



## | PGFM SERIES (ELCI, MARINE)

### ELCI MARINE GROUND FAULT PROTECTION SENSING MODULE

#### Introduction

The LineGard™ PGFM product family provides ELCI (equipment leakage) ground fault sensing and is designed and manufactured by North Shore Safety, a leader in innovative safety products. The PGFM series operates in tandem with an Airpax™ LEL series, UL 489 listed circuit breaker, with shunt trip and auxiliary switch manufactured by Sensata Technologies. The PGFM can be paired with an Airpax™ IDLNK breaker for applications requiring ignition protection.

The combined assembly of the PGFM and an Airpax™ breaker meets the requirements of ABYC E-11 for ground fault protection and main shore power circuit protection. The PGFM constantly monitors the current balance of the conductors (wires / cables) supplying power to the load. When a ground fault of 27mA nominal (30 mA max) occurs, the PGFM uses the LEL's shunt trip coil to signal the breaker to trip.



#### Features

- Power and fault status indicators
- Provides identification of a ground fault vs. short circuit trip
- Chemical and UV resistant enclosure
- Trip level of sensing device < 30mA (27mA nominal) at trip time of < 100mS (60mS nominal) per E-11
- Protection range and operating voltage: 0 - 50 Amps, 120 VAC, 120/240 VAC
- Unit operating temperature is -35°C to +66°C
- Accommodates up to 3 wires, 6 AWG, with no twisting of the wires required

#### SPECIFICATIONS

<b>Type</b>	E-11 GFP - UL 943 Category FTTJ2 when used in tandem with Airpax LEL series (UL 489 listed circuit breaker with shunt trip)
<b>Operating Voltage</b>	120 VAC or 120/240 VAC, 50/60 Hz
<b>Interrupting Voltage</b>	Rating of UL 489 listed circuit breaker
<b>Sensing Coil Voltage Limit</b>	600 VAC maximum
<b>Phase Interrupt</b>	Single (120 VAC 3 wire), Split (120/240 VAC 4 wire) , 240VAC 3-wire (L1, L2, N)
<b>Interrupting Current</b>	120VAC, 50A, 5kAIC 120/240VAC, 50A, 5kAIC
<b>Trip Time of Combined Assembly</b>	100mS or less (60mS nominal)
<b>Trip Level</b>	27mA +/- 3mA
<b>Operating Temperature</b>	-35°C to +66°C
<b>Reset Type</b>	Automatic on power up
<b>ABYC E-11 Acceptability</b>	The LineGard™ PGFM ELCI module used in tandem with the Airpax™ circuit breaker meets the requirements of the ABYC (American Boat and Yacht Council) E-11 standard covering AC and DC systems on boats

Note:

1. Manual configuration should be specified if automatic start-up after power restoration of circuit power creates an unsafe condition.
2. As per UL 943 requirements, portable devices may require breaking of neutral during ground fault detection. Please contact the factory.
3. Please contact Airpax for optional ELCI, UL 1053 compliant devices.

## AIRPAX™ LEL & IDLNK SERIES CIRCUIT BREAKER RATINGS (PER UL489)

Voltage	Current	Frequency	Short Circuit	Poles
125VAC	0.05 to 50 amps	50/60 Hz	5,000 amps	1 to 3
120/240VAC	.05 to 50 amps	50/60 Hz	5,000 amps	2 to 3

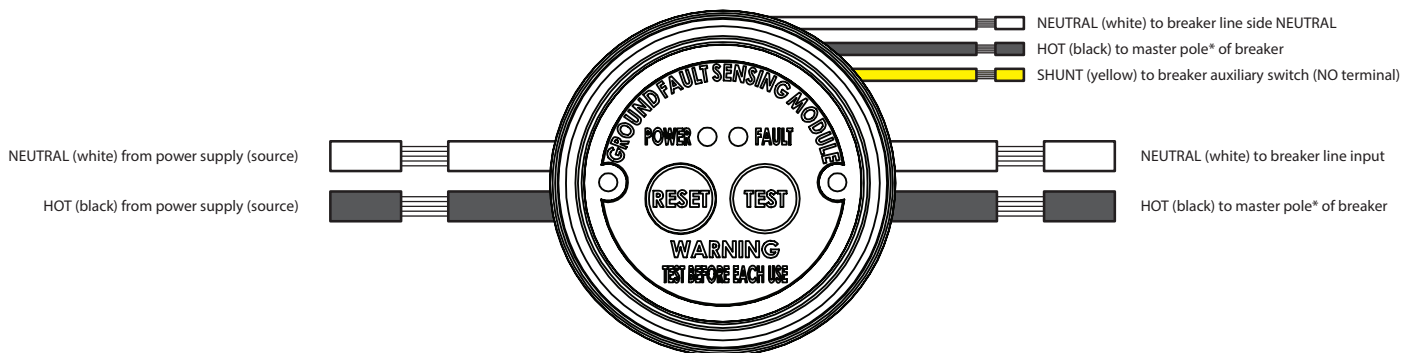
## AIRPAX™ LEL & IDLNK SERIES CIRCUIT BREAKER SPECIFICATIONS

<b>Moisture Resistance</b>	MIL-STD-202, Method 106
<b>Salt Spray (Corrosion)</b>	MIL-STD-202, Method 101
<b>Shock</b>	MIL-STD-202, Method 213, Test Condition I with 100% rated current applied
<b>Vibration</b>	MIL-STD-202, Method 204, Test Condition A with 100% rated current applied
<b>LEL Agency Approvals</b>	UL489 Listed, CSA Certified, VDE Approved, CCC Approved, CE Compliant
<b>IDLNK Agency Approvals</b>	UL 1077 Recognized, C22.2 No. 235 complaint to UL 1500 or SAE J1171 ignition protection

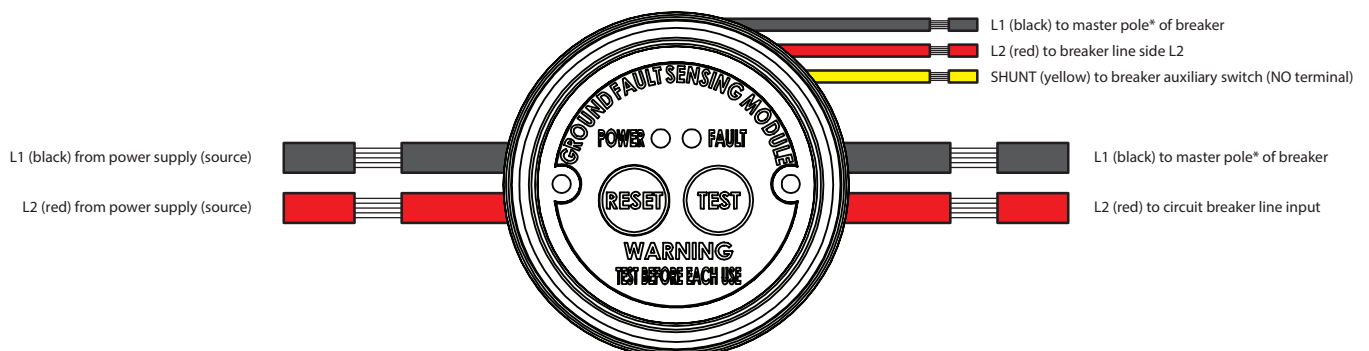
<b>Salt Fog (Corrosion)</b>	ASTM B117
<b>Shock</b>	33CFR183.534 - modified to supply 5,000 shocks @ 25G, instead of test standard of 1,000 shock
<b>Vibration</b>	MIL-STD-810 (random vibs 4G RMS), IEC 6945 (sine sweep 5 to 100 Hz for low frequency)
<b>Ignition Protection</b>	SAE J1171 (UL1500)

## ● WIRING DIAGRAM

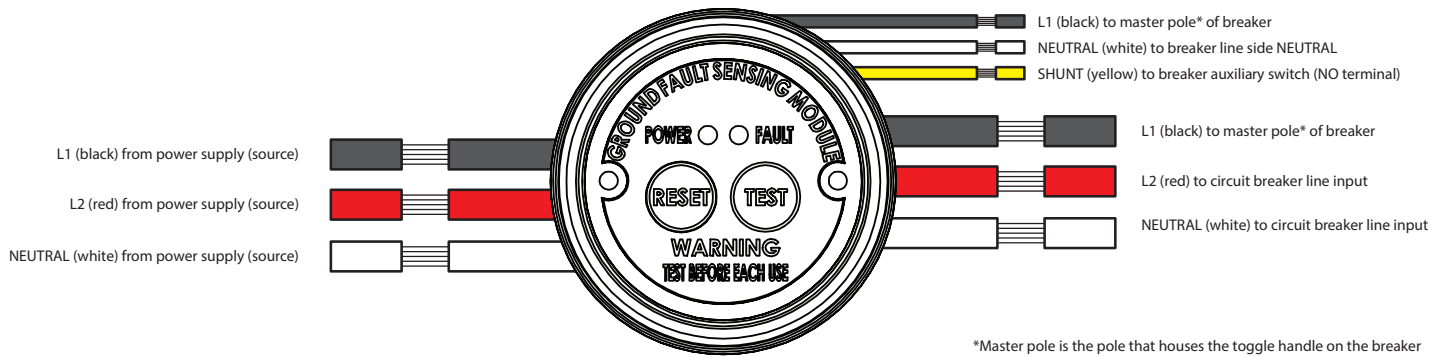
### Wiring Diagram (120VAC APPLICATION)



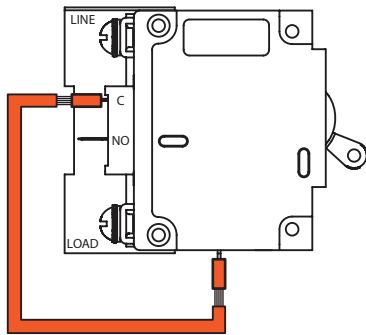
### Wiring Diagram (240 VAC APPLICATION)



## Wiring Diagram (120/240 VAC APPLICATION)



## Wiring Diagram (Orange Jumper Wire For Circuit Breaker)



### **DANGER!**

Hazard of electrical shock, burn or explosion.  
Disconnect power at main power feed before you start installation. Failure to do so may cause severe shock, personal injury, or death.

### Installation Instructions

1. Read and follow all instructions
2. Identify all the features and wires (see drawings)
3. Identify line wires and load wires
4. Verify that the ratings on the device, including the circuit breaker, match your field line ratings
5. Strip wires to 5/8", or as recommended for your connections (module may include field terminations)
6. Choose the right wiring application (120VAC or 120/240VAC split phase) and connect wires according to diagrams
7. Place supplied test instruction label in close proximity to the ground fault sensing module mounting location.

NOTE: The ground wire should be connected externally. The Ground wire does not enter or exit the ground fault sensing module. Although the PGFM does not monitor ground leads or require ground to operate, ground connection is recommended and should be made at junction box.

### Testing And Troubleshooting

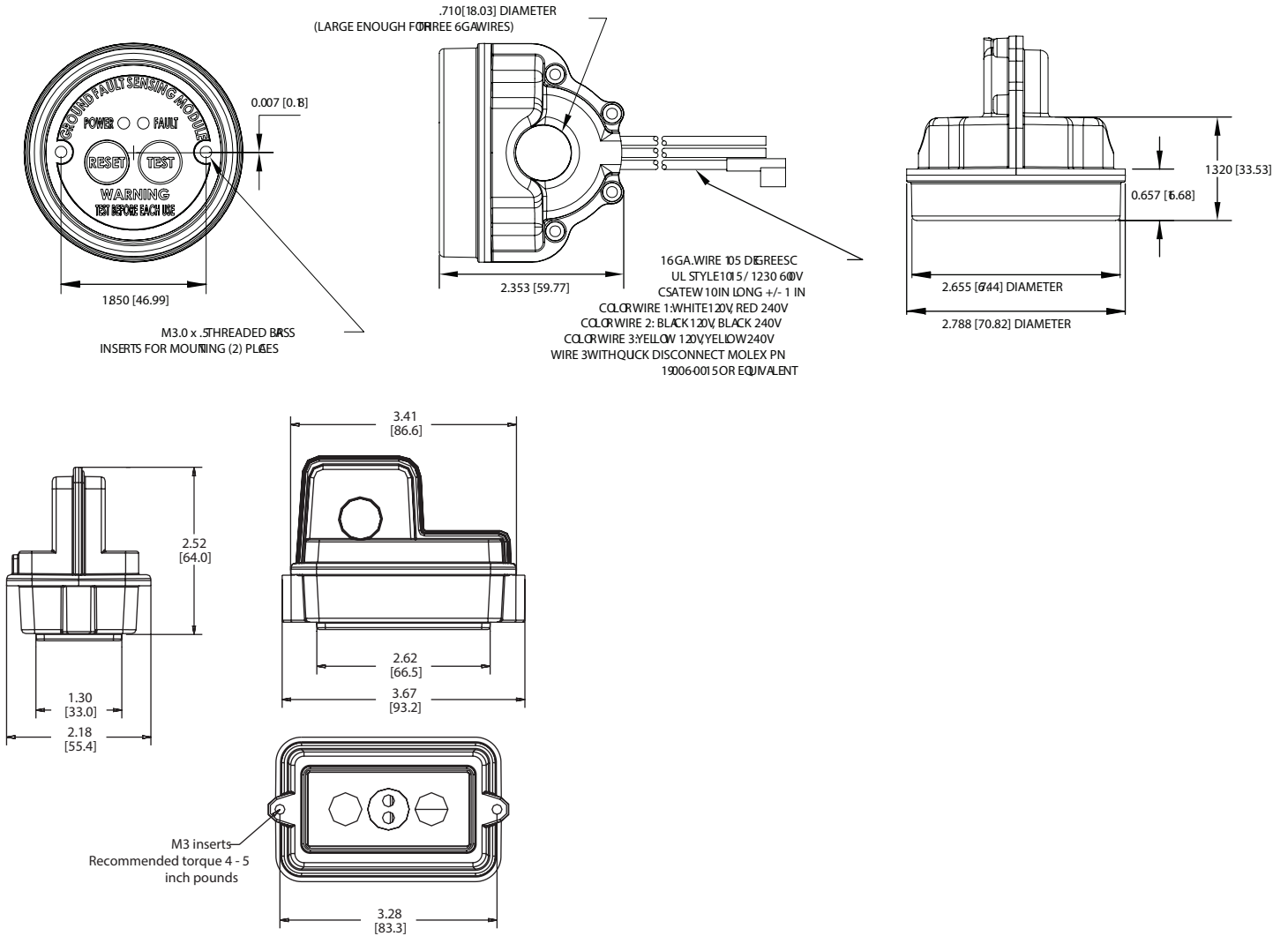
In the normal operating state, the PGFM green LED is "ON" and circuit breaker is in the "ON" position.

1. Press "TEST" button: Green LED should go "OFF" and red LED should come "ON" and circuit breaker should trigger to "OFF" position
2. If sensing device red LED does not illuminate or breaker does not trip or change state, DO NOT USE and consult an electrician for assistance
3. Press "RESET" button: Red LED should turn "OFF" and green LED should turn "ON"
4. Manually reset (switch) the circuit breaker to the "ON" position to restore circuit power

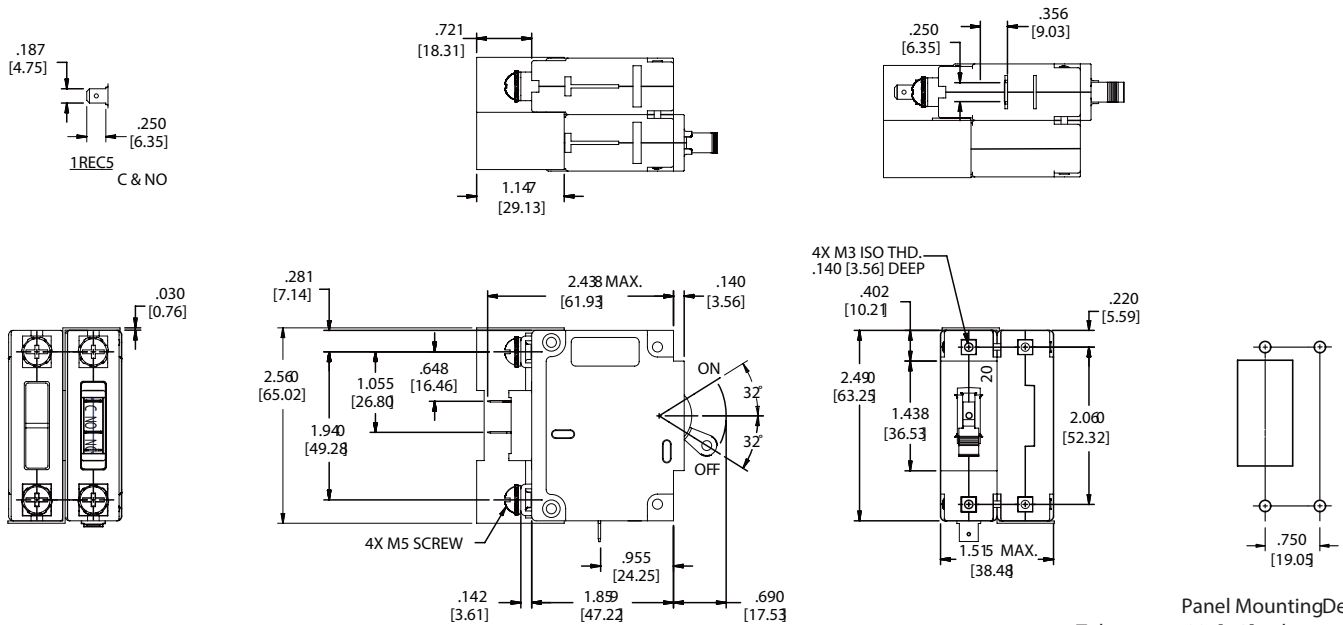
WARNING: If the test fails, do not use this ELCI. Consult a qualified electrician for repair or replacement

# DIMENSIONAL DRAWINGS

## Dimensional Drawings (Pgfm Marine)



## Dimensional Drawings (Example Of Iel, Typical 2-Pole Configuration)

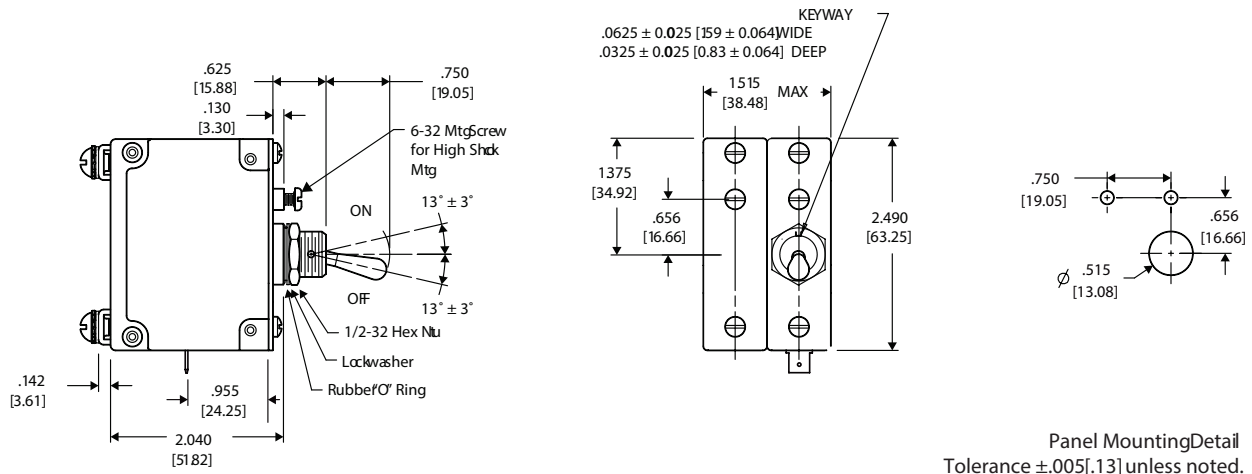


Panel Mounting Detail  
Tolerance ±.005[.13] unless noted.

## Compatible Airpax™ Circuit Breakers - UI 489 Listed; Vde Per En 60934 (Non-Ignition Protected)

Amps	Poles	Part Number	Voltage	Trip Coil	Short Circuit	Delay Curve
30	2	LEL12-1REC5-37583-30-G1-V	120V	120V	5000A	
30	2	LEL12-1REC5-37583-30-G2-V	240V	240V	5000A	
30	3	LEL121-1REC5-37275-30-G1-V	120/240V	120V	5000A	
50	2	LELK12-1REC5-37583-50-G1-V	120V	120V	5000A	
50	2	LELK12-1REC5-37583-50-G2-V	240V	240V	5000A	
50	3	LELK121-1REC5-37275-50-G1-V	120/240V	120V	5000A	

## Dimensional Drawings (Example Of Idlnk, Typical 2-Pole Configuration)



## Compatible Airpax™ Circuit Breakers - UI 1077 Recognized; Ignition Protected Per Sae J1171 (UI 1500)

Amps	Poles	Part Number	Voltage	Trip Coil	Short Circuit	Delay Curve
30	2	IDLNK21-1REC5-38140-30-G1	120V	120V	5000A	
30	2	IDLNK21-1REC5-38140-30-G2	240V	240V	5000A	
30	3	IDLNK121-1REC5-39945-30-G1	120/240V	120V	5000A	
50	2	IDLNK21-1REC5-38140-50-G1	120V	120V	5000A	
50	2	IDLNK21-1REC5-38140-50-G2	240V	240V	5000A	
50	3	IDLNK121-1REC5-39945-50-G1	120/240V	120V	5000A	

## ORDERING OPTIONS

### ELCI Marine (Round) Modules

<b>PGFM-111-B-A1-188</b>	UP TO 50A 120V AUTO ROUND MARINE 27mA +/- 3mA ELCI
<b>PGFM-211-B-A1-188</b>	UP TO 50A 240V AUTO ROUND MARINE 27mA +/- 3mA ELCI
<b>PGFM-111-B-A1-188A</b>	UP TO 50A 120V AUTO ROUND MARINE 27mA +/- 3mA (Turned 90 Degrees) ELCI

### Elevated Trip Mod's

<b>PGFM-111-B-A1-187</b>	UP TO 50A 120V AUTO RECT. MOD (POTTED) 27mA +/- 3mA ELwCI
<b>PGFM-211-B-A1-187</b>	UP TO 50A 240V AUTO RECT. MOD (POTTED) 27mA +/- 3mA ELCI
<b>PGFM-211-B-A1-291</b>	UP TO 50A 240V AUTO RECT. MOD 18mA +/- 2mA ELCI

### Class A Mod's

<b>PGFM-111-B-A1</b>	UP TO 50A 120V AUTO RECT. MOD (W/ SHUNT TRIP) 5mA +/- 1mA GFCI
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## WARNINGS



#### RISK OF MATERIAL DAMAGE AND HOT ENCLOSURE

- The product's side panels may be hot, allow the product to cool before touching
- Follow proper mounting instructions including torque values
- Do not allow liquids or foreign objects to enter this product

**Failure to follow these instructions can result in serious injury, or equipment damage.**



#### HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Disconnect all power before installing or working with this equipment
- Verify all connections and replace all covers before turning on power

**Failure to follow these instructions can result in death or serious injury.**

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Mailing Address: Sensata Technologies, Inc., 529 Pleasant Street, Attleboro, MA 02703, USA.

## CONTACT US

### Americas

508-236-2551  
electrical-protection-sales@  
sensata.com

### Europe, Middle East & Africa

+31743578156  
info-sse@list.sensata.com

### Asia Pacific

sales.isasia@list.sensata.com  
China +86 (21) 2306 1500  
Japan +81 (45) 277 7117  
Korea +82 (31) 601 2004  
India +91 (80) 67920890  
Rest of Asia +886 (2) 27602006  
ext 2808