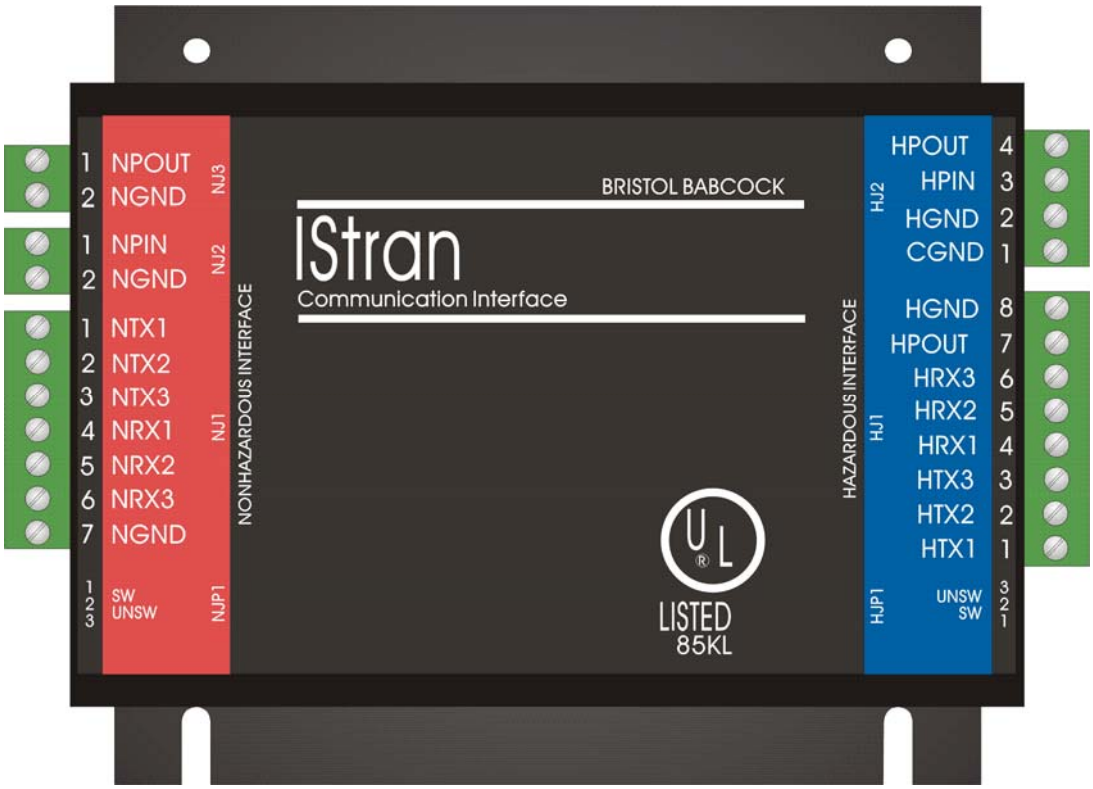
ControlWave GFC IStran
Intrinsically Safe Communication Interface



ControlWave

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Be sure that these instructions are carefully read and understood before any operation is attempted. Improper use of this device in some applications may result in damage or injury. The user is urged to keep this book filed in a convenient location for future reference.

These instructions may not cover all details or variations in equipment or cover every possible situation to be met in connection with installation, operation or maintenance. Should problems arise that are not covered sufficiently in the text, the purchaser is advised to contact Emerson Process Management, Remote Automation Solutions division (RAS) for further information.

EQUIPMENT APPLICATION WARNING

The customer should note that a failure of this instrument or system, for whatever reason, may leave an operating process without protection. Depending upon the application, this could result in possible damage to property or injury to persons. It is suggested that the purchaser review the need for additional backup equipment or provide alternate means of protection such as alarm devices, output limiting, fail-safe valves, relief valves, emergency shutoffs, emergency switches, etc. If additional information is required, the purchaser is advised to contact RAS.

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When returning any equipment to RAS for repairs or evaluation, please note the following: The party sending such materials is responsible to ensure that the materials returned to RAS are clean to safe levels, as such levels are defined and/or determined by applicable federal, state and/or local law regulations or codes. Such party agrees to indemnify RAS and save RAS harmless from any liability or damage which RAS may incur or suffer due to such party's failure to so act.

ELECTRICAL GROUNDING

Metal enclosures and exposed metal parts of electrical instruments must be grounded in accordance with OSHA rules and regulations pertaining to "Design Safety Standards for Electrical Systems," 29 CFR, Part 1910, Subpart S, dated: April 16, 1981 (OSHA rulings are in agreement with the National Electrical Code).

The grounding requirement is also applicable to mechanical or pneumatic instruments that include electrically operated devices such as lights, switches, relays, alarms, or chart drives.

EQUIPMENT DAMAGE FROM ELECTROSTATIC DISCHARGE VOLTAGE

This product contains sensitive electronic components that can be damaged by exposure to an electrostatic discharge (ESD) voltage. Depending on the magnitude and duration of the ESD, this can result in erratic operation or complete failure of the equipment. Read supplemental document S14006 for proper care and handling of ESD-sensitive components.

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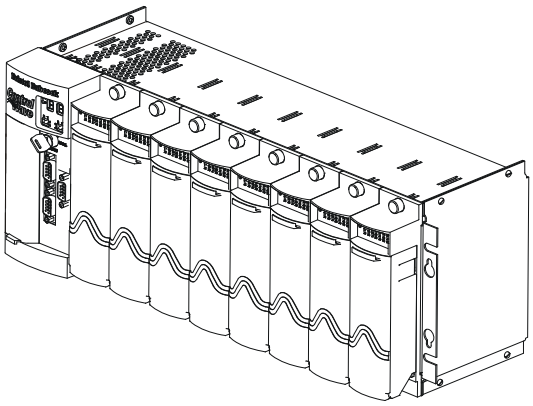

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Contents

Chapter 1 – Introduction

The ControlWave GFC Intrinsically Safe IStran Communication Interface (**IStran**) allows an intrinsically safe ControlWave Gas Flow Computer / Corrector (CW-GFC-IS) to communicate with a device located in a Division 2 or non-hazardous area.

Underwriter's Laboratories (UL) approves the IStran interface with a CW-GFC-IS unit when you use it with approved intrinsically safe battery power/solar panel power, or when the CW-GFC-IS receives external power through the IStran.

The IStran performs the following functions:

- Replaces six intrinsic safety barriers for RS-232 signals (3 in, 3 out)
- Provides 500V isolation between two devices
- Operates at speeds up to 19,200bps
- Allows the CW-GFC-IS to receive power from outside the Division 1 area
- Allows the CW-GFC-IS to control power to a radio or modem located outside the Division 1 area

You can also use the IStran for certain applications where intrinsic safety is unnecessary, such as to provide isolation between two devices or to allow multiple devices to share a single radio or modem.

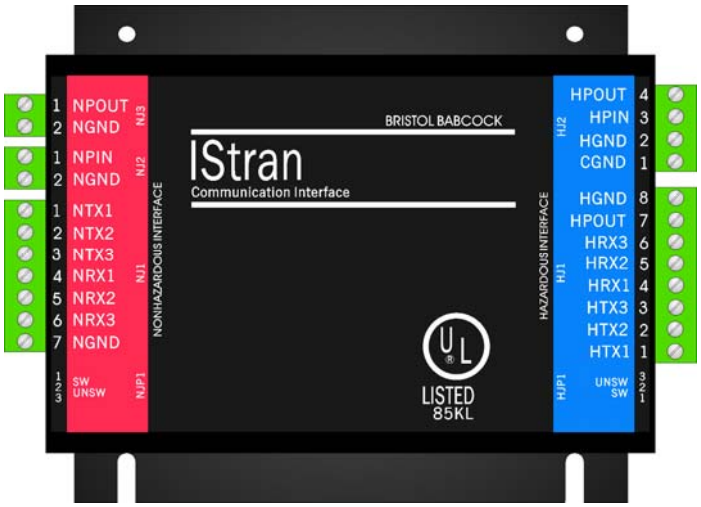

Figure 1-1. IStran Front View

1.1 Physical Description

The IStran assembly measures 6.25 inches (length) by 4.50 inches (width) by approximately 1 inch (depth). (See *Figure 1-2, 1-3,* and *1-4.*)

The IStran assembly consists of the following major components:

- One IStran printed circuit board (PCB) for the IStran assembly
- Yellow alodined aluminum base plate (0.060 inch thick)
- Black anodized cover (0.090 inch thick)

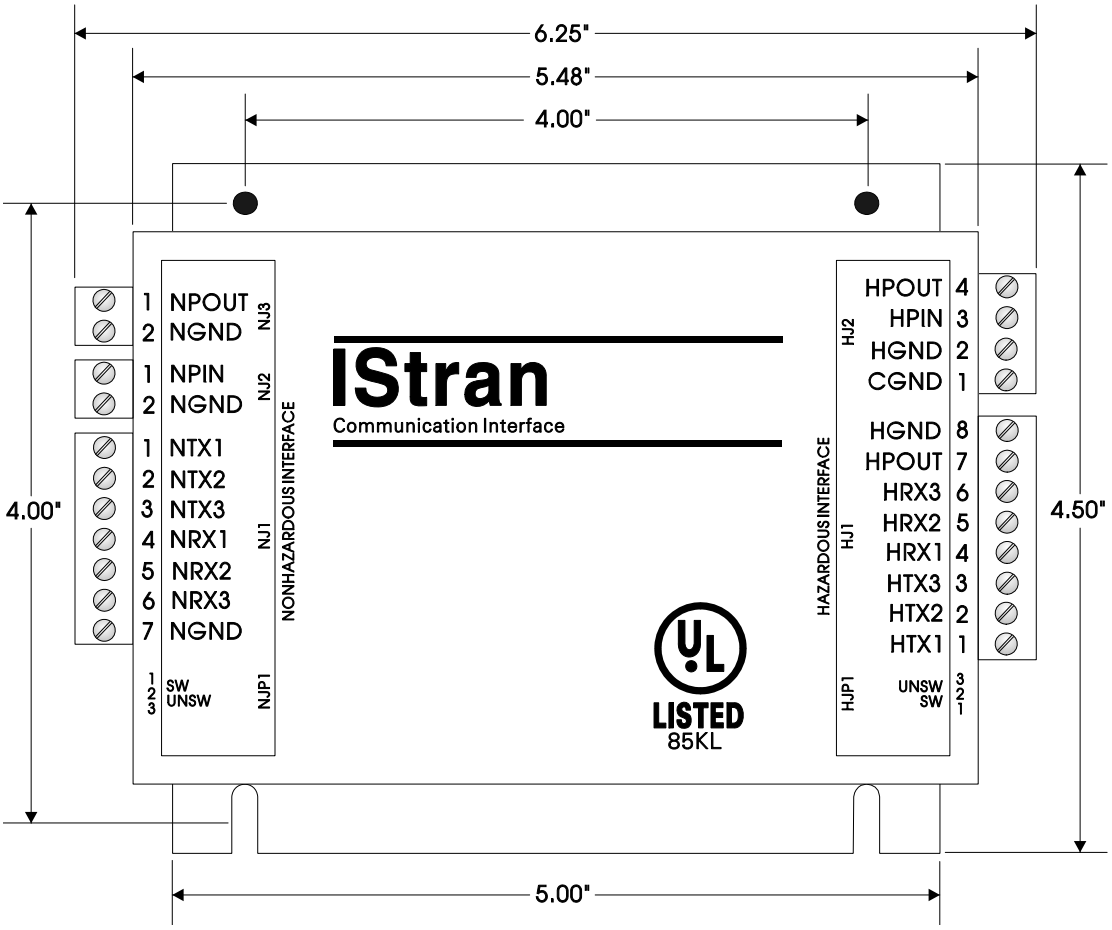

Figure 1-2. Physical Dimensions – IStran – Front View

Figure 1-3. Physical Dimensions – IStran – Edge (Side) View

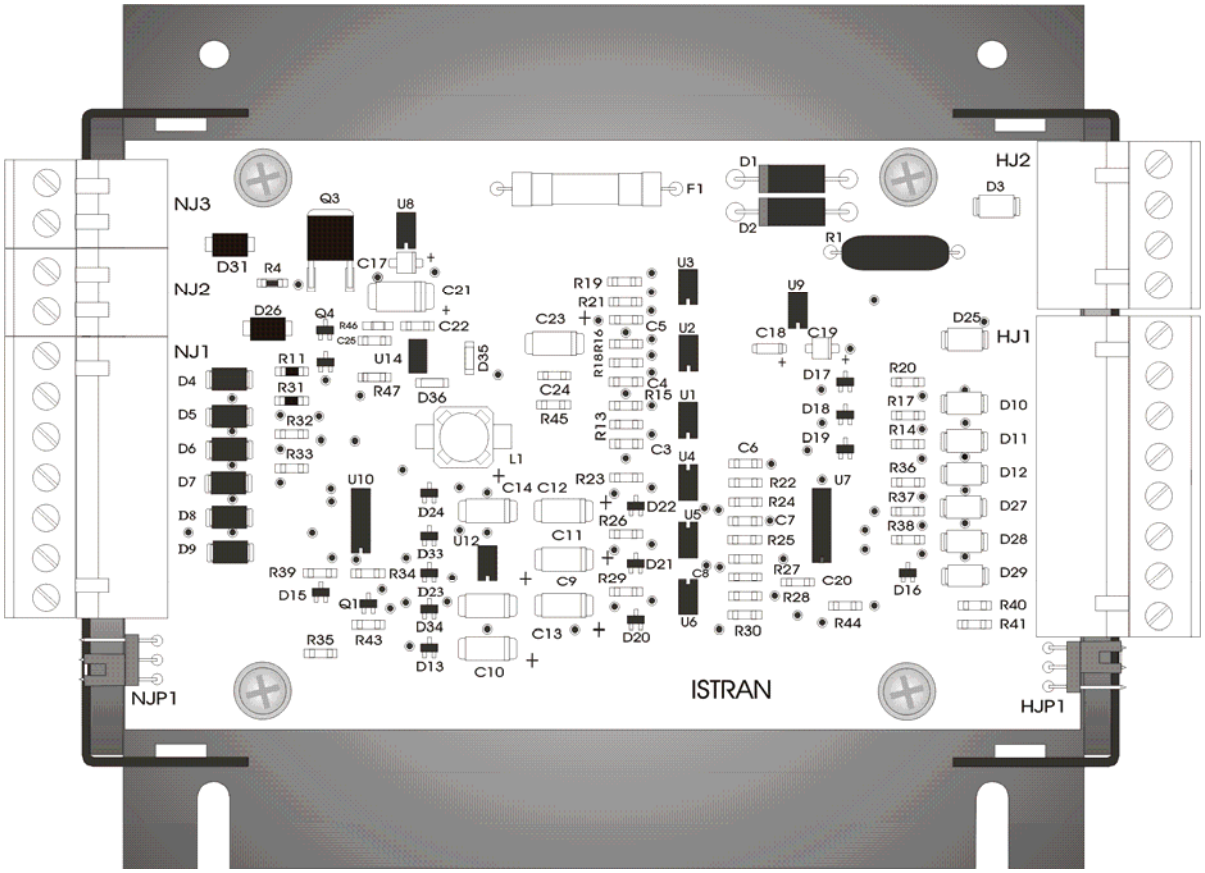

Figure 1-4. IStran PCB Mounted on Base Plate (Cover removed)

1.1.1 IStran PCB

The IStran PCB provides two interfaces designated hazardous and non-hazardous. You configure each interface independently to operate in either **switched** or **unswitched** mode.

Switched Mode Switched mode sets the TX drivers into a high-impedance state to reduce power consumption.

Unswitched Mode In unswitched mode, the TX drivers are always active and they always follow the corresponding RX inputs. In cases where power consumption is not a key factor, configure the IStran for unswitched mode.

Chapter 2 – Function and Electrical Characteristics

You can use the ControlWave GFC Intrinsically Safe IStran Communication Interface (**IStran**) in both hazardous and non-hazardous environments.

2.1 Hazardous and Non-Hazardous Characteristics

Table 2-1 provides the characteristics common to both the hazardous and non-hazardous IStran interfaces:

Table 2-1. Common Characteristics for Hazardous and Non-Hazardous Interfaces

Description	Specification	
Data Rate	Maximum:	19.2 Kbps
Propagation Delay, any RX to any TX	Maximum:	10 uS
Output Enable Delay (Switched Mode, enable to TX valid)	Typical: Maximum:	< 10 uS 50 uS
RX Input High Level	Minimum: Maximum:	4.5 VDC 16 VDC
RX Input Low Level	Minimum: Maximum:	-16 VDC 0.5 VDC
RX Input Load Resistance	Typical:	3.01 Kohm
TX Output Load Resistance	Minimum:	3 Kohm
Quiescent Supply Current (Both if in switched mode, all TX off)	Maximum:	800 uA
Idle Supply Current (Both if in unswitched mode, all TX low)	Typical:	21 mA
Active Supply Current (Both if active, worst case)	Maximum:	43 mA

2.1.1 Hazardous Interface

You connect the hazardous interface to an intrinsically safe device. *Table 2-2*, identifies each connector position, the corresponding signal name, and briefly describes each input/output point on the hazardous interface.

Table 2-2. Hazardous Interface Connector

Position	Name	Function
HJ2-4	HPOUT	Hazardous Power Output - connect to HJ1-3 (HPIN) for single supply applications
HJ2-3	HPIN	Hazardous Power Input
HJ2-2	HGND	Hazardous Interface Ground - connect to HJ2-1 (CGND) for single supply applications
HJ2-1	CGND	Enclosure Ground (Tied to NGND)
HJ1-8	HGND	Hazardous Interface Ground - (Reference for

Position	Name	Function
		HPOUT and signals)
HJ1-7	HPOUT	Hazardous Power
HJ1-6	HRX3	Signal Input
HJ1-5	HRX2	Signal Input
HJ1-4	HRX1	Signal Input
HJ1-3	HTX3	Signal Output (Follows NRX3)
HJ1-2	HTX2	Signal Output (Follows NRX2)
HJ1-1	HTX1	Signal Output (Follows NRX1)
HJP1-1	SW	Jumper to COM for Switched Mode
HJP1-2	COM	Mode Selection Common
HJP1-3	UNSW	Jumper to COM for Unswitched Mode

Table 2-3 provides the characteristics of the hazardous interface.

Table 2-3. Hazardous Interface Characteristics

Description	Specification
HPOUT Voltage	Typical 6.3 VDC (No Load) Minimum: 5.9 VDC (Max. Load) Maximum: 6.4 VDC (No Load)
HPOUT Current Limit Threshold	Minimum: 130 mA at 8 VDC Maximum: 300 mA at 16 VDC
HPOUT Load Capacitance	Maximum: 100 uF
HPIN Quiescent Supply Current (Switched Mode, Transmitters Off)	Maximum: 100 uA
HPIN Supply Current (All TX Outputs High, 3 K Load	Maximum: 6 mA
HTX Output High Level	Minimum: 4.5 VDC, Maximum: 5.0 VDC
HTX Output Low Level	Minimum: 0 VDC, Maximum: 0.1 VDC
HJP1 Jumper Operation	If you don't install a jumper, or if you install the jumper between pins 1 and 2 (SW), the hazardous interface operates in switched mode. If you install the jumper between pins 2 and 3 (UNSW), the hazardous interface operates in unswitched mode. *Figure 2-1* shows the jumper in switched mode.

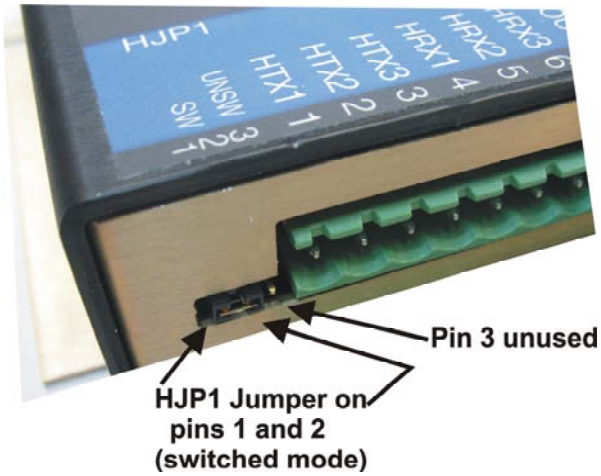

Figure 2-1. Setting Jumper HJP1

2.1.2 Non-Hazardous Interface

Typically you connect the non-hazardous interface to a radio or modem located with the IStran assembly in a non-hazardous or Division 2 rated area. *Table 2-4* identifies each connector position and the corresponding signal name, and provides a brief description of each I/O point on the non-hazardous interface.

Table 2-4. Non-Hazardous Interface Connector

Position	Name	Function
NJ3-1	NPOUT	Switched Power Output
NJ3-2	NGND	Local Ground reference (Return for NPOUT)
NJ2-1	NPIN	Power Supply Input
NJ2-2	NGND	Local Ground (Return for NPIN)
NJ1-1	NTX1	Signal Output (Follows HRX1)
NJ1-2	NTX2	Signal Output (Follows HRX2)
NJ1-3	NTX3	Signal Output (Follows HRX3)
NJ1-4	NRX1	Signal Input
NJ1-5	NRX2	Signal Input
NJ1-6	NRX3	Signal Input
NJ1-7	NGND	Local Ground
NJP1-1	SW	Jumper to COM for Switched Mode
NJP1-2	COM	Mode Selection Common
NJP1-3	UNSW	Jumper to COM for Unswitched Mode

Table 2-5 provides the characteristics of the non-hazardous interface.

Table 2-5. Non-Hazardous Interface Characteristics

Description	Specification
NPIN Voltage (When HPOUT is not used)	Minimum: 5.4 VDC Maximum: 16 VDC
NPIN Voltage (When HPOUT is used)	Minimum: 8 VDC Maximum: 16 VDC
NPIN Supply Current (Switched Mode, Transmitters Off)	Typical: < 500 uA at 12 VDC, 77 °F (25 °C) Maximum: 750 uA
NPIN Supply Current (All TX Outputs High, 3 K Loads)	Maximum: 37 mA
NPOUT Leakage	Typical: < 1 uA Maximum: 100 uA
NPIN to NPOUT On-Resistance (NPIN 12 V)	Typical: < 0.3 ohm Maximum: 0.5 ohm
NRX3 to NPOUT On	Typical: < 10 uS
NPOUT Load Current	Maximum: 1.8 A Continuous Maximum: 3.0 A Intermittent (Max 60 Seconds, 50% duty)
NTX Output High Level	Typical: 7.4 VDC into 3 Kohm Load Minimum: 5.0 VDC Maximum: 9.5 VDC
NTX Output Low Level	Typical: -4.9 VDC into 3 Kohm Load Minimum: -9.5 VDC Maximum: -3.0 VDC
NJP1 Jumper Operation	If you didn't install a jumper, or if you installed a jumper between pins 1 and 2 (SW), the non-hazardous interface operates in switched mode. If you install a jumper between pins 2 and 3 (UNSW), the non-hazardous interface operates in unswitched mode. (*Figure 2-2* shows the jumper in switched mode.)

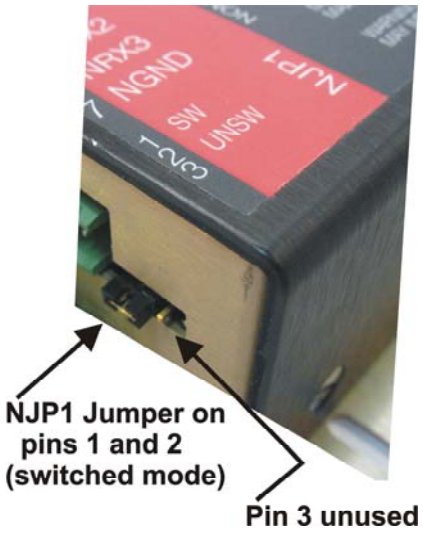

Figure 2-2. Setting Jumper NJP1

2.2 Switched & Unswitched Modes

You can configure each IStran interface independently to operate in switched or unswitched mode. In switched mode, the TX drivers can enter a high-impedance state to reduce power consumption. The outputs transition smoothly to and from the high-impedance state. Most modern device inputs pull the high impedance IStran output to ground and interpret it as a low, or **mark** state. Some devices may not properly interpret the high-impedance signal, and in some systems it is impractical for you to operate either or both interfaces in switched mode. In these cases, or when power consumption is not a concern, configure the interface(s) for unswitched mode. In unswitched mode, the TX drivers are always active and they always follow the corresponding RX inputs.

You enable or disable switched mode for the hazardous interface by jumper position HJP1, and for the non-hazardous interface by jumper position NJP1 (see *Figures 2-1* and *2-2*). When either interface is in switched mode, the RX3 (NRX3 or HRX3) input of the opposite interface turns it on or off.

2.2.1 Configuring the Hazardous Interface for Switched Mode

To configure the hazardous interface for switched mode, place the supplied shorting jumper in the HJP1 position marked SW (short HJP1 pins 1 and 2 as shown in *Figure 2-1*). If you don't install a jumper at HJP1 the hazardous interface defaults to switched mode. When you configure the hazardous interface for switched mode, the HTX outputs are in a high-impedance state when NRX3 is low (or negative), and the HTX outputs follow the NRX inputs normally when NRX3 is high (positive).

2.2.2 Configuring the Hazardous Interface for Unswitched Mode

To configure the hazardous interface for unswitched mode, place the supplied shorting jumper in the HJP1 position marked UNSW (short HJP1 pins 2 and 3). This is the **opposite** jumper position of that shown in *Figure 2-1*. In unswitched mode, the HTX outputs remain on and they always follow the corresponding NRX inputs.

2.2.3 Configuring the Non-Hazardous Interface for Switched Mode

To configure the non-hazardous interface for switched mode, place the supplied shorting jumper in the NJP1 position marked SW (short NJP1 pins 1 and 2 as shown in *Figure 2-2*). The non-hazardous interface is also in switched mode by default if you don't install a jumper at NJP1. When you configure the non-hazardous interface for switched mode, the NTX outputs are in a high-impedance state when HRX3 is low (or negative), and the NTX outputs follow the HRX inputs normally when HRX3 is high (positive).

2.2.4 Configuring the Non-Hazardous Interface for Unswitched Mode

To configure the non-hazardous interface for unswitched mode, place the supplied shorting jumper in the position marked UNSW (short NJP1 pins 2 and 3). This is the **opposite** jumper position of that shown in *Figure 2-2*. In unswitched mode, the NTX outputs are always turned on and they always follow the corresponding HRX inputs.

2.3 Non-Hazardous Power Output

The non-hazardous power supply is routed through a FET (field effect transistor) from the power input to an output terminal. The power supply comes in on the NPIN terminal and switched power goes out on the NPOUT terminal.

When hazardous interface signal input HRX3 is at a high (positive) level, NPOUT turns on and can supply power to an external device. When HRX3 is at a low (or negative) level, NPOUT turns off. You determine the voltage drop between NPIN and NPOUT by multiplying the NPOUT load current by the NPIN to NPOUT on-resistance. You must also take into account the resistance of the associated field wiring when you calculate the total drop between the power supply and the load.

⚠ Caution

In order to minimize resistance between NPIN and NPOUT, the IStran does not provide over-current. You must install a fuse or other means of over-current protection at the power source to prevent damage to the IStran, power source, or load in case of a short circuit or other over-current condition.

Chapter 3 – System Wiring

This chapter includes details on grounding and wiring for the IStran.

3.1 Introduction to System Wiring

The IStran connects a radio, modem, or other communications device to a ControlWave GFC-IS Flow Computer/Corrector. An IStran can also provide an intrinsically safe interface between an external power supply and RS-232 signals associated with a radio, modem or ControlWave RTU (in a non-hazardous area) and a ControlWave GFC-IS in a Class I, Division 1 area.

3.2 Grounding

The IStran provides up to 500V of isolation between the hazardous and non-hazardous interfaces. When using the ground isolation capability of the IStran, devices on either side require separate power sources, and each source must power the corresponding IStran interface. Refer to the field wiring diagrams in *Section 3.4* for systems with independent power sources.

When isolation is not required, a single power source supplies both IStran interfaces and, optionally, both connected devices. To power both IStran interfaces using a single power source, connect the power source between NPIN and NGND. Use connector HJ2 (see *Figure 1-4)* as a jumper position to wire HPOUT to HPIN and HGND to CGND. Note that CGND and NGND are internally connected, and that CGND is connected to the IStran case. Refer to the field wiring diagrams in *Section 3.4* for systems with a single power source.

When a ground connection already exists between the power source and the ControlWave or communications device, do not wire the ground terminal on the IStran communications connector (NJ1 or HJ1). The ground reference established on the IStran power connector (NJ2 or HJ2) serves as both power supply return and signal ground reference. Wiring the communications connector ground terminal may introduce a ground loop and degrade the performance of the IStran under these circumstances. The wiring diagrams in *Section 3.4* illustrate the recommended practices.

For intrinsic safety applications, you must use redundant earth grounds. Both grounds must measure less than one ohm to earth. The NGND terminal provides one ground, and the case provides the other. If the mounting panel does not provide a suitable ground path, connect a 12AWG or larger ground conductor to one of the IStran mounting screws.

3.3 Cable Length

Underwriter's Laboratories (UL) lists the IStran for use with cable lengths up to 25 feet on either or both interfaces. Typically, you install the IStran in close proximity to the communications device (connected to the non-hazardous interface) and at some distance from the CW-GFC-IS (connected to the hazardous interface). Because of cable capacitance and inductance, 25 feet is the maximum cable length allowable for use with a CW-GFC-IS located in a Division 1 area.

Warning **The cable length between a CW-GFC-IS operating in a Division 1 area and the IStran must not exceed 25 feet.**

3.4 Field Wiring Diagrams

Figure 3-1 illustrates a typical communication system. The power source to the non-hazardous interface must not use or generate more than 250V. If you install the IStran in a Division 2 area, you must make power input and output connections using Division 2 wiring methods described in *Section 4.1*.

In this example a single power source supplies both the communications device and the CW-GFC-IS. The power supply input range for this configuration is 8 to 16V. You connect the grounds of both devices together through the IStran. The CW-GFC-IS power supply current must be 120mA or less, and it must operate down to 5.9V. The IS termination panel (part number 400135-01-9) contains the power and communication connections.

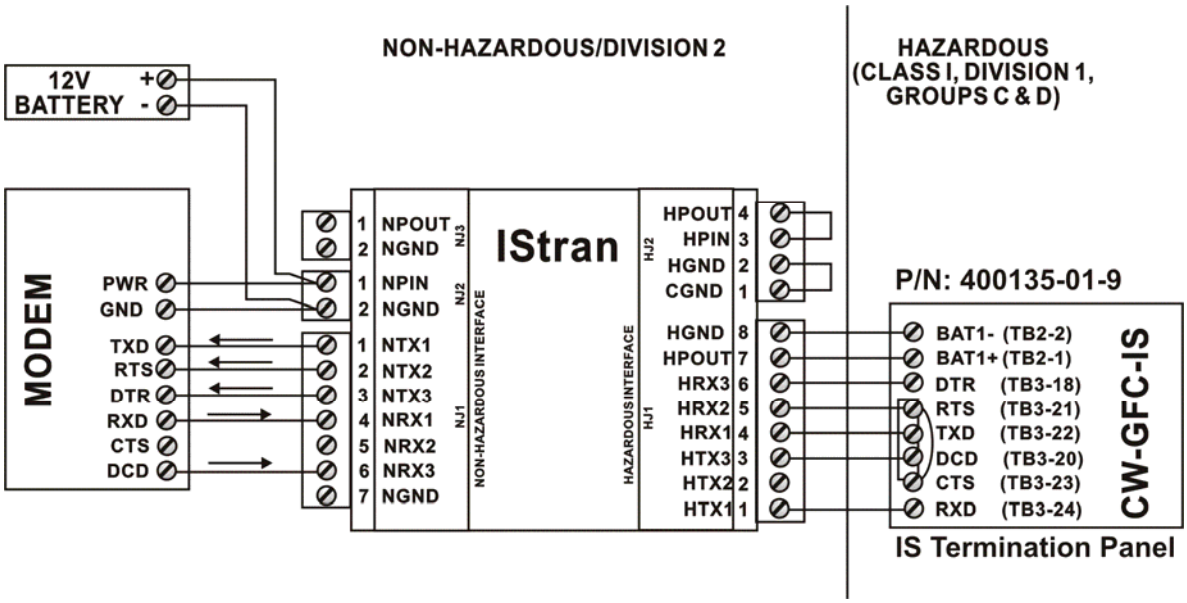

Figure 3-1. Modem System with Single Power Source

Figure 3-2 is similar to *Figure 3-1* except it uses an MDS radio instead of a modem.

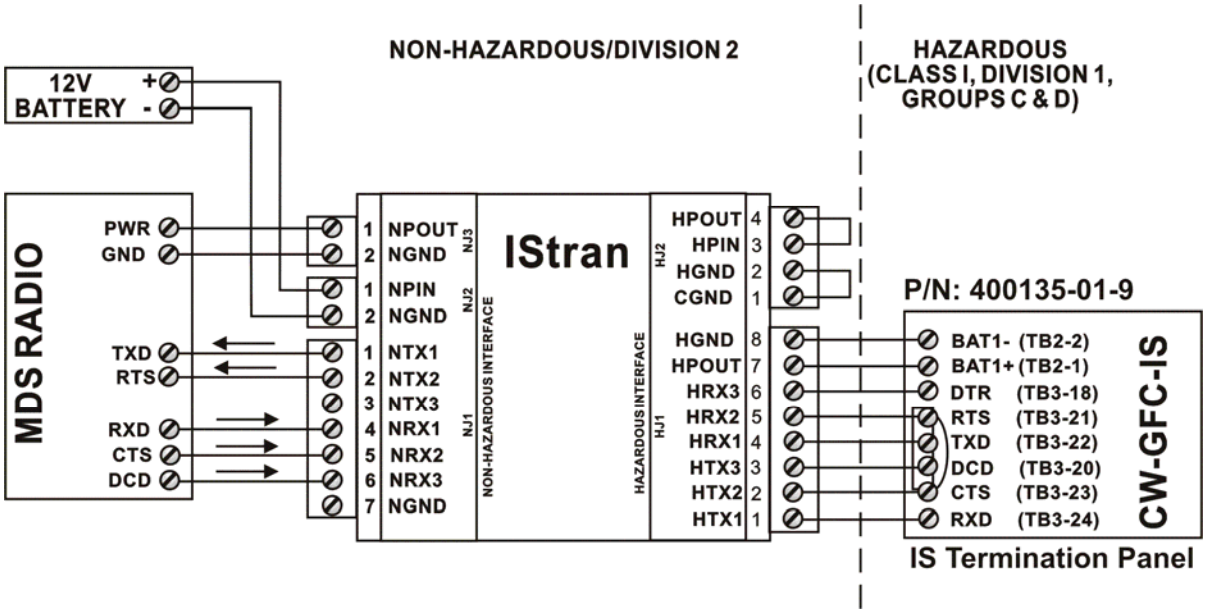

Figure 3-2. Radio System with Single Power Source

Figures 3-3 and *3-4* illustrate an externally powered CW-GFC-IS (without a modem or radio). In this example, the external power source to the non-hazardous interface must not generate more than 16Vdc and must be able to supply at least 8Vdc. If you install the IStran in a Division 2 area, you must connect the power inputs and outputs using Division 2 wiring methods. (See *Section 4.1*.)

Note: If you only require a modem or radio, refer to *Figure 3-1* and *Figure 3-2*. The only difference is that you can replace the 12V battery by an external 8 to 16 Vdc power supply.

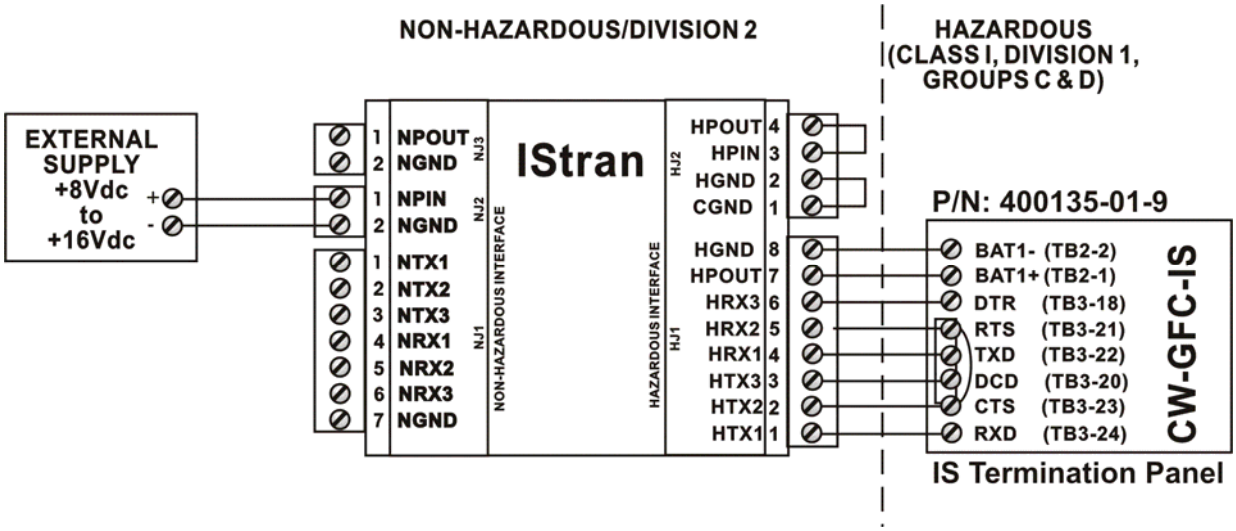

Figure 3-3. CW-GFC-IS with External Power Source

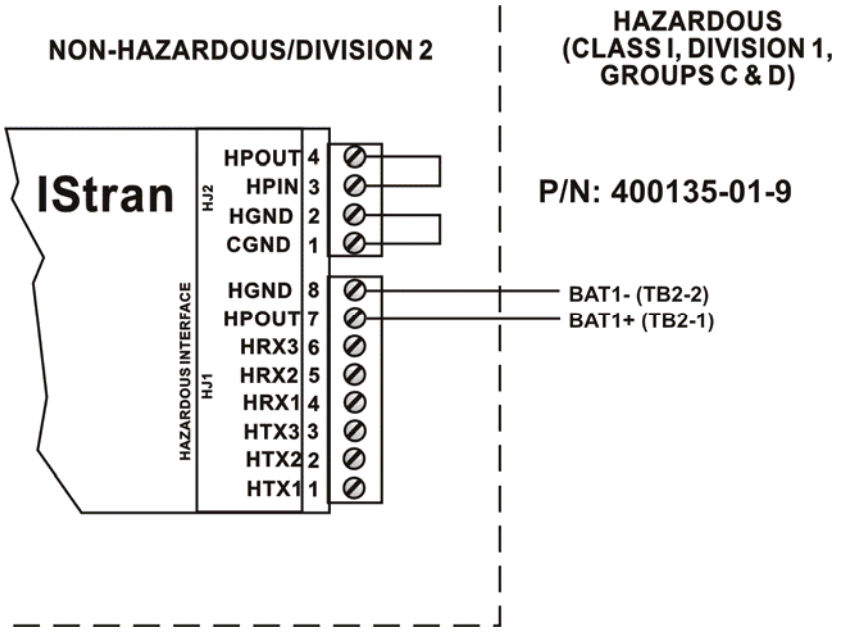

Figure 3-4. CW-GFC-IS with External Power Supply

Chapter 4 – Installation

4.1 Installation Overview

The IStran and the communications device reside in a non-hazardous or Division 2 rated area, while the CW-GFC-IS resides in a Division 1, Division 2, or non-hazardous area.

You must provide a suitable enclosure for the IStran. When you mount the IStran in a Division 2 area, you must make the non-hazardous interface connections in accordance with *Article 501-4(b)* of the *National Electrical Code NFPA 70.*

Caution

When you connect the IStran to a CW-GFC-IS mounted in a Division 1 area, wire all circuits according to wiring methods specified in article 504 of the *National Electrical Code NFPA 70*. Contact your IStran supplier for assistance.

Warning

When you install the IStran in a Division 2 area, ensure that the area is non-hazardous before you connect or disconnect the non-hazardous interface.

4.2 Installation Notes

Use four #6 screws with lock washers to secure the IStran to a grounded metal panel. Illustrations in *Chapter 1* show the physical dimensions of the IStran units. The four mounting holes/slots are 0.156" in diameter. Total height is approximately 1". The case material is 5052 aluminum with a black anodize finish. The thickness of the base is 0.060", and the top is 0.090". The case hardware is stainless steel.

The IStran accepts stranded wires up to 14AWG. When you must insert two wires in a single position, 18AWG is the maximum recommended size. The recommended strip length is 1/4 inch, and the insulation must not extend into the connector clamp. For cables, use 26AWG or larger conductors and do not configure them as twisted pairs. If you use a shield, connect it only at one end, closest to the system ground reference. For optimum performance over long distances, use low-capacitance cables. In the multi-drop configuration, keep all IStran units in close proximity.

Secure all wiring before you apply power to the IStran or to the associated devices. For intrinsic safety applications, use a single cable to connect the IStran hazardous interface to the intrinsically safe device. Maintain a minimum 2” separation between the intrinsically safe wiring and all other wiring. Install the IStran hazardous interface near the point where the intrinsically safe wiring exits the enclosure housing the

IStran. Do not install any other wiring through the same hole or allow other wires to share a cable or conduit with the intrinsically safe wiring. Secure the intrinsically safe wiring and limit slack to ensure that, should one of the intrinsically safe wires become dislodged from an IStran terminal, it must still maintain a 2” separation with either the IStran non-hazardous interface wiring or any other circuits except those on the IStran hazardous interface.

Refer to *Figures 3-1* through *3-4* in *Chapter* 3 when you connect wires between an optional modem or radio and an IStran assembly.

Note: MDS and Freewave radios use different RXD/TXD naming conventions. MDS uses RXD and TXD to mean “receive input” and “transmit output” respectively, while Freewave uses RXD for “transmit output” and TXD for “receive input.”

Refer to *Chapter 3* when you connect wires between an externally powered CW-GFC-IS and an IStran.

Chapter 5 – Specifications

5.1 Environment

The IStran design supports operation inside a building or a weather-proof enclosure only.

5.2 Operating Specifications

Table 5-1 provides the operating specifications for the IStran:

Table 5-1. IStran Operating Specifications

Description	Specification
Operating Temperature Range	-40°C to +70°C (-40°F to +158°F)
Operating Humidity Range	15% to 95% RH (non-condensing)
Transient Susceptibility	Field connected circuits designed to meet requirements of *ANSI/IEEE C37.90.1-1989* (formerly *IEEE 472*) for surge withstand capability.
Vibration Effect	10 to 500 Hz at 1 g on any axis per *SAMA PMC-31-1* without damage or impairment.
ESD Susceptibility	Field connected circuits designed to meet the requirements of *IEC 801-2* for ESD withstand capability up to 10KV.
EMI Compatibility	Designed to meet the susceptibility requirements of *IEC 801-3 level 2*(3V/M) from 500kHz to 500MHz. Designed to meet *FCC Rules Part J, Subpart 15, Class A* for radiated emissions.
Hazardous Locations	Designed to meet *NFPA* and *UL* requirements for installation in Class I, Division 2, Groups C and D hazardous locations. Designed to meet *NFPA* and *UL* requirements for connection to intrinsically safe devices located in Division 1 locations. The intrinsically safe device must be designed and/or approved for the intended connection.

WARRANTY

A. Remote Automation Solutions (RAS) warrants that goods described herein and manufactured by RAS are free from defects in material and workmanship for one year from the date of shipment unless otherwise agreed to by RAS in writing.

B. RAS warrants that goods repaired by it pursuant to the warranty are free from defects in material and workmanship for a period to the end of the original warranty or ninety (90) days from the date of delivery of repaired goods, whichever is longer.

C. Warranties on goods sold by, but not manufactured by RAS are expressly limited to the terms of the warranties given by the manufacturer of such goods.

D. All warranties are terminated in the event that the goods or systems or any part thereof are (i) misused, abused or otherwise damaged, (ii) repaired, altered or modified without RAS consent, (iii) not installed, maintained and operated in strict compliance with instructions furnished by RAS or (iv) worn, injured or damaged from abnormal or abusive use in service time.

E. These warranties are expressly in lieu of all other warranties express or implied (including without limitation warranties as to merchantability and fitness for a particular purpose), and no warranties, express or implied, nor any representations, promises, or statements have been made by RAS unless endorsed herein in writing. Further, there are no warranties which extend beyond the description of the face hereof.

F. No agent of RAS is authorized to assume any liability for it or to make any written or oral warranties beyond those set forth herein.

REMEDIES

A. Buyer's sole remedy for breach of any warranty is limited exclusively to repair or replacement without cost to Buyer of any goods or parts found by Seller to be defective if Buyer notifies RAS in writing of the alleged defect within ten (10) days of discovery of the alleged defect and within the warranty period stated above, and if the Buyer returns such goods to the RAS Watertown office, unless the RAS Watertown office designates a different location, transportation prepaid, within thirty (30) days of the sending of such notification and which upon examination by RAS proves to be defective in material and workmanship. RAS is not responsible for any costs of removal, dismantling or reinstallation of allegedly defective or defective goods. If a Buyer does not wish to ship the product back to RAS, the Buyer can arrange to have a RAS service person come to the site. The Service person's transportation time and expenses will be for the account of the Buyer. However, labor for warranty work during normal working hours is not chargeable.

B. Under no circumstances will RAS be liable for incidental or consequential damages resulting from breach of any agreement relating to items included in this quotation from use of the information herein or from the purchase or use by Buyer, its employees or other parties of goods sold under said agreement.

How to return material for Repair or Exchange

Before a product can be returned to Remote Automation Solutions (RAS) for repair, upgrade, exchange, or to verify proper operation, Form (GBU 13.01) must be completed in order to obtain a RA (Return Authorization) number and thus ensure an optimal lead time. Completing the form is very important since the information permits the RAS Watertown Repair Dept. to effectively and efficiently process the repair order.

You can easily obtain a RA number by:

A. FAX
Completing the form (GBU 13.01) and faxing it to (860) 945-2220. A RAS Repair Dept. representative will return the call (or other requested method) with a RA number.

B. E-MAIL
Accessing the form (GBU 13.01) via the RAS Web site (www.emersonprocess.com/remote) and sending it via E-Mail to CustServe.RAS@Emerson.com . A RAS Repair Dept. representative will return E-Mail (or other requested method) with a RA number.

C. Mail
Mail the form (GBU 13.01) to

Remote Automation Solutions
A Division of Emerson Process Management
Repair Dept.
1100 Buckingham Street
Watertown, CT 06795

A RAS Repair Dept. representative will return call (or other requested method) with a RA number.

D. Phone
Calling the RAS Repair Department at (860) 945-2442. A RAS Repair Department representative will record a RA number on the form and complete Part I, send the form to the Customer via fax (or other requested method) for Customer completion of Parts II & III.

A copy of the completed Repair Authorization Form with issued RA number should be included with the product being returned. This will allow us to quickly track, repair, and return your product to you.

EMERSON
Process Management

Remote Automation Solutions

Repair Authorization Form

(Providing this information will permit Remote Automation Solutions to effectively and efficiently process your return. Completion is required to receive optimal lead time. Lack of information may result in increased lead times.)

Date _____ **RA #** _____ **SH** **Line No.** _____

Standard Repair Practice is as follows: Variations to this is practice may be requested in the "Special Requests" section.

- Evaluate / Test / Verify Discrepancy/Repair/Replace

Please be aware of the Non warranty standard charge:

- There is a $100 minimum evaluation charge.

The party sending in material is responsible to ensure that the materials returned are clean to safe levels, defined and/or determined by applicable federal, state and /or local law regulations or codes. Such party agrees to indemnify Remote Automation Solutions harmless to any liability or damage which Remote Automation Solutions may incur or suffer due to such party's failure to so act.

Part I Please complete the following information for single unit or multiple unit returns

Address No. _____ **Address No.** _____

Bill to : _____ **Ship to:** _____

_____ _____

_____ _____

Purchase Order: _____ **Contact Name:** _____

Phone: _____ **Fax:** _____ **E-Mail:** _____

Part II Please complete Parts II & III for each unit returned

Model No./Part No. _____ **Description:** _____

Range/Calibration: _____ **S/N:** _____

Reason for return : ☐ Failure ☐ Upgrade ☐ Verify Operation ☐ Other _____

1. Describe the conditions of the failure (Frequency/Intermittent, Physical Damage, Environmental Conditions, Communication, CPU watchdog, etc.) _____ (Attach a separate sheet if necessary)
2. Comm. interface used: ☐ Standalone ☐ RS-485 ☐ Ethernet ☐ Modem (PLM (2W or 4W) or SNW) ☐Other: _____
3. What is the **Firmware** revision?_____ What is the **Software** & version? _____

Part III If checking "replaced" for any question below, check an alternate option if replacement is not available

A. If product is deemed not repairable would you like your product: ☐ returned ☐ replaced ☐ scrapped?

B. If Remote Automation Solutions is unable to verify the discrepancy, would you like the product: ☐ returned ☐ replaced ☐ *see below?

* Continue investigating by contacting the customer to learn more about the problem experienced? The person to contact that has the most knowledge of the problem is: _____ phone _____

If we are unable to contact this person the backup person is:_____ phone _____

Special Requests:

_____

Ship prepaid to: Remote Automation Solutions, Repair Dept., 1100 Buckingham Street, Watertown, CT 06795
Phone: 860-945-2442 Fax: 860-945-2220

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www.EmersonProcess.com/Remote

Emerson Process Management
Remote Automation Solutions
6338 Viscount Rd.
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