USER GUIDE

Sensor eValuator™

Testing and diagnostics.

Error Reporting.

Sensor Validation.

Training and Technology for Injection Molders



USER GUIDE Sensor eValuator™

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USER GUIDE INTRODUCTION

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

DISCLAIMER

Inasmuch as RJG, Inc. has no control over the use to which others may put this material, it does not guarantee that the same results as those described herein will be obtained. Nor does RJG, Inc. guarantee the effectiveness or safety of any possible or suggested design for articles of manufacture as illustrated herein by any photographs, technical drawings, and the like. Each user of the material or design or both should make his own tests to determine the suitability of the material or any material for the design as well as the suitability of the material, process, and/or design for his own particular use. Statements concerning possible or suggested uses of the material or designs described herein are not to be construed as constituting a license under any RJG, Inc. patent covering such use or as recommendations for use of such material or designs in the infringement of any patent.

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ALERTS

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



Term

A definition of a term or terms used in the text.



NOTE A note provides additional information about a discussion topic.



CAUTION A caution is used to make the operator aware of conditions that can cause damage to equipment and/or injury to personnel.

PRODUCT OVERVIEW

The Sensor eValuator[™] 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
Piezoelectric Sensors
Basic Force Test
Basic Force Test

Specifications

Hardware

• Power Requirements I I 5–240 V AC

• 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:

- I RJG, Inc. Sensor eValuator™
- I 7" Samsung Tablet with USB cable
- I OtterBox Tablet Case
- I 120 V AC Power Supply
- I Lynx Cable



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START EQUIPMENT AND APPLICATION

Connect the power supply cable to the Sensor eValuator

1 power port and a power source. The green 2 power indication light will indicate that the Sensor eValuator is on; if no green light is visible the Sensor eValuator is off.

Connect the Lynx cable to the Sensor eValuator 3 Lynx input, and the sensor(s) to be tested.

Select the RJG Sensor eValuator 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 eValuator.

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



RUN AN AUTOMATED SENSOR TEST

MULTIPLE SENSORS

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

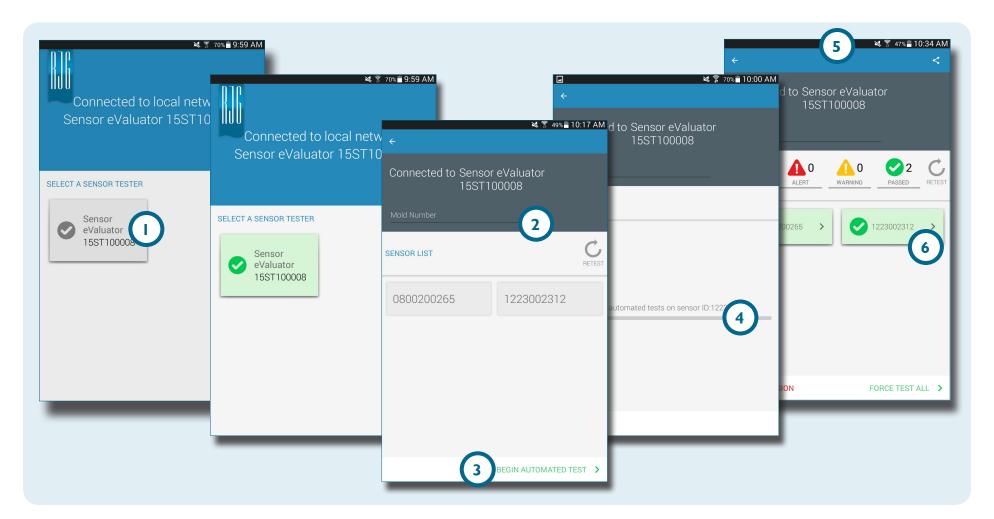
Enter the 2 Mold Number in the provided field. Select **3** Begin Automated Test to test all sensors.

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

The 3 automated test complete page will indicate any alerts, warnings, and the number of sensors that passed the test.

Select 0 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 5).



SINGLE SENSOR

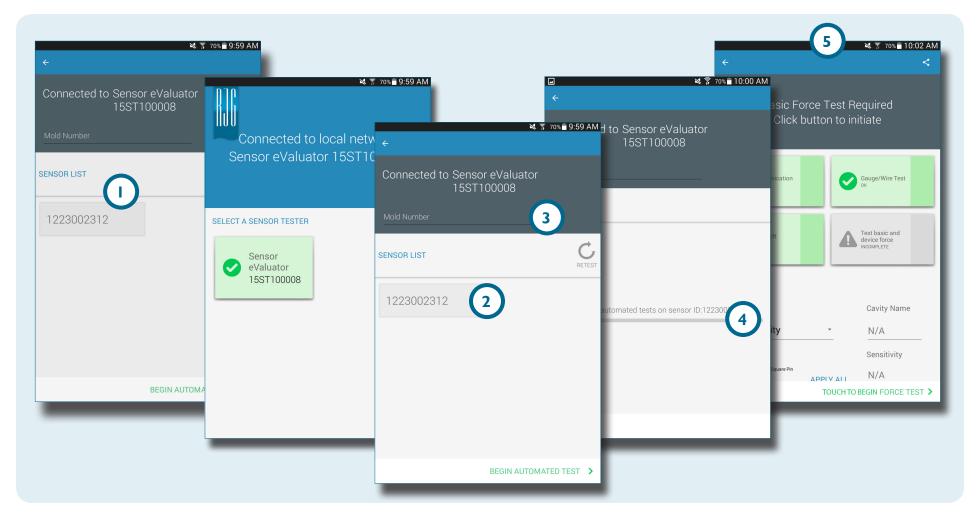
Select **b** a **1** Sensor eValuator icon from the application Home Page with which to connect. The Sensor eValuator icon will be grey until selected, and will turn green after selection.

Select the desired 2 sensor to test.

Enter the 3 Mold Number in the provided field. The 4 Progress Bar will indicate the test progress. Wait for the test to complete.

The 5 test complete page will indicate if the sensor passed the communication, gage/wire, zero shift (strain gage only), and drift (piezoelectric sensors only) tests. Enter the sensor information below the test results, including Location, Cavity Name, Pin Size, Sensitivity, Sensor Model, and Sensor Serial Number.

Complete the testing by running a manual force test (page 5).



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 eValuator to evaluate if the sensor is detecting force.

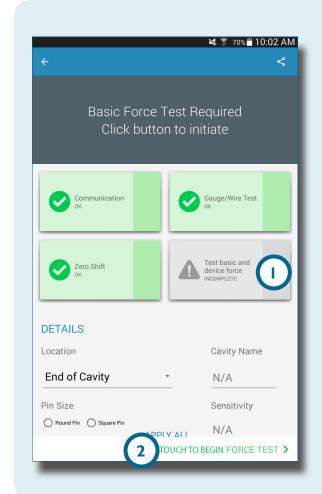


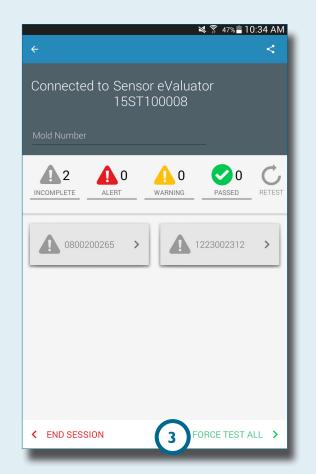
NOTE The application will time out if no signal is received from the sensor in a specified length of time; be ready to apply force to the sensor(s).

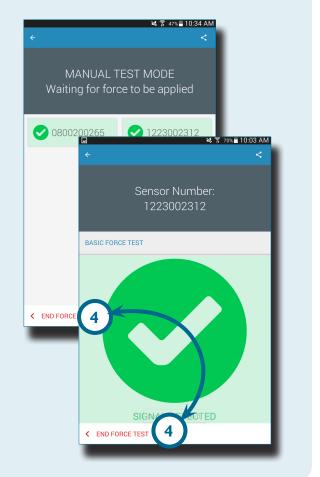
STRAIN GAGE SENSORS

After completing an automated test, **select** ① 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 • End Force Test to return to the test results screen when the force test is complete.







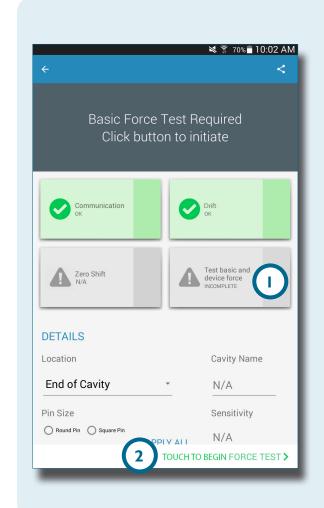
PIEZOELECTRIC SENSORS



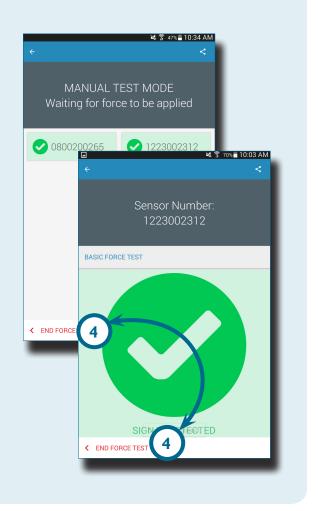
NOTE Do not move the Lynx cable during multi-channel piezoelectric sensor testing. Moving the Lynx cable during multi-channel piezoelectric sensor testing will create false test results.

After completing an automated test, **select** ① 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

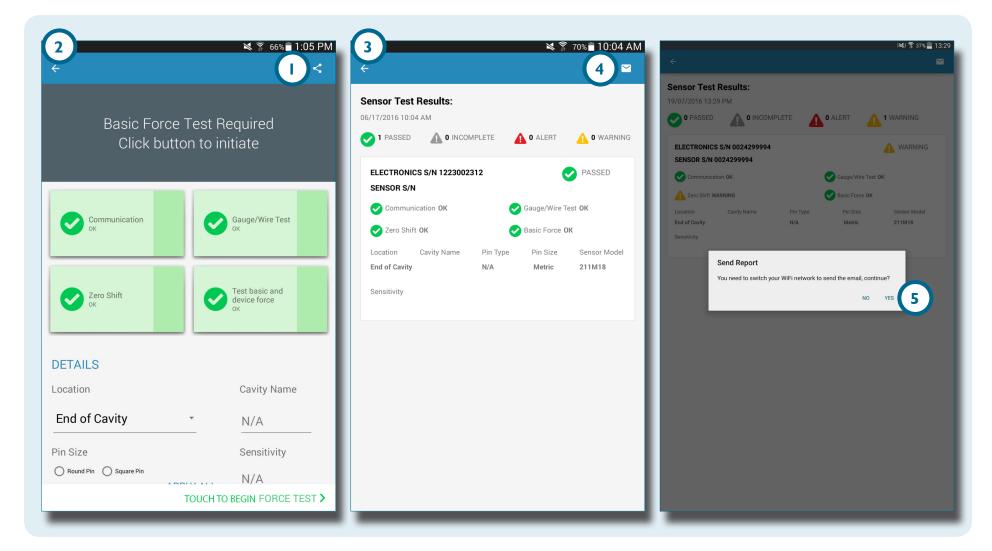
The Sensor eValuator application generates a report file for tested sensors.

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 eValuator hardware and connect to a WiFi network.

Email the report to the desired email address.





OVERVIEW

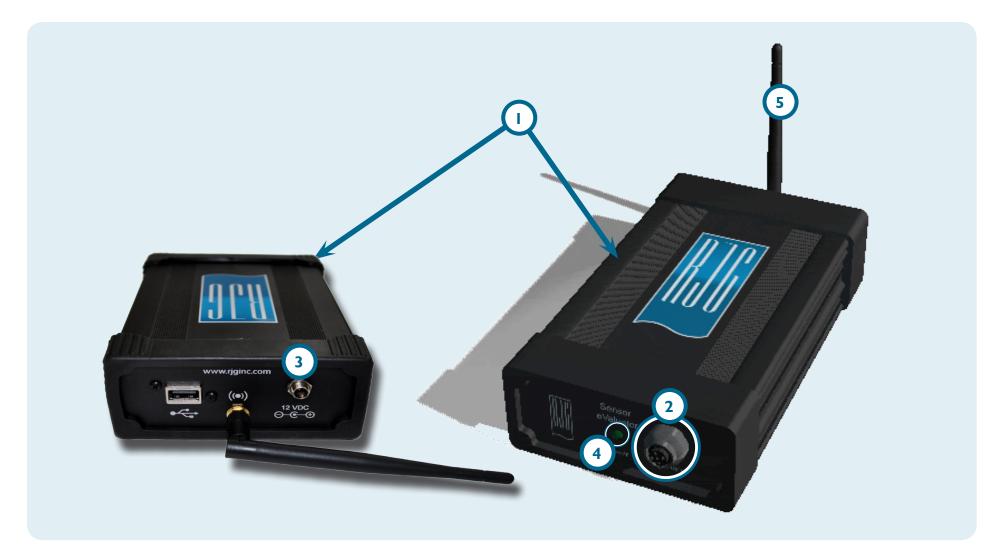
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SENSOR EVALUATOR HARDWARE

SENSOR EVALUATOR

The Sensor eValuator verifies proper operation of Lynx cavity pressure sensors, and includes the following:

- 2 Lynx Connector
- 3 Power Supply Connector
- 4 Power Supply Indicator
- 5 Wireless Signal Antenna



LYNX SENSOR CABLE

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

TABLET

The tablet provided with the Sensor eValuator device is preloaded with the Sensor eValuator 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 eValuator and the sensors being tested.

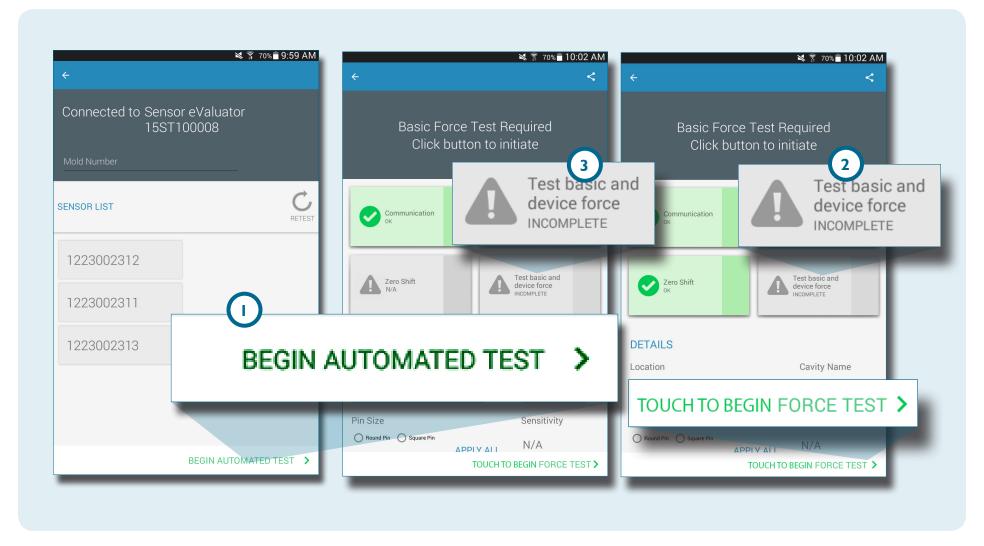


SENSOR EVALUATOR APPLICATION

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

The application provides the following tests:

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

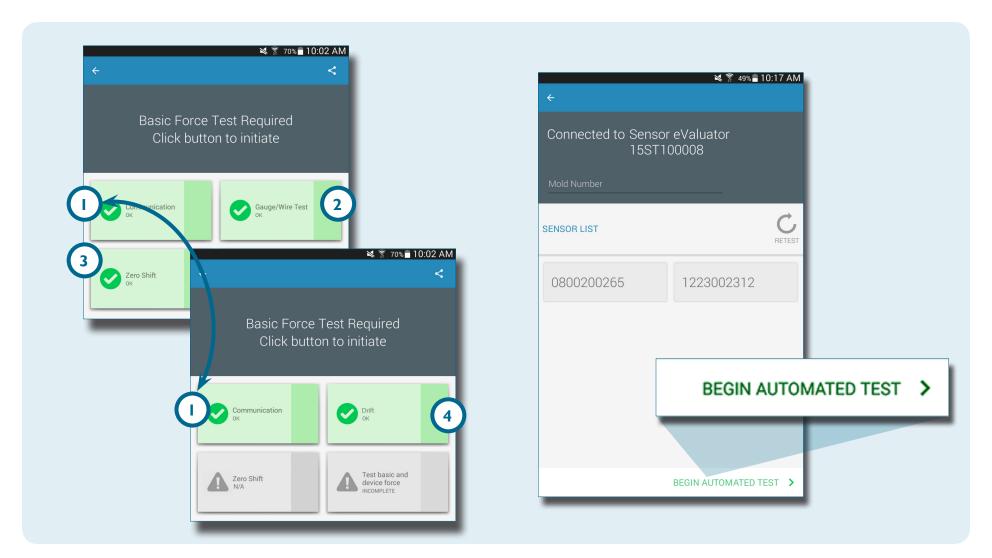


AUTOMATED SENSOR TEST—MULTIPLE SENSORS

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

- Communication
- 2 Gage/Wire Test (for Strain Gage only)

- 3 Zero Shift (for Strain Gage only)
- 4 Drift (for Piezoelectric Sensors only)

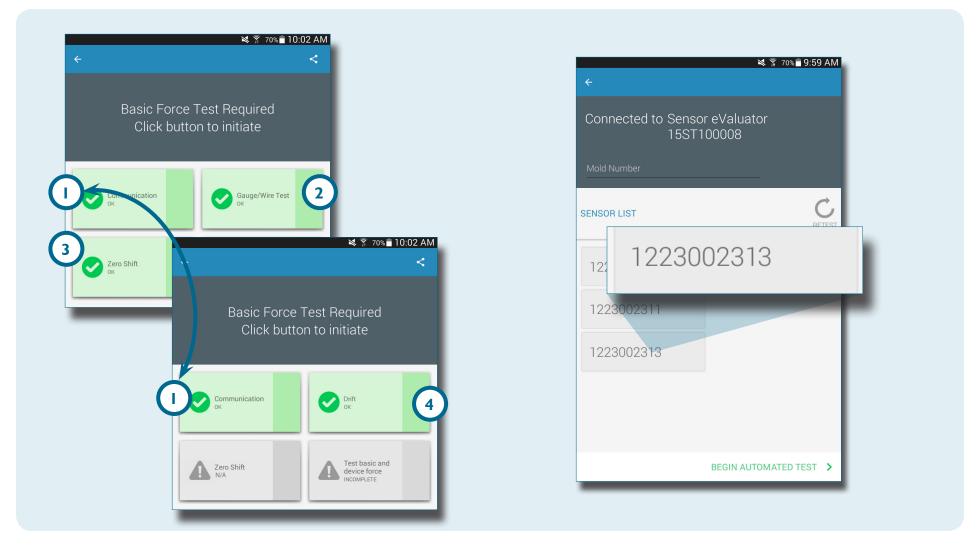


AUTOMATED SENSOR TEST—SINGLE SENSOR

The automated sensor test will test a single sensor that is connected to and detected by the Sensor eValuator and selected by the user for the following:

Communication

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



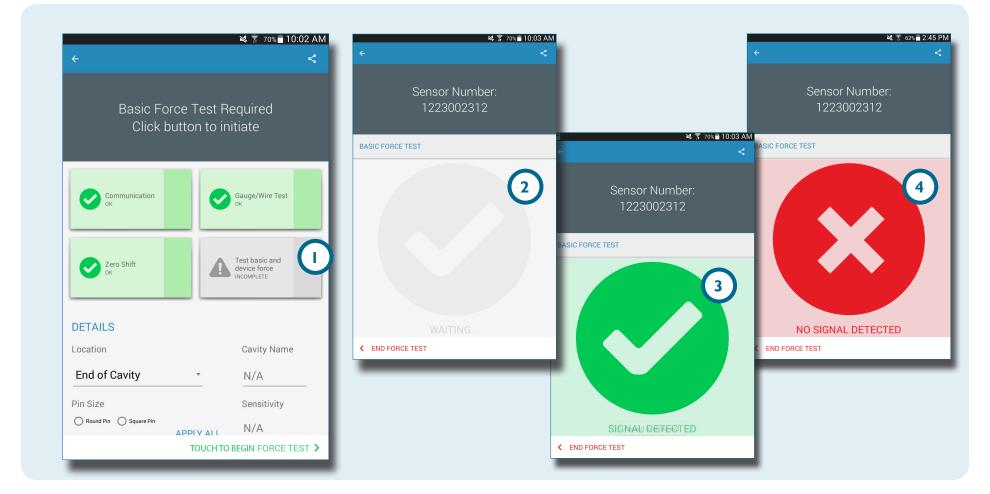
MANUAL STRAIN GAGE SENSOR FORCE TEST

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 eValuator 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 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.



MANUAL PIEZOELECTRIC SENSOR FORCE TEST

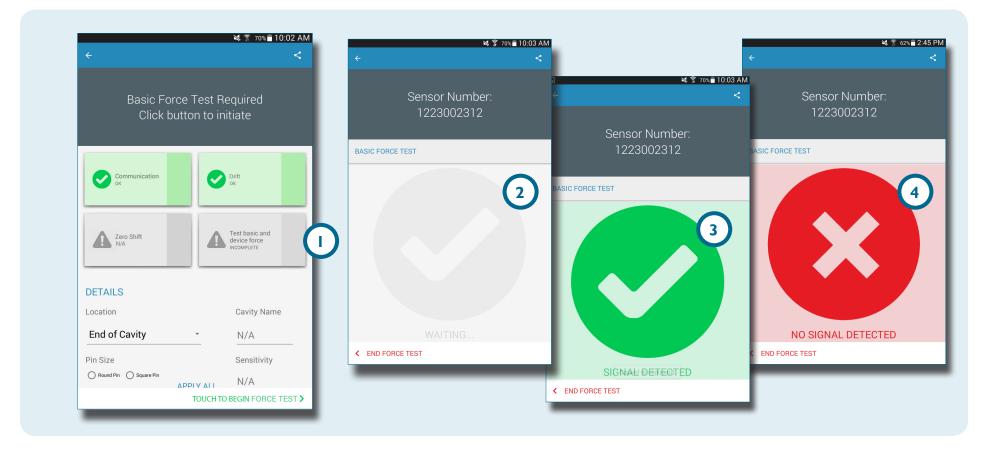
The manual piezoelectric sensor force test tests for 1 Basic and Device Force. The operator must physically press on the sensor(s) being tested in order for the Sensor Tester to evaluate if the sensor is detecting force.

1

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 Lynx sensor cable during multi-channel piezoelectric sensor testing. Moving the Lynx 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.

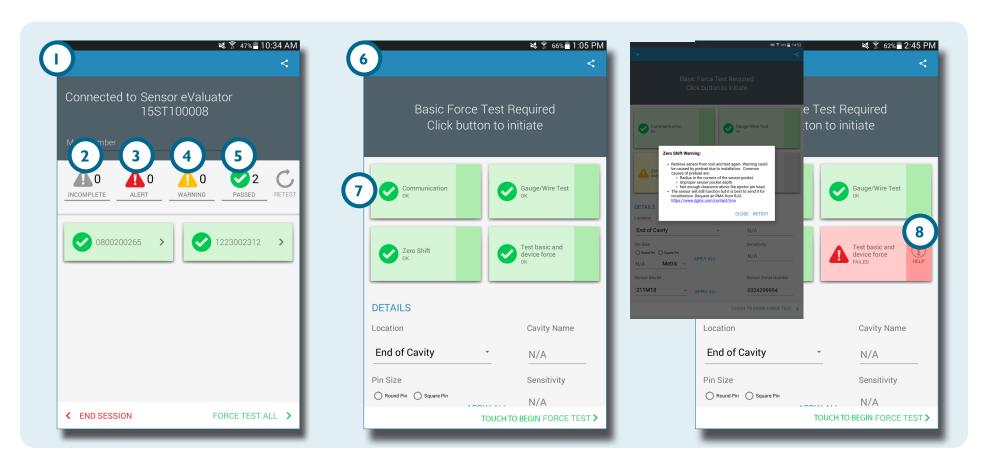
3 Alerts indicate a sensor is outside ±2% (strain gage) or ±20 picocoulombs/min (piezoelectric) normal.

4 Warnings indicate a sensor is outside $\pm 5\%$ (strain gage) or ± 40 picocoulombs/min (piezoelectric) normal.

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.

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.

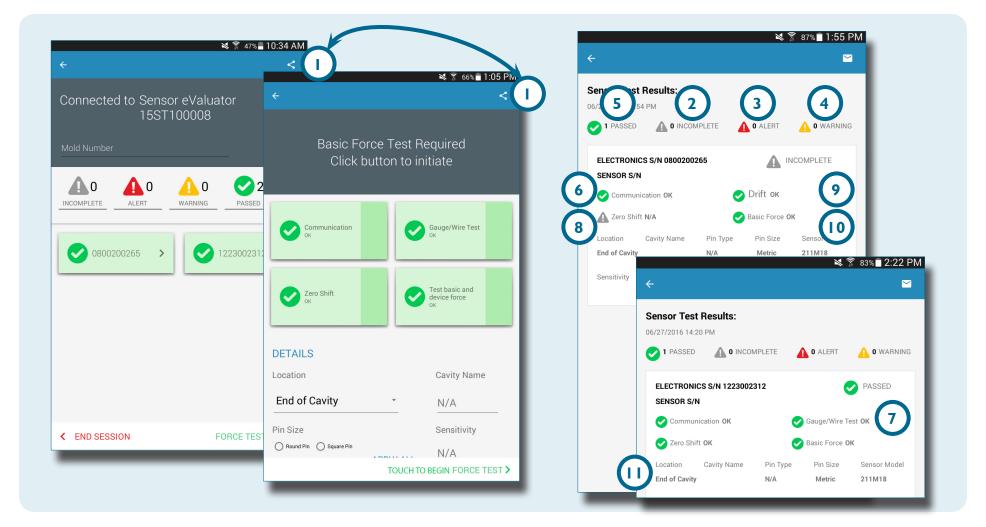


SENSOR TEST REPORTS

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 eValuator 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.



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AUTOMATED SENSOR TESTS

MULTIPLE SENSORS

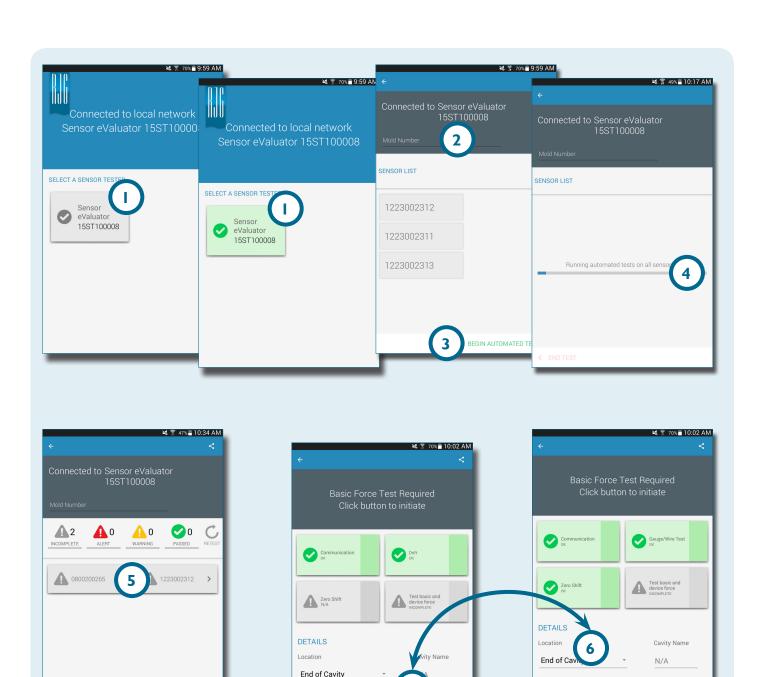
Select a Sensor eValuator from the application home page with which to connect. The Sensor eValuator will be grey until selected and will turn green after selection.

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



Pin Size

FORCE TEST ALL >

O Round Pin O Square Pin

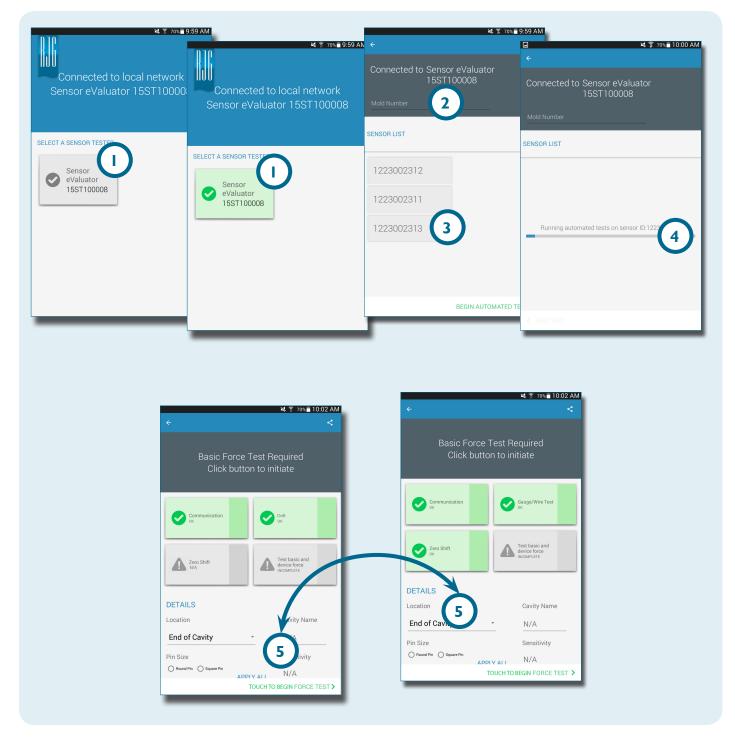
TOUCH TO BEGIN FORCE TEST >

Pin Size

Round Pin Square Pin

Sensitivity

TOUCH TO BEGIN FORCE TEST



SINGLE SENSOR

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

If desired, enter the mold name in the 2 Mold Name field.

Select a a a sensor to test.

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

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

MANUAL SENSOR FORCE TESTS

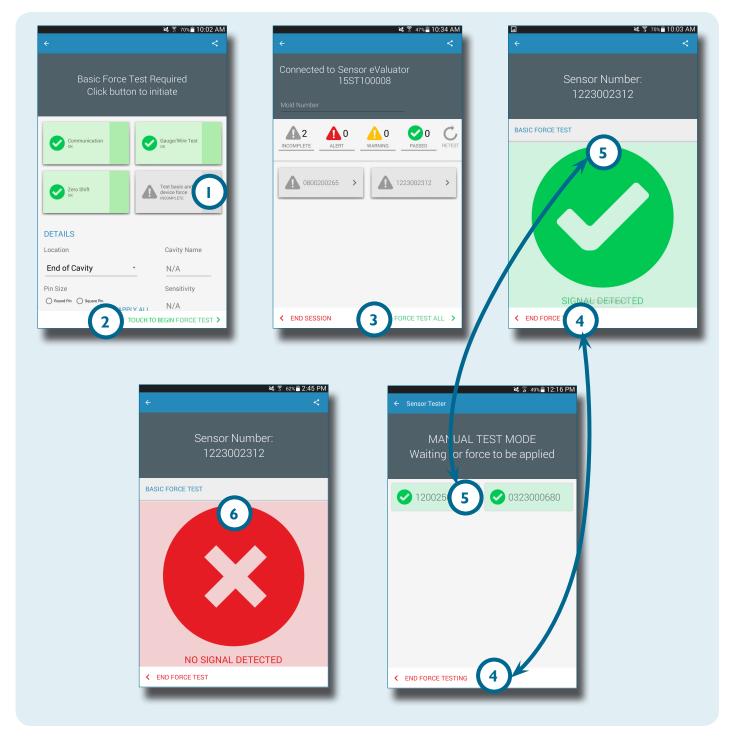
STRAIN GAGE SENSORS

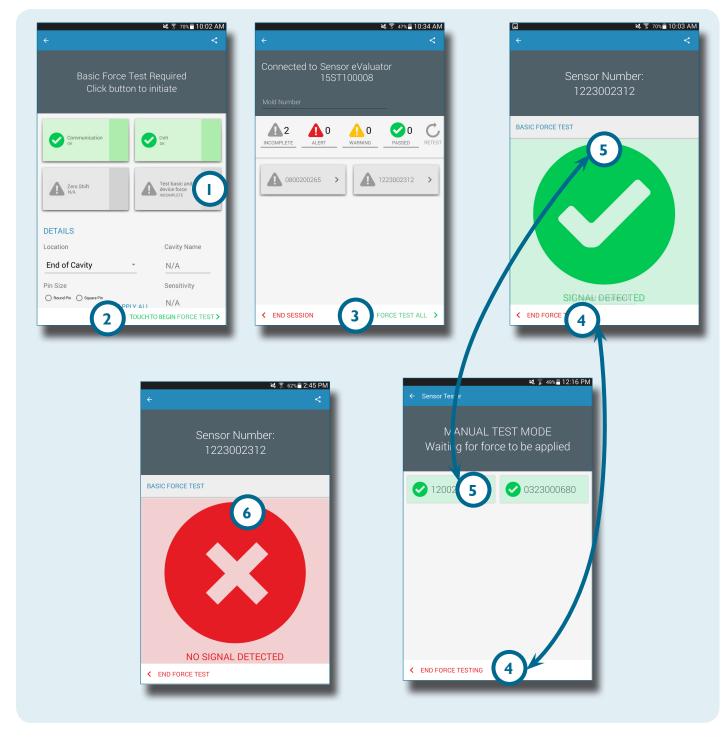
After running an automated test, **select** one of the following:

- 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 32** 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:

- 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 33** for troubleshooting.

SENSOR TEST REPORTS

Sensor reports are automatically stored in the tablet's Device Storage/ Downloads folder.

Close the application and disconnect from the Sensor eValuator.

Select the **1** Applications icon from the tablet home page.

Select 🖰 2 My Files.

Select 🖰 3 Device Storage.

Select 🖰 4 Downloads.

Select the desired

5 report **OR**

Tap and hold a file until a 6 green check mark appears to select that file, and then tap on other files to add them to the selection.

Select 🖱 the 🕡 Share button, and then select 8 email in the Share Via pop-up window.



Q | # | # | &

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sensorp...33.pdf

Sensor...1.1.apk

Y Timeline

Favorite folders ~

─ Devi...ge

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DCIM

Pla...ts

Sc...er

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Po...ts

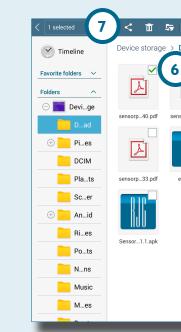
N...ns

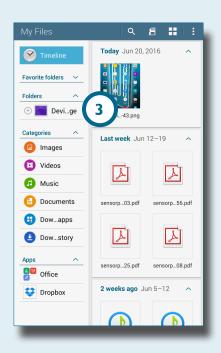
Music M...es

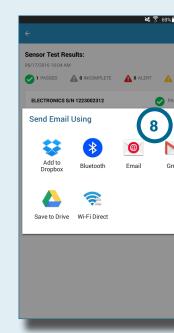
⊕ An...id

Device storage > Download









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INSTALLATION AND SETUP

APPLICATION DOWNLOAD AND INSTALL FROM TABLET

Select the **1** Applications icon from the tablet home page.

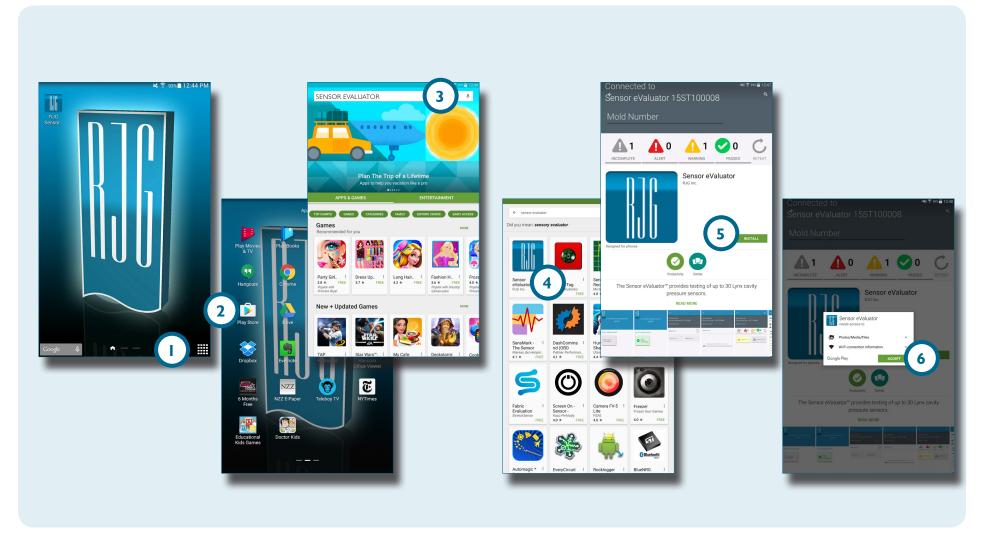
Select the 2 Play Store from the list of Apps.

Enter 3 sensor evaluator in the search bar.

Select the 4 Sensor eValuator application.

Select **5** Install from the application page.

Select 6 Accept from the permissions pop-up window.



APPLICATION DOWNLOAD AND INSTALL FROM COMPUTER

NOTE Google account sign-in is required to download from the Google Play Store.

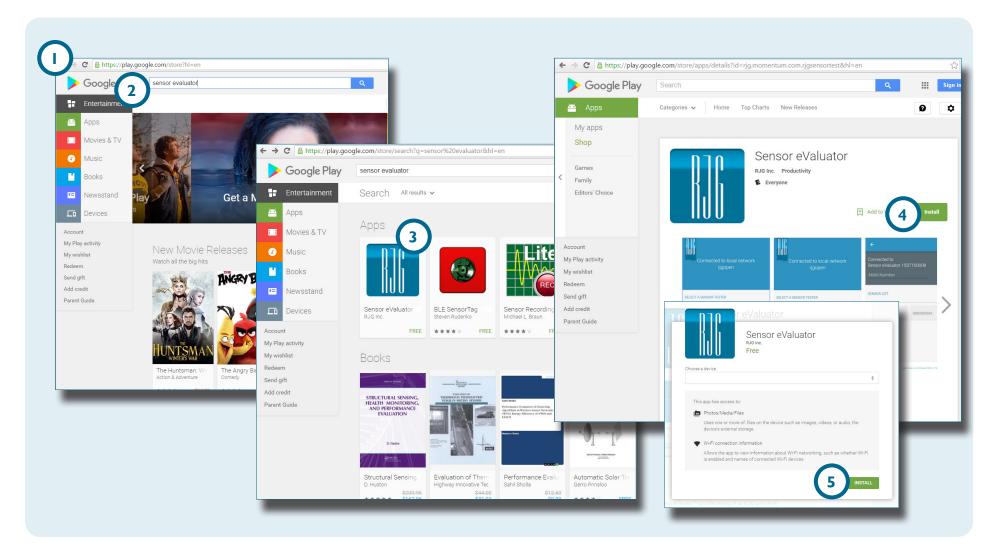
Open Google Chrome and enter the following address:

https://play.google.com/store.

Enter 2 sensor evaluator in the search bar.

Click [↑] 3 Sensor eValuator on the search results page.

Click 4 Install; select the device on which to install the application and click 5 INSTALL in the pop-up window.



REFRESH APPLICATION

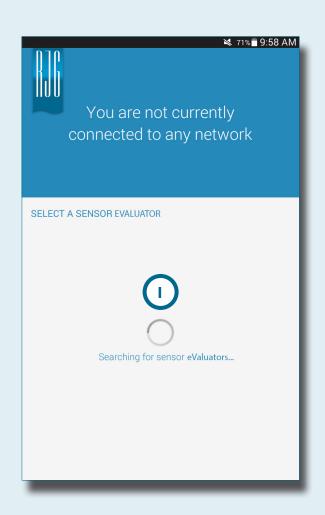
REFRESH SENSOR EVALUATOR LIST

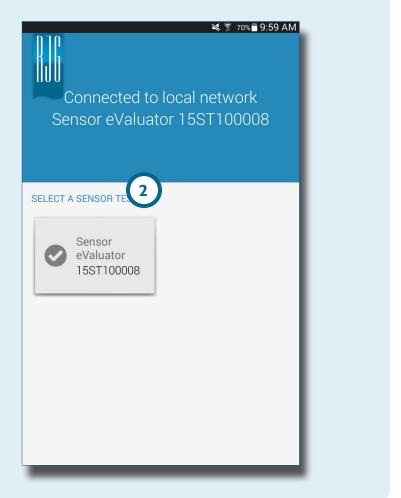
If no Sensor eValuators appear upon application start-up, or if a recently connected Sensor eValuator does not appear on the list of Sensor eValuators, swipe the tablet screen in a downward motion to 1 refresh the application for any recently added or removed Sensor eValuators.

Any 2 connected Sensor eValuators will display in the window.



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

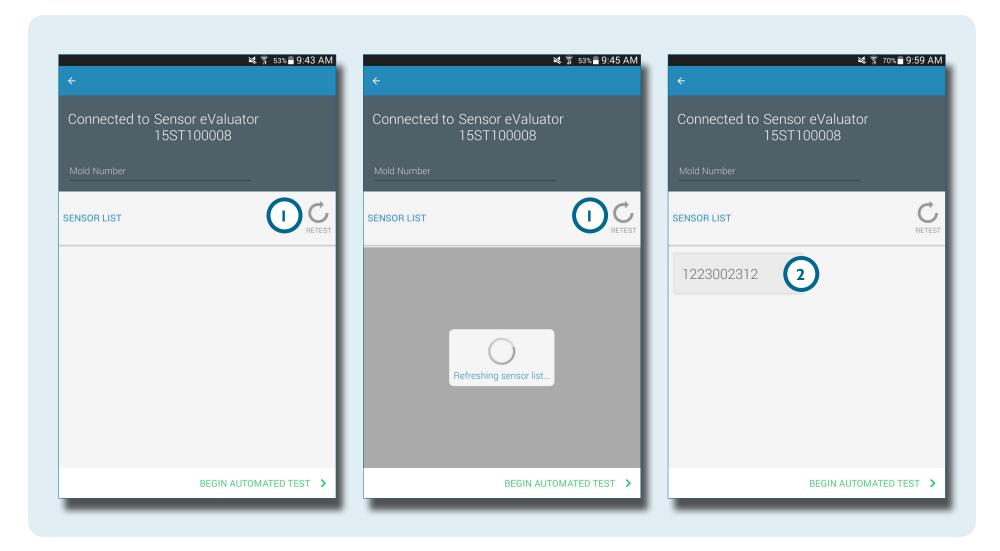




REFRESH SENSOR LIST

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

Any 2 connected sensors will display in the window.





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STRAIN GAUGE SENSORS

COMMUNICATION FAILURE

The Sensor eValuator 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 eValuator 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.

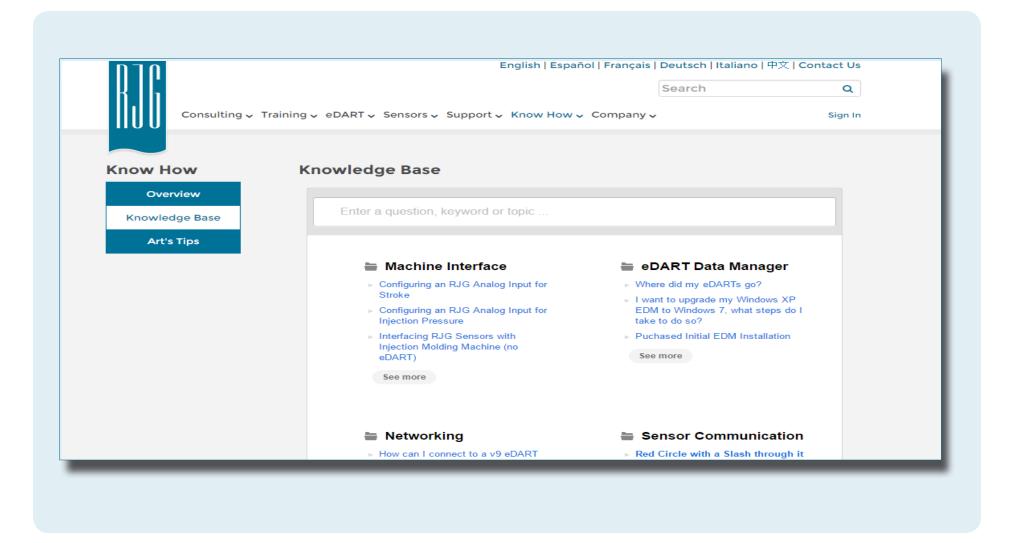
KNOWLEDGE BASE

For further information, visit

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

RJG's searchable virtual help library.

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



CUSTOMER SUPPORT

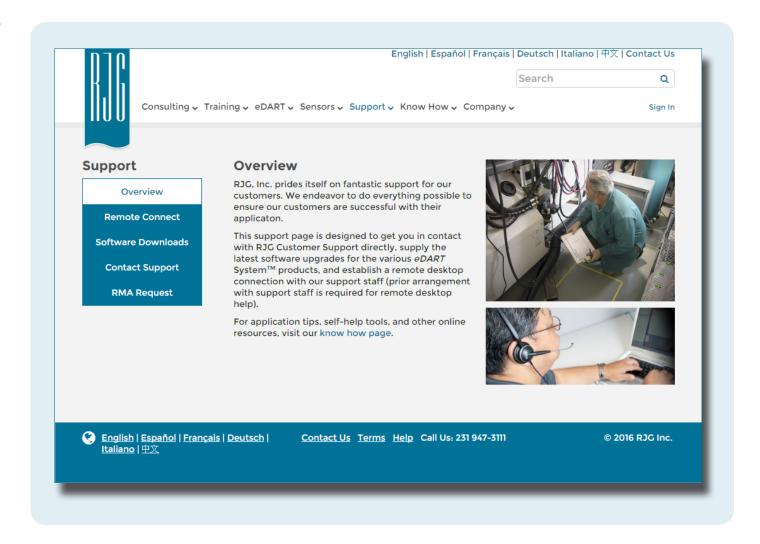
Contact RJG's Customer Support team by phone or email.

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