VIAVI ONX 580

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2. Outside Plant Testing

2.1 POTS Dialer

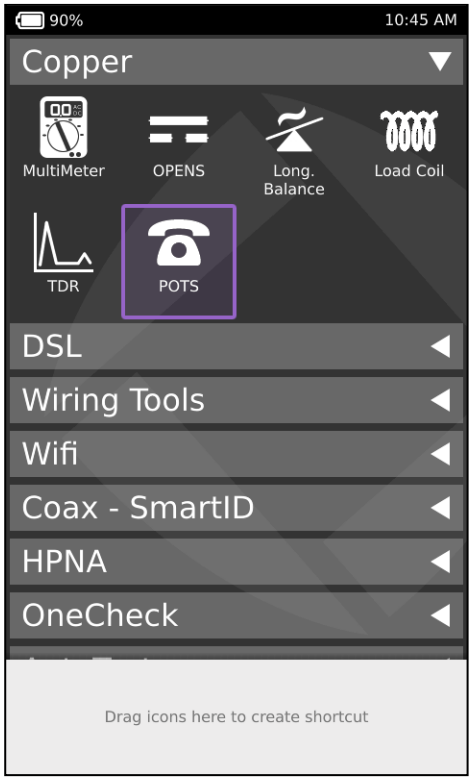
Purpose

The purpose of this is to use test set as a buttset.

Test Interface

Copper connector

Procedure



1. Connect Tip and Ring test leads from the test set to the desired pair. Connect Green lead to Ground. Or connect the RJ-11 to the POTS connector on the side panel.
2. Under **Copper** select **POTS** test application

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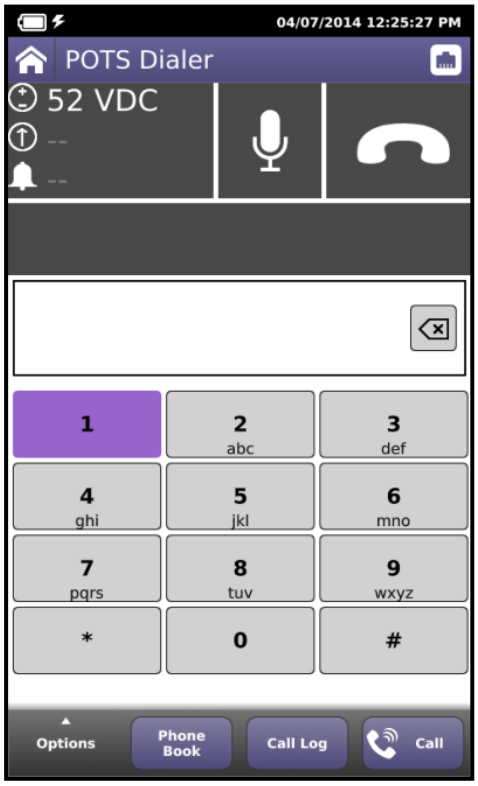
2.1 POTS Dialer (continued)

3. Verify the proper connector is shown in the upper right hand corner of the display. To switch between **T/R** or **RJ-11,** tap the icon.
4. Verify VDC is displayed.
5. Press **Call** and verify that dial tone is present, and current in mA is displayed.
6. Enter the number to be called**.**
7. Press **End** to end call.



8. Using a cell phone or other means, dial customers number and verify Ring voltage is displayed.

Note:

Some jobs are issued with no dial tone associated on the order; you will not be able to perform an Automatic Number Identification because no telephone number has been assigned.

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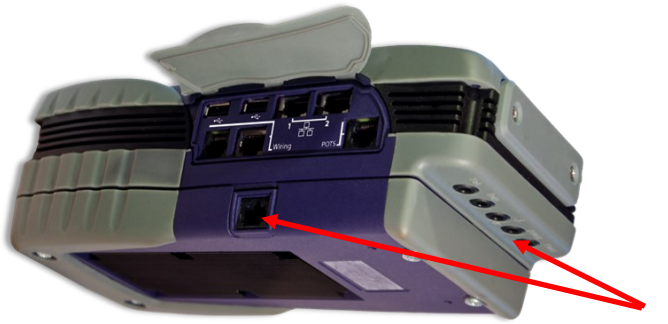
3.0 XDSL Rate Test

3.1 Single Pair Test

Purpose

Ensure that the proper rate/reach of the xDSL signal of a pair while also maintaining error criteria.

Test Interface

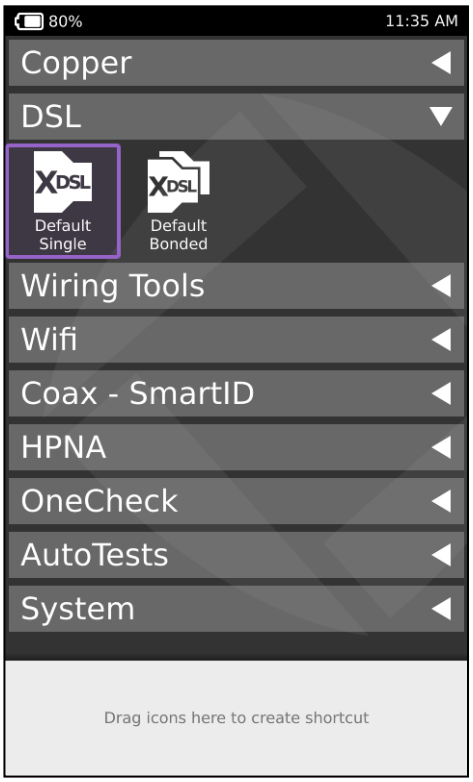


VDSL connectors

Test lead cables

Procedure

1. Connect Tip, and Ring test leads from the test set to the desired pair. Connect Green lead to Ground.
2. Under **DSL** select the **Default Single** test application.



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3. After the Modem boots the Link State result shows:
   (Approximate boot time is 35 seconds)

Idle: DSLAM is in idle state.

Handshake: Attempting to open the connection to the DSLAM.

Training: Found the DSLAM and training to establish a VDSL connection.

Showtime: Training is complete and Sync is established.

4. The following results are displayed for the Upstream and Downstream direction.

Connector: Showing the T/R/G connection or RJ45. To switch connection types, tap the icon

Profile: DSLAM Profile.

Transport: ATM or PTM should be PTM.

Vector: Whether line supports Vectored DSL.

Uptime: Count of time modem is in Showtime state.

Est. Length: Estimated length of loop in feet based off VDSL signal.

Actual Line Rate: Current data rate.

Max Line Rate: Maximum theoretical achievable data rate.

Capacity: Relative capacity (% of the available bandwidth being currently used).

Margin: This is the margin above the noise floor where noise will cause the VDSL system to drop.

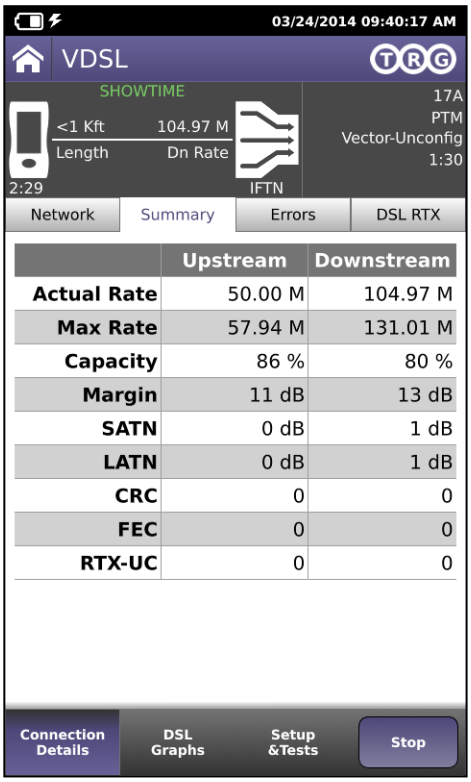
SATN: This is the total attenuation of signal over the actual tones used.

LATN: This is the total attenuation over the entire frequency range (PSD Controlled).

CRC: Number of CRC errors accumulated sometimes referred to as code violations.

FEC: Number of Far End Correctable errors errors that are corrected.

RTX-UC: Retransmissions that are uncorrected.



Press **System Tray**, and then press **Save Report.**

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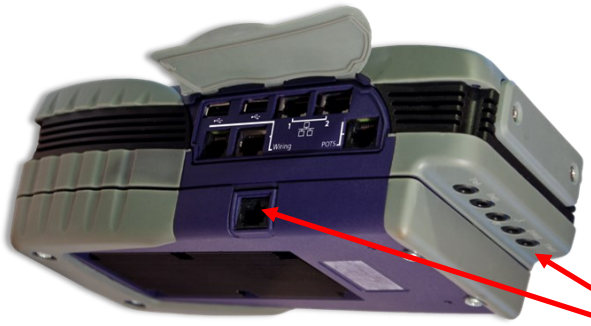
3.2 Bonded Pair Test

Purpose

Ensure that the proper rate/reach of the xDSL signal of each Bonded pair while also maintaining error criteria.

Test Interface

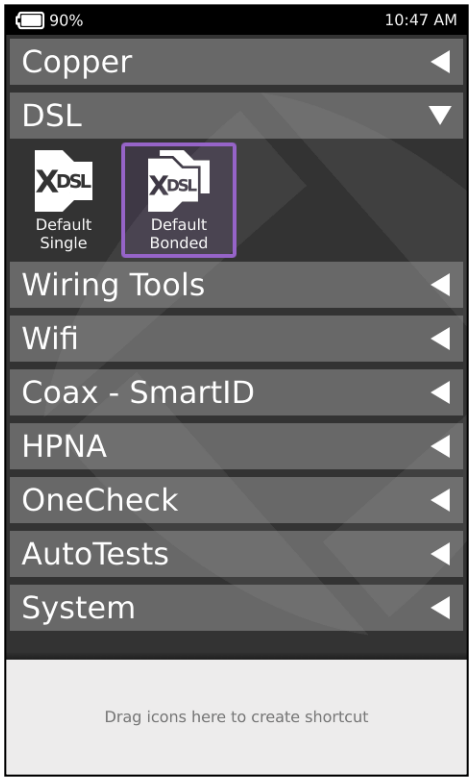


VDSL connector

Test lead cables

Procedure

1. Connect Tip and Ring to Pair 1 and Tip1 and Ring1 to Pair 2 of the desired pairs. Connect Green lead to Ground.
2. Under DSL select **Default Bonded.**



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3. After the Modem boots the Link State result shows:
   (Approximate boot time is 35 seconds)

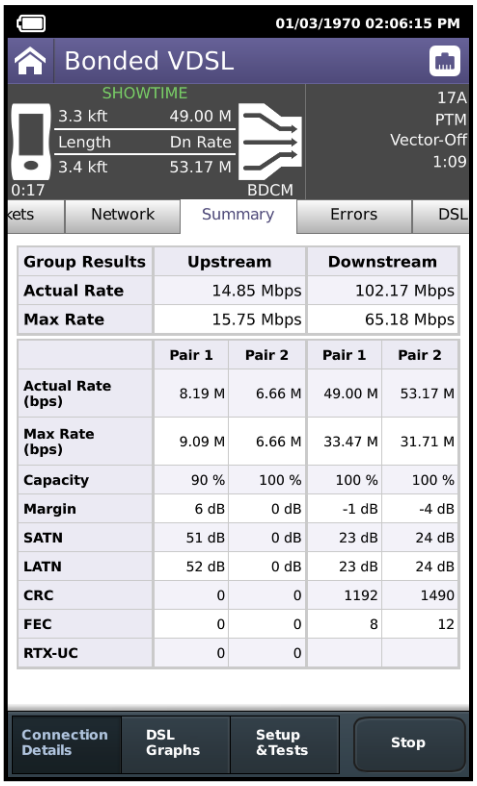
Idle: DSLAM is in idle state.

Handshake: Attempting to open the connection to the DSLAM.

Training: Found the DSLAM and training to establish a VDSL connection.

Showtime: Training is complete and a link is established.

4. Verify the following results are displayed for the Group, Upstream, and Downstream:



Connector: Showing the T/R/G connection or RJ45. To switch connection types, tap the icon

Profile: DSLAM Profile.

Transport: ATM or PTM should be PTM.

Vector: Whether line supports Vectored DSL.

Uptime: Count of time modem is in Showtime state.

Est. Length: Estimated length of loop in feet based off VDSL signal.

Actual Line Rate: Current data rate.

Max Line Rate: Maximum theoretical achievable data rate.

Capacity: Relative capacity (% of the available bandwidth being currently used).

Margin: This is the margin above the noise floor where noise will cause the VDSL system to drop.

SATN: This is the total attenuation of signal over the actual tones used.

LATN: This is the total attenuation over the entire frequency range (PSD Controlled).

CRC: Number of CRC errors accumulated.

FEC: Number of Far End Correctable errors.

RTX-UC: Retransmissions that are uncorrected.

5. Press **System Tray**, and then press Save Report.

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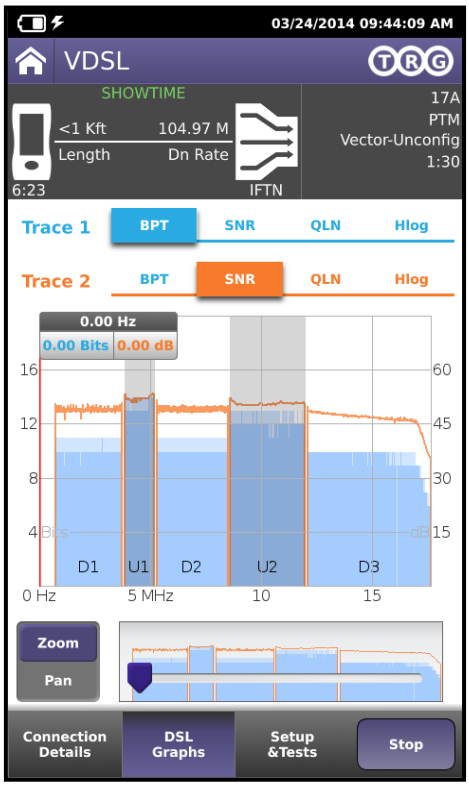
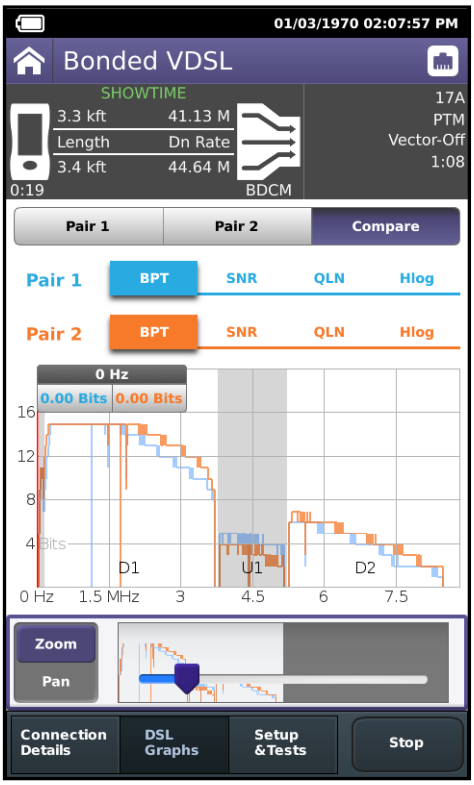
Bit rates (Actual and Maximum Attainable) that are out of limits (excessively low) are typically the result either excessive attenuation (loss) or noise on the line or a combination of both.

- Excessive attenuation or loss on the line is usually the result of either excessive loop length (loop too long) or impairments on the line such as wet sections, bridged tap or resistive faults. If a problem is suspected, the loop length should be re-verified as within limits and if so the pair should be examined for the presence of fault conditions as discussed in the previous section.
- Excessive noise on the line is usually the result of either pair imbalance or bonding and grounding issues. In addition to lower than acceptable VDSL bit rates, a second potential indicator of this would be a Noise Margin failure condition. The excessive VDSL line errors, especially when they occur in bursts, are often another indicator of a potential noise problem. If VDSL testing indicates a suspected noise problem, the pair should be tested for the presence of excessive Wideband Noise or Wideband Impulse Noise and if out of limits the root cause should be isolated to a pair imbalance or bonding and grounding issue as described in the previous section.
- Bits-per-Tone and SNR-per-Tone tips graphs can be viewed simultaneously. The SNR and Bits-per-Tone data are shown on the same screen graphically and in text (text read out is based on the cursor position) as shown below.





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4. Copper Testing

4.1 AutoTests OneCheck Copper

Purpose

The OneCheck test is used to determine whether the DVOM (Voltage, Resistance), Capacitance (Loop Length), and Balance pass on the F2/Drop section of the loop. This test requires open pairs on the far end.

Note: High Voltages on the line can lead to false test results or damage to the instrument. The test set performs a voltage measurement prior to starting a test; if there is voltage present, a popup warning message will be displayed.

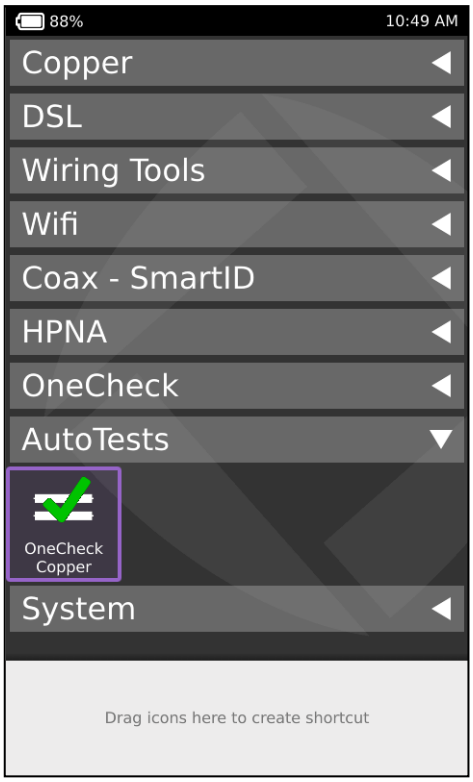
Test Interface

Copper connectors

Copper Test Leads

Procedure

1. Connect a Tip Ring and Ground of the pair under test to the **Tip, Ring and Ground** cable of the test set.
2. Under **AutoTests** select **OneCheck Copper.**



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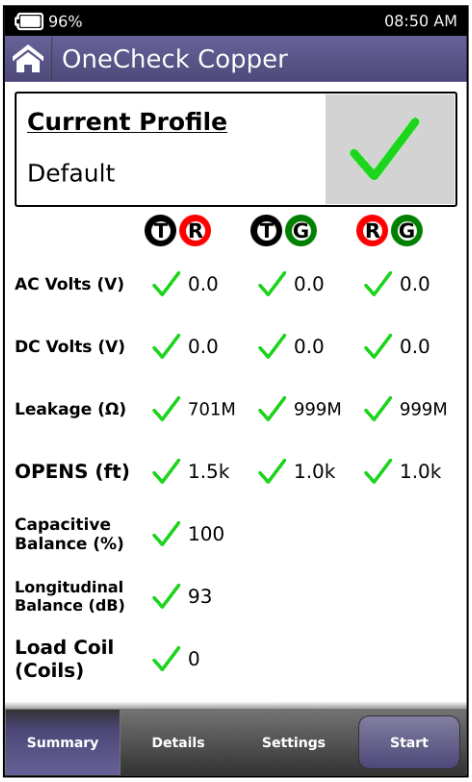
4.1 OneCheck Copper (continued)

3. Verify the Tests pass.
4. If any test fails, press cancel and run that individual test. Descriptions of tests are located in Section 9.
5. 9.1 Copper Tests
6. To rerun the test press Start.
7. Press System Tray, and then press Save Report.



Measurement	Pass
VAC	< 4 VAC T-R, T-G, R-G
VDC	< 3 VDC T-R, T-G, R-G
Circuit Resistance (Leakage)	> 3500 kOhm T-R,T-G, R-G
Capacitive Balance	> 95%
Longitudinal Balance	> 55 dB
Load Coil	0

VAC	The presence of excessive AC voltage is often due to induction from the AC power grid.	Visually inspect jumpers, and terminal connections. Open Pair at terminal, run test towards VRAD and Customer Prem. If problem is on drop trouble troubleshoot, if on the F2 get a helper ticket.
VDC	Cross Battery is an indication of contact between test pair and another working circuit	Visually inspect jumpers, and terminal connections. Open Pair at terminal, run test towards VRAD and Customer Prem. If problem is on drop trouble troubleshoot, if on the F2 get a helper ticket.
Circuit Resistance (Leakage)	Resistive fault shorts /grounds test pair is in contact with ground or Tip and Ring are in contact with each other. Low resistance (<100 Ohm) connections across tip and ring can be located with Distance to Short measurement.	Visually inspect jumpers, and terminal connections. Open Pair at terminal, run test towards VRAD and Customer Prem. If problem is on drop trouble troubleshoot, if on the F2 get a helper ticket.
Opens (Loop Length)	Loop Length determines if pair is too long to support digital service or is longer than your cable records show.	Visually inspect jumpers, and terminal connections. Open Pair at terminal, run test towards VRAD and Customer Prem. If problem is on drop trouble troubleshoot, if on the F2 get a helper ticket.
Capacitive Balance	Capacitive balance is an indication of conductor length differences. Failures can be the result of open or partially open conductors	Visually inspect jumpers, and terminal connections. Open Pair at terminal, run test towards VRAD and Customer Prem. If problem is on drop trouble troubleshoot, if on the F2 get a helper ticket.
Longitudinal Balance	Pair Balance is the measurement of overall pair quality values < 60 dB indicate physical trouble	Visually inspect jumpers, and terminal connections. Open Pair at terminal, run test towards VRAD and Customer Prem. If problem is on drop trouble troubleshoot, if on the F2 get a helper ticket.
Load Coil	Detect the presence of Load coils on the pair	Remove load coil

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5.0 Additional Copper Tests

5.1 Voltage

Purpose

MultiMeter is used to measure Voltage. The presence of excessive AC voltage is often due to induction from the AC power grid. The presence of any DC voltage is an indication of a resistive coupling (cross) to one or more working pairs (with CO battery).

Test Interface

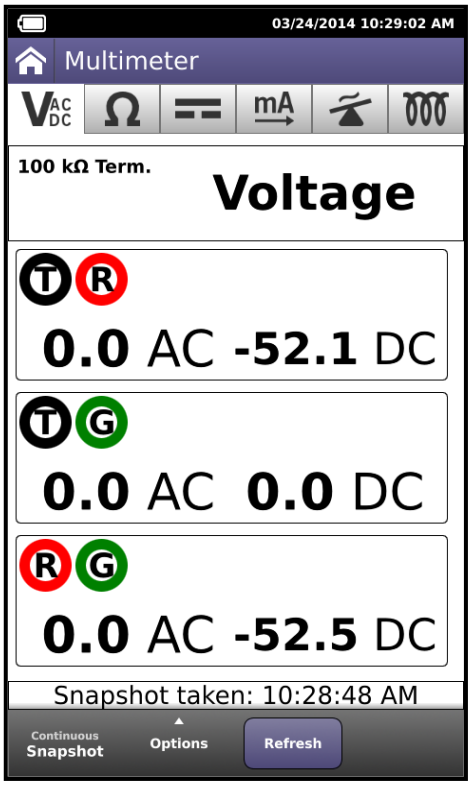
Copper connectors

Copper Test Cables

Procedure

1. Connect a Tip Ring and Ground cable from the line to the **Tip, Ring and Ground** connector on the top of the test set.
2. Under Copper select **Multimeter.**
3. Press **Snapshot** to automatically provide the AC and DC voltage across each of the Tip, Ring, and Ground pairs.
4. Select **Continuous** to provide real time access to pairs.
5. Touch or use the up down arrow keys to cycle through the pairs.
6. Press **AC Volts** or **DC Volts** to Cycle through the tests.

If Required Select **Option** to change the Termination between 100K and 1 Meg ohm, default is 100K.



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5.0 Additional Tests Trouble Shooting Procedure (continued)

5.2 Resistance

Test Interface

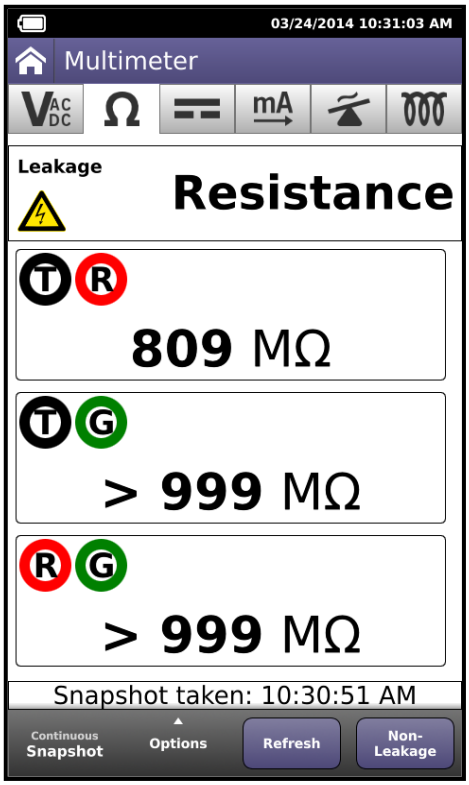
Copper connectors

Copper Test Cables

Procedure

1. Connect a Tip Ring and Ground cable from the line to the **Tip, Ring and Ground** connector on the top of the test set.
2. Under **Copper,** select **MultiMeter.** Select **Resistance.**
3. Touch or use the up down arrow keys to cycle through the pairs.
4. Select **Snapshot** to view the resistance across each of the Tip, Ring, and Ground pairs,
5. Press **Continuous** to return to individual pair tests.
6. Press **Leakage** to apply 120 VDC (current limited source) to the pairs.

Note: Leakage indicator shows in the Resistance box.



If Required select **Options** then select **Distance to Short** to convert a resistance measurement to a distance in feet.

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5.0 Additional Tests Trouble Shooting Procedure (continued)

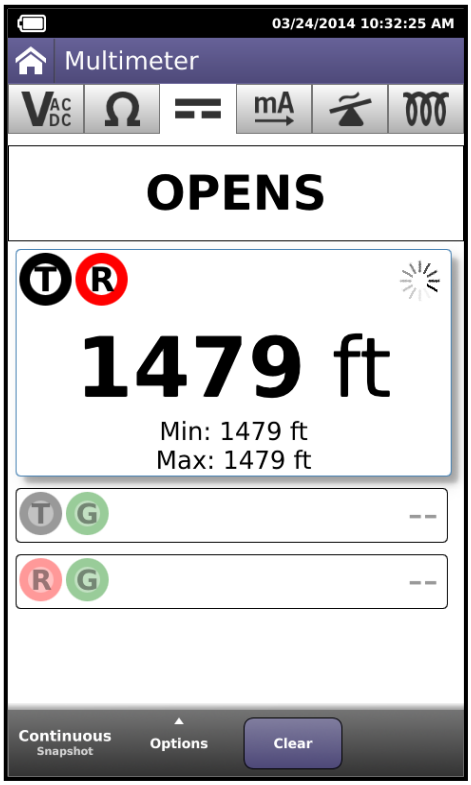
5.3 Opens

Test Interface

Copper Test Cables

Procedure

1. Connect a Tip Ring and Ground cable from the line to the **Tip, Ring and Ground** connector on the top of the test set.
2. Under **Copper,** select **OPENS.**
3. Touch or use the up down arrow keys to cycle through the pairs.
4. Select **Snapshot** to view the opens across each of the Tip, Ring, and Ground pairs, of which all should be relatively close to each other.
5. Press **Continuous** to return individual pair tests.
6. Select **Options** and ensure correct cable type is selected. Tip/Ground Ring/Ground measurements.
7. Results can be viewed in Capacitance only. The Opens measurement will count standard Bell ringers. (older phone types).



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5.0 Additional Tests Trouble Shooting Procedure (continued)

5.4 Current

Purpose

To measure the AC or DC current of the pair under test.

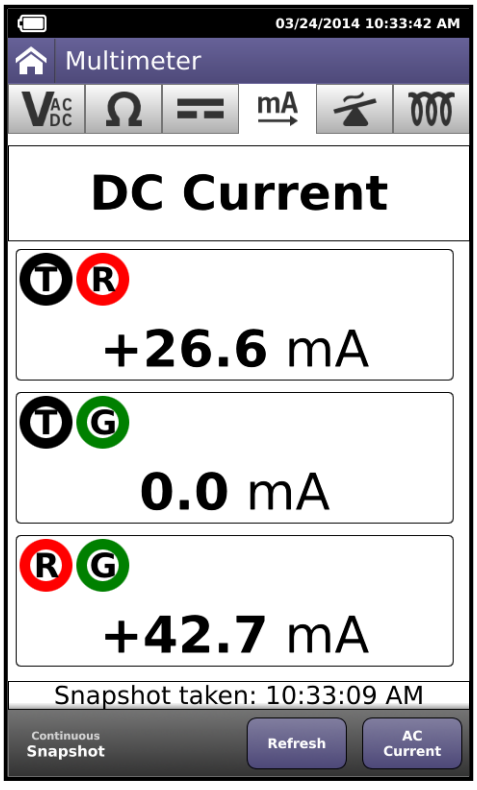
Test Interface

Copper connectors

Copper Test Cables

Procedure

1. Connect a Tip Ring and Ground cable from the line to the **Tip, Ring and Ground** connector on the top of the test set.
2. Under **Copper,** select **Multimeter** Select Current.
3. Touch or use the up down arrow keys to cycle through the pairs
4. Select **Snapshot** to provide the current across each of the Tip, Ring, and Ground pairs,
5. Press **Continuous** to return individual pair tests.
6. If required select **AC Current** to measure the AC Current on a pair.



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5.0 Additional Tests Trouble Shooting Procedure (continued)

5.5 Longitudinal Balance

Purpose

This measurement provides an overall assessment of pair balance, critical in assuring quality service. The Longitudinal Balance measurement should be > 60 dB.

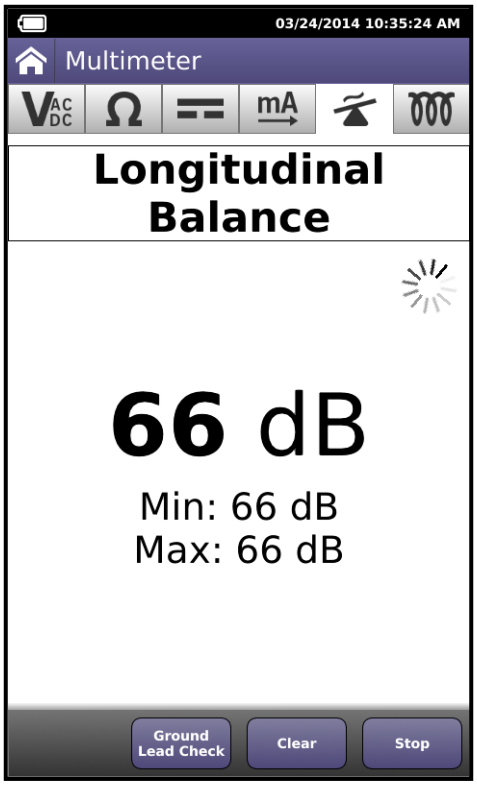
Test Interface

Copper connectors

Copper Test Cables

Procedure

1. Connect a Tip Ring and Ground cable from the line to the **Tip, Ring and Ground** connector on the top of the test set.
2. Under **Copper,** select **Longitudinal Balance**.
3. Press **Stop** to halt the test then **Start** to begin it.
4. Press **Ground Lead Check** to ensure there is an acceptable ground reference.



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5.0 Additional Tests Trouble Shooting Procedure (continued)

5.6 Load Coil Counter

Purpose

The Load Coil test is used to determine the presence of Load Coils in a loop.

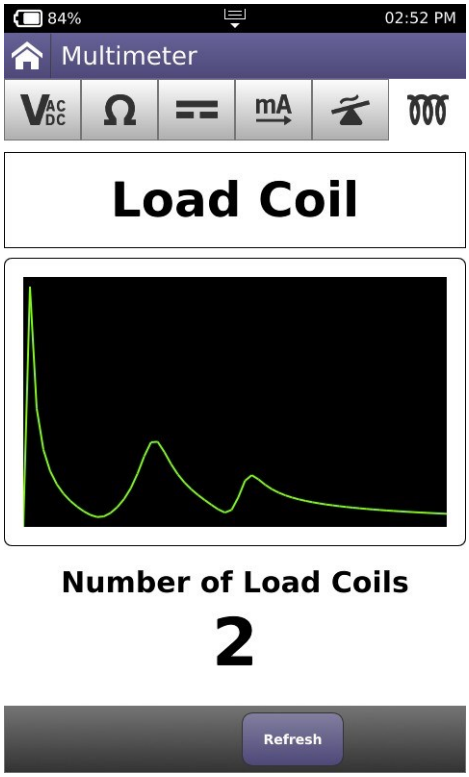
Test Interface

Copper connectors

Copper Test Cables

Procedure

1. Connect a Tip Ring and Ground cable from the line to the **Tip, Ring and Ground** connector on the top of the test set.
2. Under **Copper,** select **Load Coil.**
3. View Results, there should never be Load coils on pairs that are delivering Digital Services such as VDSL2. *Some DSLAMS may falsely appear as multiple load coils*



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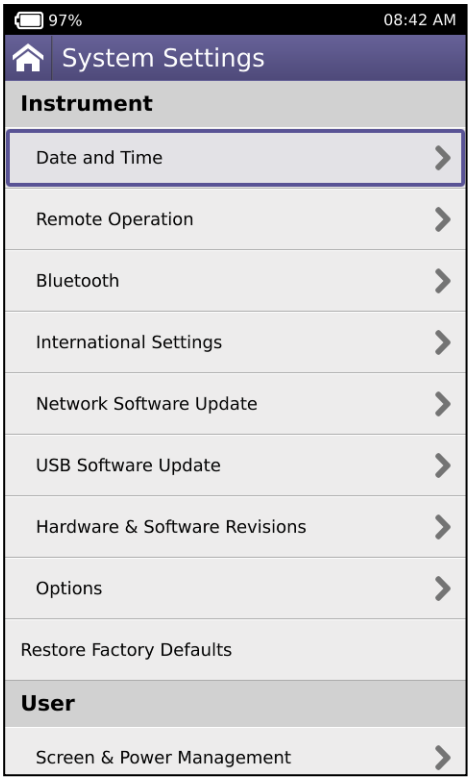
6.0 System Utilities

6.1 System Settings



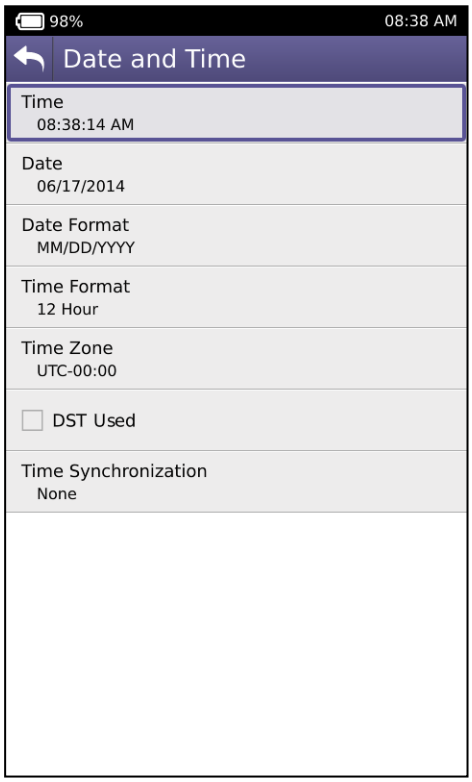
Purpose

Use the System Settings menu to change stored settings.

Procedure

1. Under **System**, select **System Settings**.

6.2 Date and Time



Purpose

To set the Date and Time on the unit. The local date and time is recorded in Job Manager and stored into LSBBT

Procedure

1. Select **Date and Time.**
2. Select **Time** to set Time.
3. Select **Date** to set Date.
4. Select **Date Format** to select between Month/Date/Year and Date/Month/Year.
5. Select **Time Format** to switch between 12 and 24 hour.
6. Select **Time Zone** for desired zone.
7. Select DST to choose whether Daylight Savings Time is used.
8. Select **OK** to accept.

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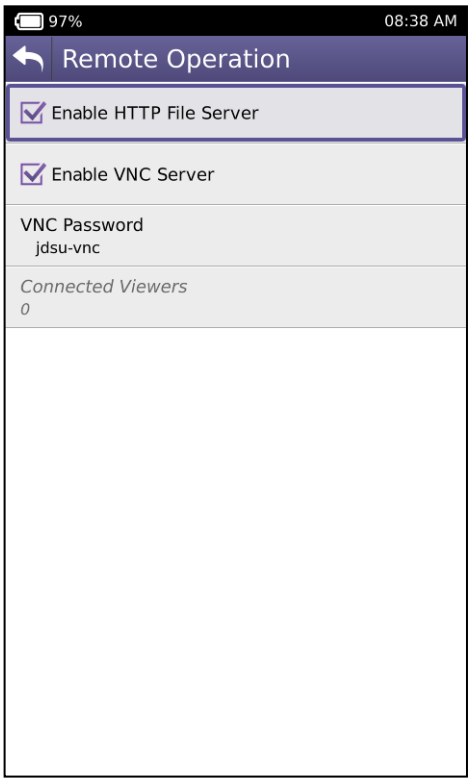
6.3 Remote Operation



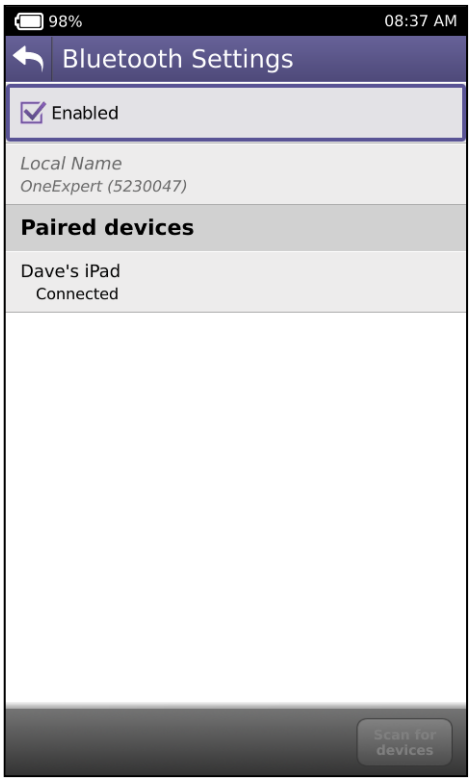
Purpose

To enable Remote Operation using a laptop, or iPad.

Procedure

1. Select **Remote Operations.**
2. Press **Enable HTTP File Server.**
3. The VNC password can be changed but it is not recommended**.**

6.4 Bluetooth



Purpose

To enable Bluetooth to communicate with SmartID Plus, or iPad..

Procedure

1. Select **Bluetooth.**
2. Press **OK.**
3. When the SmartID Plus is set up as a Bluetooth Master it will automatically pair with the unit and will not need to be paired, nor will it show up in the paired device window.
4. For other devices press **Scan for device**, follow pairing procedure

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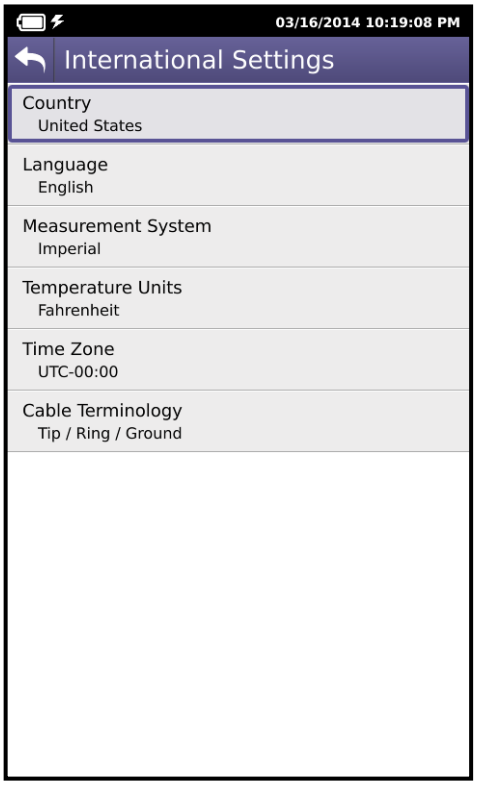
6.5 International Settings

Purpose

To set the International Settings on the unit.

Procedure

1. Select **International Settings.**
2. Select **Country** to set the correct Country standards,
3. Select **Language** for GUI Language,
4. Select **Measurement** for Imperial or Metric.
5. Select **Temperature** for Fahrenheit or Celsius.
6. Select **Time Zone** to set proper UTC.
7. Select **Cable Terminology** for Tip/Ring/Ground or A/B/Earth.
8. Select **OK** to accept it.



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6.0 System Utilities (continued)

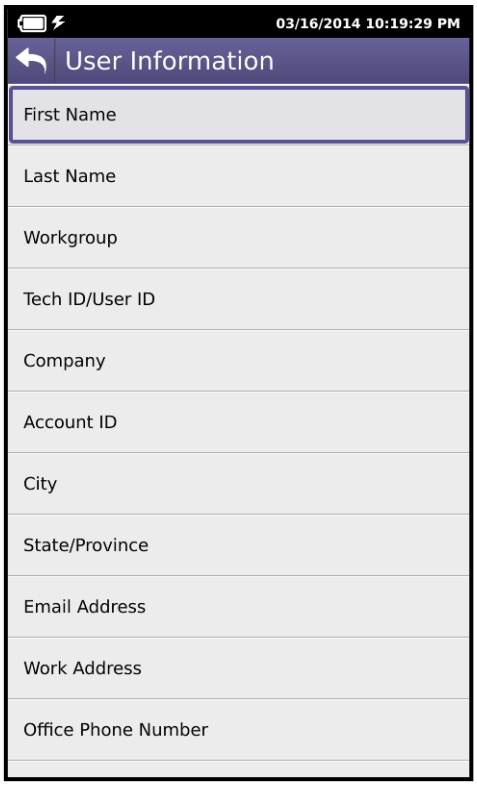
6.6 User Information

Purpose

To set the User Information on the unit. The User Information is to identify the user of the instrument.

Procedure

1. Select **User Information.**
2. Select **First Name** for first name.
3. Select **Last Name** for last name,
4. Select **Workgroup** for workgroup.
5. Select **Tech ID/ User ID** for proper ID.
6. Select **Company** to set proper Company.
7. Select **Account ID** for StrataSync Account ID.
8. Select **City** for City.
9. Select **State/Province** for State or Providence.
10. Select **Email Address** for proper email address.
11. Select **Work Address** to set proper address.
12. Select **Office Phone Number** to set proper phone number.
13. Select **Mobile Phone Number** to set proper phone number.
14. Select **OK** to accept it.



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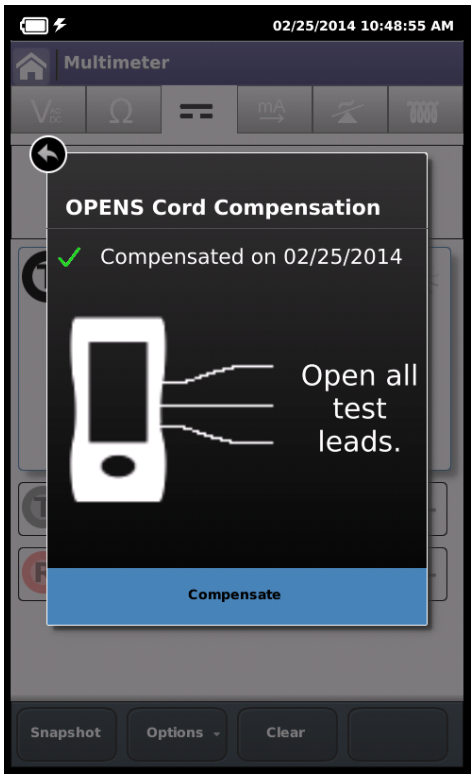
7.0 Configurations and Compensations

7.2 Opens Compensation



Purpose

To perform an OPENS compensation for the leads, this is a onetime setup.

Procedure

1. From the Copper test screen, use the swipe down motion or press the **System Tray** button.
2. Select **OPENS Compensation.**
3. Open all Test Leads.
4. Press **Compensate.**
5. Press **Return** to return to Copper test.

7.3 Resistance Compensation

Purpose

To perform a Resistance Cord Compensation for the leads, this is a onetime setup.

Procedure

1. From the Copper test screen, use the swipe down motion or press the **System Tray** button.
2. Select **Resistance Compensation.**
3. Short all Test Leads.
4. Press **Compensate.**
5. Press **Return** to return to Copper test.

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