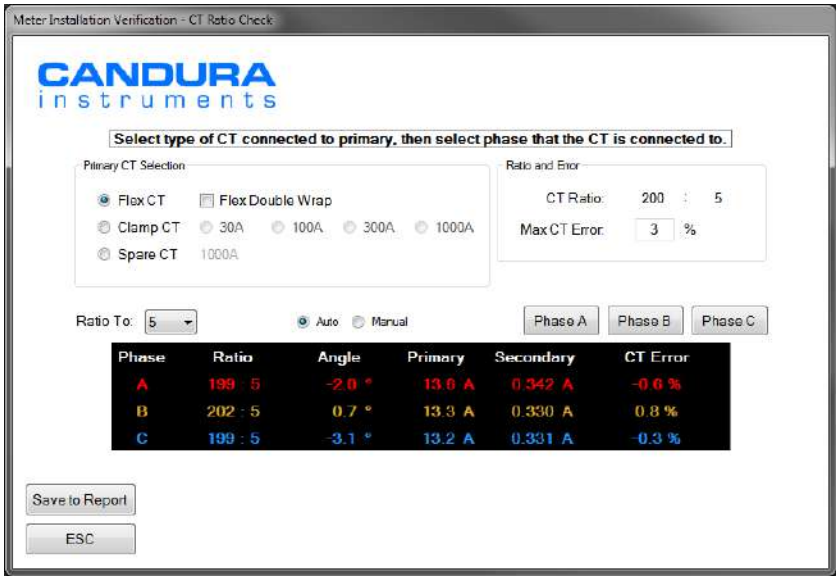




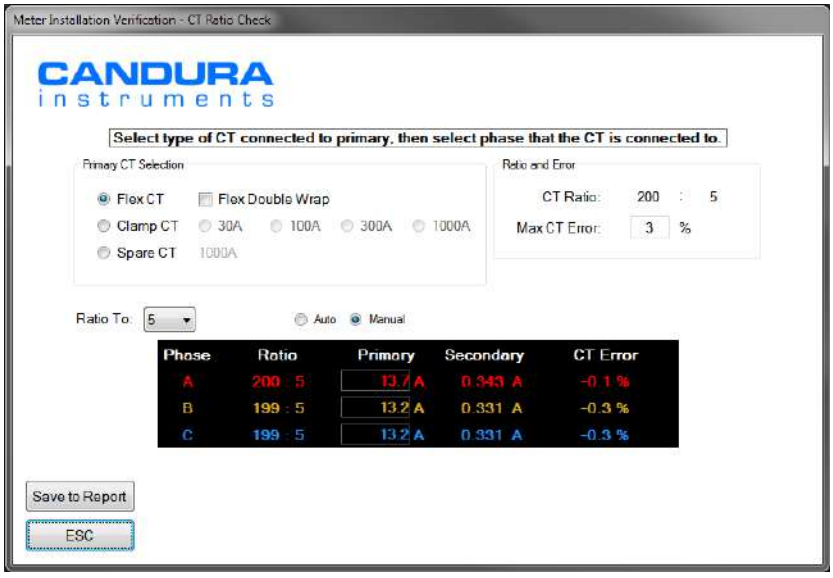
For ‘Delta at the Block’ service type, the vector diagram can be done with 2 CTs on the meter side of the CT test block or with 3 CTs on the CT side of the CT test block. This is selectable in the ‘Phasor Configuration’ dialog box. Running the test twice can have both results included in the same report.

CT Ratio Check

CT Ratio Check measures the primary to secondary CT ratio. Channels 1, 2 and 3 are connected to the secondary side of the CTs using the selected secondary CT's. In Auto Mode, flexible CT or a multirange Clamp CT is used for the primary side measurement. Channel 4 is used for the primary CT. The user selects the type of Primary CT being used and then clicks the button for the phase that the primary CT is connected to. The primary CT is then moved to the next phase and the corresponsing button is clicked.

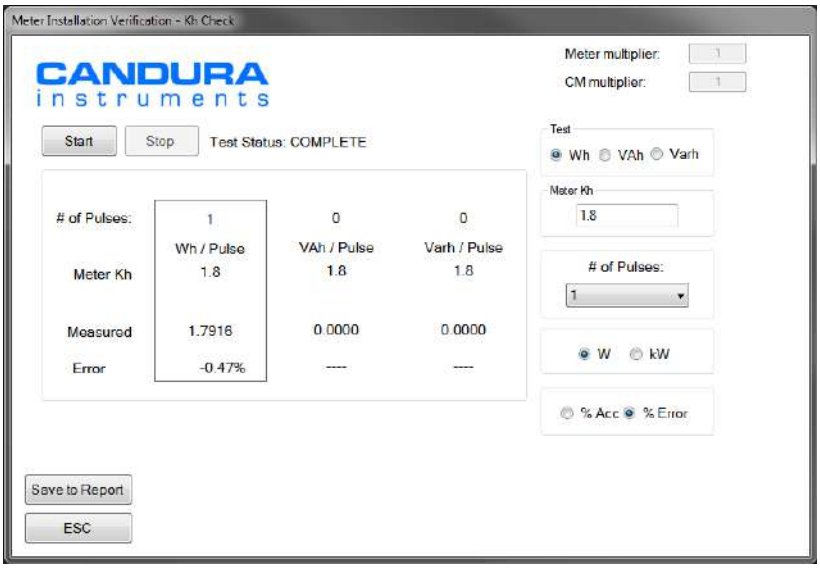


In Manual mode the user manually measures the primary currents and enters them in the Primary data entry boxes.



All tests, except for the CT Ratio Check, for a Delta at the Block connection two secondary CTs are used to monitor the meter currents. For the CT Ratio Check three CTs are used to monitor the 3 individual CT currents. This will require a repositioning of the secondary CTs.

MIV Software – Test Panel



Watt/Var Registration

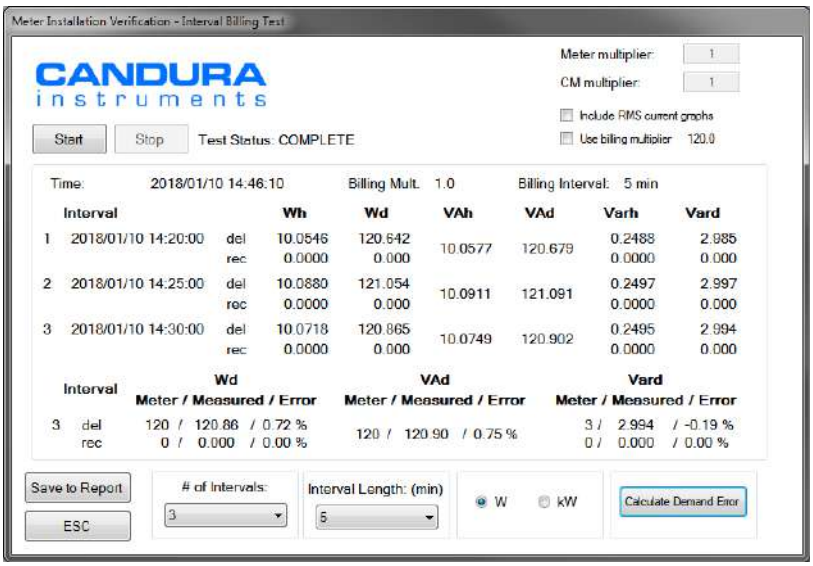
Watt/Var Registration tests the Wh, VAh or Varh per pulse of the meter. The user can select which quantity to test (Wh, VAh or Varh) and the number of pulses to accumulate. During the test or after the test the user can change how the data is viewed. The data can be viewed as Watts or kWatts and the resulting accuracy can be view as % of accuracy or % error.

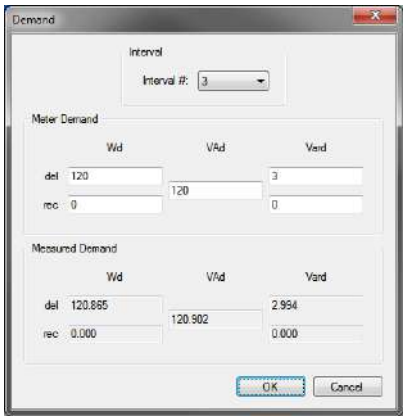
Interval Billing Test

Interval Billing Test is used to check the meter's interval billing results. It is important to do this test synchronized with the meter time. Synchronizing the time is done using the 'Update Time' button in the Status Screen. The interval time stamp is the time of the end of the interval.

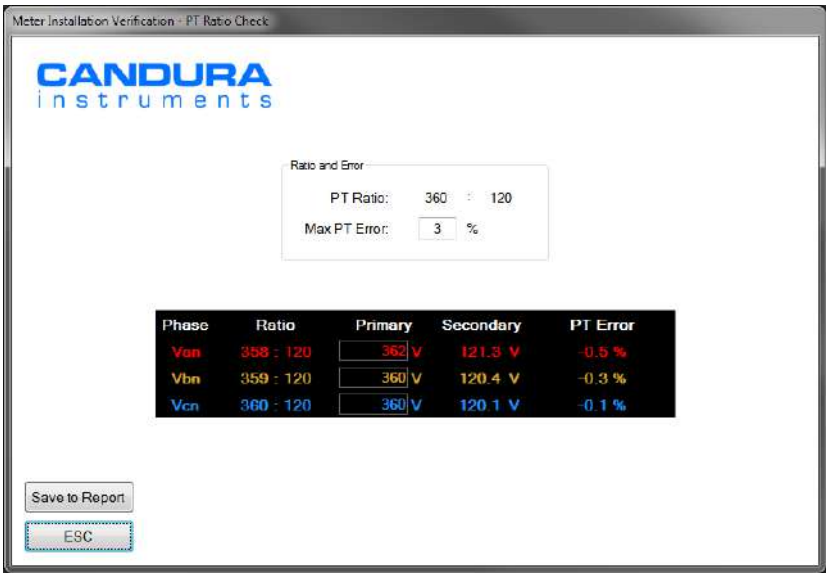
The user can select the number of intervals for the test and the time period for each interval. When the user presses the 'Start' button the software will automatically start the test at the beginning of the next time interval. The software will also automatically stop the test at the end of the last time interval. Both accumulated Watt hours and average Watts (demand) are displayed. The scaling can be adjusted to Watts or kWatts.

The user can choose to include RMS current measured during the interval billing test by checking 'Include RMS current graphs'. The 'Calculate Demand Error' button becomes available after the interval billing test. Clicking on this button opens a form that allows the user to input meter demand values and they will be compared with the measured demand values for a specified interval:



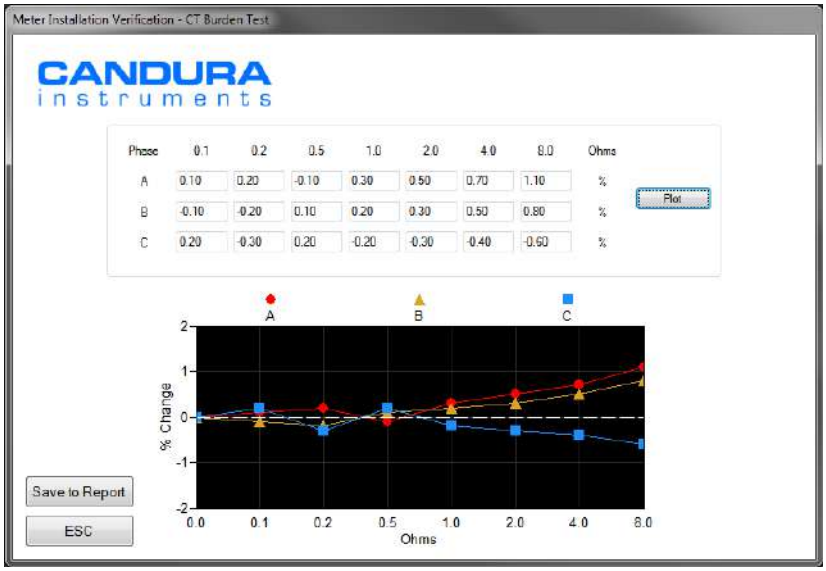


MIV Software – Test Panel



PT Ratio Check

The PT Ratio Check uses manually measured primary voltages with the measured secondary voltages to calculate the measured PT ratios. The errors are calculated from the difference between the calculated ratios and the nominal ratios entered in the first page.



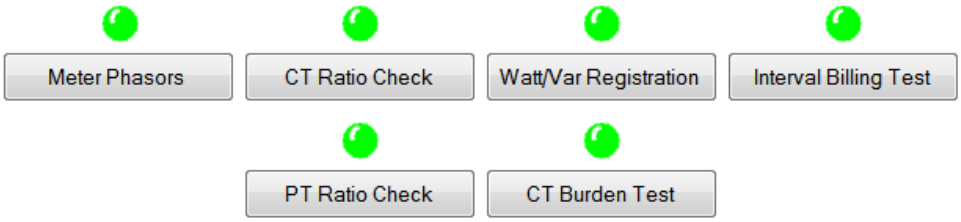
CT Burden Test

The CT Burden Test is done using a Radian Model 585 Burden Tester. The percentage errors reported by the burden tester are entered in the table. Pressing the 'Plot' button will plot the results on a graph.

Note: CT Burden Test can be done in Standalone Mode but data must be recorded separately to be entered into the MIV software at a later time.

MIV Software – Test Panel

When the tests have been saved the “LED” above each test selection button will change from red to green.



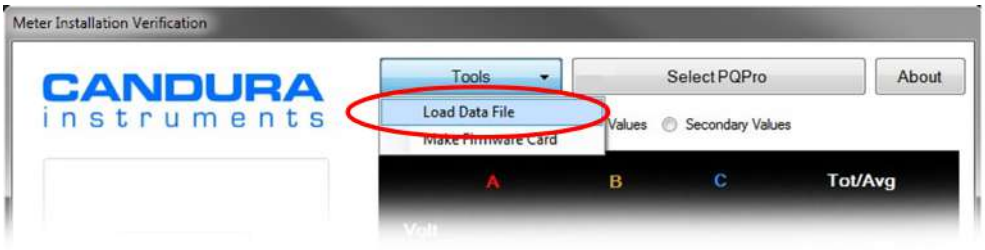
Save Report / Save to Data File

After the necessary tests are performed, the user can generate a PDF report file by clicking the ‘Save Report’ button. The user can also save results as a *.MIV Data File by clicking the ‘Save to Data File’ button.

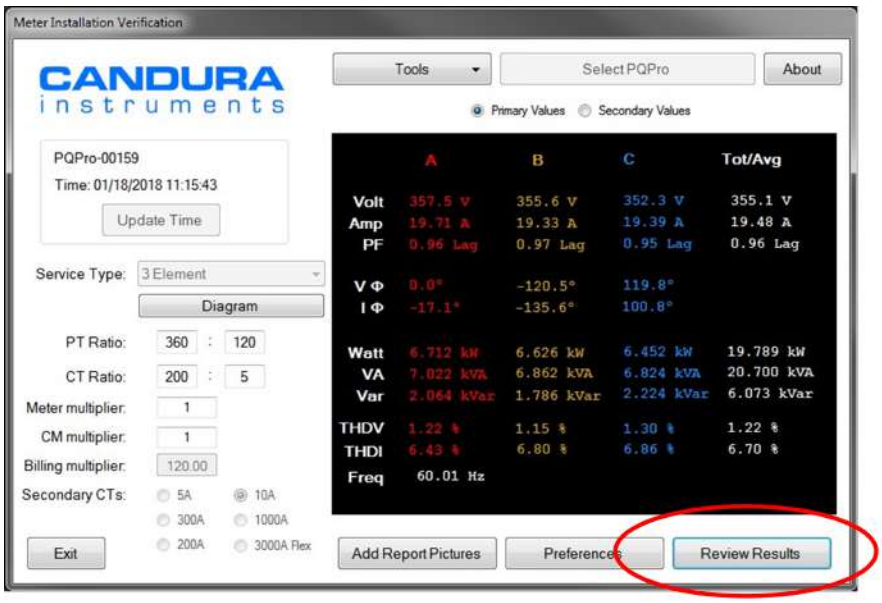
‘Save to Data File’ is particularly important for PT Ratio Check and CT Burden Test, where parameters are acquired by using other instruments readings. The user can input those parameters at a later time by re-opening the *.MIV data file using ‘Load Data File’.

Load Data File

Load the *.MIV Data File using ‘*Status Screen* > *Tools* > *Load Data File*’.



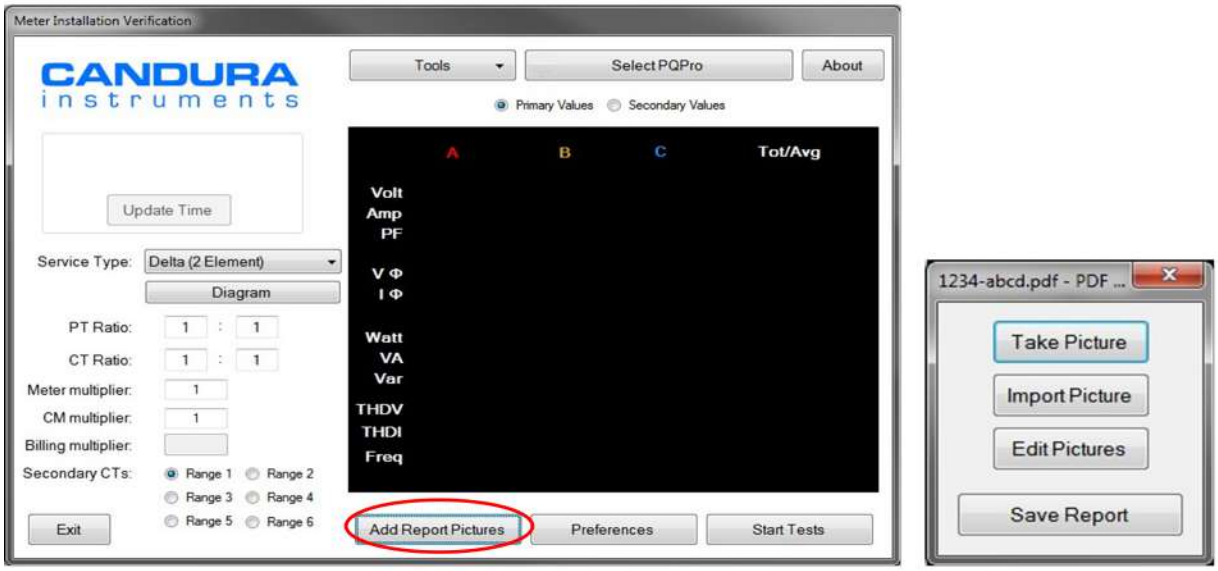
Once data file is loaded, the user can click on the ‘Review Results’ button to access the Test Panel again. Note that the ‘Select PQPro’ button and ‘Service Type’ drop down list are no longer available when reviewing results.



MIV Software – Add Report Pictures

Add Report Pictures

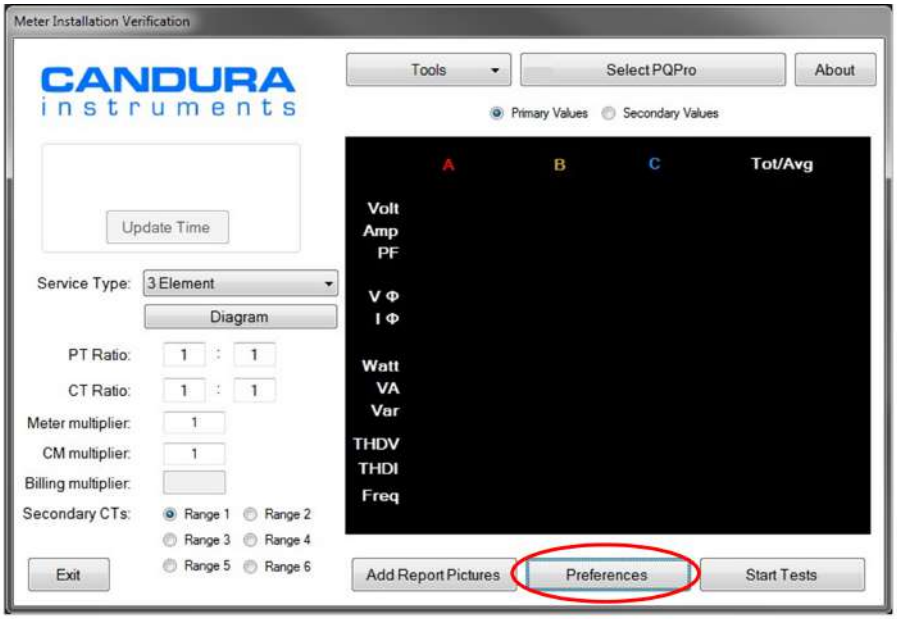
While pictures can be added to the report during the tests (see section **Test Panel - Take Picture**), it can also be done after the tests are done and report PDF is generated. Click on 'Add Report Pictures' at the 'Status Screen', then select the report PDF to be updated.



MIV Software – Preference

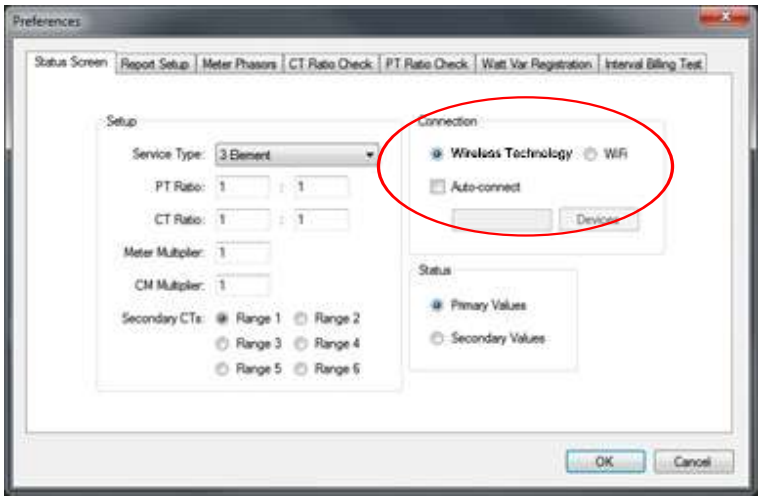
Preferences

Most of the settings described in the **Test Panel** sections can be pre-set using the Preferences feature.
Preferences can only be viewed/modified when not wirelessly connected to the *PQPro*™.



MIV Software – Preferences

The following sections describe the function of each tab found in Preferences dialog box.

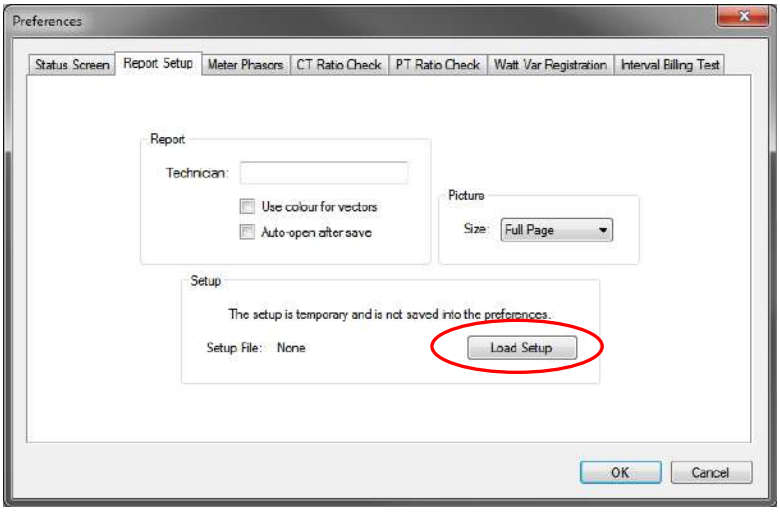


Status Screen

The first tab is for 'Status Screen' settings.

As mentioned in earlier section, the wireless connection type can be configured here. The user can select whether to use Wireless Technology or Wifi connection, depending on the interface installed in the ***PQPro™***. The user can also enable 'Auto-connect' to a specific ***PQPro™***.

The Secondary CTs ranges will be generic unless 'Auto-connect' option is selected.



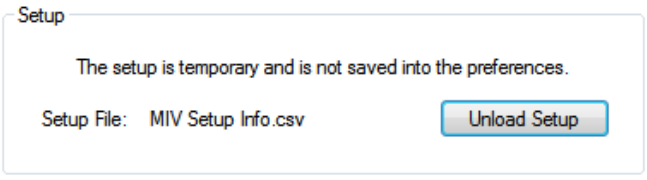
Report Setup

The second tab is for general report and picture settings.

The user can also use the 'Load Setup' button to load a CSV setup file. This setup file contains a list of specified values that will automatically populate fields in the report.

A sample of the setup file can be found in the USB thumb drive supplied in the MIV accessory kit. The file location is:

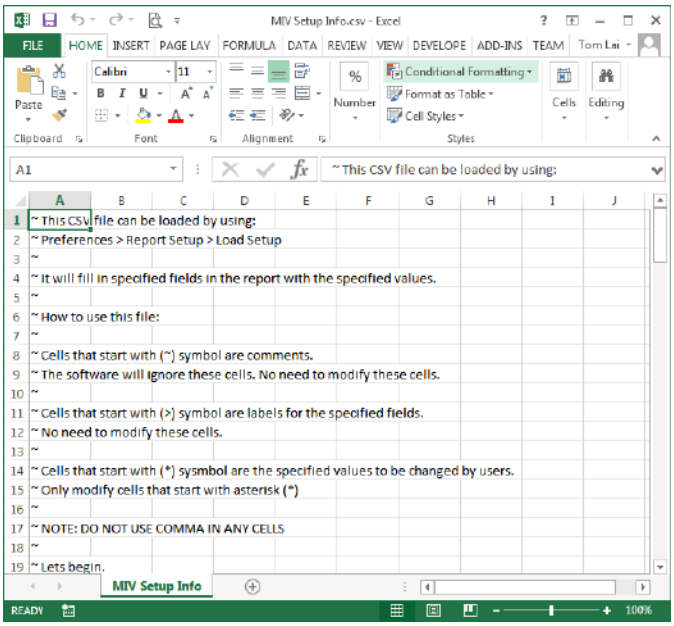
```
USB_DRIVE_LETTER:\Software\extras\MIV Setup Info.csv
```



Note that the specified values loaded by the setup file will override (but not overwrite) those that were set in other Preferences tabs. This is particularly useful for loading parameters for a specific site without changing the Preferences settings that are reserved for typical sites.

MIV Software – Preferences

It is important to configure the setup file first before loading it. Use Microsoft Excel or a standard text editor such as Notepad to configure the setup file.

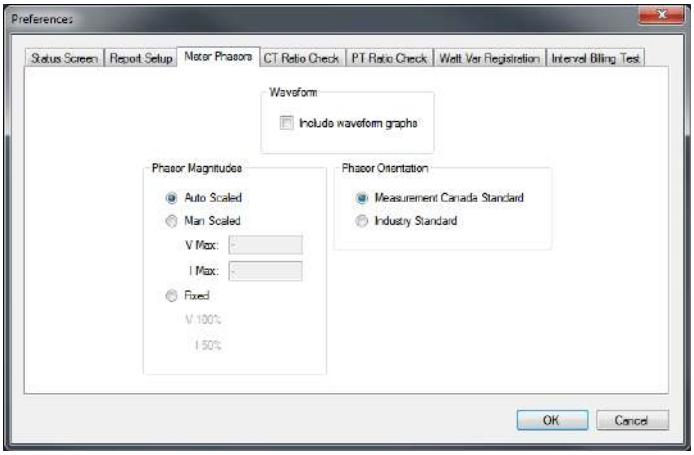


Cells that start with (~) symbol are comments. The software will ignore these cells. No need to modify these cells.

Cells that start with (>) symbol are labels for specified fields. No need to modify these cells.

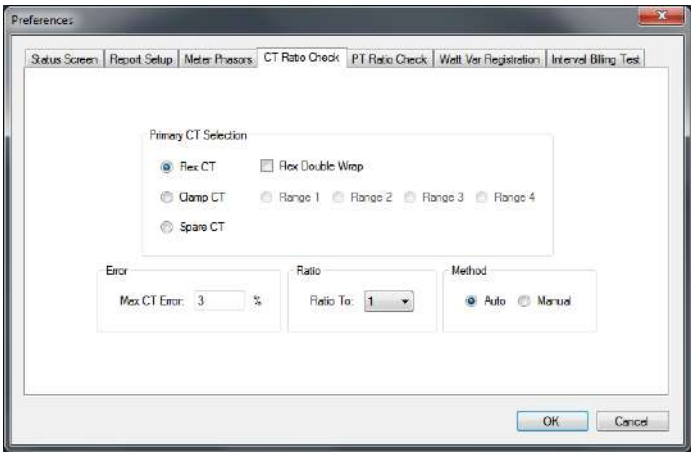
Cells that start with (*) symbol are the specified values to be changed by users. Only modify cells that start with asterisk (*).

NOTE: DO NOT USE A COMMA (,) IN ANY CELL.



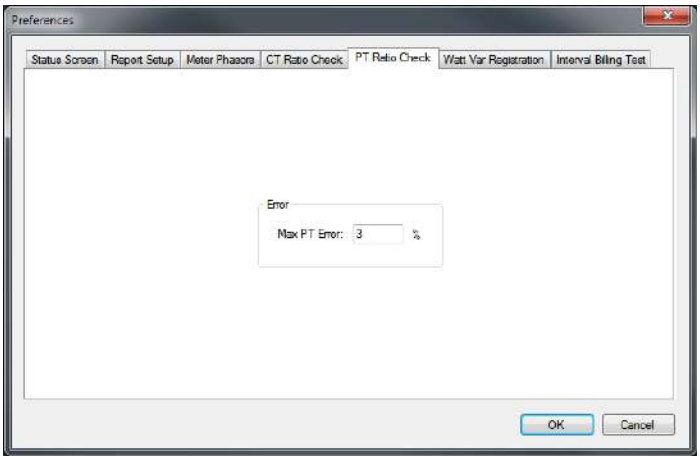
Meter Phasors

The third tab is for ‘Meter Phasors’ settings.



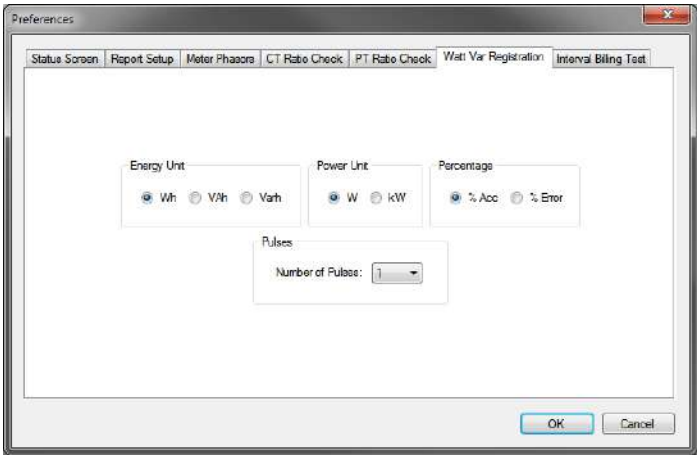
CT Ratio Check

The fourth tab is ‘CT Ratio Check’ settings. The CT range labels displayed will be generic unless the ‘Auto-connect’ option is selected in the ‘Status Screen’ tab.



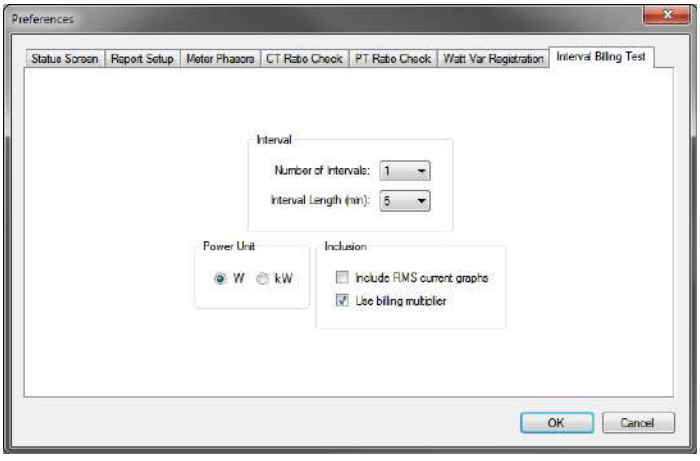
PT Ratio Check

The fifth tab is 'PT Ratio Check' settings.



Watt Var Registration

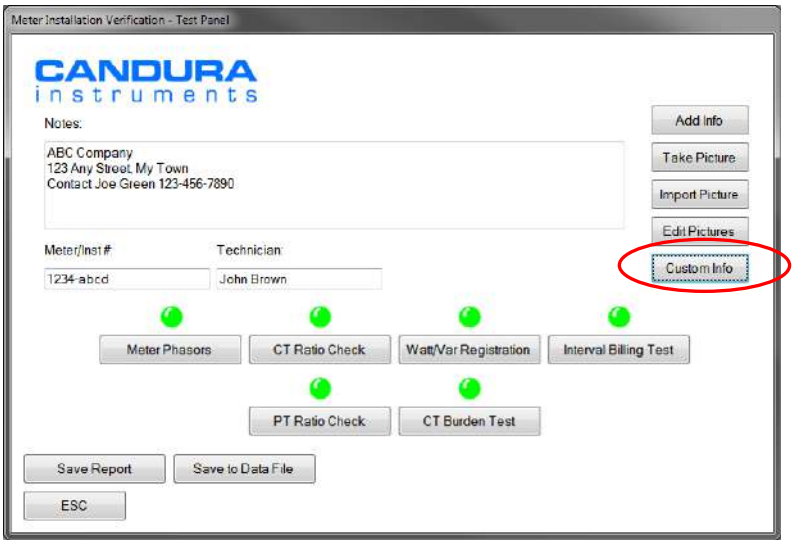
The fifth tab is for 'Watt Var Registration' settings.



Interval Billing Test

The sixth and final tab is for 'Interval Billing Test' settings.

MIV Software – Custom Info



Custom Info

A custom one page add-on can be added to the end of the standard report. Once this option is enabled the user will see an additional 'Custom Info' button in Test Panel. Contact info@candura.com for more details.

Custom Report

Fully customized report as specified by customer can also be implemented. Contact info@candura.com for more details.

Custom logo file

To use custom logo file in the report instead of default Candura logo, prepare the logo graphics as a .jpg file with file name 'Logo_*YourCompanyName*.jpg', then place it in the folder 'Documents/Candura'. This will also replace the default Candura logo seen in the upper left hand corner of the software.

MIV Standalone Mode

In MIV standalone mode the MIV tests are performed from the front panel of the ***PQPro™*** without *a wireless connection to a computer or tablet*. Test data is saved on the memory card. At a later time the MIV software can open these files and generate a PDF report.

Start Up



In order to use the MIV in standalone mode, there must be no wireless connection between the ***PQPro™*** and a computer. A 4GB memory card must also be inserted. Upon powering up, ***PQPro™*** will detect if there are existing files on the memory card.

Before entering into the MIV Standalone mode, the user might need to configure the CT connection settings first by pressing 'SETUP' button.

SETUP



The 'SETUP' screen allow user to configure Phase CT (Secondary CT) range, CH4 CT (Primary CT) range, connection type, external PT/CT ratio and ***PQPro™*** internal clock time. Use the Function Keys to scroll through and select each setting.

The following configurations will be available when reviewing the recorded data with the MIV software:

- Meter multiplier
- CM multiplier

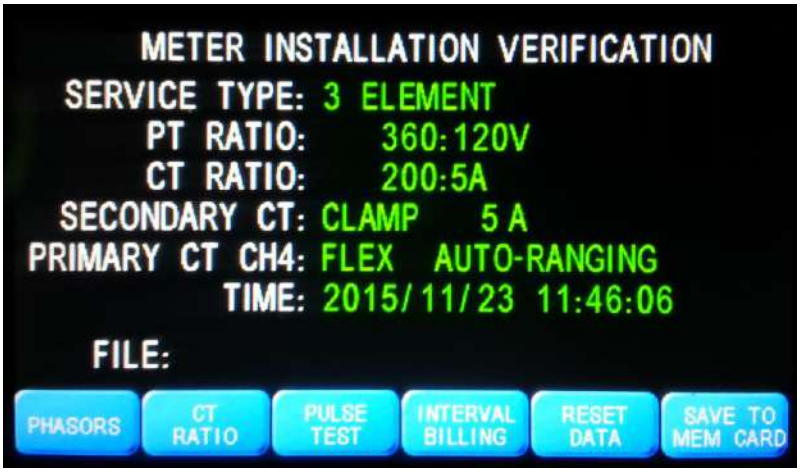
MIV Standalone Mode – SETUP

The following list shows the available CONNECTION types:

MBA2S	4 Wire Delta
MBA12S	1 Element 2 Wire CT
MBA16S	Network Service
Delta 2 Element	1 Element 2 Wire CT
2.5 Element	1 Element 3 Wire CT
Delta At The Block	1 Element 2-2 Wire CT
3 Element	

When all settings are done, press the 'RECORD' button on the keypad to enter the Standalone mode main screen.

Main Screen

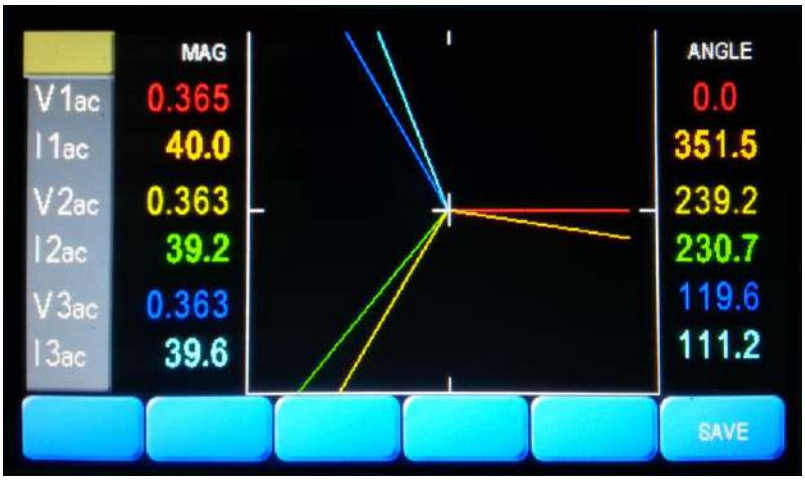


The Main screen displays a setup summary. At the bottom of the main screen the first four function buttons are used to select individual tests: Phasors, CT Ratio, Pulse Test and Interval Billing. The buttons are initially in blue colour indicating that the test has not been performed yet. Once a test is completed and 'Saved', the button will turn green indicating that the data for the particular test has been stored in the local temporary memory. When all the desired tests are completed, press 'F6' to save the data on to the memory card.

Note: PT Ratio Check and CT Burden Test can be done in Standalone Mode but data must be recorded separately to be entered into the MIV software at a later time.

Phasors

Press ‘F1’ at the Main screen to enter the Phasors test.

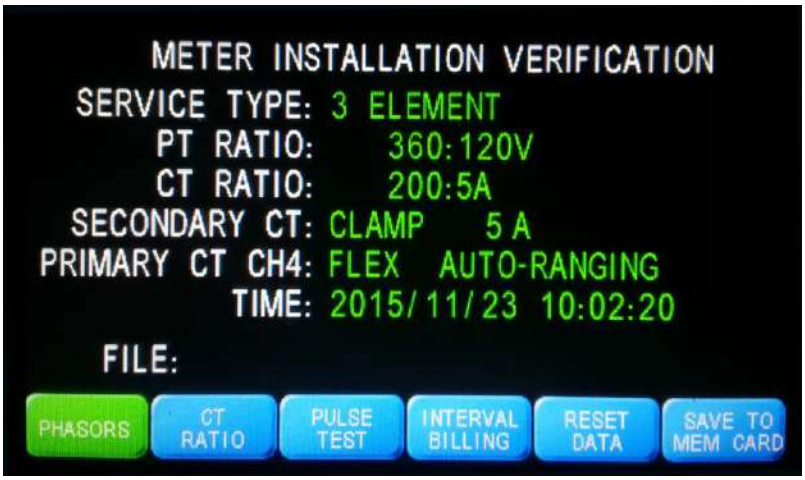


The following configurations will be available when reviewing the recorded data with the MIV software:

- Change V_{max} and I_{max} scale
- Phasor orientation

Note: Waveform graphs cannot be included in standalone mode

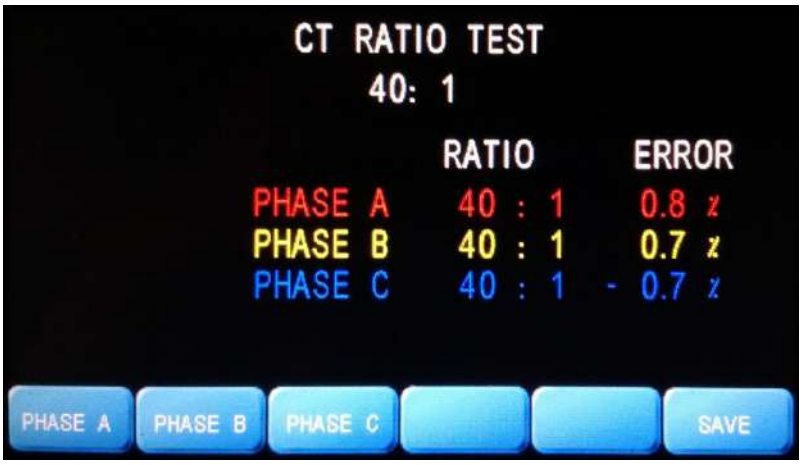
When the desire phasor diagram is displayed, press ‘F6’ to Save.



Note that in the Main screen, the Phasors button is now green.

CT Ratio Check

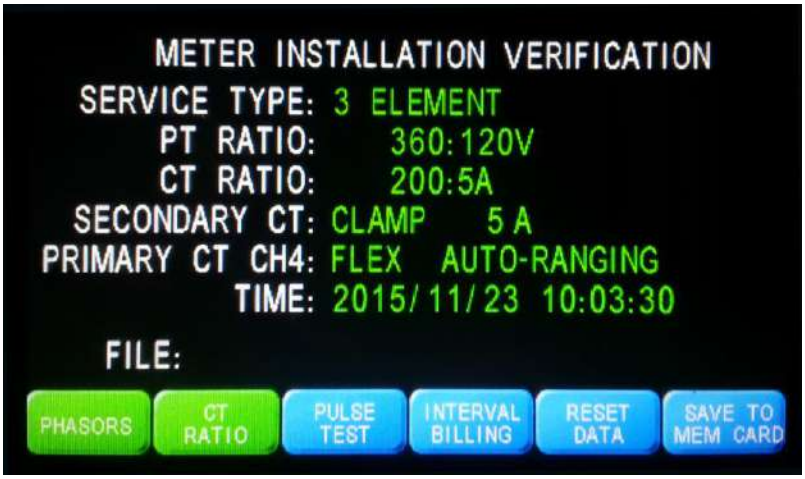
Press ‘F2’ at the Main screen to enter the CT Ratio check.



The CT Ratio check is done by placing the 36” Flex CT around a phase on the primary and pressing the corresponding Function key. Once all the phases have been done press ‘F6’ to save.

The following configurations will be available when reviewing the recorded data with the MIV software:

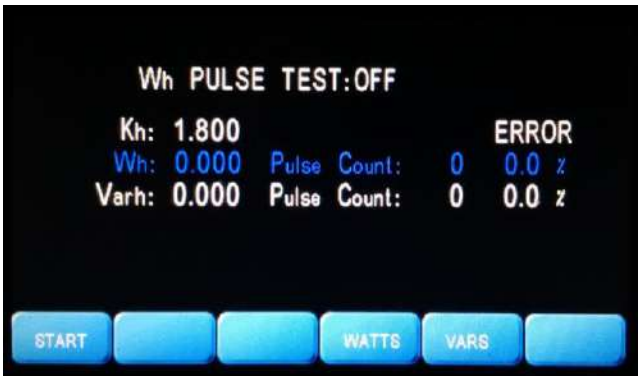
- Max CT Error %
- Ratio To (1A or 5A)



Note that in the Main screen, the CT Ratio button is now green.

Pulse Test

Press ‘F3’ at the Main screen to enter the Pulse test.



The following configurations will be available when reviewing the recorded data with the MIV software:

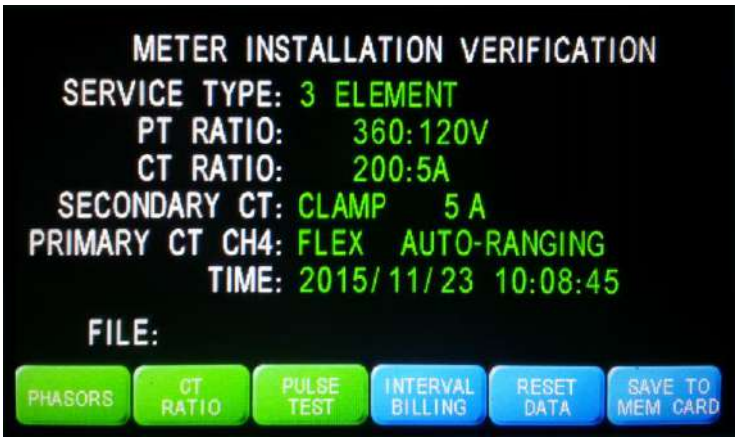
- W or kW
- %Acc or %Error
- Change meter Kh

The Pulse Test (also referred to as Watt/Var Registration in MIV software) is started by pressing ‘F1’. User can also select the type of test (Wh or Varh) before starting the





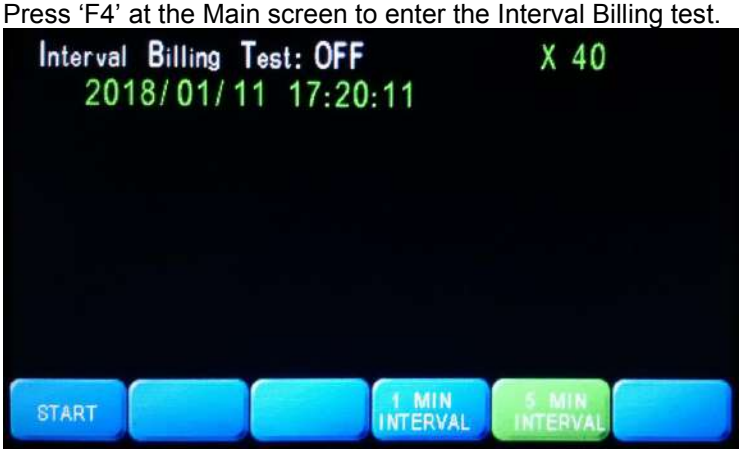
When the desired result is captured, press ‘F2’ to stop the test, then press ‘F6’ to save the test.



Note that in the Main screen, the Pulse Test button is now green.

Interval Billing

Press ‘F4’ at the Main screen to enter the Interval Billing test.



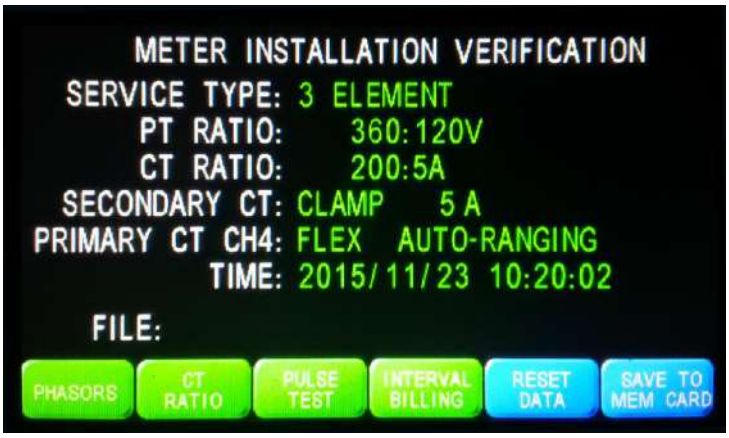
The following configurations will be available when reviewing the recorded data with the MIV software:

- Calculate Demand Error
- W or kW
- Use Billing Multiplier

The Interval Billing test is started by pressing ‘F1’. User can select between 1 minute and 5 minute intervals before starting the test.

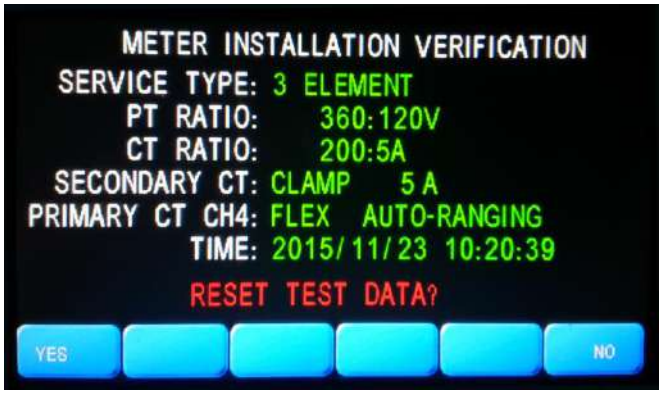


Up to 6 intervals can be stored. Note that you can re-start the test after the intervals are stored by pressing ‘F1’ again. Press ‘F6’ to save the results.



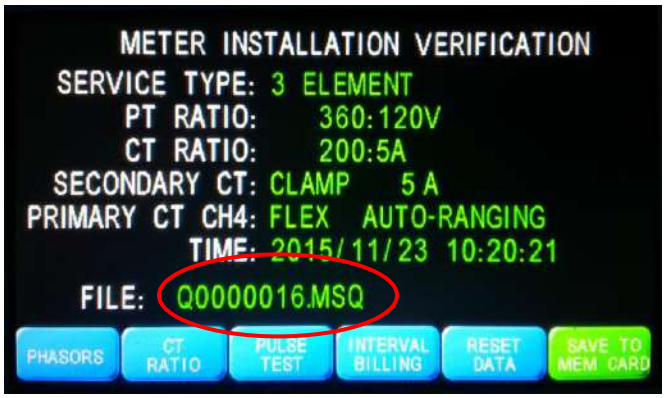
Note that in the Main screen, the Interval Billing button is now green.

Reset Data



User can reset all test data by pressing ‘F5’ at the main screen. Confirm reset test data by selecting ‘Yes’ or ‘No’.

Save to Mem Card



Save all test data to the memory card by pressing ‘F6’. The Standalone Data file with extension *.MSQ will appear in the main screen.

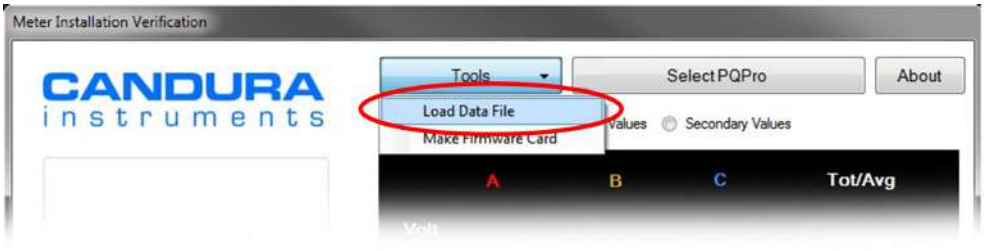


If the test data are not saved to the memory card before turning off power or memory card is removed, a warning message will prompt user to save test data first.

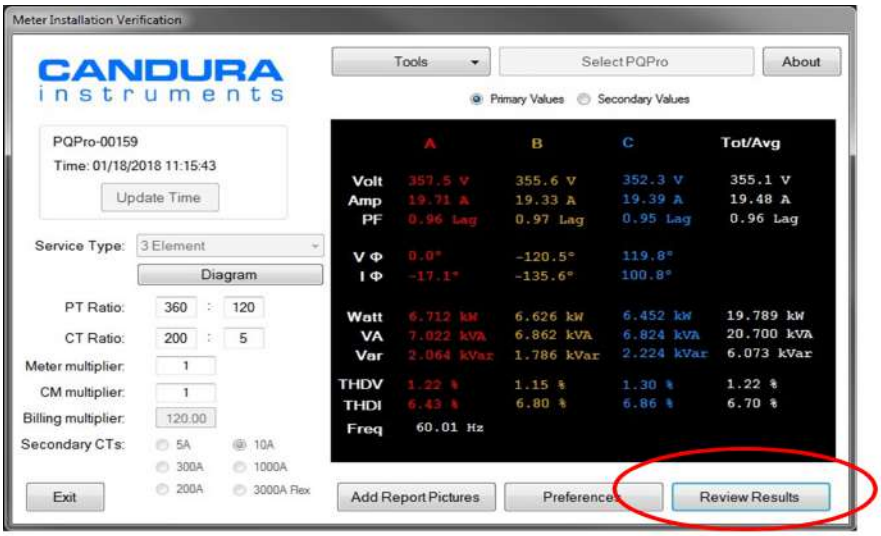
MIV Standalone mode

Load Data File

User can opne the *.MSQ Standalone Mode Data File using '*Status Screen* > *Tools* > *Load Data File*'.



Once the data file is loaded, the user can click on the 'Review Results' button to access the Test Panel again. Note that the 'Select PQPro' button and 'Service Type' drop down list are no longer available when reviewing results.



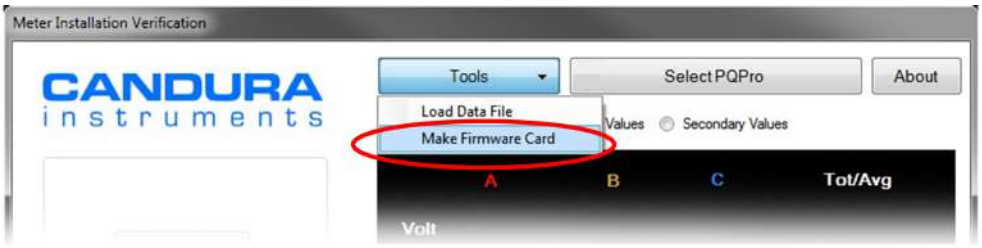
Changes made in the Test Panel can be saved using 'Save to Data File'. Note that the file will now be saved as *.MIV Data file instead of *.MSQ.

Firmware Programming

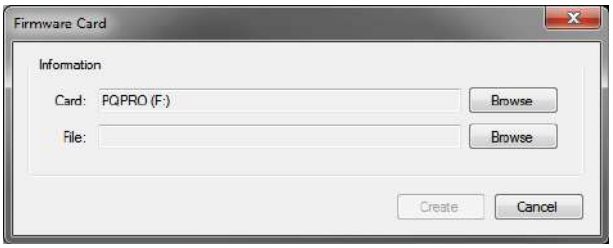
When a new version of MIV (MV) firmware is available, the user can upload it to the ***PQPro™*** by using the following steps.

Step 1: Create the Firmware Card

- Insert the supplied 4GB card into computer.
- Open MIV software. Go to '*Status Screen* > *Tools* > *Make Firmware Card*'.



- Use the 'Browse' button to select memory card drive and the firmware file (*.PQC).



- When ready, click the 'Create button'. You will be prompted with a warning saying the memory card will need to be formatted. Click 'Yes' to continue.

Step 2: Update PQPro with Firmware Card

- Connect ***PQPro™*** with either 12Vdc external power supply or Channel 1 voltage.
- Turn off ***PQPro™***.
- Insert firmware card from STEP 1 into ***PQPro™*** memory card slot.
- Upon powering up, ***PQPro™*** will detect the presence of the firmware card and begin to load the new firmware automatically.
- When finished, remove firmware card and reboot ***PQPro™***.
- Confirm the latest firmware version is installed. Using the ***PQPro™*** keypad, go to '*DISPLAY* > *System Info*', and check 'Firmware Rev #'.

MIV Sample Report

CANDURA instruments

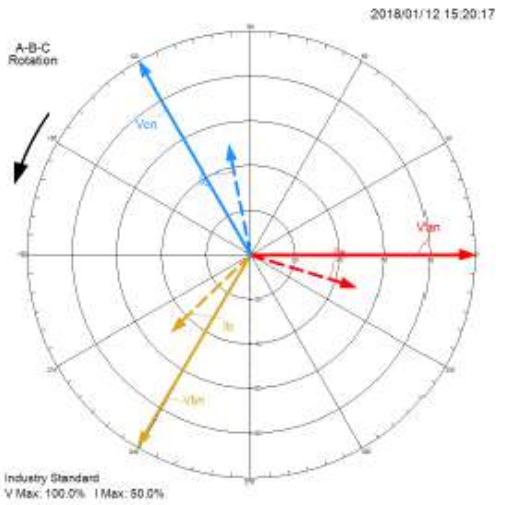
Meter/Inst #: 1234-abcd
Service Type: 3 Element
PT/CT Ratios: 360:120V 200:5A

Technician: Bill Brown
Instrument: PQPro-00159
File: 1234-abcd.pdf
Created: 2018/01/12 15:20:56

MIV Example Report

Primary Values 2018/01/12 15:20:17

	A	B	C	Tot/Avg
Volt	366.2 V	361.8 V	361.8 V	363.3 V
Amp	20.10 A	19.59 A	19.82 A	19.84 A
PF	0.96 Lag	0.97 Lag	0.95 Lag	0.96 Lag
V ∠	0.0°	-120.4°	119.9°	
I ∠	-17.2°	-135.6°	101.1°	
Watt	7.019 kW	6.828 kW	6.775 kW	20.621 kW
VA	7.344 kVA	7.074 kVA	7.157 kVA	21.569 kVA
Var	2.169 kVar	1.850 kVar	2.206 kVar	6.225 kVar
THDV	1.16 %	1.10 %	1.30 %	1.19 %
THDI	6.31 %	6.63 %	6.79 %	6.58 %
Freq	59.98 Hz			



CT Ratios (Auto)

Phase	Ratio	Angle	Primary	Secondary	CT Error
A	40 : 1	-1.3 °	20.1 A	0.500 A	0.5 %
B	40 : 1	0.5 °	19.5 A	0.488 A	-0.3 %
C	40 : 1	-3.0 °	19.9 A	0.498 A	0.0 %

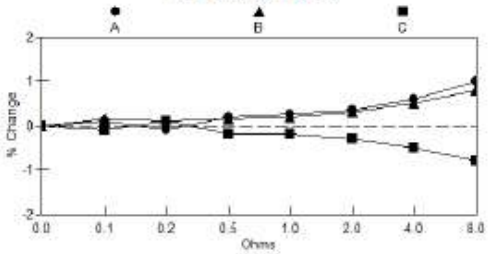
PT Ratios

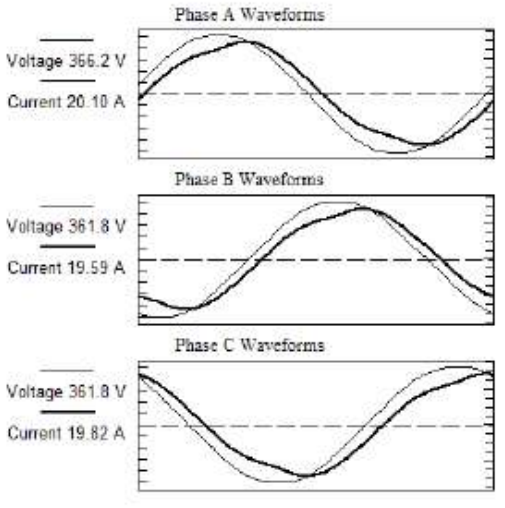
Phase	Ratio	Primary	Secondary	PT Error
Van	357 : 120	362 V	121.6 V	-0.8 %
Vbn	359 : 120	360 V	120.4 V	-0.3 %
Vcn	360 : 120	360 V	120.0 V	0.0 %

Watt/Var Registration

# of Pulses:	1	0	0
	Wh / Pulse	VAh / Pulse	Varh / Pulse
Meter Kh	1.8	1.8	1.8
Measured	1.8008	0.0000	0.0000
Error	0.04%	—	—

CT Burden Test





2.1.6583 MV02.07.00

1

MIV Sample Report

CANDURA instruments

Meter/Inst #: 1234-abcd
Service Type: 3 Element
PT/CT Ratios: 360:120V 200:5A

Technician: Bill Brown
Instrument: PQPro-00159
File: 1234-abcd.pdf
Created: 2018/01/12 15:20:56

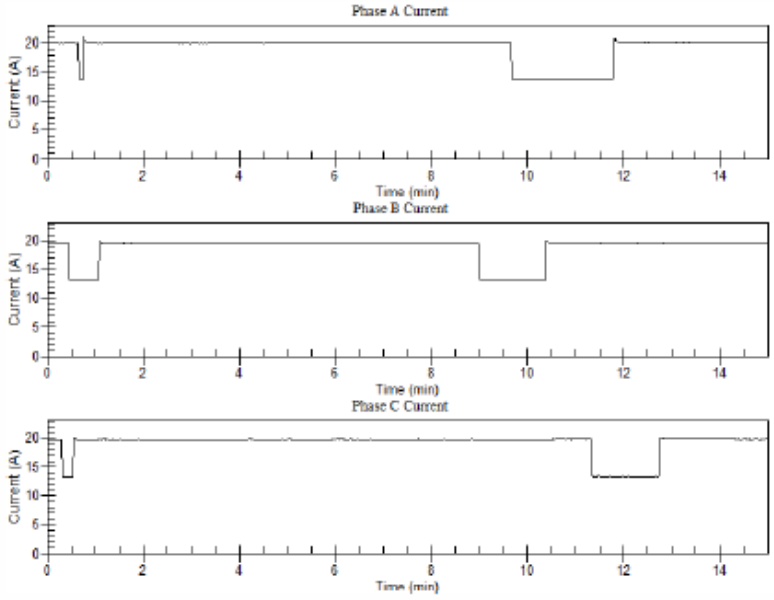
MIV Example Report

Interval Billing Test

Time: 2018/01/12 15:09:04 Billing Mult. 1.0 Billing Interval: 5 min

	Interval		Wh	Wd	VAh	VAd	Varh	Vard
1	2018/01/12 14:55:00	del	13.9624	167.531	14.5929	175.096	4.2432	50.913
		rec	0.0000	0.000			0.0000	0.000
2	2018/01/12 15:00:00	del	13.8862	166.645	14.4933	173.931	4.1509	49.814
		rec	0.0000	0.000			0.0000	0.000
3	2018/01/12 15:05:00	del	13.3277	159.934	13.7804	165.367	3.5032	42.039
		rec	0.0000	0.000			0.0000	0.000

Interval		Wd Meter / Measured / Error	VAd Meter / Measured / Error	Vard Meter / Measured / Error
2	del	166.4 / 166.64 / 0.15 %	173.5 / 173.93 / 0.25 %	49.99 / 49.814 / -0.35 %
	rec	0 / 0.000 / 0.00 %		0 / 0.000 / 0.00 %



MIV Sample Report

CANDURA instruments

Meter/Inst #: 1234-abcd
Service Type: 3 Element
PT/CT Ratios: 360:120V 200:5A

Technician: Bill Brown
Instrument: PQPro-00159
File: 1234-abcd.pdf
Created: 2018/01/12 15:20:56

MIV Example Report

Service Work Order #:	12345678
Customer Name:	ACME Manufacturing
Address:	123 Any Street
Address:	Unit #321
Customer Contact Name:	John Smith
Customer Contact Phone:	555-123-4567
Meter #:	1234-abcd
Meas. Can. Meter Approval #:	5678
Seal Year:	2018
Meas. Can. Stand. Drawing #:	3416
Meter multiplier:	1.00
CM multiplier:	1.00
Billing Multiplier:	120.00
CT Phase A Serial #:	CT-123-A
CT Phase B Serial #:	CT-123-B
CT Phase C Serial #:	CT-123-C
PT Phase A Serial #:	PT-222-A
PT Phase B Serial #:	PT-222-B
PT Phase C Serial #:	PT-222-C

Record of installation sheet:	YES
Meter type approved and correctly sealed:	YES
Grounding correct:	YES
Primary wiring and connections correct:	YES
Secondary wiring and connections correct:	YES
Cross-phase testing completed:	YES
Billing multiplier verified:	YES
Communications operational:	N/A
Electricity metering installation correct:	YES
Verification label signed, dated, and applied:	YES

Test Performed By: Bill Brown
Report Checked By:

MIV Sample Report

CANDURA instruments

Inserted: 2018/01/12 15:40:04

As found  	As left 

2.1.6583 4