
DEVICE NET SELECTION GUIDE

BradCommunications[™]

BradConnectivity[™]

BradControl[™]



Molex "Empowers the Industrial Infrastructure" with innovative communication, control and connectivity solutions for a wide range of DeviceNet applications - from the device and sensor level, to the operations and supervisory level, to connectivity with enterprise business and operations systems.

The success of an Industrial DeviceNet relies on the quality and performance of its underlying infrastructure - all the devices, components and pathways needed to support the network's communications, connectivity and control capabilities. Our Brad[®] automation and networking solutions are engineered to facilitate reliable information flow, from machines to PCs and PLCs, and all the way from the plant floor to the enterprise.

Brad[®] Automation Solutions

Our Brad[®] product lines - including such globally recognized names as Brad Harrison[®], applicom[®], SST[™], mPm[®], and RJ-Lnxx[®] - are designed and built industrial-tough to ensure the flexibility, interoperability and rock-solid performance of your DeviceNet applications. Our industrial network solutions include:

- **BradCommunications[™]** - Network interface cards, PLC communications, switches, gateways, simulation software, diagnostic tools and embedded software stacks
- **BradConnectivity[™]** - Connectors, cordsets and distribution boxes for sensor, actuator and bus network applications
- **BradControl[™]** - Network I/O for on-machine and in-cabinet applications
- **BradPower[™]** - Modular wiring systems for machine power distribution and motor control

Based in Lisle, Illinois, USA, Molex operates from 59 manufacturing facilities in 19 countries spanning North America, Europe and Asia/Pacific. We have the resources to assist you locally with all of your DeviceNet project needs.

DEVICENET OVERVIEW*

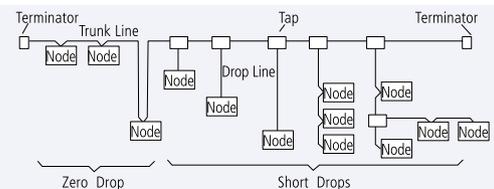


DeviceNet is a digital, multi-drop network that connects and serves as a communication network between industrial controllers and I/O devices. Each device and/or controller is a node on the network. DeviceNet is a producer-consumer network that supports multiple communication hierarchies and message prioritization. DeviceNet systems can be configured to operate in a master-slave or a distributed control architecture using peer-to-peer communication. DeviceNet systems offer a single point of connection for configuration and control by supporting both I/O and explicit messaging. DeviceNet also has the unique feature of having power on the network.

Network Size Up to 64 Nodes

Network Length	Selectable end-to-end network distance varies with speed: 125 Kbps 500 m (1,640 ft) 250 Kbps 250 m (820 ft) 500 Kbps 100 m (328 ft)
Data Packets	0-8 bytes
Bus Topology	Linear (trunkline/dropline); power and signal on the same network cable
Bus Addressing	Peer-to-Peer with Multi-Cast (one-to-many); Multi-Master and Master/Slave special case; polled of change-of-state (exception-based)
System Features	Selectable end-to-end network distance varies with speed

DeviceNet uses a trunk-line/drop-line topology that provides separate twisted pair busses for both signal and power distribution.



Thick or thin cable can be used for either trunklines or droplines. End-to-end network length varies with data rate and cable thickness as shown below:

Network Size	125 KBPS	250 KBPS	500 KBPS
Thick Trunk Length	500 m (1,640 ft)	250 m (820 ft)	100 m (328 ft)
Thin Trunk Length	100 m (328 ft)	100 m (328 ft)	100 m (328 ft)
Flat Trunk Length	420 m (1,378 ft)	200 m (656 ft)	75 m (246 ft)
Maximum Drop Length	6 m (20 ft)	6 m (20 ft)	6 m (20 ft)
Cumulative Drop Length	156 m (512 ft)	78 m (256 ft)	39 m (128 ft)

(*) - Source ODVA web site



NETWORK INTERFACE CARDS, PLC COMMUNICATIONS, SWITCHES, GATEWAYS, SIMULATION SOFTWARE AND DIAGNOSTIC TOOLS

NETWORK INTERFACE CARDS

ISA Interface Card



- Fast scan times and high performance

Characteristics

- Speed: 125, 250, 500 Kbps
- Protocol:
 - DeviceNet Master & Slave
- Software components:
 - OPC Server + DLL Library
- OS Supported:
 - Windows XP, 2000, NT4
- Network diagnostics and configuration software

Order Number

5136-DNP-ISA ISA bus

CompactPCI 3U Interface Card



- Fast scan times and high performance
- Available in 2, 4, 8 port versions

Characteristics

- Speed: 125, 250, 500 Kbps
- Protocol:
 - DeviceNet Master & Slave
- Software components:
 - OPC Server + DLL Library
- OS Supported:
 - Windows XP, 2000, NT4
- Network diagnostics and configuration software

Order Number

5136-DNP-CPCI CompactPCI 3U bus

NEW

Remote DeviceNet Scanner



- Connect up to 16 Remote DeviceNet Scanners to a PC over Ethernet
- Save money on computer – eliminates the cost of additional PCs, and frees up PC slots
- Save money on cabling - inexpensive Ethernet cable
- Manage DeviceNet application across Ethernet LAN

Characteristics

- DIN rail mountable
- Speed: 125, 250, 500 Kbps
- Protocols: DeviceNet Master & Slave
- Diagnostic LEDs (scanner status, DeviceNet network power, health and communications, etc)

Order Number

SST-EDN-1 Remote DeviceNet Scanner

Interface Cards for High Speed Applications



- High speed deterministic communication for control applications
- OEM ready, hardware and software components provided separately
- Supports Poll, Strobe, Change of state (COS) and cyclic I/O messaging
- Provides simultaneous execution of Group2 Client (Master) and Server (Slave) operation

Characteristics

- Speed: 125, 250, 500 Kbps
- Protocol: DeviceNet Master & Slave
- Software components: OPC Server + DLL Library
- OS Supported: Windows Vista, XP, 2000, NT4
- Network diagnostics and configuration software
- DeviceNet conformance tested

Order Number

- SST-DN3-PCU-1** PCI bus, 3.3/5V, 1 port
- SST-DN3-PCU-2** PCI bus, 3.3/5V, 2 ports
- SST-DN3-PCX-1** PCI Express 1X bus, 1 port
- SST-DN3-PCX-2** PCI Express 1X bus, 2 ports
- SST-DN3-104-1** PC/104 bus, 1 port
- SST-DN3-104-2** PC/104 bus, 2 ports
- SST-DN3-VME-1** VME bus, 1 port
- SST-DN3-VME-2** VME bus, 2 ports
- SST-DN3-VME-4** VME bus, 4 ports
- SST-DN3-OPC** OPC DA Server
- SST-DN3-CNF-P** Configuration and Diagnostics Console, Parallel Key
- SST-DN3-CNF-U** Configuration and Diagnostics Console, USB Key

Interface Cards for Control and SCADA Applications



- Deterministic data acquisition
- Auto-mapping of I/O in DPRAM card
- Ready to use: configuration and diagnostic tools

Characteristics

- Speed: 125, 250, 500 Kbps
- RoHS compliant
- Protocol:
 - DeviceNet Master & Slave
- Software interfaces included:
 - OPC server, ActiveX Control, Wonderware I/O server & DAServer, Wonderware, DLL Library
- Various OS supported:
 - Win 32-bits, XPe, NTe, VxWorks, QNX, Linux, DOS

Order Number

- DRL-DVN-PCU** PCI bus, 3.3/5V, 1 port
- DRL-DVN-104** PC/104 bus, 1 port

EMBEDDED INTERFACE

Interface Card for High Speed Applications



- New DeviceNet card Generation 4 (fully compatible with DN3 cards)
- OEM ready, hardware and software components provided separately

Characteristics

- Speed: 125, 250, 500 Kbps
- Protocol: DeviceNet Master & Slave
- Software components: OPC Server + DLL Library
- OS Supported: Windows Vista, XP, 2000
- Network diagnostics and configuration software

Order Number

- SST-DN4-104** PC/104 bus, 1 port
- SST-DN4-104-2** PC/104 bus, 2 ports
- SST-DN4-PCU** PCI bus, 3.3/5V, 1 port
- SST-DN4-PCU-2** PCI bus, 3.3/5V, 2 ports

Embedded DC100 OEM Module



- Fast implementation of DeviceNet fieldbus
- Compact, horizontal or vertical mounting
- Simple integration with Direct DP-RAM access
- Independent of operating systems
- Lower engineering and integration costs

Characteristics

- 5 pin terminal block or HE13 ribbon connector
- RoHS compliant
- Speed: 125, 250, 500 Kbps
- Protocol:
 - DeviceNet Slave only
 - DeviceNet Master & Slave
- ODVA conformance tested

Order Number

- DC100DNS-x-B10** DC100 DeviceNet Slave, bulk of 10 [1]
- DC100DNM-x-B10** DC100 DeviceNet Master/Slave, bulk of 10 [1]

Development Kit for DC100 OEM Module



- Allows development of customer specific application with DC100 OEM module
- Driver and APIs for Windows XP and source code for specific OS (Linux, DOS, QNX, Vx-Works, etc.)

Characteristics

- Development Board: High Speed USB Adapter V2 & V1.1
- Package includes:
 - Electronic documentation
 - DLL source
 - Demo / Test software with source code

Order Number

- SST-DNS-USB-KIT** USB Development Kit for DeviceNet Slave
- SST-DNM-USB-KIT** USB Development Kit for DeviceNet Master & Slave

[1] Replace x with C for 5 pin connector or H for HE13 connector



NETWORK I/O FOR ON-MACHINE AND IN-CABINET APPLICATIONS

DIAGNOSTIC TOOLS

NetMeter® for DeviceNet



- Helps with certification of new DeviceNet installations
- Speed maintenance and repair times
- Prevent downtime by predicting faults caused by marginal operating characteristics
- 2 modes of operation: Auto search & Expert

Order Number

DN-MTR	NetMeter
DN-MTR-BAG	NetMeter carrying case
DN-MTR-CAL	NetMeter Calibration Testing
715-0016	NetMeter User's Guide
N2K-MTR	NetMeter for Marine applications utilizing NMEA 2000
DN-MTR-KIT	NetMeter and accessories

NEW

NetDoctor™ for DeviceNet



- Continuously monitors a DeviceNet network across EtherNet/IP
- Store information as OPC status tags for HMI or historian applications
- By storing a baseline measurement of a "good" network, imminent failures on individual devices can be predicted
- Log data to USB flash drive
- Samples at 100 million times per second

Order Number

DN-DOC	NetDoctor
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INDUSTRIAL GATEWAYS

Simple DeviceNet to Ethernet/Serial Tunneling Gateway



- Cost effective gateway solutions
- Allows easy integration of legacy Ethernet/Serial devices to a DeviceNet network
- DIN rail, IP20 mounting

Characteristics

- Speed:
 - DeviceNet: 125, 250, 500 Kbps
 - Ethernet: 10/100 Mbps
 - Serial: 300 to 230.4 Kbps
- Protocols:
 - DeviceNet Slave
 - Modbus RTU Master/Slave
 - Modbus ASCII Master/Slave
 - A-B DF1 Master/Slave

Order Number

DRL-DVN-SRE	DeviceNet to Ethernet or Serial gateway
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IP67 I/O MODULES

Compact, 8 Ports, M8 Connection



- IP67 digital IO modules - Reliable world-class product for harsh environments
- Supports ADR and Quick-Connect
- Standard mounting hole pattern allows for interchangeably with popular I/O modules
- Visible diagnostics through status LEDs for network, module, external power, inputs & outputs

Characteristics

- 30 mm wide package size
- 8 ports, M8
- Speed: 125, 250, 500 Kbps
- Group 2 Server Slave
- I/O data: polled, cyclic and COS

Order Number

TBDDN-880P-804	8 input [1]
TBDDN-880N-804	8 input [1]

Compact, 4 Ports, M12 Connection



- 30 mm wide package size
- 4 ports, M12 Ultra-Lock™ technology
- Speed: 125, 250, 500 Kbps
- Group 2 Server Slave
- I/O data: polled, cyclic and COS

Order Number

TBDDN-480P-80U	8 input [1]
TBDDN-480N-80U	8 input [1]
TBDDN-444P-88U	4 input, 4 output [1]
TBDDN-444N-88U	4 input, 4 output [1]

Classic, 8 Ports, M12 Connection



- 60 mm wide package size
- 8 ports, M12 Ultra-Lock™ technology
- Speed: 125, 250, 500 Kbps
- Group 2 Server Slave
- I/O data: polled, cyclic and COS

Order Number

TCDDN-8D0P-10U	16 input [1]
TCDDN-8D0N-10U	16 input [1]
TCDDN-888P-11U	8 input, 8 output [1]
TCDDN-888N-11U	8 input, 8 output [1]

Classic, 8 Ports, Complies with Automotive Industry Standards

NEW



- Supports ADR and Quick-Connect
- Visible diagnostics through status LEDs
- Terminal connector version for transfer of control signals

Characteristics

- 60 mm wide package size
- 8 ports, M12 Ultra-Lock™ technology
- Speed: 125, 250, 500 Kbps
- 17-pole round connector (Bus + Power)
- I/O data: polled, cyclic and COS

Order Number

TCDDN-8B4P-KKU	12 input, 4 output [1]
TCDDN-8B4P-KKU-T	12 input, 4 output, 13 pins terminal connection [1]

SLAVE ADAPTERS

DeviceNet Slave Adapter for SIEMENS ET200S



- Allows easy connectivity between SIEMENS ET200S expansion modules and DeviceNet
- Built with licensed technology from SIEMENS
- Connect SIEMENS I/O to DeviceNet as a slave device

Characteristics

- Group 2 only server (non-UCMM)
- Supports poll, strobe, cyclic, and change-of-state I/O connections
- Supports all SIEMENS ET200S expansion modules

Order Number

5136-DNS-200S	DeviceNet slave adapter for SIEMENS ET200S
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DeviceNet slave Adapter for SIEMENS ET200X



- IP67 modules for harsh environments
- Allows easy connectivity between SIEMENS ET200X expansion modules and DeviceNet
- Built with licensed technology from SIEMENS
- Connect SIEMENS I/O to DeviceNet as a slave device

Characteristics

- Group 2 only server (non-UCMM)
- Supports poll, strobe, cyclic, & change-of-state I/O connections
- Supports all SIEMENS ET200X expansion modules

Order Number

5136-DNS-200X-8DI	DeviceNet slave adapter for SIEMENS ET200X (8 digital inputs)
5136-DNS-200X-4DO	DeviceNet slave adapter for SIEMENS ET200X (4 digital outputs)

[1] N for NPN input and P for PNP input



CONNECTORS, CORDSETS AND DISTRIBUTION BOXES FOR SENSOR, ACTUATOR AND BUS NETWORK APPLICATIONS

BUS CONNECTIVITY

Trunk Cordsets



- Plug-and-play connection between DeviceNet nodes
- Mini-Change® to Mini-Change® cordsets
- Single and double-ended
- Straight and 90°
- Standard and application-specific lengths

Characteristics

- Rugged, IP-68 rated connectors for continual connection integrity in industrial environments
- Phosphor-bronze contacts for greater reliability
- Variety of cable types, cable exit, coupling nut and length options for maximum flexibility

Trunk Receptacles



- Connects the external trunk line with an enclosure
- Mini-Change® receptacles with DeviceNet color rotation
- Male and female
- Front-panel mount
- Bulkhead feed-through
- PCB-mount or Cable lead

Characteristics

- A variety of options allows for maximum flexibility in connecting device nodes
- Bulkhead version features rugged keyways for positive alignment of connections

Drop Cordsets



- Connect tees or ports on drop distribution boxes to active devices
- Mini-Change® to Micro-Change® (M12) cordsets, Micro-Change® (M12) to Micro-Change® (M12) cordsets or Micro-Change® (M12) to Nano-Change® (M8) cordsets
- Single and double-ended
- Straight and 90°
- Standard and application-specific lengths

Characteristics

- Rugged, IP-68 rated connectors for continued connection integrity in industrial environments
- Variety of cable types, cable exit, form factor, coupling nut and length options for maximum flexibility

Drop Receptacles



- Connects an external drop-line with an enclosure
- Micro-Change® (M12) receptacles
- Male and female
- Front-panel mount
- Bulkhead feed-through
- Wire leads or PCB-mount
- Straight and 90° version

Characteristics

- A variety of options allows for maximum flexibility in connecting device nodes
- Bulkhead version features keyways for positive alignment of connections
- PCB version features space saving small footprint

Tees



- Tees enable tapping into trunk line to add drop lines or devices
- Optional diagnostic tee monitors real-time power fluctuations on the bus and provides visual multi-colored feedback

Characteristics

- Phosphor bronze contacts for greatest reliability
- Variety of Mini-Change® to Micro-Change® (M12) cordset configurations for installation flexibility

Trunk and Drop Distribution Boxes



- Trunk distribution boxes enable branching/extension of the trunk line
- Drop distribution boxes consolidate multiple drop lines back to the trunk
- Eliminates the need to have numerous tees connected near a single point
- 4, 6, 8 and 14-port versions

Characteristics

- Versions with home-run connectors and with molded home-run cable available for maximum system flexibility
- Rugged housing and connectors designed to withstand harsh industrial environments

Field Attachable Connectors



- Field termination for specific length or repair
- Internal and external threads
- Color-coded screw terminators make for error free field installation

Characteristics

- Accept a wide range of DeviceNet cables for maximum installation flexibility

Trunk Gender Changers



- Change connection interface from male to female or visa-versa
- Female-to-Male, Straight and 90° versions
- Right angle version specially designed for tight spaces

Characteristics

- Phosphor bronze contacts for greatest reliability

Termination Resistors



- Used to terminate end of data line
- Trunk and drop versions
- LED diagnostic versions

Characteristics

- Phosphor bronze contacts for greatest reliability
- Diagnostic versions indicate power connection and correct polarity



CONNECTORS, CORDSETS AND DISTRIBUTION BOXES FOR SENSOR, ACTUATOR AND BUS NETWORK APPLICATIONS

DISTRIBUTION BOXES - ORDER NUMBER

SIDE-MOUNT				TOP-MOUNT			
MINI-CHANGE® BUS IN W/MINI PORTS	MINI-CHANGE® BUS IN W/MICRO PORTS	MINI-CHANGE® BUS IN/BUS OUT W/MINI PORTS	MINI-CHANGE® BUS IN/BUS OUT W/MICRO PORTS	MINI-CHANGE® BUS IN W/MICRO PORTS	MICRO-CHANGE® BUS IN W/2 METER CABLE W/MICRO PORTS	MINI-CHANGE® BUS IN W/2 METER CABLE W/MICRO PORTS	MINI-CHANGE® BUS IN/BUS OUT W/NANO PORTS
2 Ports	-	-	DN2100	-	-	-	-
4 Ports	DN4000	DND4000	DN4100	DND4200	DND4500-02	DND4300-02	-
6 Ports	DN6000	DND6000	DN6100	-	-	-	-
8 Ports	DN8000	DND8000	-	DND8200	DND8500-02	DND8300-02	-
14 Ports	-	-	-	-	-	-	DNTA14114A1

TEES AND SPLITTERS - ORDER NUMBER

TRUNK (FEMALE-MALE) / DROP (FEMALE)							
MINI-CHANGE® TO MINI-CHANGE® CONNECTION				MINI-CHANGE® TO MICRO-CHANGE® CONNECTION		MICRO-CHANGE® TO MICRO-CHANGE® CONNECTION	
STANDARD BUS DROP TEE	STANDARD BUS DROP TEE W/DROP CAP	STANDARD BUS DROP TEE W/POWER DIAGNOSTICS	BUS DROP WYE	BUS DROP MICRO TEE	MICRO-BUS DROP TEE	M-F/F SPLITTER	
Right [2]	DN3020	DN3020CAP	DN3020-PM-3	DN3200	DND3021	MICT555	DNYG001
Front [2]	DN3021	-	-	-	-	-	-
Back [2]	DN3022	-	-	-	DND3020	-	-
Left [2]	DN3023	-	DN3020-PM-1	-	-	-	-

OTHER CONNECTIVITY - ORDER NUMBER

FIELD-ATTACHABLE CONNECTORS			
TRUNK (MINI-CHANGE® CONNECTION)		DROP (MICRO-CHANGE® (M12) CONNECTION)	
FEMALE STRAIGHT	MALE STRAIGHT	FEMALE STRAIGHT	MALE STRAIGHT
1A5000-34DN	1A5006-34DN	8A5000-32DN	8A5006-32DN

GENDER CHANGERS (INLINE ADAPTERS) [1]			
TRUNK (MINI-CHANGE® CONNECTION)			
MALE STRAIGHT/MALE	FEMALE STRAIGHT/FEMALE	FEMALE STRAIGHT/MALE W/POWER DIAGNOSTICS	FEMALE/MALE 90°
115060A [1]	115010A [1]	115011A-PM-1 [1] [3]	115032A [1]
-	-	115011A-PM-3 [1] [3]	-

TERMINATION RESISTORS / JUMPERS			
TRUNK (MINI-CHANGE® CONNECTION)		DROP (MICRO-CHANGE® (M12) CONNECTION)	
MALE	FEMALE	MALE	FEMALE
Standard	DN100	DND100	DND150
w/LED	DN100L	-	-
Jumpered [4]	-	DND101	DND151

BUS EXTENDER
DNETEXT-C

OPEN STYLE - ORDER NUMBER

A variety of Open-Style cordsets are available. Ask us!	
	Open Style Single-Ended Cordsets
	Thick Standard cable
	Open Style-to-Mini-Change® Cordsets
	Mid cable
	Open Style-to-Micro-Change® (M12) Cordsets
	Thin Standard cable
	Open Style-Back-Panel-Mount Receptacles

[1] The standard coupling nut is black epoxy-coated zinc. For stainless steel, replace "A" with "SS". For nickel-brass, replace "A" with "NB"
 [2] Orientation of a 90° drop cable with the female trunk connector on the left. DN3020-PM-1 must be mounted male left, female right and DN3020-PM-3 must be mounted female left, male right in order to see the display
 [3] Orientation: 115060A-PM-1 must be mounted male left, female right, and 115060A-PM-3 must be mounted female left, male right in order to see the display
 [4] Jumpered terminators are used during network installation for continuity verification



CONNECTORS, CORDSETS AND DISTRIBUTION BOXES FOR SENSOR, ACTUATOR AND BUS NETWORK APPLICATIONS

POWER RECEPTACLES - ORDER NUMBER

FRONT PANEL - MOUNT RECEPTACLES		
FEMALE W/LEADS	MALE W/LEADS	BULKHEAD FEED-THRU
MINI-CHANGE® RECEPTACLES		
1F	1R4000A20A120	1R4006A20A120
3F	1R4000A20F030	1R4006A20F030
6F	1R4000A20F060	1R4006A20F060
MICRO-CHANGE® M12 RECEPTACLES (FOR COMPACT I/O)		
1F	8R4A00A18A120	8R4L30

POWER CONNECTORS - ORDER NUMBER

FIELD-ATTACHABLE CONNECTORS	
FEMALE STRAIGHT	MALE STRAIGHT
MINI-CHANGE® FIELD-ATTACHABLE CONNECTORS	
1A4000-34	1A4006-34
MICRO-CHANGE® M12 FIELD-ATTACHABLE CONNECTORS (FOR COMPACT I/O)	
8A4000-32	8A4006-32

POWER TEES AND TAPS - ORDER NUMBER

EMERGENCY STOP & AUXILIARY POWER MINI-CHANGE® TEES			
STANDARD TEE PARALLEL WIRING	STANDARD TEE PARALLEL WIRING WITH POWER DIAGNOSTIC	SEGMENTING TEE TO ADD 24VDC POWER	MACHINE-STOP TEE
Front [1]	-	DNAPT	-
Back [1]	DNETAUXPT	-	DNEST-001 (2 ckt)
	DNETAUXPT-PM-1	-	-
	DNETAUXPT-PM-3	-	-
	DNEST	-	-

POWER TAP MINI-CHANGE® CONNECTIONS (BUS IN/BUS OUT)			
SEGMENTED POWER- INFUSION TEE	FEMALE/MALE	FEMALE/FEMALE	MALE/FEMALE
Right [1]	DN-PT1	DN-PT2	DN-PT3
Back [1]	-	-	-
	DN3030-PT-1	-	-
	DN3030-PT	-	-

OTHER POWER CONNECTIVITY - ORDER NUMBER

INLINE ADAPTER
INLINE ADAPTER WITH POWER DIAGNOSTICS
114011A-PM-3

JUMPER
MACHINE-STOP JUMPER PLUG
DNESJ

SURGE SUPPRESSOR
SURGE SUPPRESSOR - AUX POWER
DN-SPAUX

[1] Orientation of a 90° drop cable with the female trunk connector on the left. Both DNETAUXPT-PM-1 and DNETAUXPT-PM-3 must be mounted female left, male right in order to see the display

NORTH AMERICA

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BradControl™

Network I/O for on-machine and in-cabinet applications.

BradPower™

Modular, flexible wiring systems for machine power distribution and motor control.

your local distributor

w o o d h e a d . c o m

Brad®
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