



ControlNet IP67 Tap and Cable Assembly Kit Installation Instructions

Catalog Number 1786-TCT2BD1

What's in This Document

This document describes how to install the ControlNet IP67 Tap and Cable Kit. The kit is made up of a tap and a 1-meter drop cable with overmolded connectors. The drop cable has a TNC connector at the tap end and a BNC connector for connection to standard ControlNet nodes. The tap and cable are rated to IP67 when mated to a sealed connector, which means they are water-tight.

The modular design of the kit lets you disconnect the devices at either the end of the drop cable, or at the tap port located on the tap body, without disrupting communications to the rest of the network. You can permanently disconnect a tap from a device by installing a tap dummy load (1786-TCAP) at the end of the tap drop cable.

IMPORTANT

No more than one tap should be disconnected at the body at a time and no more than 10% of the taps in a network may be terminated with tap dummy loads (1786-TCAP). Failure to adhere to these rules may cause excessive network errors and/or loss of network communications.

The kit also includes other items, such as a DIN rail mounting bracket and screws. See Table A below for a complete listing of the kit's contents.

Table A ControlNet IP67 Tap and Cable Assembly Kit Contents

| Catalog/Part/ Publication Number | Description | Qty. |
|---|---|-------------|
| 1786-TPIP67 | IP67 Tap (not sold separately) | 1 |
| | TNC to BNC drop cable (thin, 1 meter in length) | 1 |
| 1786-TNCL10 | TNC Plugs (bagged) | 2 |
| 1799-BRKD | DIN Rail Mounting Bracket | 1 |
| | DIN Rail Mounting Screws, #4-40 x .375 Pan Head, Cross Recess, Stainless Steel | 2 |
| | Gray colored dust cap | 1 |
| 1786-IN017A-EN-P | ControlNet IP67 Tap and Cable Assembly Kit Installation Instructions | 1 |

Use this document as a guide when you install the ControlNet IP67 Tap and Connector Kit.

| Topic | Page |
|---|-------------|
| Rockwell Automation Support | 3 |
| Important User Information | 3 |
| Why Use Sealed Media Components? | 4 |
| Select a Location to Install Sealed Components | 6 |
| Install the Components | 7 |
| Connect ControlNet Segments in a Network Topology | 13 |
| Specifications | 14 |

Rockwell Automation Support

Rockwell Automation offers support services worldwide, with over 75 sales/support offices, over 500 authorized distributors, and 260 authorized systems integrators located throughout the United States alone, plus Rockwell Automation representatives in every major country around the world. Contact your local Rockwell Automation representative for:

- sales and order support
- product technical training
- warranty support
- support service agreements

Obtain Pre-Sales Product Support

If you need to contact Rockwell Automation for pre-sales product support, call your local Rockwell Automation representative.

Obtain Technical Product Support

If you need to contact Rockwell Automation for technical assistance, try one of the following methods:

- Call your local Rockwell Automation representative
- Post-Sales Technical Support, 1.440.646.5800
- Web Links, <http://www.ab.com> — if you are a registered member, go to <http://www.ab.com/mem/technotes/techmain.html>

Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley does not

assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI-1.1, *Safety Guidelines for the Application, Installation and Maintenance of Solid-State Control* (available from your local Allen-Bradley office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

Reproduction of the contents of this copyrighted publication, in whole or part, without written permission of Rockwell Automation, is prohibited.

Throughout this manual we use notes to make you aware of safety considerations:

ATTENTION



Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss

Attention statements help you to:

- identify a hazard
 - avoid a hazard
 - recognize the consequences
-

IMPORTANT

Identifies information that is critical for successful application and understanding of the product.

Allen-Bradley is a trademark of Rockwell Automation

Why Use Sealed Media Components?

Sealed media components are ControlNet taps and connectors suitable for use in harsh environments. The sealed tap contained in the kit protects the BNC connector, which is not water-tight.

ATTENTION



Be sure to mate or terminate all connections. The taps and drop cables are rated to IP67 only when mated, and unterminated connections could be a source of contamination. Use the gray dust caps supplied in this kit to terminate unused connections. Never install extra taps in IP67 environments because there is no way to seal and protect the tap connections.

ATTENTION

The IP67 rating is guaranteed only when you use Rockwell Automation-supplied connectors.

Here are some example applications in which you would use water-tight IP67 BNC or TNC connectors:

ATTENTION

Contact your Rockwell Automation representative (refer to page 3 for contact information) for information on chemical environments in which the taps are suited for use. Cutting fluids and oils are not recommended for use with the taps.

- robotic welding
- bottling
- automotive paint spray booth
- food processing (with washdown)
- metal processing
- wastewater treatment facility
- automotive manufacturing
- paper/pulp processing

IMPORTANT

For information on how to plan and install your ControlNet cable System, see the ControlNet Coax Media Planning and Installation Guide, publication CNET-IN002A-EN-P.

Select a Location to Install Sealed Components

Use these guidelines to select where to install the components.

IMPORTANT

ControlNet is an isolated system. Connectors and the shield must not come in direct contact with a metal enclosure or other grounded equipment. The 1786-BNC2TNC isolated bulkhead (available from Rockwell Automation) provides an isolation from ground when properly installed.

ATTENTION



Do not allow any metal portions of the tap, such as the universal mounting bracket screws or connectors to contact any conductive material. This contact could cause noise on the network.

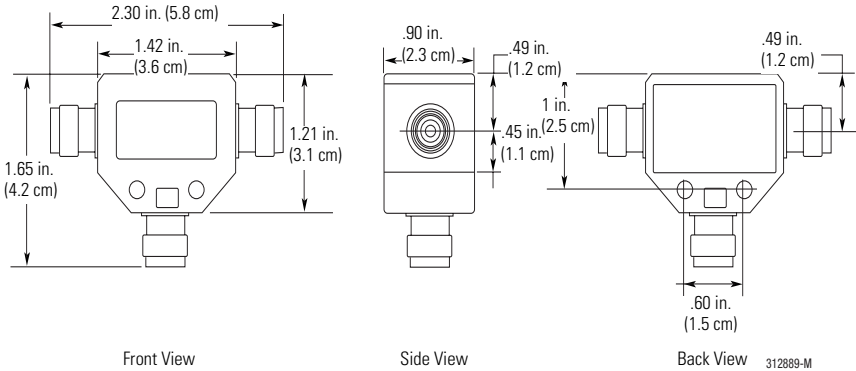
IMPORTANT

Do not cut, lengthen, or substitute the drop cable supplied in this kit. Doing so may diminish the integrity of your ControlNet network connection.

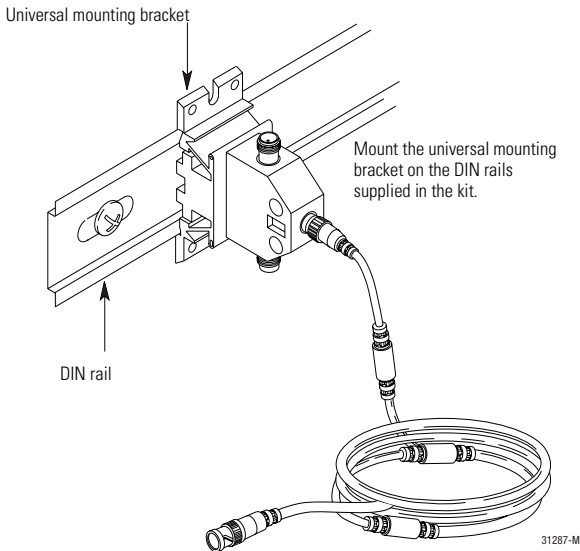
- Be certain that the installation location is convenient for routing your cable and meets the bend radius of the coax trunk line.
- Do not install sealed components so that the dropline cable is routed over any ac power terminals on nearby modules.

Install the Components

1. Determine an adequate mounting location for the tap. Refer to the dimension drawing shown below.



2. Mount the tap to the DIN rail (using the hardware provided in the kit) as shown in the following illustration.



ATTENTION



Do not over-tighten the screws. Over-tightening the screws can damage the tap. The applied torque should be 0.2-0.4 N-m (1-2 ft.-lbs).

3. Terminate the cable.

IMPORTANT

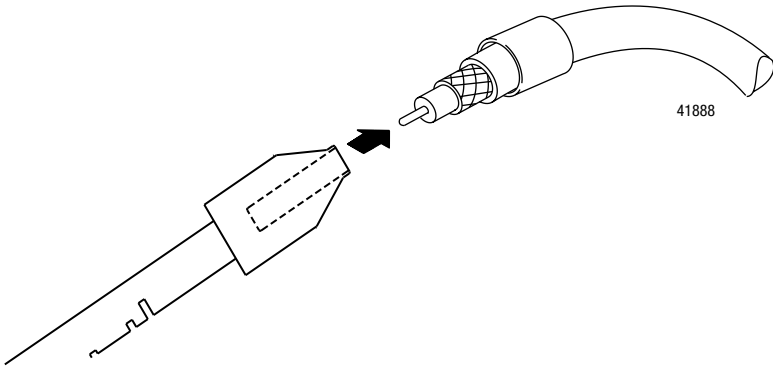
To make IP67-approved crimps when installing connectors onto a cable, order the ControlNet Coax Tool Kit, catalog number 1786-CTK).

For more information on the ControlNet Coax Tool Kit, contact your Rockwell Automation representative or refer to the ControlNet Coax Media Planning and Installation Guide, publication CNET-IN002A-EN-P. You can order a paper copy or view an electronic copy of this manual at www.theautomationbookstore.com, or call 1-800-963-9548.

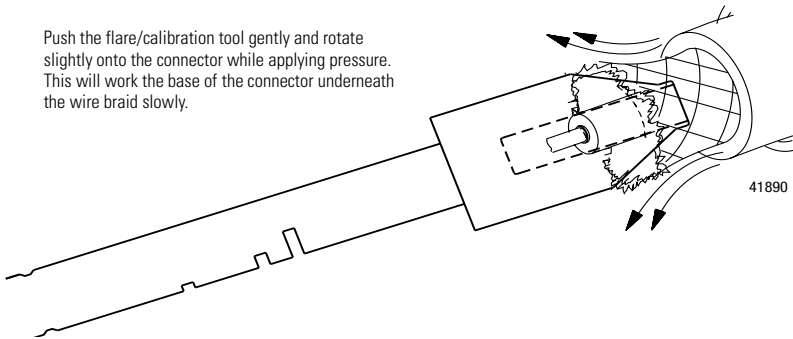
For more information on how to properly terminate cables, refer to the ControlNet BNC installation training video on compact disk, publication CNET-DM001A-EN-C. This CD is available from www.theautomationbookstore.com or by calling 1-800-963-9548.

-
- a. If your installation requires IP67-rated connectors, slide the heat-shrink tubing onto the cable.
 - b. Place the crimp ring on to the cable.
 - c. Strip the cable using the 1786-CTK stripper tool.
 - d. Remove an extra 1/8 inch of the jacket from the cable. Be careful not to cut the braid.
 - e. Trim the center conductor to the required length as directed on the connector bag.

- f. Push the flare tool onto the cable with a slight twisting motion (with sufficient inward pressure to expand the braid).



Push the flare/calibration tool gently and rotate slightly onto the connector while applying pressure. This will work the base of the connector underneath the wire braid slowly.

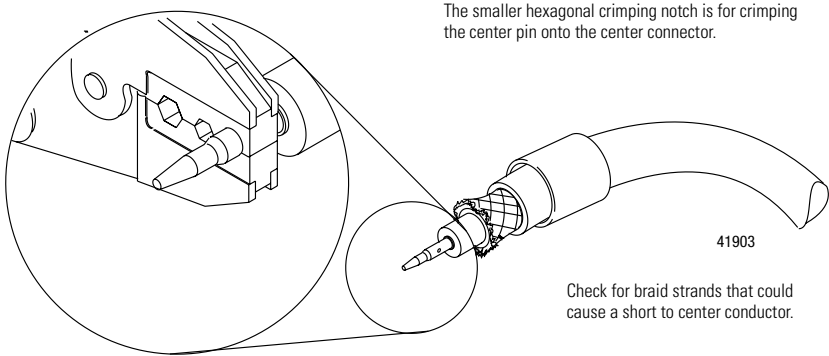


- g. Place the center pin over the center conductor.

IMPORTANT

Be certain that the center pin slips onto the center conductor completely. The back shoulder of the center pin should be up against the white insulation. If it is not, recheck the length of the center conductor.

- h. With the center pin in place, use the crimp tool to crimp the pin into place.



- i. Slide the ControlNet connector onto the cable. Push the connector body on tight until the center pin tip is flush with the inner ground ring.
- j. Slide the crimp ferrule over the three outer shields and connector base until it meets the shoulder on the connector.

- k. Using the crimp tool, crimp the ferrule. Position the crimp tool on the ferrule as close as possible to the connector base and ferrule meeting line. Press the tool tightly around the ferrule until the crimp tool allows release.

TIP

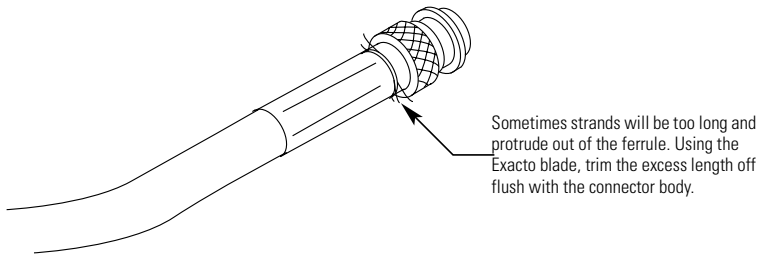
The larger hexagonal crimping notch is for crimping the ferrule which holds the connector to the cable.

**TIP**

Many network problems are due to improperly installed connectors. You should have tight-fitting connectors on the ends of all your cables. Pull the connector to verify that it is attached. If it is loose or comes off, snip off the connector and install a new one. The connector should withstand a minimum 60lbs pull force if properly installed.



4. Inspect the cable at the TNC connector end for any loose cable braids. Loose braids may cause voids in the heat-shrink tubing.



5. Place the heat-shrink tubing with heat-active glue (provided in the IP67 Tap and Cable Assembly Kit) over the TNC connector body and cable.

IMPORTANT

Use only the ACUM heat-shrink tubing provided in the kit. Do not substitute other types of heat-shrink tubing. Substitutions may cause a loss of the IP67 rating.

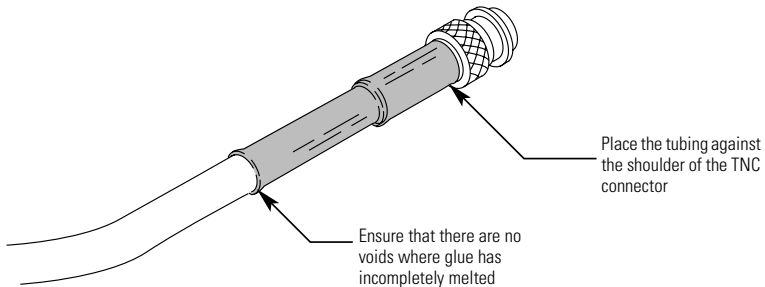
6. Follow these guidelines when heating the tubing:

ATTENTION

Be careful when using heat guns. High temperatures can lead to burns, risk of fire, or other property damage.



- a. Place the tubing against the shoulder of the TNC connector.
- b. Allow the heat gun to come to a temperature of between 110 and 160 degrees Celsius.
- c. Hold the cable assembly approximately 2 inches away from the heat exhaust area of the heat gun while shrinking the tubing.
- d. Continuously rotate the cable assembly around the heat exhaust area of the heat gun. The entire process should take about 4 minutes.
- e. Inspect the heat-shrink tubing to ensure that there are no voids where the glue has incompletely melted. Voids could cause a loss of the IP67 rating.



31297-M

7. Attach the trunk line to the tap. Tighten the trunk-line connector to 1 N-m (0.74 ft.-lbs.).

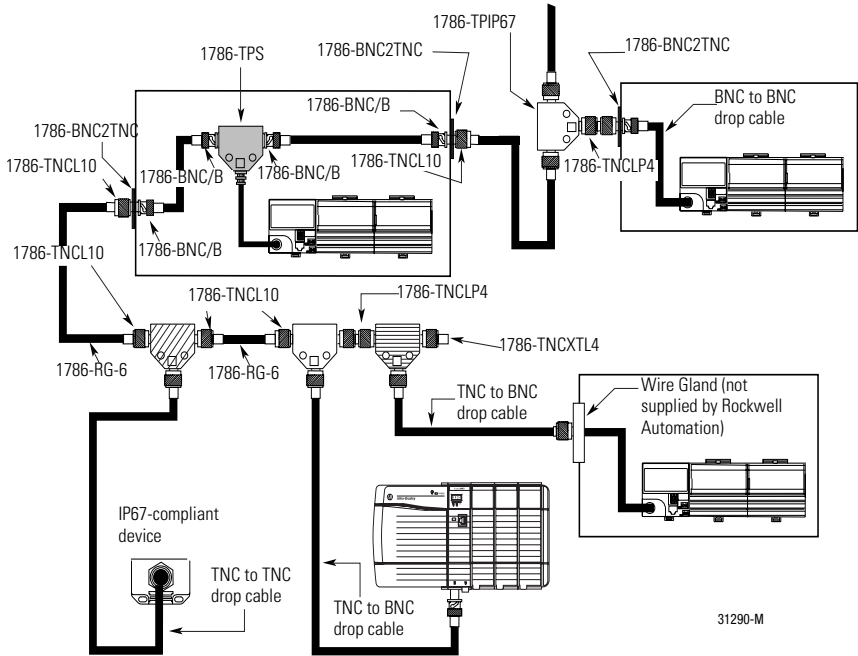
IMPORTANT

Be sure to install the dust cap on any unused connectors. Doing so will:

- prohibit the center conductor or the outer conductor from inadvertently shorting to ground during installation
 - provide partial environmental protection if a tap is left disconnected for a prolonged time
-

Connect ControlNet Segments in a Network Topology

See the following illustration for a sample network topology installation.



TIP



Except where indicated in the illustration above, use only the hardware that we provide with the connector. Other hardware can diminish the integrity of your connection. For catalog numbers shown in the illustration above but not supplied in the kit, contact your local Rockwell Automation distributor.

IMPORTANT

Do not cut, lengthen, or substitute the drop cable supplied in this kit. Doing so may diminish the integrity of your ControlNet network connection.

Specifications

| Item | Specification |
|--|--|
| Temperature operating storage | IEC 60068-2-1 IEC 60068-2-2 -20 to 70 degrees C. ambient -40 to 85 degrees C ambient |
| Humidity | IEC 60068-2-30 5 to 95% non - condensing |
| Vibration operating | IEC 60068-2-6 10-500Hz (4-15 minute cycle) 10 g peak (all axis) |
| Vibration packaged | NSTA Project 1A ASTM D999-75 truck bed simulation |
| Mechanical Shock operating non-operating | IEC 60068-2-27 3 shocks per axis-category I 30 g peak (all axis) 50 g peak (all axis) |
| Mechanical Shock packaged | drop test ASTM D775-80 |
| Sealing | IEC529- IP67 when fully mated |

Reach us now at www.rockwellautomation.com

Wherever you need us, Rockwell Automation brings together leading brands in industrial automation including Allen-Bradley controls, Reliance Electric power transmission products, Dodge mechanical power transmission components, and Rockwell Software. Rockwell Automation's unique, flexible approach to helping customers achieve a competitive advantage is supported by thousands of authorized partners, distributors and system integrators around the world.

Americas Headquarters, 1201 South Second Street, Milwaukee, WI 53204, USA, Tel: (1) 414 382-2000, Fax: (1) 414 382-4444
European Headquarters SA/NV, avenue Herrmann Diebroux, 46, 1160 Brussels, Belgium, Tel: (32) 2 663 06 00, Fax: (32) 2 663 06 40
Asia Pacific Headquarters, 27/F Citicorp Centre, 18 Whitfield Road, Causeway Bay, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846



**Rockwell
Automation**

Publication 1786-IN017A-EN-P - March 2002

PN 957555-39

© 2002 Rockwell International Corporation. Printed in the U.S.A.