



New Product Update



Prepared by Tom Lawton, TESCO
The Eastern Specialty Company

for the Mid-South Electric Metering Association 2015

Overview

- Meter Qualification Boards, Meter Farms and Meter Lab boards
- Hot Socket Research and Products - Simulator, Hot Socket Gap Indicator, Socket Safety Clips
- Meter Lab and Meter Shop Services
- Multi-Position Meter Test Boards
- Meter Manager Software Suite



Meter Qualification Boards (MQB)

TESCO's Multi-Position Meter Qualification Boards (MQBs) are test beds to evaluate meters prior to an AMI deployment as well as to validate newer generations of meters in a post deployment world.

- All are made to order
- 1 to 96 positions have been accommodated
- True three phase, simulated three phase, single phase boards are all available
- Designed to be test beds for the functional testing and evaluation of new generations of meters any utility is considering to deploy or has deployed already.
- Typically used first on the front end of a deployment in the meter lab and then moved to the meter shop during deployment as a functional test bed and Quality Control Board
- Each socket is a zero insertion force socket for ease of use
- Sockets have selectable form (all offered by any individual utility), voltage (69 to 600 VAC) and currents as requested
- Phantom loads or resistive loads available
- Test ports available to verify meter performance and readings independently
- Designed to accommodate disconnect testing



Meter Farms

TESCO Meter Farms are a necessary tool for managing your AMI Populations in a post-deployment environment. They provide a base line to compare future generations against as well as a test bed for over the air upgrades and most importantly a diagnostic tool for any suspected meter or system issues that arise in the future.

The meter farms power up banks of meters and runs a current load through each meter. TESCO Meter Farms are designed to serve as a cost effective method for testing communication, functionality and firmware upgrades from your meter manufacturer(s). The Meter Farm can be used as part of the qualification process prior to deployment, but has been more popular as a post deployment tool to allow large scale testing of all new releases of firmware over hundreds or even thousands of meter points prior to upgrading the entire system. The Meter Farm can also be used to perform long term testing for new hardware releases prior to introducing later generation meters into the field. Every farm is made to order from the form styles and configurations to the loads and voltages for each panel and form.



Hot Socket Simulator (Catalog No. 3100-L)



**Hot Socket Simulator for
the Lab**

Catalog # 3001-L

Slide 5



Hot Socket Simulator (Catalog No. 3100-L)

The new TESCO Hot Socket Simulator gives you the ability to investigate meter failure issues related to hot socket phenomenon. The Simulator is equipped with one 2S meter socket with four jaws, one of which is the heated jaw. The arcing/heating apparatus can be moved to any of the four jaws (jaw 1 is the standard). Additional arcing/heating elements can be provided as an option for multiple hot jaws on the existing socket. The TESCO Hot Socket Simulator records temperature and other pertinent data through the plastic deformation phase of meter failures. The Simulator has selectable loads, and adjustable arcing. The TESCO Hot Socket Simulator has been designed with safety in mind. The simulation chamber is interlocked and must be closed to initiate the start of a test. All power is terminated if the chamber doors are opened. A polycarbonate impact resistant shield is used to enclose all simulations. A temperature output alarm can also be set to a desired cut-off temperature.

Features

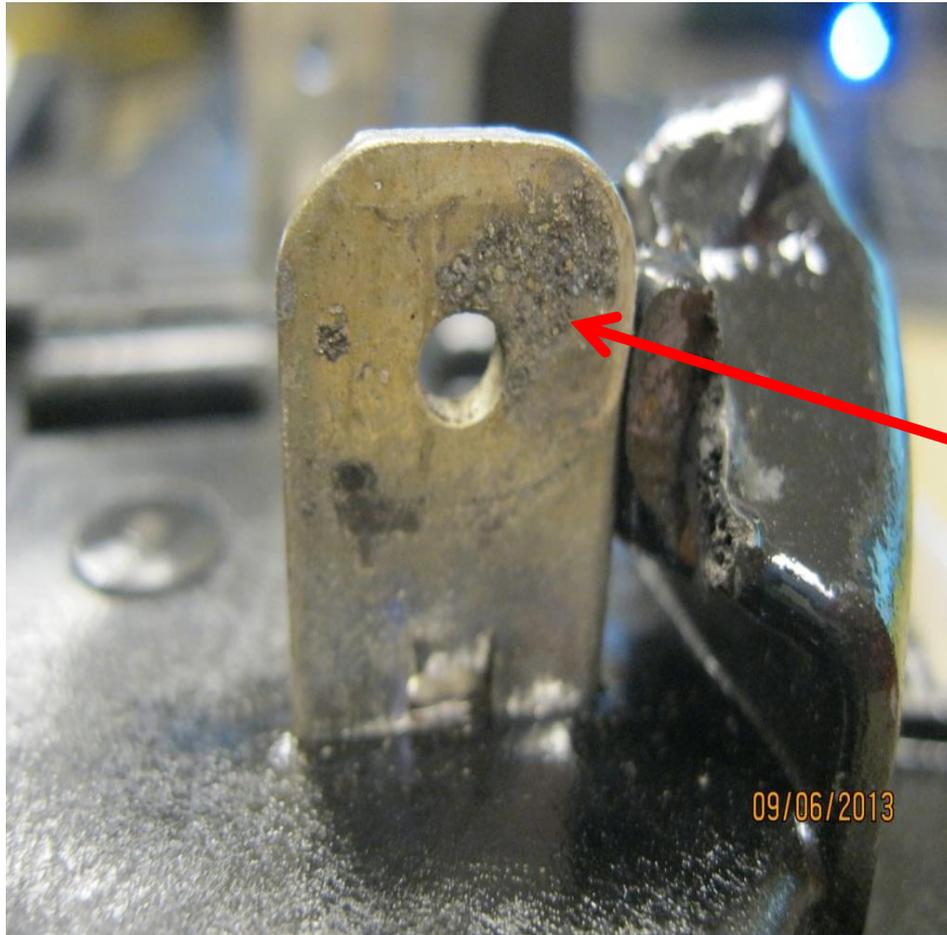
- Ability to simulate a hot socket in line and load jaws through controlled arcing (frequency, gap size) or cartridge heater (temperature control)
- Easily replaceable jaw and socket parts
- Temperature recorded at stab with non-contact pyrometer with a digital display and thermocouple signal output
- Selectable loads (5A, 10A, 15A, 20A, 25A)
- Adjustable arcing gap size, 0.03" (0.8mm) and 0.015" (0.4mm) cams provided (other sizes available)
- Screw adjustment of gap size for non-vibration arcing
- Fixture is on locking casters for ease of mobility

Catalog No. 3100-L Options

- Ability to program vibration periods and "at rest periods"
- Ability to program duration and intensity of vibration
- Ability to gather data on secondary blade temperatures



Jaw to Blade Arcing



Jaws with intermittent connections will arc to the meter blade resulting in pitting on the blade and melted plastic.

Blade shows clear signs of arcing.

Hot Socket Gap Indicator (Catalog No. 300)

The TESCO Hot Socket Gap Indicator is used to determine if a meter socket jaw has become worn-out and unsafe for continued use. The Gap Indicator determines unsafe holding force on meter socket jaws based on laboratory testing.

The TESCO Hot Socket Gap Indicator is quick, easy-to-use and has a rugged, non-conductive insulated shell. The mechanical tool engages the jaws of a meter socket and will indicate a gap or significant loss of jaw pre-load. Total estimated time of testing four jaws is less than 30 seconds. Even minor gaps can result in electrical arcing, resulting with a more serious problem, failure, or electrical fire.

- **Catalog No. 300** - The newly designed Wide-Blade Hot Socket Gap Indicator is better suited for newer style meter socket jaws with designed-in gaps, and socket jaws which have fresh lubricant. This version will work with all sockets, but has a smaller built-in safety margin than the original Hot Socket Gap Indicator.

Note: If feasible, service should be disconnected. Regardless of whether the service has been disconnected or is live, personal protective equipment (PPE) should always be used while operating.



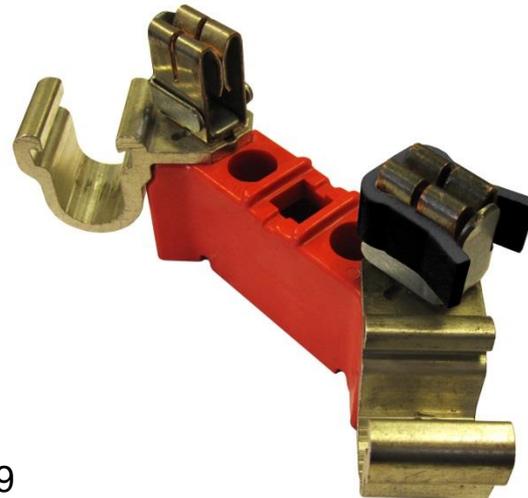
Socket Safety Clip (Catalog No. 301)

TESCO's Socket Safety Clip has been designed to give meter technicians a way to temporarily reassure that a hot socket will not affect a faulty meter socket jaw. The danger zone of a meter socket jaw is 5 lbs. of holding force. At 5 lbs. arcing can occur, resulting in a more serious problem, failure, or electrical fire. The Socket Safety Clip improves the holding force of a meter socket jaw to close to 20 lbs., and can withstand temperatures beyond 400 degrees. This temporary solution simply clips around the jaws of a meter socket until the socket can be replaced.

The TESCO Socket Safety Clip gives utilities an alternate option to disconnecting the service. The Socket Safety Clip is intended for one-time use, and is recommended for each jaw, regardless of the quantity of faulty jaws per meter socket.

Features

- Single-piece, injection molded with non-conductive, highly-durable, high-temperature plastic
- Improves holding force to 20 lbs. per meter socket jaw
- Temporary solution to alleviate disconnecting service
- UL-94 VO Flame Rating



Slide 9



Meter Lab and Meter Shop Service

Our Lab has become a test bed to both identify industry issues as well as potential solutions for these problems. The Hot Socket Simulator is just one example of this. We have also started to increase our ANSI meter testing capabilities so we can better understand how the latest generation of AMI meters is performing or how our latest piece of field equipment or accessory is performing in an outdoor environment (e.g. rain, sunlight). This also enables us to interact with our customers on a more equal footing regarding new meters under consideration for an AMI deployment. This also let's us better understand customer requests for various features on a make-to-order training board or training room.

In our Meter Shop we practice what we preach. We use our own equipment and software enabling us to better understand where the equipment or the software can be improved or in some cases – needs to be improved. We also take in on exchange older test boards of various manufacturers and use those in our meter shop as well, giving us first hand experience into the strenghts and weaknesses of these boards. We use this experience to try and take the best features of these boards and incorporate this into our boards and to avoid the pitfalls of the same boards.



Multi-Position Meter Test Boards (MTB)

TESCO's Multi-Position Watt-Hour Meter Test Boards are designed to serve as a cost effective solution to perform watt-hour accuracy tests. These boards are designed for maximum throughput and operator efficiency to perform a watt-hour accuracy test. A common application is as a retirement test board or an acceptance test board during a large scale meter exchange project (e.g. AMI deployment). Each board can be custom designed to suit your individual requirements. Test results are exported from the board in a .CSV file and can be automatically uploaded to your meter records system or stored in a TESCO meter records module. Recently added was the capability to adjust the voltage magnitude via a variac at each socket position from 0 to 240v. Additionally, digital voltage and digital power factor displays are available for each socket position as well

Meter Sockets: Up to 96 pneumatic socket positions (banks of 4)

Operation

- Operator loads meters into a bank of sockets – an indicator light confirms properly seated meters.
- Operator scans barcodes on meters and sockets to set up the board and capture meter information. If this is a retirement test, the operator then takes photo of last dial locations on meter with same hand held bar code scanner.
- After scanning, test automatically begins.
- Operator loads second bank, while first is testing (if applicable)
- Cycle time is better than 2 meters per minute but ultimately depends on the number of sockets and the type of meters



Meter Manager Software Suite

TESCO Meter Manager Software automates metering, field and shop operations while helping metering managers make better business operational decisions.

TESCO's software interfaces with competitors' software and hardware, as TESCO understands that our software and hardware are not the only products in use by the industry. In addition, TESCO's Meter Manager Modules also provide a hardware interface for field and shop equipment, providing a complete solution for our customers. There is no competitor on the market that has the combination of software and metering expertise that TESCO has.

Each Module is written specifically to support metering operations. No Module has been adapted for use from some niche outside of metering. TESCO has the only software written exclusively for metering professionals, by metering professionals. TESCO has worked tirelessly to create a uniform set of Modules written on the same software base for every customer in North America. An enhancement for one customer is an enhancement for every customer. At the same time, every customer has every module configured for their use and their reporting requirements.

The TESCO Meter Manager Software Suite consists of separate modules which can be purchased individually or separately depending on your specific needs. Here is the list of modules TESCO offers:

- **Meter Shop** (ordering, receiving, testing, accepting & retiring)
- **Meter Inventory** (tracking of non-installed meters)
- **Meter Records** (all attributes and ancillary devices associated with a meter)
- **In-Service Testing** (random sample testing)
- **Personal Protective Equipment (PPE) & Tool Tracking Management**
- **Field & Site Verification** (includes timekeeping, scheduling & routing)

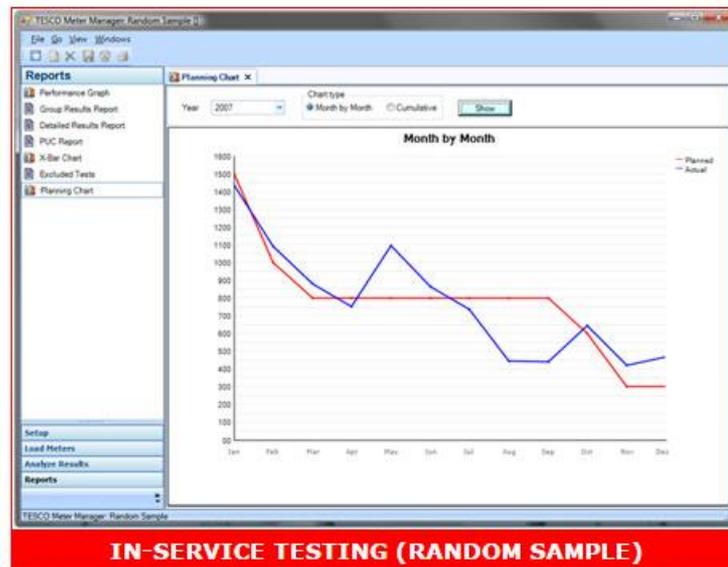


Meter Shop, Inventory, In-Service Test Modules

TESCO's Meter Manager Meter Shop Module handles every aspect of an electric or gas meter shop from tracking meters and equipment through the shop to performing any required testing, from sample testing shipments to 100% testing.

Utilities can import manufacturer test data, import test data from the meter test boards, and enter test information directly. Today's meters require more than just an accuracy test; it is possible to capture test information for mesh radios, ZigBee modules, remote-service switches, cellular modems, firmware versions or any other component of the meter.

All components attached to a meter can be tracked. This can include permanently mounted components, such as a mesh radio with its own ID, and removable components.



Meter Records Module

The TESCO Meter Manager Meter Records Module provides a repository for all the information about meters and other metering devices that need to be tracked and retained for Metering operations. This module is designed to hold all the information about a device, and will work in conjunction with a utility's customer information system (CIS), keeping the important meter attribute information that the CIS system might not be capable of (such as firmware version, IP address, MAC address, etc.).

The system can store any information required about the metering equipment as well as site specific information. The system is capable of tracking communication modules and firmware levels for these modules if the utility tracks this information. The system tracks orders for new meters from initiation through acceptance in the meter shop and field deployment. Meters can initially be tracked by quantity, and then serialized upon receipt. TESCO's Meter Records Module will integrate directly with the utility's CIS, including SAP, providing the required information that is needed about the meters for the utility's financial asset management system while also keeping the balance of the information that is needed by the metering department to effectively perform daily tasks.

The screenshot displays the TESCO Meter Manager software interface. The window title is "TESCO Meter Manager (Editing V3439N)". The interface includes a navigation tree on the left with categories like "Installed Service", "Channels", "CTs", and "Trails". The main area shows configuration for "Meters V3439N-S20929".

Key sections in the interface include:

- As Found:** A table with columns for "KV", "KV2", "KV2B", and "KV3R".
- Line Voltage:** A table with columns for "480", "436", and "481", with a "Nominals" row showing "480" and "504".
- Phase Voltage:** A table with columns for "277", "280", "279", "0", "263", "291", "263", "291", "263", "291", "0", "4".
- Phase Angles:** A table with columns for "1-2", "1-3", "2-0", "2-1", "3-0", "3-1".
- Check CTs:** A table with columns for "CT Serial #", "Phase", "Rating Factor", "Measured Primary", "Measured Secondary", and "Correct Secondary".

CT Serial #	Phase	Rating Factor	Measured Primary	Measured Secondary	Correct Secondary
1122830	2	-	3.00	314	3.93
1131290	3	-	3.00	314	3.93

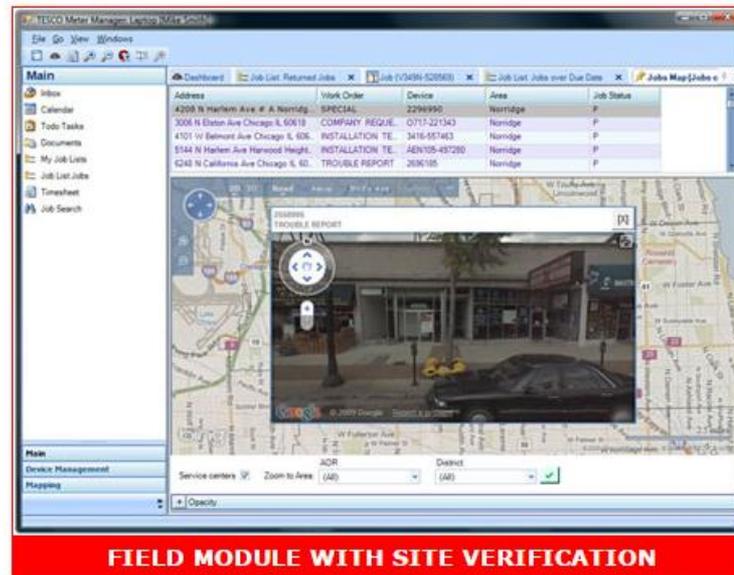
At the bottom of the screenshot, there is a red banner with the text "FIELD MODULE WITH SITE VERIFICATION".



Field & Site Verification Module

TESCO Meter Manager's Field and Site Verification module can operate on several different levels of complexity. In the simplest mode, the system is suitable for a field tech to perform standard field operations such as self-contained meter changes or field tests. In a more complex mode, it can validate billing constants for meters with CTs and VTs, record voltage and phase angle information, as well as tests of meters and instrument transformers.

Site Verification is designed specifically for metering, so the system is able to enforce utility-specific business rules about what tasks, inspections and tests should be performed based on the work order type and type of service.



Questions and Discussion



**We are working very hard to become “everything but the meter”.
We want to be the resource you turn to first when you have any
meter related question or requirement.**

Tom Lawton

TESCO – The Eastern Specialty Company
Bristol, PA

215-688-0298 (cell)
1-800-762-8211

This presentation can also be found on the South East Exchange web site and
under Meter Conferences and Schools on the TESCO web site:

www.tesco-advent.com

