

## Input Universal Function Module-102

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# Introduction

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## *Description*

The Input Universal (IUN) Function Module-102, like the IUN101 it replaces, is an interface between field devices and either the DCM or the XM. The IUN Function Module:

- provides a current limiting device to protect the base frame
- accommodates 2-wire and 4-wire RTD (Resistive Temperature Device) inputs, voltage inputs, current inputs, and binary inputs—all by means of jumper selections
- does not require software calibration of typical 2-wire 1000 ohm RTD input applications

The IUN Function Module plugs into any of the top ten slots associated with the DCM. Figure 1 shows typical function module locations in the NCU. A five-slot panel is pictured.

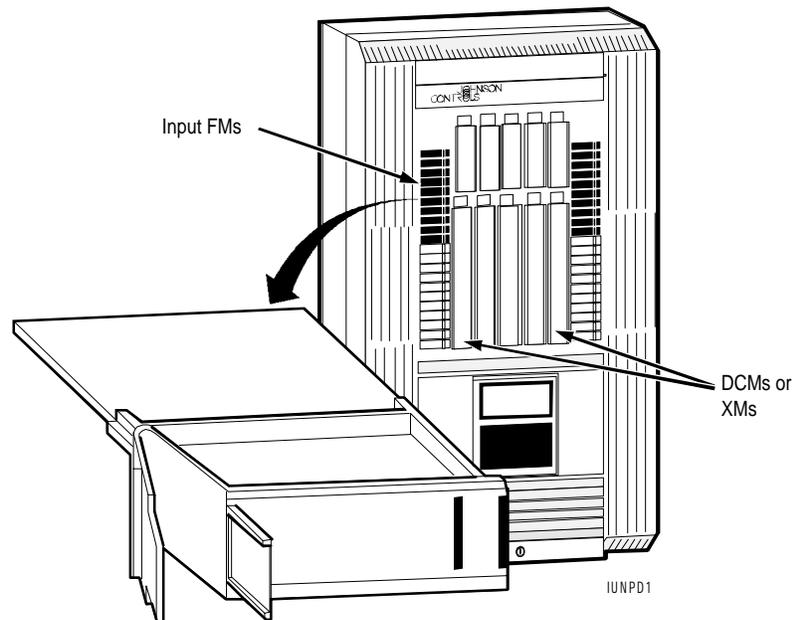


Figure 1: IUN Function Module Locations

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**Application**

The IUN Function Module is typically used to:

- connect the DCM to a 2-wire or 4-wire platinum or nickel RTD (Resistive Temperature Device)
- connect the DCM to an analog current device
- connect the DCM to an analog voltage device
- condition two binary inputs for XMs
- connect the DCM to a binary input (dry contact only)

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**Capabilities**

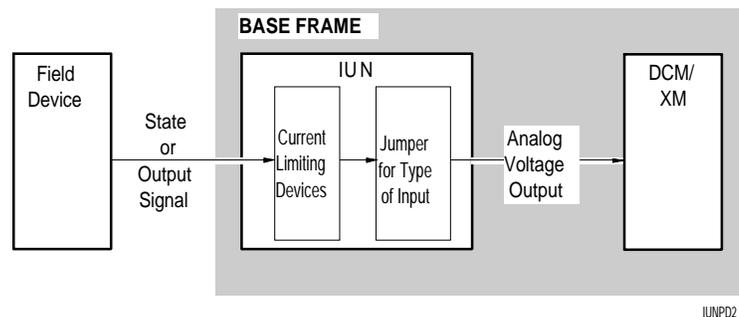
**Table 1: IUN102 Capabilities**

Capability	Description	Purpose
Input from Field	Field device inputs can be any of a variety of current, voltage, resistance, or binary state signals.	Provides simple interface of field signals to the DCM or to the XM.
Two Jumper Selections	Two jumper selections configure the IUN for the type of input signal.	Configures easily for different input types.
Output to DCM	Module outputs DC voltage according to input level.	Provides direct, plug-in connection to the DCM.
Output to XM	Module output type (binary state) matches input type.	Provides direct, plug-in connection to the XM.

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**Theory of Operation**

Figure 2 is a simplified function diagram of the Input Universal (IUN) Function Module.



**Figure 2: IUN Function Diagram**

The process is:

- A field device inputs signals to the IUN.
- The IUN routes the input signal to the DCM or XM and protects the base frame via current limiting devices.
- Jumpers on the IUN select different input types.

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**Specifications****Table 2: IUN Function Module Specifications**

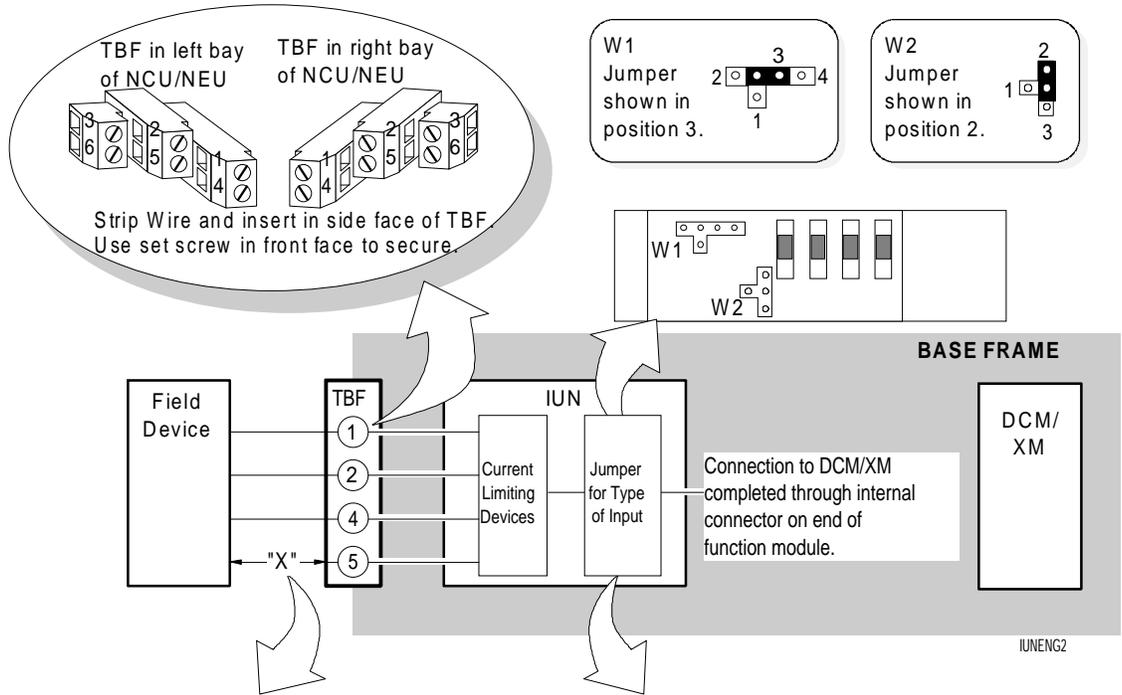
<b>Category</b>	<b>Specifications For Configurations</b>
<b>Product Code Number</b>	FM-IUN102
<b>Input Limits</b>	Maximum input voltage with XM: 120 VDC or RMS (non-destructive) Maximum input voltage with DCM: 50V
<b>Input Protection</b>	Protects against misapplication of 110 VAC with a non-field replaceable, current limiting device.
<b>Source Power</b>	Power is from the DCM and NCU/NEU.
<b>Operating Environmental Requirements</b>	32 to 122°F (0 to 50°C) 10 to 90% noncondensing relative humidity 86°F (30°C) maximum dew point
<b>Storage/Shipping Environmental Requirements</b>	-40 to 158°F (-40 to 70°C) 5 to 95% noncondensing relative humidity 86°F (30°C) maximum dew point
<b>Size</b>	0.85 in. H x 2.8 in. W x 6.0 in. L (2.2 cm H x 7.1 cm W x 15.2 cm L)
<b>Weight</b>	0.5 lb. (0.22 kg)
<b>Agency Compliance</b>	FCC Part 15—Class A, UL 916, CSA C22.2 No. 205
<b>Agency Listings</b>	UL Listed and CSA Certified as part of Metasys®



# Installation

## Typical Connections

Figure 3 diagrams typical connections for IUN applications.



Application	Distance "X"	TBF Terminals				Jumper	
		1	2	4	5	W1	W2
2-wire RTD	250 ft max. 18 AWG twisted pair	X	X			3	2
4-wire RTD	250 ft max. 24 AWG telephone cable (2 twisted pairs, unspliced run)	X	X	X	X	4	1
Voltage: 0 to 10 volt DC	250 ft max. 18 AWG twisted pair	X	X	X		1	1
Differential Voltage	250 ft max. 18 AWG twisted pair	X	X			4	1
3-wire Transducer	250 ft max. 18 AWG twisted pair	X	X	X		2	1
Potentiometer	250 ft max. 18 AWG twisted pair	X	X	X		1	1
Current: Remote Source	250 ft max. 18 AWG twisted pair	X	X			4	3
True 2-wire Current	See Note 1	X		X		2	3
Contacts	250 ft max. 18 AWG twisted pair	X	X			3	2
XM Inputs	250 ft max. 18 AWG twisted pair	X	X	X	X	4	1

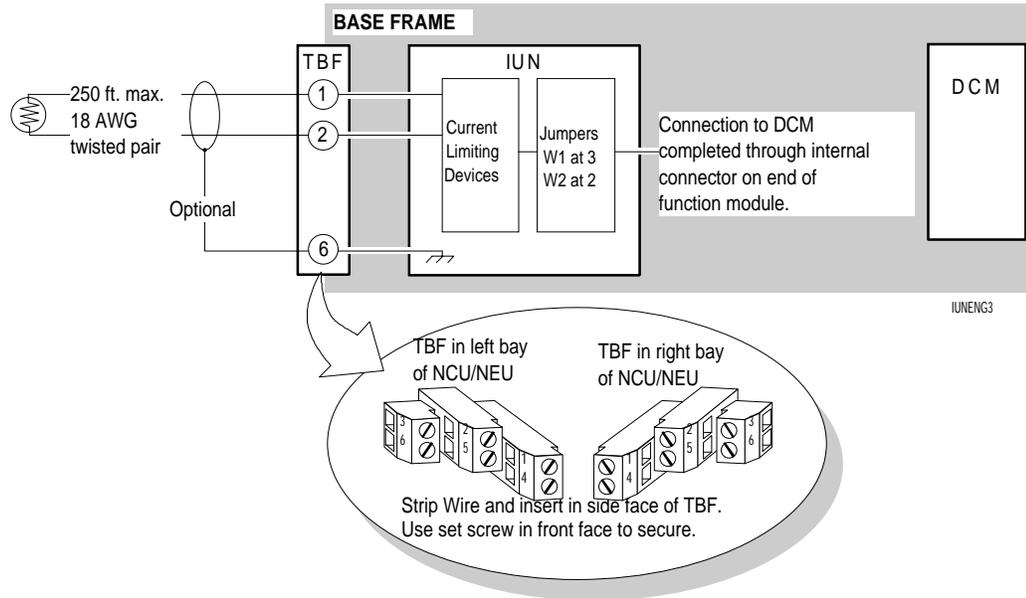
Note 1: Use field device literature to determine max. wiring resistance, given that:

- Source is 25V.
- IUN impedance is 499 ohms.

Figure 3: Connections for Typical IUN Applications

**2-Wire RTD**

Figure 4 diagrams typical connections for 2-wire RTD applications.



**Figure 4: Connections for 2-Wire RTD Applications**

**4-Wire RTD**

Figure 5 diagrams typical connections for 4-wire RTD applications.

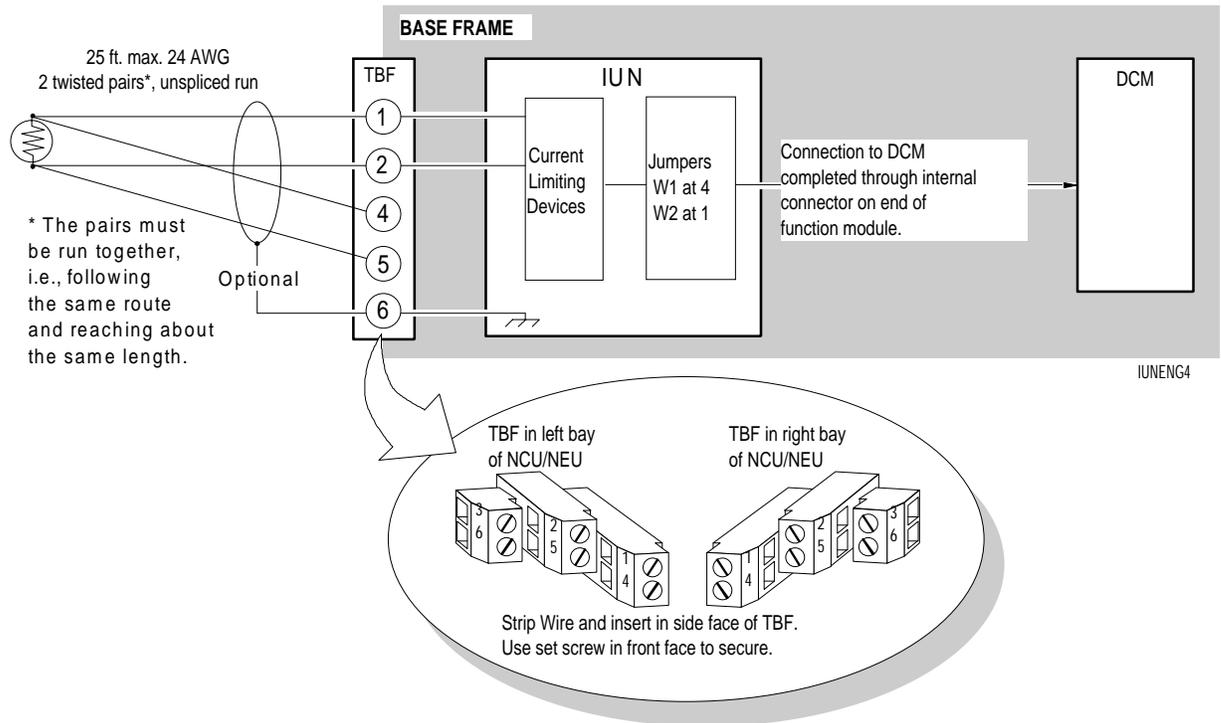


Figure 5: Connections for 4-Wire RTD Applications

## 10V Voltage

Figure 6 diagrams typical connections for IUN applications with field devices having a 0 to 10 volt signal.

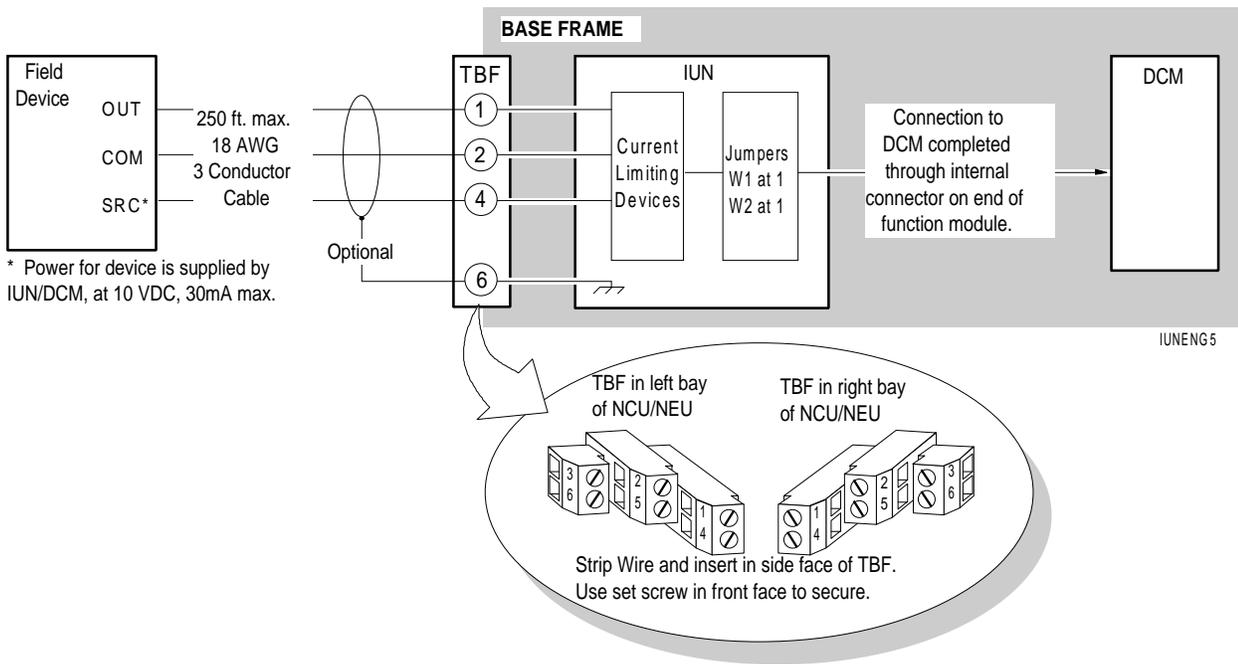
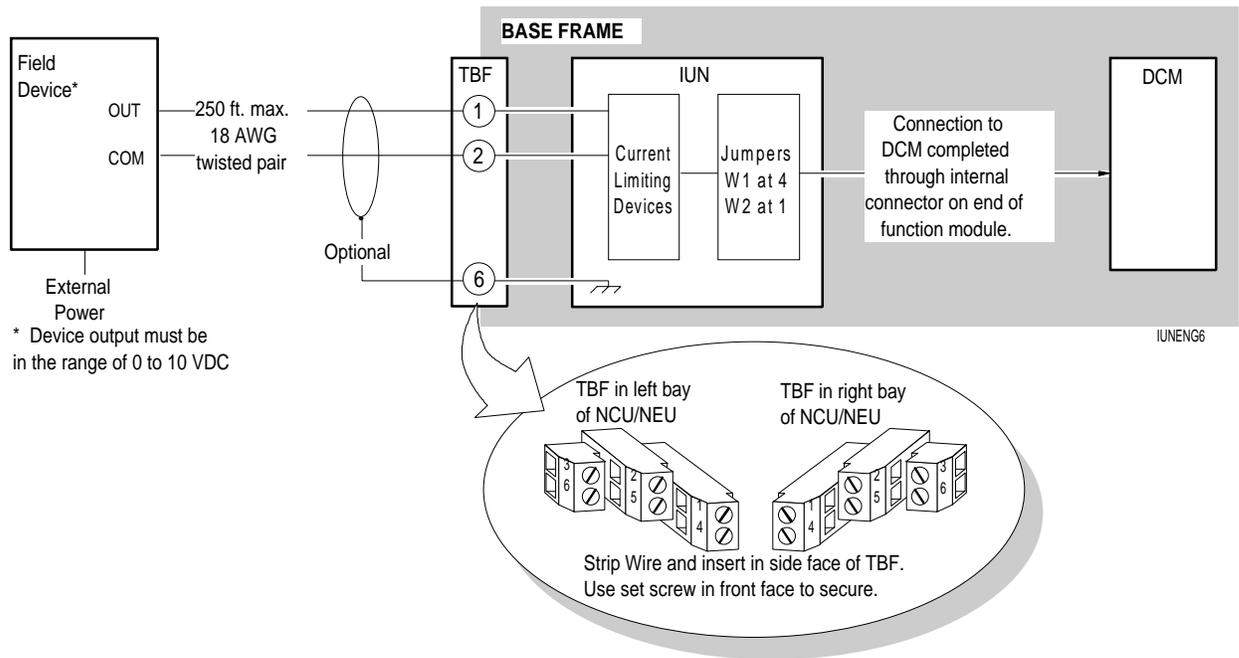


Figure 6: Connections for 10V Voltage Applications

**Differential Voltage**

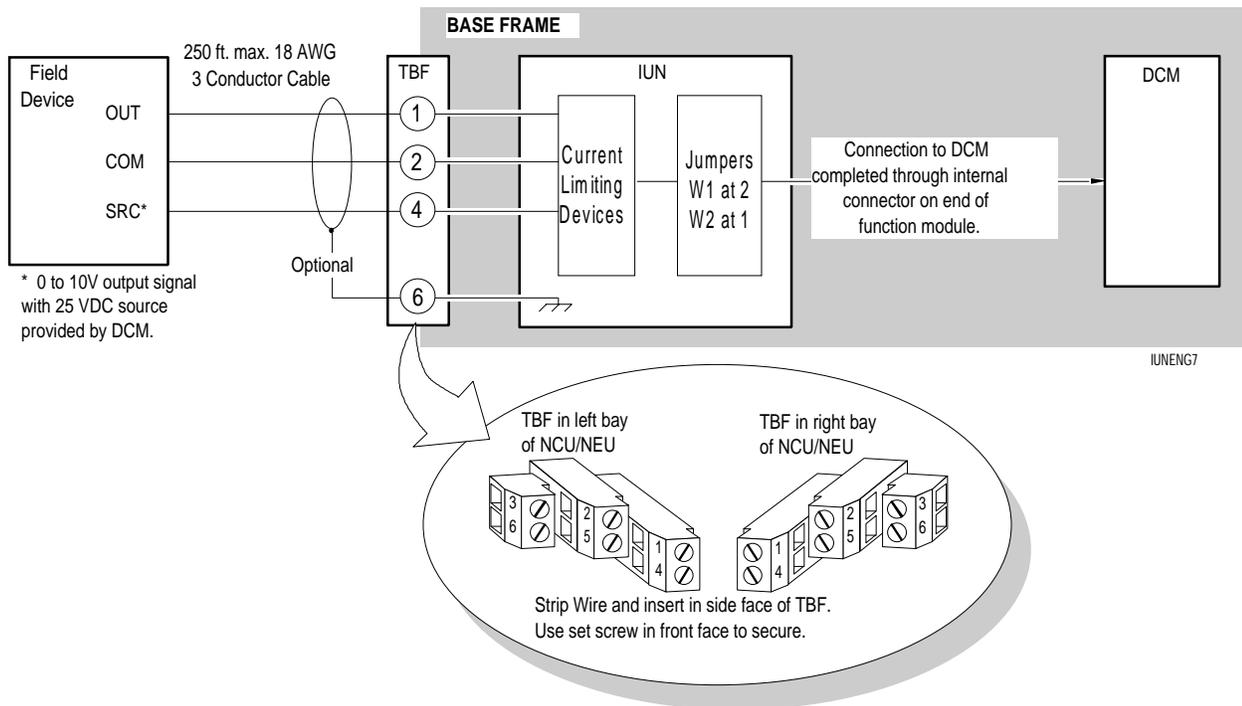
Figure 7 diagrams typical connections for differential voltage applications.



**Figure 7: Connections for Differential Voltage Applications**

**3-Wire Transducer**  
(25 VDC Supply)

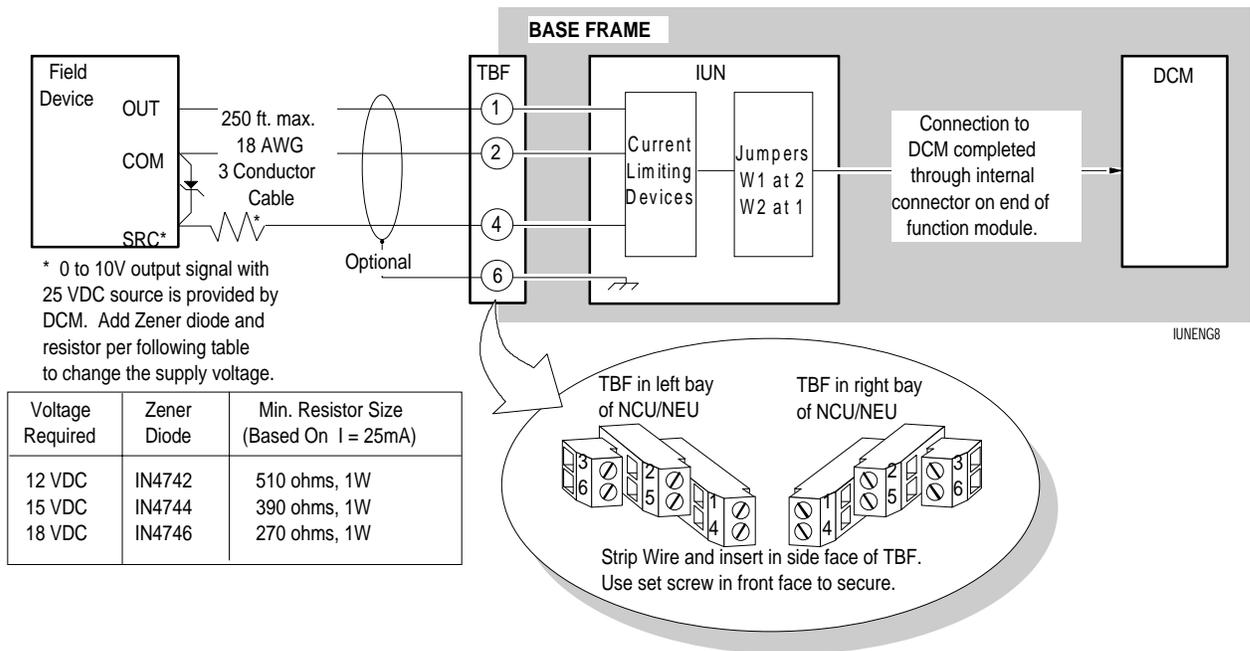
Figure 8 diagrams typical connections for 3-wire transducer applications, where the transducer uses a 25 VDC supply.



**Figure 8: Connections for 3-Wire Transducer Applications (25 VDC)**

**3-Wire Transducer**  
(12, 15, or 18 VDC)

Figure 9 diagrams typical connections for 3-wire transducer applications, where the transducer uses a 12, 15, or 18 VDC supply.



**Figure 9: Connections for 3-Wire Transducer Applications (12, 15, or 18 VDC)**

**Potentiometer**

Figure 10 diagrams typical connections for potentiometer applications.

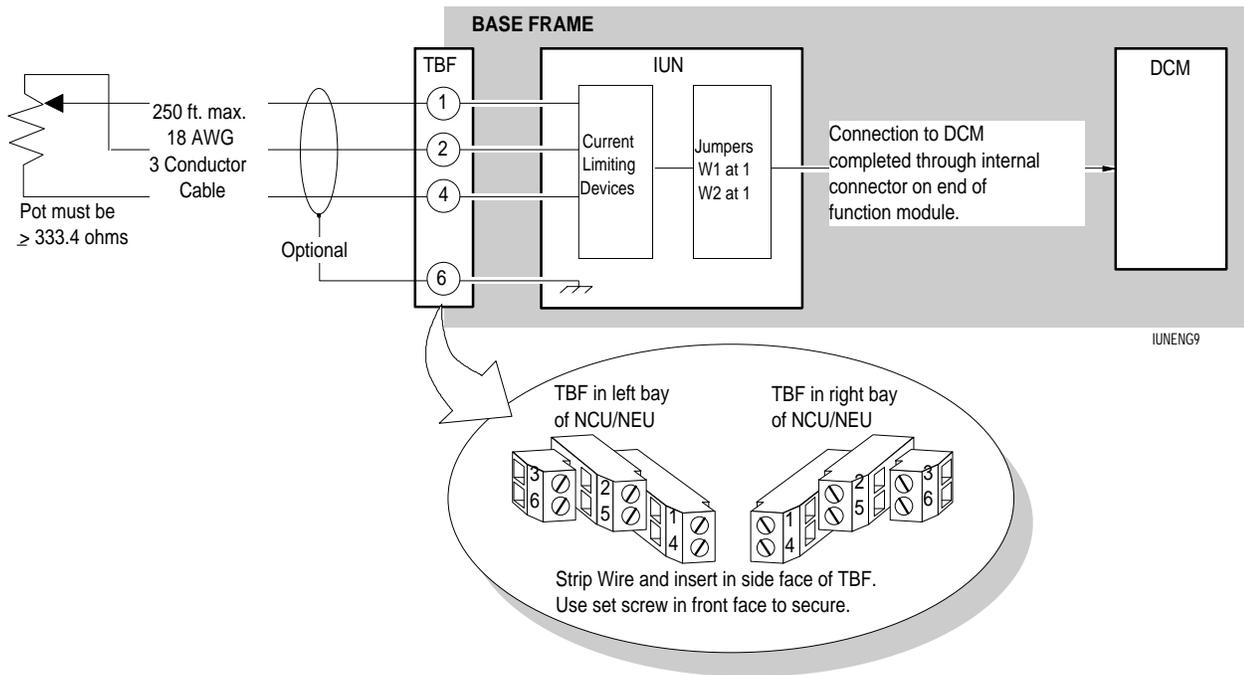


Figure 10: Connections for Potentiometer Applications

**Current Remote**

Figure 11 diagrams typical connections for remote source current device applications.

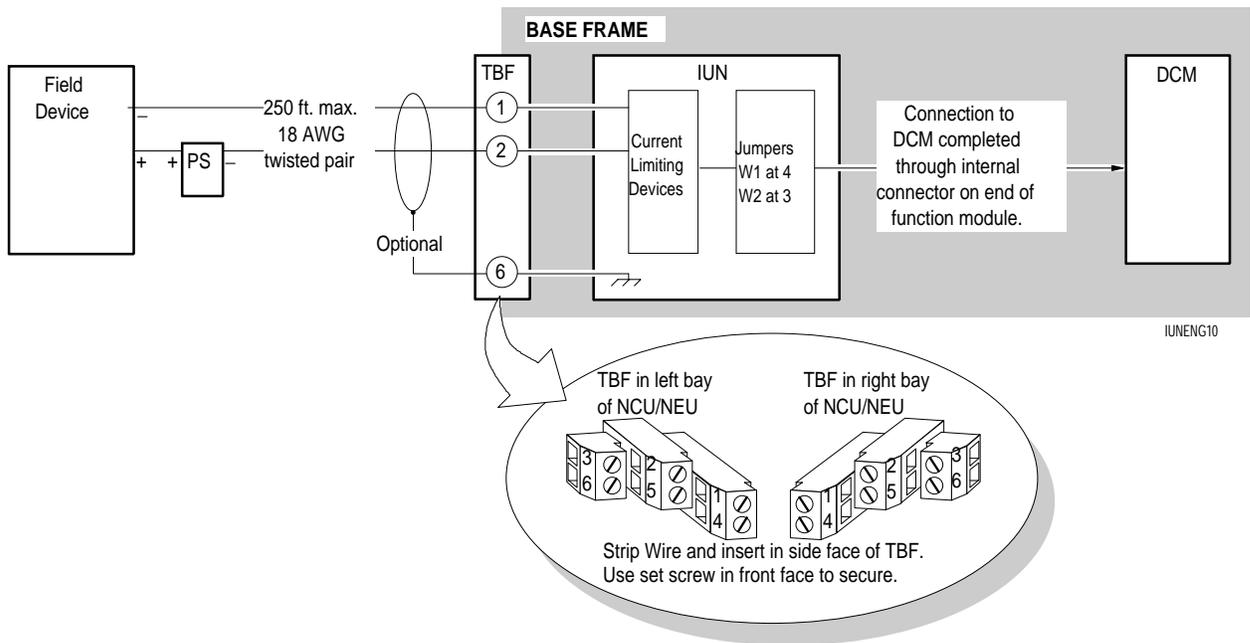
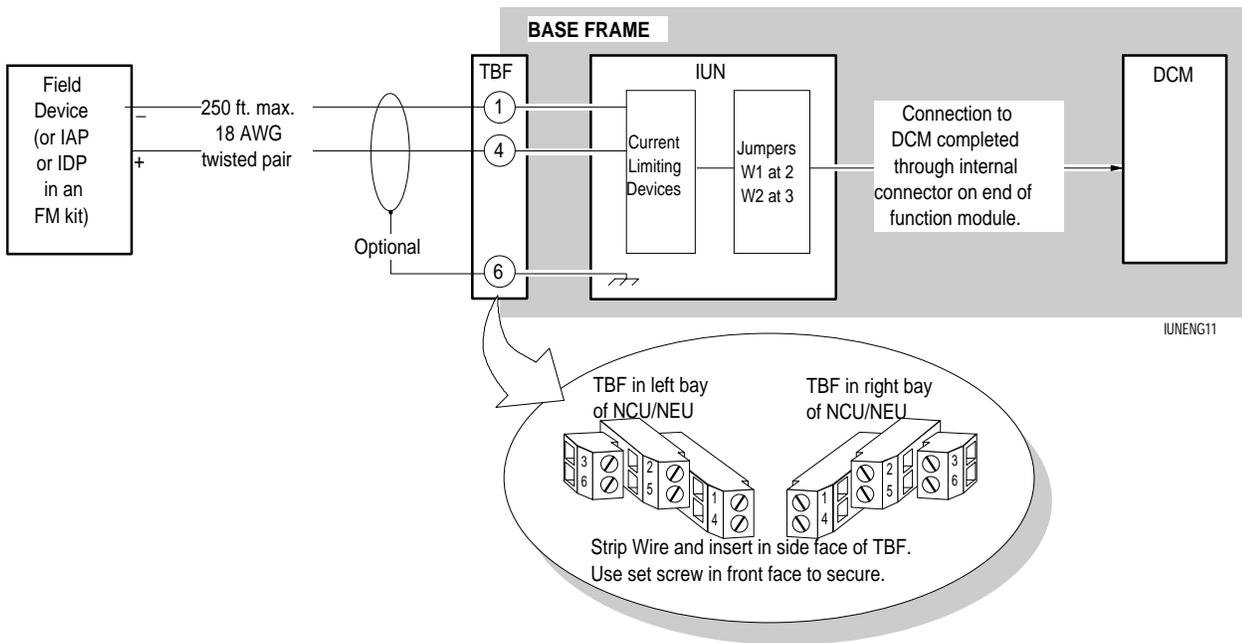


Figure 11: Connections for Remote Current Applications

**True 2-Wire**

Figure 12 diagrams typical connections for true 2-wire current applications and for remotely mounted IAP or IDP Function Module applications.



**Figure 12: Connections for True 2-Wire Current Applications**

**Contact**

Figure 13 diagrams connections for contact applications.

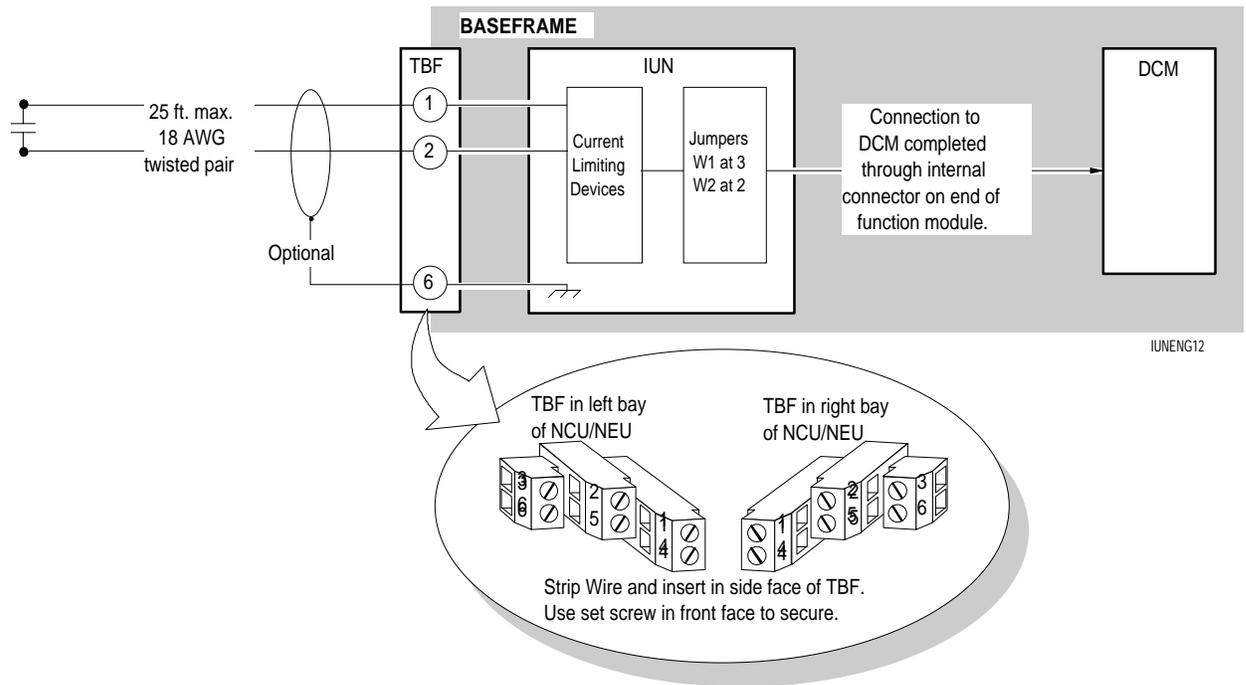
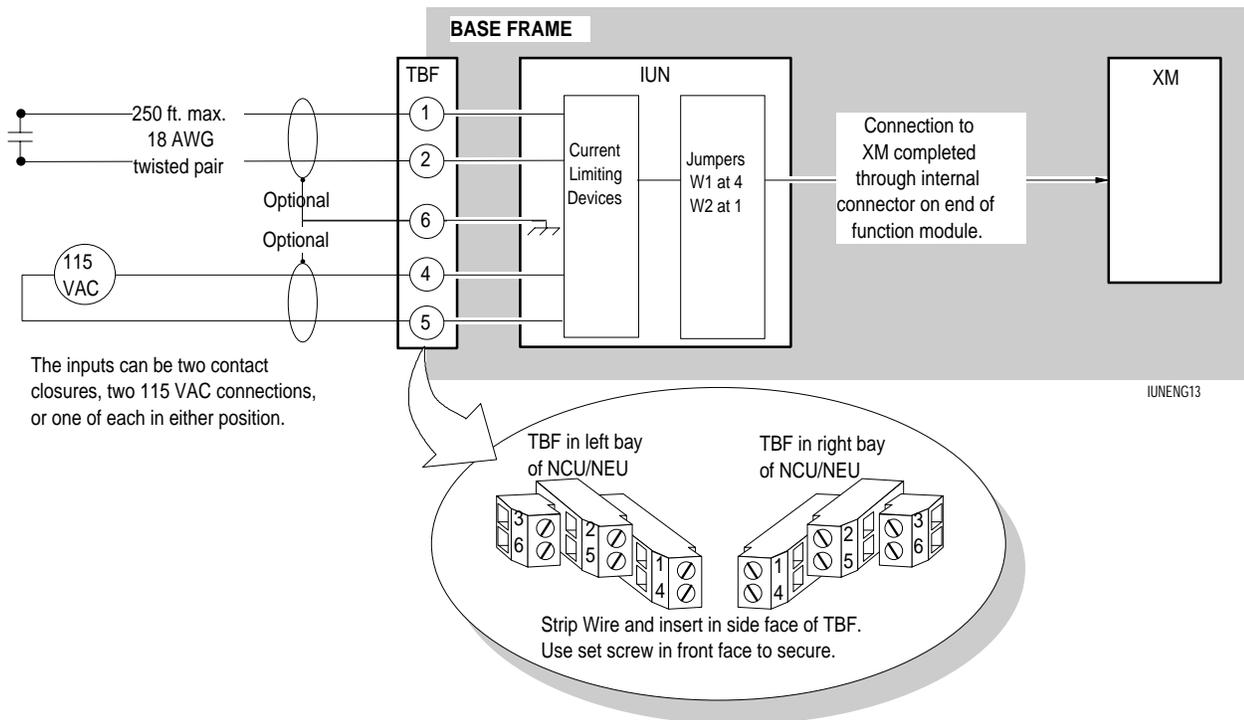


Figure 13: Connections for Contact Applications

**XM Inputs**

Figure 14 diagrams connections for XM applications. In these applications, each FM-IUN101-0 will connect two binary inputs.



**Figure 14: Connection for 2 Binary Inputs Going to an XM**

# Commissioning Procedures

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To commission an IUN Function Module, first install it, then verify performance via software. The software verification procedure depends on whether the IUN connects to a Digital Control Module (DCM) or a Point Multiplex Module (XM). Both procedures are described in this document.

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## ***Physical Installation***

The following procedure for the physical installation of the Input Universal (IUN) Function Module assumes:

- Panel (NCU or NEU) is installed.
- Connections to field devices are complete.
- You have engineering drawings defining details for the installation.
- You are familiar with Metasys Network terminology, and the location and operation of power switches.

## **Procedure**

In general, when installing and connecting function modules:

- follow NEC and local codes
- observe maximums as specified in the specification table and in these installation guidelines

For each IUN Function Module in the network, perform the following steps.

1. Set jumpers W1 and W2 on the IUN as specified in the engineering drawings. See the *Installation* section for an explanation.
2. Refer to the engineering drawings, and identify the proper panel and slot number location for this module.
3. Insert the module in the appropriate slot by plugging it into the base frame with your fingers. (Described in the *NCU/NEU Technical Bulletin*.)

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**Software  
Verification**

The following procedure for the software verification of the IUN Function Module assumes:

- Physical installation at the NCU/NEU panel is complete, including the electronic modules and all wiring connections.
- The operating software for the network has been downloaded to the NCM controlling the panel.
- You have an Operator Workstation available.

**Procedure for DCM  
Applications**

For each IUN Function Module associated with a DCM on the network, perform the following steps.

1. Select the System summary that includes this IUN object.
2. Verify that the point object defined in the System summary, the function module, and the field device are connected as defined by the engineering drawing. Correct if necessary.
3. Verify that the object's Value attribute (as seen in the summary) matches the actual value for the field device. Calibrate if necessary.
4. If calibration is required, adjust Linearization Parameter 1 up or down as appropriate:
  - a. Using the Focus window, adjust Linearization Parameter 1 for proper calibration.
  - b. Enter the new linearization parameter setting in the DDL or GPL source file.

**Procedure for XM  
Applications**

For each IUN Function Module associated with an XM in the network, perform the following steps.

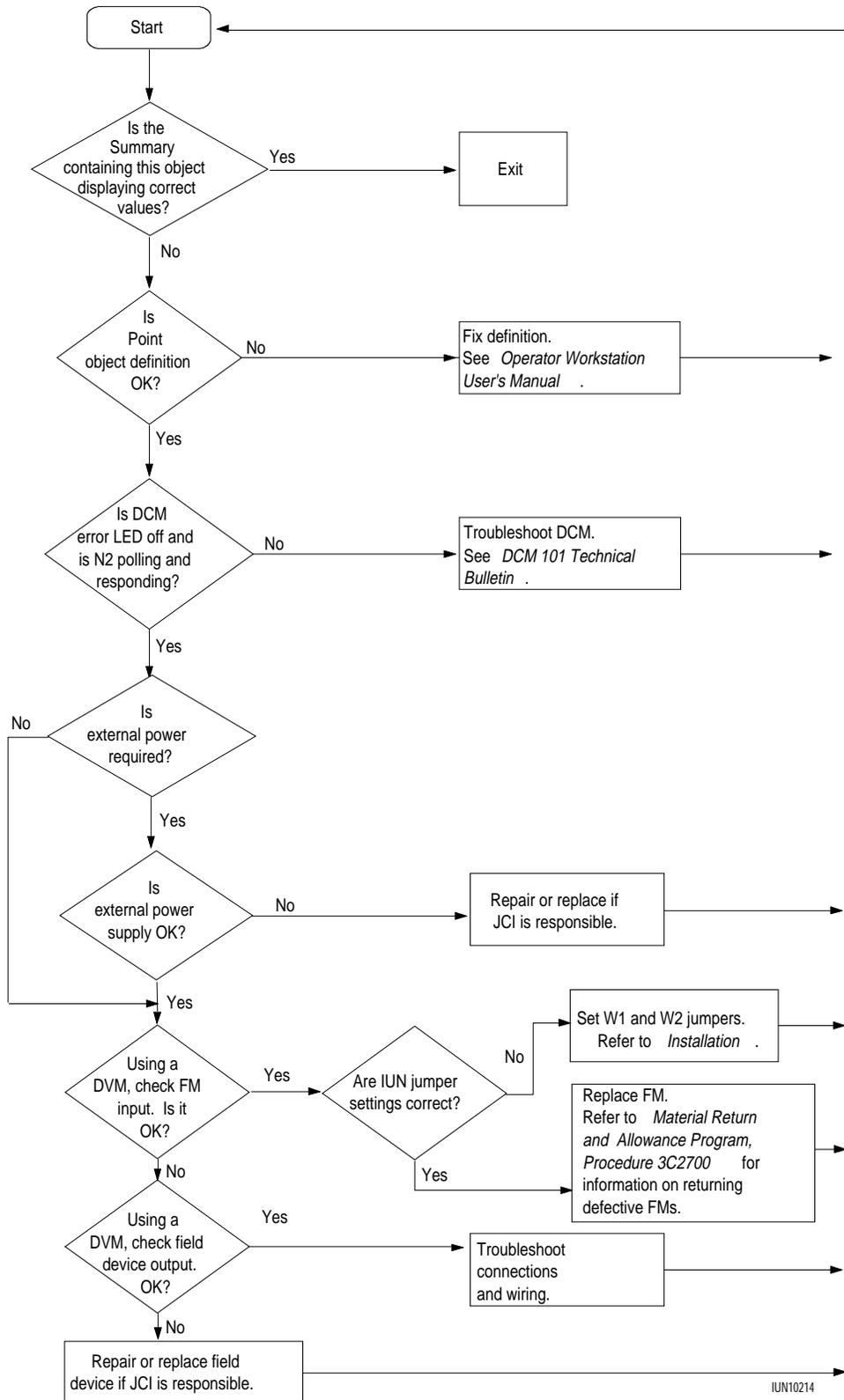
1. Select the System summary that includes this IUN object.
2. Verify that the point object defined in the System summary, the function module, and the field devices are connected as defined by the engineering drawing. Correct if necessary.
3. Verify that the object's Value attribute (as seen in the summary) matches the actual value for the field device.
4. Change state of field device, and verify that the IUN object's Value attributes change accordingly.

# Troubleshooting Procedures

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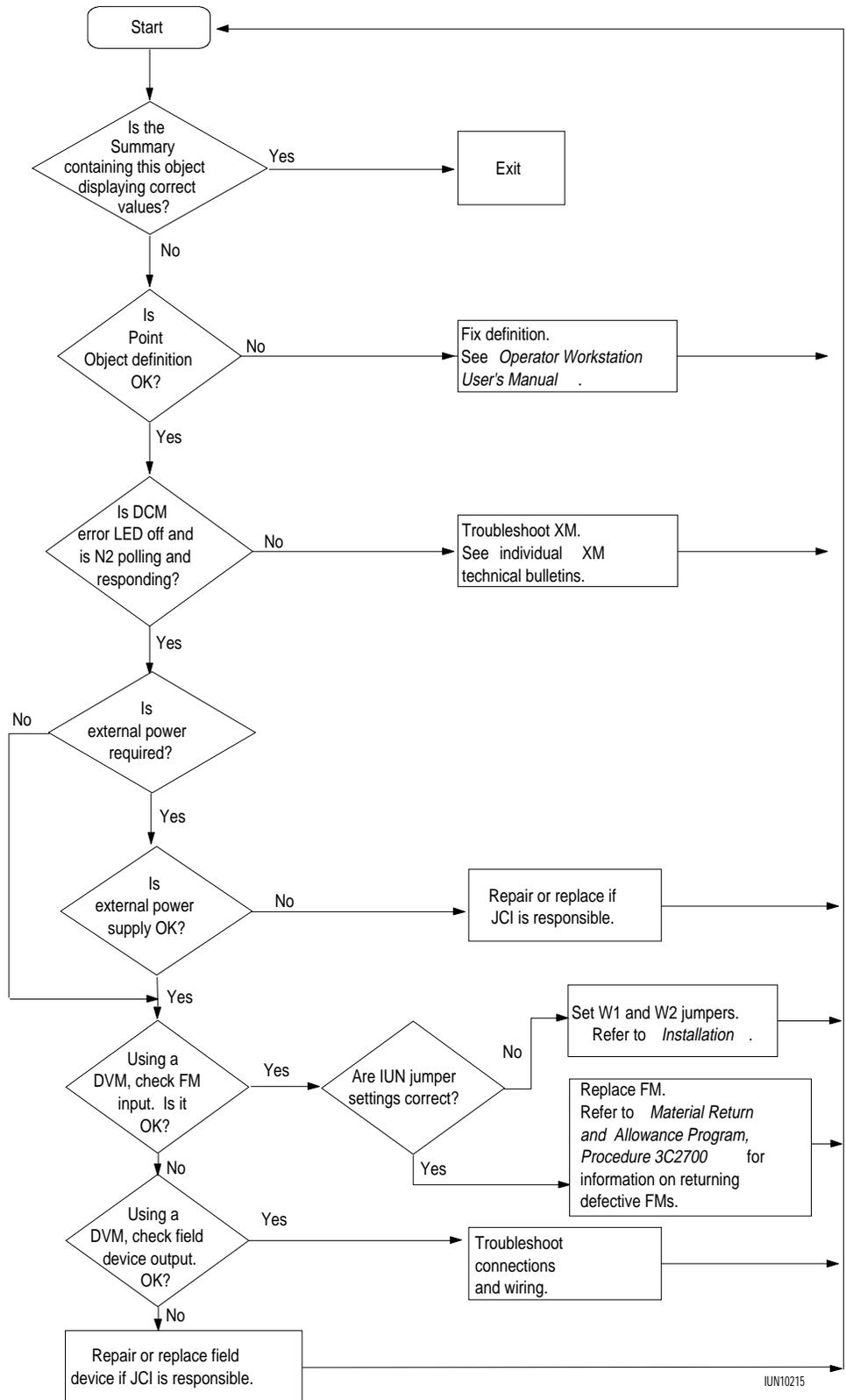
Figure 15 (next page) troubleshoots DCM applications, applying to failures between point objects and field devices connected through the IUN

Figure 16 troubleshoots XM applications, applying to failures between point objects and field devices connected through the IUN.



IUN10214

**Figure 15: IUN Troubleshooting—DCM Applications**



IUN10215

Figure 16: IUN Troubleshooting—XM Applications

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**Ordering  
Information**

**Table 3: Ordering Information**

Description	Product Code Number
IUN Function Module	FM-IUN102-0



**Controls Group**  
507 E. Michigan Street  
P.O. Box 423  
Milwaukee, WI 53201

**FAN 636**  
Metasys Network Technical Manual  
Revision Date 0793  
Printed in U.S.A.