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CHAPTER 1 GENERAL

1.1 Product Introduction

The Wireless Field Interface (WFI) adds a wireless capability to the existing servo or the radar gauge by supporting the GPU protocol which is compliant with the ISA100 standards. It consists of multiple electronic boards, an antenna cable, and an antenna. The WFI communicates with the servo or the radar gauge through the Honeywell Enraf field bus Bi-Phase Mark, processes the data, and forwards the information wirelessly to the Wireless Device Manager (WDM) which is compliant with the ISA100 standards. The complete network including the WFI is based on the ISA100 wireless field device network.

Also, there are different ways of communication which are as follows:

- The protocol tunnel (Engauge and Entis)
- Function blocks (Experion integration)

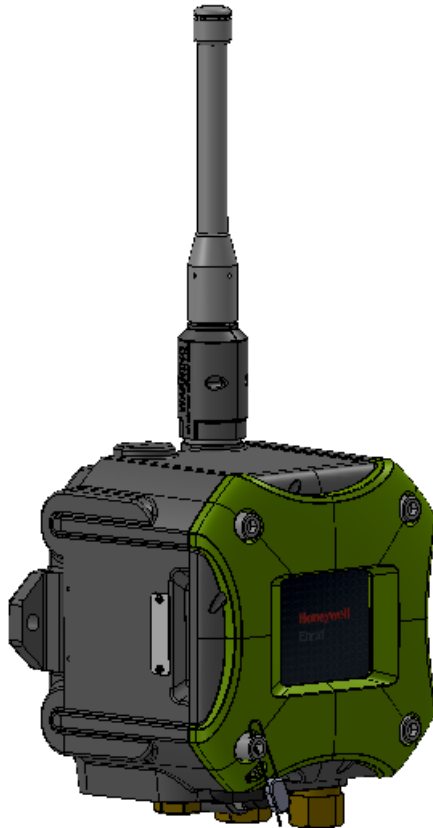


FIGURE 1-1

Wireless Field Interface (WFI)

1.2 Target Audience for this Manual

This manual is intended for engineers and technicians, who are assigned to install, commission, and service the WFI. Also, all Honeywell Enraf customers who use wireless.

CHAPTER 2 SAFETY

2.1 Safety Conventions



2.1.1 Warnings

The following warning mark is used within this document to urge attention in order ***to prevent personal injuries or dangerous situations***, further described in this document.

Symbol	Description	Remark
	General warning	Will always be explained by text.

2.1.2 Cautions

The following caution mark is used within this document to urge attention in order ***to prevent damages to the equipment***, further described in this document.

Symbol	Description
	General caution sign
	Electrostatic Discharge (ESD) sensitive device

2.2 Safety Instructions for the WFI

The WFI device is used for converting the wired communication of various Honeywell Enraf equipment into a wireless transmission.

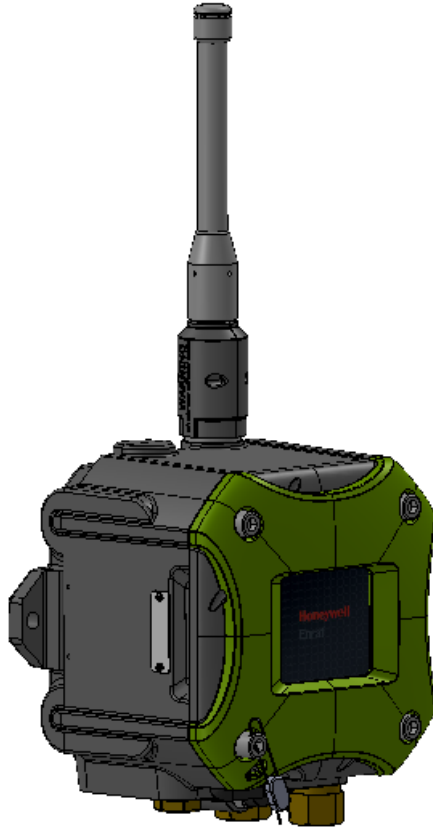


FIGURE 2-1











Wireless Field Interface (WFI)

2.2.1 General



WARNING! You must strictly follow the safety instructions mentioned in this manual and the safety instructions shipped with the WFI device for installation, commissioning, operation, and maintenance, for the safe operation of the WFI device.

The WFI may be located in explosion safety areas as follows:

USA (FM) and Canada (CSA)		Canada (CSA)		Rest of the World (ATEX / IECEx)	
Safety level	Remarks	Safety level	Remarks	Safety level	Remarks
Class 1, Division 1	 WARNING! Do NOT open when an explosive atmosphere may be present.	Zone 1	 WARNING! Do NOT open when an explosive atmosphere may be present.	Zone 1	 WARNING! Do NOT open when an explosive atmosphere may be present.
	 CAUTION! Seal conduit within 18 inches.		 CAUTION! Seal conduit within 18 inches.		
Class 1, Division 2	 WARNING! Do NOT open when an explosive atmosphere may be present.	Zone 2	 WARNING! Do NOT open when an explosive atmosphere may be present.	Zone 2	 WARNING! Do NOT open when an explosive atmosphere may be present.
	 CAUTION! Seal conduit within 18 inches.		 CAUTION! Seal conduit within 18 inches.		
Safe Area	-	Safe Zone	-	Safe Zone	-

2.2.1.1 EC declaration of conformity (for EU)

Refer to the EC declaration of conformity and the ATEX certificate(s), shipped with the WFI device for EC declarations.

2.2.1.2 Control Drawings for FM and CSA

Refer to the control drawings shipped with the WFI for FM and CSA.

2.2.1.3 Users

The mechanical and electrical installation must be performed only by trained people with the knowledge of the requirements for installation of explosion proof equipment in hazardous areas.

The entire installation procedure for the WFI must be implemented in accordance with national, local, and company regulations.

The entire electrical installation may be performed in accordance with the national requirements for electrical equipment to be installed in hazardous areas.

NOTE: See EN IEC 60079-14 document for more information.

2.2.1.4 Additional information

For additional information about Honeywell Enraf solutions, see the back cover of this manual to contact Honeywell Enraf or its representative.

2.2.1.5 Environmental Conditions

The environmental conditions regarding the permissible operating temperature for the WFI is -40 °C to +65 °C (-40 °F to +149 °F). The relative humidity is RH 5 to 95%, non-condensing.

2.2.2 Personal Safety



WARNING! *In hazardous areas, it is compulsory to use personal protection and safety gear. Safety can be achieved by using the following equipment:*

1. Safety helmet
2. Fire-resistive overall
3. Safety shoes
4. Safety glasses
5. Working gloves
6. LEL-meter

Pay attention to the kind of product involved. If there is any danger to your health, wear a gas mask and take all the necessary precautions.



WARNING! *Take appropriate precautions when chemical or toxic product vapors are present (compressed air, chemical protection suit, detection equipment).*

2.2.2.1 General

2.2.2.1.1 Repairs and Maintenance



WARNING! *Any repairs or parts replacements must be performed by the manufacturer or its appointed repair agent.*

2.2.2.1.2 Opening of the Device



WARNING! *It is forbidden to open the WFI device within an explosive hazardous environment in power, unless otherwise stated on the safety label.*



WARNING! *Treat the flange surface of the cover and the housing with care. Keep the flange surface free of dirt. The O-ring must be present and undamaged.*

2.2.2.1.3 Tools



WARNING! Use non-sparking tools and explosion-proof testers. Use suitable explosion-proof tools (for example, testing devices).

2.2.2.1.4 Working Environment



WARNING! Avoid generation of static electricity. Make sure the explosive gas mixtures are not available in the working area.

2.2.2.1.5 Required Skills



WARNING! The technician must have technical skills to be able to safely install the WFI device. The technician also must be trained to work in accordance with the national requirements for electrical equipment in hazardous areas.

2.2.2.2 Commissioning

The commissioning of the device is conducted by qualified engineers trained by Honeywell Enraf and with the knowledge of the (local and national) requirements for electrical equipment in (potentially) explosive atmospheres.

2.2.2.3 Maintenance and troubleshooting

If the WFI device does not function accurately, only a qualified service engineer, trained by Honeywell Enraf and with the knowledge of safety regulations for working in (potentially) explosive atmospheres are allowed to repair the WFI device.

2.2.2.4 Grounding

Make sure the housing of the device is properly connected to ground reference. See FIGURE 3-5.

Make sure the electrical resistance of the ground connections is below the maximum prescribed by local requirements.

2.2.3 Electrical


2.2.3.1 Safety Standards

- The entire electrical installation must be in accordance with the International Standard EN IEC 60079-14 for electrical equipment in hazardous areas.
- The stopping plugs, cable glands, and reducers must be installed in accordance with the appropriate IP requirements.
- Use the bolts that are property class A2-70 or better captured types and are not user replaceable. Contact Honeywell Enraf if you need to replace the bolts.
- Use suitable flameproof (Ex d) compound cable glands or conduit seals.

- Improper installation of cable glands, threaded adaptors, stopping plugs, and their interface invalidates the Ex approval of the WFI device.
- Accurate dimensions of the flameproof joints must be used. Contact Honeywell Enraf for information regarding the dimensions of the flameproof joints.

2.2.3.2 Accordance to Regulations

2.2.3.3 Explosion Safety

Approval	Certificate no.	Type of protection identification		
ATEX	Approval pending	 II 2 G	Ex d [ia] IIB T6 Gb	T _a = -40 °C ... +65 °C (-40 °F ... +149 °F)
IECEX	Approval pending	Zone 1		
FM	Approval pending	Class I, Division 1	group C, D T6	
CSA	Approval pending	Class I, Division 1	group C, D T6	
		Zone 1	Ex d [ia] IIB T6	

2.2.3.4 Compliance to FCC

This device complies with Part 15 of the FCC Rules. The WFI device does not cause any harmful interference and accepts any interference received.




2.2.3.5 Low-Voltage Directive

- The device is suitable for 2006/95/EC.
- The applicable standard value is IEC 61010-1 (3rd Edition).

2.2.3.6 Reference of Applicable Standards

Standard	Description
ATEX 95	Applicable for manufacturers of equipment used in places where explosion danger may exist.
IECEX	The IECEX System is an International Conformity System where a Mark of Conformity is granted by approved IECEX certifiers (ExCBs) located in IECEX participating countries for equipment that is covered by an IECEX Certificate of Conformity and hence has been tested and manufactured under systems that are under ongoing surveillance by ExCBs.
FM	Factory Mutual Approvals Division The Factory Mutual Approvals Division determines the safety and reliability of equipment, materials, or services utilized in hazardous locations in the United States and elsewhere.
CSA	Canadian Standards Association The standards generated by CSA are the cornerstone for determining a product's eligibility for certification in hazardous locations in Canada.


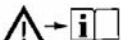
2.2.3.7 WFI Labels 

Honeywell Enraf		Enraf B.V. Delftechpark 39 2628 XJ Delft made in The Netherlands	
Wireless Field Interface			
Serial nr. :	Input : 65-240 Vac / 24-65 Vdc (Um 250 V)		
Test date :	: 50 - 60 Hz max. 12 W		
	II 2 G Ex d [ia] IIB T6 Gb DEKRA 13ATEX9999 X	Ex d [ia] IIB T6 Gb IECEX DEK 13.9999 X	2074328-000
	0344 / 1556 ⓘ	Ta: -40°C to +65°C	
	IP66/67		

warning - do not open when an explosive atmosphere may be present

Honeywell Enraf		Enraf B.V. Delftechpark 39 2628 XJ Delft made in The Netherlands	
Wireless Field Interface			
Serial nr. :	Input : 65-240 Vac / 24-65 Vdc (Um 250 V)		
Test date :	: 50 - 60 Hz max. 12 W		
	Class I, Division 1, Groups C & D, T8 Zone 1, Ex d [ia] IIB T6, Certificate No: CSA13.xxxxxxx refer to certificate and control drawing 135-1978000-4 for I.S. terminations		2074326-000
	Ta: -40°C to +65°C		
NEMA 4X, IP66			

warning - seal all conduits within 18 inches
warning - do not open when an explosive atmosphere may be present

Honeywell Enraf		Enraf B.V. Delftechpark 39 2628 XJ Delft made in The Netherlands	
Wireless Field Interface			
Serial nr. :	Input : 65-240 Vac / 24-65 Vdc (Um 250 V)		
Test date :	: 50 - 60 Hz max. 12 W		
	Class I, Division 1, Groups C & D, T8 refer to certificate and control drawing 135-1978000-4 for I.S. terminations		2074327-000
	Ta: -40°C to +65°C		
NEMA 4X			

warning - seal all conduits within 18 inches
warning - do not open when an explosive atmosphere may be present

NOTE to FM label:

Ta = -40 °F to +149 °F

FIGURE 2-2

Identification labels with Safety note on the WFI

2.3 Liability

The information in this installation guide is the copyright property of Honeywell International Inc. Honeywell International Inc. disclaims any responsibility for personal injury or damage to equipment caused by:

- Deviation from any of the prescribed procedures.
- Execution of activities that are not prescribed.
- Neglect of the safety regulations for handling tools and use of electricity.

The contents, descriptions, and specifications in this manual are subject to change without notice. Honeywell International Inc. accepts no responsibility for any errors that may appear in this manual.



WARNING! *Only certified technicians are authorized to make changes to the WFI configuration. All modifications must be in accordance with the guidelines as set forth by Honeywell International Inc. Modifications not authorized by Honeywell International Inc. invalidates the approval certificates.*

CHAPTER 3 SYSTEM DESCRIPTION

3.1 Introduction

3.2 System Architecture

The WFI is a box that can be installed next to an installed Servo/Radar gauge. The WFI retrieves the information from this gauge and sends the information wirelessly to the supervisory level.

This is an ISA100 compliant solution that supports transducer blocks for transferring basic process values to the supervisory level and supports the GPU tunnel to connect to the Engauge (maintenance) and Entis (inventory management package) systems. See FIGURE 3-1.

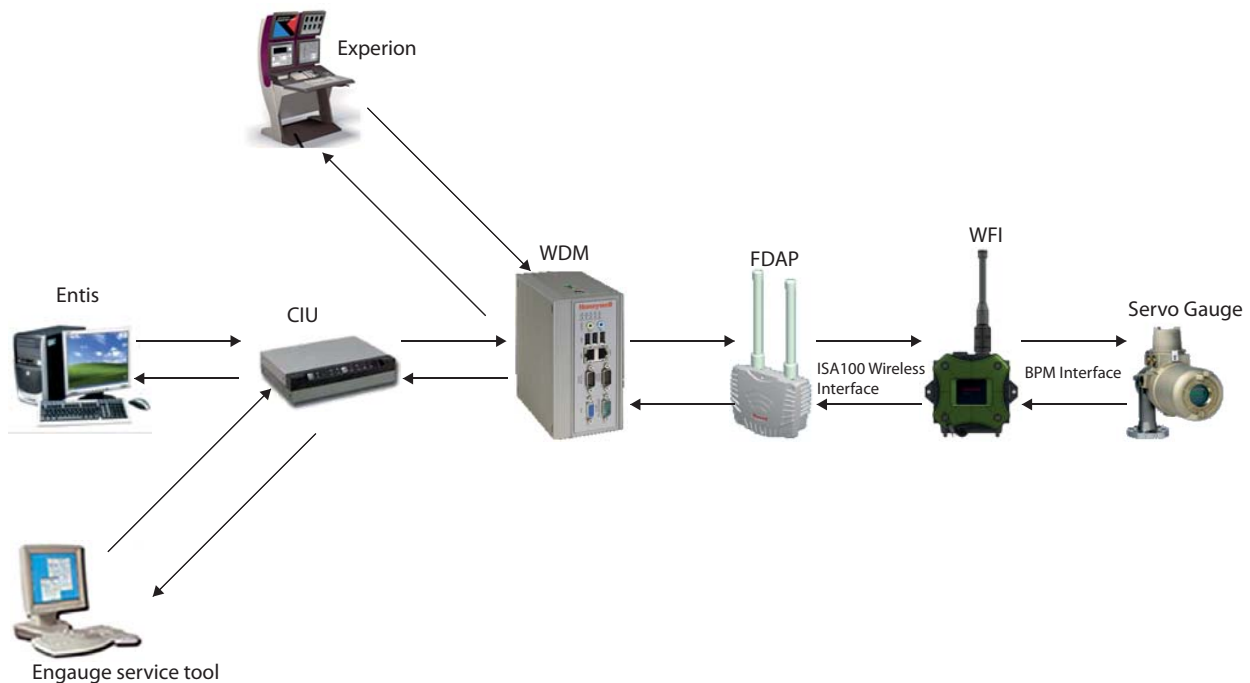


FIGURE 3-1

WFI architecture overview

3.3 FlexConn Modules

3.3.1 General

One of the main characteristics of the FlexConn architecture is the placement flexibility of the FlexConn modules. The backbone of this

concept is the serial CAN¹ bus to which each FlexConn module connects.

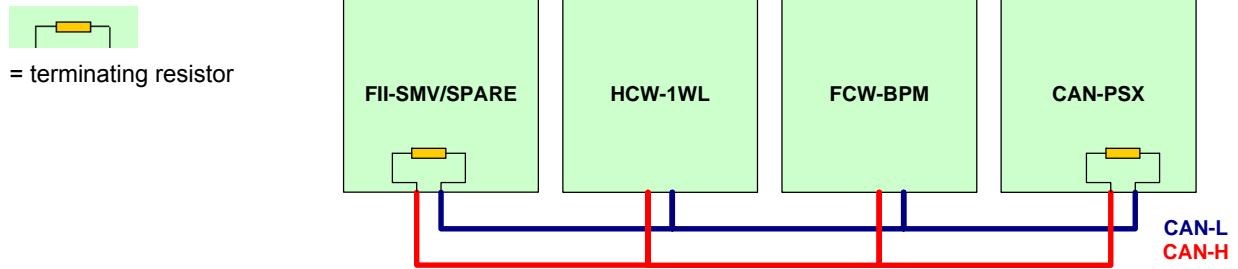


FIGURE 3-2

FlexConn CAN bus concept

Inside the enclosure, the following modules are available.

- FII-SMV or Spare Module
- HCW-1WL
- FCW-BPM

The stack of modules are mounted on the DIN Rail and placed vertically inside the enclosure as illustrated in FIGURE 3-3.

1. Controller Area Network.

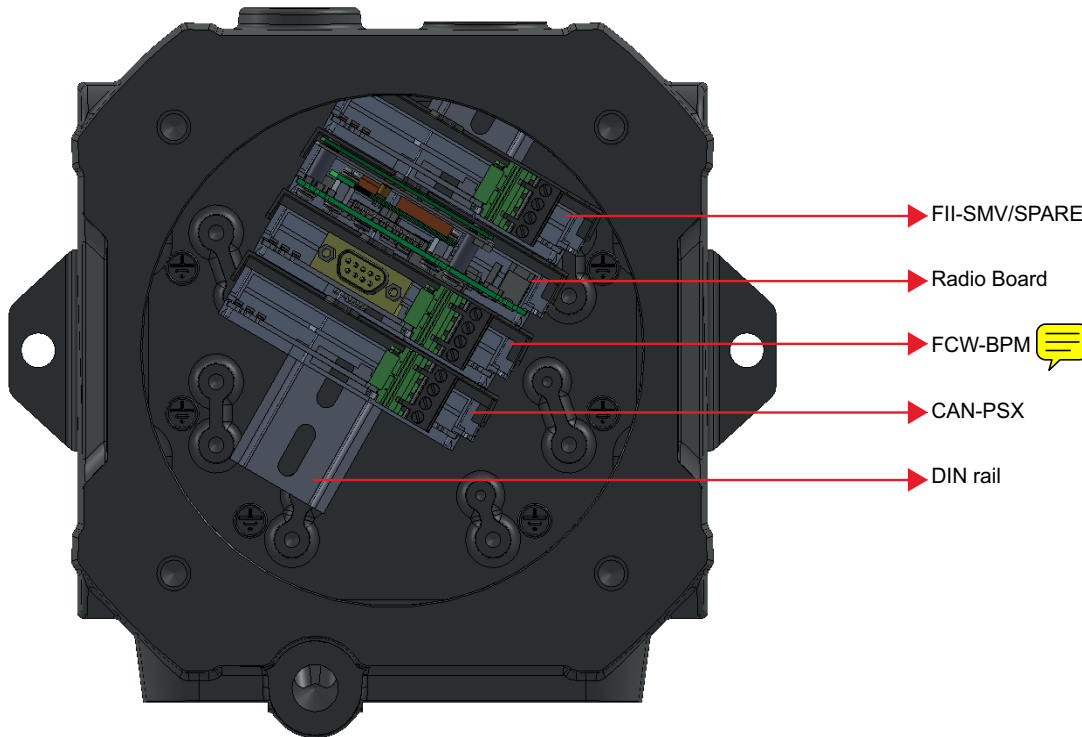


FIGURE 3-3 FlexConn board sequencing

Module	Description
Radio Board	Includes the circuit of 1WL Main Board and Carrier Boards. It is assembled with DFSS Radio or LCRB and Barrier Boards.
CAN-PSX	Generates the power of 15 V DC with auxiliary supply.
CAN-BPM	Provides an interface to a BPM based Enraf field bus to communicate with Servo/Radar Gauge.
FII-SMV	Connects the display type SmartView with a standard CAN bus.

3.3.2 Grounding Concept

Each printed circuit board has 2 grounding points. These grounding points are used to electrically connect every board with the metal housing. This is performed by means of metal spacers, which are pressed into the boards. See FIGURE 3-4.

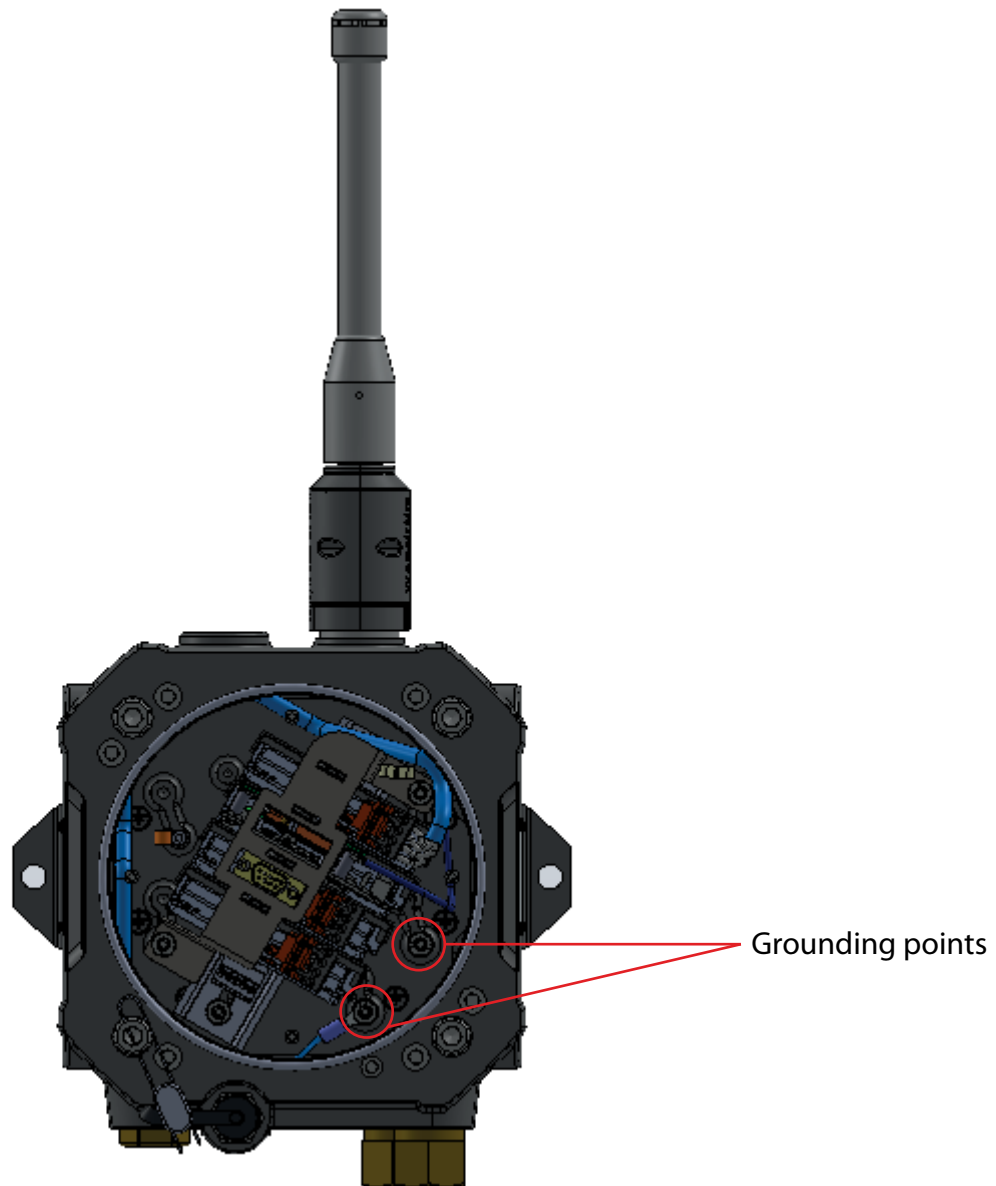


FIGURE 3-4

Grounding concept

3.3.3 Enclosure Earth Details

Inside the enclosure, 2 Protected Earthing (PE) or Mains input earth points and 1 external point is available to connect to the field earth point. See FIGURE 3-5.

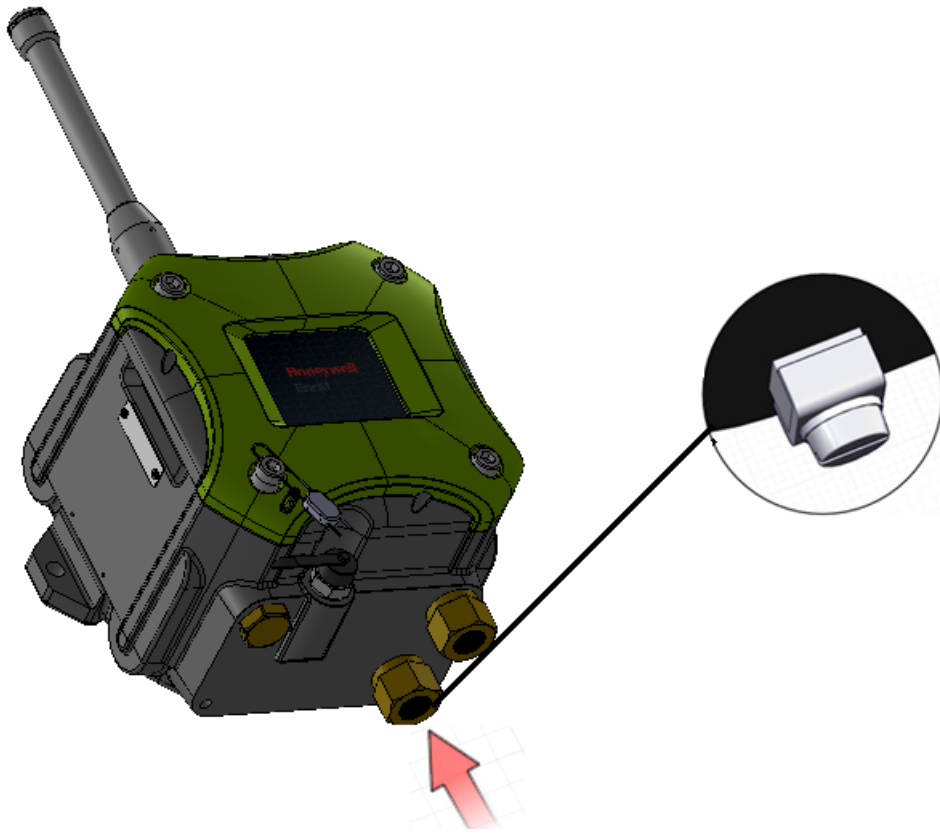


FIGURE 3-5 The grounding connections for the WFI

3.3.4 Field Wiring

The mains input and the CAN-BPM signal lines enter the enclosure through different glands from one side of the enclosure.

The mains input (Line and Neutral) cable wires terminate on the PSX module connector. The mains input earth wire terminates on one of the PE points provided inside the enclosure. From the PE point inside the enclosure, the PSX gets the PE connection through the wire terminated on the PSX connector.

The CAN-BPM signals cable from the servo gauge enters the enclosure with the gland and terminates on the CAN-BPM module connector. The CAN-BPM module then gets the earth wire from the PE point inside the enclosure. See FIGURE 3-6.

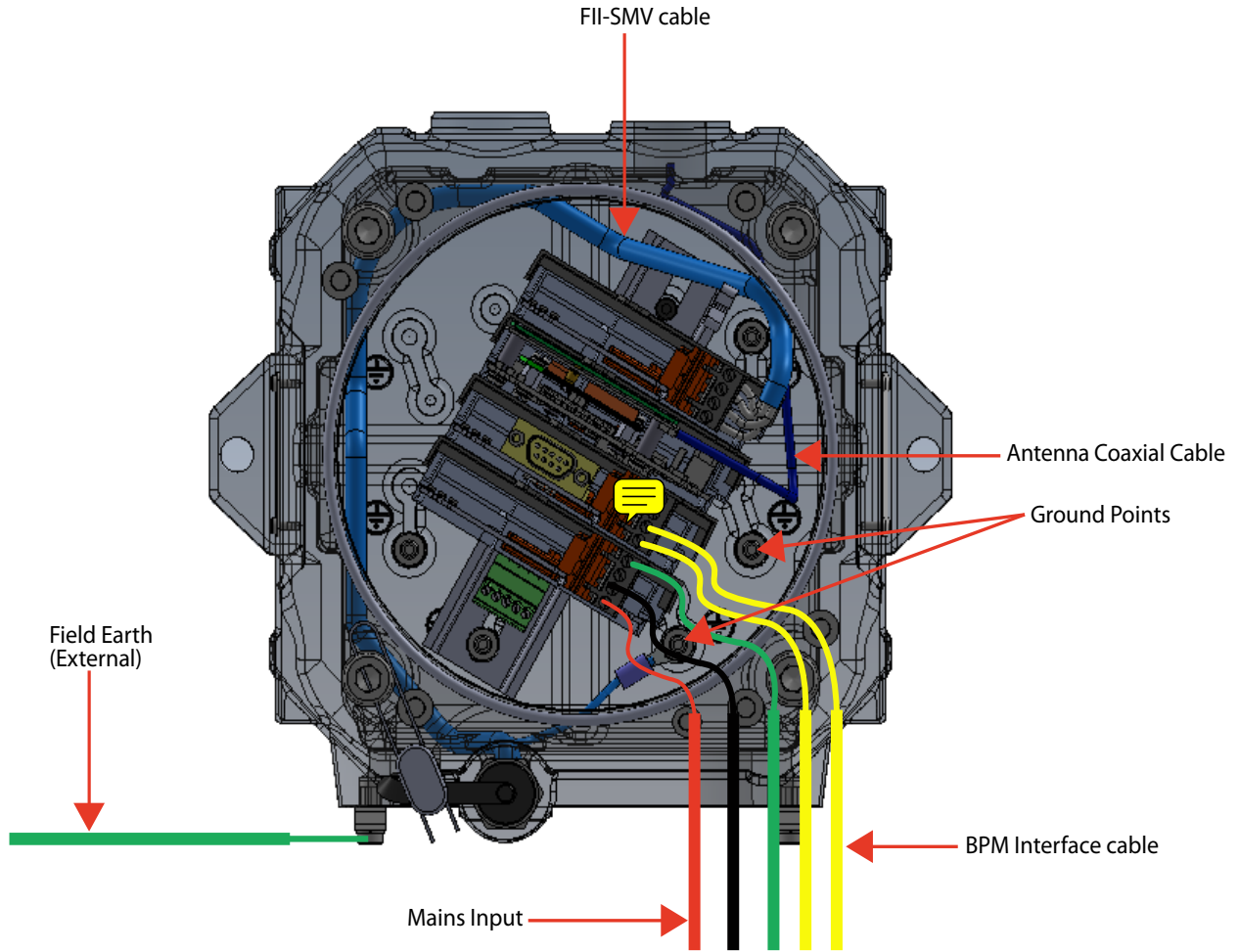


FIGURE 3-6

Field wiring

3.3.5 PCB Details

3.3.5.1 CAN-1WL Board

The CAN-1WL board is used to interface data between a FlexConn system and the OneWireless network (including the antenna).

The 1WL main board occupies a single slot in the FlexConn rail and the other three boards (1WL carrier board, 1WL radio board, and 1WL barrier board) are mounted together to form the second FlexConn board. See FIGURE 3-7.

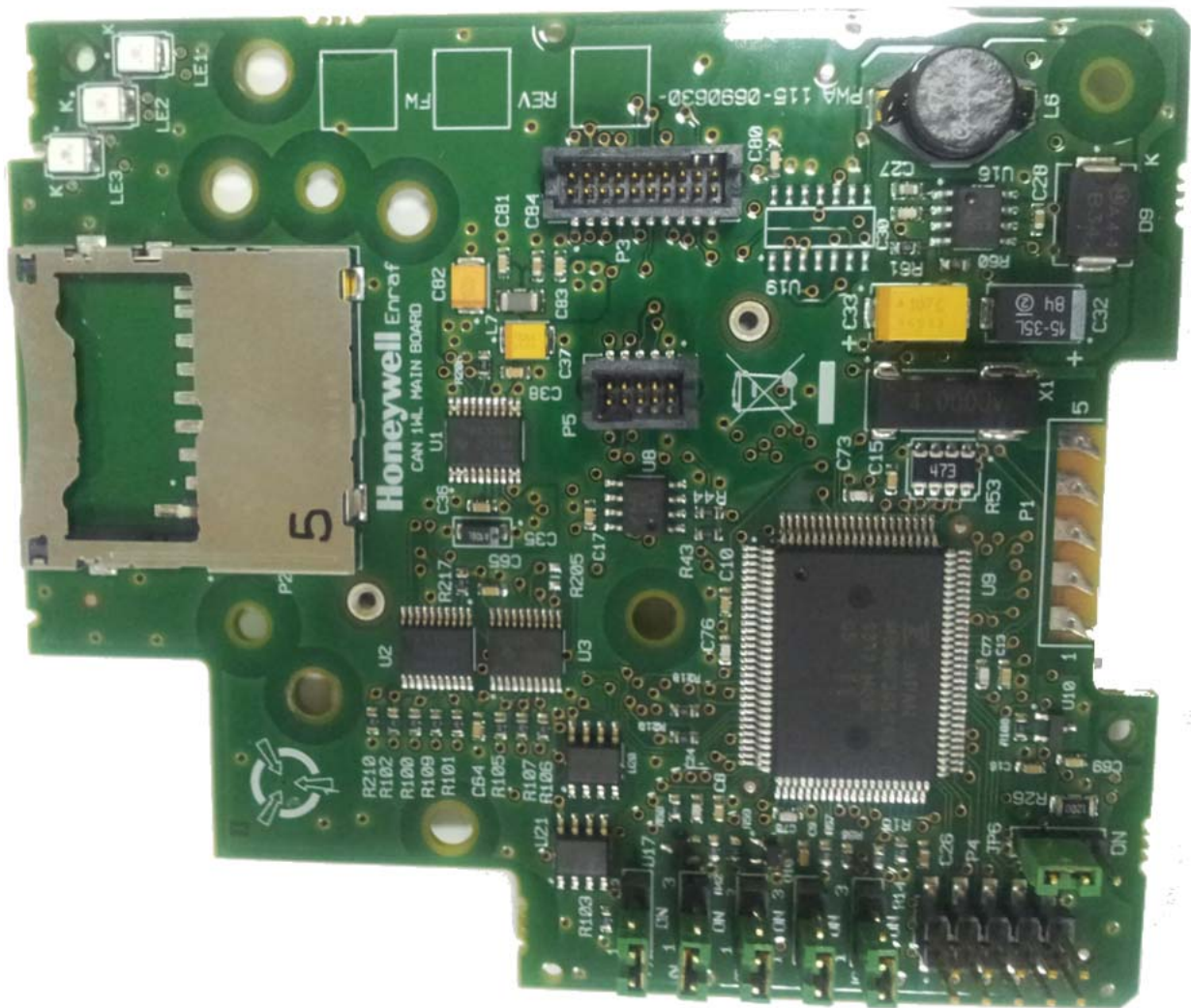


FIGURE 3-7 CAN-1WL board layout

The functions of the CAN-1WL board are as follows:

- 1WL main board
 - FlexConn electronics

- 3V3 power supply
- SD card interface
- 5V / 3V3 level converter
- 1WL carrier board
 - Filter the 3V3 power supply
- 1WL radio board
 - OneWireless radio board
- 1WL barrier board
 - Barrier board

3.3.5.2 CAN-BPM module

3.3.5.2.1 Functions

The CAN-BPM module provides an interface to a BPM based Enraf field bus. It is a communication print that is based on Flexconn and can be installed in a SmartLink (new CIU) or in a new instrument such as a Flexconn based radar or servo gauge. The CAN-BPM print in a SmartLink is called FCM-BPM module. See FIGURE 3-8.



FIGURE 3-8

CAN-BPM board layout

3.3.5.2.2 Terminal Descriptions

■ **CN2 - BPM**

Pin no.	Name/Signal
1	TL1
2	TL2
3	n.c/spare
4	PE (optional)

■ **LEDs**

Items	Description
LE1	Error indication
LE2	Follows TxD on BPM line (TXEFB1)
LE3	Follows RxD on BPM line (RXEFB)

3.3.5.3 FII-SMV (HMI-TSI)

3.3.5.3.1 Functions

The FII-SMV (HMI-TSI) module is intended to connect the display type SmartView with a standard CAN bus. The display is an intrinsic safe device. The interface module is located within an Ex d enclosure or in a safe area and provides intrinsic safe circuits for the supply and communication to the display module. See FIGURE 3-9.

The module implements the following functions.

Function	Description
Supply 10 V	Safe_+ = 10V for the SmartView display module, isolated (Ex certified)
RS485	RS485 for the SmartView display module, isolated (Ex certified)
Local service	Software, processing messages from/to the SmartView display unit and CAN-BUS
Display interface	Software, processing messages from/to the SmartView display unit and CAN-BUS

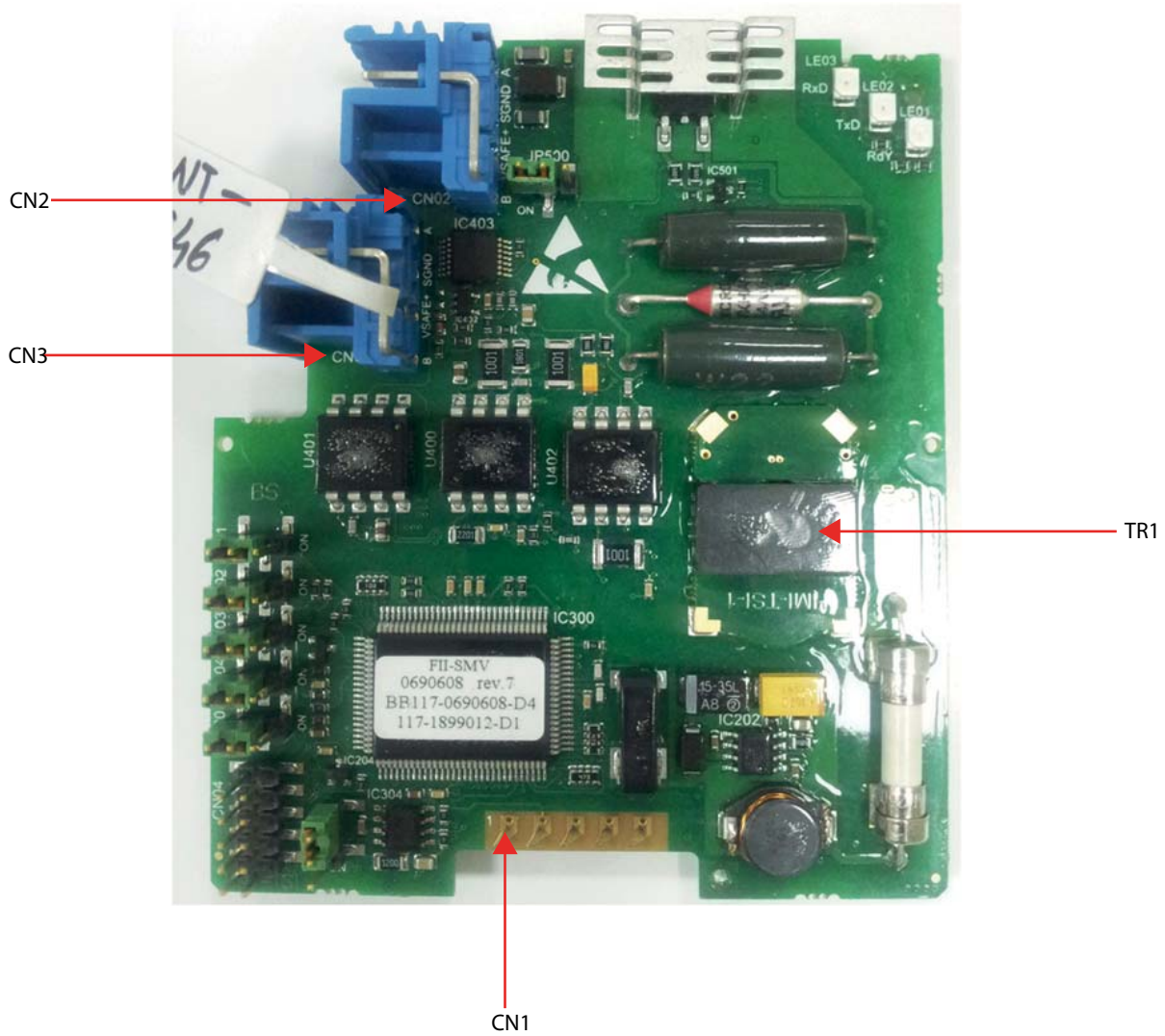


FIGURE 3-9 FII-SMV board layout

3.3.5.3.2 Terminal Descriptions

- LE1 is connected to the V_{dc} output signal.
- Connectors

Connectors	Description
CN1	CAN-BUS
CN2	Display output
CN3	Display output
CN4	Program Header

■ CN1

Pin no.	Name/Signal
1	W&M
2	CAN_H
3	CAN_L
4	V _{dc} = + 15 V
5	GND

■ CN2

Pin no.	Name/Signal	Description
1	SGND	Isolated secondary ground
2	Vsafe_+	Isolated DC supply output
3	Safe_A	Isolated RS485 A input/output
4	Safe_B	Isolated RS485 B input/output

■ CN4

Pin no.	Name/Signal
1	P00
2	P01
3	MD0
4	MD2
5	RST
6	SIN0
7	SOT0
8	SCK0
9	V _{cc}
10	GND

■ LEDs

Items	Description
LE1	Error indication
LE2	Application specific
LE3	Application specific

■ Jumpers

Items	Description
JP1	W&M entities protection
JP2	Password read protection
JP3	Write protection all entities

Items	Description
JP4	Spare
JP5	Spare
JP6	Termination of CAN-bus

3.3.6 CAN-PSX module - Power Supply

3.3.6.1 Functions

The CAN Power supply (+15V DC) is intended to power up the FlexConn modules. It can be used within the application and also within an Ex-d enclosure. See FIGURE 3-10.

The module implements the following specifications.

Item	Specification
AC Input Voltage Range	65 V - 240 V AC (+10% to -15%)
Input Frequency	50 Hz to 60 Hz \pm 10%
Input Fuse Value	1.25 A
Isolation Voltage	4.3 KV
DC Input Voltage Range	24 V - 65 V DC (+10% to -15%)
Output Voltage	15 V DC \pm 4%
Continuous current	1 A

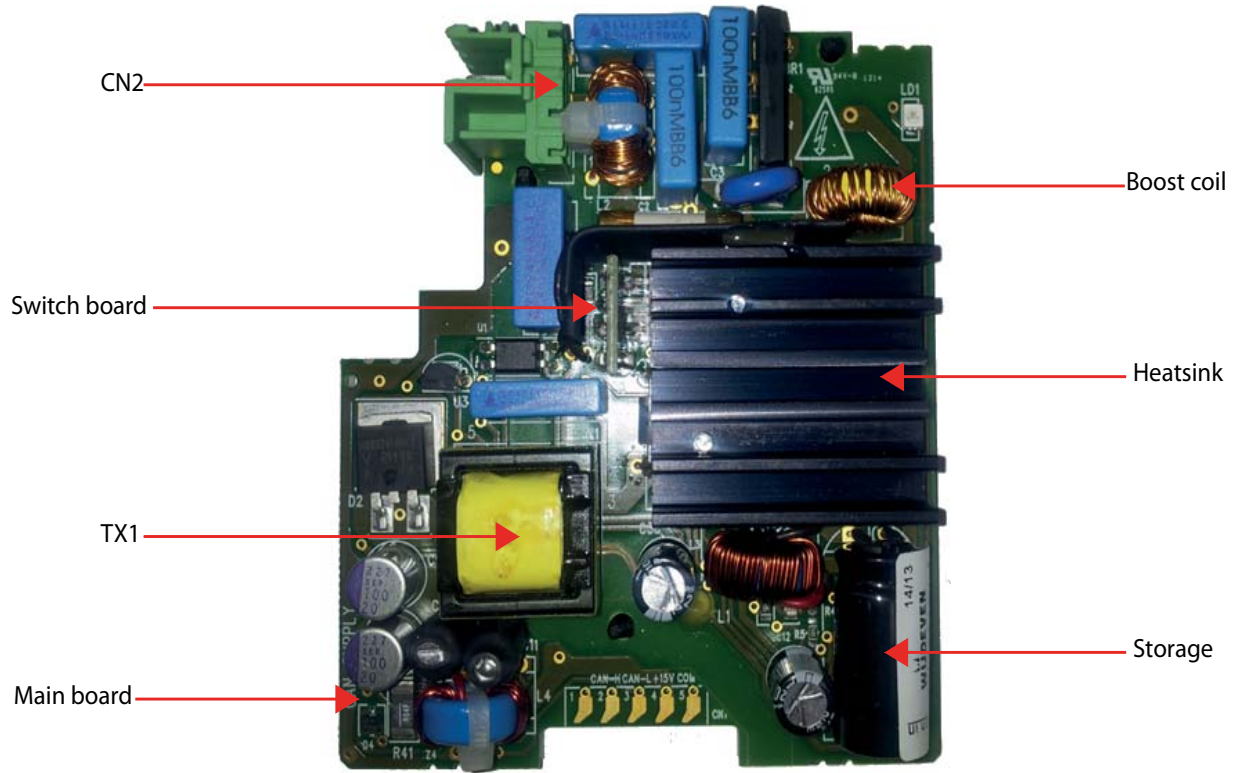


FIGURE 3-10 CAN-PSX board layout

3.3.6.1.1 Terminal Descriptions

- LE1 is connected to the V_{dc} output signal.
- Connectors

Connectors	Description
CN1	CAN-BUS
CN2	Mains/DC input
CN3	Not placed

- CN1

Pin no.	Name/Signal	Description
1	n.c.	
2	CAN_H	Interconnected by 120Ω 1206
3	CAN_L	
4	$V_{dc} = + 15 V$	
5	GND ^a	Internally connected to CN2, earth PE

a. CN1 pin 5 may not be used as an extension on the protective earth. However, it may be used as a functional earth pin.

■ CN2 (AC/DC input)

Pin no.	Name / signal	Description
1	V _{in_a}	Mains or DC + / - input
2	V _{in_b}	Mains or DC + / - input
3	PE	Earth = PE = GND
4	n.c	

CHAPTER 4 INSTALLATION

4.1 Mounting the Antenna

The antenna is placed on top of the WFI enclosure as shown in the following figure.

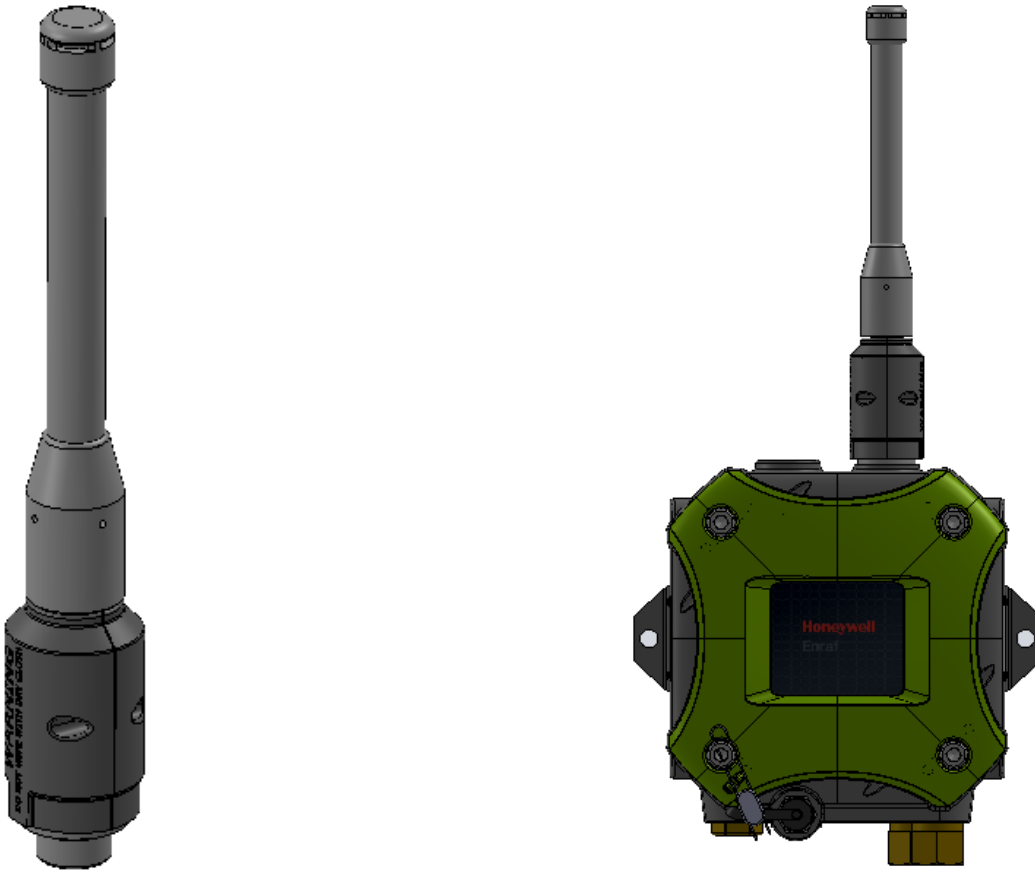


FIGURE 4-1

WFI antenna

To mount the communication antenna on the WFI device, screw the communication antenna clockwise on the lightning arrestor. See FIGURE 4-2.

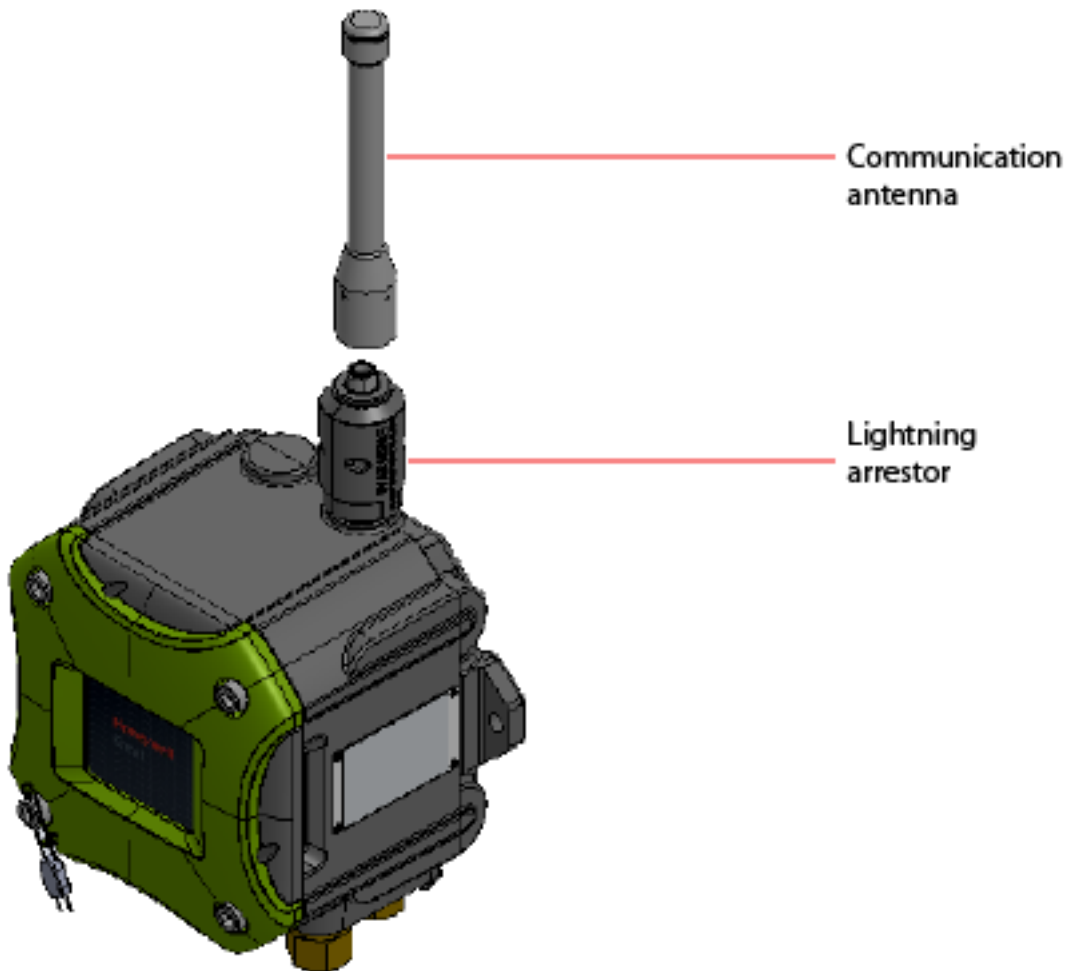


FIGURE 4-2

Mounting the communication antenna

NOTE: The lightning arrester protects the inside electronics from the lightning damage. Although it protects against multiple discharges, it can be replaced as a preventive maintenance action. Preventive maintenance interval depends on the location, position of the equipment, grounding, and other protection measures installed.

4 dBi and 8 dBi integral antenna's are supported in WFI.

For more information about the antenna types supported, refer to the *SmartRadar FlexLine Service Manual*.

4.2 Mounting Dimensions

NOTE: This section will be updated when the mounting dimensions for the WFI is finalized.

