

Driver Manual

FS-8700-22 DeviceNet Slave Adapter

APPLICABILITY & EFFECTIVITY

Effective for all systems manufactured after February 2021.



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fieldserver

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1 Description

The DeviceNet Slave Adapter driver can be used to emulate a single slave station on a DeviceNet network. The FieldServer DeviceNet adapter is implemented as an ODVA profile 12 communications adapter and acts as a group 2 only server on the DeviceNet network. Standard DeviceNet baud rates of 125k, 250k and 500kbit/s are supported. DeviceNet masters/scanners can open an IO connection of up to 512 Bytes in each direction to the FieldServer.

Max Nodes Supported

FieldServer Mode	Nodes	Comments
Server	1	The FieldServer can only emulate one DeviceNet Slave station

2 Driver Scope of Supply

2.1 Supplied by MSA Safety

Part #	Description
DeviceNet-Slave	Anybus-S DeviceNet Card

2.2 Provided by the Supplier of 3rd Party Equipment

2.2.1 Required 3rd Party Software

RSNetWorx, RSLogix or another Network Scheduling Tool.

2.2.2 Required 3rd Party Configuration

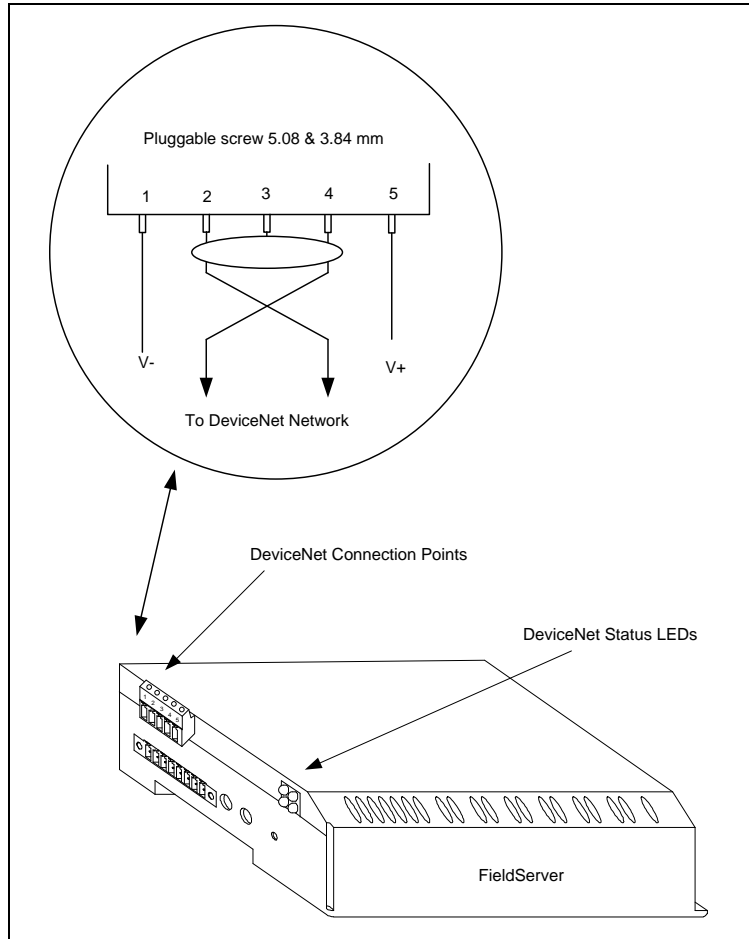
Connection to a properly terminated DeviceNet network.

2.2.3 Optional Items

Part #	Vendor/Manufacturer	Description
-	HMS-Networks	Anybus-S DeviceNet EDS file

3 Hardware Connections

The FieldServer is connected to the DeviceNet network as shown in the connection drawing below.



Connector Pinouts

Pin	Signal	Description	Wire color
1	V-	Negative supply voltage	black
2	CAN_L	CAN_L Bus line	blue
3	SHIELD	Cable Shield	(bare)
4	CAN_H	CAN_H Bus line	white
5	V+	Positive Supply Voltage	red

3.1 Hardware Connection Tips / Hints

- Use the recommended network cable and terminators as specified by the DeviceNet network organization and/or the manufacturer of your network equipment.
- Terminate each end of the DeviceNet network with a 121 Ω resistor.
- The bus interface shall be supplied with 24DC \pm 10% on the Fieldbus connector.
- The DeviceNet Slave Card's network current consumption is maximum 30mA = 0.03 Amps.

4 Data Array Parameters

Data Arrays are “protocol neutral” data buffers for storage of data to be passed between protocols. It is necessary to declare the data format of each of the Data Arrays to facilitate correct storage of the relevant data.

Section Title		
Data_Arrays		
Column Title	Function	Legal Values
Data_Array_Name	Provide name for Data Array.	Up to 15 alphanumeric characters
Data_Array_Format	Provide data format. Each Data Array can only take on one format.	Float, Bit, Byte, Uint16, Uint32, Sint16, Sint32
Data_Array_Length	Number of Data Objects. Must be larger than the data storage area required by the Map Descriptors for the data being placed in this array.	1-10000

Example

```
// Data Arrays
Data_Arrays
Data_Array_Name , Data_Array_Format , Data_Array_Length
DA_AI_01 , Uint16, , 200
DA_AO_01 , Uint16 , , 200
DA_DI_01 , Bit , , 200
DA_DO_01 , Bit , , 200
```

5 Slave Configuration

For detailed information on FieldServer configuration, refer to the FieldServer Configuration Manual. The information that follows describes how to expand upon the factory defaults provided in the configuration files included with the FieldServer (see “.csv” sample files provided with the FieldServer).

This section documents and describes the parameters necessary for configuring the FieldServer to communicate with a DeviceNet Master/Scanner.

The configuration file tells the FieldServer about its interfaces, and the routing of data required. In order to enable the FieldServer for DeviceNet communications, the driver independent FieldServer buffers need to be declared in the “Data Arrays” section, the FieldServer virtual node(s) needs to be declared in the “Server Side Nodes” section, and the data to be provided to the clients needs to be mapped in the “Server Side Map Descriptors” section. Details on how to do this can be found below.

NOTE: In the following tables, * indicates an optional parameter and bold legal values are default.

5.1 DeviceNet Settings

Section Title		
FieldServer		
Column Title	Function	Legal Values
System_Station_Address*	DeviceNet MAC ID of the FieldServer.	0-63

NOTE: The DeviceNet MAC ID can also be set via the DIP switches on the side of the FieldServer but then the system station address parameter must be removed from the configuration file. Refer to Section 8.1 for more information.

Example

```
// FieldServer

FieldServer
Title           , System_Station_Address
DeviceNet_Test  , 5
```

5.2 Server Side Connection Parameters

Section Title		
Connections		
Column Title	Function	Legal Values
Adapter	Adapter Name.	DNet
Protocol	Protocol name.	X30_DNet_Slave
DNet_Slave_Baudrate	Baud rate.	125K, 250K, 500K

Example:

```
// Client Side Connections

Connections
Adapter   , Protocol           , DNet_Slave_Baudrate
DNet     , X30_DNet_Slave    , 500K
```

5.3 Server Side Node Parameters

Section Title		
Nodes		
Column Title	Function	Legal Values
Node_Name	Provide name for Node.	Up to 31 alphanumeric characters
Node_ID	BACnet device identifier of physical Server Node.	0 - 4194303
Protocol	Specify protocol used.	BACnet_IP

Example

```
// Client Side Nodes

Nodes
Node_Name , Node_ID , Protocol
DN5      , 01      , X30_DNet_Slave
```


5.4 Server Side Map Descriptor Parameters

5.4.1 FieldServer Specific Map Descriptor Parameters

Column Title	Function	Legal Values
Map_Descriptor_Name	Name of this Map Descriptor.	Up to 32 alphanumeric characters
Data_Array_Name	Name of Data Array where data is to be stored in the FieldServer.	One of the Data Array names from "Data Array" section above
Data_Array_Offset	Starting location in Data Array.	0 to maximum specified in "Data Array" section above
Function	Function of Server Map Descriptor.	RDBC-Reads data from the local input buffer WRBC-Writes data to the local output buffer

5.4.2 Driver Related Map Descriptor Parameters

Column Title	Function	Legal Values
Node_Name	Name of Node.	One of the node names specified in "Server Node Descriptor" above
DeviceNet_Data_Type	Data Type of local buffer.	BYTE, WORD, DWORD, FLOAT, BOOL
Address	Byte offset into local buffer.	RDBC: 0 – 511 WRBC: 0 – 511
Length	Number of DeviceNet_Data_Type items in local buffer.	BYTE: 1 – 512 WORD: 1 – 256 DWORD: 1 – 128 FLOAT: 1 – 128 BOOL: 1 – 4096

5.5 Map Descriptor Example

```
// Client side Map Descriptors
Map_Descriptors
Map_Descriptor_Name , Data_Array_Name , Data_Array_Offset , Function
Get_Data           , Input_Data       , 0                , RDBC
Put_Data           , Output_Data      , 0                , WRBC

, Node_Name , DeviceNet_Data_Type , Address , Length , Scan_Interval
, CN5      , WORD                  , 0       , 10     , 1s
, CN5      , WORD                  , 0       , 10     , 1s
```

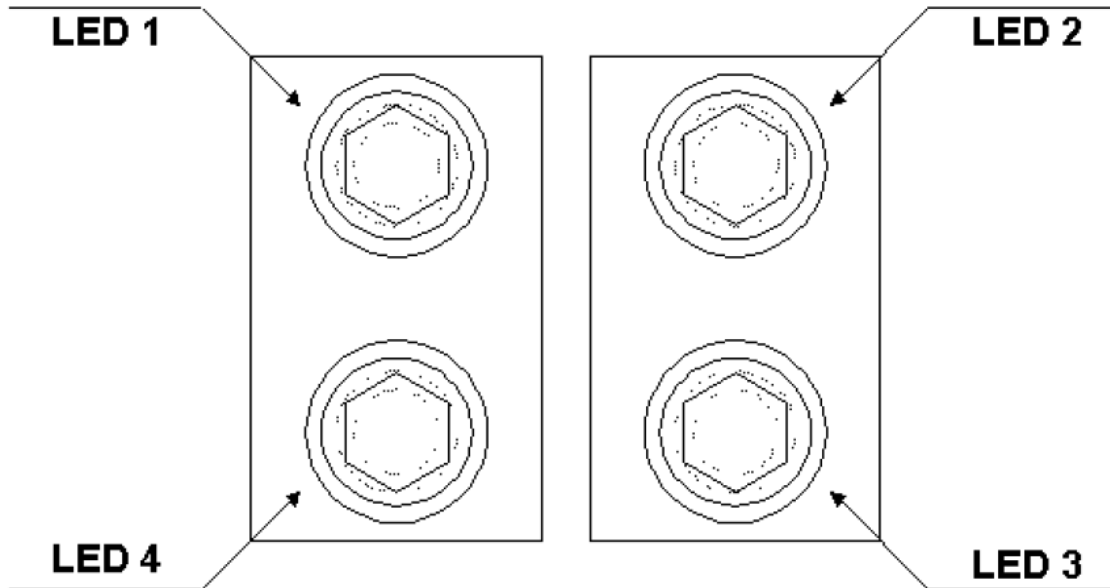
The read function map descriptor gets data from the DeviceNet network and stores it in the Input_Data data array.

Write function map descriptor puts data from the Output_Data data array onto the DeviceNet network.

Each address refers to an individual local input and output buffer. Each buffer can contain up to 512 bytes.

6 Advanced Topics

6.1 FieldServer LED Indicators



LED 1 – Reserved

LED 2 – Network Status

Color	Frequency	Description
-	Off	Not powered / Not online
Green	On	Link OK, online, connected
Green	Flashing	Online, not connected
Red	On	Critical link failure
Red	Flashing	Connection timeout

LED 3 – Module Status

Color	Frequency	Description
-	Off	Not powered
Green	On	Device operational
Green	Flashing	Data size bigger than configured
Red	On	Unrecoverable fault
Red	Flashing	Minor fault

LED 4 – Reserved

6.2 Using RSNetWorx

Refer to the RSNetWorx document on the [HMS website](#).

NOTE: Establish I/O communication between AnyBus-S DeviceNet via RsNetWorx for DeviceNet.

6.3 Using RSLogix 5000

Refer to the RSLogix 5000 document on the [HMS website](#).

NOTE: Reading/writing data from AnyBus-S DeviceNet using ControlLogix5000 MSG instruction.

7 Troubleshooting

If there is no 24VDC supply on the DeviceNet Network or if the power supply current is not enough to support the entire network, then the FieldServer will report that any device configured in the config file is not in the master scan list, regardless if it is in the scan list or not.

8 Driver Notes

8.1 Setting the FieldServer DeviceNet MAC ID and Baud Rate

The MAC ID and baud rate can be set in the FieldServer's CSV file using the System_Station_Address and DNet_Slave_Baudrate parameters or it can be set with the DIP switches.

NOTE: The System_Station_Address parameter must be removed from the config file if the DIP switch settings are to be used.