NetLinx Selection Guide

Allen-Bradley • Rockwell Software

Rockwell Automation

Choose the Best Network for Your Application

NetLinx Open Network Architecture is the Rockwell Automation strategy of using open networking technology for seamless, top-floor to shop-floor integration. The networks in the NetLinx architecture speak a common language and share a universal set of communication services. As a result, information can be communicated seamlessly throughout the plant, from shop floor to top floor, and to and from the Internet for e-business applications.

Each Rockwell Automation network is ideal for a wide-range of applications. Plus, all Rockwell Automation Open Communication Networks operate with devices manufactured by various vendors and share data with industry-standard information networks.

Choose from the following NetLinx networks, based on your system requirements.

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	ControlNet Network	**DeviceNet Network**	**EtherNet/IP Network**
Function	Supports transmission of time-critical data between PLC processors and I/O devices	Connects low-level devices directly to plant-floor controllers — without interfacing them through I/O modules	Plant management system tie-in (material handling); configuration, data collection, and control on a single high-speed network
Typical devices networked	PLC processors, I/O chassis, HMIs, PCs, drives, robots	Sensors, motor starters, drives, PCs, push buttons, low-end HMIs, bar code readers, PLC processors, valve manifolds	Mainframe computers, PLC processors, robots, HMI, I/O and I/O adapters, drives
Data repetition	Medium-size packets; data transmissions are deterministic and repeatable	Small packets; data sent as needed	Large packets, data sent regularly
Number of nodes (max)	99	64 logical	No limit
Data transfer rate	5 Mbps	500, 250, or 125 Kbps	10 Mbps, 100 Mbps
Device suppliers	Open	Open	Open

ControlNet Network

The ControlNet network is a real-time control network that provides high-speed transport of both time-critical I/O and interlocking data and messaging data, including upload/download of programming and configuration data on a single physical media link. The ControlNet network's highly efficient data transfer capability significantly enhances I/O performance and peer-to-peer communication in any system or application where it is used.

The ControlNet network is highly deterministic and repeatable, and remains unaffected as devices are connected or disconnected from the network. This ensures dependable, synchronized, and coordinated real-time performance.

The ControlNet network is most often used as a:

- default network for the ControlLogix platform.
- substitute/replacement for the Universal remote I/O (RIO) network, because ControlNet handles large numbers of I/O points.
- backbone to multiple distributed DeviceNet networks.
- peer communication network.
- high-speed I/O network.

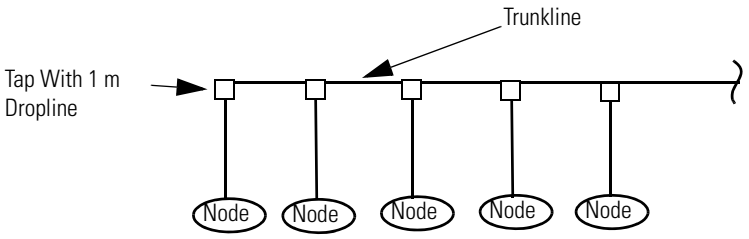
Flexible installation options for the ControlNet network include:

- fiber media for optical isolation from noise and distances up to 20 km (12.43 miles).
- fiber ring option for additional topology flexibility.
- redundant media option to help ensure that a system can maintain operation during a cable fault condition.
- intrinsic safety option lets you install a ControlNet network in hazardous, explosive locations.
- IP67 installation rated for adherence to standards.

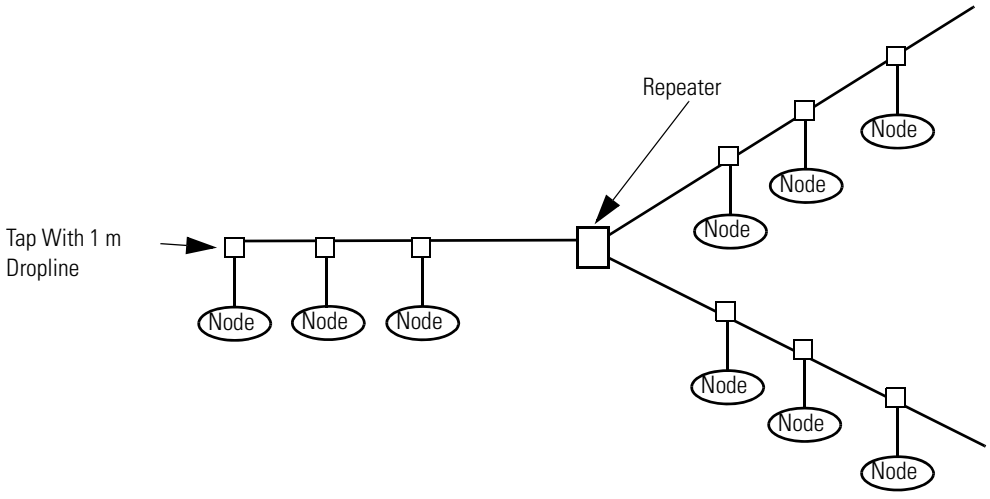
ControlNet Network Topology

The ControlNet network supports a variety of topologies, including trunkline/dropline, star, tree, and ring. In its simplest form, the ControlNet network is a trunkline, to which you connect nodes with a tap and a 1 m dropline. Repeaters are required to create other topologies, such as star or ring topologies.

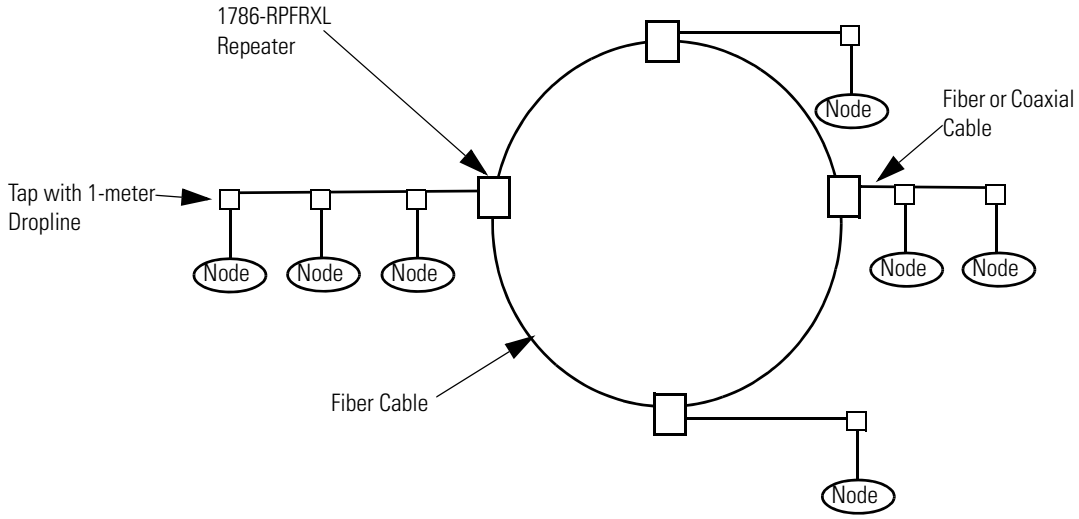
Example ControlNet System Trunkline/dropline Topology



Example ControlNet System Star Topology



Example ControlNet System Ring Topology



See ControlNet Coax Media Planning and Installation Guide, publication CNET-IN002, for more information on topologies.

See ControlNet Fiber Media Planning and Installation Guide, publication CNET-IN001, for more information on fiber media.

ControlNet Network Capacity

Capacity on a ControlNet network is based on:

- The number of nodes on the network, as well as the number of networks in your application
- The maximum allowable distance on your network
- The number of connections on your network

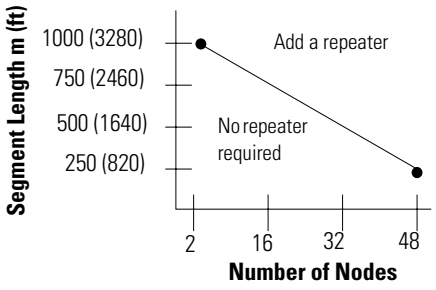
Number of Nodes

Each ControlNet network supports up to 99 nodes. The master scanner uses one node number. Some Rockwell Automation controllers support multiple ControlNet networks, giving you the flexibility to add more nodes to your ControlNet network, or to boost performance.

Distances

In a ControlNet network, the maximum distance depends on the number of nodes on the network. Use repeaters to add more nodes or gain more distance. Use the following chart and/or formula to determine whether repeaters are required.

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



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Connections

The number of available connections are another factor you must consider when determining capacity on a ControlNet network. Connections are a measure of the number of devices with which a controller or communication card communicates. The connection establishes a communication link between two devices. Connections can be:

- controller to local I/O modules or local communication modules.
- controller to remote I/O or remote communication modules.
- controller to remote I/O (rack-optimized) modules.
- produced and consumed tags.
- messages.

You indirectly determine the number of connections the controller uses by configuring the controller to communicate with other devices in the system.

Scheduled connections are unique to the ControlNet network. A scheduled connection lets you send and receive data repeatedly at a pre-determined interval. This interval is called the requested packet interval, or RPI. For example, a connection to an I/O module is a scheduled connection because the controller repeatedly receives data from the module at a specified interval. Other specified connections include connections to:

- communication devices.
- produced and consumed tags.

The ControlNet network also uses unscheduled connections. An unscheduled connection is a message transfer between controllers or I/O that is triggered by the program with a MSG instruction. Unscheduled messaging lets you send and receive data when needed.

On a ControlNet network, you must use RSNetWorx for ControlNet software to enable all scheduled connections and establish a network update time (NUT).

Use the following table to determine the number of available connections for each controller and communication card. Then see the table on page 47 to determine the number of connections you will need for your application.

IMPORTANT

The information provided here is simplified for easy estimation. The actual number of connections used may be more or less than you estimate, depending on your system configuration. In general, the following factors will affect the number of connections used:

- Data rate
- Amount of data
- Enabling several options

If you are close to a connection limit, or if you want to determine the exact number of connections, refer to the individual controller selection guides, or contact your Rockwell Automation representative.

Available ControlNet Communication Module Connections

Controller	Communication Module	Available Connections
ControlLogix	1756-CNB	250 per controller; 64 per 1756-CNB module[1]
CompactLogix	Integrated port on the 1769-L32C or -L35CR controllers	• As many as 100 connections; typically 32 connections • Depending on RPI, as many as 22 connections can be scheduled • The remaining connections (or all 32, if you have no scheduled connections) can be used for message connections
FlexLogix	1788-CNC	24 per 1788-CNC
SoftLogix 5800	1784-PCICS	250 per controller/128 per 1784-PCICS
PLC-5	1771-ACN, 1771-ACNR	64 - 128, depending on the type of processor
SLC 500	1747-SCNR	64

[1] As you count the connections you will need for your application, you will use connections for both the controller and the 1756-CNB module.

Determining Connections for Messages

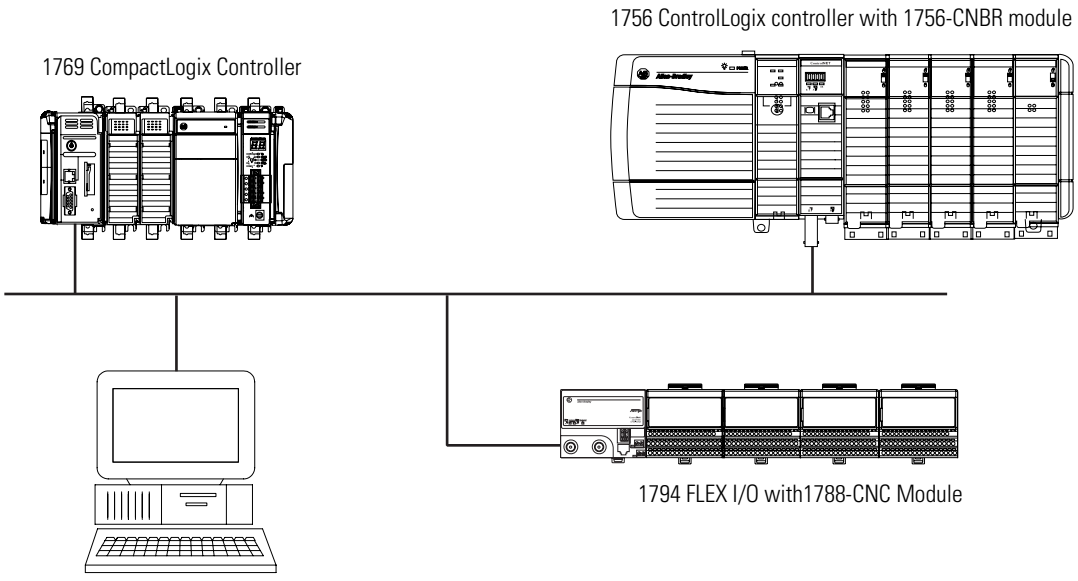
Messages transfer data to other devices, such as other controllers or operator interfaces. Each message uses one connection, regardless of how many devices are in the message path. To conserve connections, you can configure one message to read from or write to multiple devices.

Connections Example

The following example shows a sample configuration.

- The 1769-L35CR CompactLogix controller:
  - produces two tags that are consumed by the 1756 ControlLogix controller.
- The 1756 ControlLogix controller:
  - produces three tags that are consumed by the 1769-L35LCR CompactLogix controller.
  - controls outputs and reads inputs from the 1794 FLEX I/O distributed on the ControlNet network.

ControlNet Connections Example



Estimate the connections used according to the following table.

Estimated Number of Connections

For Each	Count This Number of Connections	In This Example, We Show This Number of Connections
Tag produced by the 1769-L35CR	1	2
Tag consumed by the 1769-L35CR	1	3
Tag produced by the 1756 ControlLogix controller	1	3
Tag consumed by the 1756 ControlLogix controller	1	2
1794 FlexLogix controller with 1788-CNC (rack optimized)	1	1
Total number of I/O connections in this example(1)		11

1 In the above example, we use a total of 11 connections (five in the 1769-L35CR; six in the 1756 ControlLogix controller).

Communication Interfaces

You can monitor and control your applications with controller interfaces and operator interfaces. Linking devices let you connect your ControlNet network to a DeviceNet or Foundation Fieldbus network.

Controller Interfaces

Various controller platforms are available for the ControlNet network.

Bulletin No.	Product	Interface
Programmable Automation Controllers		
1769	CompactLogix Controllers, 1769-L3 series	Built-in ControlNet interface (standard and redundant)
1768	CompactLogix Controllers, 1768-L4 series	1768-CNB scanner 1768-CNBR scanner (redundant)
1756	ControlLogix Controllers, 1756-L6 series	1756-CN2 interface 1756-CN2R interface (redundant) 1756-CNB interface 1756-CNBR interface (redundant)
1789	SoftLogix 5800 Controllers	1784-PCICS scanner

Bulletin No.	Product	Interface
Programmable Logic Controllers		
1747	SLC 500 Controllers, 5/02, 5/03, 5/04, and 5/05 series	1747-SCNR scanner (scheduled)
1747	SLC 500 Controllers, 5/03, 5/04, and 5/05 series	1747-KFC15 interface (unscheduled)
1785	PLC-5 Controllers	Built-in ControlNet interface (5/20C, 5/40C, 5/80C controllers) 1771-ACN15 adapter 1771-ACNR15 adapter (redundant) 1785-CHBM Hot Backup Memory Cartridge for 5/40C, 5/80C controllers
Safety Programmable Controllers		
1756	GuardLogix Integrated Safety System, 1756-L series	1756-CN2 interface 1756-CN2R interface (redundant) 1756-CNB interface 1756-CNBR interface (redundant)
Legacy Controllers		
1794	FlexLogix Controllers	1788-CNC (coax) 1788-CNCR (redundant coax) 1788-CNF (fiber) 1788-CNFR (redundant fiber)

Operator Interfaces

Customize your status and fault reporting with graphic terminals and message displays from Rockwell Automation.

Bulletin No.	Product	Interface
2711	PanelView Standard Operator Terminals PV550, 600,1000	Built-in ControlNet option on PanelView 550, 600, and 1000 Operator Terminals
2711P	PanelView Plus Operator Terminals	Built-in ControlNet option on PanelView Plus 700, 1000, 1250, 1500 terminals 2711P-RN15C ControlNet module for PanelView Plus 400, 600 terminals 2711P-RN15S ControlNet module for PanelView Plus 700, 1000, 1250, 1500 terminals
2711P	PanelView Plus CE Operator Terminals	Built-in ControlNet option on PanelView Plus CE 700, 1000, 1250, 1500 terminals 2711P-RN15S ControlNet module for PanelView Plus CE 700, 1000, 1250, 1500 terminals
2706	InView Message Displays	2706-PCNETM ControlNet Module for 2706-P4 series display 2706-PCNETK ControlNet Module for 2706-P7 and 2706-P9 series display 2706-PCNETP ControlNet Module for 2706-P22R displays

Computer Interfaces

These products provide ControlNet communication for control systems.

Cat. No.	Product	Description
1784-U2CN	USB to ControlNet Cable	Provides a ControlNet network connection for any Microsoft Windows-based computer with a USB interface
1784-PCIC	ControlNet PCI Bus Interface - Redundant Media	Lets a PCI-bus computer communicate on a ControlNet network and supports redundant media operation
1784-PCICS	ControlNet PCI Bus I/O Bridge Card	Supports 128 unscheduled and 127 scheduled connections; drivers for Microsoft Windows NT, 2000, and XP operating systems
1784-PKTCS	ControlNet Universal PCI Scanner Card	Enables PCI local bus compatible computers to communicate directly with other ControlNet products
1770-KFC15	ControlNet RS-232-C PC Interface for PLC-5 Controllers	Lets you connect RS-232 devices to a ControlNet network
1747-KFC15	ControlNet RS-232-C PC Interface for SLC 500 Controllers	

RFID Interfaces

The ControlNet Interface module provides a solution for automatic identification.

Cat. No.	Product	Description
54RF-IN-CNF	ControlNet RFID Control Interface (geral purpose; read only)	Integrates passive Radio Frequency Identification technology (RFID) and the ControlNet network architecture into a field mountable enclosure
54RF-IN-CNG	ControlNet RFID Control Interface (general purpose; read-write)	
55RF-IN-CN	ControlNet RFID Control Interface (high speed)	
56RF-IN-CN	ControlNet RFID Control Interface (light industrial)	
56RF-ICIN-CN	ControlNet RFID Control Interface (iCode SL2 / ISO 15693)	

Linking Devices

Linking devices from Rockwell Automation can reduce control device costs by leverage existing network structures to access data from other level networks. You can also expand the number of nodes on ControlNet and other networks.

Cat. No.	Product	Description
1788-CN2DN	ControlNet-to-DeviceNet Linking Device	Link a ControlNet network to a DeviceNet network
1757-FFLDC2	ControlNet-to-Foundation Fieldbus Linking Device, 2 H1 segments	Link a ControlNet network to a Foundation Fieldbus H1 network for process control applications or Link any Logix controller to a Foundation Fieldbus device
1757-FFLDC4	ControlNet-to-Foundation Fieldbus Linking Device, 4 H1	

I/O Platforms

Rockwell Automation's I/O family provides world-class I/O products for virtually every application need. Once you have chosen your controller platform, you can choose from these I/O types for the ControlNet network:

- In-cabinet distributed I/O
- On-machine I/O
- Chassis-based I/O

In-cabinet Distributed I/O

In-cabinet (IP20) distributed I/O requires an enclosure for environmental protection, and is available for ControlNet in the modular I/O style. Modular I/O is a system of interface cards and communications adapters that interface directly to the machines's sensors and actuators and communicate their status to the controller via a communication network. It allows the designer to mix and match I/O interfaces and communications adapters.

Bulletin No.	Product	Adapter
1734	POINT I/O	1734-ACNR adapter (redundant)
1794	FLEX I/O	1794-ACN15 adapter 1794-ACNR15 adapter (redundant) 1794-ACN15K adapter, conformal coated 1794-ACNR15K adapter (redundant), conformal coated 1794-ACNR15XT adapter (redundant), extreme temperature (-20 °C…70 °C)
1797	FLEX Ex Intrinsically Safe I/O	1797-ACNR15 adapter (redundant) 1794-ACN15 adapter (use with 1797-BIC and 1797-CEC to connect to hazardous areas) 1794-ACNR15 adapter (redundant; use with 1797-BIC and 1797-CEC to connect to hazardous area)

On-Machine Distributed I/O

On-Machine (IP67) distributed I/O does not require an additional enclosure, allowing for easier maintenance. On-Machine I/O for ControlNet is available in the modular I/O style. Modular I/O is a system of interface cards and communications adapters that interface directly to the machine's sensors and actuators and communicate their status to the controller via a communication network. It allows the designer to mix and match I/O interfaces and communications adapters.

Bulletin No.	Product	Adapter
1738	ArmorPoint I/O	1738-ACNR adapter with TNC Connector (redundant media)

Chassis-based I/O

Chassis-based I/O is specifically designed for a particular controller, as part of its family. Rockwell Automation chassis-based I/O systems are also capable of being mounted away from the controller via networks.

Bulletin No.	Product	Adapter
1756	ControlLogix I/O	1756-CN2 1756-CN2R (redundant) 1756-CNB 1756-CNBR (redundant)
1747	SLC 500	1747-ACN 1747-ACNR (redundant)
1771	PLC-5 I/O	1771-ACN15 1771-ACNR15 (redundant)

Drives

Rockwell Automation drives are a full family of adjustable speed drives that can connect to the ControlNet network. These drives can be configured locally via a Human Interface Module (HIM), or over the network at any point—during start-up or runtime. You can read diagnostics (such as current draw, phase, output, nd voltage) from a computer or operator interface. Data from the drives can be used for monitoring, trending, and analysis to fine-tune your processes.

Bulletin No.	Product	Adapter
PowerFlex 4 AC Drives	• 0.2…3.7 kW (0.25…5 Hp) • Voltage ratings: 100…120V, 200…240V, 380…480V	22-COMM-C (coax)
PowerFlex 4M AC Drives	• 'A' frame, 'B' frame, liquid cooled 'C' frame • 0.2…11 kW (0.25…15 Hp) • Voltage ratings: 120V, 240V, 480V	22-COMM-C (coax)
PowerFlex 40 AC Drives	• 0.4…11 kW (0.5…15 Hp) • Voltage ratings: 100…120V, 200…240V, 380…480V, 460…600V	22-COMM-C (coax) ControlNet network connectivity also available as a configured option
PowerFlex 40P AC Drives	PowerFlex 40P AC Drives • 0.4…11 kW (0.5…15 Hp) • Voltage ratings: 200…240V, 380…480V, 460…600V	22-COMM-C (coax)
PowerFlex 400 AC Drive	• 2.2…37.5 kW (3…50 Hp) at 200…240V • 2.2…250 kW (3…350 Hp) at 380…480V	22-COMM-C (coax) ControlNet network connectivity also available as a configured option
PowerFlex 70 AC Drive	• 0.37...37 kW (0.5…20 Hp) • Voltage ratings: 200...240V, 380...480V, 500...600V	20-COMM-C (coax) 20-COMM-Q (fiber)
PowerFlex 700 AC Drive	• 0.37...110 kW (0.5...150 Hp) • Voltage ratings: 200...240V, 380...480V, 500...690V	20-COMM-C (coax) 20-COMM-Q (fiber)
PowerFlex 700S AC Drive with DriveLogix	• 0.75...110 kW (1...150 Hp) with voltage ratings of 380...480V • 0.75...15 kW (1...20 Hp) with voltage ratings of 200...240V	20-COMM-C (coax) 20-COMM-Q (fiber)
PowerFlex 755 AC Drive	• 5.5…250 kW (7.5…350 Hp) • Voltage ratings: 380…480V	20-750-CNET
PowerFlex 7000, 7000A, or 7000L AC Drive	• Air-cooled, 200...5500 Hp • 'A' frame, 200...1200 Hp • Liquid-cooled 'C' frame, 3000...9000 Hp	20-COMM-C (coax) 20-COMM-Q (fiber)
PowerFlex DC Drive	• 1.2…112 kW (1.5…150 Hp) at 230V AC • 1.5…298 kW (2…400 Hp) at 460V AC	20-COMM-C (coax)
Bulletin 1397 Digital DC Drive	• 2.2...224 kW (3...300 Hp) at 460V • 1.2...112 kW (1.5...150 Hp) at 230V	1203-CN1 communication module

Power Management

The Powermonitor family is a group of 16-bit microprocessor-based, digital instruments for integrating the measured and calculated power parameters of industrial, commercial, and utility power systems.

The Combined Generator Control Module (CGCM) consists of a single module that provides multiple functions needed to implement a generator control system.

Bulletin No.	Product	Interface
Bulletin 1404	Powermonitor 3000 Provides real-time power quality data, harmonics analysis, oscillography, and sub-metering	Built-in ControlNet network communication port
1407-CGM	• Supplies controlled excitation current to the generator field winding to produce the desired generator output voltage. • Measures the generator field current, the generator output voltage, and the generator output current. ata and functions is provided via a s	Standard ControlNet network communication port.

Software

Rockwell Automation provides a variety of software packages to help you manage and control your processes. In general, you should order the appropriate version of RSLogix, RSLinx and RSNetWorx software for your platform and application.

Choose from the following Rockwell Software packages for your application:

Cat. No.	Product	Description
9357 series	RSNetWorx for ControlNet Software (available separately or bundled with RSLogix programming software packages)	Provides graphical network management, including an intuitive network browser for multi-network viewing
	RSNetWorx MD for ControlNet Software Add-On (add-on to your existing RSNetWorx for ControlNet software)	Maintenance and diagnostic component for RSNetWorx for ControlNet software that provides pre-configured diagnostic analysis and troubleshooting information for the ControlNet network
	RSNetWorx MD for ControlNet Software Bundle (includes RSNetWorx for ControlNet software and the MD subsystem)	
9355 series	RSLinx Software	Provides a means for data exchange between a controller and a variety of client applications, including many Rockwell Software packages
9230-IOLINXSDK	IOLinx Software Development Kit	IOLinx API function calls documentation; helps you design your application software to control and collect information from a network

Media

Rockwell Automation's ControlNet cabling components provide flexibility when designing a communication network for your particular application. A typical ControlNet network consists of one or more of the following: trunk cables, taps, repeaters, terminators, and bridges.

ControlNet Media for Nonhazardous Locations

Cat. No.	Description
ControlNet Coaxial Tap Kits See the ControlNet Coax Media Planning & Installation Guide, publication CNET-IN002 for more information.	
1786-TPR	Right-angle T-tap
1786-TPS	Straight T-tap
1786-TPYR	Right-angle Y-tap
1786-TPYS	Straight Y-tap
ControlNet Coaxial Connectors See the ControlNet Coax Media Planning & Installation Guide, publication CNET-IN002 for more information.	
1786-BNCP	Barrel, Plug-to-Plug
1786-BNC	BNC, Plug
1786-BNCJ	Bullet, Jack-to-Jack
1786-BNCJI	Isolated Bulkhead, Jack-to-Jack
1786-XT	Terminator, Plug
1786-TCAP	Tap Dummy Load
1786-TJPR	Jumper, Plug-to-Plug (5 in. long)
ControlNet RG-6 Quad-shield Coaxial Cable See the ControlNet Coax Media Planning & Installation Guide, publication CNET-IN002 for more information.	
1786-RG6F/A	High-flex (304.8m [1000 ft.])
1786-RG6	Standard PVC CM-CL2 (304.8m [1000 ft.])
1786-CTK	Coax Toolkit
ControlNet IP67 TNC Media See the ControlNet IP67 Tap & Cable Assembly Kit Installation Instructions, publication 1786-IN017 for more information.	
1786-TCT2BD1	TNC to BNC ControlNet IP67 Tap Kit with Removable Drop Cable
1786-TPST2T	TNC to TNC ControlNet IP67 Tap Kit with Removable Drop Cable
1786-TNCLP4	Barrel, Plug-to-Plug, TNC to TNC
1786-TNCL10	TNC, Plug
1786-TNCJ4	Bullet, Jack-to-Jack, TNC to TNC
1786-TNCJI4	Bulkhead, Jack-to-Jack, TNC to TNC
1786-BNC2TNC	Isolated Bulkhead, Jack-to-Jack, BNC to TNC
1786-TNCLXT4	Terminator, Plug

Cat. No.	Description
ControlNet Short-distance Fiber-optic Cable with V-pin connectors See the ControlNet Fiber Media Planning & Installation Guide, publication CNET-IN001 for more information.	
1786-FS10	10 m Cable Assembly
1786-FS20	20 m Cable Assembly
1786-FS60	60 m Cable Assembly
1786-FS100	100 m Cable Assembly
1786-FS200	200 m Cable Assembly
1786-FS300	300 m Cable Assembly
ControlNet Network Access Cable (laptop computer to ControlNet) See the ControlNet Network Access Cable Installation Instructions, publication 1786-TD006 for more information.	
1786-CP	ControlNet Network Access Cable (3.05 m, 10 ft)

ControlNet Media for Hazardous Locations

Cat. No.	Description
ControlNet Intrinsically Safe (FLEX Ex) Tap Kits See the ControlNet Ex Media Planning & Installation Guide, publication CNET-IN003 for more information.	
1797-TPR	FLEX Ex Right-angle T-tap
1797-TPS	FLEX Ex Straight distance T-tap
1797-TPYR	FLEX Ex Right-angle T-tap
1797-TPYS	FLEX Ex Straight Y-tap
ControlNet Intrinsically Safe (FLEX Ex) Connectors See the ControlNet Ex Media Planning & Installation Guide, publication CNET-IN003 for more information.	
1797-XT	FLEX Ex Terminator
1797-TCAP	FLEX Ex Safe Tap Dummy Load
ControlNet Intrinsically Safe (FLEX Ex) Accessories See the ControlNet Ex Media Planning & Installation Guide, publication CNET-IN003 for more information.	
1797-BOOT	FLEX Ex Boot Insulator Kit
1797-EXM	FLEX Ex Cable Marking Kit
ControlNet Coaxial Barrier See the ControlNet Ex Media Planning & Installation Guide, publication CNET-IN003 for more information.	
1797-BCNR	ControlNet Coaxial Barrier, isolates a ControlNet segment from a hazardous to a non-hazardous area

Repeaters

Repeater modules can be used to extend the length of the network, create a point-to-point, star, or ring topology, or perform network media conversion from copper (coaxial) media to fiber media, and vice versa.

Cat. No.	Product	Used With	Description
ControlNet Repeater Modules			
See the following for more information: ControlNet Fiber Media Planning & Installation Guide, publication CNET-IN001. ControlNet Ex Media Planning & Installation Guide, publication CNET-IN003.			
1786-RPCD	Coaxial Repeater • Two coaxial segments per module • Point-to-point and star topologies	RG6 copper coax	Extend the physical length of the ControlNet network up to 1 km
1786-RPFS	Short-distance Fiber Repeater • Two fiber segments per module • Point-to-point and star topologies	V-pin (use pre-made 1786-FSxx 10-300 m cables)	Optically isolate and extend the physical length of the ControlNet network up to 300 m
1786-RPFM	Medium-distance Fiber Repeater • Two fiber segments per module • Point-to-point and star topologies	ST 62.5/125 um multimode fiber	Optically isolate and extend the physical length of the ControlNet network up to 3 km
1786-RPFRL/B	Long-distance Fiber Ring Repeater • Two fiber segments per module • Point-to-point, star, and ring topologies • Fault Relay for runtime diagnostics	ST 62.5/125 um multimode fiber	Optically isolate and provide fiber ring media redundancy or Extend the physical length of the ControlNet network up to 10 km
1786-RPFRXL/B	Extra-long-distance Fiber Ring Repeater • Two fiber segments per module • Point-to-point, star, and ring topologies • Fault Relay for runtime diagnostics	ST 62.5/125 um multimode fiber or ST 9/125 um single mode fiber	Optically isolate and provide fiber ring media redundancy or Extend the physical length of the ControlNet network up to 20 km
1797-RPFM	Intrinsically Safe Medium-distance Repeater • Two fiber segments per module • Point-to-point and star topologies • Connect the 1797-RPFM repeater module (in an intrinsically safe area) to the 1786-RPFM repeater module (in a non-intrinsically safe area) using fiber	ST 62.5/125 um multimode fiber	Optically isolate for intrinsically safe areas or Extend the physical length of the ControlNet network up to 3 km

Cat. No.	Product	Used With	Description
ControlNet Repeater Adapters			
See the following for more information: ControlNet Fiber Media Planning & Installation Guide, publication CNET-IN001. ControlNet Ex Media Planning & Installation Guide, publication CNET-IN003.			
1786-RPA/B	Modular Repeater Adapter • Supplies power for up to 4 repeater modules (1786-RPCD, -RPFS, and -RPFM) • Supplies power for up to 2 repeater modules (1786-RPFRL, -RPFXL) • One coax BNC connection	RG6 copper coax	Use with these repeater modules: 1786-RPCD 1786-RPFS 1786-RPFM 1786-RPFRL 1786-RPFRXL
1797-RPA	IntrinSically Safe Modular Repeater Adapter • supplies power for up to 2 repeater modules (1797-RPFM) • One coax BNC connection	RG6 copper coax	Use with these repeater modules: 1797-RPFM

Tools

A variety of tools exist to help you quickly and easily detects common network problems such as opens, shorts, miswired connectors, and missing network terminations.

Cat. No.	Product	Description
1788-CNCHKR	ControlNet NetChecker	Handheld diagnostic tool that analyzes active ControlNet networks
1788-MCHKR	NetLinx Media Checker	Handheld diagnostic tool that identifies cable failures, measures length, and checks wiring for ControlNet, DeviceNet, DH+/RIO, and Ethernet physical media