scully

MTT 1000

MOBILE TRUCK TESTER

Application Notes
for the Truck Tester
and Mobile Application

Mobile Truck Tester® - Application Notes

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Updates Released August 2025

1.1 Home Screen

1.1.1 Truck Re-Test Button
The Truck Re-Test button on the home screen restarts the truck detection and testing sequence.

Uses: After making a change to the equipment on a truck, such as replacing a sensor and wanting to re-test the system, the button is easily accessible on the home screen.

1.1.2 Real-Time Clock (RTC) Status Displayed in App Log List
All RTC updates, both manual and automatic, are now displayed in the application log on the home screen. This includes country, time, and time zone.

Uses: Displays the truck tester clock settings during start up, enabling users to confirm it is accurate to their setting and the tests they run will display the correct time stamps.

1.2 Data & Reports

1.2.1 Human Readable MTT Device Logs
The MTT device logs are now in a user-friendly format that interprets logs in plain English, reducing confusion for non-technical users. Click on a single test result to review the data log.

Uses: Supports user analysis of test log results in the basic format

1.2.2 Log Filter
Users can now filter logs by MTT device, trailer ID, or date range. Click on the top left filter icon to view "Filter" options. After selecting a preference, click apply and the log data files that meet the filtering criteria will appear on the "Data and Reports" screen. Users can also refine their filtered results by selecting individual logs.

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Select Individual Records to Filter
You can work with all filtered results or a selection to refine your results. To select individual logs, either tap and hold (long press) on a log or use the kebab menu (three-dot menu) and choose "Select Individual Records."

To complete your selection, simply tap the checkmark icon and only the records chosen will appear in the list. To modify a selection, switch back to selecting individual records.

Uses: The filter makes it easy to find a specific test report within a large data report set. It can also quickly identify all completed tests for a particular truck or trailer.

1.2.3 Export Options
Users can now export MTT device logs in multiple formats, including plain text, CSV, and raw content.

• Application records are presented in plain text format
• CSV provides a comma-separated view of records.
• Raw format retains the records' original format (as received from the tester)—useful for troubleshooting but not ideal for everyday operations.

All export options are available on the kebab menu. When exported, all visible records will appear in the selected format and included as an attachment file to be emailed.

Uses: Easily transfer log test data to Microsoft® Excel or other reporting programs.

1.2.4 Create Reports from Templates
Users can now create a report using the Report Template based on the MTT device log selection. The report templates enable users to display test data in a user-friendly, intuitive format. Two types of reports can be created—a single log test report presenting data of one test result and an aggregate log test report presenting data of multiple test results.

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1.2.4.1 Single log test reports:
To run this report, choose "Create Report..." from the kebab menu or the Share button in IOS, and select the desired template. The Scully MTT Test Report will open in a new window and display the following information:

Log information: In the test report we included a field named Log Information. This allows a user to reference the test log the report was created from. he log information includes the log number of the data file and the customer-specified file name is applied.

Scully MTT Test Report

Date/Time of Test:	8/18/2025 09:20:28.434 AM EDT
Log Information	Log Number =326 Log Label = Sample Report
Tester Name & ID:	Scully Tester Dani-0000243201; truck tester ID is 243201
Vehicle ID (decimal):	20550373 on Pin 9
Vehicle ID (HEX):	013992e5 on Pin 9
Sensor Type:	2-wire
Initial Sensor State:	Count = 8, Dry => S1 D, S2 D, S3 D, S4 D, S5 D, S6 D, S7 D, S8 D
Initial Ground State	diode
Sensor Wet Test:	Count = 8, Wet => S1 W, S2 D, S3 D, S4 D, S5 D, S6 D, S7 D, S8 D Count = 8, Dry => S1 D, S2 D, S3 D, S4 D, S5 D, S6 D, S7 D, S8 D Count = 8, Wet => S1 D, S2 W, S3 D, S4 D, S5 D, S6 D, S7 D, S8 D Count = 8, Dry => S1 D, S2 D, S3 D, S4 D, S5 D, S6 D, S7 D, S8 D Count = 8, Wet => S1 D, S2 D, S3 O, S4 D, S5 D, S6 D, S7 D, S8 D Count = 8, Wet => S1 D, S2 D, S3 W, S4 D, S5 D, S6 D, S7 D, S8 D Count = 8, Dry => S1 D, S2 D, S3 D, S4 D, S5 D, S6 D, S7 D, S8 D
Ground Type & Status:	Diode => Good
Tester Status:	Battery Level High

Uses: Add details to the Log Information field to create a reference between the test log data and the report.

Wet Test and Ground Test results: The sensor wet test data displays any change in test results in a new row. In this example the first sensor changed from a wet to dry state. Then in row 3, sensor two was wet and in row 4 it changed back to dry. Note that sensors can be W-Wet, D-Dry, O-Open, or S-Short. This logic is the same on the Ground Test where the report displays the change status between "good" and "none found" ground.

1.2.4.2 Aggregate log test reports:
To run this report, first choose which log files to include in the aggregated report using the "Select Individual Records" in the kebab or three dot drop menu. Select the tests to be reported by checking the boxes on the left of the log file and accept by clicking the check mark on the top right in IOS and in Android. The filtered reports will be listed in the Data and Reports window. Choose 'Create a Report' from the kebab menu or the Share button in IOs and select the desired template. The Scully MTT Test Report will open in a new window displaying the following information:

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Each test log presents the ground status, sensor last wet test result, and the time and date of the test. The data is presented based on the Truck ID and result. If no Truck ID is present, then it would state "none." If a test resulted in a faulty condition, a Report notification will mention "Trailer XYZ needs service" based on the trailer ID, and faulty test result listed in the sections above.

Scully MTT Aggregated Test Report

Period of Testing:	8/18/2025 09:19:35.000 AM EDT - 7/18/2025 02:56:21.000 PM EDT
Ground Verification:	20550373 => Ground Diode = Good None => Ground Diode = Good 20550373 => Ground Diode = Good 20550373 => Ground Diode = Good
Sensor Verification:	20550373 => 2-wire, Count = 8, Dry None => 5-wire, Count = 4, Dry 20550373 => 2-wire, Count = 8, Dry 20550373 => 2-wire, Count = 8, Dry
Test Times & Dates:	20550373 => 7/18/2025 02:56:21.000 PM EDT None => 7/22/2025 03:58:41.000 PM EDT 20550373 => 8/14/2025 07:46:56.000 AM EDT 20550373 => 8/18/2025 09:19:35.000 AM EDT
Report Notations:	
Tester Name(s), ID(s) & Status:	Scully Tester Dani-0000243201, Battery Level High Scully Tester Dani-0000243201, Battery Level Good Scully Tester Dani-0000243201, Battery Level Good Scully Tester Dani-0000243201, Battery Level Good

On the Create Report screen, tap on the help icon in the tab bar for additional information.

1.3 App Settings Screen

1.3.1 Countries List
The application now automatically detects the country based on the phone's language (Android) or region (iOS). Users can manually override the country's setting.

Uses: Properly configure the Real-Time Clock (RTC) on your tester and manually apply any necessary correction if the country is not automatically detected. If your country is not listed, we recommend picking one of the valid options that are also in the time zone you want to use.

1.3.2 Report Templates Management
The app now supports configurable report templates for creating standalone or aggregated reports from one or more MTT device logs. Scully is supplying a default report template for standalone or aggregated reports available during initial installation or update. If a customer wants to create a customized report, Scully can support this effort for a fee

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Each report template has a version number. You can keep multiple versions of the same report and switch which one you use by default at any time. Different versions may support different test result formats, contain updates, and include improvements.

You can see a list of all templates you currently have. Each row shows the template title, author's name, and template version. Tapping on a template will expand the row to provide additional information.

New report templates can be added, restored, deleted, and selected as default. Details how to implement are listed below.

1.3.2.1 Adding new template
At any time, you can add a new template to the ones you already have. To do this, simply tap on menu icon at the top of the screen, select "+ Add" menu item and you will be prompted to select a file. You can choose either a single template, typically ending with .j2 or .j2.txt, or a zip file to add multiple templates at once.

1.3.2.2 Restore defaults
At any time, you can restore the templates to their original state. To do this, simply tap on the menu icon at the top of the screen, select the "Restore Defaults" menu item, and confirm the action when prompted. This will replace your current templates with the pre-installed default versions. Those changes do not affect custom added templates. Please ensure you create a fresh backup before proceeding.

1.3.2.3 Deleting template
You can delete templates that you no longer need. To do this, tap on the kebab menu for the template and choose 'Delete,' then confirm your choice. After deletion, all versions of the template will be permanently removed. Be careful — there is no way to undo the deletion. The only way to bring a deleted template back is to add it again.

1.3.2.4 Deleting template version

If you still use a template but need to delete older versions that you no longer require, you can delete specific versions while keeping the others intact. To do this, tap on the kebab menu for the template and select 'Versions' from the submenu. Once you locate the version you no longer need, tap on it and choose 'Delete.' Confirm your choice, and the version will be permanently removed. Similar to deleting templates, this operation cannot be undone, and you will have to add the version again to bring it back.

1.3.2.5 Changing default template versions

When selecting a report template to create a report, you can only use a particular template version. By default, the latest available template version is set as the default. However, you might want to use a different version as your go-to choice.

To change which template version is used by default, tap on the kebab menu for the template and select 'Versions' from the submenu, then tap on the desired version and choose 'Make Default.'

If you change the default version to something other than the latest, it will not be automatically updated to the latest when you import a new version.

Uses –advanced users may have multiple versions of reports for different customers therefore will need to navigate using different templates as they create reports.

1.3.3 Backup & Restore

Users can now create and restore backups of their data using two modes: replacing everything or loading only missing data. Backups capture the complete application state, enabling quick restoration to a previously backed up state.

For your data safety, the backup and restore options are only available when you are not connected to any tester.

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1.3.3.1 Backup data

The data backup allows you to create a reserve copy of your application data. It includes everything necessary to restore your application to its state at the time of the backup, such as tester information, logs, report templates, application settings, and more. Have peace of mind with a secure backup copy of your data.

To create a backup file just click the 'Backup Data' feature and the system will archive the .ZIP file and save it either on the device or the cloud.

1.3.3.2 Restore data

Restore option allows you to bring your application back to the state it was at the time you created a backup copy. Before a backup copy is restored, you can choose to replace everything or add missing items. If you choose to replace everything, all current data will be deleted and replaced with the data from the backup archive you select.

If you choose to add missing, your existing data will be preserved and only the data from the backup that you don't currently have will be added. Your existing data will remain unchanged.

Uses – backing up your data periodically is a good practice if something gets corrupted and you need to reinstall the application your data will be saved to the last back up.

In a case where a device needs to be replaced / upgraded, having the ability to restore the Scully App to the same configuration as the last backed up version is now feasible.

1.3.4 Report an Issue

When a user comes across an unexpected technical problem with the App that they deem important to share with Scully technical team, an easy means of communication is via the 'Report an Issue' function. This feature provides technical information on the status of the App and would be sent as an Attachment via email. and allows users to share it with the Support Team when they encounter issues. This file should be emailed to Scully application team to email address: techservice@scully.com.

1.4 Help Screen

Help screens now feature updated content. We transitioned the help sections to Markdown format, enabling cross-referencing within the content.

1.5 Tester settings

Help screens now feature updated content. We transitioned the help sections to Markdown format, enabling cross-referencing within the content.

1.5.1 Real-time clock (RTC) update

The tester maintains an internal real-time clock (RTC) that allows for the time and date tagging of all testing activities without the need for a wireless connection. This RTC needs to know which time zone the tester is operating in and periodically needs to be updated for accuracy. By default, the App updates the tester RTC whenever the wireless Bluetooth connection to the app is established. However, you can disable this setting and manually set the time, date, and time zone stored in the tester. Select real-time clock and use the controls on the next screen to make your selections.

1.5.1.1 Current tester time

Regardless of which way the RTC is configured, you can see the current time and date in your tester, along with the time zone and country, at the top of the screen.

1.5.1.2 Set RTC automatically

This option instructs the application to adjust the RTC to the time currently set on your mobile device every time you connect to that tester. The date and time will follow your country and time zone settings from your mobile device. In the unlikely event that your time zone is not detected correctly, you can adjust the country in App Settings to improve detection. If you have a custom country set in App Settings, it will be used instead of the country sent from the device.

1.6 Set RTC manually

This option allows you to set the date and time manually. Be careful — incorrectly setting the RTC can result in improperly dated test results, so always double-check the time you are setting. Automatic RTC adjustment is highly recommended instead.

When you select this option, you will be presented with a screen where you can adjust the date, time, and time zone. By default, the date and time will be updated to match your tester device's current settings, respecting the time zone and country set on the tester. Unless you change the values, they will automatically update while you are on the screen. Changing either the date or time by more than one minute from the mobile device's time will stop updating the values, and you will see a warning. You can tap "Reset" to bring the time back into sync.

Your selection will be applied to the tester, switching it to manual RTC adjustment once you tap the 'Update Tester RTC' button. If you click 'Cancel' or use the back button, you will navigate back to the RTC screen, and no changes will be applied.

2. 2-Wire Wet Test Errors During Initial BT Connection

The MTT stores all results of testing sessions in its internal memory for downloading to the MTT application. The test results download begins automatically when a Bluetooth connection is made between the MTT and the MTT application. On the home screen of the application, the download activity can be seen as a progress bar across the very top and a count of test reports on the right side of the screen.
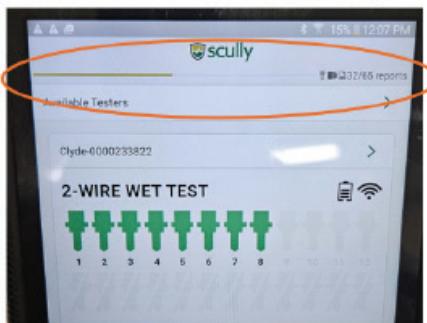
If the MTT is running an active wet test on a 2-wire sensor system during this download, it may display false intermittent faults on the 2-wire sensors until the download progress is complete. Random sensor icons may turn red on the app screen as well as the MTT screen and if audible alerts are enabled, alert tones will be briefly heard.   These faults are the result of the MTT uProcessor taking time to process the download messages and not correctly measuring the timing of the 2-wire sensor pulses. The problem will clear when the download operation completes. This problem would be more noticeable when a tester with a large number of test reports is connected to a new mobile device or a new instance of the MTT application. In this case the entire library of test reports is automatically refreshed on the mobile device and this process can take up to 5 minutes to complete. Once it is done, subsequent connection sessions should only need a few new reports to be down-loaded and will only take a few seconds to complete. The test report download process cannot be manually paused although it can be inter-rupted without errors if the app is closed or the MTT powers off during the download. If it is interrupted in this way, it will recover and continue during the next Bluetooth connection event.

3. Errors During Tester to Application Reconnections Over Bluetooth
In normal operation, when a MTT is connected to a mobile device using the MTT application, the application remembers the connection. When the MTT powers off or loses connection due to interference, distance, etc. the application will listen for it to return and make multiple attempts to reconnect. Usually this is successful, and the pairing can be resumed without problems. Occasionally, however, this process can fail and there are two scenarios that can occur.   One is when the application is unable to complete the reconnection, and it stays in a waiting loop. The other is when the tester believes that the connection has been made but the application does not respond. These two scenarios both result in a condition when the application appears to be stuck attempting to reconnect.

The application will timeout if the reconnection is not successful within a default time of 30 seconds. (This timeout is user selectable from 15 seconds to up to 2 minutes.) Once this timeout occurs, use the menu option "Available Testers" to start a new connection to the MTT.   If the MTT does not appear on the list of available testers at this time, then the tester may need a power cycle to recover. This is achieved by waiting for the tester to timeout and shut itself down. Once the MTT times out, remove it from the socket, reconnect it to a socket, and then restart the application.

4. 5-Wire Sensor Circuit Diagnostics

A system of 5-wire overfill sensors has some characteristics that can make troubleshooting challenging. The system has elements of both a series circuit and a parallel circuit. The series side is represented by the dry-sensor pulse that is passed like a baton from the first sensor to the last sensor in the string. The rack controller begins the chain by sending a pulse to the first sensor in the chain. Any sensor that is wet or faulted will not hand off the pulse to the next sensor and after a short timeout interval, if the pulse does not arrive back at the controller, the state of the sensors is determined to be "wet" – meaning one of more of the sensors in the chain is reporting a wet state.

Each sensor has it's own power & ground connection. Each sensor also has an additional control line called a "diagnostic" line. The diagnostic lines are all connected in parallel to one circuit that goes back to the rack controller. When a dry sensor receives the pulse, and for a short time period after, it connects that diagnostic line to an internal resistance to ground to cause a pull-down of energy from the parallel diagnostic line circuit. By measuring the combined parallel resistance on the diagnostic line, the controller can calculate the number of dry sensors in the system. When a sensor is wet or faulted, it will not pull-down the diagnostic line and not hand-off the pulse (baton) to the next sensor. That loss of the return pulse combined by the change in load on the diagnostic line is what the rack controller uses to determine not only a wet state, but likely which sensor in the circuit has become wet.

5-Wire Sensor Circuit Diagnostics

Diagnosing this circuit requires starting with the assumption that any part of the circuit could be compromised and using the information from the MTT to narrow down the logical choices. It's important to start by knowing how many fuel compartments your vehicle has. This should correspond to the number of 5-wire sensors reported by the MTT. On the MTT screen you will see a display of the sensors identified by red or green icons. On a properly working vehicle with 6 compartments, six green sensor icons will be shown on the screen. The MTT does not have any a-priori knowledge of the number of sensors on a vehicle. It can only display what it sees. Therefore, it is possible that the MTT might show only 5 (or less) sensors instead of 6, but all green. The most likely cause for this situation would be a broken connection between one of the individual sensor diagnostic lines and the main return circuit on pin 5 of the socket. It's also possible one of the sensors has an internal fault that causes it not to pull-down the diagnostic line. The MTT will not be able to identify which sensor has this condition. But, because all sensors are green, the daisy-chain return pulse circuit is confirmed to be working properly, and all sensors are reporting a dry condition. The MTT is not able to otherwise know how many sensors should be in the system so it can only report what it can measure from the system in it's current state.

Using our example above, another possible display would be five (or less) green sensors and one (or more) red sensor icons totaling to 6. This indicates that one or more sensors are reporting as wet (or faulted). The first likely candidate is the sensor associated with the first red icon on the display. This is the sensor that should be checked first.

5-Wire Sensor Circuit Diagnostics

A third possible display would be the correct number of green sensor icons (6) and then one extra red sensor icon for a total of 7. At first this is not intuitive. A vehicle with 6 sensors should not be showing 7 on the MTT display. However, there are a couple of scenarios where this can happen. The first is when the circuit from the last sensor in the chain is damaged causing the pulse chain to be broken, but since the last sensor received and forwarded the pulse, it also asserted it's diagnostic line pulldown. That would give the MTT the impression that there are 6 dry sensors but apparently no pulse return, implying the presence of a seventh wet sensor. In this case start by tracing back the circuit from pin 6 on the socket to the last sensor in the system. Another possible, but less likely scenario would be a sensor that internally does not output the pulse, but still asserts it's diagnostic line. This could be determined by manually testing the last sensor in the system.

4.1 Setting the PIN 5 Resistance Calibration Value
Proper determination of number of sensors (meaning compartments) in a 5-wire system requires measurement of the combined load on the socket pin 5 diagnostic circuit during the pulse cycle. The accuracy of this measurement is impacted by any resistance in the vehicle wiring, the quality of the wiring terminations to each sensor, and the cleanliness of the socket connections. Any additional resistance in the system can contribute to a case where the count of the number of sensors displayed by the MTT could be less than the actual number. To prevent this, the MTT is calibrated for diagnostic line accuracy, and a small amount of excess wiring resistance is compensated for in that calibration. Under the hardware settings for the MTT in the mobile application there is a setting named "Pin 5 Resistance". This setting can be used to adjust the diagnostic line measurement calibration in case the MTT is consistently reporting any incorrect compartment count with all green icons. The default value will be either 365 or 370 ohms depending on factory setting. Increasing the value will reduce the number of sensors and decreasing the value will increase the number of sensors reported. The settings can be changed in 5 ohm increments between 355 and 380 ohms. It is recommended to change this value only if necessary and in increments of 5 ohms at a time.

5-Wire Sensor Circuit Diagnostics

4.2 Diagnosing a Single 5-wire Sensor Connection with the MTT

The MTT can be used to troubleshoot a 5-wire overfill sensor circuit with one or up to 12 sensors attached. This section will discuss the methods to diagnose a system with a single sensor. Some aspects of this are different from a multi-sensor 5-wire system. The picture below illustrates the typical wiring of a 5-wire overfill sensor.
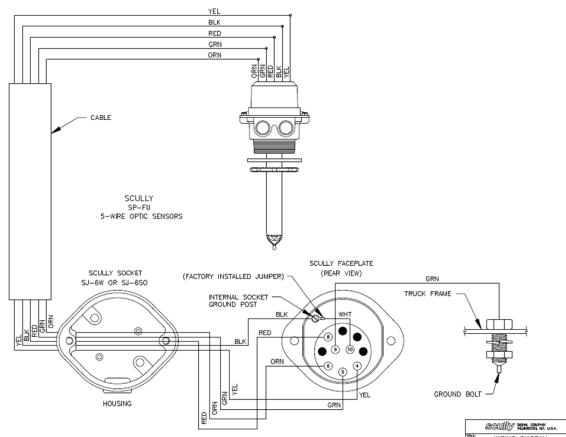
The functions of the 5 wires by color and socket pin number are listed here:

Wire Color	Vehicle Socket Pin #	Function
Red	8	Power to sensor
Black	10	Ground
Yellow	4	Test pulse to sensor
Green	5	Diagnostic line
Orange	6	Test pulse return to controller

Detailed instructions on the installation and operation of 5-wire sensors can be found on the Scully website and other app notes about general debugging of 5-wire systems.

5-Wire Sensor Circuit Diagnostics

Connect the MTT to the overfill sensor socket and allow it to complete its initial detection and testing. If you have a good working single sensor circuit the display will be a single green sensor icon and the system type of "5-Wire" will be displayed.

If you then physically wet the sensor, the display will appear like this:

5-wire sensor circuit faults can take on several forms. One option is the interruption of the diagnostic line. If the MTT is running the wet-test and the diagnostic line is interrupted, (but all other connections are working) the MTT will not indicate a fault on the screen. This is unique to a single sensor configuration.

5-Wire Sensor Circuit Diagnostics

Restarting the MTT or selecting the "Truck Config" command can be used to re-run the initial diagnostics. The MTT will now display the error message "NO DIAG/CTRL" indicating that the diagnostic line is faulty, while still showing the single green icon. When you repair the diagnostic line connection you must re-run the initial testing to confirm the diagnostic line is now working.

NO DIAG/CTRL
10/23/2024 12:32:56 PM

Another scenario would be the failure of the pulse-in or pulse-out wires (yellow and orange) to the sensor. The MTT display during the initial test can be used to determine which circuit is the likely suspect. If the orange wire from the pulse return circuit to pin 6 is interrupted, the MTT will switch to a display that shows one green sensor and one red sensor.

5-WIRE WET TEST

1 2 3 4 5 6 7 8 9 10 11 12
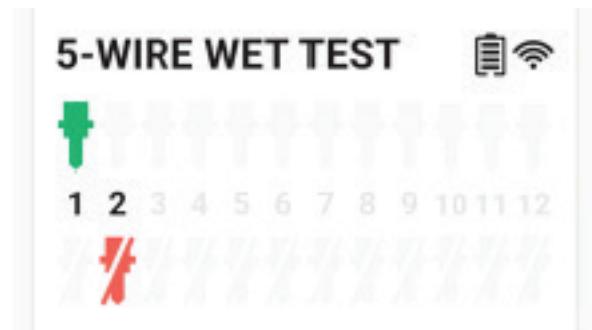
This display occurs because the test pulse is still reaching the dry 5-wire sensor, so the sensor is asserting it's diagnostic line. The diagnostic line is being monitored by the MTT so the count of dry sensors is shown to be at least 1. However, the test pulse return is not being detected so the MTT adds an additional sensor to the display and marks it as red. This display with a known-good single 5-wire sensor is generally found when there is a break in the orange wire (pin 6) circuit.

5-Wire Sensor Circuit Diagnostics

A similar scenario would be the failure of the yellow wire (pin4) circuit. In this case, the MTT display will only show a single red sensor after initial detection or during the wet-test. Hence, if you see either of these two displays, you can determine which pulse circuit (pin 4 or pin 6) is most likely at fault.

Another scenario is the interruption of either the red (pin 8) power or black (pin 10) ground channels. A fault in the power line with all other connections in good order would most likely appear the same as the yellow wire fault, with just one red sensor being displayed. An open ground connection, however, would likely result in the MTT completely mis-detecting the system and showing a display like this:

5-Wire Sensor Circuit Diagnostics

Here, because there is no ground circuit connected, the MTT is unable to properly detect the configuration and defaults to 8 bad 2-wire sensors. It's enough to know that you have a 5-wire system instead to know that you need to begin with validating the ground circuit.

As a final note, when you have more than one circuit fault at a time, any combination of displays could be possible on the MTT. Begin by debugging each circuit and as repairs are made, re-start the tester to re-detect the new state of the system.

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and Dependability since 1936.

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