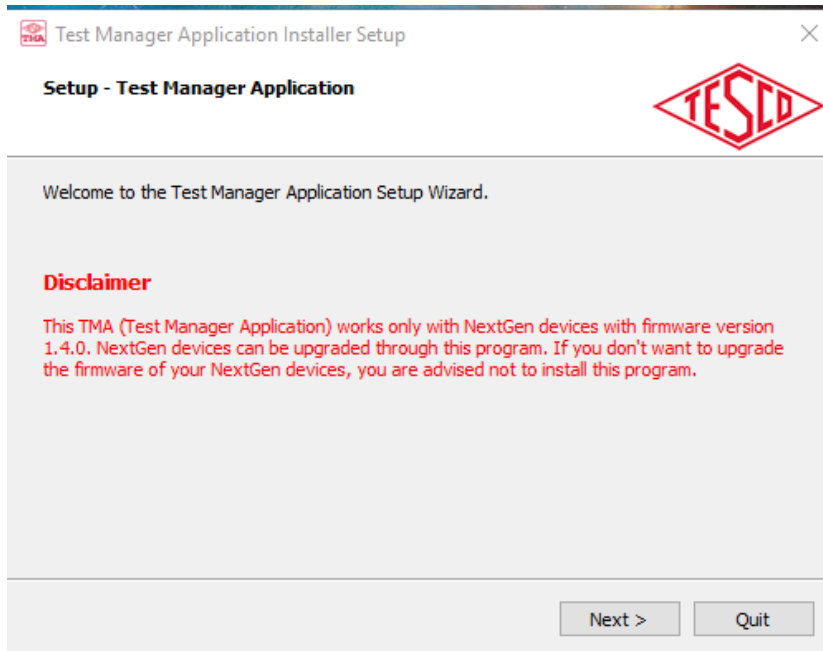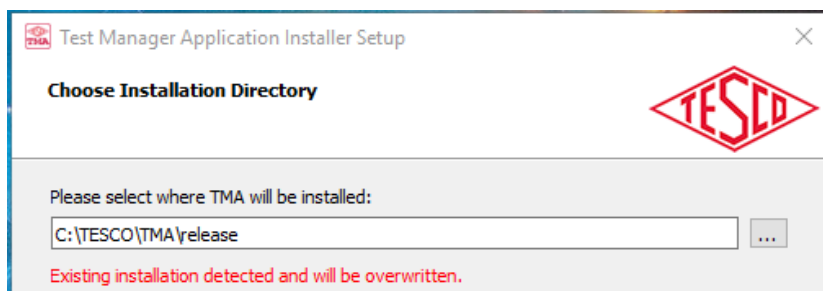# TEST MANAGER
Quick Start Guide

This document is intended to guide you through the process of installing the Test Manager™ software and to give you a quick tour so that you can explore the software on your own.

Installation

The Test Manager™ software is furnished either as a USB dongle or as a zip file named TMA_X.Y.Z where X.Y.Z is the revision number of the software. Also included in the zip file are release notes and this guide. To install the software simply double click the TMA_Setup file. The installer program will run.

Click next. Please install the software in the default directory location. If you have a previous version installed in the default path the software will be overwritten but the database containing all of your data will be updated if required without loss of any of your data. If you install in a non-default directory your data may not be retained.

Configuring the Software

TMA talks to your TESCO NextGen™ devices over an ethernet connection. There are two different ways to set up your connection depending on the security requirements of your company.
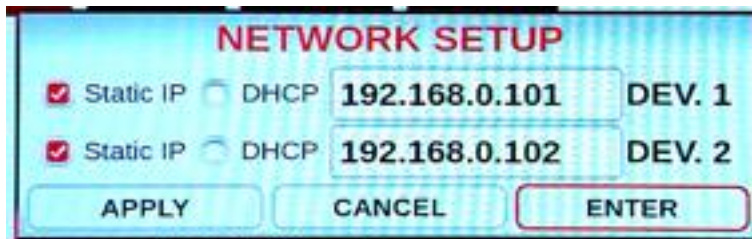
Private Segment

The NextGen™ devices can be placed on a private network segment. In this configuration the TMA software does not communicate over your corporate network. If you want to have the computer which the TMA software is installed to also have access to your corporate network, then you will need to either: (1) Install two NIC cards (one for the corporate network and one for the private segment) or (2) Use WIFI to connect to the corporate network and the NIC to connect to the private segment.

If you do not want the computer connected to your corporate network then you will only need one NIC card which will be used for the private segment.
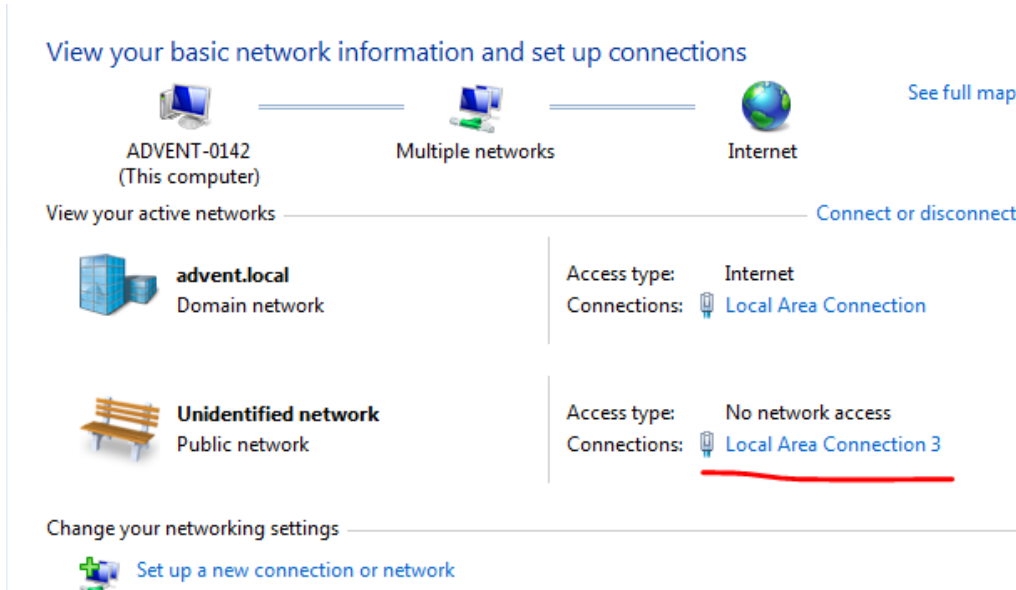
Connecting to a private network segment

Consult your IT department to determine an available private network segment. The systems ship from TESCO with the IP addresses set in the 192.168.0.XXX segment. They can be changed on the Setup>System>Network screen of the device.

Some devices will show two IP addresses, some only one. For a PRIVATE segment installation, select Static IP and set the IP address within the desired segment. When there are two IP addresses, set the second to one more that the first as shown above. Make sure that all units have unique IP addresses.

If you are on a private network segment you will also have to go into Windows Control Panel and select Network and Sharing Center. You should see a display similar to this - where one NIC is connected to your company network and the new NIC has no network access.
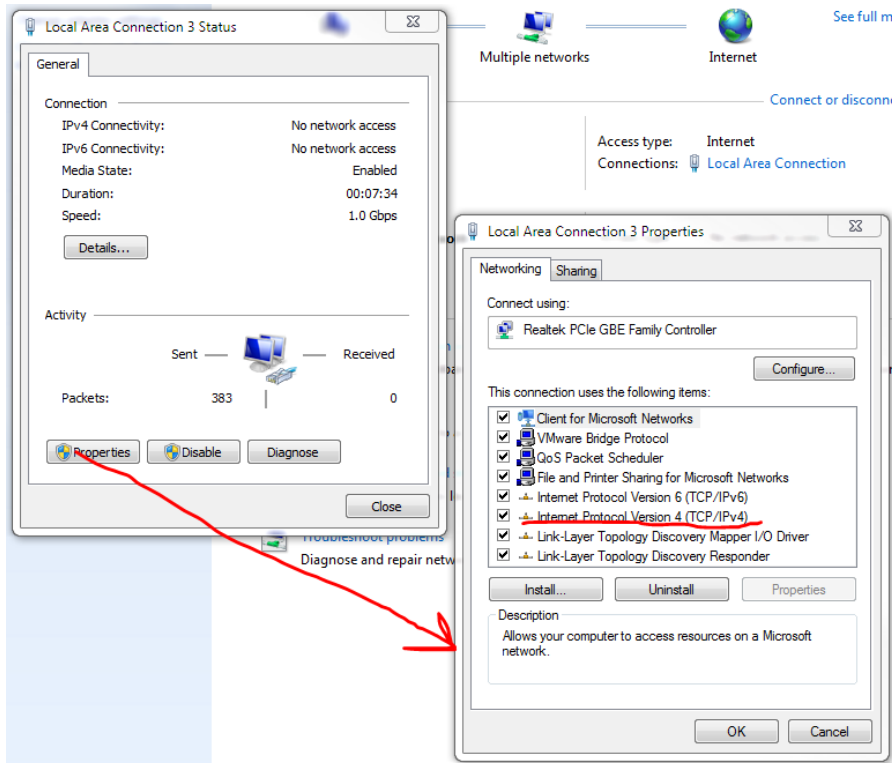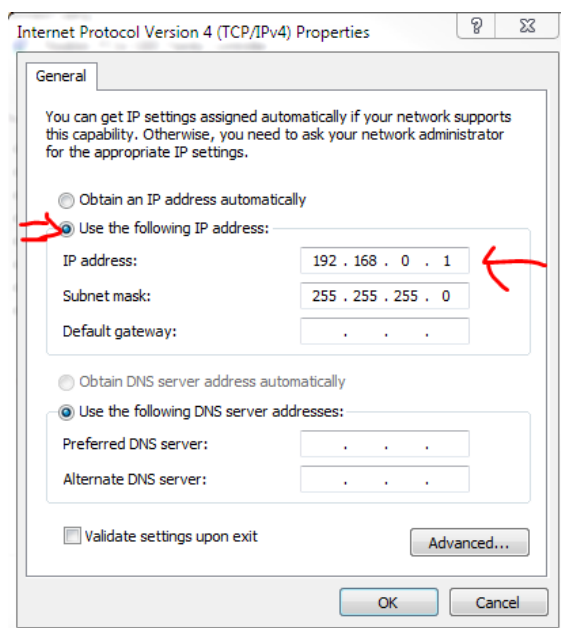
THE EASTERN SPECIALTY COMPANY

Next we need to set a static IP address for the private NIC. Double click on the connection (underlined in red above). This will bring up the Status window. There click on Properties. That will bring up a Properties window.

In the properties window double click on Internet Protocol Version 4. Now set a private IP address for that adapter. If your company network does not use 192.168.0.xxx, set 192.168.0.1 as the IP address as shown below.
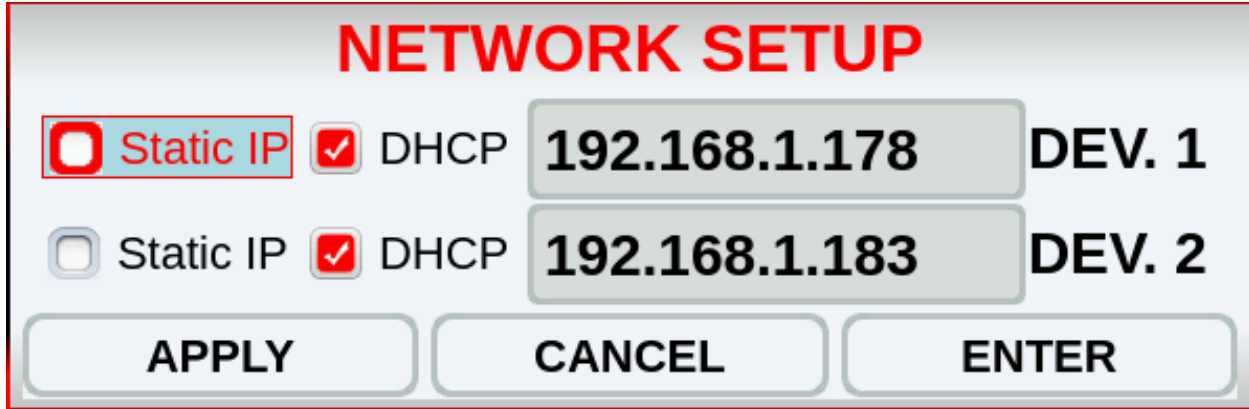
Say OK on each pop-up until you get back to the Control Panel. The segment set here must match the segment set in the devices.

Connecting to a public network

Consult your IT department to determine whether they want these devices set to fixed IP addresses or to DHCP. If FIXED proceed as for a private network using the addresses assigned by your IT department. If DHCP change the Network Setup from Static IP to DHCP. You do not need to set an IP address. That will be setup through DHCP.

Connecting the Ethernet cables

If you have any device other than a DMS-2199 or a DTS-2990 you can connect the device either to a hub/switch or to a computer with a standard Ethernet cable. If you have a DTS-2990 or a DMS-2199 you can connect the unit to a switch/hub with a standard Ethernet cable or directly to a computer with a crossover cable. Beginning January 1, 2019 all systems are shipped with a BLUE standard cable and the DTS systems also include a red crossover cable for your convenience.

TEST MANAGER

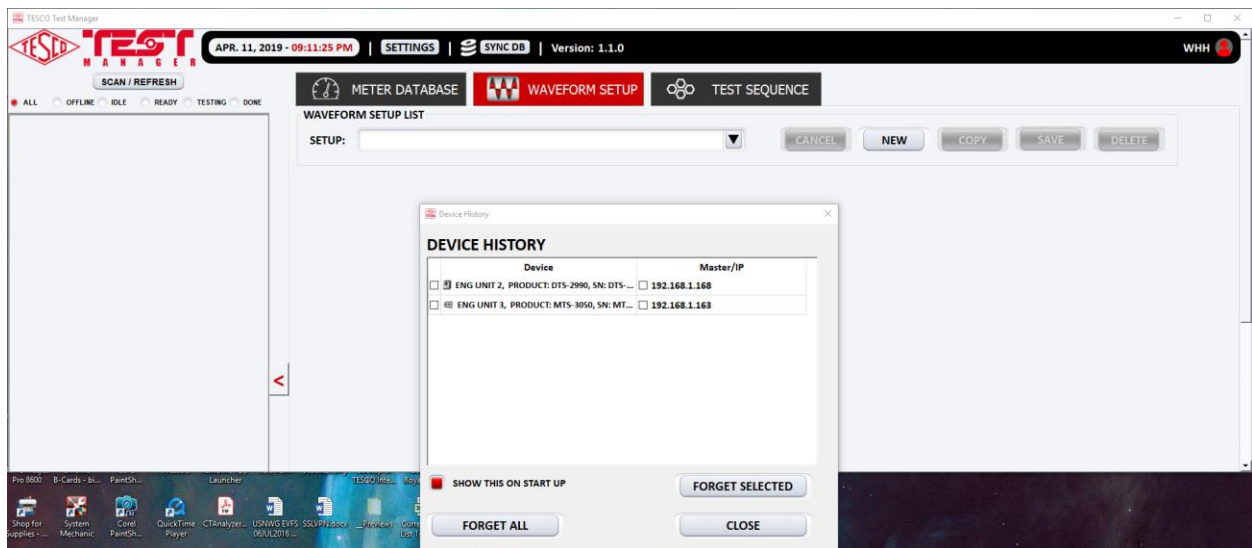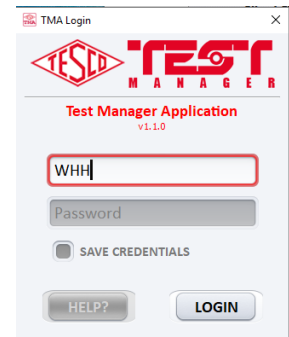**Quick Start Guide**

Running Test Manager for the first time

When you run the TMA software you will be asked to LOGIN. At this point no credentials are verified. The LOGIN is simply so an operator name can be attached to data when taken.

Next you should see two windows pop-up. The first is the Device History window. If this is an initial installation you have no history yet so click CLOSE. If this is an update, your existing devices will be shown. You can either FORGET ALL and rescan or just click close.
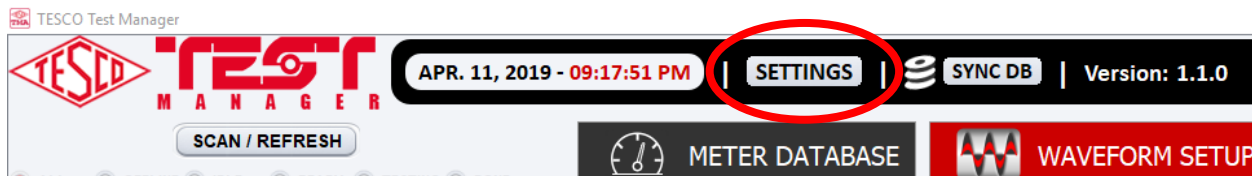

You should now see the Test Manager main window. If it is not maximized then do so by clicking the maximize button in the upper right corner.

You should now have a full screen view of the main window.

If this is the first time you have used the software, you will have to setup the networking configuration of the software. Click the SETTINGS button at the center top of the screen.
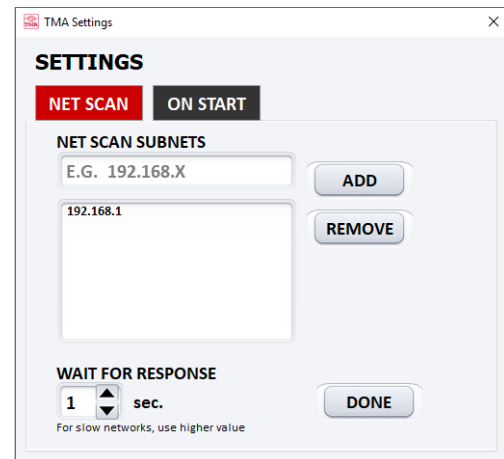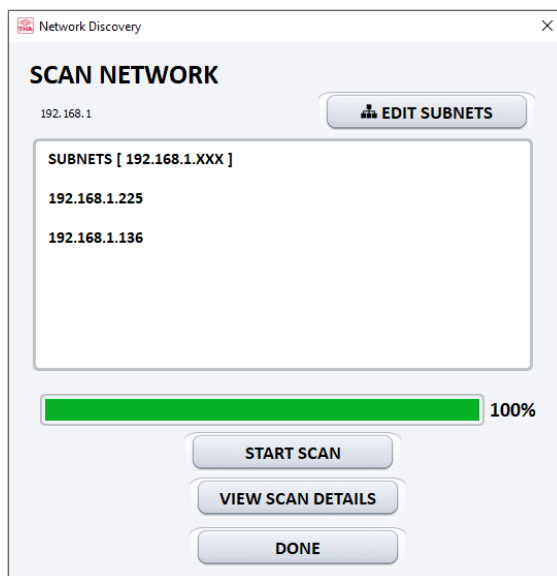
TEST MANAGER
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This will bring up the CONNECTION SETTINGS pop-up. By default, the network segment is set to 192.168.0. If this is not the network segment you are using, then enter your network segment in the box that says E.G. 192.168.X. If you are on a corporate network this is the segment given to you by your network administrator. Press ADD. Now select the unused segment and click REMOVE.
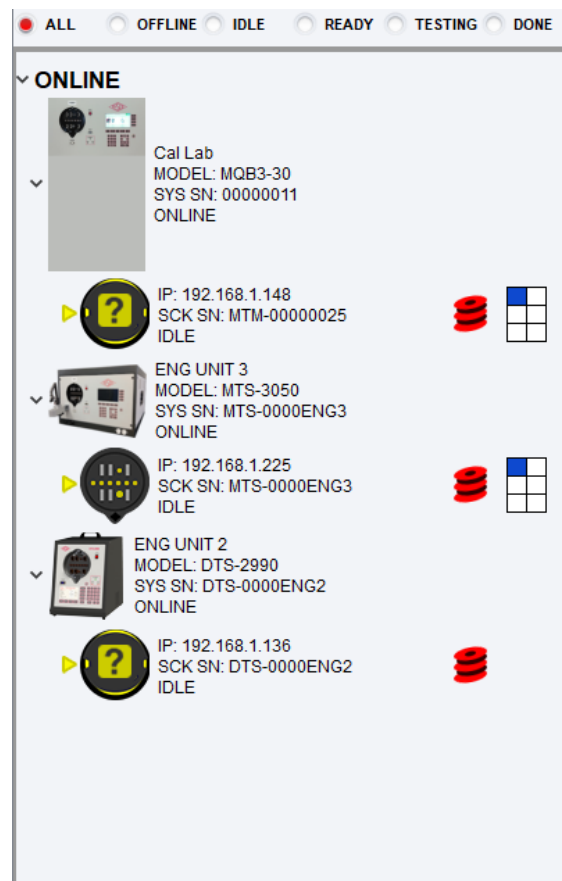
When everything is correct click DONE

Now you are ready to discover the devices on your network by SCANNING. Click the SCAN/REFRESH button on the upper left of the screen.

Click START SCAN and any TESCO NextGen™ devices will be discovered. New devices will be listed as shown. All devices will be shown in the NETWORK VIEW window.
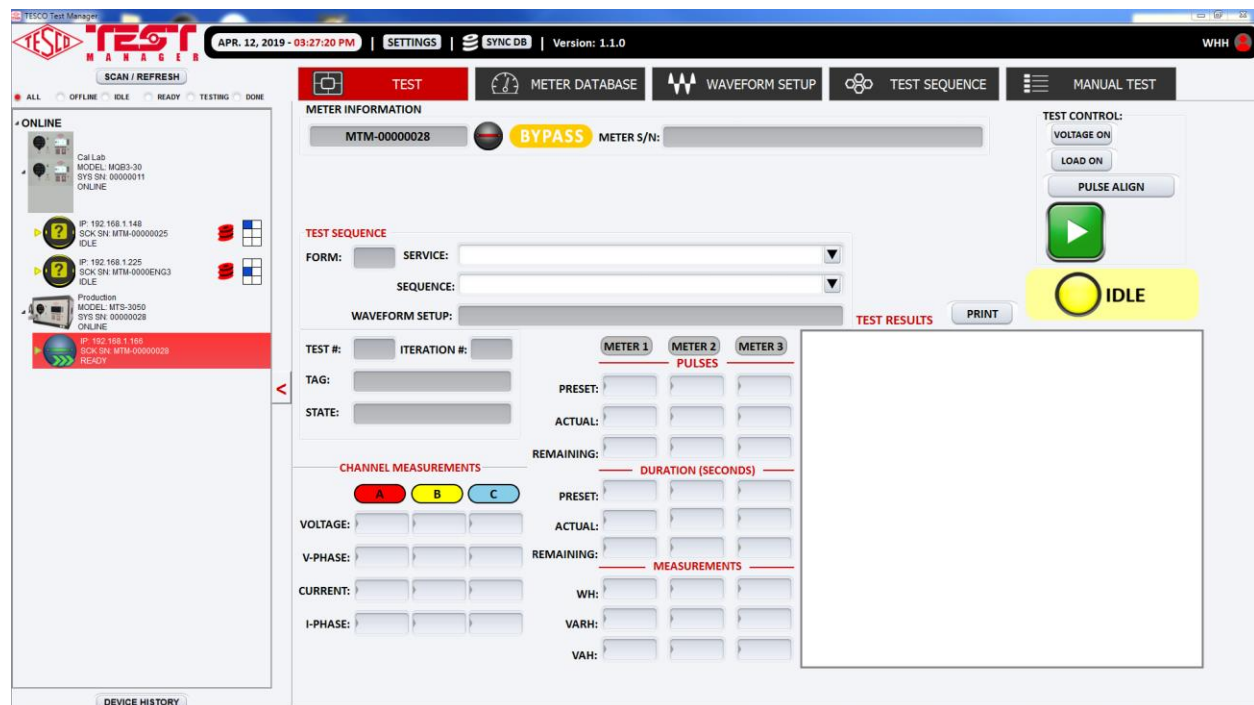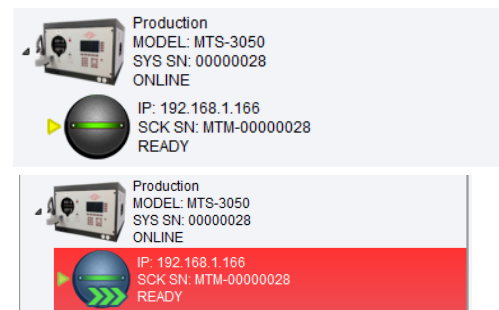
General Operational Concepts

The software has two basic modes for running tests: TEST and MANUAL TEST. TEST mode is intended for production meter testing where the operator places a meter(s), enters(scans) the ID and runs a pre-setup test sequence. MANUAL TEST does not use predefined sequences. It allows the user to adjust all system parameters on the fly and run a single test at a time.

For TEST mode the process is based on test sequences and waveform setups. A waveform setup defines a single test condition in terms of the voltage, current, phase angle and waveform for each phase. The system comes with predefined waveform setups for the most common service types and tests (full load, light load and full load at 0.5PF). The user can also create any waveform using the WAVEFORM SETUP tab. A test sequence is then created to automate the testing process. Each step in the process corresponds to one or more repetitions of a specific type of test (Accuracy, Demand, Time or Drive depending on the capabilities of the specific product). The TEST SEQUENCE tab allows the user to create or edit test sequences. Predefined test sequences are provided for most common testing scenarios.

TEST tab

To open the TEST tab, click the socket icon in the NETWORK view. This will bring up the TEST tab associated with that device. The screen will show the status of each socket associated with that master device. For example, a DTS-2990 or MTS-3050 will show only one socket, but a MEB3-12 will show three sockets. The currently selected device will be highlighted in RED .
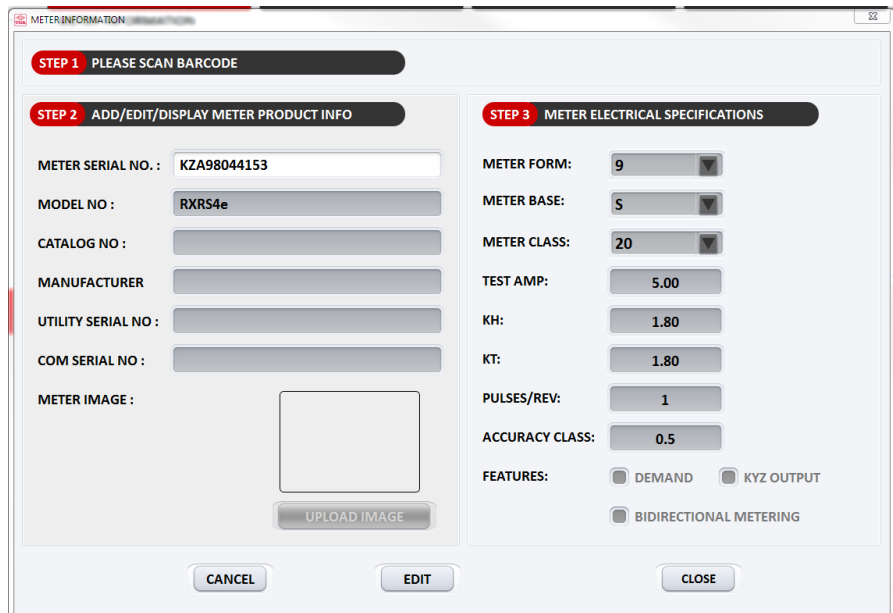
TEST MANAGER
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When a meter is placed in a socket the indicator will change from **EMPTY** to **METER**. Clicking anywhere in the socket status bar selects a meter in a multi-meter master.

METER INFORMATION

DTS-00000018   **METER**   METER S/N:

Double clicking will bring up the meter dialog. You can either type in the meter information or tab to a given field and scan the data with a barcode scanner.

When you are done adding data click ADD, then CLOSE.

METER INFORMATION

STEP 1 PLEASE SCAN BARCODE

STEP 2 ADD/EDIT/DISPLAY METER PRODUCT INFO

METER SERIAL NO. :	KZA98044153
MODEL NO :	RXRS4e
CATALOG NO :	
MANUFACTURER	
UTILITY SERIAL NO :	
COM SERIAL NO :	
METER IMAGE :	

UPLOAD IMAGE

STEP 3 METER ELECTRICAL SPECIFICATIONS

METER FORM:	9
METER BASE:	S
METER CLASS:	20
TEST AMP:	5.00
KH:	1.80
KT:	1.80
PULSES/REV:	1
ACCURACY CLASS:	0.5
FEATURES:	☐ DEMAND ☐ KYZ OUTPUT
	☐ BIDIRECTIONAL METERING

CANCEL   EDIT   CLOSE

To perform a meter test, select the desired Test Sequence from the dropdown box. Only those test sequences appropriate for the test device, meter form and selected service will be shown.

TEST SEQUENCE

FORM: **9S**   SERVICE: **SP 120 A B C** ▼

SEQUENCE: **SP 120 A B C FL, LL, FLPF @TA SINUSOIDAL, ACCURACY** ▼

WAVEFORM SETUP:

At this point the system is in IDLE mode. You can turn on voltage, turn on load (current) or put the system into pulse align mode. In pulse align mode, you can see pulses accumulating on the PC, see them accumulating on the device, or see the pulse flashes on device or pickup.

The large green RUN button will start the Test Sequence.

TEST CONTROL:

VOLTAGE ON

LOAD ON

PULSE ALIGN

▶

◯ IDLE

TEST MANAGER
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The system will run through all the tests in the test sequence. As each test is completed the results are shown on the screen.

When the test is complete you can print a test report using the print button.

All results are saved in the database. These results can be exported to a CSV file in a variety of formats.

WAVEFORM SETUP tab

Each WAVEFORM SETUP has a name. In the image above the name is:

> 4W, WYE FL 120V, @TA PF=1 SINUSOIDAL

The name is arbitrary. The preset setups all conform to the naming approach above. You can create, copy and edit any setup to satisfy your specific test requirements.

The first step in creating a waveform is to select the SERVICE to which the waveform is associated. Service refers to the transformer (CT, PT, LINE) configuration that is feeding the meter. For example, a 4-WIRE, WYE waveform can have three voltages and three currents. You can create any conditions that you wish. The only restriction is that you cannot enable a voltage or current that does not exist for that service type.

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For each voltage and current there are a number of parameters that can be setup. The first is the MODE.

WAVEFORM GENERATOR

CHANNEL	MODE	AMPLITUDE	PHASE	FILE		SHOW
VOLTAGE A	SINUSOIDAL	120.00	0.00		BROWSE	
	SINUSOIDAL					
	HARMONIC (A&P)					
VOLTAGE B	HARMONIC (FC)	120.00	120.00		BROWSE	
	ANSI C12.20 WAVEFORMS					
VOLTAGE C	CUSTOM (USER DEFINED)	120.00	240.00		BROWSE	

Available modes are:

SINUSOIDAL	A pure sinusoidal wave
HARMONIC (A&P)	Waveform is defined by a CSV file containing harmonic number, amplitude and phase. A typical file is shown in Appendix B.
HARMONIC (FC)	Waveform is defined by a CSV file containing harmonic number and the two Fourier coefficients for each. A typical file is shown in Appendix B.
ANSI C12.20	ANSI C12.20-2015 specifies a number of waveforms for harmonic testing of meters. All of these waveforms are predefined in the system and can be selected by picking the appropriate definition in the File Browser. Note that there are different files for voltage and current.
CUSTOM	Each waveform is specified by a file containing 4096 points representing 8 cycles of a waveform. A waveform can vary from cycle to cycle but remember that the last point is followed by the first point, so be aware of unintentional discontinuities.

90_deg_I.ansi
90_deg_V.ansi
MZCC_I.ansi
MZCC_V.ansi
MZCV_I.ansi
MZCV_V.ansi
Peaked_I.ansi
Peaked_V.ansi
Pulse_I.ansi
Pulse_V.ansi
Quad_I.ansi
Quad_V.ansi

For all waveform definitions the amplitude of the waveform is automatically scaled by the system so that the RMS value is as specified under AMPLITUDE. The phase is shifted by the amount specified compared to the original definition.
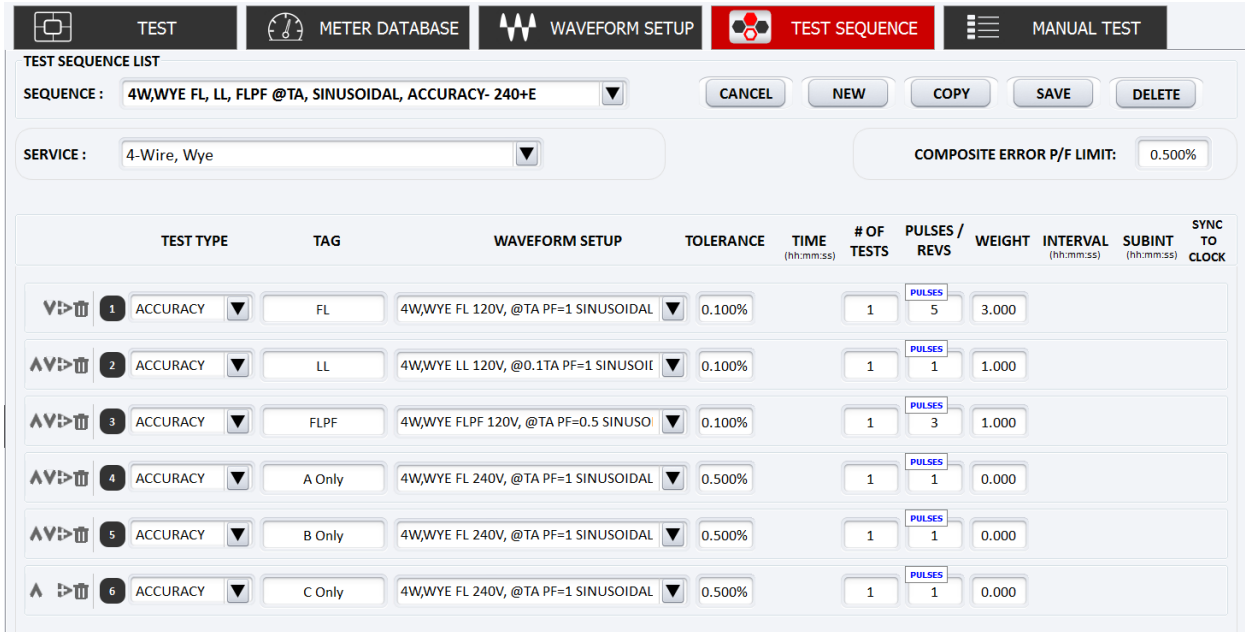
AMPLITUDE	PHASE
120.00	0.00
120.00	120.00

TEST SEQUENCE tab

The Test Sequence tab is used to setup or edit test sequences. Test sequences allow you to setup a complex test scenario that can be run from the TEST tab by selecting it in a dropdown box.

The system comes with a variety of sequences preprogrammed for most common services and meter types. However, many customers will probably want to setup their own sequences with names that make sense to them.

The supplied sequences generally consist of three tests: a full load test, a light load test and a test at PF = 0.5. You can create your own sequence by clicking NEW or by COPYing an existing sequence, editing it and changing the name before SAVEing.

SEQUENCE: is the name you give the test scenario.

Each sequence has a unique service type with which it is associated.

A sequence may contain any number of tests. There are five Test Types available. They can be combined in any order. Each type requires different parameters. The five test types are:

ACCURACY   Measure the meter's Watt-Hr accuracy based on the meter's pulse output

DEMAND   Check the meter's demand measurements

		TEST TYPE	TAG	WAVEFORM SETUP	TOLERANCE	TIME (hh:mm:ss)	# OF TESTS	PULSES / REVS	WEIGHT	INTERVAL (hh:mm:ss)	SUBINT (hh:mm:ss)	SYNC TO CLOCK
⋀ ▷🗑 6		DEMAND ▼	FL	4W,WYE FL 240V, @TA PF=1 SINUSOIDAL ▼	0.500%		1		1.000	00:15:00	00:03:00	⬭

DRIVE   Run the waveform generator for a specified time (no metrology)

		TEST TYPE	TAG	WAVEFORM SETUP	TOLERANCE	TIME (hh:mm:ss)	# OF TESTS	PULSES / REVS	WEIGHT	INTERVAL (hh:mm:ss)	SUBINT (hh:mm:ss)	SYNC TO CLOCK
⋀ ▷🗑 6		DRIVE ▼	FL	4W,WYE FL 240V, @TA PF=1 SINUSOIDAL ▼		00:05:00	1					

TIME RUN

		TEST TYPE	TAG	WAVEFORM SETUP	TOLERANCE	TIME (hh:mm:ss)	# OF TESTS	PULSES / REVS	WEIGHT	INTERVAL (hh:mm:ss)	SUBINT (hh:mm:ss)	SYNC TO CLOCK
⋀ ▷🗑 6		TIME RUN ▼	FL	4W,WYE FL 240V, @TA PF=1 SINUSOIDAL ▼	0.500%	00:01:00	1		1.000			

TIMED REGISTER

		TEST TYPE	TAG	WAVEFORM SETUP	TOLERANCE	TIME (hh:mm:ss)	# OF TESTS	PULSES / REVS	WEIGHT	INTERVAL (hh:mm:ss)	SUBINT (hh:mm:ss)	SYNC TO CLOCK
⋀ ▷🗑 6		TIMED REG ▼	FL	4W,WYE FL 240V, @TA PF=1 SINUSOIDAL ▼	0.500%	00:01:00	1		1.000			

The additional parameters are:

TAG	A user defined short label for the test.
WAVEFORM SETUP	The specific waveform setup associated with this test.
TOLERANCE	The percent accuracy required to pass the test.
TIME (min:sec)	Duration of the test in minutes and seconds
REPEATS	Number of times a test will be repeated
PULSES/REVS	Number of meter pulses that the test will be run OR
WEIGHT	A weight associated with each test. A weighted average error is computed that is the sum of the products of weight and test error.

$$Werr = \sum_{\#tests} \sum_{\#repeats} Error * Weight$$

INTERVAL (min:sec)	For a demand test, the demand interval.
SUBINT (min:sec)	For a demand test, the demand sub-interval.
SYNC TO CLOCK	For demand tests, if set the time interval will be synced to real time.

A Composite Weighted average error limit is also available. The percent error entered here will be the error that the weighted average error is compared against to determine pass/fail.

TEST MANAGER
Operational Reference

This section contains detailed descriptions of each screen in the program and explanations of how to use their options.
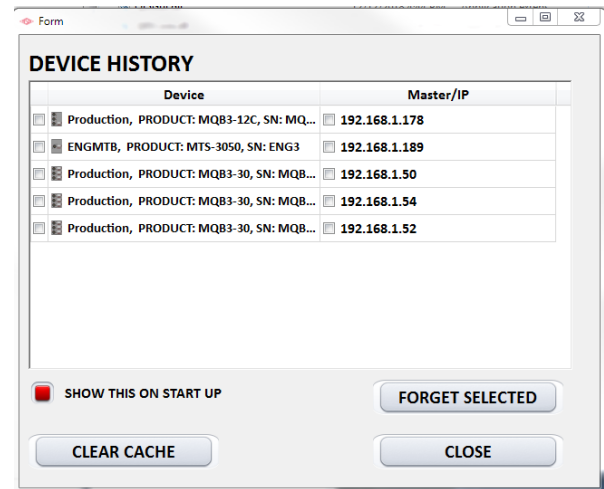
DEVICE HISTORY

By default the DEVICE HISTORY screen appears every time you start Test Manager. This screen displays any devices which were connected to the system the last time TMA was run.

CLEAR CACHE causes all systems to be forgotten.

FORGET SELECTED causes only those systems selected to be forgotten.

Most users prefer NOT to have this system appear on startup. To disable uncheck the SHOW THIS ON STARTUP check box.

Press CLOSE to continue.

SETTINGS `SETTINGS`

The SETTINGS tab has two tabs:

NET SCAN: The NET SCAN tab allows the user to select which subnets will be scanned by TMA to find Tesco NextGen systems. The software can scan multiple subnets.

To add a new subnet type the subnet address into the NET SCAN SUBNETS field. Then click ADD.
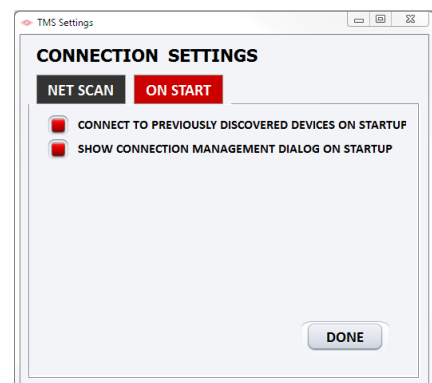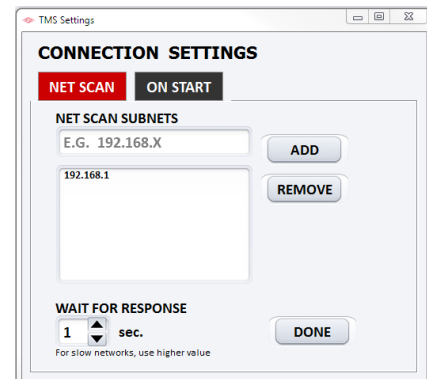
To remove a subnet click to select then press REMOVE.

You can increase the time the scan will wait for a response using the control at the lower left. Generally, even for remote connections over the internet 1 second is sufficient.

ON START: The ON START tab controls what happens when the program starts. The system remembers the devices to which it was connected. If the CONNECT TO PREVIOUS... box is checked then the system will automatically connect to these devices. This is the normal mode of operation. If you disable this function you will have to rescan your network for devices each time.

The SHOW CONNECTION DIALOG at startup was discussed above. This is another place you can enable or disable it.
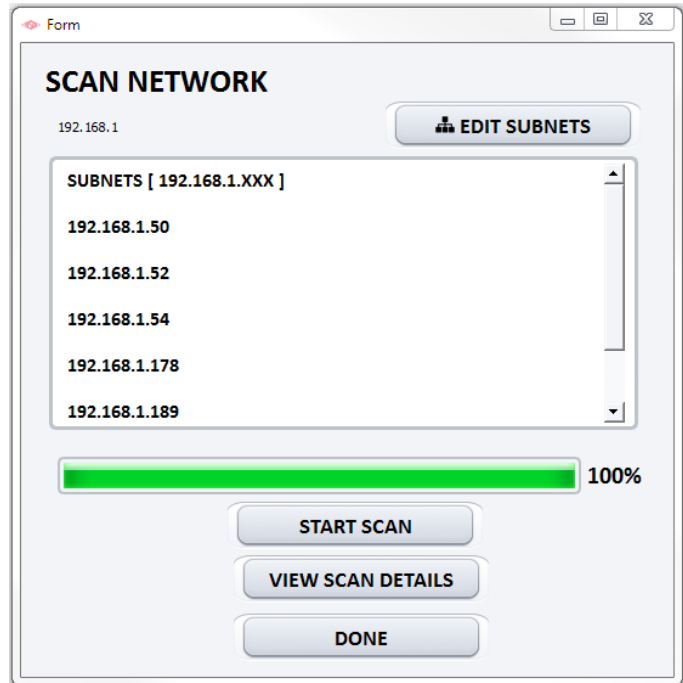
Click DONE on either tab when finished.

SCAN NETWORK

To determine what devices are available on your network(s). Click the SCAN/REFRESH button SCAN / REFRESH on the main screen.

Clicking the START SCAN button will cause TMA to scan all IP addresses on the segments selected in SETTINGS. The IP addresses of all master devices found will be shown on the NETWORK VIEW window of the main screen.

The details of the scan operation are shown via VIEW SCAN DETAILS.

"TCP Connection" means that the PC successfully made a TCP connection to the device on port 1235. Normal PCs and non-TESCO devices will not respond to this attempt.

"Handshaked" means that the device responded to a hashed, "What are you?" request with an appropriate response.

"Info Retrieved" means that in response to system information requests it responded with valid information.

"Unique" means that the system and socket serial numbers received are unique within the network space.

NETWORK VIEW

When you scan a network(s) all devices will be listed on the main screen of TMA.

Each system on your network is represented by an icon.

Each master device on the system is represented by a socket icon.

The database status and position of the device in the system are shown by these icons.

When a particular master is selected it is highlighted in red.

The color of the arrow and graphic of the socket tell the state of the device

In systems with two master devices per row, the purple highlight tells which row the device is located.

TEST MANAGER
Operational Reference

METER DATABASE

SERIAL NO	MANUFACTURER	MODEL NO	CATALOG NO	UTILITY SERIAL NO	COM SERIAL NO	FORM KEY	KT	KH	PULSES/REV	HAS DEMAND	HAS KYZ	IS BIDIRECTIONAL	CLASS	TA	ACCURACY CLASS	METER BASE
J3D561473330PMNA8						16	27	27	1	0	0	0	200	15	0.5	S
KZA98044182	Landis+Gyr					9	1.8	7.2	4	0	1	0	20	2.5	0.5	S
KZAB12352323						9	1.8	1.8	1	0	0	0	20	2.5	0.5	S
2345678						9	1.8	9	5	0	0	0	20	2.5	0.5	S
1234567						9	1.8	1.8	1	0	0	0	20	2.5	0.5	S
KZA98044153		RXRS4e				9	1.8	1.8	1	0	0	0	20	5	0.5	S

NEW	Brings up the meter edit dialog. On exit from the dialog creates a new meter.
EDIT	Brings up the currently selected meter in the meter edit dialog.
DELETE	Deletes a meter and all associated data records from the database.
IMPORT METERS	Allows a CSV file with meter information to be imported into the database.
EXPORT METERS	Exports the selected meters from the database to a CSV file.
EXPORT RESULTS	Brings up the data export form. On this form you can filter what meter's data to export and select the export format.
USE IN TEST	The selected meter will be selected for testing on the currently selected device.

DATA EXPORT MANAGER

There are currently three filters that can be applied to meter test data:

METERS	Either all meters or those selected on the database page.
DATE	All dates, today, yesterday or dates within a certain range.
TEST TYPE	Accuracy, Demand, Time Run, Timed Register or All.

There are also three formats for the output data:

Record per Test	One line of output for each test run. If a test had a number of tests equal to three, then three lines will be generated.
Record per Test Sequence	(Summary) A single line per test sequence with one average test result per step in the sequence.
	(Detailed) A single line per test sequence with each individual test result in the sequence.