Installation Instructions

ControlNet Modular Repeater Dual Copper Module

Catalog Number 1786-RPCD

This document describes how to install and apply the 1786-RPCD dual copper repeater module.

Topic:	Page:
Important User Information	2
Rockwell Automation Support	4
European Communities (EC) Directive Compliance	5
About the Dual Copper Repeater Module	6
Mount the Dual Copper Repeater Module	7
Utilize Trunk Line Terminators	10
Remove the Module from the DIN Rail	11
Wire the Dual Copper Repeater Module	12
Series Topology	14
Star Topology	15
Trunk Extender Topology	16
Hub/Star Topology	17
Slip-ring Isolation Topology	18
Constraints of the COAX Segment	19
Status Indicators	20
Related Publications	21
Mount Dimensions	21
CSA Hazardous Location Approval	22
Specifications	24

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About the Dual Copper Repeater Module

Use this copper repeater module when the:

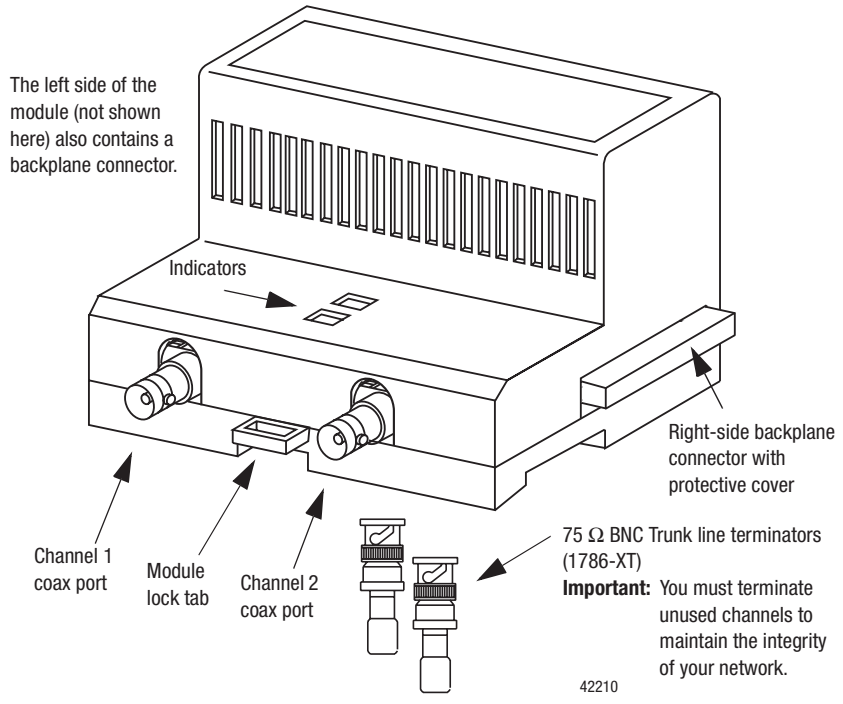
- design of the network requires a hub based topology
- segment requires a greater copper distance
- design requires a isolated segment

The copper repeater module allows multiple 1000m copper segments with up to five repeaters in a series. You can communicate to any two nodes through a maximum of 5 repeaters. See pages 16-19 for topology examples and segment length constraints.

The module provides two copper channels and activity LED indicators for each channel.

The figure below identifies the components of the module:

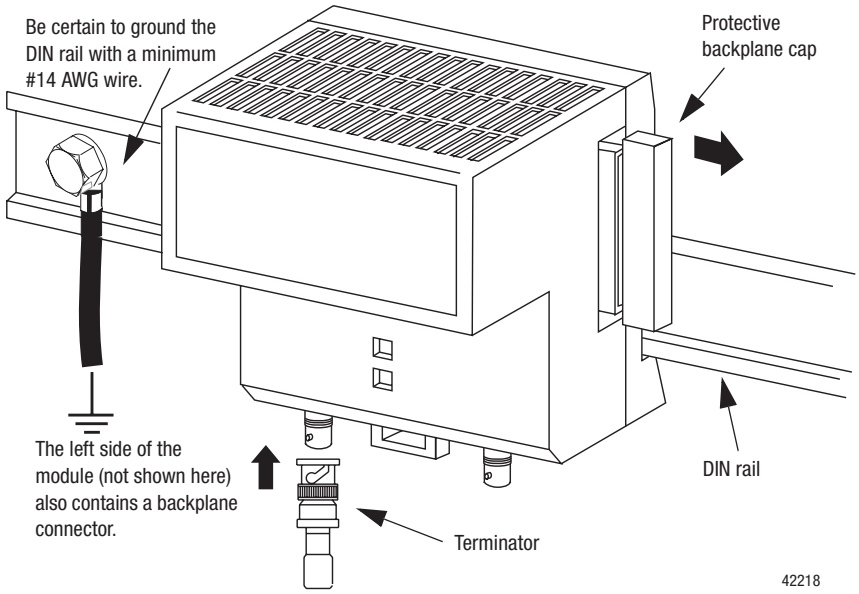
Figure 1 The 1786-RPCD Dual Copper Module



Utilize Trunk Line Terminators

When you are not going to connect a trunk line to a channel on the 1786-RPCD repeater module, connect a 75 Ω trunk line terminator (1786-XT) to maintain the integrity of your network.

Figure 2 Trunk Line Terminators



If:	Then:
you are not going to use a channel	keep the terminator on an unused channel for optimal network performance
you connect another repeater module or repeater adapter to the right backplane connector	remove the protective backplane cap and save the cap for future use
you are not going to connect a module to the right backplane connector	leave the backplane cap attached
the module is in the right-most position	attach a DIN rail latch

Wire the Dual Copper Repeater Module

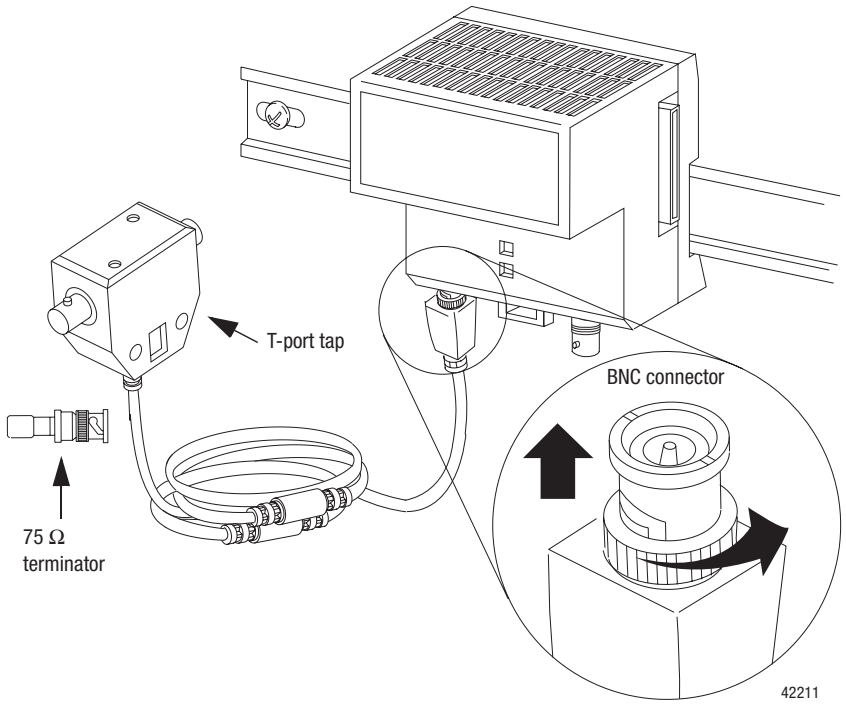
If you only need to wire one channel, you can use either channel 1 or channel 2.

To wire the module for channel 1:

1. Connect the copper to port #1.

   a. Align the knob of the BNC cable connector with the locks of the BNC module connector, and insert the connector into channel 1.

Figure 3 Wire the copper repeater module

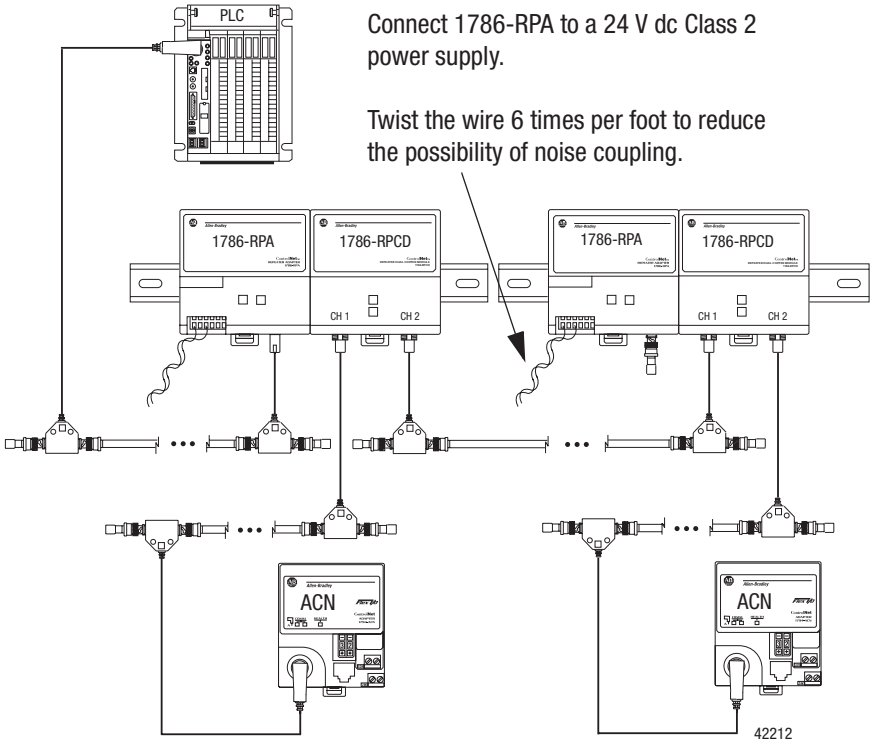


   b. Twist the BNC connector until the bayonet lug is locked into place.

2. To connect channel 2, repeat Step 1.

Series Topology

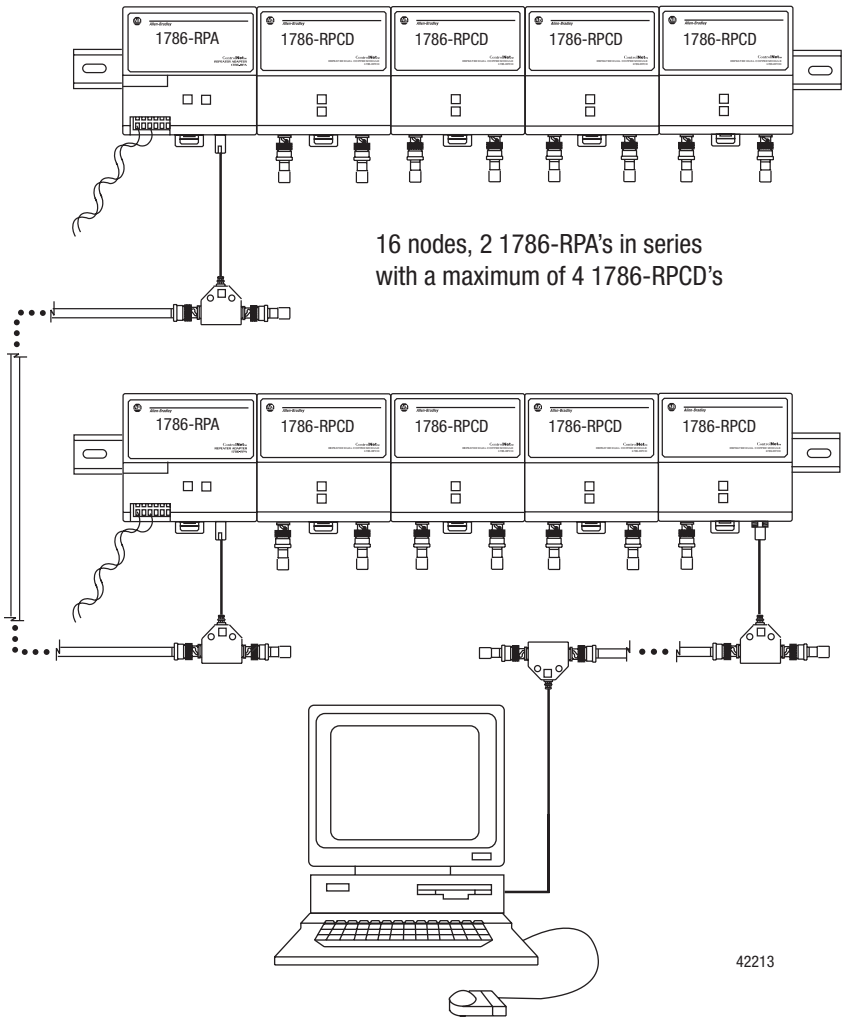
Figure 4 The 1786-RPCD's in a series topology



Star Topology

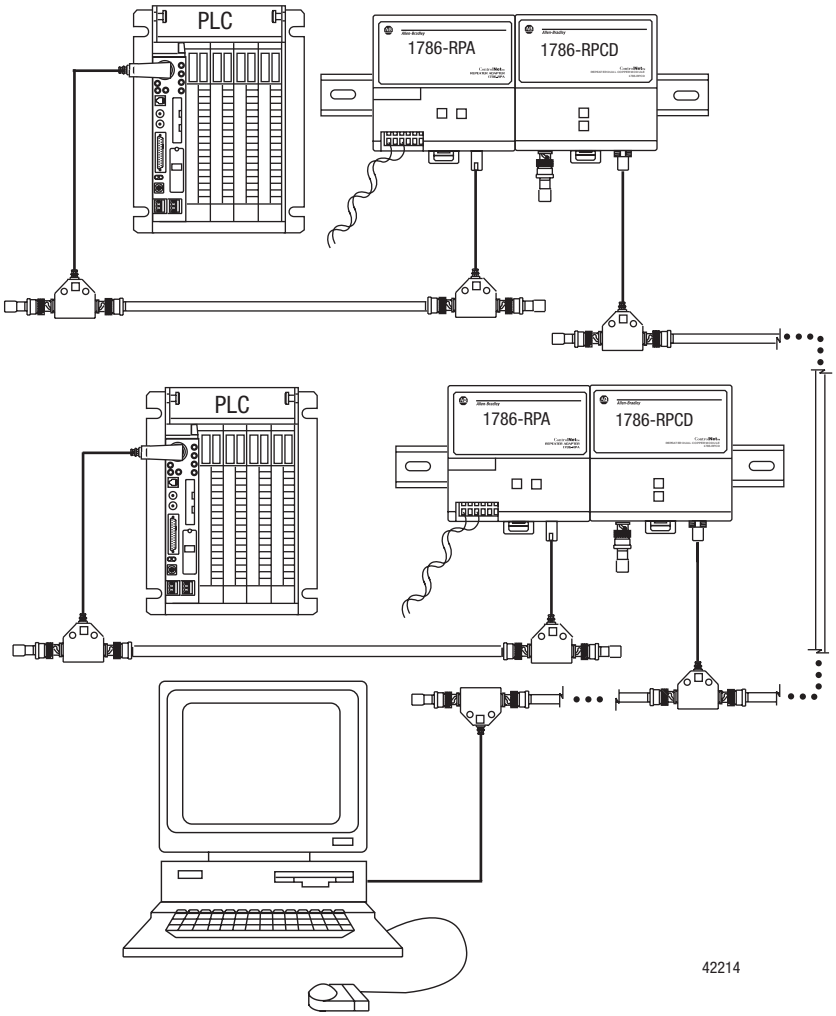
Figure 5 illustrates a star configuration offering a 16 port hub topology.

Figure 5 The 1786-RPCD's in a star configuration



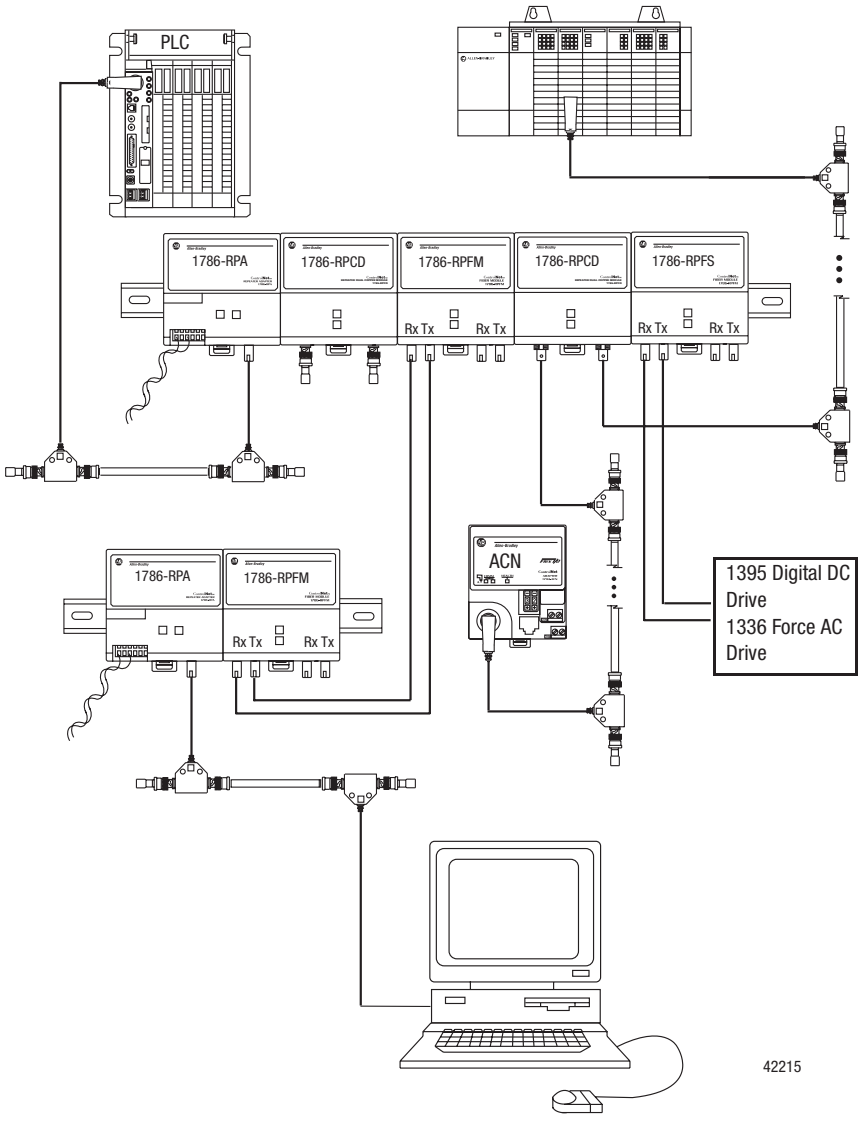
Trunk Extender Topology

Figure 6 Trunk Extender Topology



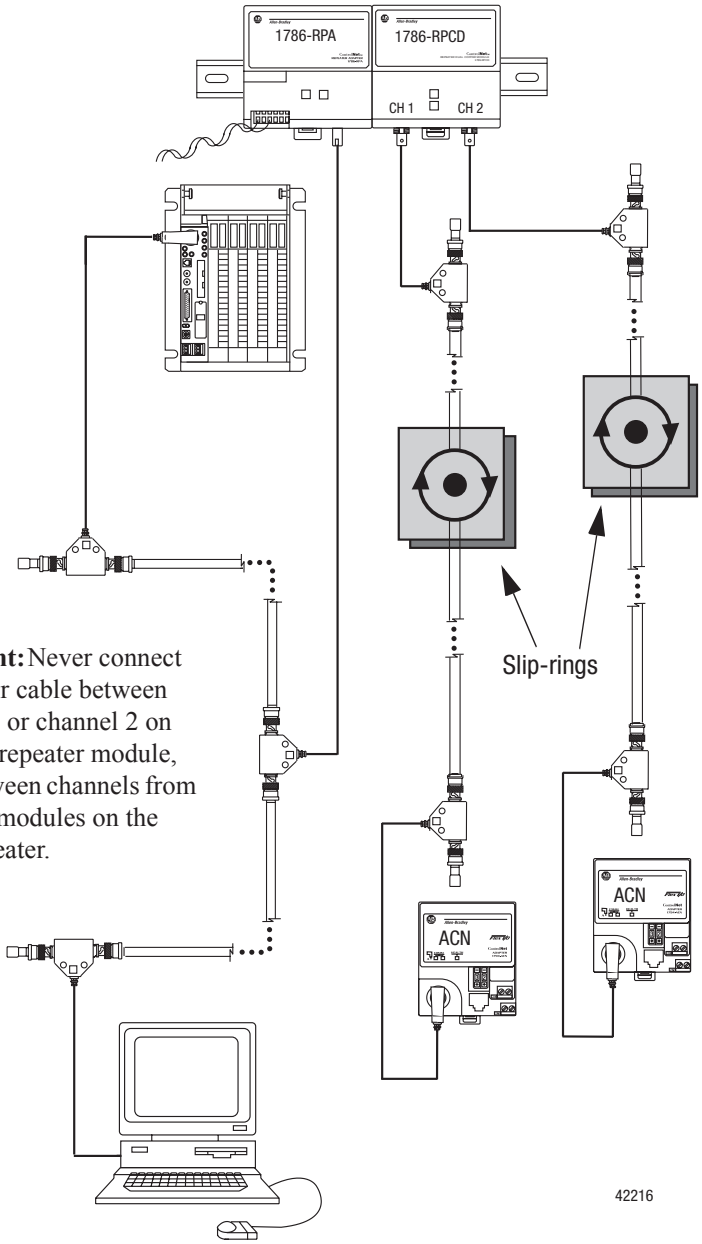
Hub/Star Topology

Figure 7 Hub/Star Topology



Slip-ring Isolation Topology

Figure 8 Slip-ring Isolation Topology

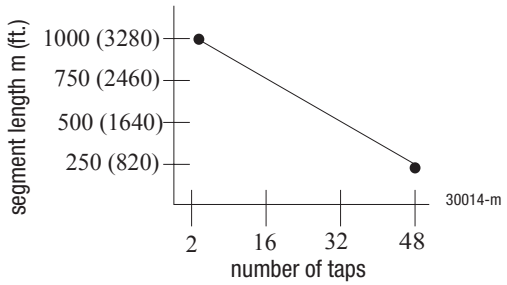


Important: Never connect the copper cable between channel 1 or channel 2 on the same repeater module, even between channels from different modules on the same repeater.

Constraints of the COAX Segment

The total allowable length of a segment that contains standard RG-6 quad shield coaxial cable depends upon the **number of taps** in your segment. There is **no minimum** trunk-cable section length requirement. The maximum allowable total length of a segment is 1000m (3280ft) with two taps connected. Each additional tap decreases the maximum length of the segment by 16.3m (53ft). The maximum number of taps allowed on a segment is 48 with a maximum length of 250m (820ft).

Figure 9 Maximum Segment Length



maximum allowable segment length =
1000m (3280ft) - 16.3m (53.4ft) X [number of taps - 2]

COAX Segment Constraint Example

If your segment requires 10 taps, the maximum segment length is:

1000m (3280ft) - 16.3m (53.4ft) x [10 - 2]
1000m (3280ft) - 130.4m (427.7ft)) = **869.6m (2852.3ft)**

If you install a repeater, you can increase the total trunk-cable length or number of taps. When you install a repeater you create another segment.

The amount of high-flex RG-6 cable (1786-RG6F) you can use in a system is less than the amount of standard RG-6 cable, so you should keep high-flex cable use to a minimum. Use BNC bullet connectors to

isolate areas that require high-flex RG-6 cable from areas that require standard RG-6 cable; this allows the high-flex RG-6 section to be replaced before flexture life is exceeded.

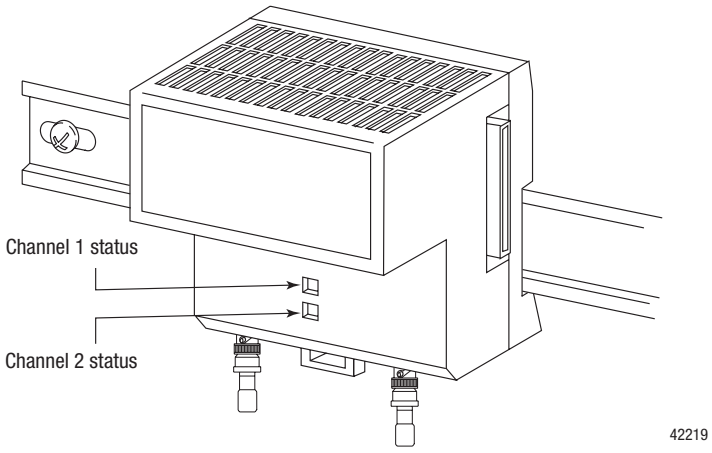
Use this example when the attenuation of the cable (1786-RG6F High Flex) is: 10MH > 5.99dB/1000'

trunk length = 20.29 (# of taps *.32/ COAX attenuation)

For more information on the installation of a coax segment, see the ControlNet Coax Media Planning and Installation Manual, publication CNET-IN002A-US-P.

Status Indicators

The figure below identifies indicators on the module:



The table below defines Channel 1 and Channel 2 status indications:

Status Indicator:	Probable Cause:
Off	No power or module faulted
Green	Channel operational
Flashing Green/Off	No data activity on associated channel

Related Publications

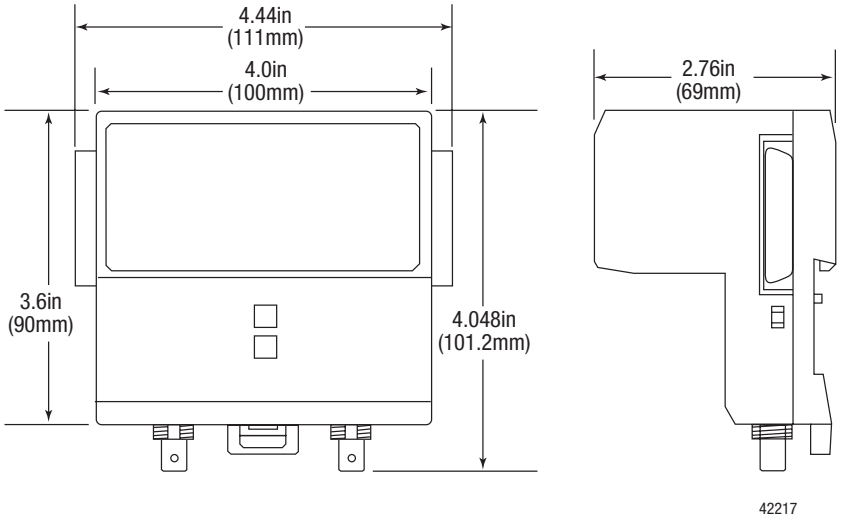
The table below lists publications that you may want to refer to for additional information:

Publication:	Publication Number:
Industrial Automation Wiring and Grounding Guidelines	1770-4.1
ControlNet Coax Tap Installation Instructions	1786-5.7
ControlNet Coax Media Planning and Installation Manual	CNET-IN002A-US-P
ControlNet Cable System Component List	AG-2.2

Mount Dimensions

The figure below provides the mount dimensions for the module.

Figure 10 The 1786-RPCD Mount Dimensions



Specifications

The table below provides specifications for the module:

Specifications	
Communication Rate	5M bits/s
Indicators	Channel 1 Status - Green Channel 2 Status - Green
Backplane Power Requirements	400 mA @ 5 V dc Class 2 from 1786-RPA
Environmental Conditions	
Operating temperature	0 to 60° C (32 to 140° F)
Storage temperature	-40 to 85° C (-40 to 185° F)
Relative humidity	5 to 95% without condensation
Shock operating width	30 g peak acceleration, 11(+-1)ms pulse
Non-operating width	50 g peak acceleration, 11(+-1)ms pulse
Vibration	Tested 5 g @ 10-500Hz per IEC 68-2-6
Copper Type	62.5/125 micron
Standard Quad RG6 Cable	
Rockwell Automation	1786-RG6
Belden	3092A
Comm/Scope	5060

Specifications	
Communication Rate	5M bits/s
High Flex RG6 Cable	
Rockwell Automation	1786-RG6F/A and 1786-RG6F/B
Belden	YR28890
Comm/Scope	5060F
Agency Certification (when product or package marked)	Listed Industrial Control Equipment ® Certified Process Control Equipment ® Certified Class I, Division 2, Groups A, B, C, D Marked for all applicable directives Marked for all applicable acts N223