![RJG MOLD SMART logo]

PRODUCT MANUAL

Lynx™ Eight-Channel Piezoelectric Sensor Adapter with Mold ID

PZ/LX8F-S-ID

Training and Technology for Injection Molding

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INTRODUCTION

Read, understand, and comply with all following instructions. This guide 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.

PRIVACY

ALERTS

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

📖 **DEFINITION** *A definition or clarification of a term or terms used in the text.*

ⓘ **NOTES** *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.*

ABBREVIATIONS

DIA	diameter
MIN	minimum
MAX	maximum
R.	radius

NOTES

The eight-channel piezoelectric sensor adapter with mold ID is an adapter that interfaces the RJG, Inc. eight-channel piezoelectric sensor connector PZ-8 and up to eight piezoelectric sensors to the eDART® or CoPilot® systems.

APPLICATIONS

MULTI-CHANNEL PIEZOELECTRIC SENSOR SYSTEM

The Lynx™ multi-channel piezoelectric systems provide quick, convenient connection between multiple sensors in a mold to a single sensor adapter and the eDART or CoPilot system outside of the mold, saving real estate and minimizing cabling.

OPERATION

PIEZOELECTRIC SENSORS

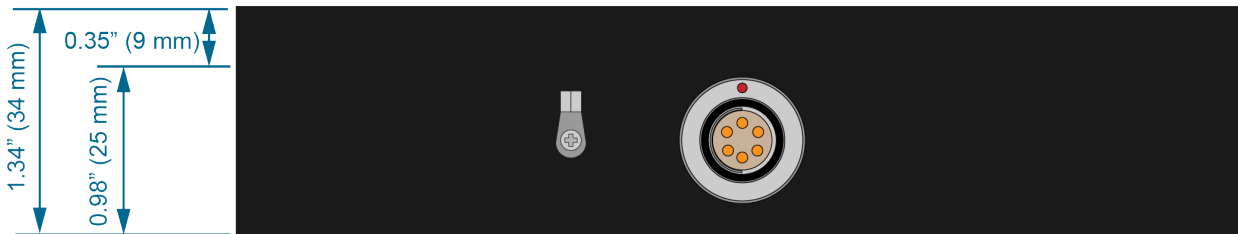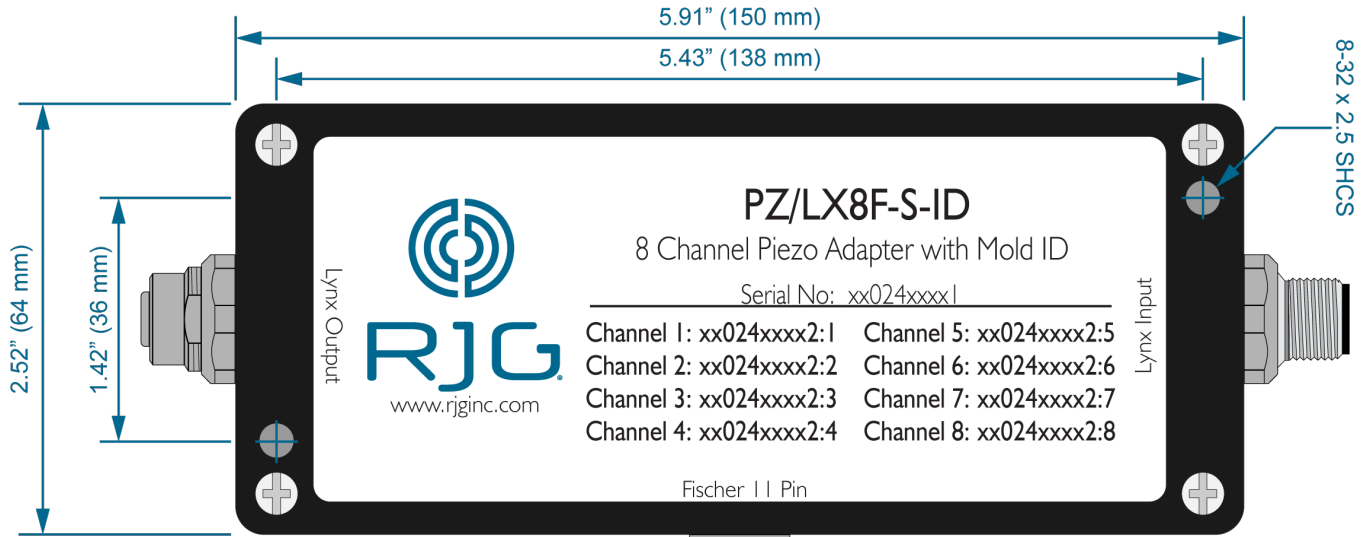Piezoelectric sensors use quartz crystals to measure the deformation, or change in resistance, of the force over the sensor. The measurement is carried through the sensor cable to a sensor adapter mounted on the outside of the mold.

The sensor adapter is connected to the RJG, Inc. eDART or Copilot system, which records and displays the sensor's measurement for operator aid in process monitoring and control.

DIMENSIONS

5.91" (150 mm)

5.43" (138 mm)

8-32 x 2.5 SHCS

2.52" (64 mm)

1.42" (36 mm)

Lynx Output

Lynx Input

PZ/LX8F-S-ID

8 Channel Piezo Adapter with Mold ID

Serial No: xx024xxxx1

Channel 1: xx024xxxx2:1   Channel 5: xx024xxxx2:5
Channel 2: xx024xxxx2:2   Channel 6: xx024xxxx2:6
Channel 3: xx024xxxx2:3   Channel 7: xx024xxxx2:7
Channel 4: xx024xxxx2:4   Channel 8: xx024xxxx2:8

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Fischer 11 Pin

0.35" (9 mm)

1.34" (34 mm)

0.98" (25 mm)

CABLE LENGTHS

Lengths must be longer than needed to facilitate safe installation and removal of connector from tool to prevent tension on the lead wire; generally, 2–3" (50–75 mm) of slack is sufficient. Use good sense to determine the appropriate cable length required for each application.

CABLE LENGTH		PART NO.
19.7"	0.5 m	C-PZ/LX4F-S-.5M
39.4"	1.0 m	C-PZ/LX4F-S-1M
78.7"	2.0 m	C-PZ/LX4F-S-2M
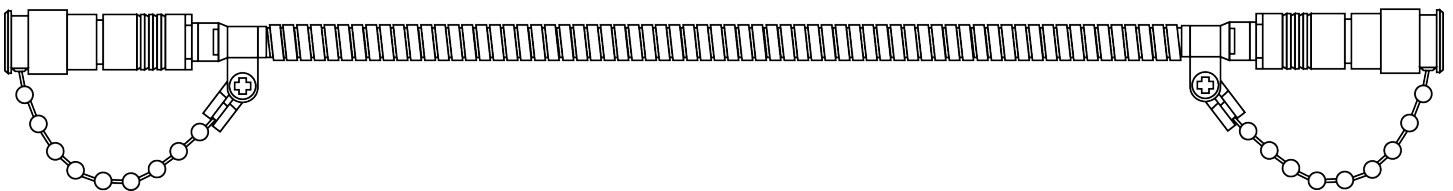
Adapter to Connector Cable C-PZ/LX8F-S Length

The PZ/LX8F-S-ID is mounted on a frame-grounded structure or control panel using the supplied 8-32 x 2.5" socket head cap screws (SHCS). The eight-channel piezoelectric sensor adapter-to-connector cable C-PZ/LX8F-S is installed on the PZ/LX8F-S-ID Fisher eleven-pin connector and the eight-channel piezoelectric sensor connector PZ-8, which is mounted on the mold. Inside the mold, up to eight piezoelectric sensors are connected to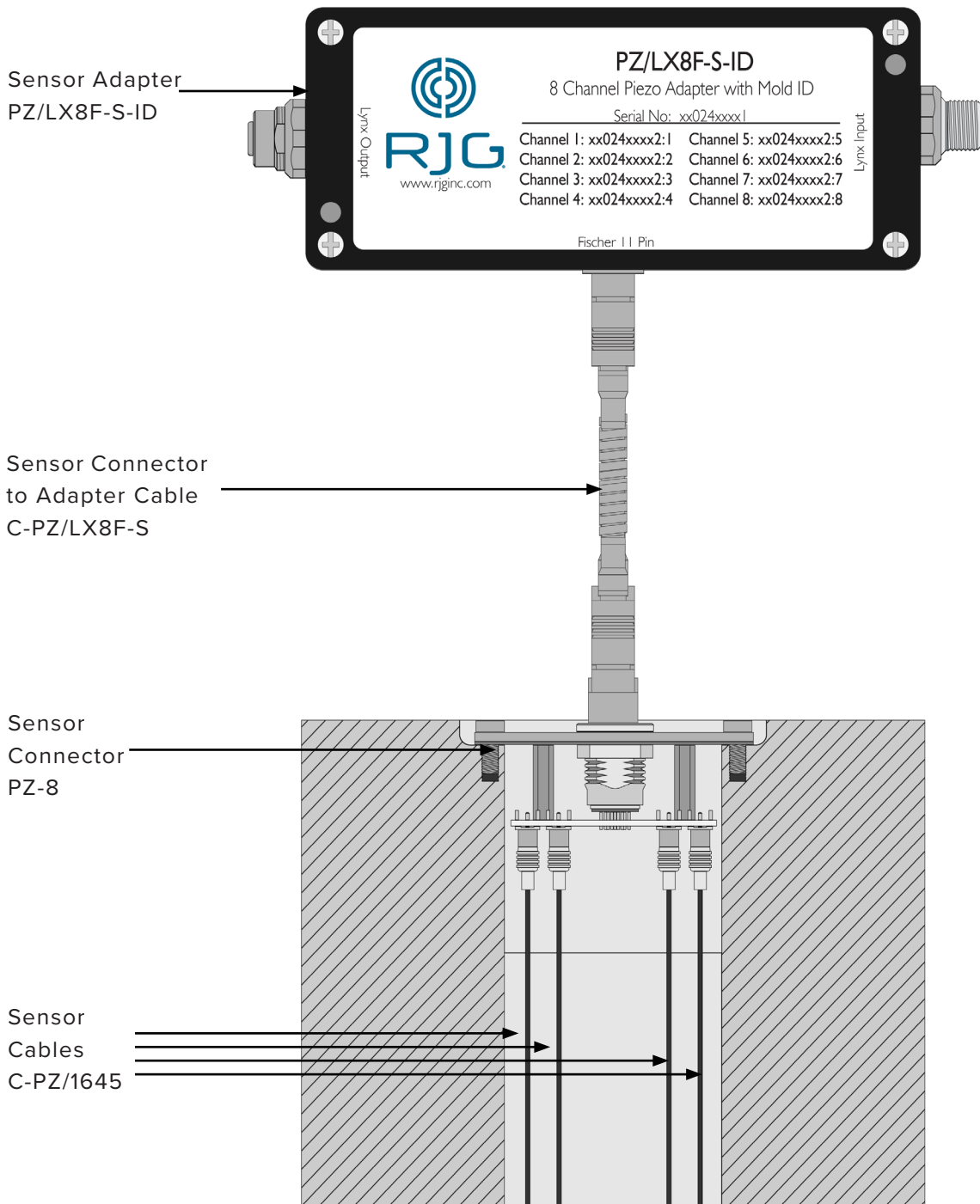 the PZ-8 using C-PZ/1645 multi-channel piezoelectric sensor cables. The PZ/LX8F-S-ID is connected to the eDART or CoPilot system by a Lynx cable CE-LX5.

Sensor Adapter
PZ/LX8F-S-ID

PZ/LX8F-S-ID
8 Channel Piezo Adapter with Mold ID
Serial No: xx024xxxx1
Channel 1: xx024xxxx2:1   Channel 5: xx024xxxx2:5
Channel 2: xx024xxxx2:2   Channel 6: xx024xxxx2:6
Channel 3: xx024xxxx2:3   Channel 7: xx024xxxx2:7
Channel 4: xx024xxxx2:4   Channel 8: xx024xxxx2:8
Fischer 11 Pin
RJG
www.rjginc.com
Lynx Output
Lynx Input

Sensor Connector
to Adapter Cable
C-PZ/LX8F-S

Sensor
Connector
PZ-8

Sensor
Cables
C-PZ/1645

INSTALLATION SPECIFICATIONS

MOUNTING

1. Requirements

The lynx piezoelectric adapter must be mounted on a frame-grounded structure to ensure proper operation. The ground potential of the structure must be the same as the ground required for the eDART or CoPilot.

✓ **CAUTION** *Must be mounted on a frame-grounded structure or control panel; ground potential is equal to that used by the eDART or CoPilot— adapter and cables are free from contact with static sources such as feeder tubes and material hoppers.*

2. Mounting

Mount the PZ/LX8F-S-ID to a frame-grounded structure or control panel using the supplied 8-32 x 2.5" SHCS.

CONNECTIONS

1. Piezoelectric Sensor Adapter Cable C-PZ/LX8F-S

Attach the C-PZ/LX8F-S cable to the eleven-pin connector of the PZ/LX8F-S-ID; attach the other end of the C-PZ/LX8F-S to the PZ-8.

2. Lynx Cable CE-LX5

Attach the female end of a Lynx cable CE-LX5 to the Lynx Output connector; attach the male end of the cable to the eDART or CoPilot, or desired Lynx junction.
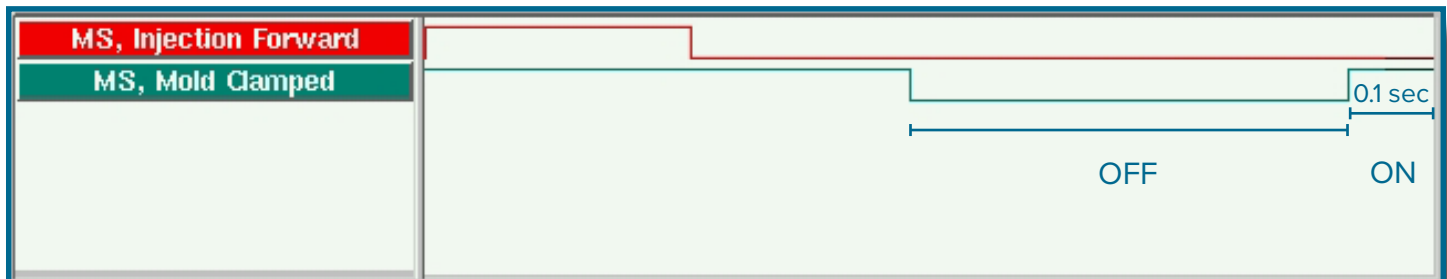
SOFTWARE SETUP

1. Requirements

The PZ/LX8F-S-ID requires a signal from either a Lynx Sequence Input Module (ID7-D-SEQ or ID7-M-SEQ), Lynx Proximity Switch L-PX, or Lynx Limit Switch L-LS in order to properly "zero" the connected piezoelectric sensors.

Refer to the table at right for accepted signals, changes, and the related hardware.

The mold-clamped signal on/off change can be viewed on the eDART or CoPilot cycle graph; the mold-clamped signal trace is high (—) when on and low (—) when off (refer to figure below).

Hardware	Signal	Change
ID7-D-SEQ Input	Mold Opening	On→Off
	Mold Closing	On→Off
	Mold Fully-Open	On→Off
	Mold Clamped	Off→On
	Injection Forward	Off→On
L-PX Input	Mold Fully-Open	On→Off
	Mold Clamped	Off→On
L-LS Input	Mold Fully-Open	On→Off
	Mold Clamped	Off→On

INSTALLATION SPECIFICATIONS (continued)

2. Software Setup Version 9.4.3 or Higher

The PZ/LX8F-S-ID will appear in the in the Sensor Locations and Scaling **1** tool for initial setup in the eDART version 9 software.

- The Sensor Type **2** and Location **3** next to the PZ/LX8F-S-ID serial number will automatically populate.

- Select the Setup **4** button next to the Identification column.

The Sensor Scaling Setup window **5** will appear. Fill in the window to complete the setup.

- Select the Sensor Model Number **6** from the drop-down menu.

- The Sensor Type **7** and Sensor Full Scale **8** will automatically populate.

- A default sensitivity is automatically populated at setup; Enter the Sensor Sensitivity **9** listed on the sensor's calibration certificate.

- Select the Accept **10** button to save settings.

- If desired, enter the cavity number of the associated sensor in the Identification **11** column.

- Select the Accept **12** button to save settings.

3. Software Setup Version 10.8 or higher

The PZ/LX8F-S-ID and associated sensors are set up during the Mold Setup/Inputs **1** in the eDART version 10 software.

- Click, drag, and drop the associated sensor from the Available Sensors **2** list into the correct cavity and cavity location listed under the mold name on the left (the individual cavity's window **3** will appear when selected).

- Click the [i] to open the Mold Sensor Configuration window **4**.

The Mold Sensor Configuration window **4** will appear. Fill in the window to complete the setup.

- Select the sensor Model **5** number from the drop-down menu; the Sensor Full Scale **6** will automatically populate.

- A default sensitivity is automatically populated at setup; enter the Sensor Sensitivity **7** listed on the sensor's calibration certificate.

- Select Done **8** to save settings.

NOTES
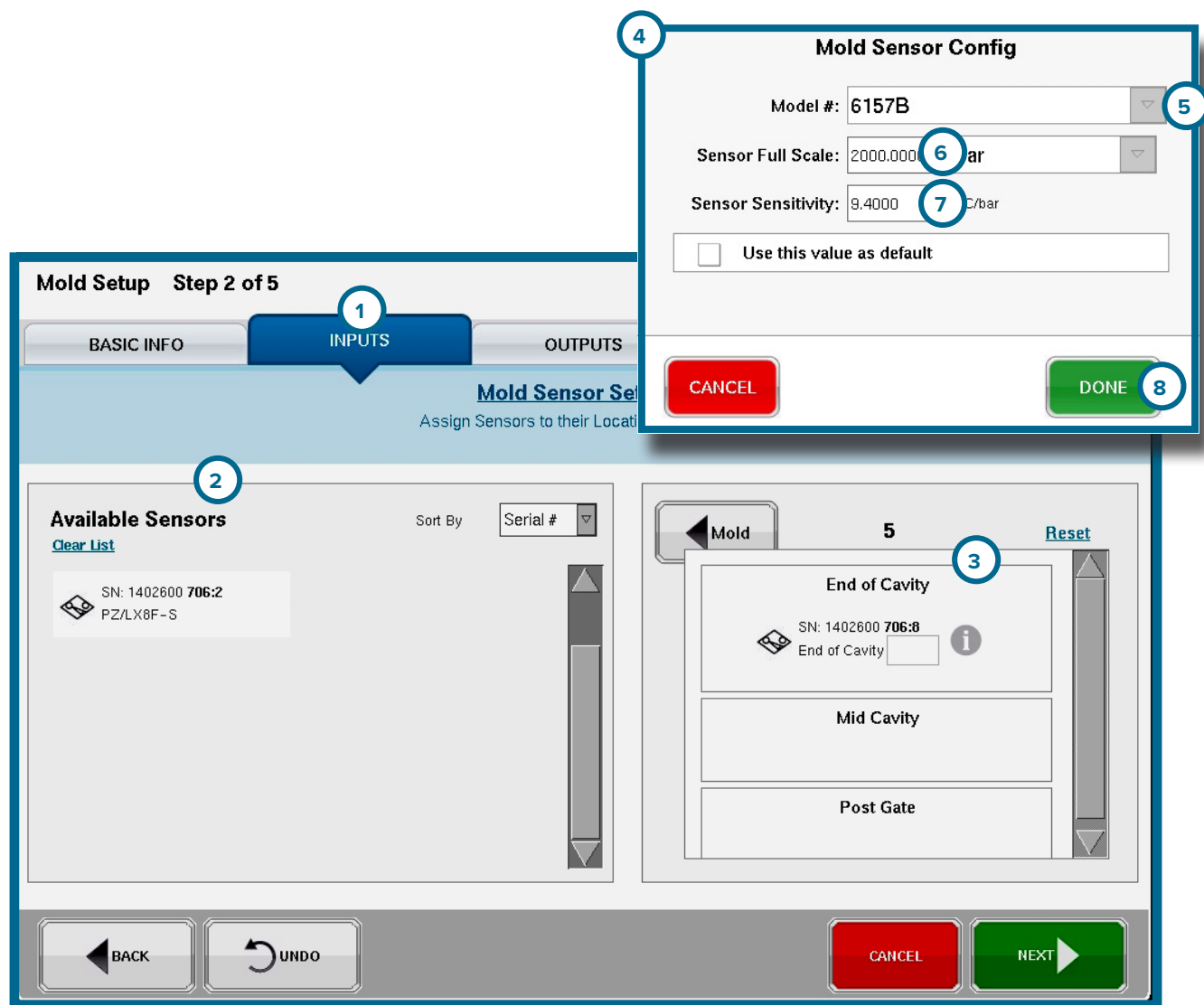
CLEANING & DRIFT

REGULAR CLEANING

Pull sensors from the mold and clean out the pockets and channels when a mold is pulled for preventative maintenance. Sensors must be installed in pockets free from oil, dirt, grime, and grease.

RJG, Inc. recommends the following cleaners:

- MicroCare MCC-CCC Contact Cleaner C

- MicroCare MCC-SPR SuprClean™

- Miller-Stephenson MS-730L Contact Re-Nu®

DRIFT

Piezoelectric sensors can drift negative (-) or positive (+). The acceptable drift specification for RJG piezoelectric sensors is 20 pC/minute. The easiest place to monitor this is the eDART "Sensor Locations" screen. Drift of ±20 pC in sixty seconds indicates abnormal drift. The cause of "Drift" is dirty/contaminated connections. This could be the connection at the sensor C-PZ/1645 cable, C-PZ/1645-to-PZ-8 connection, PZ-8-to-C-PZ/LX8F-S cable, or PZ/LX8F-S-ID-to-CE-LX5 connection.

Properly clean all connection points with an electronics grade contact cleaner. Allow the sensors and cables to air-dry before reconnecting them. Do not blow them out with a "shop" air line as this air usually contains oil and other contaminants.

If drift continues, clean the sensors out again with electronics grade cleaner then bake them in an oven to remove the contaminants (same method used at RJG). It is recommended to bake the sensors/cables at 212 °F (100 °C) for sixty minutes; bake the plate/adapter at 140 °F (60 °C).

If continuing to experience drift after this, please contact RJG Sales for pricing and lead time on replacement items.

TESTING & CALIBRATION

The Lynx Eight-Channel Piezoelectric Sensor Adapter PZ/LX8F-S-ID features high resolution and low drift ratings and requires no calibration. Follow all instructions and recommendations for individual sensor testing and calibration for optimal operation.

SENSOR TESTING

1. Sensor PreCheck

The Sensor PreCheck provides diagnostics on typical sensor problems such as sensor drift, preload, and zero shift, and can also detect sensor installation errors caused by improper pocket dimensions, damaged wires, and damaged sensor heads. A test report with sensor configuration can be emailed or printed from the device. This device allows testing of up to thirty-two sensors at one time and can verify that a force was applied to the sensor.

2. eDART Software—Raw Data Viewer

The eDART Raw Data Viewer displays the status of the sensor, either Valid, No Reply, Stale, or Invalid.

- A Valid sensor has raw counts that change when force is applied to the sensor; this indicates a properly working sensor.

- A No Reply sensor is not communicating with the eDART; the sensor may be unplugged.

- A Stale sensor indicates a sensor that is unused.

- An Invalid sensor will indicate a Failure of either Over-range (Ovrng) or Under-range (Undrng). The Ovrng indicates the sensor's calibration has changed too far in a positive direction, outside of the upper specification. The Undrng indicates that the sensor's calibration has changed too far in a negative direction, and the sensor may report a number below zero when load is applied.

WARRANTY

RJG, INC. STANDARD WARRANTY

RJG, Inc. is confident in the quality and robustness of the PZ/LX8F-S-ID, and so are offering a one-year warranty. RJG's surface mount piezoelectric sensor adapter is guaranteed against defects in material and workmanship for one year from the original date of purchase. The warranty is void if it is determined that the adapter was subjected to abuse or neglect beyond the normal wear and tear of field use, or in the event the adapter box has been opened by the customer.

PRODUCT DISCLAIMER

RJG, Inc. is not responsible for the improper installation of this equipment, or any other equipment RJG manufactures.

Proper RJG equipment installation does not interfere with original equipment safety features of the machine. Safety mechanisms on all machines should never be removed.

COMMON ERRORS

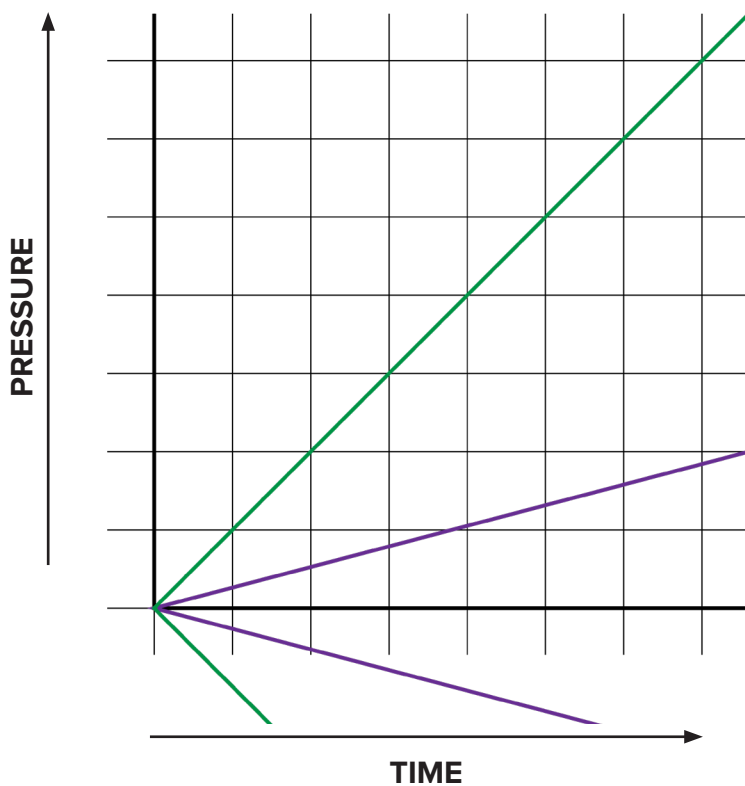1. **Slow sensor drift reading.**

   A sensor reading that slowly rises or falls (positive or negative) from the set zero value.

2. **Fast sensor drift/invalid reading.**

   A sensor reading that quickly or rises or falls (positive or negative) from the set zero value, possibly so much that the reading becomes invalid.

3. **No sensor to eDART/CoPilot systemcommunication.**

   The sensor reading cannot be obtained by the eDART/CoPilot system.

Piezoelectric Sensor Drift Type Graph	
🟩	Fast Drift/Invalid
🟪	Slow Drift

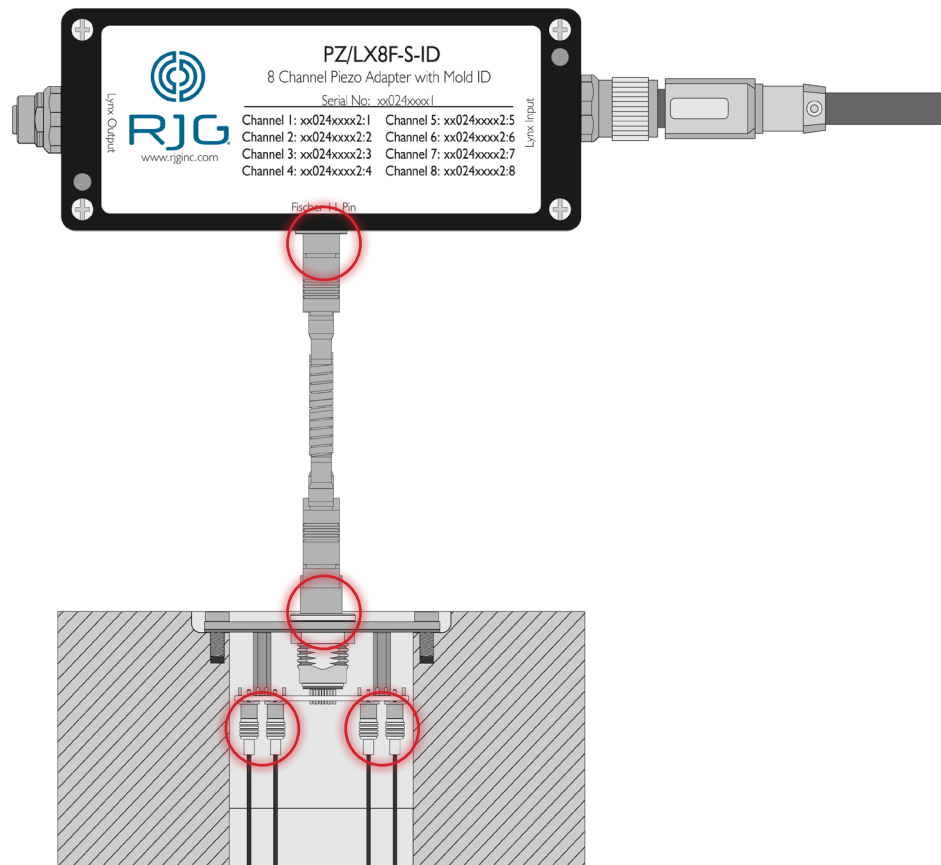## SLOW SENSOR DRIFT READING

If the sensor reading will not remain steady and drifts positive or negative, the sensor, cables, or adapter connectors may be contaminated. To identify the connector(s) with contamination, perform the following:

1. Disconnect sensor from C-PZ/1645 cable and clean ends; if reading continues to drift, continue to next step.

2. Disconnect the C-PZ/1645 from the PZ-8 and clean ends; if the reading continues to drift, continue to next step.

3. Disconnect the C-PZ/LX8F-S cable from the PZ-8 and clean end and connector; if the reading continues to drift, continue to next step.

4. Disconnect the C-PZ/LX8F-S cable from the PZ/LX8F-S-ID and clean end and connector; if the reading continues to drift, continue to next step.

If the sensor reading continues to drift after the above troubleshooting steps are completed, either the sensor, cables, or adapter must be replaced.
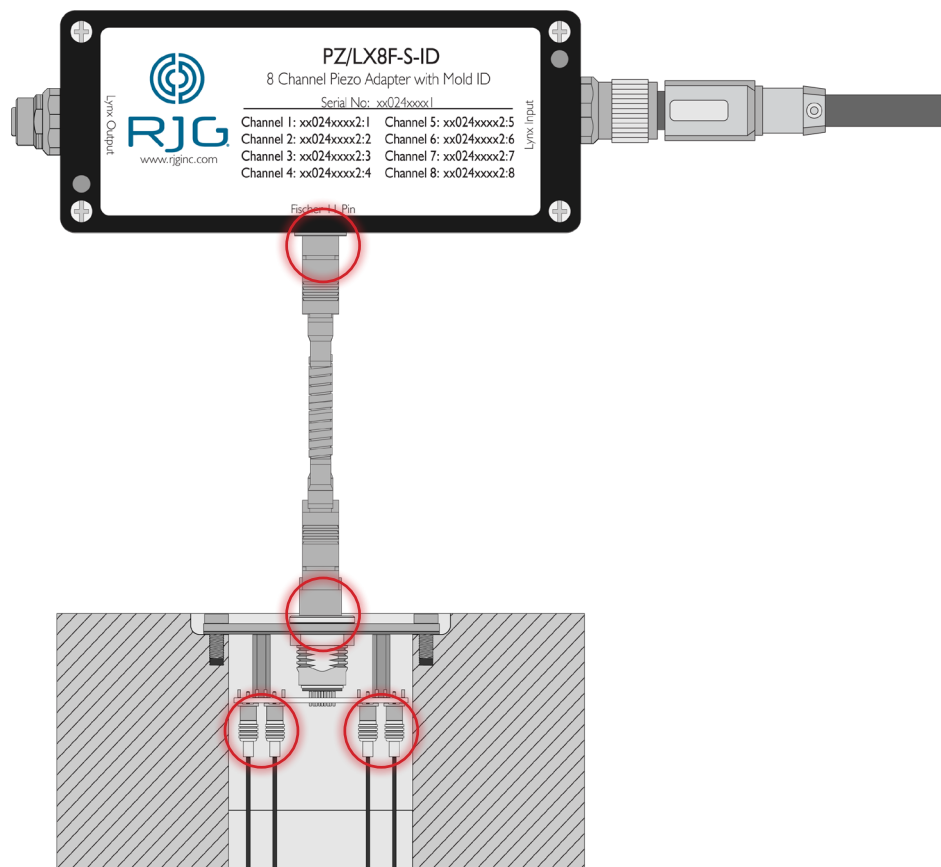
FAST SENSOR DRIFT/INVALID READING

If the sensor reading drifts quickly and becomes invalid, the sensor, cables, or adapter connectors may be heavily contaminated, or the adapter may have failed. To identify the connector(s) with contamination, perform the following:

1. Disconnect sensor from C-PZ/1645 cable and clean ends; if reading continues to drift, continue to next step.

2. Disconnect the C-PZ/1645 from the PZ-8 and clean ends; if the reading continues to drift, continue to next step.

3. Disconnect the C-PZ/LX8F-S cable from the PZ-8 and clean end and connector; if the reading continues to drift, continue to next step.

4. Disconnect the C-PZ/LX8F-S cable from the PZ/LX8F-S-ID and clean end and connector; if the reading continues to drift, continue to next step.

If the sensor reading continues to drift or remains invalid after the above troubleshooting steps are completed the adapter must be replaced.

SENSOR DOES NOT COMMUNICATE WITH EDART

If the eDART/CoPilot system is unable to establish communication with the sensor, the cables or adapter may have failed. To identify the failed component, perform the following;

1. Replace the C-PZ/1645 sensor cable with working cable; test sensor operation. If communication remains non-existent, continue to next step.

2. Replace the C-PZ/LX8F-S sensor adapter cable with working cable; test sensor operation. If communication remains non-existent, continue to next step.

3. Replace the CE-LX5 Lynx cable with working cable; test the sensor operation.

   If the eDART/CoPilot system cannot establish communication after these steps, the adapter has failed and must be replaced.
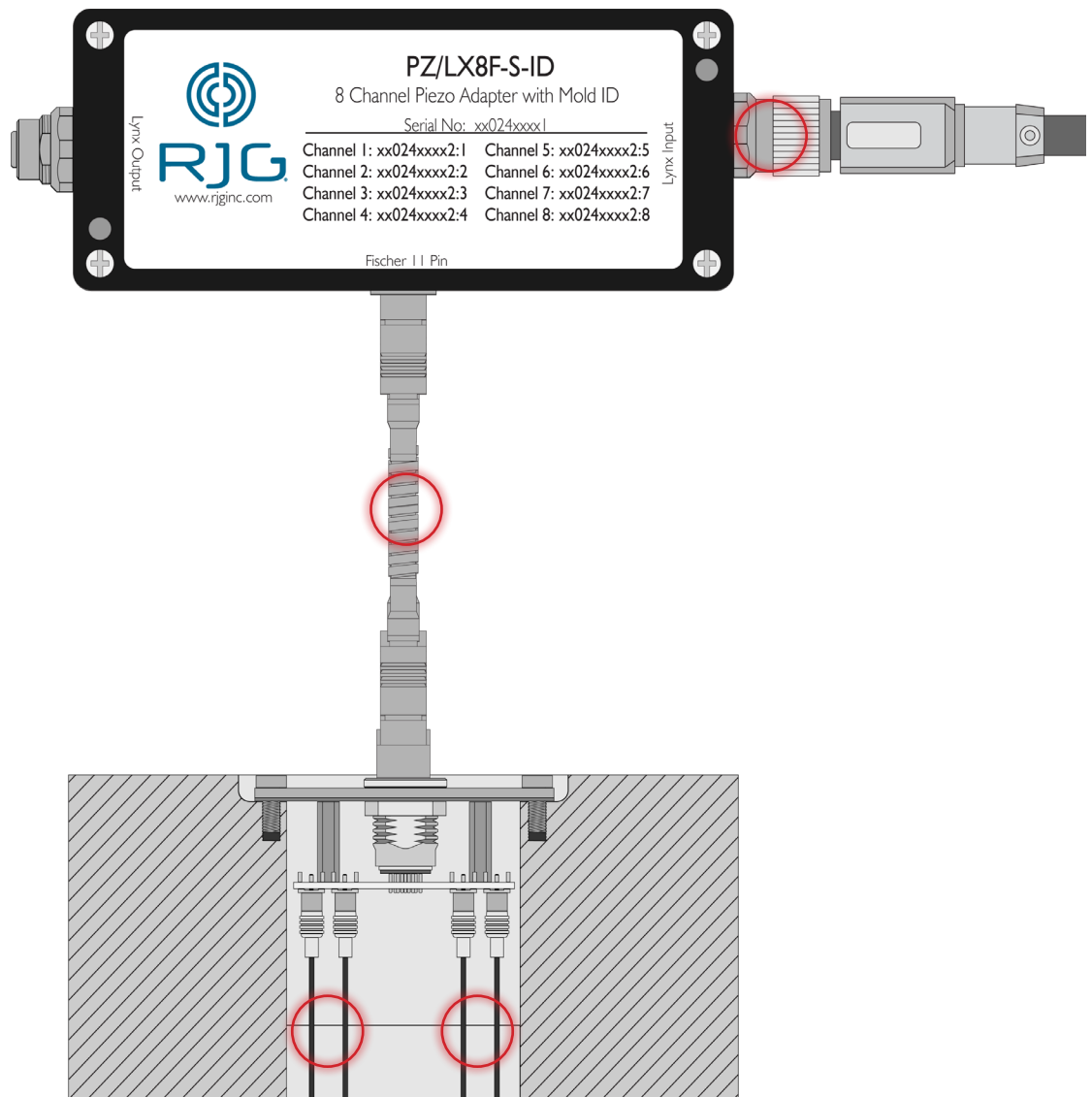
CUSTOMER SUPPORT

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

RJG, Inc. Customer Support

P: 800.472.0566 (Toll Free)

P: +1.231.933.8170

email: CustomerSupportGroup@rjginc.com

www.rjginc.com/support

NOTES

RJG

The PZ/LX8F-S-ID is compatible with other RJG, Inc. products for use with the eDART or CoPilot process control and monitoring systems.

COMPATIBLE PRODUCTS

LYNX CABLES CE-LX5

The Lynx Cable (**1** at right) is a polypropylene-coated cable suited for the heat and stress found in injection molding environments. The cable is available in lengths from 11.8– 472.4" (0,3–12 m), and can be ordered with straight or 90° fittings. One CE-LX5 is required to interface the PZ/LX8F-S-ID with the eDART or CoPilot system.

LYNX EIGHT-CHANNEL PIEZOELECTRIC SENSOR ADAPTER CABLE C-PZ/LX8F-S-ID

The Lynx Eight-Channel Piezoelectric Sensor Adapter Cable (**2** at right) is a PTFE/PFA coaxial cable with metal sheathing suited for the heat and stress found in injection molding environments. A single C-PZ/LX8F-S is required to interface the PZ/LX8F-S-ID to the PZ-8 and up to eight sensors.

EIGHT-CHANNEL PIEZOELECTRIC SENSOR CONNECTOR PZ-8

The Eight-Channel Piezoelectric Sensor Connector with Mold ID (**3** at right) is a connector that interfaces up to eight piezoelectric sensors with the PZ/LX8F-S-ID with a single connection outside of the mold.

FOUR/EIGHT-CHANNEL PIEZOELECTRIC SENSOR CONNECTOR CABLE C-PZ/1645

The Four/Eight-Channel Piezoelectric Sensor Connector Cable (**4** at right) is a PTFE/FEP coaxial cable suited for the heat and stress found in injection molding environments that provides a quick, direct connection from the PZ-4/8 to in-mold cavity pressure sensors.

SIMILAR PRODUCTS

RJG, Inc. offers a wide array of piezoelectric cavity pressure sensors and adapters for each application—mold mount, surface mount, single channel, and multi-channel.

LYNX PIEZOELECTRIC MOLD-MOUNT SENSOR ADAPTER LP/LX1-M

The Lynx Mold-Mount Piezoelectric Sensor Adapter LP/LX1-M (1 at right) accepts input from a single piezoelectric sensor and 1645 cable to interface with a single CE-LX5 cable and the eDART or CoPilot system.

LYNX SURFACE-MOUNT PIEZOELECTRIC SENSOR ADAPTER PZ/LX1F-S

The Lynx Surface-Mount Piezoelectric Adapter PZ/LX1-S (2 at right) accepts input from a single piezoelectric sensor and 1645 cable to interface with a single CE-LX5 Lynx cable and the eDART or CoPilot system.

PIEZOELECTRIC FOUR-CHANNEL PZ-4 & PZ/LX4F-S

The Four Channel Piezoelectric Connector PZ-4 and Four Channel Piezoelectric Adapter PZ/LX4F-S (3 at right) interface up to four piezoelectric sensors to the eDART or CoPilot system with a single connection.

LOCATIONS / OFFICES

USA

RJG USA (HEADQUARTERS)
3111 Park Drive
Traverse City, MI 49686
P +01 231 947-3111
F +01 231 947-6403
sales@rjginc.com
www.rjginc.com

MEXICO

RJG MEXICO
Chihuahua, Mexico
P +52 614 4242281
sales@es.rjginc.com
es.rjginc.com

FRANCE

RJG FRANCE
Arnithod, France
P +33 384 442 992
sales@fr.rjginc.com
fr.rjginc.com

GERMANY

RJG GERMANY
Karlstein, Germany
P +49 (0) 6188 44696 11
sales@de.rjginc.com
de.rjginc.com

IRELAND/UK

RJG TECHNOLOGIES, LTD.
Peterborough, England
P +44(0)1733-232211
info@rjginc.co.uk
www.rjginc.co.uk

ITALY

NEXT INNOVATION SRL
Milano, Italy
P +39 335 178 4035
sales@it.rjginc.com
it.rjginc.com

SINGAPORE

RJG (S.E.A.) PTE LTD
Singapore, Republic of
Singapore
P +65 6846 1518
sales@swg.rjginc.com
en.rjginc.com

CHINA

RJG CHINA
Chengdu, China
P +86 28 6201 6816
sales@cn.rjginc.com
zh.rjginc.com

KOREA

CAEPRO
Seoul, Korea
P +82 02-2113-1870
sales@ko.rjginc.com
www.caepro.co.kr