RJG
MOLD SMART

Sensor PreCheck

USER GUIDE

Problem Prevention.

Scrap Reduction.

Cycle Time Optimization.

Sensor PreCheck

Training and Technology for Injection Molders

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INTRODUCTION

Read, understand, and comply with all following instructions. These instructions must be kept available for reference at all times.

DISCLAIMER

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COMPLIANCE

The CoPilot™ System (including Sensor PreCheck Version 2.4.2)" has been designed and tested in accordance with the following standards:

EN 61326-1:2013

EMC Requirements for electrical equipment for measurement, control, and laboratory use. Intended for use in industrial locations.

IEC 61010-1:2010

Safety requirements for electrical equipment for measurement, control, and laboratory use.

CE The Sensor PreCheck system conforms to European Conformity (CE) requirements and is eligible for sale in the European Union (EU).

PRIVACY

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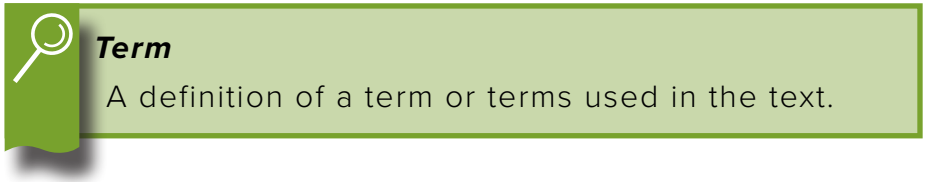
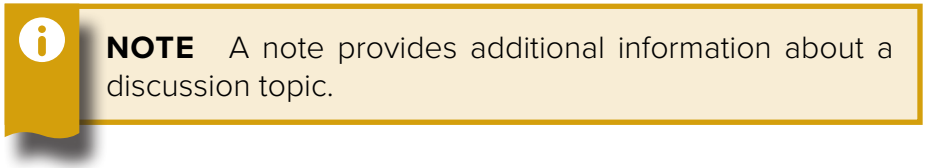
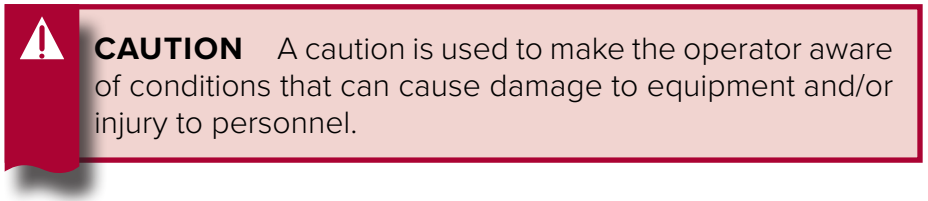
ALERTS

The following three alert types are used as needed to further clarify or highlight information presented in the manual:







PRODUCT OVERVIEW

The *Sensor PreCheck* provides testing of up to 30 Lynx cavity pressure sensors simultaneously, including the following:

Automatic Testing

- Strain Gage Sensors

  Lynx Communication, Zero Offset, and Broken Wire/ Failed Gage Tests

- Piezoelectric Sensors

  Lynx Communication and Drift Tests

Manual Testing

- Strain Gage Sensors Basic Force Test
- Piezoelectric Sensors Basic Force Test

Specifications

Compatible Sensor Models

- Strain Gage

  LS-B-127-50/125/500/2000, LS-B-159-4000, LES-B-127-50/125/500/2000, LES-B-159-4000, MCSG-B-60-50/250, MCSG-B-127-125/500/2000, & MCSG-B-159-4000

- Piezoelectric

  6157, 6159, 9204, 9210, & 9211

Hardware

- Power Requirements 12 V DC
- Max Lynx Sensors 30

Application

- Tablet Samsung Galaxy Tab 4
- OS Requirements Android 4.4 KitKat or Later
- Memory Required 10 MB

This Product Includes:

- 1 RJG, Inc. AP 32C with USB WiFi Adapter (TP Link TL-WN7225N v3.8)
- 1 8" Samsung Tablet with USB cable
- 1 OtterBox Tablet Case
- 1 12 V DC Power Supply Cable
- 1 Lynx Cable

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START EQUIPMENT AND APPLICATION

Connect the power supply cable to the AP 32C 1 power port and a power source. The green 2 power indication light will indicate that the AP 32C is on; if no green light is visible the AP 32C is off.

Connect the Lynx cable to the AP 32C 3 Lynx input, and the sensor(s) to be tested; ensure the provided USB WiFi adapter is inserted in the AP 32C USB port.

Select the RJG Sensor PreCheck 4 application icon on the tablet home page to start the application.

NOTE WiFi must be enabled on the tablet to connect to the Sensor PreCheck.

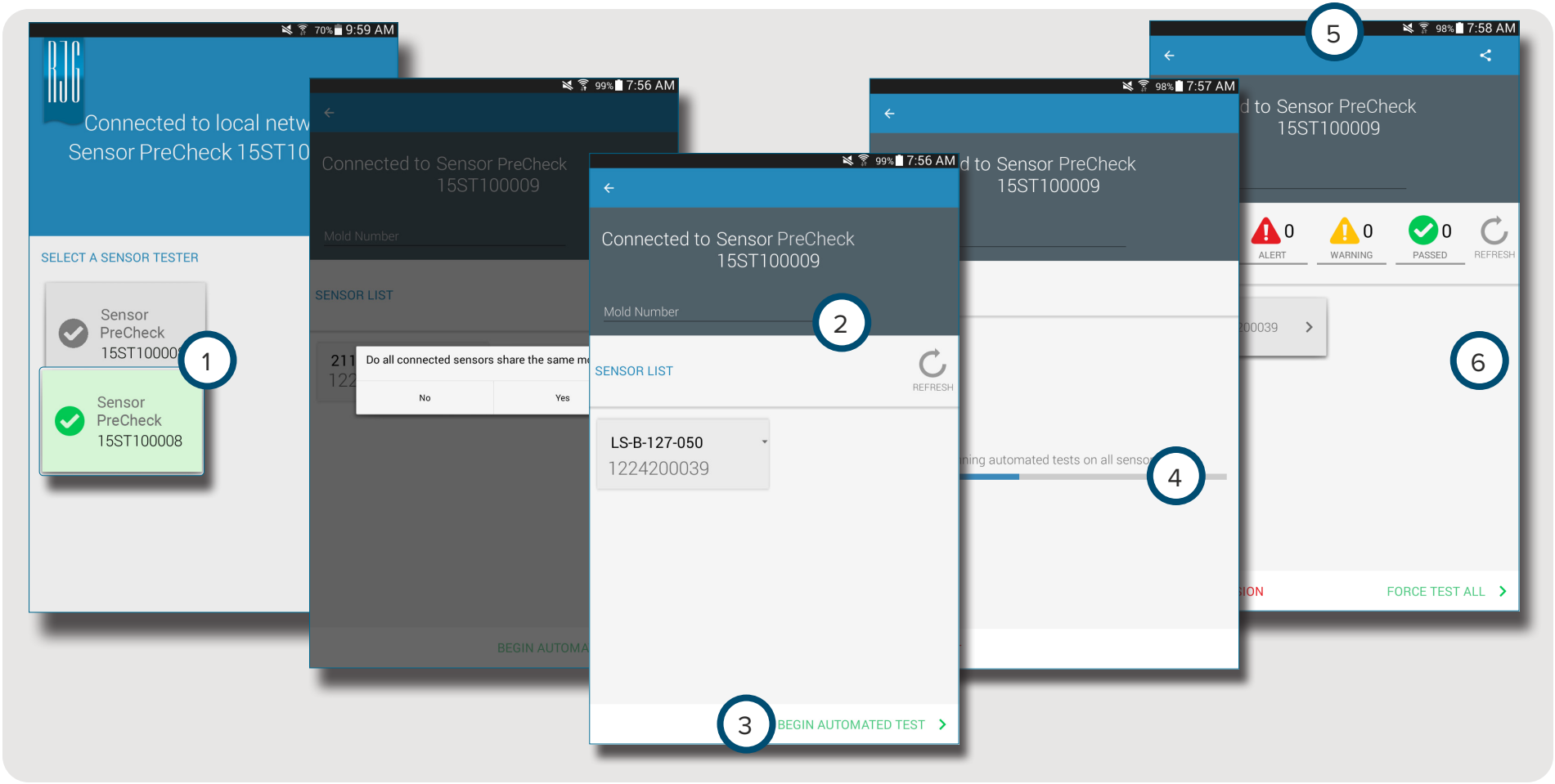
NOTE For optimal performance the tablet should be physically near the Sensor PreCheck and the sensors being tested.

RUN AN AUTOMATED SENSOR TEST

Select a 1 Sensor PreCheck icon from the application home page with which to connect. The Sensor PreCheck icon will be grey until selected, and will turn green after selection. If multiple sensors are attached for testing, a pop-up window will appear to determine if each connected sensor is the same or different model(s). **Select** the appropriate response for the connected sensor(s) to continue.

Enter the 2 Mold Number in the provided field. **Select** 3 Begin Automated Test to test the sensor(s). The 4 Progress Bar will indicate the test progress. Wait for the test to complete.

The 5 automated test complete page will indicate any alerts, warnings, and the number of sensors that passed the test. **Select** a 6 sensor to enter the sensor information, including Location, Cavity Name, Pin Size, Sensitivity, Sensor Model, and Sensor Serial Number. Complete the testing by running a force test (page 4).



RUN A MANUAL SENSOR FORCE TEST

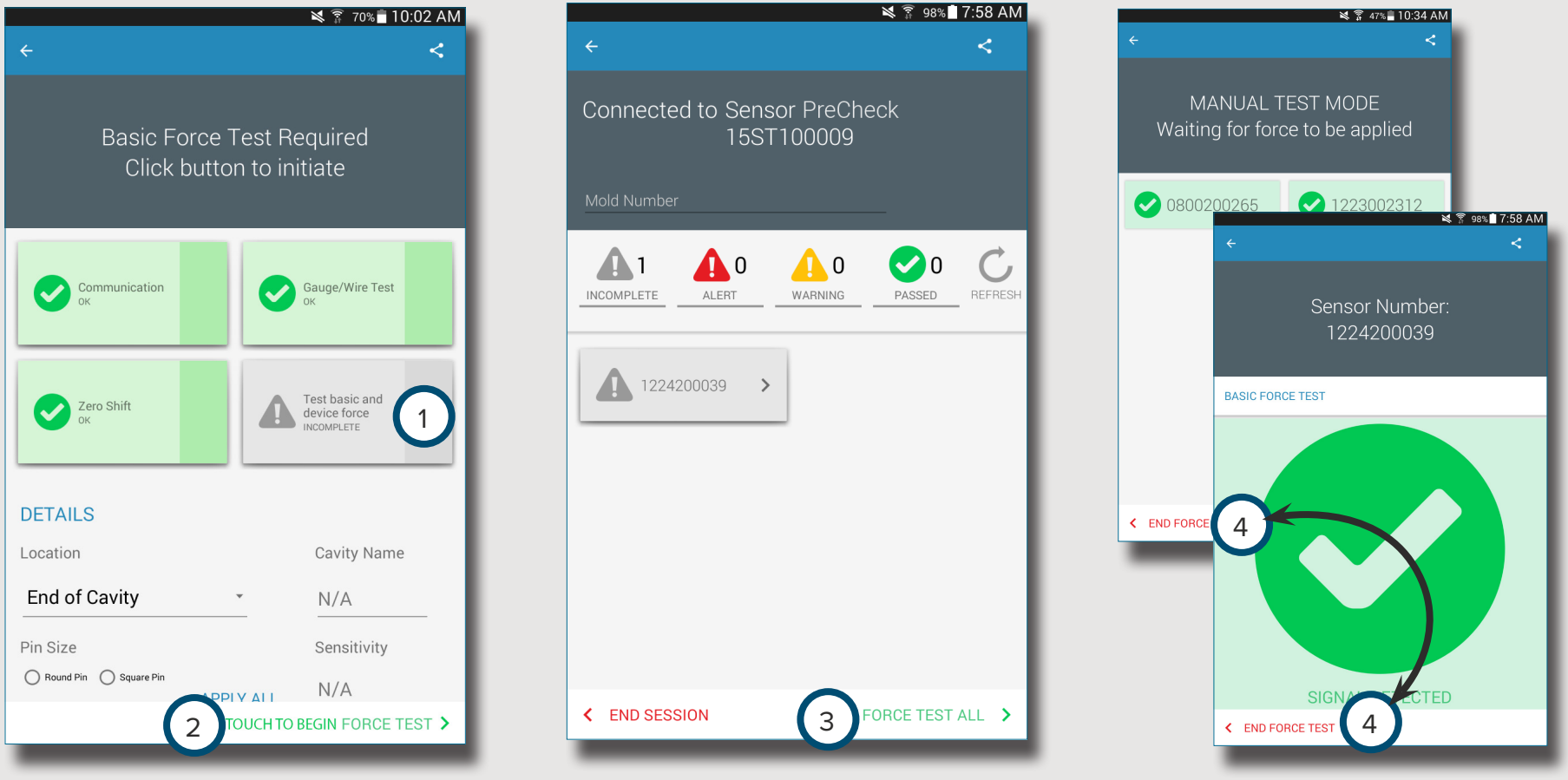
Sensor force tests require the operator to physically press on the sensor(s) being tested in order for the Sensor PreCheck to evaluate if the sensor is detecting force.

NOTE The application will time out if no signal is received from the sensor in a specified length of time; be ready to apply force to the sensor(s).

STRAIN GAGE SENSORS

After completing an automated test, select 1 Test Basic and Device Force ***OR*** 2 Touch to Begin Force Test to force test a single sensor, ***OR*** 3 Force Test All to force test all sensors.

Select 4 End Force Test to return to the test results screen when the force test is complete.

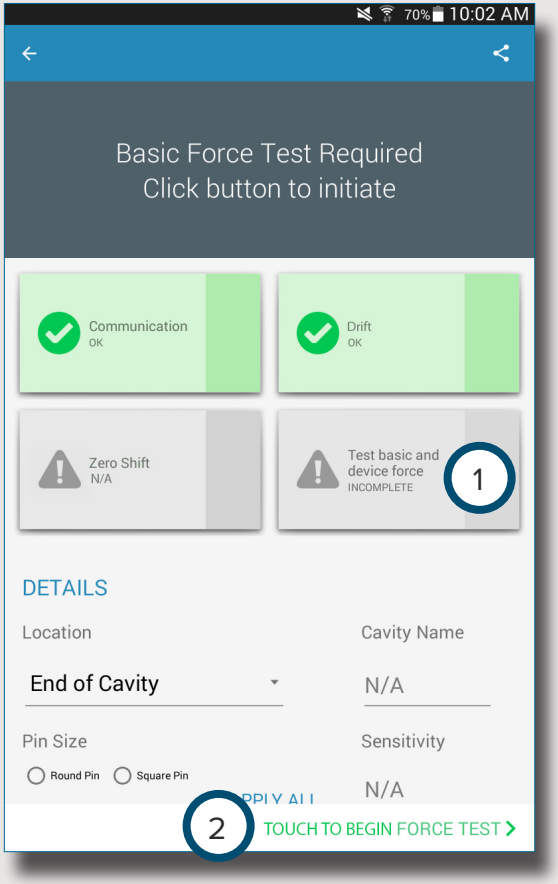


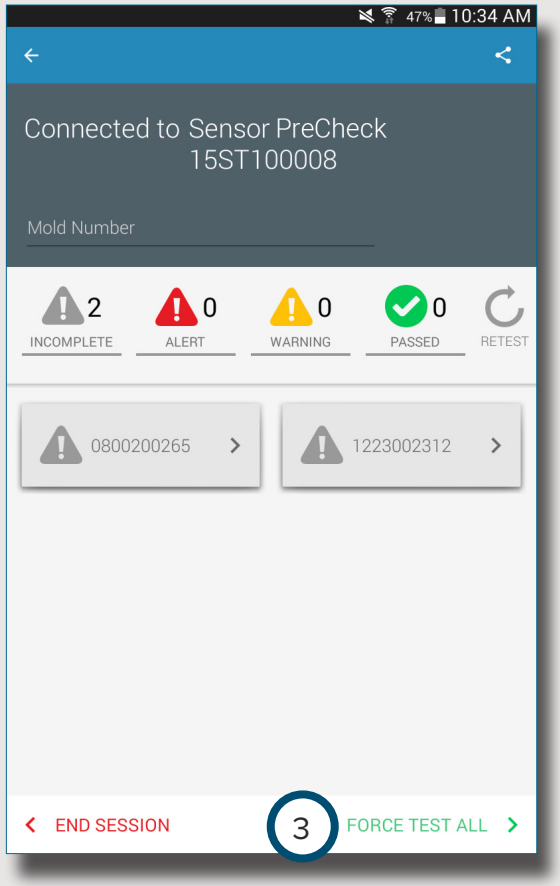
PIEZOELECTRIC SENSORS

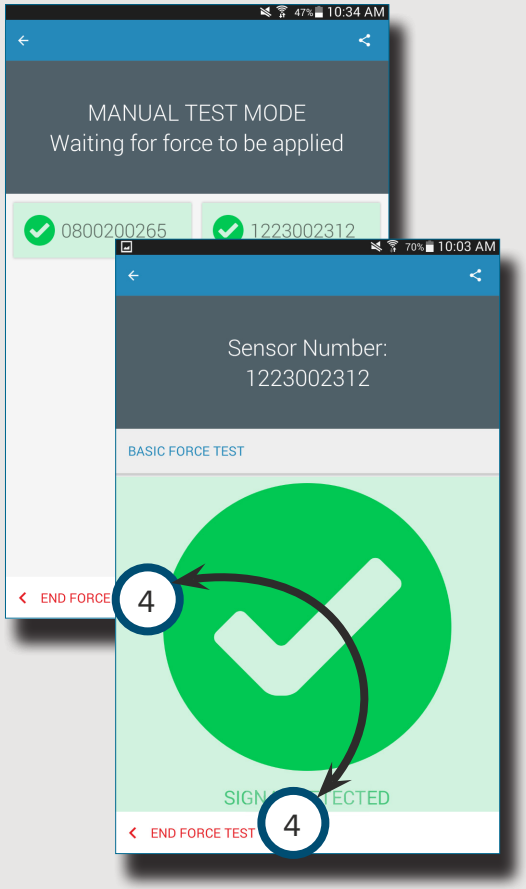
NOTE Do not move the sensor adapter cable during multi-channel piezoelectric sensor testing. Moving the sensor adapter cable during multi-channel piezoelectric sensor testing will create false test results.

After completing an automated test, select 1 Test Basic and Device Force ***OR*** 2 Touch to Begin Force Test to force test a single sensor, ***OR*** 3 Force Test All to force test all sensors.

Select 4 End Force Test to return to the test results screen when the force test is complete.







GENERATE AND DISTRIBUTE REPORTS

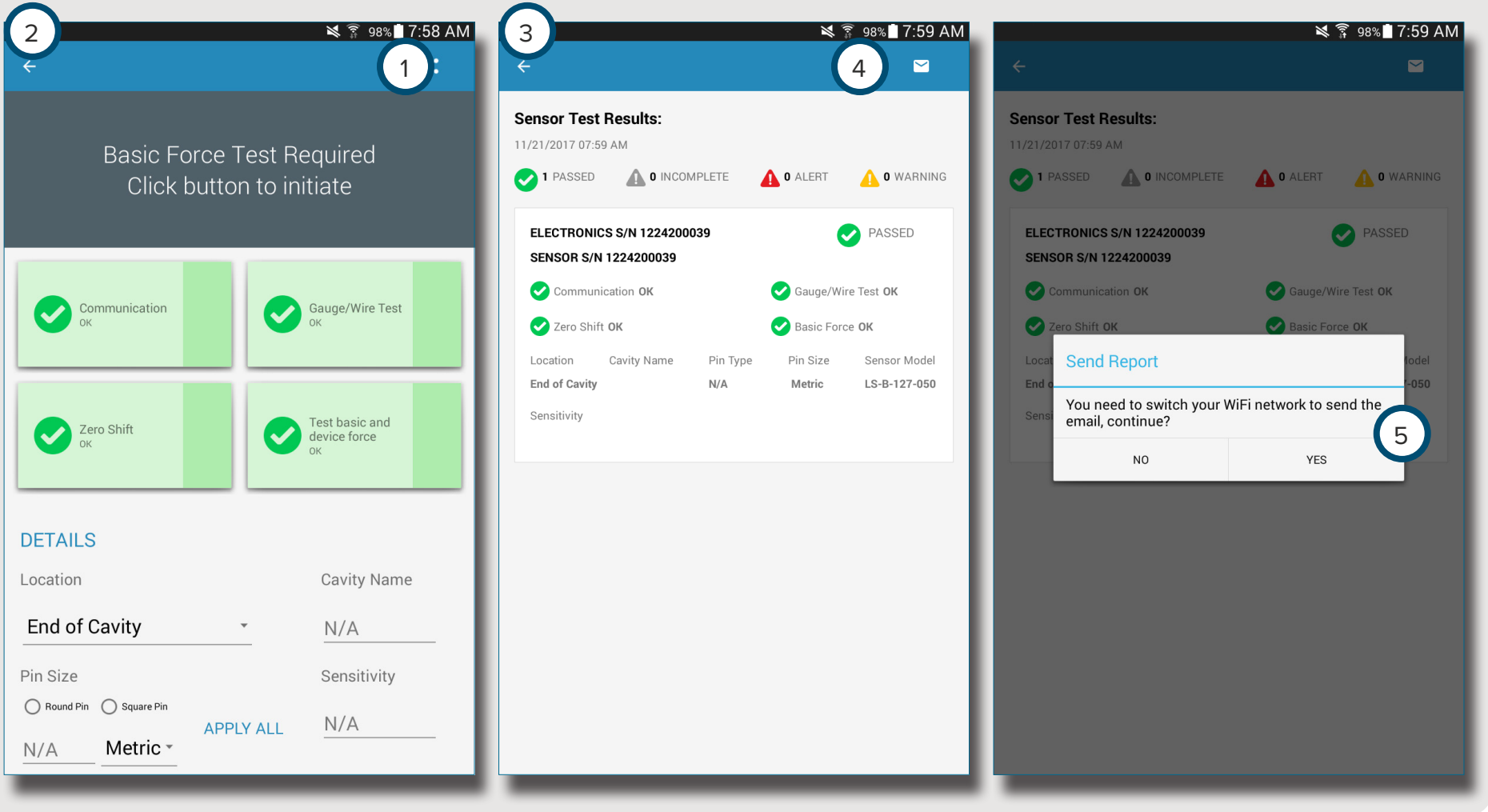
The Sensor PreCheck application generates a report file for tested sensors.

Select the 1 share button located at the top right-hand corner of the 2 completed test screen. The 3 report screen will display.

Select the 4 email function from the 3 report screen.

Select 5 YES to disconnect from the Sensor PreCheck hardware and connect to a WiFi network.

Email the report to the desired email address.



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SENSOR PRECHECK HARDWARE

AP 32C

The 1 AP 32C verifies proper operation of Lynx cavity pressure sensors, and includes the following:

2 Lynx Connector

3 Power Supply Connector

4 Power Supply Indicator

5 USB WiFi Adapter

LYNX SENSOR CABLE

The Lynx sensor cable provided with the AP 32C provides a physical connection between the AP 32C and strain gage or piezoelectric sensors for testing.

TABLET

The tablet provided with the AP 32C is preloaded with the Sensor PreCheck application, and provides a user interface for testing sensors and generating sensor test reports. Refer to the tablet manufacturer's manual for operating and troubleshooting instructions.

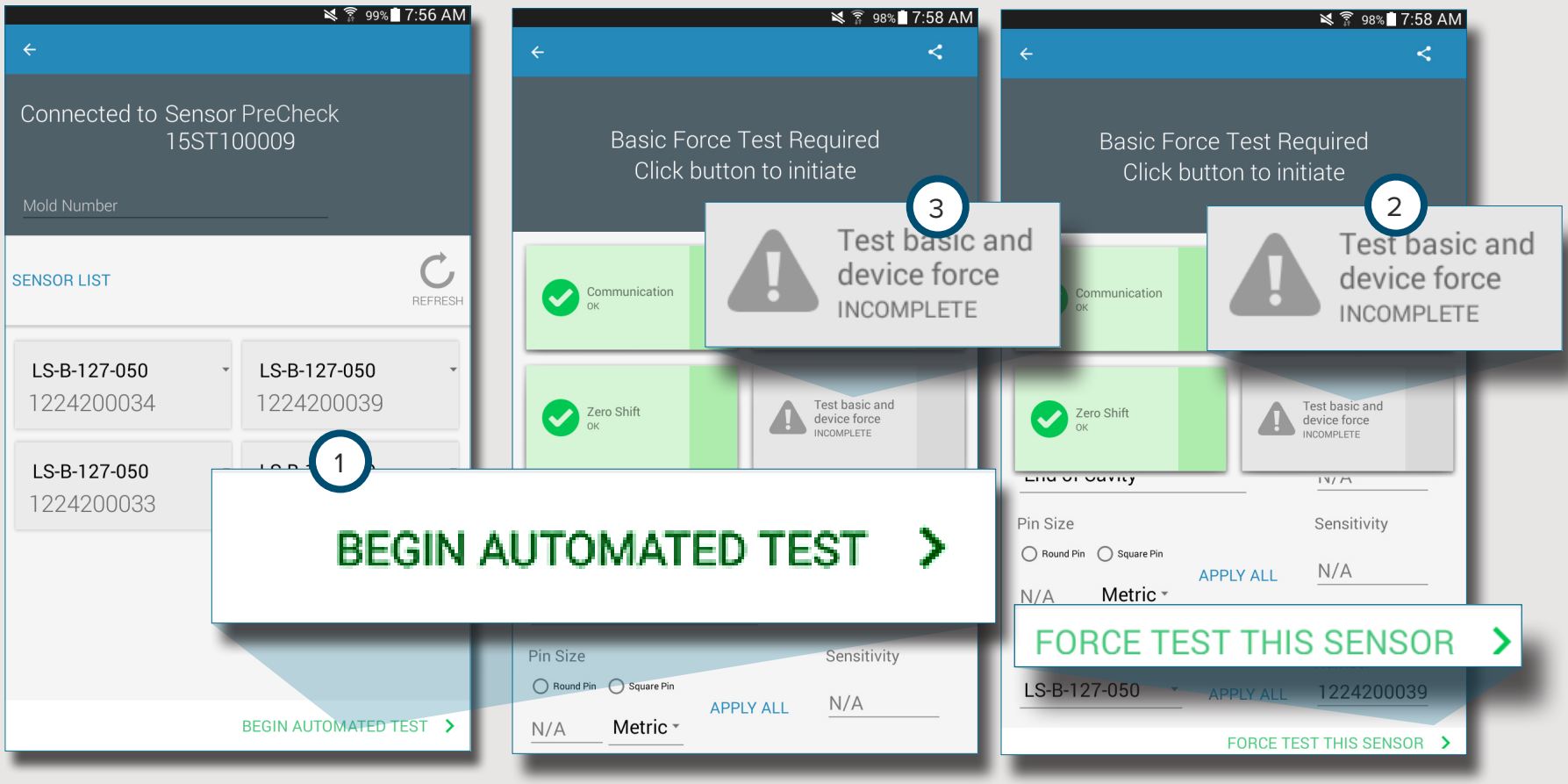
NOTE For optimal performance the tablet should be physically near the Sensor PreCheck and the sensors being tested.

SENSOR PRECHECK APPLICATION

The Sensor PreCheck application tests, labels, and generates a report for up to 30 sensors simultaneously.

The application provides the following tests:

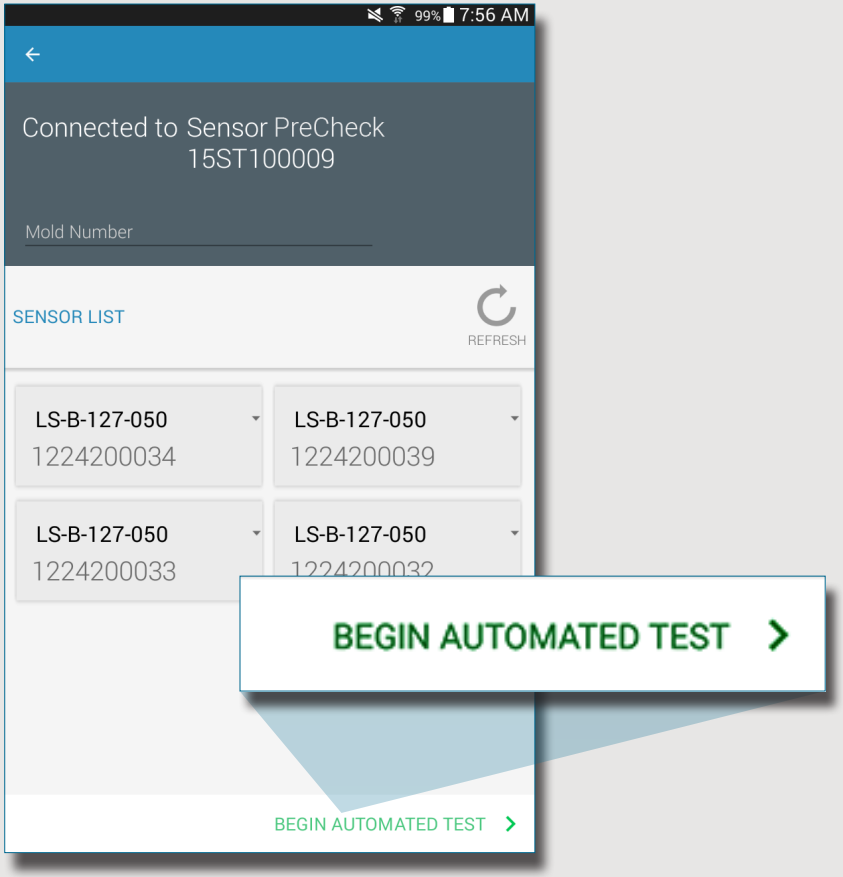
1. Automated Sensor Tests (Multiple or Single Sensor)
2. Manual Strain Gage Sensor Force Tests
3. Manual Piezoelectric Sensor Force Tests



AUTOMATED SENSOR TEST

The automated sensor test will test each sensor connected to the Sensor PreCheck simultaneously for the following:

1. Communication
2. Gage/Wire Test (for Strain Gage only)
3. Zero Shift (for Strain Gage only)
4. Drift (for Piezoelectric Sensors only)

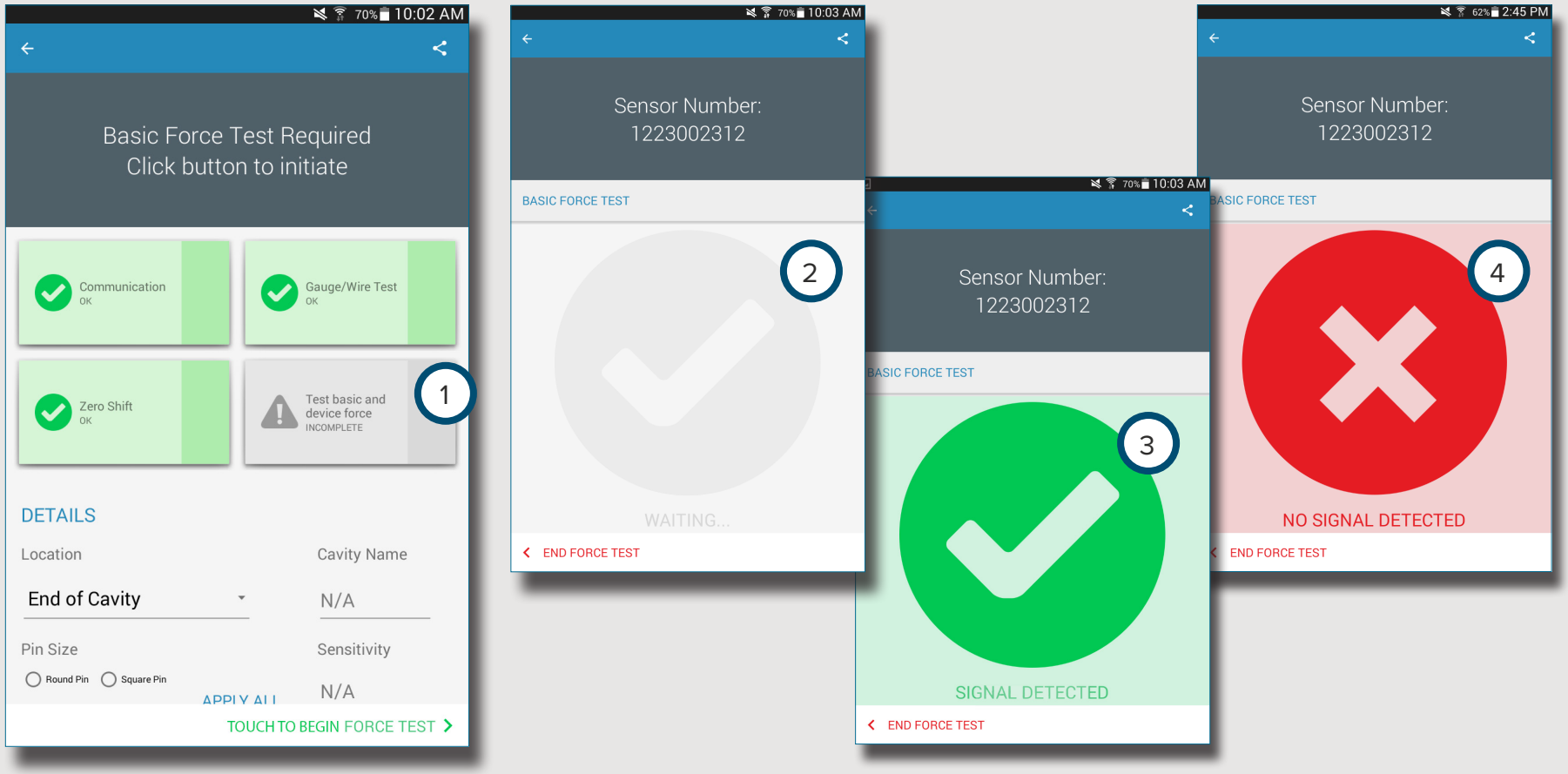


MANUAL STRAIN GAGE SENSOR FORCE TEST

The manual strain gage sensor force test tests for (1) Basic and Device Force. The operator must physically press on the sensor(s) being tested in order for the Sensor PreCheck to evaluate if the sensor is detecting force.

The manual strain gage sensor force test will display a (2) test in progress page, then a (3) Signal Detected ***OR*** (4) No Signal Detected screen to indicate if a sensor signal is or is not detected.

NOTE The application will time out if no signal is received from the sensor within a specified length of time; be ready to apply force to the sensor(s).



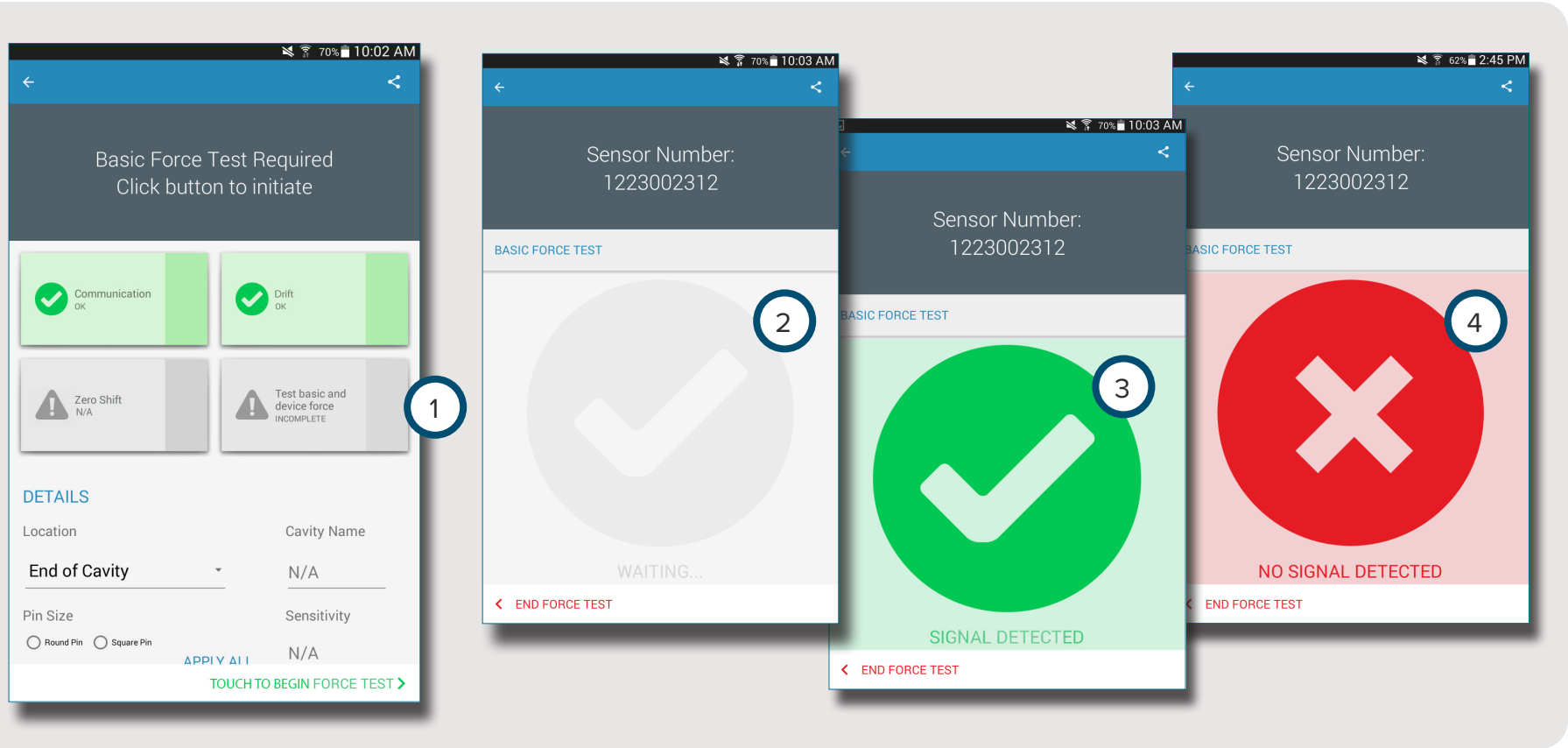
MANUAL PIEZOELECTRIC SENSOR FORCE TEST

The manual piezoelectric sensor force test tests for 1 Basic and Device Force. The operator must physically press on the sensor(s) being tested in order for the Sensor Tester to evaluate if the sensor is detecting force.

NOTE The application will time out if no signal is received from the sensor within a specified length of time; be ready to apply force to the sensor(s).

The manual piezoelectric sensor force test will display a 2 test in progress page, then a 3 Signal Detected ***OR*** 4 No Signal Detected screen to indicate if a sensor signal is or is not detected.

NOTE Do not move the sensor adapter cable during multi-channel piezoelectric sensor testing. Moving the sensor adapter cable during multi-channel piezoelectric sensor testing will create false test results.



SENSOR TEST RESULTS

The 1 multiple sensor test results page indicates any 2 incomplete tests, 3 alerts, 4 warnings, and the 5 number of sensors that passed testing.

2 Incomplete tests indicates sensors that have not been force tested. Sensor names will be grey until force tested.

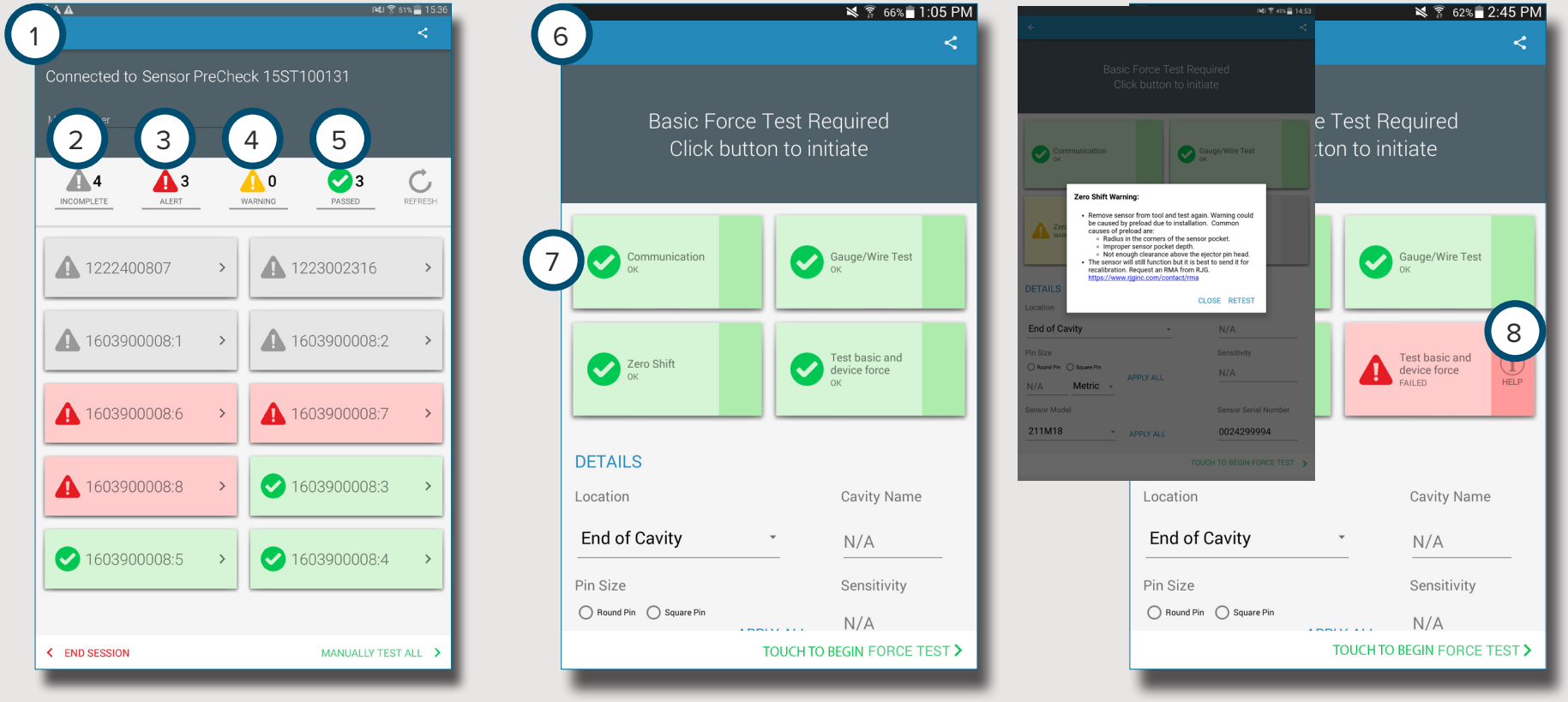
3 Alerts indicate a sensor is outside normal.

4 Warnings indicate a sensor is outside normal, but not in an Alert range.

The 6 single sensor test results page indicates if the tested sensor has passed communication, gage/wire, zero shift (strain gage only), drift (piezoelectric only), and basic force testing successfully. Refer to **SENSOR TEST SPECIFICATIONS ON PAGE 16** for sensor alert and warning ranges.

Successful tests are indicated by 7 green check marks. If a box is red the sensor is in the 3 alerts state. If a box is yellow, the sensor is in 4 warnings state.

Select the 8 help icon for information on an 3 alert or 4 warning, or to retest the sensor.

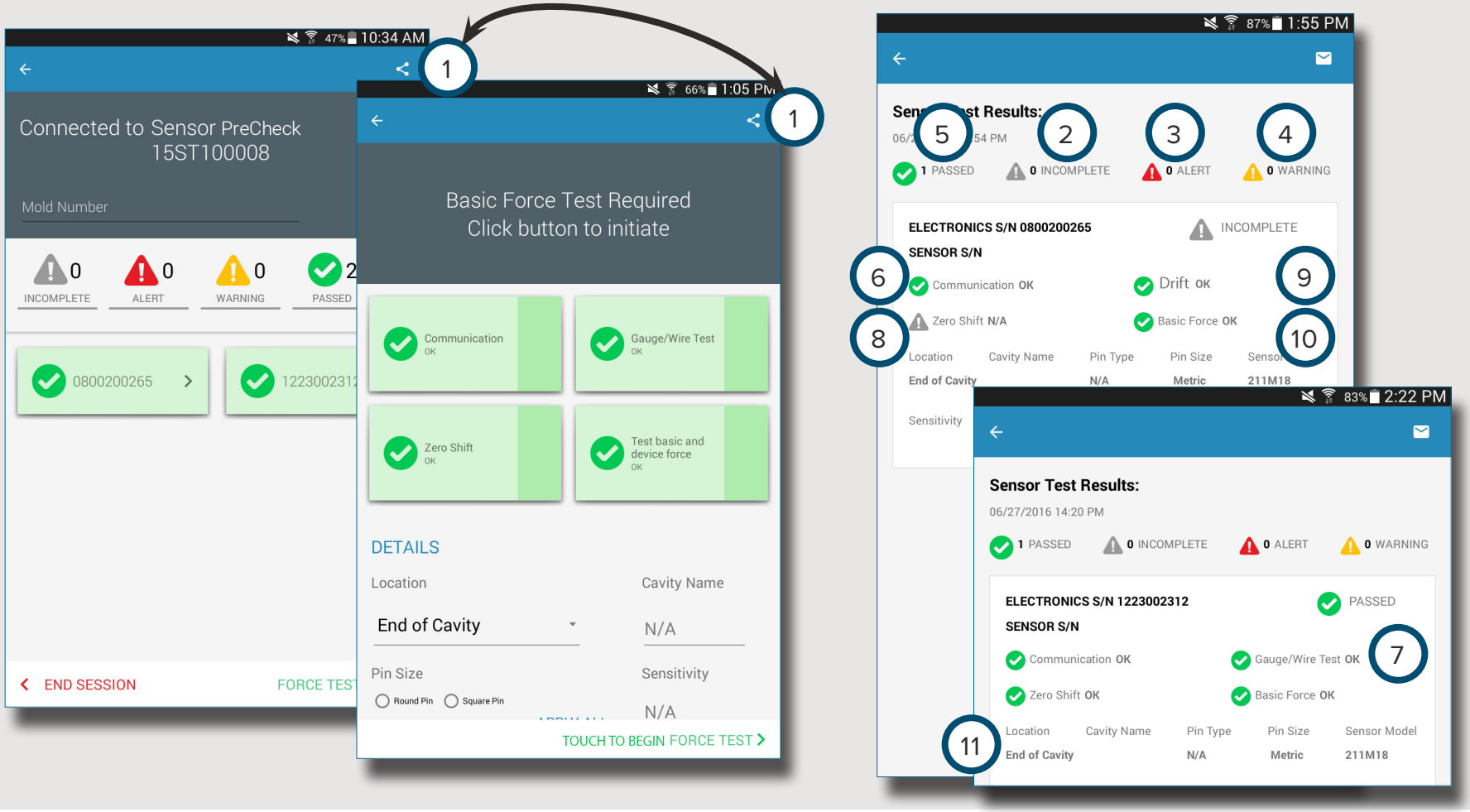


SENSOR TEST REPORTS

Sensor test reports are generated automatically and stored in the tablet's Device Storage/Downloads folder. The reports can be viewed while in the Sensor PreCheck application, or opened or emailed from the tablet's file directory.

Select the 1 share button to view a sensor test report after completing sensor testing.

Reports detail 2 incomplete tests, 3 alerts, 4 warnings, and the 5 number of sensors that passed testing. The reports also show if the tested sensor has passed 6 communication, 7 gage/wire (strain gage only), 8 zero shift (strain gage only), 9 drift (piezoelectric only), and 10 basic force testing successfully. The report will include any entered 11 sensor information, such as Location, Pin Type, and Pin Size.



SENSOR TEST SPECIFICATIONS

SENSOR MODEL	TEST							
	LYNX COMMUNICATION	ZERO OFFSET			GAUGE/ WIRE	DRIFT		
		ALERT	WARN	PASS		ALERT	WARN	PASS
LS-B-127-50/125/500/2000	PASS / FAIL	±5% F.S.	±2% F.S.	< ±2% F.S.	PASS / FAIL	-	-	-
LS-B-159-4000	PASS / FAIL	±5% F.S.	±2% F.S.	< ±2% F.S.	PASS / FAIL	-	-	-
LES-B-127-50/125/500/2000	PASS / FAIL	±5% F.S.	±2% F.S.	< ±2% F.S.	PASS / FAIL	-	-	-
LES-B-159-4000	PASS / FAIL	±5% F.S.	±2% F.S.	< ±2% F.S.	PASS / FAIL	-	-	-
MCSG-B-60-50/250	PASS / FAIL	±20% F.S.	±15% F.S.	< ±15% F.S.	PASS / FAIL	-	-	-
MCSG-B-127-125/500/2000	PASS / FAIL	±9% F.S.	±6% F.S.	< ±6% F.S.	PASS / FAIL	-	-	-
MCSG-B-159-4000	PASS / FAIL	±9% F.S.	±6% F.S.	< ±6% F.S.	PASS / FAIL	-	-	-
9204	PASS / FAIL	-	-	-	PASS / FAIL	> 20 pC/30s	> 10 pC/30s	< 10 pC/30s
9210	PASS / FAIL	-	-	-	PASS / FAIL	> 20 pC/30s	> 10 pC/30s	< 10 pC/30s
9211	PASS / FAIL	-	-	-	PASS / FAIL	> 20 pC/30s	> 10 pC/30s	< 10 pC/30s
6157	PASS / FAIL	-	-	-	PASS / FAIL	> 20 pC/30s	> 10 pC/30s	< 10 pC/30s
6159	PASS / FAIL				PASS / FAIL	> 20 pC/30s	> 10 pC/30s	< 10 pC/30s

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AUTOMATED SENSOR TESTS

MULTIPLE SENSORS

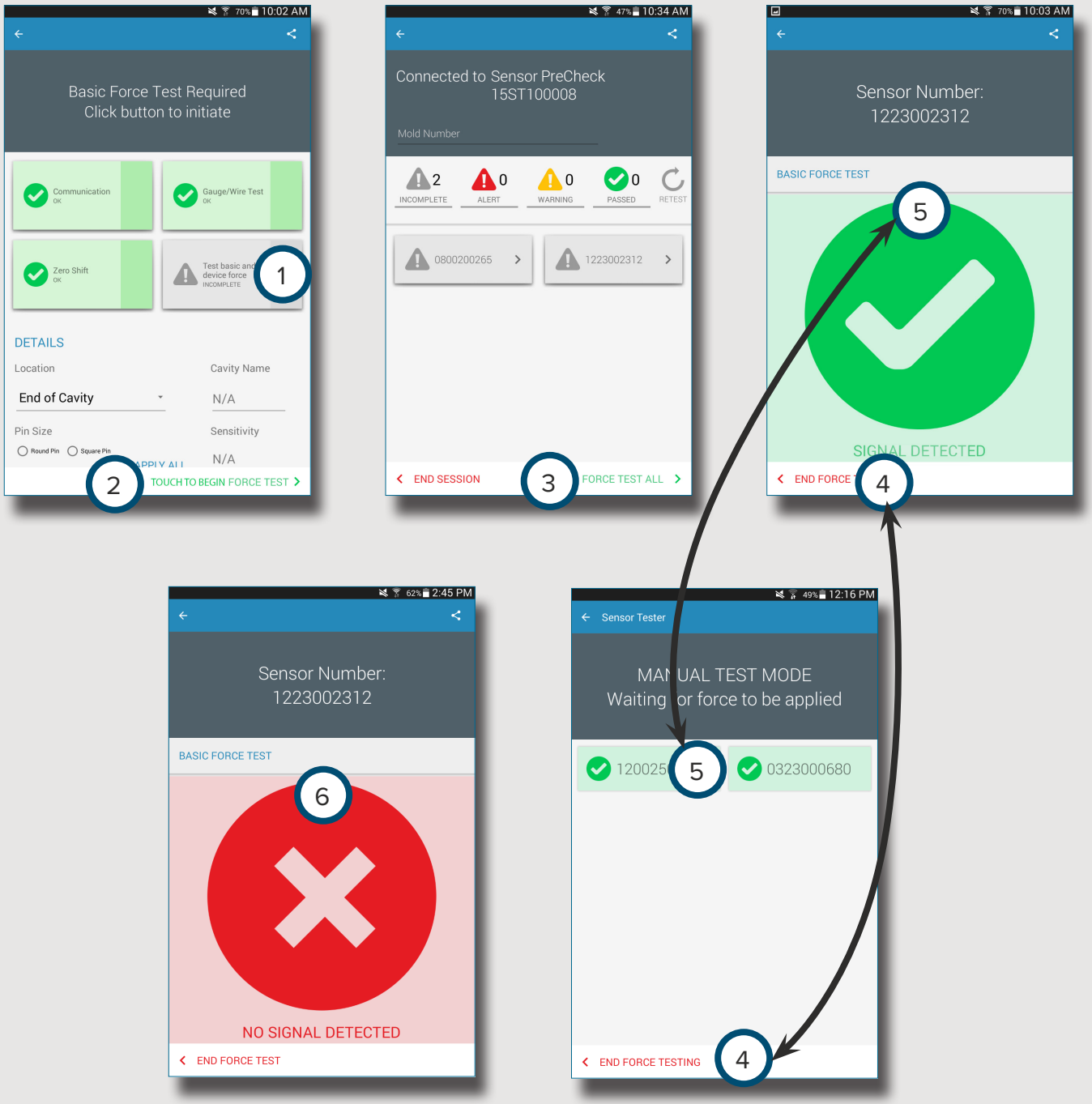
Select a 1 Sensor PreCheck from the application home page with which to connect. The Sensor PreCheck will be grey until selected and will turn green after selection.

If desired, enter the mold number in the 2 Mold Number field.

Select 3 Begin Automated Test to test all sensors.

The 4 Progress Bar will indicate the test progress. Wait for the test to complete.

Select a 5 sensor to enter the sensor information including Location, Cavity Name, Pin Size, Sensitivity, Sensor Model, and Sensor Serial Number in the provided 6 fields. Run a manual force test to complete testing.



MANUAL SENSOR FORCE TESTS

STRAIN GAGE SENSORS

After running an automated test, **select** one of the following:

1. Test Basic and Device Force
2. Touch to Begin Force Test
3. Force Test All

> **NOTE** The application will time out if no signal is received from the sensor in a specified length of time; be ready to apply force to the sensor(s).

Select 4 End Force Test after the 5 Signal Detected screen is displayed.

The 6 No Signal Detected screen will be displayed if the test was unsuccessful. Refer to **PAGE 30** for troubleshooting.

PIEZOELECTRIC SENSORS

NOTE Do not move the Lynx cable during piezoelectric sensor testing, as it will create false test results.

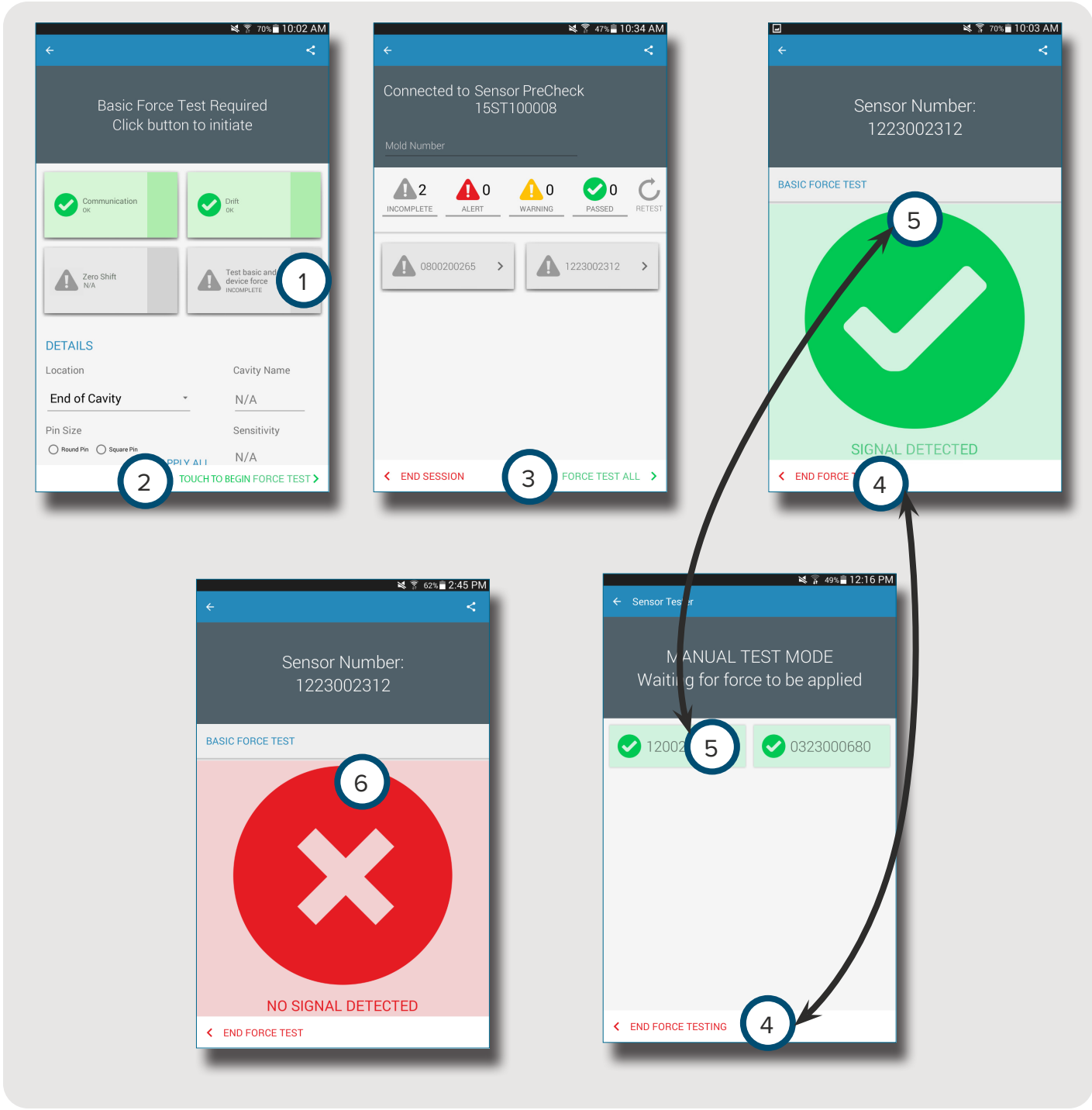
After running an automated test, **select** one of the following:

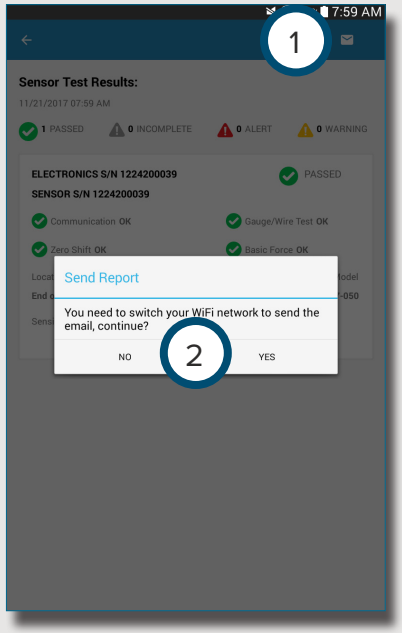
1. Test Basic and Device Force
2. Touch to Begin Force Test
3. Force Test All

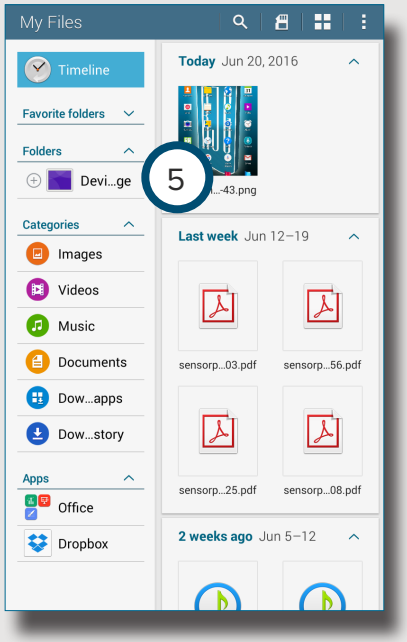
NOTE The application will time out if no signal is received from the sensor in a specified length of time; be ready to apply force to the sensor(s).

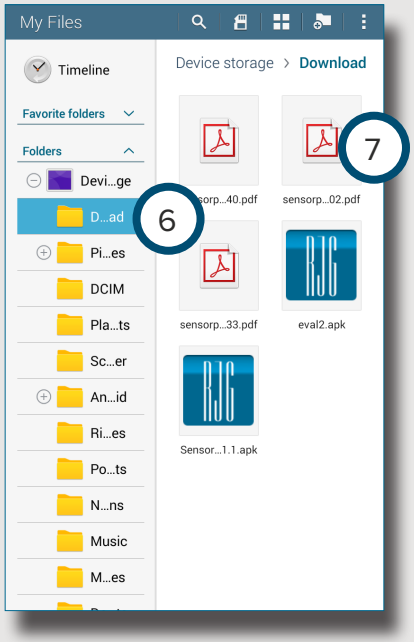
Select 4 End Force Test after the 5 Signal Detected screen is displayed.

The 6 No Signal Detected screen will be displayed if the test was unsuccessful. Refer to **PAGE 31** for troubleshooting.









SENSOR TEST REPORTS

Sensor reports are stored in the tablet's Device Storage/Downloads folder *after the report is generated*.

Select the 1 Email button, then select either 2 NO to remain connected, or YES to disconnect from the Sensor PreCheck and email the report.

NOTE The email button must be selected to generate the report; if the email button is not selected, the report will not be generated.

Select the 3 Applications icon from the tablet home page.

Select 4 My Files.

Select 5 Device Storage.

Select 6 Downloads.

Select the desired 7 report.

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APPLICATION DOWNLOAD AND INSTALL FROM TABLET

Select the 1 Applications icon from the tablet home page.

Select the 2 Play Store from the list of Apps.

Enter 3 Sensor PreCheck in the search bar.

Select the 4 Sensor PreCheck application.

Select 5 Install from the application page.

Select 6 Accept from the permissions pop-up window.

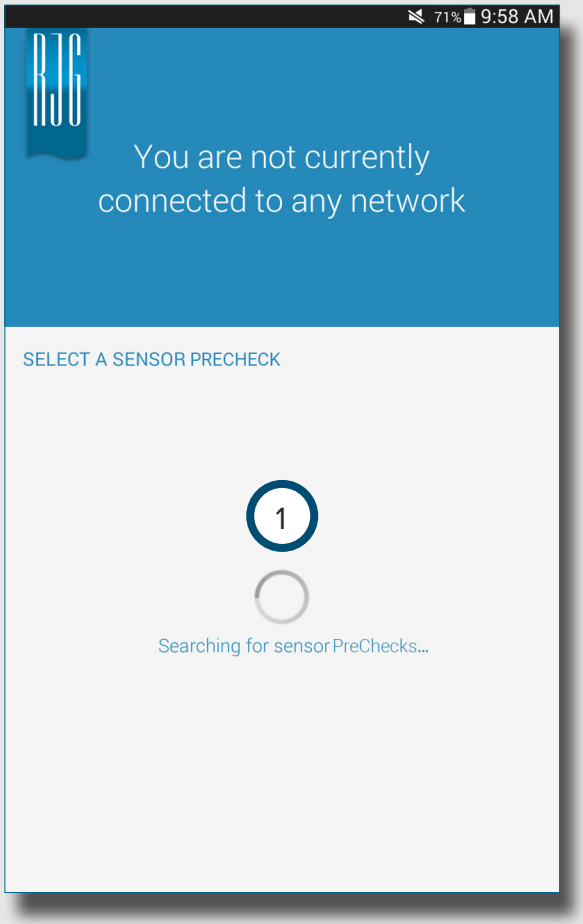
REFRESH APPLICATION

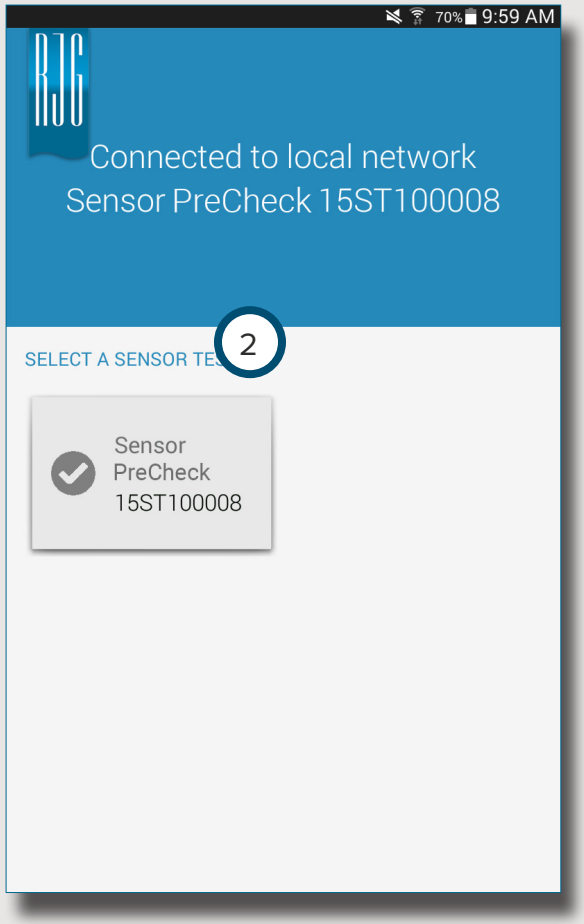
REFRESH SENSOR PRECHECK LIST

If no Sensor PreChecks appear upon application start-up, or if a recently connected Sensor PreCheck does not appear on the list of Sensor PreChecks, swipe the tablet screen in a downward motion to (1) refresh the application for any recently added or removed Sensor PreCheck systems.

Any (2) connected Sensor PreCheck systems will display in the window.

NOTE WiFi must be enabled on the tablet to connect to the Sensor PreCheck.

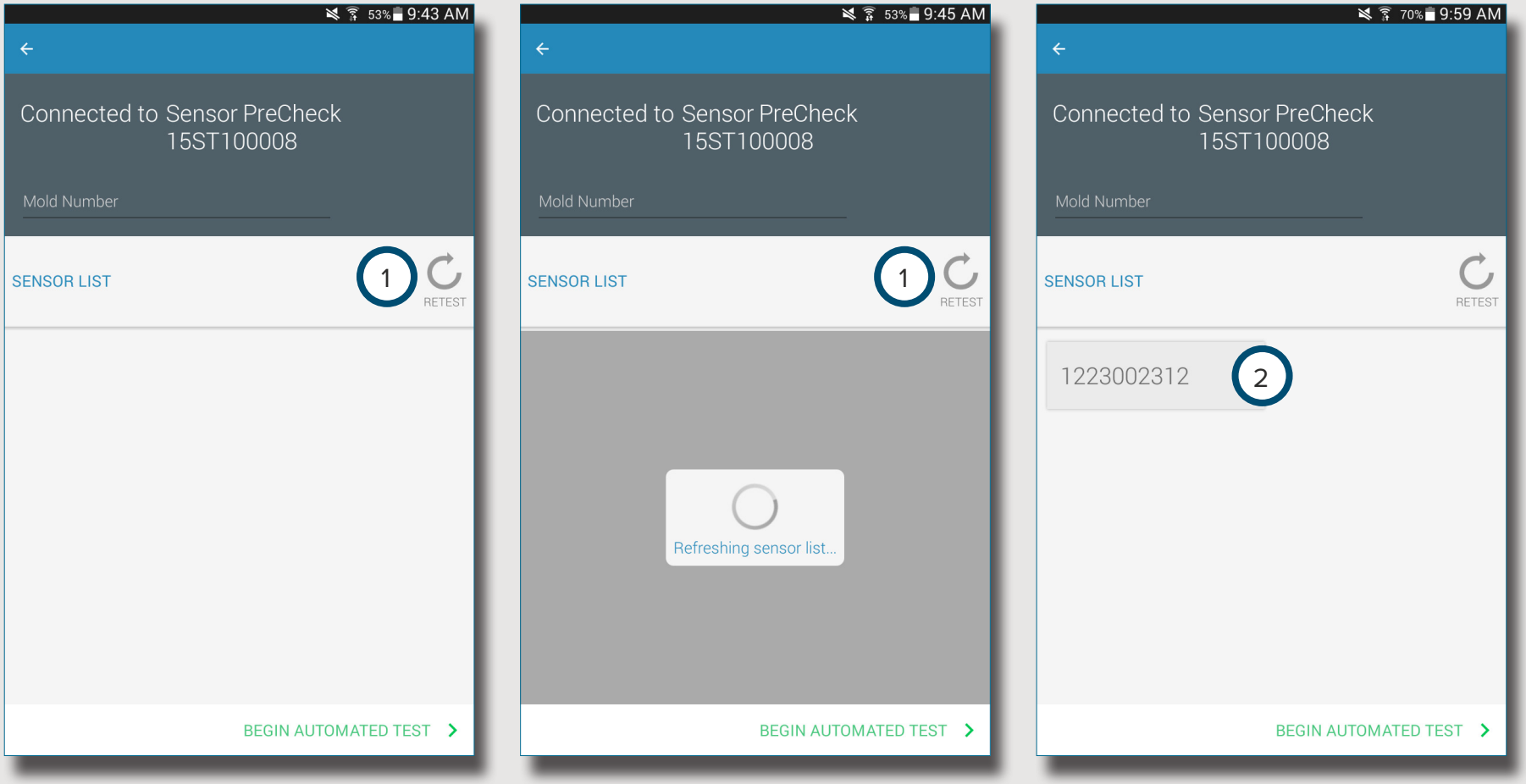




REFRESH SENSOR LIST

If no sensors appear upon application start-up, or if a recently connected sensor does not appear on the list of sensors, **select** (1) Retest to refresh the application for any recently added or removed sensor connections.

Any (2) connected sensors will display in the window.



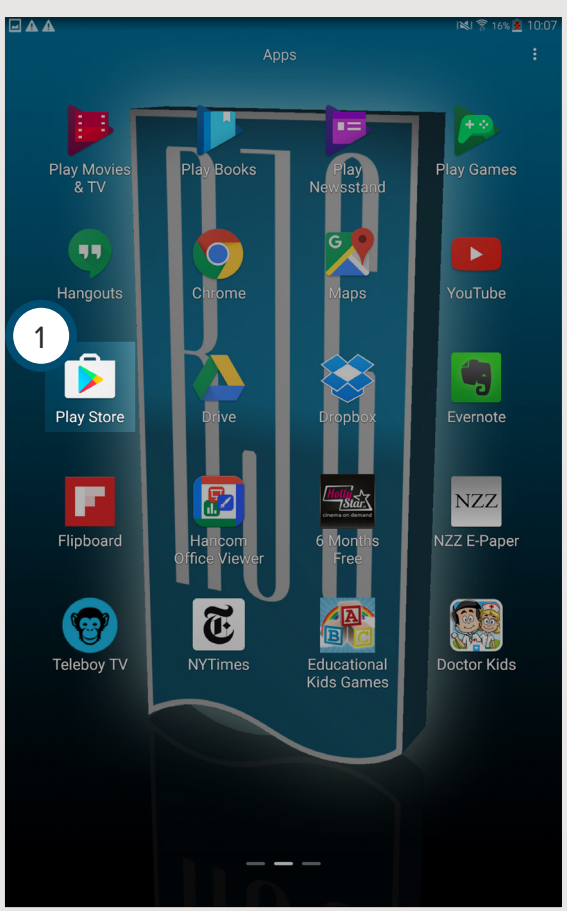
UPDATES

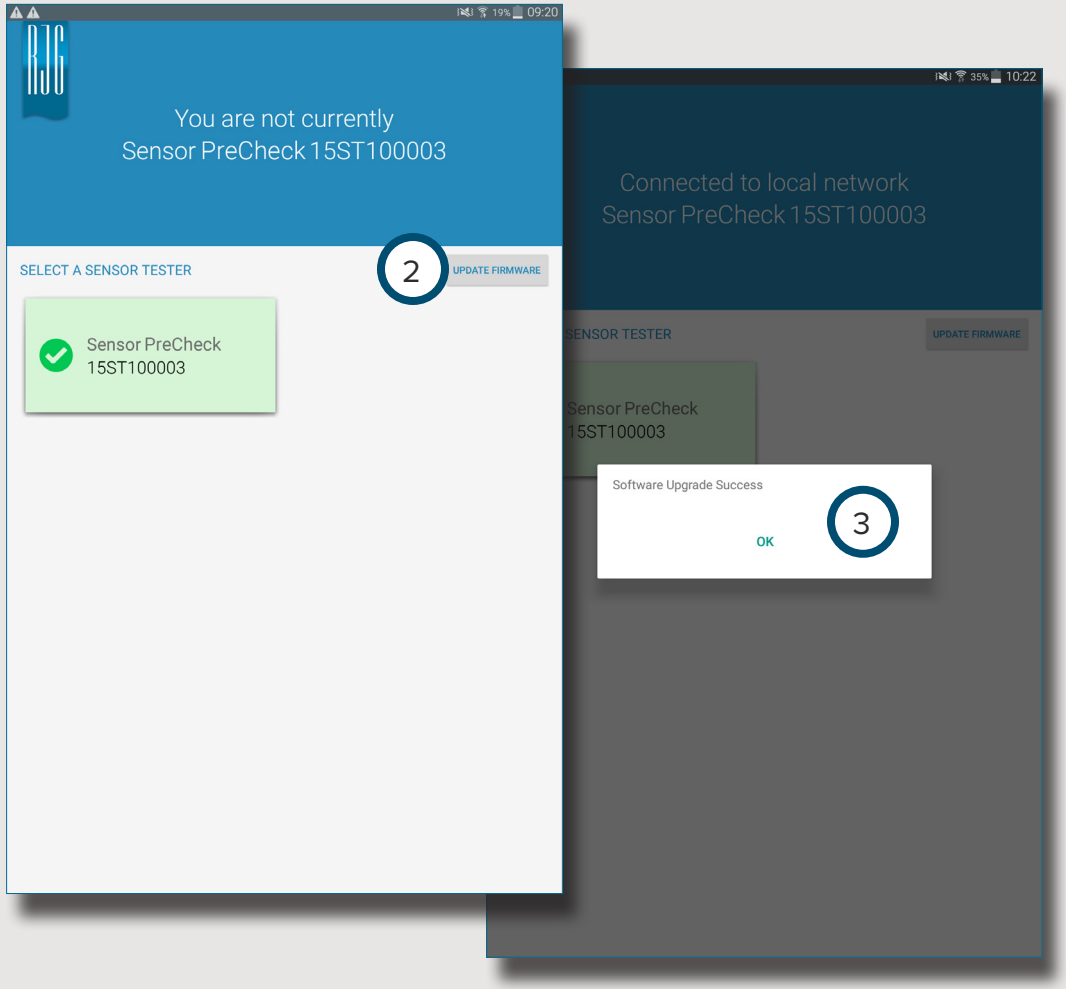
APPLICATION

Check for application updates in the 1 Google Play store. Refer to **APPLICATION DOWNLOAD AND INSTALL FROM TABLET ON PAGE 24.**

FIRMWARE

Firmware updates for the Sensor PreCheck are installed from the tablet. Open and connect to the Sensor PreCheck. Select the 2 UPDATE FIRMWARE button. Any firmware updates will be pushed to the Sensor PreCheck from the tablet. Once the firmware is updated, a 3 success message is displayed. *Restart the Sensor PreCheck to complete the update.*





NOTES

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STRAIN GAGE SENSORS

COMMUNICATION FAILURE

The Sensor PreCheck lost connection to the sensor electronics:

- Replace the Lynx cable and try again.
- If a new cable does not correct the issue, the problem is most likely the sensor electronics.
- If the test fails again, replace the strain gage adapter (SG/LX....) and retest.
- If the test fails again, request an RMA for return from RJG.

GAGE/WIRE TEST FAILURE

There may be a broken wire:

- Perform a visual inspection of the sensor cable.
- If cable is okay the gage may be damaged or overloaded.
- Remove the sensor form the tool and retest the sensor. If the sensor now passes the test, check the sensor pocket installation dimensions.
- If the sensor fails again, request an RMA for return from RJG.

ZERO SHIFT FAILURE

Remove sensor from tool and retest. Failure could be caused by preload due to installation. Common causes of preload are:

- Radius in the corners of the sensor pocket.
- Improper sensor pocket depth.
- Not enough clearance above the ejector pin head.

If the sensor fails after removal from the tool, the sensor needs to be re-calibrated or replaced.

- Request an RMA from RJG.

FORCE TEST FAILURE

Tester did not detect any force being applied;

- apply pressure on pin or directly on sensor head.
- Remove the sensor from the tool and retest the sensor.

If the sensor passes, check that the pin moves freely. The pin should slide forward and backward easily. The pin should also spin easily.

- If the sensor fails again, request an RMA from RJG.

PIEZOELECTRIC SENSORS

COMMUNICATION FAILURE

The Sensor PreCheck lost connection to the sensor electronics:

- Replace the Lynx cable and try again.
- If a new cable does not correct the issue, the problem is most likely the sensor electronics.
- If the test fails again, replace the strain gage adapter (SG/LX....) and retest.
- If the test fails again, request an RMA for return from RJG.

FORCE TEST FAILURE

1. Single Channel

Tester did not detect any force being applied;

- apply pressure on pin or directly on sensor head.
- Remove the sensor from the tool and retest the sensor.
- If the test fails again, remove the sensor from the tool and retest the sensor.

If the sensor passes, check that the pin moves freely. The pin should slide forward and backward easily. The pin should also spin easily.

- If the sensor fails again, request an RMA from RJG.

2. Multi Channel

Tester did not detect any force being applied;

- apply pressure on pin or directly on sensor head.
- Remove the sensor from the tool and retest the sensor.

If the sensor passes, check that the pin moves freely. The pin should slide forward and backward easily. The pin should also spin easily.

- If the sensor fails again, request an RMA from RJG.

FORCE TEST PASS WITHOUT APPLICATION OF FORCE

If force was not applied, but the test was passed, be aware that moving the piezoelectric sensor cable during the test can cause false readings. Check the sensor again without moving any of the components.

DRIFT FAILURE

1. Multi-channel

Something happened to cause a change in reading during the test. Be aware that moving the piezoelectric sensor cable during the test can cause false readings. Check the sensor again without moving any of the components.

- If the test fails a second time, start testing backwards from the mold to the electronics until drift passes.

Disconnect sensor head from 1645 cable and Retest.

- If the test passes the problem is in the sensor head.

Disconnect 1645 cable from PZ plate and Retest.

- If the test passes the problem is in the 1645 cable.

Disconnect PZ Plate and Retest.

- If the test passes the problem is in the PZ Plate.

Disconnect piezoelectric sensor adapter cable (C-PZ/LX...) and Retest

- If the test passes the problem is in the piezoelectric sensor adapter cable (C-PZ/LX...)
- If the test fails, the problem is in the piezoelectric sensor adapter electronics (PZ/LX...)

Clean the sensor can cable connection points with an approved cleaner. Follow instructions at: https://rjginc.com/paperclip/product_downloads/547/cleaning-connectors_cables.pdf. Retest after cleaning.

- If the test fails after cleaning, request an RMA from RJG.

2. Single Channel

Something happened to cause a change in reading during the test. Be aware that moving the piezoelectric sensor cable during the test can cause false readings. Check the sensor again without moving any of the components.

- If the test fails a second time, start testing backwards from the mold to the electronics until drift passes.

Disconnect sensor head from 1645 cable

- If the test passes the problem is in the sensor head.

Disconnect 1645 cable from the piezoelectric sensor adapter (PZ/LX1-M) and Retest.

- If the test passes the problem is in piezoelectric sensor adapter.

Disconnect 1661 cable from piezoelectric sensor adapter (PZ/LX-S) and Retest.

- If the test passes the problem is in the piezoelectric sensor adapter.

Clean the sensor can cable connection points with an approved cleaner. Follow instructions at: https://rjginc.com/paperclip/product_downloads/547/cleaning-connectors_cables.pdf. Retest after cleaning.

- If the test fails after cleaning, request an RMA from RJG.

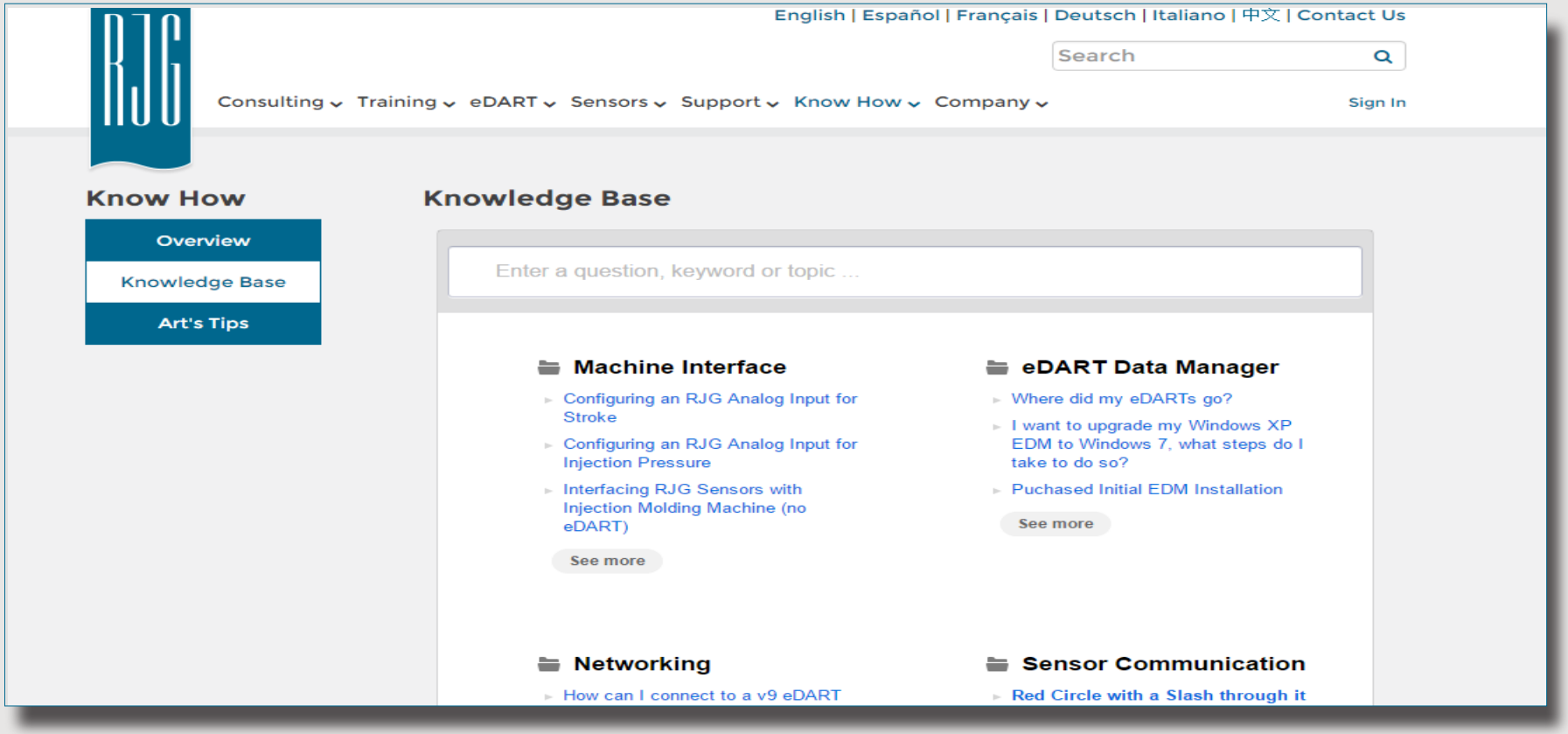
KNOWLEDGE BASE

For further information, visit

https://rjginc.com/know-how/knowledge-base

RJG's searchable virtual help library.

Topics include Machine Interface, e*DART* Data Manager, Networking, Sensor Communication, Extracting e*DART* Data, Advanced System Overview, Microsoft Windows, Valve Gate, System Utilities Software, Hardware, and other product-related issues.



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RJG, Inc. Customer Support

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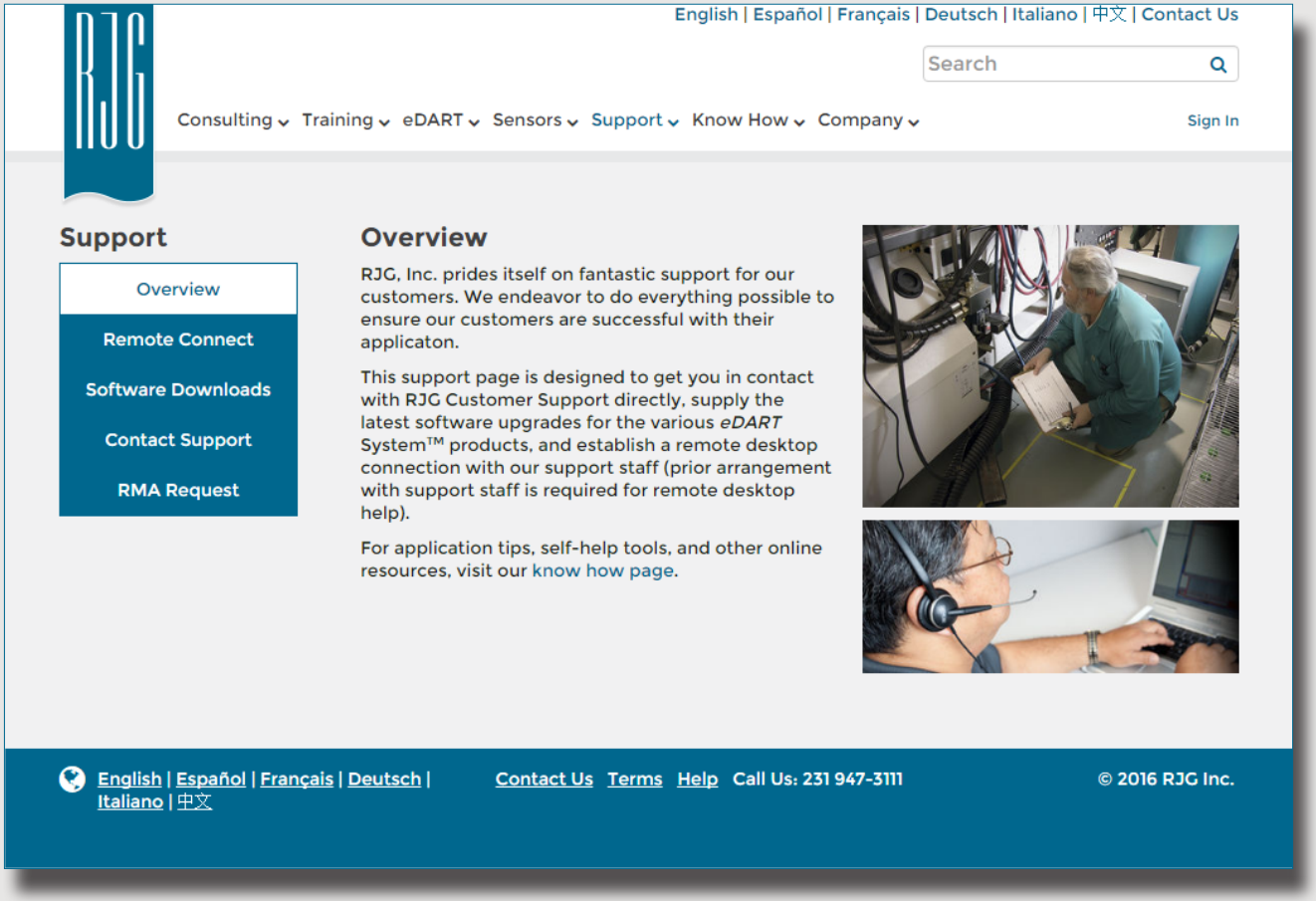
https://rjginc.com/support



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