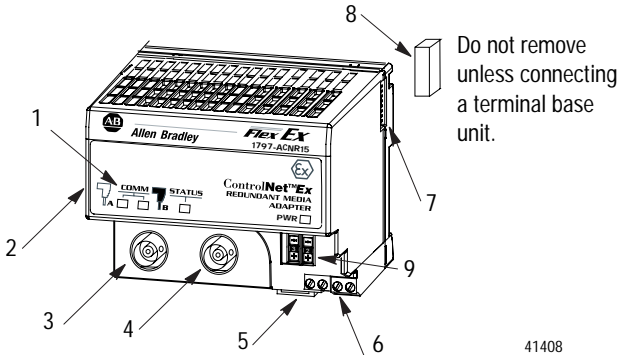




## Installation Instructions

# ControlNet Ex Redundant Media Adapter

(Cat. No. 1797-ACNR15/B)



41408

Use the redundant media adapter module to connect FLEX Ex™ modules to the ControlNet™ network.

### Component Identification

Component Identification	
1	Indicators
2	Label
3	ControlNet Ex tap drop BNC connector channel A with insulator boot
4	ControlNet Ex tap drop BNC connector channel B with insulator boot
5	Module locking tab
6	Removable power connectors
7	Backplane connector
8	Backplane connector cover
9	Node address push switch



## Describing the ControlNet Ex System Diagram

A maximum of 48 ControlNet Ex™ nodes may be connected together by coax cable and taps.

The fiber media of the 1797-RPFM can be installed in a hazardous location (Zone 0 and Zone 1) to connect two 1797-RPFM modules or they can be installed through different locations into the non-hazardous location to connect the 1797-RPFM with any approved associated apparatus.

All cables and fiber media that are not light blue must be marked as IS using the 1797-EXMK marking kit or other locally approved IS identification and/or segregation method.

During the installation of the ControlNet Ex system, all metallic parts must be isolated to prevent an earth connection (high voltage withstanding of isolating material must be > 500V ac).

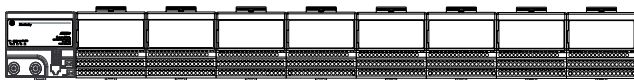
①= The entity concept allows interconnection of IS apparatus with associated apparatus not specially examined in combination as a system when the approved values of  $V_{oc}$  and  $I_{sc}$  for the associated apparatus are  $\leq V_{max}$  and  $I_{max}$  for the IS apparatus and the approved values of  $C_a$  and  $L_a$  for the associated apparatus are  $> C_i + C_{cable}$  and  $L_i + L_{cable}$  respectively for the IS apparatus.

②= Wiring methods must be in accordance with the National Electric Code, NFPA 70, Article 504 and ANSI/ISA-RP 12.6.

System Drawing Name	Catalog Number	Catalog Name	Description
1797-RPA	1797-RPA	ControlNet Ex Modular Repeater Adapter	Represents one ControlNet Ex node and must be connected to a coax trunk cable by 1797-TPx
1797-RPFM	1797-RPFM	ControlNet Ex Fiber Repeater Module, Medium Distance	Allows connection of a maximum of two devices per 1797-RPA and is powered directly by 1797-RPA

System Drawing Name	Catalog Number	Catalog Name	Description
1797-ACNR15/B	1797-ACNR15/B	Redundant Media ControlNet Ex Adapter	Represents one ControlNet Ex node and must be connected to a coax trunk cable by 1797-TPx -each one with two redundant output channels that are connected to different ControlNet Ex networks (coax cables and 1797-TPx)
CNet Ex Tap Trm	1797-TCAP	ControlNet Ex Tap (Dummy) Terminator	Represents one ControlNet Ex node and is a simple capacitor (56pF) with a coax connector
ControlNet Ex Tap	1797-TPx	ControlNet Ex Coax Tap	Four types of connections available: S (straight t-tap), R (right angle t-tap), YS (straight y-tap), and YR (right angle y-tap) - a maximum of 48 taps can be connected together by coax trunk cable
CNet Ex Trk Trm	1797-XT	ControlNet Ex Trunk Terminator	Simple resistor (75Ω) with coax connector that must be on each end of the ControlNet Ex coax trunk for termination
Coax Trunk Cable	1797-RG6	Quad-Shield, RG-6 75Ω Coax Trunk Cable	Maximum (functional) length between 2 1797-TPx is 3280ft (1000m) - each 1797-TPx reduces the (functional) coax cable length by 53.4ft (16.3m)
None	None	Standard Coax Trunk Cable BNC Couplers	Different standard cable couplers, 90°, 180°, etc.

Make certain that you only connect ControlNet Ex adapters to other intrinsically safe system modules to maintain the integrity of the intrinsically-safe backplane.



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## Installation in Zone 1

This adapter must not be exposed to the environment. Provide a suitable metal enclosure. This adapter has a protection factor of IP20.

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**ATTENTION:** This adapter cannot be used in an intrinsically safe environment after it has been exposed to non-intrinsically safe signals.

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## Electrostatic Charge

Protect the system against electrostatic charge. Post a sign near this adapter: **Attention! Avoid electrostatic charge.** For your convenience, a sign which can be cut out is included in this installation instruction.

## European Community Directive Compliance

If this product has the CE mark it is approved for installation within the European Community or EEA regions. It has been designed and tested to meet the following directives.

### EMC Directive

This product is tested to meet the Council Directive 89/336/EC Electromagnetic Compatibility (EMC) by applying the following standards, in whole or in part, documented in a technical construction file:

- EN50081-2

EMC - Generic Emission Standard, Part 2 - Industrial Environment

- EN50082-2

EMC - Generic Immunity Standard, Part 2 - Industrial Environment

This product is intended for use in an industrial environment.

## Ex Directive

This product is tested to meet the Council Directive 94/9 EC (ATEX 100a) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres by applying the following standards:

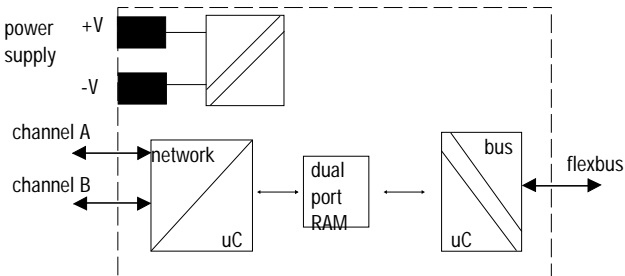
- EN50014:1992, Electrical Apparatus for Potentially Explosive Atmospheres
- EN50020:1994, Electrical Apparatus for Potentially Explosive Atmospheres - Intrinsic Safety "i"
- EN50039:1980, Electrical Apparatus for Potentially Explosive Atmospheres - Intrinsically Safe Electrical Systems "i"
- pr EN50284:1997, Special requirements for construction, test, and marking of electrical apparatus of equipment group II, category 1 G

## Inputs/Outputs

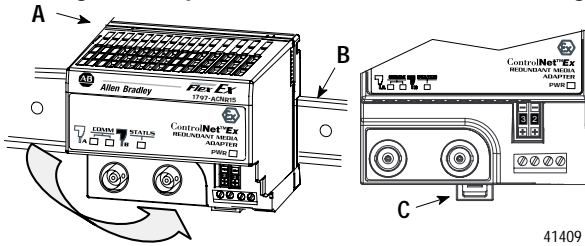
Do not apply any non-intrinsically safe signals to the adapter.

When using as an intrinsically safe electrical apparatus according to EN50020, the European directives and regulations must be followed.

## Customer Connections



## Mounting the Adapter on a DIN Rail Before Installing Modules

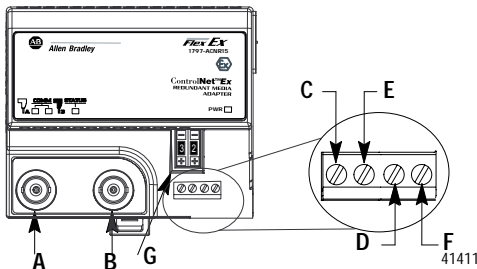


1. Position the ControlNet Ex adapter module (A) on a 35 x 7.5mm DIN rail (B) (A-B pt. no. 199-DR1) at a slight angle.
2. Hook the lip on the rear of the adapter (A) onto the top of the DIN rail (B), and rotate the module onto the rail.
3. Press the adapter module down onto the DIN rail until flush.
4. The locking tab (C) should snap into position and lock the adapter module to the DIN rail.
5. If the adapter does not snap into position, use a screwdriver or similar device to move the locking tab down while pressing the adapter module flush onto the DIN rail. Release the locking tab to lock the module in place.
6. If necessary, push up on the locking tab to lock.
7. Connect the adapter wiring as shown under “Wiring” later in this document.

## Wiring



**ATTENTION:** When connecting wiring, torque terminal screws to 7-9 inch-pounds.





**ATTENTION:** Make certain that you power this adapter with an intrinsically safe power supply. Do not exceed the values listed in the specifications for this adapter.

1. Connect the ControlNet Ex tap drop cable to connector, terminal **A** after removing the insulator boot.

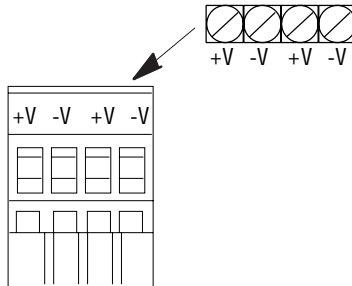
**Important:** The tap drop BNC must also have its insulator ring in position when inserted.

2. Connect the redundant ControlNet Ex tap drop cable to connector **B** after removing the insulator boot.

**Important:** The tap drop BNC must also have its insulator ring in position when inserted.

Only remove the BNC covers if the ControlNet Ex tap drop cable is installed.

3. Apply +V and -V power to the adapter through a removable terminal block.



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Screw terminals and spring terminals are provided.



4. Strip the +V and -V wires to a length so no bare conductor shows after inserting the wires into position (+V, -V).
5. If you are using the spring terminals of the plug, insert a screwdriver into the slot and *carefully* pry until the spring clamp opens to accept the wire.



- Do not remove or replace an adapter when power is applied. Interruption of the bus can result in unintended operation or machine motion.

- Do not use any unused terminals on this adapter. Using these terminals as supporting terminals can result in damage to the module and/or unintended operation of your system.

- Make certain that you power this adapter with an intrinsically safe power supply. Do not exceed the values listed in the specifications for this adapter.

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6. Set the network address using the 2-position push-switch **G**.

Valid settings range from 01 to 99. Press either the + or - buttons to change the number.

### Mounting (or Replacing) the Adapter on an Existing System

1. Disconnect the BNC connectors from the front of the ControlNet Ex adapter.
2. Remove the front power plug from the ControlNet Ex adapter.
3. Remove the I/O module from the terminal base unit that is to the immediate right of the ControlNet Ex adapter.
4. Push the flexbus connector toward the right side of the terminal base to unplug the backplane connection.

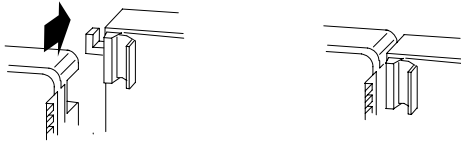


**ATTENTION:** Make certain that the flexbus connector is completely clear of the adapter. The slide must be completely to the right and the raised spot on the slide visible.

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5. Release the locking tab and remove the adapter.
6. Remove the backplane connector cover from the adapter.
7. Before installing the new adapter, notice the notch on the right rear of the adapter.

This notch accepts the hook on the terminal base unit. The notch is open at the bottom. The hook and adjacent connection point keep the terminal base and adapter tight together, reducing the possibility of a break in communication over the backplane.



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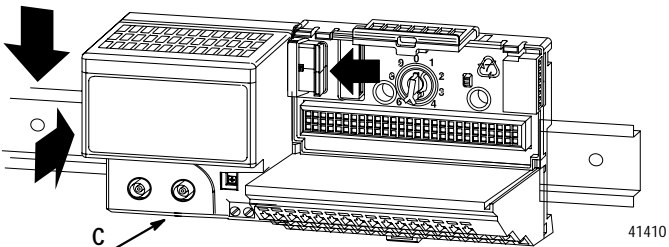


**ATTENTION:** Make certain that the hook on the terminal base is properly hooked into the adapter. Failure to lock the hook into the adjacent base/adapter can result in loss of communication on the backplane.

8. Complete the adapter mounting as shown below.

Push down and in at the same time to lock the adapter to the DIN rail.

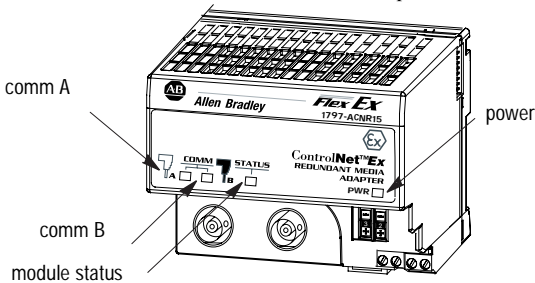
When the adapter is locked onto the DIN rail, gently push the flexbus connector into the adapter to complete the backplane.



9. If the adapter module does not lock in place, use a screwdriver or similar device to move the locking tab (C) down while pressing the adapter module flush onto the DIN rail. Then release the locking tab to lock the adapter module in place.
10. If necessary, push up on the locking tab to lock.
11. Reinstall the I/O module into the terminal base unit.
12. Make sure the last terminal base has its right-side flexbus connector cover in place.

## Indicators

The figure below identifies indicators on the adapter module.



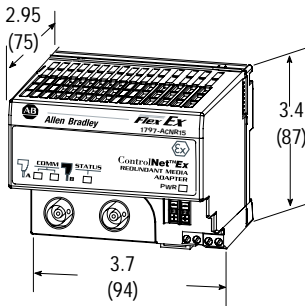
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## Comm, Module, and Power Status Indicators

Status Indicators	Probable Cause
<b>Comm A and Comm B Simultaneously</b>	
Off	No power, or reset
Red	Adapter inoperative
Red/Grn - (flashing alternately)	Adapter self-test
<b>Comm A and Comm B Simultaneously (continued)</b>	
Red/Off - (flashing alternately)	Bad node configuration (duplicate address)
<b>Comm A or Comm B Individually</b>	
Off	Channel disabled
Green	Channel operational
Flashing Grn/Off	Temporary network errors
Flashing Red/Off	Cable fault, broken cable, redundancy warning
Flashing Red/Grn	Bad network configuration
<b>Status Indicator</b>	
Off	No power
Flashing Grn	On-line, but not connected
Green	On-line, link okay, connected
Flashing Red	I/O module removed, wrong I/O module inserted, FLASH program update in progress
Red	Critical - adapter failure

Module Status	
Steady Green	At least one connection is established.
Flashing Green	No connections are established.
Flashing Red	Module removed, wrong module reinserted, or flash update in progress.
Steady Red	Bad adapter.
Power	
Steady Green	Power is applied to the module.

### Mounting Dimensions



Inches  
(Millimeters)  
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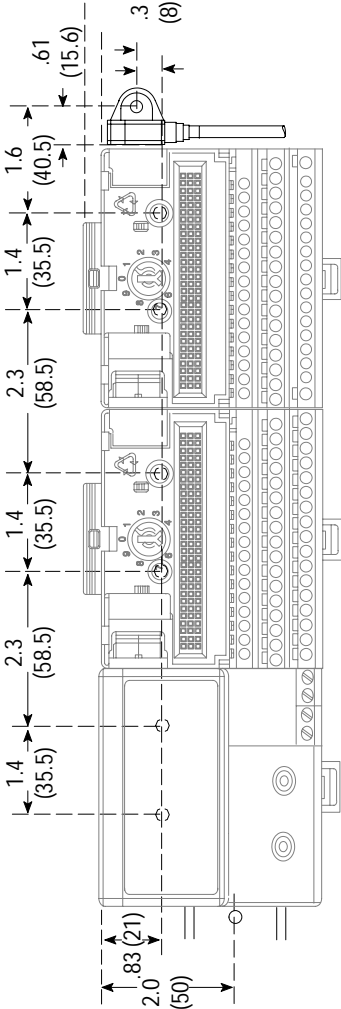
### Repair

The adapter module is not field-repairable. Any attempt to open this adapter module will void the warranty and the IS certification. If repair is necessary, return the adapter module to the manufacturer.

**1797-ACNR15/B Specifications**

I/O Capacity	8 modules
IS Media Type	EEx ib IIB/IIC T4, Class I, II, III Division 1 Groups A-G
IS Module Type	EEx ib IIB/IIC T4, Class I Division 1 Groups A-D
Communication Rate	5m bit/s
ControlNet Ex BNC (ChA and ChB)	Oscillation powered by: $U_i \leq 5.4V$ dc $I_i \leq 160mA$ ac coupled with high-pass filter $f \geq 500kHz$
Indicators	Comm A            red/grn Comm B            red/grn Module Status    red/grn Power              grn
Output (Intrinsically Safe) (16 pin male and female flexbus connector)	$U_o \leq 5.8V$ dc $I_o \leq 400mA$ $P_o \leq 2.12W$ $L_o \leq 10\mu H$ $C_o \leq 65\mu F$
Isolation Path Flexbus to Power Supply Flexbus to ControlNet ControlNet Ex Node to Other Node ControlNet Ex to Power Supply	Galvanic to DIN EN50020 Galvanic functional Galvanic functional Galvanic to DIN EN50020
Power Supply (+V, -V Intrinsically Safe)	$U_i \leq 9.5V$ dc $I_i \leq 400mA$ $P_i \leq 9.5W$ $L_i =$ Negligible $C_i \leq 120nF$
Power Consumption	8.5W
Power Dissipation	8.5W
Thermal Dissipation	29 BTU/hr
Conductor Wire Size	12 gauge (4mm <sup>2</sup> ) stranded maximum 3/64in (1.2mm) insulation maximum
Weight	Approximately 200g
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Vibration	-20 to 70°C (-4 to 158°F) -40 to 85°C (-40 to 185°F) 5 to 95% noncondensing Tested 15g peak acceleration, 11 (±1)ms pulse width Tested 15g peak acceleration, 11 (±1)ms pulse width Tested 2g @ 10-500Hz per IEC 68-2-6
Agency Certification	II 2G EEx ib IIB/IIC T4
Certificate of Conformity	DMT 99 ATEX E008 X

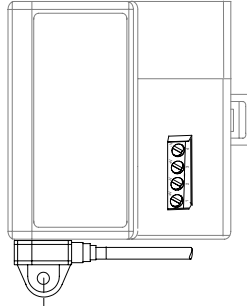
# Mounting Dimensions



Inches  
(Millimeters)

**⚠ ATTENTION:** Be careful of metal chips when drilling cable mounting holes. Do not drill holes above a system that has any modules installed.

Cable length approximately 11.5 (292.1) or 35.5 (901.0) from upper connector [length depends upon cable -1ft (0.3m) or 3ft (0.091m)]



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**Attention: Avoid electrostatic charge.**

ControlNet is a trademark of ControlNet International.

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