Allen-Bradley 1756-DNB

ControlLogix DeviceNet Bridge/Scanner Module

Allen-Bradley 1756-DNB provides the DeviceNet network connection for a ControlLogix system. It exchanges control data with DeviceNet field devices through its bridge/scanner function. Choose the 1756-DNB when the required field network is DeviceNet and check the complete module identity against the existing controller project.



Technical Specifications

Product Identity	
Manufacturer	Allen-Bradley
Catalog number	1756-DNB
Chassis width	1 slot
Functional Configuration	
Product function	ControlLogix DeviceNet bridge/scanner
Network	DeviceNet
Data rates	125, 250 or 500kbps
Maximum network nodes	64 total network nodes
Listed maximum trunk length	500m at 125kbps; 250m at 250kbps; 100m at 500kbps, with appropriate network media
USB connection	12Mbps; temporary local programming only, not for hazardous locations
Network-to-backplane isolation	50V continuous; USB is not isolated
Photographed hardware series	Series E; minimum firmware baseline 12.x
Performance & Power	
DeviceNet supply	11–25V DC; use the required Class 2/SELV supply arrangement
DeviceNet current	60mA at 24V DC
Backplane current	400mA at 5.1V DC; 0mA at 24V DC
Power dissipation	3.5W
Environment	
Operating temperature	0–60°C

Selected original manufacturer material follows on pages 3–6.

Compatibility & Selection Guide

System and software compatibility. The photographed 1756-DNB is Series E, requiring a minimum firmware baseline of 12.x. Its I/O and configuration data formats are unchanged. Compatibility extends back at least to ControlLogix controller version 12 projects that include the 1756-DNB selection, with the appropriate module revision and Compatible Keying. Confirm the exact controller and software combination before replacement.

Wiring & Installation Reference

Signal and terminal selection

DeviceNet network. 11–25V DC network supply · Use the required Class 2/SELV supply arrangement and correctly designed DeviceNet media.

Network connector. 5- or 10-pin linear plug · Tighten the connector to 0.56–0.79N·m; confirm the connector arrangement for the offered unit.

USB. Temporary local programming · Not a permanent connection; never use in a hazardous location.

Configuration checks

Confirm the system match. Verify the ControlLogix chassis, available backplane power and the complete Series E hardware identity.

Check DeviceNet design. Confirm the network supply, baud rate, media, node count and trunk-length limits before connecting field devices.

Verify project compatibility. Check the Series E minimum firmware 12.x baseline, configured module revision and electronic keying in the controller project before commissioning.

Installation precautions. Do not use the USB port in hazardous locations; USB is not isolated and is intended only for temporary local programming. Use the network power supply and connector limits applicable to the exact module. Do not apply Series C/D-only installation instructions to Series E without a verified applicability statement.

View network specifications (PDF) · PDF page 3 | View firmware compatibility · PDF page 5

Manufacturer sources: ControlLogix System Selection Guide / ControlLogix Communication Modules Technical Data / 1756-DNB Firmware/Hardware and RSLogix 5000 Compatibility.

DeviceNet Network



The DeviceNet network is open, providing connections between simple industrial devices, such as sensors and actuators, and higher-level devices, such as controllers and computers. The DeviceNet network uses the Common Industrial Protocol (CIP) to control, configure, and collect data for industrial devices.

Table 10 - Technical Specifications - 1756-DNB DeviceNet Module

Attribute	1756-DNB
DeviceNet communication rate	125 Kbps (500 m max) 250 Kbps (250 m max) 500 Kbps (100 m max)
Number of nodes, max	64
Current draw @ 5.1V DC	400 mA
Current draw @ 24V DC	0 mA
DeviceNet current draw @ 24V DC	60 mA
DeviceNet voltage range	11...25V DC CL 2/SELV
Power dissipation	3.5 W
Thermal dissipation	11.9 BTU/hr
Isolation voltage	50V (continuous), basic insulation type, DeviceNet network to backplane Type tested at 853V AC for 60 s No isolation between USB and backplane Compliant and tested according to IEC/UL 61010-1
Slot width	1
Module location	Chassis-based, any slot
Chassis	1756-A4, 1756-A7, 1756-A10, 1756-A13, 1756-A17
Power supply, standard	1756-PA72/C, 1756-PA75/B, 1756-PB72/C, 1756-PB75/B, 1756-PC75/B, 1756-PH75/B
Power supply, redundant	1756-PA75R, 1756-PB75R, 1756-PSCA2
DeviceNet power	To comply with the CE Low Voltage Directive (LVD), the DeviceNet network must be powered from a source compliant with the safety extra low voltage (SELV) or protected extra low voltage (PELV). To comply with UL restrictions, the DeviceNet network must be powered from a source compliant with Class 2 or limited voltage/current.
DeviceNet port	1 DeviceNet open-style 5- or 10-pin linear plug
DeviceNet connector torque	0.56...0.79 N•m (5...7 lb•in)
USB port(1)	USB full speed (12 Mbps)
Wiring category(2)	1 - On DeviceNet ports 3 - On USB ports
Temperature code	T4
Enclosure type rating	None (open-style)

(1) The USB port is intended for temporary local programming purposes only and not intended for permanent connection. Do not use the USB port in hazardous locations.
(2) Use this conductor category information for planning conductor routing as described in the system level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1. Refer to the DeviceNet Media Design and Planning Guide, publication DNET-UM072, for information specific to your DeviceNet network.

Table 11 - Environmental Specifications - 1756-DNB DeviceNet Module

Attribute	1756-DNB
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold) IEC 60068-2-2 (Test Bd, Operating Dry Heat) IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, storage IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold) IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat) IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions CISPR 11 (IEC 61000-6-4):	Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±3 kV at 5 kHz on DeviceNet ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on DeviceNet ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine wave 80% AM from 150 kHz...80 MHz

1756-DNB Firmware/Hardware and RSLogix5000 Compatibility

Firmware Considerations

There currently are five Series of the 1756-DNB scanners in existence. Each will be discussed below in detail

The series A module was the first hardware platform designed for the 1756-DNB scanner module. Any version of firmware through V7.xxx will operate on a Series A scanner. Series A modules are obsolete.

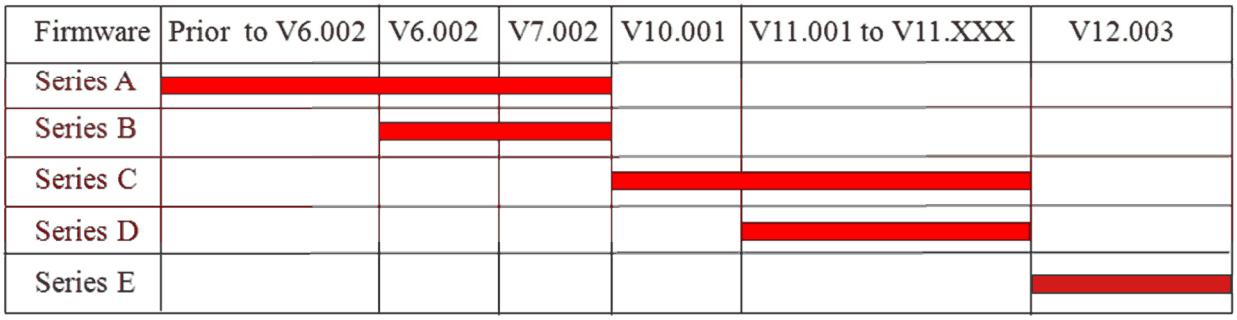
The series B module uses the same hardware as the series A module, but has a new version of the Mid Range ASIC chip installed in the hardware. The series B hardware will ONLY work with firmware revisions V6.02 to V7.xxx, because that firmware will only recognize the new ASIC along with the original ASIC. ControlFlash will not allow you to backflash the Series B module to an earlier firmware revision. Series B modules are obsolete.

The series C module have brand new hardware and requires firmware revision V10.001 to V11.XXX to operate correctly. Series C modules are obsolete.

The series D Scanners uses the same hardware as the series C, but has an ASIC upgrade that requires version V11.001 to V11.XXX firmware to operate, which will also work with all Series C 1756-DNB modules. The series D hardware will ONLY work with firmware revisions V11.001 to V11.xxx, because that firmware will only recognize the new ASIC along with the original ASIC. V11.003 is currently recommended as the minimum acceptable firmware revision for both the Series C and D module. Series D modules are obsolete.

The series E 1756-DNB is yet another completely different hardware platform compared to the last four series of modules. It requires a minimum of V12.xxx firmware to operate, which is NOT compatible with any of the earlier hardware platforms.

The chart below gives an easy way to determine which firmware is compatible with which hardware.



RSLogix5000 Considerations

Every I/O or communications module on a ControlLogix backplane has a certain format of data that is available not only back to the Logix controller, over the backplane, but also that can be configured using RSLogix5000 software. Generally, when I/O or Communications modules change their data format on the backplane, new AOP (Add On Profiles) are required in RSLogix 5000 software to configure them and add them to the I/O configuration tree. This will normally happen at a series change of a particular module. The good news is that 1756-DNB module has not changed its I/O or configuration data format ever in its lifetime. So no particular AOP revision is required to add a 1756-DNB to the I/O configuration tree or to configure it.

This is very important when you are trying to add a very recent series of the 1756-DNB module, into an earlier revision of Logix controller. Because of Series A thru D module obsolescence's, it could become common place for a Series E 1756-DNB module to be used as a replacement in early Logix controllers. NOTE: When this happens the exact major firmware revision of the 1756-DNB may NOT be in the RSLogix5000 configuration window, but since the data formats never changed, it will work just fine regardless. The key to using 1756-DNB modules for earlier revisions of Logix controllers is to select the highest major revision in the RSLogix5000 pull down list and then set the Electronic Keying to Compatible Keying. What this does is that when the Logix controller opens up the backplane connection the 1756-DNB module, it tells the module what revision it is looking for on the backplane. The 1756-DNB then makes a decision about the revision, and reports back to the controller that the actual DNB revision is compatible with the selected revision in the controller. The good news is that the Series E 1756-DNB module should be compatible with all released versions of ControlLogix controllers that at least have the 1756-DNB in the I/O configuration tree selection list. This means going back at least to V12 of ControlLogix controllers.