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

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NetLinx Networks

The NetLinx architecture, created specifically for industrial applications, provides the ability to control, configure, and collect data on a single network, thus simplifying your plant communication. Time-critical communications, such as I/O, interlocking, and messages are supported without impacting network performance.

The Common Industrial Protocol (CIP) is a major component within the NetLinx Open Network Architecture, and it provides you with the following common features:

- Common control services—provides you with a standard set of messaging services for all three networks within the NetLinx architecture.
- Common communication services—lets you connect to any network and configure and collect data from any network common routing capabilities. This saves time and effort during system configuration because no routing tables or added logic are necessary to move data between networks.
- Common base knowledge—reduces the amount of training needed when moving to different networks within the NetLinx architecture by providing similar configuration tools and features.

All of the NetLinx-based networks – DeviceNet, ControlNet, and EtherNet/IP – use the Common Industrial Protocol (CIP), so they speak a common language and share a universal set of communication services.

- The DeviceNet network offers low-cost, high-speed access to plant-floor data from a broad range of plant-floor devices and a significant reduction in wiring.
- The ControlNet network allows intelligent, high-speed control devices to share the information required for supervisory control, work-cell coordination, operator interface, remote device configuration, programming, and troubleshooting.
- The EtherNet/IP network is an open industrial-networking standard that supports implicit and explicit messaging and uses commercial, off-the-shelf Ethernet equipment and physical media.

Network Selection

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.

How do I Know which Network is Best for My Application?

Use the following information to help decide which network is the best fit for what you want to accomplish.

Step 1: Determine my most important need.	Step 2: Choose a network.			Step 3: Evaluate which products are available for each network.
	DeviceNet network	ControlNet network	EtherNet/IP network	
Diagnostics	✓	✓	✓	Chapter 2: DeviceNet Network Chapter 3: ControlNet Network Chapter 4: EtherNet/IP Network
Lower-cost integration	✓ (Best choice)		✓	Chapter 2: DeviceNet Network Chapter 4: EtherNet/IP Network
Speed		✓	✓ (Best choice)	Chapter 3: ControlNet Network Chapter 4: EtherNet/IP Network
Determinism		✓	✓ (Best choice)	Chapter 3: ControlNet Network Chapter 4: EtherNet/IP Network
Redundancy		✓		Chapter 3: ControlNet Network
Enterprise-wide information		✓	✓ (Best choice)	Chapter 3: ControlNet Network Chapter 4: EtherNet/IP Network
Leverage web technologies			✓	Chapter 4: EtherNet/IP Network

This table shows characteristics for each network to help you make the best selection for your appliction.

Characteristic	DeviceNet Network	ControlNet Network	EtherNet/IP Network
Best Suited For	• Controlling low-density I/O • Configuring devices	• Controlling I/O • Configuring devices • Controller-to-controller (peer-to-peer) messaging and interlocking • Data collection	• Controlling I/O • Configuring devices • Controller-to-controller (peer-to-peer) messaging and interlocking • Data collection • Shop floor-to-top floor integration
Topology	Trunkline, dropline	• Trunkline,dropline • Star • Tree • Ring	• Multi-drop • Star • Daisy chain • Ring
Capacity	• Each DeviceNet network supports up to 64 nodes • The master scanner uses one node number, and node 63 is reserved as a default node number, leaving 62 nodes available for devices	• Each ControlNet network supports up to 99 nodes • Use repeaters to add more nodes • Some Rockwell Automation controllers support multiple ControlNet networks	Determined by individual devices on the network
Connections	N/A	• Scheduled or unscheduled • You indirectly determine the number of connections the controller uses by configuring the controller to communicate with other devices in the system	• Unscheduled • You indirectly determine the number of connections the controller uses by configuring the controller to communicate with other devices in the system
Distances	Daisy-chain or branch nodes along droplines up to a maximum of 6 m (20 ft) from the trunk	• Maximum distance depends on the number of nodes on the network • Use repeaters to gain more distance	• Distance choices vary widely, depending on whether you use CAT5 cable (UTP) or fiber media • With CAT5 cable, you can achieve maximum distances between a switch and a node of up to 100 m (328.08 ft)

For More Information

To learn more about NetLinx networks, look for these resources.

You can view or download publications at http://literature.rockwellautomation.com. To order paper copies of technical documentation, contact your local Rockwell Automation distributor or sales representative.

Resource	Description
Integrated Architecture Builder	Helps you build a product configuration based on your needs
DeviceNet Media Design and Installation Guide, publication DNET-UM072	Provides information on creating DeviceNet networks
ControlNet Coax Media Planning and Installation Guide, publication CNET-IN002	Provides information on creating ControlNet networks using coaxial media
ControlNet Fiber Media Planning and Installation Guide, publication CNET-IN001	Provides information on creating ControlNet networks using fiber media
ControlNet Ex Media Planning and Installation Guide, publication 1797-UM001	Provides information on creating ControlNet networks using extrinsically-safe media
EtherNet/IP Performance and Application Guide, publication ENET-AP001	Provides detailed EtherNet/IP connection information
Open DeviceNet Vendor Association (ODVA) and ControlNet International (CI) website, http://www.odva.org	Provides information on implementing DeviceNet, ControlNet and EtherNet/IP network technology

Encompass Partners

Through the Encompass program, our third-party product referencing program, you can quickly locate the products that best solve your application challenges. Use the Encompass search tool to sort and filter products from best-in-industry suppliers in your region to connect to the Rockwell Automation architecture, or to use with our products.

For Information on Encompass Products for the	Visit
DeviceNet Network	http://www.ab.com/db/encompass/bps_ext.abcom_search?x_connectivity_id=5
ControlNet Network	http://www.ab.com/db/encompass/bps_ext.abcom_search?x_connectivity_id=6
EtherNet/IP Network	http://www.ab.com/db/encompass/bps_ext.abcom_search?x_connectivity_id=181,341
EtherNet/IP Network with Add-on Profiles	http://www.ab.com/db/encompass/bps_ext.abcom_search?x_connectivity_id=181,341

DeviceNet Network

The DeviceNet network is a simple, open networking solution that reduces the cost and time required to wire and install industrial automation devices, while providing interchangeability of like components from multiple vendors.

Based on the Controller Area Network (CAN) technology, the DeviceNet networks a cost-effective solution for low-level industrial device networking and an effective way to provide access to the intelligence present in those devices. A DeviceNet network lets you connect devices directly to plant-floor controllers without hard-wiring each device into an I/O module.

Use a DeviceNet network to:

- reduce wiring and installation cost.
- reduce start-up time.
- significantly reduce downtime and the total cost of ownership with the aid of diagnostics, Auto Device Replacement, and other time- and cost-saving features.
- support standard and safety applications on the same wire.
- benefit from an open network.
- control, configure, and collect data on a single network.

Rockwell Automation offers a complete line of DeviceNet products.

Plan a DeviceNet Network

When planning a DeviceNet network, you should consider the following:

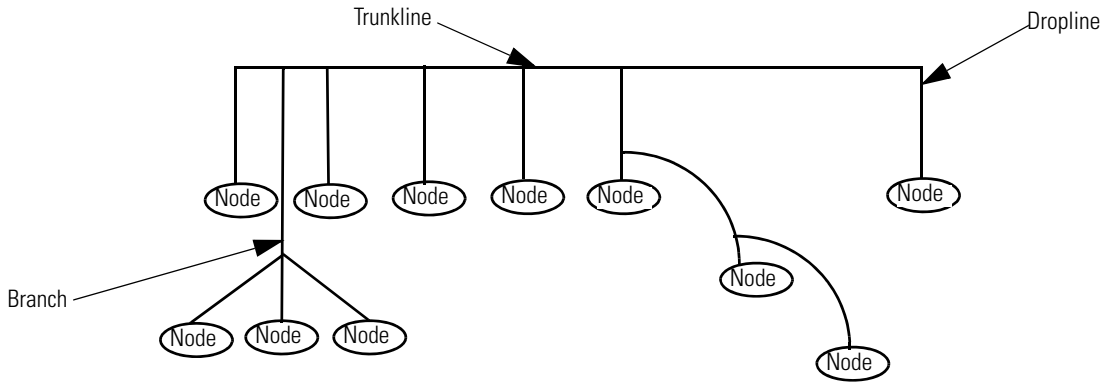
- Topology
- Number of nodes
- Distances
- Scanner memory

Network Topology

The DeviceNet network supports trunkline/dropline topology. You can daisy-chain or branch nodes along droplines up to a maximum of 6 m (20 ft) from the trunk.

TIP	Refer to the DeviceNet Media Design and Installation Guide, publication DNET-UM072, for more information on topologies you can create.

Example DeviceNet Network Topology



Number of Nodes

Each DeviceNet network supports up to 64 nodes. The master scanner uses one node number, and node 63 is reserved as a default node number, leaving 62 nodes available for devices. Most Rockwell Automation controllers support multiple DeviceNet networks, giving you the flexibility to add more nodes if needed.

Distances

For the DeviceNet network, you'll need to consider the distance of the:

- trunkline.
- dropline
- total distance of all the droplines in the network.

The data rate and type of trunkline cable you choose also affects maximum achievable network distances.

If you are concerned about system performance at a lower data rate, contact your Rockwell Automation representative to discuss options.

Use the following chart to determine maximum distances.

Data Rate	Max Distance (Flat Cable)	Max Distance (Thick Cable)	Max Distance (Thin Cable)	Max Distance (Lite Cable)	Cumulative Drop Line Length
125 Kbps	420 m (1378 ft)	500 m (1640 ft)	100 m (328 ft)	350 m (1448 ft)	156 m (512 ft)
250 Kbps	200 m (656 ft)	250 m (820 ft)	100 m (328 ft)	150 m (492 ft)	78 m (256 ft)
500 Kbps	75 m (246 ft)	100 m (328 ft)	100 m (328 ft)	55 m (180 ft)	39 m (128 ft)

Scanner Memory

Data is written to the memory of a scanner module by the processor. Depending on the devices connected to the DeviceNet network, the total I/O data sizes could exceed the capability of a single scanner module. The following table shows the allowable input and output data sizes for each DeviceNet scanner module. Adding together the data table input size and the discrete input size gives you the total input size for a scanner. Adding together the data table output size and the discrete output size gives you the total output size for a scanner. If the total I/O input size of the devices on the network exceeds the total input size or the total I/O output size exceeds the total output size, you will need an additional scanner for the control platform.

Scanner/communication Module	Data Table Input Size[1]	Data Table Output Size[1]	Discrete Input[2]	Discrete Output[2]
ControlLogix/1756-DNB	124 long words	123 long words		
SLC 500/1747-SDN	150 words	150 words	31 words	31 words
FlexLogix/1788-DNBO	124 long words	123 long words		
SoftLogix 5/1784-PCIDS	1024 words	1024 words		
SoftLogix 5800/1784-PCIDS	124 long words	123 long words		
CompactLogix/1769-SDN	90 long words	90 long words		
MicroLogix 1500/1769-SDN	180 words	180 words		
PLC-5/1771-SDN	356 words	356 words	1/2-slot: 24 bits 1-slot: 8 bits 2-slot: 0 bits	1/2-slot: 24 bits 1-slot: 8 bits 2-slot: 0 bits
1734-ADNX	251 words	124 words		
1738-ADNX	251	124		
Linking Devices On the DeviceNet network, linking devices function as scanners.				
1788-CN2DN (ControlNet-to-DeviceNet Linking Device)	124 long words	123 long words		
1788-EN2DN (EtherNet/IP-to-DeviceNet Linking Device)	124 long words	123 long words		

[1] 1 word = 16 bit; 1 long word = 32 bits.

[2] This discrete I/O space is mappable and accessible data space within the two scanners. It is called discrete because it is automatically transfered between the scanner and the processor in the PLC or SLC processors. In RSNetWorx for DeviceNet software, you can map data from the network into these areas and have them appear in the processor for the user program.

Communication Interfaces

You can customize your status and fault reporting with operator interface offerings from Rockwell Automation.

Controller Interfaces

Various controller platforms are available for the DeviceNet network.

Bulletin No.	Product	Interface
Programmable Automation Controllers		
1769	CompactLogix Controllers, 1769-L2 and 1769-L3 series	1769-SDN scanner 1769-ADN adapter
1768	CompactLogix Controllers, 1768-L4 series	1769-SDN scanner 1769-ADN adapter
1756	ControlLogix Controllers, 1756-L6 series	1756-DNB scanner
1789	SoftLogix 5800 Controllers	1784-PCIDS scanner
Programmable Logic Controllers		
1760	Pico Controllers, 1760-L18 and 1760-L20 series Pico GFX-70 Controllers	1760-DNET interface (slave only)
1761	MicroLogix 1000 Controllers	1761-NET-DNI interface (messaging)
1763	MicroLogix 1100 Controllers	1761-NET-DNI interface (messaging)
1762	MicroLogix 1200 Controllers	1761-NET-DNI interface (messaging)
1766	MicroLogix 1400 Controllers	1761-NET-DNI interface (messaging)
1764	MicroLogix 1500 Controllers	1769-SDN scanner (I/O control) 1761-NET-DNI interface (messaging)
1747	SLC 500 Controllers, 5/02, 5/03, 5/04, and 5/05 series	1747-SDN scanner
1785	PLC-5 Controllers	1771-SDN scanner
Safety Programmable Controllers		
1756	GuardLogix Integrated Safety System, 1756-L series	1756-DNB scanner
1752	SmartGuard 600 Controller	Built-in DeviceNet interface (safety master, safety slave, or standard slave)
Legacy Controllers		
1794	FlexLogix Controllers	1788-DNBO scanner

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	Built-in DeviceNet option on PanelView Standard 300, 550, 600, and 1000 Operator Terminals
2711P	PanelView Plus Operator Terminals	2711P-RN10C DeviceNet module for PanelView Plus 400, 600 terminals 2711P-RN10H DeviceNet module for PanelView Plus 700, 1000, 1250, 1500 terminals
2711P	PanelView Plus CE Operator Terminals	2711P-RN10H DeviceNet module for PanelView Plus CE 700, 1000, 1250, 1500 terminals
2706	InView Message Displays	2706-PDNETM DeviceNet module for 2706-P4 series displays 2706-PDNETK DeviceNet module for 2706-P7 and 2706-P9 series displays 2706-PDNETP DeviceNet module for 2706-P22R displays

Computer Interfaces

These products provide DeviceNet communication for control systems.

Cat. No.	Product	Description
1784-U2DN	USB to DeviceNet cable	Provides a DeviceNet network connection to any Microsoft Windows-based computer with a USB interface
1784-PCIDS	DeviceNet PCI I/O scanner card	Provides a PCI-bus PC with a DeviceNet port for general communication and I/O scanning
1770-KFD	DeviceNet RS-232 PC interface	Connects to a computer's RS-232 port, making it a DeviceNet node
1770-KFDG	DeviceNet RS-232 PC interface with power supply adapter	

RFID Interfaces

The DeviceNet Interface module provides a solution for automatic identification.

Cat. No.	Product	Description
54RF-IN-DNF	DeviceNet RFID Control Interface (general purpose; read only)	Integrates passive Radio Frequency Identification technology (RFID) and the DeviceNet network architecture into a field mountable enclosure
54RF-IN-DNG	DeviceNet RFID Control Interface (general purpose; read-write)	
55RF-IN-DN	DeviceNet RFID Control Interface (high speed)	
56RF-IN-DN	DeviceNet RFID Control Interface (light industrial)	
56RF-ICIN-DN	DeviceNet 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 DeviceNet and other networks.

Cat. No.	Product	Description
1788-CN2DN	ControlNet-to-DeviceNet Linking Device	Link a ControlNet network to a DeviceNet network
1788-EN2DN	EtherNet/IP-to-DeviceNet Linking Device	• Bridge explicit messages from an EtherNet/IP network to a DeviceNet network • Scan the DeviceNet network via the EtherNet/IP network

I/O Platforms

The 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 DeviceNet network:

- In-cabinet distributed I/O
  - Modular
  - Block
  - Safety block
- On-machine distributed I/O
  - Modular
  - Block
  - Embedded
  - Safety block
- Chassis-based I/O

In-cabinet Distributed I/O

In-cabinet (IP20) distributed I/O requires an enclosure for environmental protection, and is available in modular, block, and safety I/O styles.

Modular I/O is a system of interface cards and communications adapters that interface directly to the sensors and actuators of the machine/process 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.

Block I/O is a complete assembly of sensor and actuator interface points including a network adapter. It may or may not include a power supply and is available in fixed configurations.

Safety block I/O can be used with Rockwell Automation safety controllers to communicate on the DeviceNet network by using CIP Safety.

Bulletin No.	Product	Adapter
Modular I/O		
1734	POINT I/O	1734D POINTBlock series, communication interface with integrated I/O 1734-ADN adapter 1734-ADNX adapter with subnet connectivity 1734-PDN communication interface
1734-IB8S 1734-OB8S	POINT Guard Safety I/O	1734-PDN communication interface
1794	FLEX I/O	1794-ADN adapter
1797	FLEX Ex Intrinsically Safe I/O	1794-ADN adapter (use with 1797-BIC and 1797-CEC to connect to hazardous areas)
Block I/O		
1790	CompactBlock LDX I/O	Built-in adapter in base block
1791D	CompactBlock I/O	Built-in adapter in base block; DeviceLogix Smart Component Technology
Safety Block I/O		
1791DS	CompactBlock Guard I/O	Built-in adapter

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 is available in modular, block, safety, and embedded I/O styles. Modular I/O is a system of interface cards and communications adapters that interface directly to the sensors and actuators of the machine/process 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.

Block I/O is a complete assembly of sensor and actuator interface points including a network adapter. It may or may not include a power supply and is available in fixed configurations.

Embedded I/O is a printed circuit board for machine-embedded applications. It can be mounted directly inside or on a machine, in the side-channel of a conveyor, or within a field replaceable unit. These printed circuit boards are ideal for applications restricted by space limitations, applications requiring highly distributed I/O close to sensors and actuators, and applications with an enclosure provided.

Safety block I/O can be used with Rockwell Automation safety controllers to communicate by using CIP Safety on the DeviceNet network.

Bulletin No.	Product	Adapter
Modular I/O		
1738	ArmorPoint I/O	1738-ADN12 adapter with M12 Quick-disconnect termination 1738-ADN18 adapter with mini connector (drop-drop) 1738-ADN18P adapter with mini connector (pass-thru-pass-thru) 1738-ADNX adapter with subnet connectivity
Block I/O		
1732D	ArmorBlock I/O	Built-in adapter in base block
1792	ArmorBlock MaXum I/O	Built-in adapter in base block; DeviceLogix Smart Component Technology
Embedded I/O		
1799	Embedded I/O	Built-in adapter; DeviceLogix Smart Component Technology
Safety Block I/O		
1732DS	ArmorBlock Guard I/O	Built-in adapter

Chassis-based I/O

Chassis-based I/O is specifically designed for a particular controller, as part of its family. Networked Rockwell Automation chassis-based I/O systems can also be mounted away from the controller.

Bulletin No.	Product	Adapter
1756	ControlLogix I/O	1756-DNB
1769	Compact I/O	1769-ADN
1762	MicroLogix Expansion I/O	1761-NET-DNI (slave only)
1771	PLC-5 I/O	1771-SDN

XM Specialty Modules

The XM series is a group of intelligent, specialty I/O modules designed for machinery protection and condition monitoring. The XM modules monitor critical machinery parameters such as vibration, temperature, position, and speed. This information is processed within the XM modules in real-time using advanced amplitude and frequency alarming techniques to determine whether machinery is operating within acceptable parameters.

When limits are exceeded, XM modules can notify operators, capture data and/or actuate relays as appropriate for the detected fault.

The XM series of modules communicates over the DeviceNet network, or may be deployed as stand-alone solutions using built-in 4…20 mA outputs, integral relays and buffered outputs.

Cat. No.	Product	Description
Specialty I/O		
1440-VST02-01RA	XM-120 Dynamic Measurement Module	Monitors high performance turbo-machinery as well general purpose machines
1440-VST02-01RA	XM-120E Eccentricity Module (requires 1440-VST02-01RA module, plus Eccentricity firmware)	Monitors all types of rotating and reciprocating machinery where rotor bow must be measured prior to or during startup
1440-VLF02-01RA	XM-121 Low Frequency Measurement Module	Monitors low speed machinery
1440-VLF02-01RA	XM-121A Absolute Shaft Module (requires 1440-VLF02-01RA module, plus Absolute Shaft firmware)	Measures the shaft's motion relative to free space - its absolute motion

Cat. No.	Product	Description
1440-VGS02-01RA	XM-122 gSE Vibration Module	Monitors machines with rolling element bearings where continuous real-time protection is not required
1440-VAD02-01RA	XM-123 Aeroderivative Module	Monitors aeroderivative and gas turbines
1440-VDRS06-00RH	XM-160 Overall Vibration Module	Measures and reports the overall vibration level between selected high- and low-pass filters, as well as the gap or bias voltage per channel
1440-VDRS06-06RH	XM-161 Overall Vibration Module with 4...20 mA Outputs	
1440-VDRP06-00RH	XM-162 Overall Vibration Module with Prox Probe Power	
1440-TPR06-00RE	XM-360 Process Module	Measures DC voltage or current loop inputs
1440-TUN06-00RE	XM-361 Universal Temperature Module	Accepts measurements from an RTD or isolated thermocouple
1440-TTC06-00RE	XM-362 Thermocouple Temperature Module	Accepts measurements from isolated or grounded thermocouples
1440-TPS02-01RB	XM-320 Position Module	Measures axial position (thrust), valve position, case expansion, or differential expansion
1440-RMA00-04RC	XM-440 Master Relay Module	Adds four relay outputs to any XM network, as well as providing XM bus master capabilities for remote, shared, and voted relay operation
1440-REX00-04RD	XM-441 Relay Expansion Module	Adds four additional relays to any XM measurement or relay modules (12X, 16X, 32X, 36X, 440)
1440-REX03-04RG	XM-442 Voted EODS Relay Module	For use on gas and steam turbine driven machinery where protection is required to prevent potentially catastrophic failures of the machine from overspeed conditions

Power Supplies

Select the power supply that best fits your application.

Cat. No.	Product	Description
Standalone Power Supplies		
1787-DNPS	DeviceNet standalone power supplies	Provides 24V DC network power for devices connected to DeviceNet taps. • UL/CSA Class 2 power supply • Standard IEC three-pin connector • Main power switch with a dual-voltage selection switch • Standard DeviceNet five-pin open style connector
Switched Mode Power Supplies		
Bulletin 1606-XL	Standard power supplies, single- and three-phase	Provides a significant space savings over existing power supply solutions. • Extra-low inrush current • Wide range AC/DC input; auto select input • Superior reserve power (can support 150% rated power for 3...5 seconds)

Cat. No.	Product	Description
Bulletin 1606-XLP	Compact power supplies, single- and two-phase	Provides an additional space and cost savings alternative for 25...100 W applications; frame size is 50% smaller than most other comparable units. • Low inrush current • Wide range input; auto select input • NEC Class 2 Limited Power
Bulletin 1606-XLS	Performance power supplies, single- and three-phase	Designed with a power boost that provides additional power reserves up to 25% without any reduction in output voltage. Overload design delivers up to 180% of nominal current continuously at a reduced voltage with no negative thermal effects. • Low inrush current • PFC Choke • NEC Class 2 Limited Power • Redundancy
Uninterruptible Power Supplies		
Bulletin 1609-U	Uninterruptible power supplies, DIN rail mounted	Provides back-up AC power to the control cabinet to bridge dips, sags, or brief losses of power. When necessary, will facilitate a safe shut-down of your industrial PC, controller, data logging HMI, or any other critical device in the control scheme. • Elevated temperature performance (up to 50 °C [122 °F]) • Remote monitoring/configuration • Line interactive • Pure sine wave output
Transformers		
Bulletin 1497	Control circuit transformer	Reduces supply voltages to machine tool control circuits, providing greater safety to operators. • Wide VA range • Enclosed construction 63...350VA • Dual primary and secondary fuse block available to 500VA • Class B insulation (130 °C [266 °F])

Industrial Controls

Rockwell Automation offers a full line of tough controls that stand up to harsh industrial conditions.

Pushbuttons

Bulletin No.	Product	Description
Bulletin 800E	Pushbutton Stations with DeviceLogix Smart Component Technology	Rugged, industrially proven pushbutton station
Bulletin 800E	Pendant Stations with Pushbuttons	DeviceNet Control Enclosure with 24V AC/DC mini quick change

Signals

Bulletin No.	Product	Description
Bulletin 855T	Control Tower Stack Lights	Enhance safety visibly and audibly. • Surface, vertical, or pole mounting • Light modules - UL Type 4/4X/13, IP65 • Sound modules - piezo and transducer options

Sensors

Bulletin No.	Product	Description
42GNx series	SmartSight 9000 DeviceNet Sensors	For use in harsh environments such as breweries and food processing plants, with temperatures up to 70 °C (158 °F), or high-pressure washdowns and many harsh solvents • NEMA 6P, IP67, 1200 psi washdown rating • Micro or mini style connectors or attached 2m CPE drop cable • I/O change-of-state and strobe messaging
42EF series	RightSight Photoelectric Sensors	For use in material handling and packaging industries where shorter sensing distances are required • NEMA 4X, IP67 1200 psi washdown rating • I/O change-of-state and strobe messaging
Bulletin 871TM	Inductive Proximity Sensors	For use in potentially corrosive environments such as metalworking, food processing, and material handling industries • 1200 psi (8270 kPa) washdown rating • Mini or micro QD, or 2 m CPE jacketed cable • I/O change-of-state and strobe messaging
Bulletin 802DN	Limit Switches	For use in applications that require heavy-duty pilot ratings, a high degree of versatility, and rugged, oil-tight construction • NEMA 13 and IP65 (IEC529) rating • Mini or micro QD, or 2m CPE jacketed cable • I/O change-of-state and strobe messaging • Built-in DeviceNet connectivity
Bulletin 842D	Absolute Rotary Encoders	For use in applications that require direct connection to the DeviceNet network • NEMA 4, 13 and IP66 (IEC 529) rating • Five-pin micro quick disconnect • I/O change-of-state and strobe messaging

Motor Control

Electric motors handle more than half the workload of a typical network, providing the power for virtually every process involved in your applications. Rockwell Automation offers a wide array of motor controllers for the DeviceNet network.

Cat. No.	Product	Description
Bulletin 280	ArmorStart Full Voltage Starter	• Networked Full Voltage Starter • IP67 NEMA Type 4 enclosure rating • NEMA Type 4x enclosure ratings available • Quick Disconnect Cabling system • Four auxiliary inputs/two auxiliary outputs • DeviceLogix enabled
Bulletin 281	ArmorStart Full Voltage Reversing Starter	• Networked Full Voltage Reversing Starter • IP67 NEMA Type 4 enclosure rating • NEMA Type 4x enclosure ratings available • Quick Disconnect Cabling system • Four auxiliary inputs/two auxiliary outputs • DeviceLogix enabled
Bulletin 283	ArmorStart Soft Starter	• Networked Soft Starter • IP67 NEMA Type 4 enclosure rating • NEMA Type 4x enclosure ratings available • Quick Disconnect Cabling system • Four auxiliary inputs/two auxiliary outputs • DeviceLogix enabled
Bulletin 284	ArmorStart Drive	• Networked Drive • IP67 NEMA Type 4 enclosure rating • NEMA Type 4x enclosure ratings available • Quick Disconnect Cabling system • Four auxiliary inputs/two auxiliary outputs • PF4 and PF40 based units available • DeviceLogix enabled
Bulletin 100	DeviceNet Starter Auxiliary Module	• Quick integration of low-level devices with minimal I/O requirements into the DeviceNet network • DeviceLogix Smart Component Technology
Bulletin 193-EC	E3 Solid-State Overload Relay	• Monitor motor performance and protect motors to prevent and minimize production downtime • DeviceNet-enabled • I/O change-of-state, cyclic and polling messaging
Bulletin 193 Bulletin 592	E1 Plus Electronic Overload Relay	Modular, self-powered devices; side-mount accessory Jam and DeviceNet modules expands the functionality of the E1 Plus Overload Relays

Cat. No.	Product	Description
Bulletin 150	SMC-Flex Smart Motor Controller	Soft start motor starting capabilities for both star-delta and standard squirrel-cage induction motors
Bulletin 825-P	Modular Protection System	Allows an installer to configure a device's functional capabilities to match the application requirements • Compact, modular design with pluggable options • DeviceNet communication option card incorporates DeviceLogix component technology
CENTERLINE 1500	CENTERLINE Motor Control Centers (MCCs) with IntelliCENTER technology	Motor control and protection devices with advanced networking and diagnostic capabilities; IntelliCENTER technology features built-in DeviceNet network connectivity, intelligent motor controls, pre-configured and tested networks
CENTERLINE 2100 CENTERLINE 2500	CENTERLINE Motor Control Centers (MCCs) with IntelliCENTER technology	Improve the intelligence of your MCC with IntelliCENTER Technology to capture information used for predictive maintenance, process monitoring and advanced diagnostics • Built-in DeviceNet network connectivity • Intelligent Motor Control • Preconfigured and tested networks • Factory configured
Bulletin 7700	OneGear Motor Control Centers (MCCs)	Motor control, protection and monitoring devices with advanced networking and diagnostic capabilities; featuring built in DeviceNet network communication capabilities

Drives

Rockwell Automation drives are a full family of adjustable speed drives that can connect to the DeviceNet networks. These drives can be configured locally via a Human Interface Module (HIM), or over the network at any point—during startup or runtime. You can read diagnostics (such as current draw, phase, output, and 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 Drive	• 0.2…3.7 kW (0.25…5 Hp) • Voltage ratings: 100…120V, 200…240V, 380…480V	22-COMM-D
PowerFlex 4M AC Drive	• 'A' frame, 'B' frame, liquid cooled 'C' frame • 0.2…11 kW (0.25…15 Hp) • Voltage ratings: 120V, 240V, 480V	22-COMM-D
PowerFlex 40 AC Drive	• 0.4…11 kW (0.5…15 Hp) • Voltage ratings: 100…120V, 200…240V, 380…480V, 460…600V	22-COMM-D DeviceNet network connectivity also available as a configured option
PowerFlex 40P AC Drive	• 0.4…11 kW (0.5…15 Hp) • Voltage ratings: 200…240V, 380…480V, 460…600V	22-COMM-D
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-D DeviceNet also available as a configured option
PowerFlex 70 AC Drive	• 0.37...37 kW (0.5…50 Hp) • Voltage ratings: 200...240V, 380...480V, 500...600V	20-COMM-D
PowerFlex 700 AC Drive	• 0.37...132 kW (0.5...200 Hp) • Voltage ratings: 200...240V, 380...480V, 500...690V	20-COMM-D
PowerFlex 700S AC Drive with DriveLogix	• 0.75...400 kW (1...600 Hp) with voltage ratings of 380...480V • 0.75....55 kW (1...75 Hp) with voltage ratings of 200...240V	20-COMM-D
PowerFlex 755 AC Drive	• 5.5...250 kW (7.5...350 Hp) • Voltage ratings: 380...480V AC	20-750-DNET
PowerFlex 7000	PowerFlex 7000A, 7000B, 7000L AC Drives • 'A' frame, 'B' frame, liquid cooled 'C' frame • 150...8500 Hp	20-COMM-D
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-D
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-GK5 (external) 1203-GU6 (external)

Servo Drives

The Ultra3000 family of servo drives supports applications ranging from simple standalone indexing applications to multi-axis integrated motion. The Ultra5000 Intelligent Positioning Drive is a high performance, compact, programmable positioning servo drive that combines performance and flexibility to satisfy the most advanced motion applications. The Ultra5000 is strategically positioned to accommodate stand-alone single axis applications through its high speed DSP processing, standard ANSI C programming language and on-board I/O and communication capabilities.

Bulletin No.	Product	Interface
Bulletin 2098	Ultra3000 Digital Servo Drive	Built-in DeviceNet network connectivity option
Bulletin 2098	Ultra5000 Intelligent Positioning Drive	2090-U5EK-DN Ultra 5000 DeviceNet Expansion Kit

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. Data from the Powermonitor family of devices can be communicated over the DeviceNet network.

Bulletin No.	Product	Interface
Bulletin 1403	Powermonitor II Monitors real-time readings, including harmonics and waveform analysis, at major incoming feeders and major transformers	1403-NDNET DeviceNet communication module
Bulletin 1404	Powermonitor 3000 Provides real-time power quality data, harmonics analysis, oscillography, and sub-metering	Built-in DeviceNet network communication port

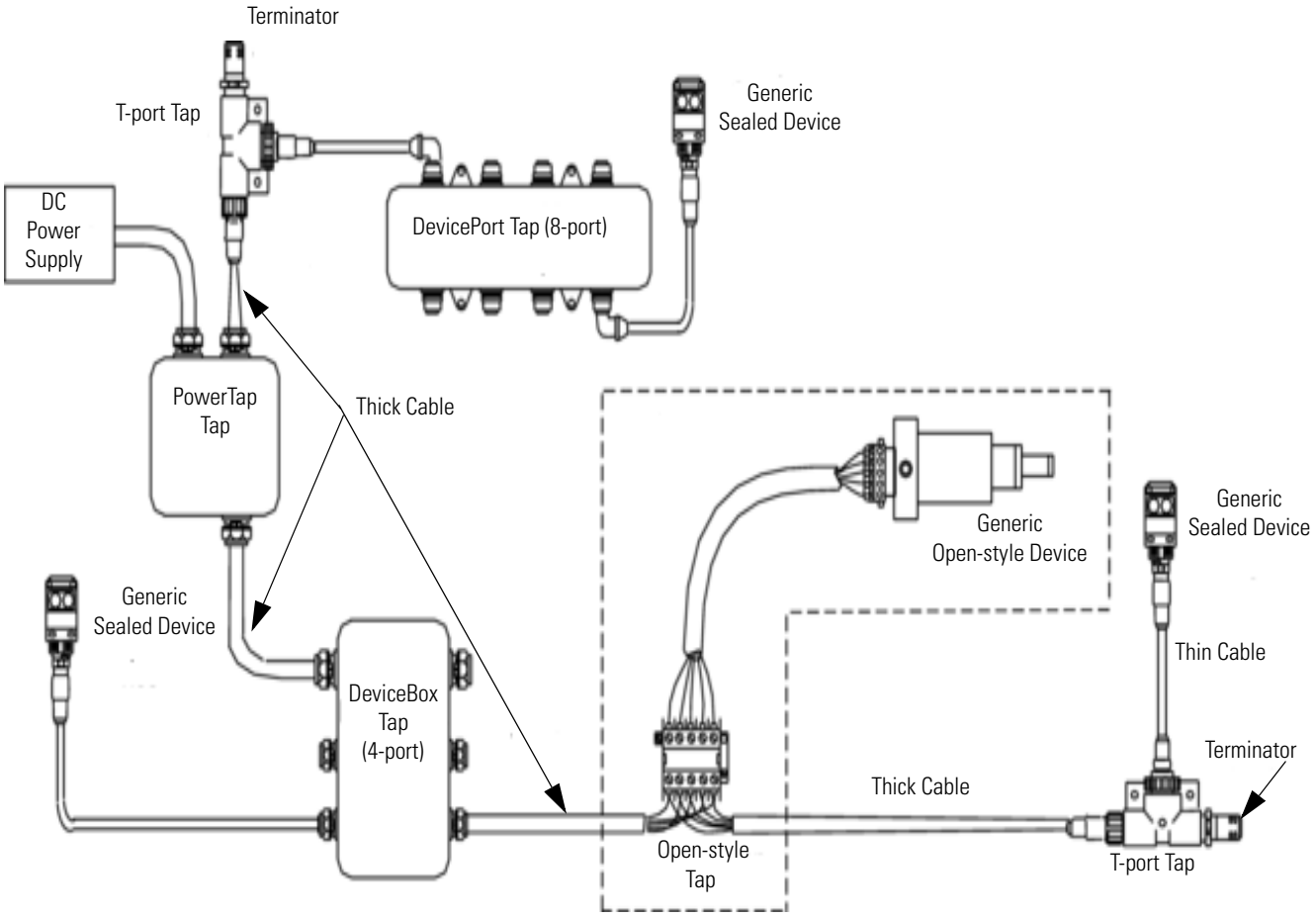
Software

There are many software options for your DeviceNet network.

Cat. No.	Product	Description
9357 series	RSNetWorx for DeviceNet 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 DeviceNet Software Add-On (add-on to your existing RSNetWorx for DeviceNet software)	Maintenance and diagnostic component for RSNetWorx for DeviceNet software that provides pre-configured diagnostic analysis and troubleshooting information for the DeviceNet network
	RSNetWorx MD for DeviceNet Software Bundle (includes RSNetWorx for DeviceNet 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

Physical Media

DeviceNet physical media includes cable for trunk lines and drop lines, as well as connectors, taps and ports. Choose from round media for standard installations, or the innovative KwikLink flat cable for more modular applications.



Round Media

Round trunk cable is available in bulk spools or as pre-molded cordsets or patchcords in varying lengths. A wide variety of rugged, durable DeviceNet components is available for use in round trunk systems. These components include drop cables, T-Ports, DeviceBox, DevicePort, PowerTap and a multitude of other components and accessories. Stainless steel versions of round cable system components are also available.

Thick Trunk Round Media System

Thick trunk round media systems use thick cable for maximum DeviceNet trunk line length.

Cat. No.	Description
This table contains information on the most popular products. See the On-Machine Connectivity Catalog, publication M116-CA001, for more information.	
Thick Trunk Cable	
1485C-P1A50	Thick Cable Spool, 50 m (164 ft)
1485C-P1A150	Thick Cable Spool, 150 m (492 ft)
1485C-P1A300	Thick Cable Spool, 300 m (984 ft)
1485C-P1A500	Thick Cable Spool, 500 m (1640 ft)
Thick Cable Terminal Chambers (Field Attachable Connectors)	
871A-TS5-NM3	Straight Mini Male Terminal Chamber, Thick, screw type
871A-TS5-N3	Straight Mini Female Terminal Chamber, Thick, screw type
Thick Trunk Molded Cordsets/Patchcords/Receptacles	
1485C-PxM5-C	Straight Mini Male to Conductor: x meters (x = 1 - 10, 12, 18, 24, 30 standard)
1485C-PxN5-C	Straight Mini Female to Conductor: x meters (x = 1 - 10, 12, 18, 24, 30 standard)
1485C-PxN5-M5	Straight Mini Male to Straight Mini Female: x meters (x = 1 - 10, 12, 18, 24, 30 standard)
1485F-PxM5-A	Receptacle, Mini Male to Conductor, 1/2NPT mount: x meters (x = 1, 2, 3, 5 standard)
1485F-PxN5-A	Receptacle, Mini Female to Conductor, 1/2NPT mount: x meters (x = 1, 2, 3, 5 standard)
1485A-CXN5-M5	Bulkhead Passthru, DeviceNet, Mini
T-Ports	
1485P-P1N5-MN5R1	T-Port, Mini to Mini Trunk, Mini Drop with Right Keyway
1485P-P1N5-MN5R1	T-Port, Mini to Mini Trunk, Mini Drop with Left Keyway
1485P-P1R5-MN5R1	T-Port, Mini to Mini Trunk, Micro Drop
PowerTap	
1485T-P2T5-T5	Thick PowerTap, Cable Gland Connections
1485T-P1M4-MN5R1	PowerTap T-port, Mini to Mini Trunk, 4-pin Mini Male input
DeviceBox	
1485P-P2T5-T5	DeviceBox, 2-port, Cable Gland Connections, Thick
1485P-P4T5-T5	DeviceBox, 4-port, Cable Gland Connections, Thick
1485P-P8T5-T5	DeviceBox, 8-port, Cable Gland Connections, Thick

Cat. No.	Description
DevicePort	
1485P-P4N5-MN5	DevicePort, 4-port, (4) Mini Female, Mini Male/Female Thru-trunk Connection
1485P-P6N5-MN5	DevicePort, 6-port, (6) Mini Female, Mini Male/Female Thru-trunk Connection
1485P-P4R5-MN5	DevicePort, 4-port, (4) Micro Female, Mini Male/Female Thru-trunk Connection
1485P-P6R5-MN5	DevicePort, 6-port, (6) Micro Female, Mini Male/Female Thru-trunk Connection
1485P-P4N5-M5	DevicePort, 4-port, (4) Mini Female, Mini Male Trunk Connection
1485P-P8N5-M5	DevicePort, 8-port, (8) Mini Female, Mini Male Trunk Connection
1485P-P4R5-C2-M5	DevicePort, 4-port, (4) Micro Female, Mini Male Pigtail (2m) Trunk Connection
1485P-P8R5-C2-M5	DevicePort, 8-port, (8) Micro Female, Mini Male Pigtail (2m) Trunk Connection
1485P-P4R5-C2	DevicePort, 4-port, (4) Micro Female, Thin Cable Pigtail (2m) Trunk Connection
1485P-P8R5-C2	DevicePort, 8-port, (8) Micro Female, Thin Cable Pigtail (2m) Trunk Connection
Auxiliary Power Cordsets/Patchcords/Receptacles/Bulkhead Passthrus	
889N-F4AFNM-x	4-pin, Straight Mini Male to Straight Mini Female: x meters (x = 1...6, 10, 15, 20 standard)
888N-M4AF1-xF	Receptacle, 4-pin Mini Male to Conductor, 1/2NPT mount: x feet (x = 1, 3 standard)
888N-D4AF1-xF	Receptacle, 4-pin Mini Female to Conductor, 1/2NPT mount: x feet (x = 1, 3, 12 standard)
889A-CXN4-M4	Bulkhead Passthru, 4-pin Mini
Auxiliary Power T-Ports	
898N-43PB-N4	Aux Pwr T-Port, Mini to Mini Pwr Trunk, Mini Drop
898N-43AB-N4	Aux Pwr / Safety T-Port, Mini to Mini Pwr Trunk, Mini Drop
898N-41AU-NM4	Aux Pwr / Safety Shorting Plug, Mini Male
898N-41AU-N4	Aux Pwr / Safety Shorting Plug, Mini Female
Accessories/Miscellaneous	
1492-DN3TW	Terminal Block Assembly, DeviceNet
1787-PLUG-10R	Open-style, 10-position Linear Plug (bag of 10pcs)
1485A-ACCKIT	Accessory Kit for DeviceBox
1485A-C2	Terminating Resistor
1485A-C1	Sealing Cap, Mini
1485A-C3	Sealing Cap, Micro

Cat. No.	Description
1799-DNETCON	5-pin Linear Plug, Open-style
1799-DNETSCON	5-pin Linear Plug, Open-style, w/ Jack Screws
1799-DNC5MMS	Female Open-style DeviceNet Y Adapter

Thin Trunk Round Media System

Round media thin trunk systems use thin cable to reduce maximum trunk line distances with a more compact and cost-effective installation for some applications. Thin cable outer jacket material is TPE for additional chemical resistance.

Cat. No.	Description
This table contains information on the most popular products. See the On-Machine Connectivity Catalog, publication M116-CA001, for more information.	
Thin Cable (Trunk and Drop)	
1485C-P1C50	Thin Cable Spool, 50 m (164 ft)
1485C-P1C150	Thin Cable Spool, 150 m (492 ft)
1485C-P1C300	Thin Cable Spool, 300 m (984 ft)
1485C-P1C600	Thin Cable Spool, 600 m (1968 ft)
Thick Cable Terminal Chambers (Field Attachable Connectors)	
871A-TS5-DM1	Straight Micro Male Terminal Chamber, Thin, screw type
871A-TS5-D1	Straight Micro Female Terminal Chamber, Thin, screw type
871A-TR5-DM1	Right Angle Micro Male Terminal Chamber, Thin, screw type
871A-TR5-D1	Right Angle Micro Female Terminal Chamber, Thin, screw type
871A-TS5-NM1	Straight Mini Male Terminal Chamber, Thin, screw type
871A-TS5-N1	Straight Mini Female Terminal Chamber, Thin, screw type
Thin Drop Molded Cordsets/Patchcords/Receptacles/Bulkhead Passthrus	
1485R-PxD5-C	Straight Micro Male to Conductor: x meters (x = 1...6 standard)
1485R-PxF5-C	Right Angle Micro Male to Conductor: x meters (x = 1...6 standard)
1485R-PxR5-C	Straight Micro Female to Conductor: x meters (x = 1...6 standard)
1485R-PxV5-C	Right Angle Micro Female to Conductor: x meters (x = 1...6 standard)
1485R-PxR5-D5	Straight Micro Male to Straight Micro Female: x meters (x = 1...6 standard)
1485R-PxR5-F5	Right Angle Micro Male to Straight Micro Female: x meters (x = 1...6 standard)
1485R-PxN5-F5	Right Angle Micro Male to Straight Mini Female: x meters (x = 1...6 standard)
1485R-PxM5-C	Straight Mini Male to Conductor: x meters (x = 1...6 standard)
1485R-PxN5-C	Straight Mini Female to Conductor: x meters (x = 1...6 standard)

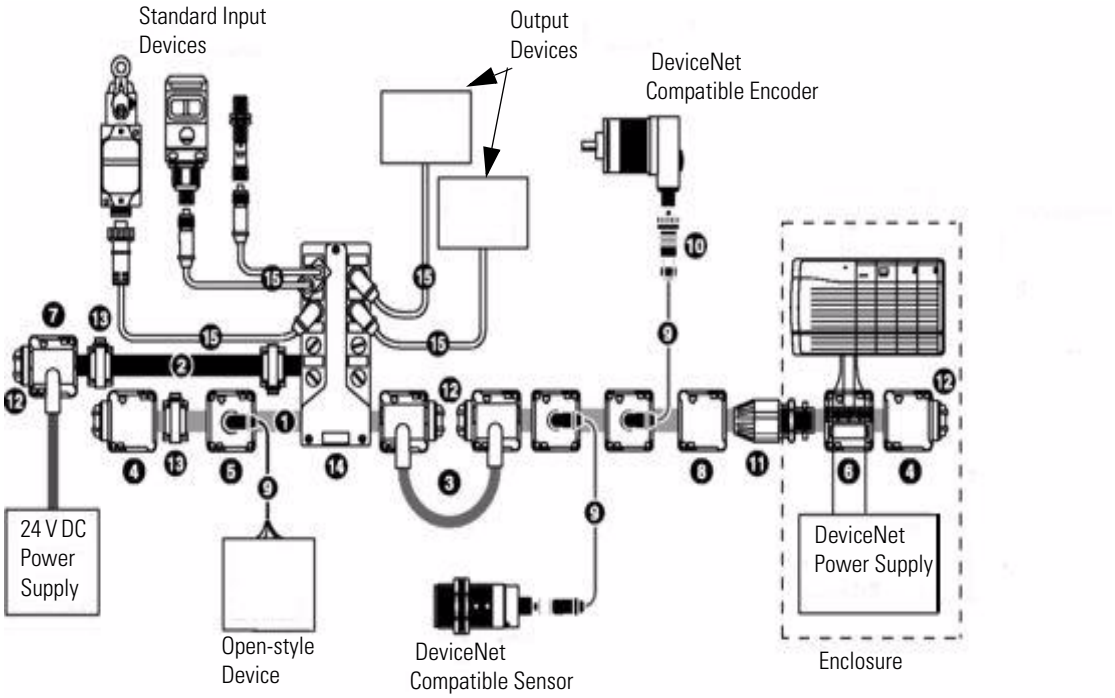
Cat. No.	Description
1485R-PxN5-M5	Straight Mini Male to Straight Mini Female: x meters (x = 1...6 standard)
1485R-PxM5-R5	Straight Mini Male to Straight Micro Female: x meters (x = 1...6 standard)
1485R-PxM5-V5	Straight Mini Male to Right Angle Micro Female: x meters (x = 1...6 standard)
1485F-PxD5-C	Receptacle, Micro Male to Conductor, 1/2NPT mount: x meters (x = 1...3 standard)
1485F-PxR5-C	Receptacle, Micro Female to Conductor, 1/2NPT mount: x meters (x = 1...3 standard)
1485F-PxM5-C	Receptacle, Mini Male to Conductor, 1/2NPT mount: x meters (x = 1...3 standard)
1485F-PxN5-C	Receptacle, Mini Female to Conductor, 1/2NPT mount: x meters (x = 1...3 standard)
1485A-CXN5-M5	Bulkhead Passthru, DeviceNet, Mini
1485A-CXR5-D5	Bulkhead Passthru, DeviceNet, Micro
Terminators	
1485A-T1D5	Micro Male Terminator
1485A-T1R5	Micro Female Terminator
T-Ports	
1485P-P1R5-DR5	T-Port, Micro to Micro Trunk, Micro Drop
PowerTap	
1485T-P2T5-T5C	Thin PowerTap, Cable Gland Connections
DeviceBox	
1485P-P2T5-T5C	DeviceBox, 2-port, Cable Gland Connections, Thin
1485P-P4T5-T5C	DeviceBox, 4-port, Cable Gland Connections, Thin
1485P-P8T5-T5C	DeviceBox, 8-port, Cable Gland Connections, Thin
DevicePort	
1485P-P4R5-D5	DevicePort, 4-port, (4) Micro Female, Male Micro Trunk Connection
1485P-P8R5-D5	DevicePort, 8-port, (8) Micro Female, Male Micro Trunk Connection
1485P-P4R5-C2-F5	DeviceBox, 4-port, (4) Micro Female, Rt Angle Micro Male Pigtail (2m) Trunk Connection
1485P-P8R5-C2-F5	DevicePort, 8-port, (8) Micro Female, Rt Angle Micro Male Pigtail (2m) Trunk Connection
1485P-P4R5-C2	DevicePort, 4-port, (4) Micro Female, Thin Cable Pigtail (2m) Trunk Connection
1485P-P8R5-C2	DevicePort, 8-port, (8) Micro Female, Thin Cable Pigtail (2m) Trunk Connection
Accessories/Miscellaneous	
1492-DN3TW	Terminal Block Assembly, DeviceNet
1787-PLUG-10R	Open-style, 10-position Linear Plug (bag of 10pcs)

Cat. No.	Description
1485A-ACCKIT	Accessory Kit for DeviceBox
1485A-C2	Terminating Resistor
1485A-C1	Sealing Cap, Mini
1485A-C3	Sealing Cap, Micro

KwikLink Flat Media

The KwikLink flat media system provides a simple, modular cabling method with its flat four-wire cable and Insulation Displacement Connectors (IDCs). Designed to provide up to 50% savings in installation costs by offering a drastic reduction in labor and materials, the KwikLink system allows nodes to be added to the network quickly and easily – without severing the trunkline. Cutting or stripping of the trunkline is eliminated, as is the need for predetermined cable lengths. The KwikLink system offers maximum simplicity while still supporting 64 nodes. A full complement of accessories is also available for the KwikLink flat media system

Visit http://www.ab.com/sensors/products/devicenet/kwiklinklite.html for more information.



Item Number	Description
1	KwikLink Trunk Cable
2	KwikLink Auxiliary Power Cable
3	Splice Kit
4	Terminator
5	Connector IDC
6	Open Style IDC
7	Class1 Drop and Power Tap
8	Dust Cap
9	KwikLink Drop Cable
10	Terminal Chamber
11	Conduit Adapter
12	Flat Cable End Cap
13	Mounting Clamp
14	ArmorBlock MaXum
15	ArmorBlock Cordsets

KwikLink Heavy Duty Flat Media System

KwikLink Heavy Duty Connectors are the original connector style for flat media. This rugged industrial connector design incorporates a removable field interface cap in a multitude of connection types including micro, mini pigtail, cable pigtail, open style, and terminator style, in addition to splice kits for joining two separate flat media trunk sections.

Cat. No.	Description
This table contains information on the most popular products. See the On-Machine Connectivity Catalog, publication M116-CA001 for more information.	
KwikLink Flat Trunk Cable	
1485C-P1Exx	Flat Cable Spool, Trunk, TPE, Class 1, Grey: xx meters (75, 200, or 420)
1485C-P1Gxx	Flat Cable Spool, Trunk, PVC, Class 2, Light Grey: xx meters (75, 200, or 420)
KwikLink Heavy Duty Splice Kits	
1485P-P1E4-S	Standard KwikLink Heavy-Duty Splice Kit, Sealed
1485P-P1H4-S	Standard KwikLink Heavy-Duty Splice Kit, Unsealed
1485P-P1E4-SX	Power Isolation KwikLink Heavy-Duty Splice Kit, Sealed
1485P-P1H4-SX	Power Isolation KwikLink Heavy-Duty Splice Kit, Unsealed
KwikLink Heavy Duty Connectors	
1485P-P1H4-T4	Open-style, Unsealed
1485P-P1E4-R5	Micro, Sealed

Cat. No.	Description
1485P-P1H4-R5	Micro, Unsealed
1485T-P1E4-Bx	Mini Pigtail drop (CL1), Sealed: x meters (x = 1...6 standard)
1485P-P1E4-Bx-N5	Cable Pigtail drop (CL1), Sealed: x meters (x = 1, 2, 3, 6 standard)
KwikLink Heavy Duty Terminators	
1485A-T1E4	Terminator, Sealed
1485A-T1H4	Terminator, Unsealed
KwikLink Drop Molded Cordets/Patchcords/Bulkhead Passthrus	
1485K-PxF5-C	Right Angle Micro Male to Conductor: x meters (x = 1...6 standard)
1485K-PxF5-R5	Right Angle Micro Male to Straight Micro Female: x meters (x = 1...6 standard)
1485K-PxF5-V5	Right Angle Micro Male to Right Angle Micro Female: x meters (x = 1...6 standard)
1485K-PxF5-N5	Right Angle Micro Male to Straight Mini Female: x meters (x = 1...6 standard)
1485K-PxF5-Z5	Right Angle Micro Male to Right Angle Mini Female: x meters (x = 1...6 standard)
1485A-CXR5-D5	Bulkhead Passthru, DeviceNet, Micro
1485A-CXN5-M5	Bulkhead Passthru, DeviceNet, Mini
Thin Cable Terminal Chambers (Field Attachable Connectors)	
871A-TS5-DM1	Straight Micro Male Terminal Chamber, Thin, screw type
871A-TS5-D1	Straight Micro Female Terminal Chamber, Thin, screw type
871A-TR5-DM1	Right Angle Micro Male Terminal Chamber, Thin, screw type
871A-TR5-D1	Right Angle Micro Female Terminal Chamber, Thin, screw type
871A-TS5-NM1	Straight Mini Male Terminal Chamber, Thin, screw type
871A-TS5-N1	Straight Mini Female Terminal Chamber, Thin, screw type
Auxiliary Power KwikLink Flat Cable	
1485C-P1Lxx	Flat Cable Spool, Auxiliary Power, PVC, Class 1, Black: xx meters (75, 200, or 420)
Auxiliary Power KwikLink Heavy Duty Connectors	
1485T-P1E4-Cx	4-conductor Cable Pigtail drop (CL1), Sealed: x meters (x = 1, 2, 3, 6 standard)
1485T-P1E4-Cx-N4	4-pin Mini Pigtail drop (CL1), Sealed: x meters (x = 1...6 standard)
Auxiliary Power Receptacles/Bulkhead Passthrus	
888N-D4AF1-xF	Receptacle, 4-pin Mini Female to Conductor, 1/2NPT mount: x feet (x = 1, 3, 12 standard)
889A-CXN4-M4	Bulkhead Passthru, 4-pin Mini
KwikLink Accessories/Miscellaneous	
1485A-C5E4	KwikLink Module Dust Cap
1485A-CAD	Flat Cable Conduit Adapter

Cat. No.	Description
1485A-FCM	Flat Cable Mounting Clamp
1485A-CAP	Flat Cable End Cap for KwikLink
1485A-M12	Sealing Cap, Micro, Plastic
1492-DN3TW	Terminal Block Assembly, DeviceNet

KwikLink General Purpose Flat Media System

KwikLink General Purpose connectors provide a simple low profile two-piece connector design for less demanding industrial applications. These micro style connectors are offered with an extremely pliable flat cable for maximum ease of installation and cable routing and are rated for use in IP67 environments.

Cat. No.	Description
This table contains information on the most popular products. See the On-Machine Connectivity Catalog, publication M116-CA001 for more information.	
KwikLink General Purpose Flat Trunk Cable	
1485C-P1Kxx	Flat Cable Spool, Trunk, PVC, Class 2, Grey: xx meters (75, 200, or 420)
KwikLink General Purpose Connectors	
1485P-K1E4-R5	Micro, Sealed (IP67)
KwikLink Terminators	
1485A-T1D5	Micro Male Terminator
KwikLink Drop Molded Cordets/Patchcords/Bulkhead Passthrus	
1485K-PxF5-C	Right Angle Micro Male to Conductor: x meters (x = 1...6 standard)
1485K-PxF5-R5	Right Angle Micro Male to Straight Micro Female: x meters (x = 1...6 standard)
1485K-PxF5-V5	Right Angle Micro Male to Right Angle Micro Female: x meters (x = 1...6 standard)
1485K-PxF5-N5	Right Angle Micro Male to Straight Mini Female: x meters (x = 1...6 standard)
1485K-PxF5-Z5	Right Angle Micro Male to Right Angle Mini Female: x meters (x = 1...6 standard)
1485A-CXR5-D5	Bulkhead Passthru, DeviceNet, Micro
1485A-CXN5-M5	Bulkhead Passthru, DeviceNet, Mini
Thin Cable Terminal Chambers (Field Attachable Connectors)	
871A-TS5-DM1	Straight Micro Male Terminal Chamber, Thin, screw type
871A-TS5-D1	Straight Micro Female Terminal Chamber, Thin, screw type
871A-TR5-DM1	Right Angle Micro Male Terminal Chamber, Thin, screw type
871A-TR5-D1	Right Angle Micro Female Terminal Chamber, Thin, screw type
871A-TS5-NM1	Straight Mini Male Terminal Chamber, Thin, screw type
871A-TS5-N1	Straight Mini Female Terminal Chamber, Thin, screw type

Cat. No.	Description
KwikLink Accessories/Miscellaneous	
1485A-CAD	Flat Cable Conduit Adapter
1485A-FCM	Flat Cable Mounting Clamp
1485A-KCAP	Standalone Flat Cable End Cap
1485A-M12	Sealing Cap, Micro, Plastic
1492-DN3TW	Terminal Block Assembly, DeviceNet
1787-PLUG-10R	Open-style, 10-position Linear Plug (bag of 10pcs)

KwikLink Lite Flat Media

KwikLink Lite is the new, ODVA-approved solution for wiring DeviceNet networks. This new physical media makes DeviceNet wiring and cable installation both quick and easy, and extends the network into light-duty, IP20-rated applications. Drop-lines for connecting nodes can be easily added using the unique KwikLink Lite two-piece connectors. Additionally, the cable system supports the intermixing of DeviceNet cable types (thin-round with flat). All of the KwikLink Lite Connectors provide Insulation Displacement Technology with reduced assembly time. Furthermore, the KwikLink Lite cable system can be used to connect to the network and communicate with other devices

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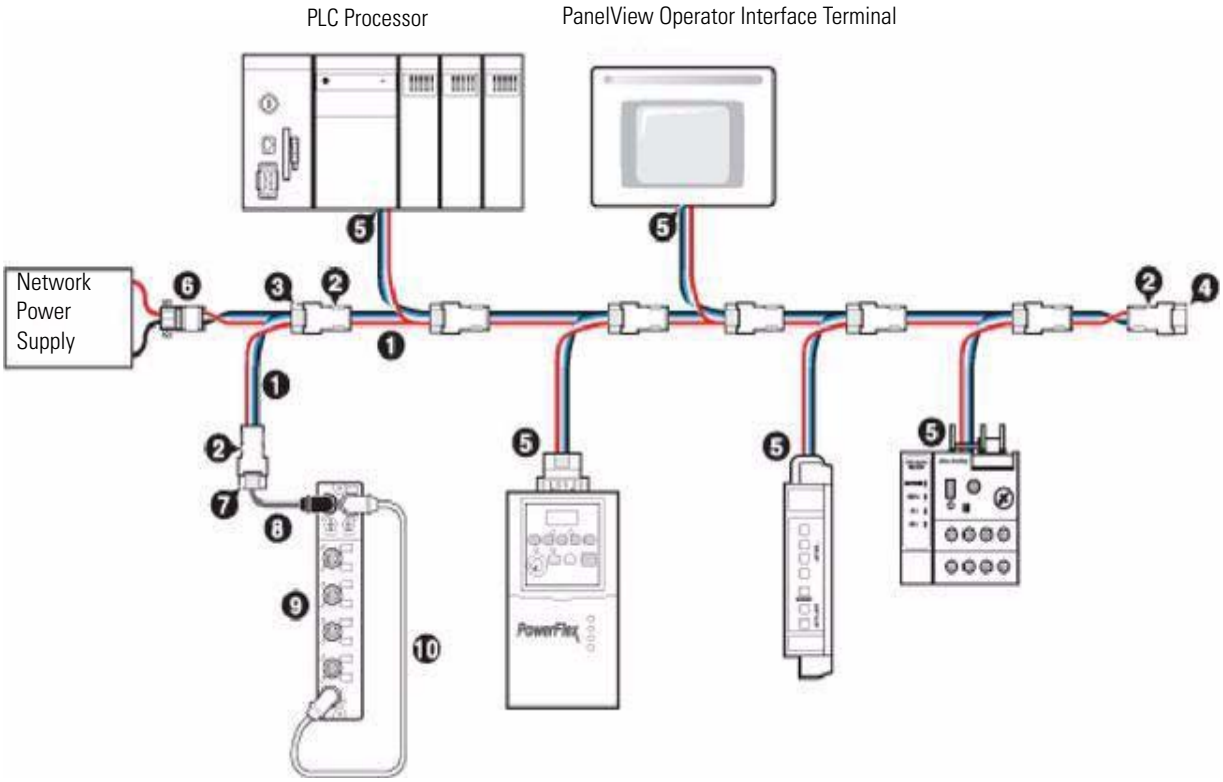


Item Number	Description
1	KwikLink Lite IP20 Media IDC
2	Trunk Line Connector IDC
3	Drop Line Connector IDC
4	Terminating Resistor IDC
5	5-pin Open Style Connector IDC
6	Terminal Block with Terminating Resistor
7	Flat to Thin Media Converter
8	KwikLink Drop Cable
9	ArmorBlock I/O
10	Auxiliary Power Cordsets

KwikLink Lite Flat Media System

Cat. No.	Description
KwikLink Lite Cable	
1485C-P1W100	IP20 flat media, cable spool, 100 m
1485C-P1W300	IP20 flat media, cable spool, 300 m
1485C-P1W600	IP20 flat media, cable spool, 600 m
KwikLink Lite Connectors	
1485P-K1GK4	Flat cable to thin cable conversion IDC
1485P-K1TLR4	Terminal block IDC
1485P-K1TG4	Trunk-line connector IDC
1485P-K1DL4	Drop-line connector IDC
1485P-K1TR4	Terminating resistor IDC
1485P-K1G4-Y5	5-pin connector IDC
KwikLink Accessories/Miscellaneous	
1485A-KCRIMP	Crimping pliers

Tools

Cat. No.	Product	Description
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
193-DNCT	DeviceNet Configuration Terminal	Handheld device that can be used to commission, configure, program, and monitor devices on your DeviceNet network

Notes:

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.

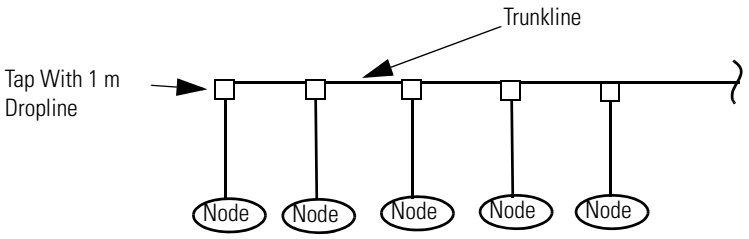
Flexible installation options for the ControlNet network include:

- 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.

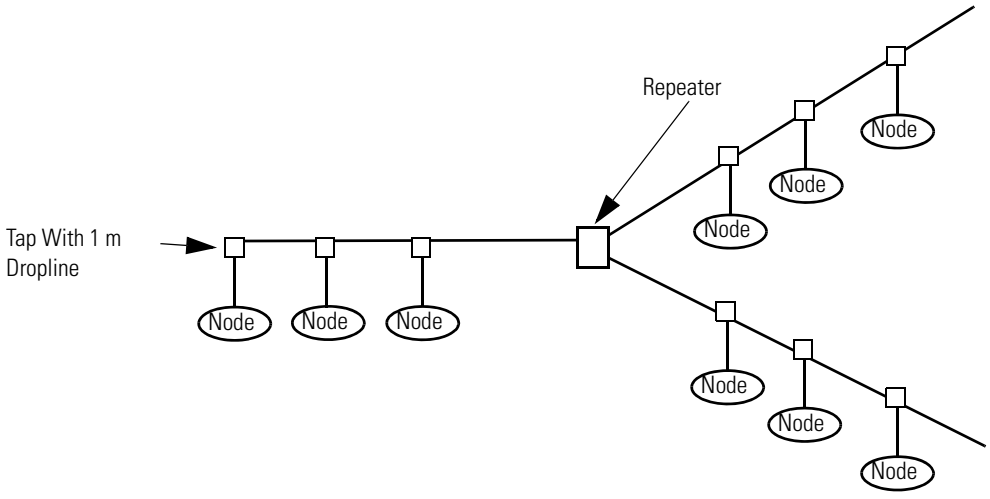
ControlNet Network Topology

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.

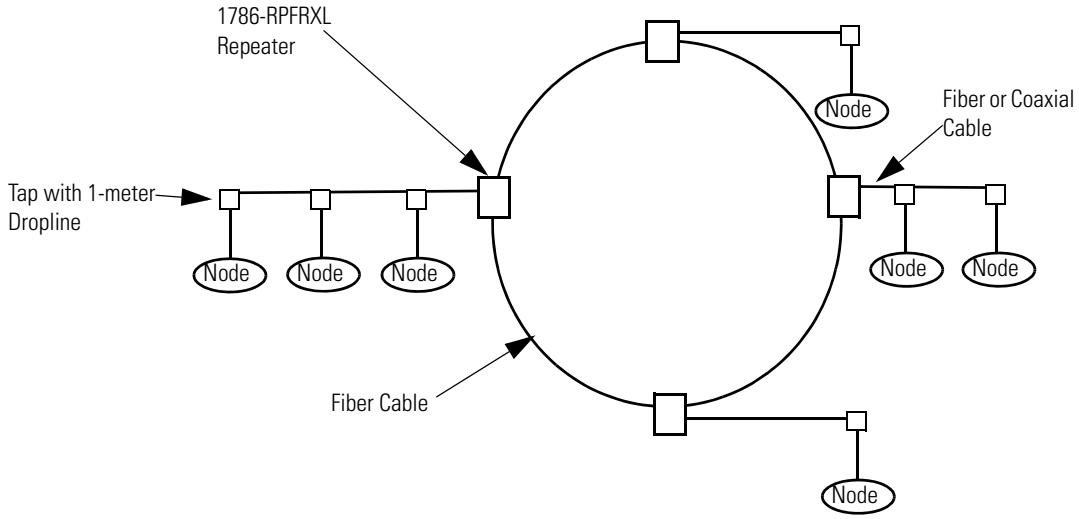
Example ControlNet System Trunkline/dropline Topology



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

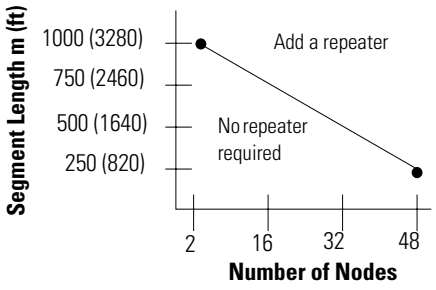
Number of Nodes

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]



30014-m

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

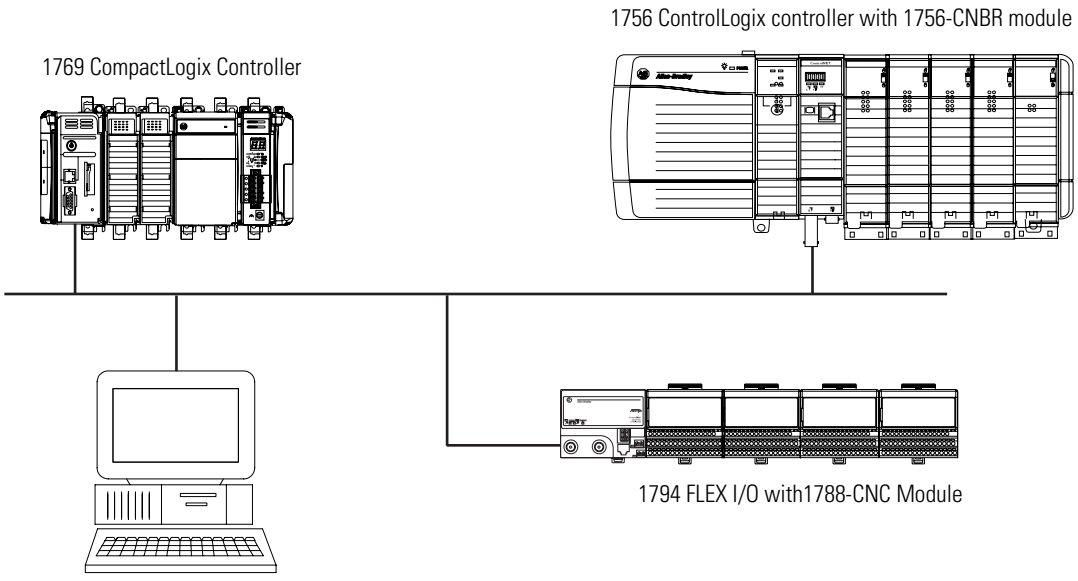
Messages transfer data to other devices, such as other controllers or operator interfaces. Each message uses one connection, regardless of how many devices are in the message path. To conserve connections, you can configure one message to read from or write to multiple devices.

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

EtherNet/IP Network

The EtherNet/IP network offers a full suite of control, configuration, and data collection services by layering the Common Industrial Protocol over the standard protocols used by the Internet (TCP/IP and UDP). EtherNet/IP uses TCP/IP for general messaging/information exchange services and UDP/IP for I/O messaging services for control applications.

The application of the CIP Safety protocol enables the simultaneous transmission of safety and standard control data and diagnostics information over a common EtherNet/IP network.

The EtherNet/IP network is most often used in these types of configurations:

- As an economical solution for connecting many computers
- As the best choice when you want to connect many devices
- As the standard network for connectivity to enterprise systems
- As the least expensive HMI option when used with PanelView Plus terminals
- In a star topology when nodes are grouped closely together

Typical Applications

An EtherNet/IP network:

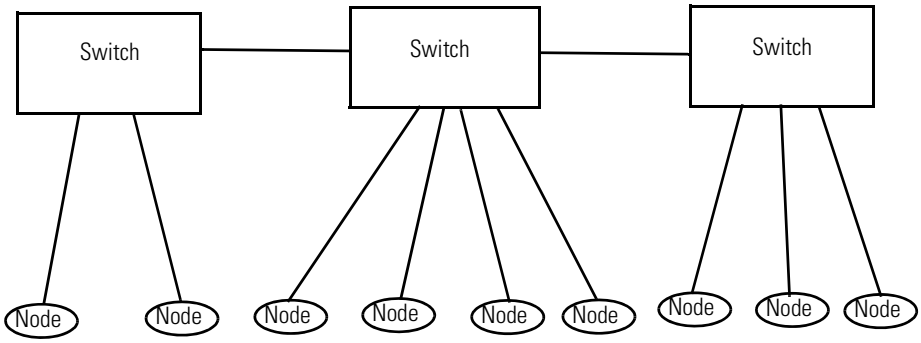
- enables configuration, data collection, and control on a single high-speed network.
- provides enterprise to plant floor integration.
- supports time-critical applications.
- supports safety, motion, drives, I/O, and time sync applications.

EtherNet/IP Network Topology

The EtherNet/IP network uses readily available, off-the-shelf media and complies with IEEE 802.3/TCP/UDP/IP standards and conventions. Topology options include multi-drop, star, daisy chain, and ring to best support your application. The simplest is the star topology, using CAT5 media. The star topology uses a switch or a series of switches connected together, with point-to-point connections from each device to a switch.

An EtherNet/IP network supports star, ring, and linear topologies.

Example EtherNet/IP Star Topology



- See the EtherNet/IP Performance and Application Guide, publication ENET-AP001, for more information.
- See the EtherNet/IP Media Planning and Installation Manual, publication 00148-BR001, for more information.

EtherNet/IP Network Capacity

When planning an EtherNet/IP network, once you have decided on the topology, you should consider the following:

- Distances
- Connections

Distances

Distance choices vary widely, depending on whether you use CAT5 cable (UTP) or fiber media. Refer to the EtherNet/IP Performance and Application Guide, publication ENET-AP001, to plan your installation. With CAT5 cable, the most widely used form of EtherNet/IP media, you can achieve maximum distances between a switch and a node of up to 100 m (328 ft).

Connections

The number of available connections are another factor you must consider when determining capacity on an EtherNet/IP 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.

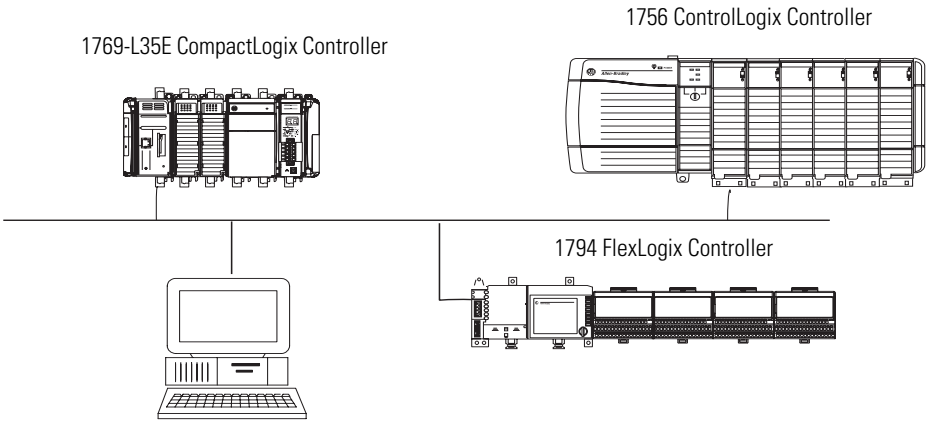
The EtherNet/IP network uses unscheduled connections. An unscheduled connection is a message transfer between controllers that is triggered by the RPI or the program (with a MSG instruction, for example). Unscheduled messaging lets you send and receive data when needed.

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.

The following example shows a sample 1756 ControlLogix controller configuration. In this configuration, the 1756 ControlLogix controller sends and receives messages to/from the 1769-L35E CompactLogix controllers on the EtherNet/IP network.

EtherNet/IP Connections Example



Estimate the connections used according to this table.

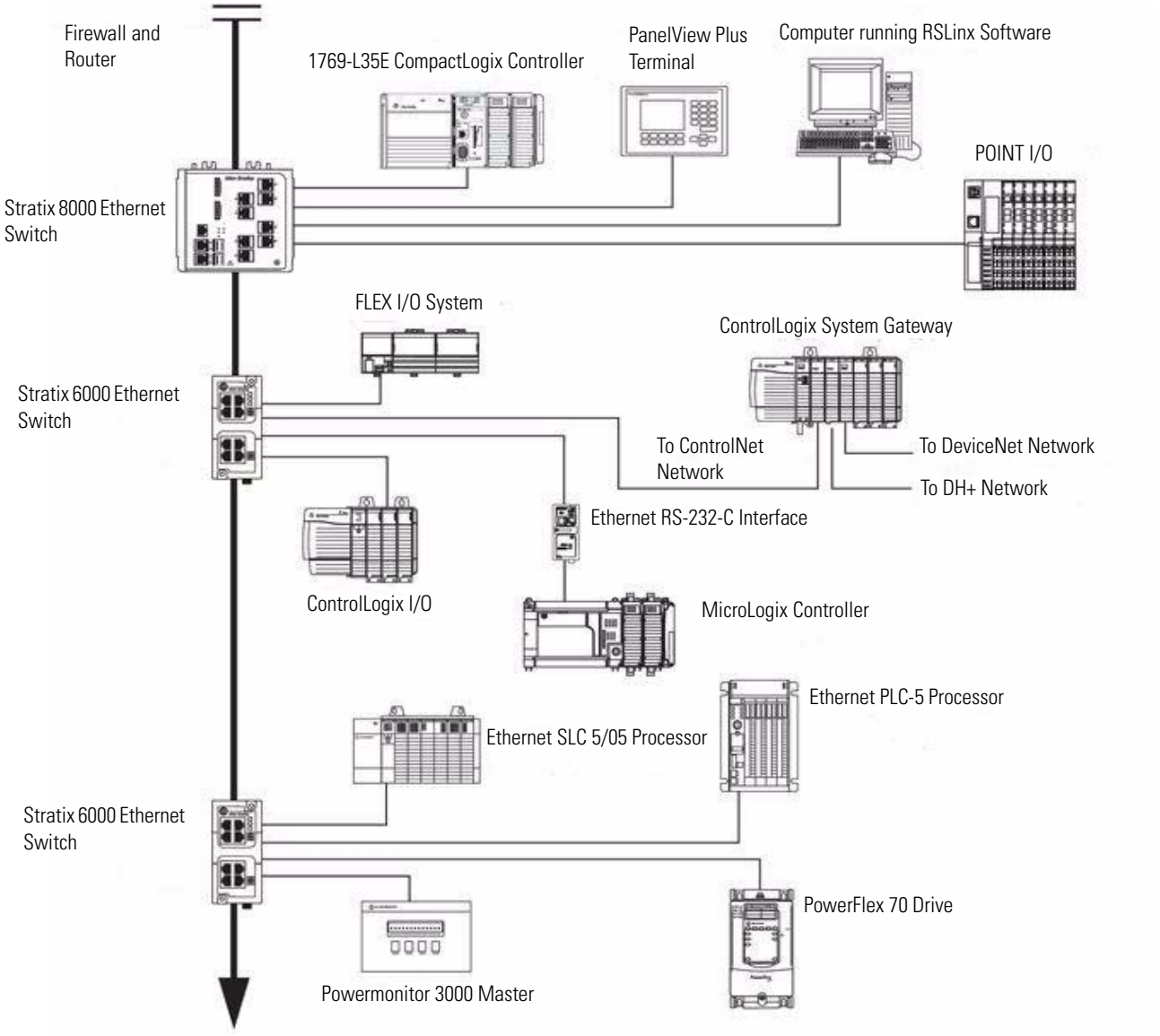
Estimated Number of Connections

For each	Count this number of connections	In this example, we show this number of connections
Tag produced by the 1769-L35E controller	1	3
Tag consumed by the 1769-L35E controller	1	2
Tag produced by the 1756 ControlLogix controller	1	3
Tag consumed by the 1756 ControlLogix controller	1	2
1794 FlexLogix controller	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-L35E; six in the 1756 ControlLogix controller).

Typical Configuration

The following figure shows a typical EtherNet/IP system configuration.



Communication Interfaces

You can monitor and control your applications with controller interfaces and operator interfaces. Access system and data information with web server modules. Linking devices let you connect your EtherNet/IP network to ControlNet, Foundation Fieldbus, or DeviceNet network.

Controller Interfaces

Various controller platforms are available for the EtherNet/IP network.

Bulletin No.	Product	Interface
Programmable Automation Controllers		
1769	CompactLogix Controllers, 1769-L2 and 1769-L3 series	Built-in EtherNet/IP port
1768	CompactLogix Controllers, 1768-L4 series	1768-ENBT scanner 1768-EWEB web server (messaging only)
1756	ControlLogix Controllers, 1756-L6 series	1756-EN2T interface 1756-EN2F interface 1756-ENBT interface 1756-EWEB web server (messaging only)
1789	SoftLogix 5800 Controllers	Personal computer Ethernet card
Programmable Logic Controllers		
1761	MicroLogix 1000 Controllers	1761-NET-ENI interface (messaging only) 1761-NET-ENIW web server (messaging only)
1763	MicroLogix 1100 Controllers	Built-in Ethernet port 1761-NET-ENI interface (messaging) 1761-NET-ENIW web server (messaging only)
1762	MicroLogix 1200 Controllers	1761-NET-ENI interface (messaging only) 1761-NET-ENIW web server (messaging only)
1766	MicroLogix 1400 Controllers	Built-in Ethernet port 1761-NET-ENI interface (messaging) 1761-NET-ENIW web server (messaging only)
1764	MicroLogix 1500 Controllers	1761-NET-ENI interface (messaging only) 1761-NET-ENIW web server (messaging only)

Bulletin No.	Product	Interface
1747	SLC 500 Controllers, 5/05 series	Built-in EtherNet/IP options 1761-NET-ENI interface (messaging only) 1761-NET-ENIW web server (messaging only)
1785	PLC-5 Controllers	Built-in EtherNet/IP options 1785-ENET 1761-NET-ENI interface (messaging only) 1761-NET-ENIW web server (messaging only)
Safety Programmable Controllers		
1752	SmartGuard 600 Safety Controller	Built-in Ethernet port (EtherNet/IP standard CIP only)
1753	GuardPLC 1600 Safety Control System	Built-in Ethernet port (safety-rated GuardPLC Ethernet and EtherNet/IP)
1753	GuardPLC 1800 Safety Control System	Built-in Ethernet port (safety-rated GuardPLC Ethernet and EtherNet/IP)
1756	GuardLogix Integrated Safety System, 1756-L series	1756-EN2T interface 1756-EN2F interface 1756-ENBT interface 1756-EWEB web-server module
Legacy Controllers		
1794	FlexLogix Controllers	1788-ENBT 1761-NET-ENI interface (messaging only) 1761-NET-ENIW web server (messaging only)

Operator Interfaces

You can customize your status and fault reporting with operator interface offerings from Rockwell Automation.

Bulletin No.	Product	Interface
2711	PanelView Standard Operator Terminals PV550, 600,1000	Built-in EtherNet/IP option on PanelView 550, 600, and 1000 Operator Terminals
2711P	PanelView Plus Operator Terminals	Built-in EtherNet/IP option on PanelView Plus 700, 1000, 1250, 1500 terminals
2711P	PanelView Plus CE Operator Terminals	Built-in EtherNet/IP option on PanelView Plus CE 700, 1000, 1250, 1500 terminals
2711C	PanelView Component Operator Terminals	Built-in Ethernet option on PanelView Component C600 and C1000 terminals
2706	InView Message Displays	2706-PENETM EtherNet/IP Module for 2706-P4 series displays 2706-PENETK EtherNet/IP Module for 2706-P7 and 2706-P9 series displays 2706-PENETP EtherNet/IP Module for 2706-P22R displays 2706-PENET1 Ethernet TCP/IP Module for InView displays (not available for 2706-P22R displays)

Web Server Modules

Many Rockwell Automation modules have built-in web server capability. You can access module, network, and system data information by using any standard web browser. Manufacturers can use the Web and the EtherNet/IP network to communicate through their entire plant.

Cat No.	Product	Description
1756-EWEB	ControlLogix EtherNet/IP Web Server Module	• Provide access to information from the control system using a web browser • Monitor and modify control system data remotely using XML web pages
1768-EWEB	CompactLogix EtherNet/IP Web Server Module	• Provide access to information from the control system using a web browser • Monitor and modify control system data remotely using XML web pages
1761-NET-ENIW	MicroLogix EtherNet/IP Web Server Module	• Provide EtherNet/IP connectivity for all MicroLogix controllers, CompactLogix controllers, and other DF1 full-duplex devices • Connect non-Ethernet controllers onto Ethernet networks to upload/download programs communicate between controllers, or generate email messages via SMTP (simple mail transport protocol)

RFID Interfaces

The DeviceNet Interface module provides a solution for automatic identification.

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

Linking Devices

With Rockwell Automation's linking devices, you can reduce control device costs because you can leverage existing network structures to access data from other level networks.

Cat. No.	Product	Description
1788-EN2DN	EtherNet/IP-to-DeviceNet Linking Device	Bridge explicit messages from an EtherNet/IP network to a DeviceNet network or Scan the DeviceNet network via EtherNet/IP Does not support CIP Safety.
1757-FFLD2	Foundation Fieldbus Linking Device, 2 H1 segments	Link an EtherNet/IP/HSE network to a Foundation Fieldbus H1 network for process control applications or Link any Logix controller to a Foundation Fieldbus device
1757-FFLD4	Foundation Fieldbus Linking Device, 4 H1 segments	
1440-GWEN2DN	XM-500 EtherNet/IP Gateway Module	Provide a gateway from DeviceNet-enabled devices to TCP/IP or EtherNet/IP protocols

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 EtherNet/IP network:

- In-cabinet distributed I/O
- On-machine distributed 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 in modular and safety block I/O styles. Modular I/O is a system of interface cards and communications adapters that interface directly to the sensors and actuators of the machine or process 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. Safety block I/O can be used with Rockwell Automation safety controllers.

Bulletin No.	Product	Adapter
Modular I/O		
1734	POINT I/O	1734-AENT adapter 1734-AENTR adapter
1794	FLEX I/O	1794-AENT adapter
1797	FLEX Ex Intrinsically Safe I/O	1794-AENT adapter (use with 1797-BIC and 1797-CEC to connect to hazardous areas)
Safety Block I/O		
1791ES	CompactBlock Guard I/O	Built-in adapter

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 is available in modular and block I/O styles. Modular I/O is a system of interface cards and communications adapters that interface directly to the sensors and actuators of the machine/process 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. Block I/O is a complete assembly of sensor and actuator interface points including a network adapter. It may or may not include a power supply and is available in fixed configurations.

Bulletin No.	Product	Adapter
Modular I/O		
1738	ArmorPoint I/O	1738-AENT adapter 1738-AENTR adapter
Block I/O		
1732	ArmorBlock I/O	Built-in adapter in base block

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-EN2T 1756-EN2TR 1756-EN2F 1756-ENBT

Drives

Rockwell Automation drives are a full family of adjustable speed drives that can connect to Ethernet/IP networks. 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, and 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 Drive	• 0.2…3.7 kW (0.25…5 Hp) • Voltage ratings: 100…120V, 200…240V, 380…480V	22-COMM-E
PowerFlex 4M AC Drive	• 'A' frame, 'B' frame, liquid cooled 'C' frame • 0.2…11 kW (0.25…15 Hp) • Voltage ratings: 120V, 240V, 480V	22-COMM-E
PowerFlex 40 AC Drive	• 0.4…11 kW (0.5…15 Hp) • Voltage ratings: 100…120V, 200…240V, 380…480V, 460…600V	22-COMM-E EtherNet/IP network connectivity also available as a configured option
PowerFlex 40P AC Drive	• 0.4…11 kW (0.5…15 Hp) • Voltage ratings: 200…240V, 380…480V, 460…600V	22-COMM-E
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-E EtherNet/IP network connectivity also available as a configured option
PowerFlex 70 AC Drive	• 0.37...37 kW (0.5…50 Hp) • Voltage ratings: 200...240V, 380...480V, 500...600V	20-COMM-E
PowerFlex 700 AC Drive	• 0.37...132 kW (0.5...200 Hp) • Voltage ratings: 200...240V, 380...480V, 500...690V	20-COMM-E

Bulletin No.	Product	Adapter
PowerFlex 700S AC Drive with DriveLogix	• 0.75...400 kW (1...600 Hp) with voltage ratings of 380...480V • 0.75....55 kW (1...75 Hp) with voltage ratings of 200...240V	20-COMM-E
PowerFlex 755 AC Drive	• 5.5…250 kW (7.5…350 Hp) • Voltage ratings: 380…480V	Embedded EtherNet/IP network connectivity standard
PowerFlex 7000	PowerFlex 7000A, 7000B, 7000L AC Drives • 'A' frame, 'B' frame, liquid cooled 'C' frame • 150...8500 Hp	20-COMM-E
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-E

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. Plug-in Ethernet communication cards provide Ethernet and RS-232 local configuration ports for Powermontior master modules.

Bulletin No.	Product	Interface
Bulletin 1403	Powermonitor II Monitors real-time readings, including harmonics and waveform analysis, at major incoming feeders and major transformers	1403-NENET Ethernet communication card • Two Ethernet (10 Mbps) ports and one RS-232 local configuration port • Compatible with EtherNet/IP PLC-5 processors and EtherNet/IP SLC5/05 processors
Bulletin 1404	Powermonitor 3000 Provides real-time power quality data, harmonics analysis, oscillography, and sub-metering	1404-M605A-ENT (limited metering) communication card 1404-M605A-ENT (full metering) communication card One Ethernet (10 Mbps) port and one RS-232 local configuration port
Bulletin 1408	Powermonitor 1000 Provides load profiling, cost allocation, and energy control, as well as seamless integration your existing energy monitoring systems where sub-metering is required.	Available EtherNet/IP, Serial DF1, Modbus RTU, Modbus TCP Communications

Sensors

The Bulletin 48MS MultiSight vision sensor is an optical multi-pixel sensor with a pass/fail PNP output and the ability to provide detailed inspection results data over the EtherNet/IP network. The MultiSight sensor uses four different methods of evaluation (pattern matching, contrast, brightness, and contour matching) to detect or differentiate objects by using previously defined optical characteristics, (for example, to separate good and bad parts).

The MultiSight sensor is an economical alternative to conventional vision systems for detecting presence or absence, completeness, position, markings, labeling, packaging, and components.

Motor Control

The E1 Plus overload relay uses an embedded Web server for configuration and monitoring over the EtherNet/Ip network.

Cat. No.	Product	Description
193-ETN	E1 Plus Overload Relay	• Built-in Web server support • Configuration • Diagnostics and monitoring • Email Notification on trips & warnings

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 EtherNet/IP 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 EtherNet/IP Software Add-On (add-on to your existing RSNetWorx for EtherNet/IP software)	Maintenance and diagnostic component for RSNetWorx for EtherNet/IP software that provides pre-configured diagnostic analysis and troubleshooting information for the EtherNet/IP network
	RSNetWorx MD for EtherNet/IP Software Bundle (includes RSNetWorx for EtherNet/IP 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

Physical Media

Various environmental and installation factors play a part in media selection for your EtherNet/IP network. The most important factor is understanding your environment. When choosing EtherNet/IP media, make sure you select products that provide the required compatibility with high noise and harsh industrial environments. Industrial concerns common to any other control system installation play an equally important part in an EtherNet/IP installation.

Rockwell Automation's offering of physical media includes the following:

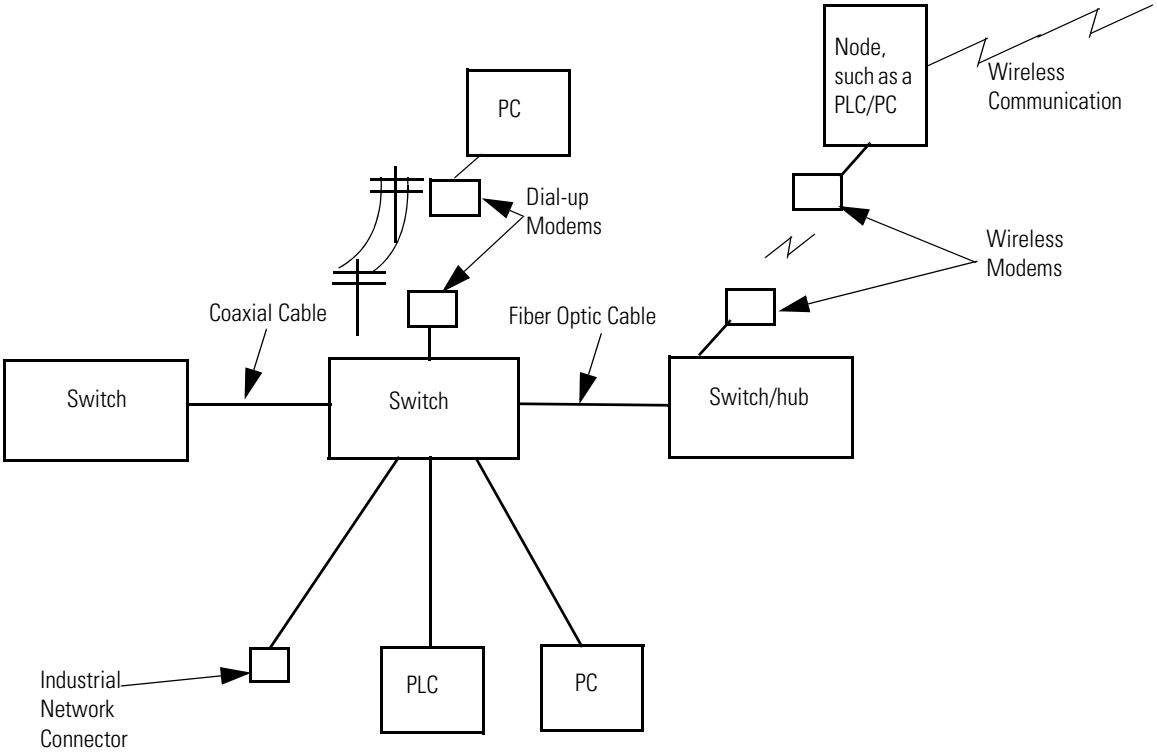
- Cables
- Taps
- Switches
- Modems

Other products, such as cables and modems, are widely available from third-party suppliers.

For details on Rockwell Automation Ethernet media for industrial environments, visit http://www.ab.com/sensors/ethernet.

The following diagram shows a simple EtherNet/IP system using widely available physical media.

Example EtherNet/IP System



Cables

Rockwell Automation Ethernet cables are specifically designed for use in harsh industrial environments, combining a specially designed cable with rugged connector construction to ensure reliability and flexibility. Ethernet cables are unshielded with conductors in a twisted pair (UTP) construction to preserve signal balance through the cable to provide noise immunity. These unshielded pressure extruded cables maintain maximum balance during flexing. In addition to giving the cable more flexibility, installation is simplified by eliminating grounding shielding.

Cat. No.	Description
Patchcords	
1585D-M4TBDM-1 (1 meter) 1585D-M4TBDM-2 (2 meter) 1585D-M4TBDM-5 (5 meter)	M12 D Code Male to M12 D Code Male Patchcords - High Flex, TPE - IP67
1585J-M8PBJM-1 (1 meter) 1585J-M8PBJM-2 (2 meter) 1585J-M8PBJM-5 (5 meter)	RJ45 to RJ45 Pathcords - General Purpose, Riser PVC - IP20
1585J-M8TBJM-1 (1 meter) 1585J-M8TBJM-2 (2 meter) 1585J-M8TBJM-5 (5 meter)	RJ45 to RJ45 Pathcords - High Flex TPE - IP20
1585D-M4TBJM-1 (1 meter) 1585D-M4TBJM-2 (2 meter) 1585D-M4TBJM-5 (5 meter)	M12 D Code Male to RJ45 Patchcord - High Flex TPE
Connectors	
1585J-M8CC-H	RJ45 Field Attachable, Insulation Displacement Connector
1585D-M4DC-H	M12 D Code Male Field Attachable, Insulation Displacement Connector
1585A-DD4JD	M12 to RJ45 Bulkhead adapter

Cat. No.	Description
Cable Visit http://www.ab.com/sensors/ethernet/ for a complete selection of Ethernet cable.	
1585-C8PB-S100 (100 meter) 1585-C8PB-S200 (200 meter) 1585-C8PB-S300 (300 meter)	Cable Spool - Unshielded, 8 conductor, General Purpose, Riser PVC
1585-C8TB-S100 (100 meter) 1585-C8TB-S200 (200 meter) 1585-C8TB-S300 (300 meter)	Cable Spool - Unshielded, 8 conductor, High Flex TPE

Taps

The Ethernet/IP tap enables single-port Ethernet devices to join a daisy-chain or ring topology.

Cat. No.	Product	Description
1783-ETAP	EtherNet/IP Tap	2-port EtherNet/IP connectivity for single-port EtherNet/IP modules in daisy-chain and ring topologies.

Switches

To effectively manage real-time control and information flow throughout the manufacturing and IT enterprise, Rockwell Automation offers a full portfolio of industrial Ethernet switches. The Rockwell Automation switch family includes these types of switches:

- Managed
- Unmanaged

Select the switch depending on the application and environment.

If Your Application	Select	Cat. No. and Description
• Integrates enterprise and manufacturing environments • Manages multicast traffic • Requires diagnostics data • Requires security options	Stratix 8000 Managed Ethernet Switches	Base modules: • 1783-MS06T, 6 copper ports • 1783-MS10T, 10 copper ports Expansion modules: • 1783-MX08T, 8 copper ports • 1783-MX08F, 8 fiber ports Fiber optic uplink (SFP) transceiver: • 1783-SFP100FX, 100 Base-FX multimode • 1783-SFP100LX, 100 Base-LX singlemode • 1783-SFP1GSX, 1000 Base-SX multimode • 1783-SFP1GLX, 1000 Base-LX singlemode
• Integrates plant floor devices • Manages multicast traffic • Requires diagnostics data • Requires security options	Stratix 6000 Managed Ethernet Switches	• 1783-EMS04T, 4 copper ports • 1783-EMS08T, 8 copper ports, 1 fiber port
• Requires easy set-up and direct replacement of switches • Is a small, isolated network	Stratix 2000 Unmanaged Ethernet Switches	• 1783-US03T01F, 3 copper ports, 1 fiber port • 1783-US05T, 5 copper ports • 1783-US06T01F, 6 copper ports, 1 fiber port • 1783-US08T, 8 copper ports • 1783-US08TZ, 8 copper ports, IP67-rated

Modems

Rockwell Automation's Remote Access Ethernet Modem combines a four-port managed switch with a 56K modem, allowing a remote connection to your EtherNet/IP network. The built-in management interface allows flexibility when implementing the device in your new or existing application.

Wireless modems for communication between networked devices are available through Encompass partners, our third-party product referencing program.

Cat. No.	Product	Description
9300-RADES	Remote Access Dial-in Ethernet Modem	Connect to your remote Ethernet network from any standard phone line

Tools

Diagnose problems and keep your NetLinx networks running smoothly with this troubleshooting tool from Rockwell Automation.

Cat. No.	Product	Description
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

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Publication NETS-SG001C-EN-P - May 2009
Supersedes Publication Nets-SG001B-EN-P - December 2004