EcoStruxure™

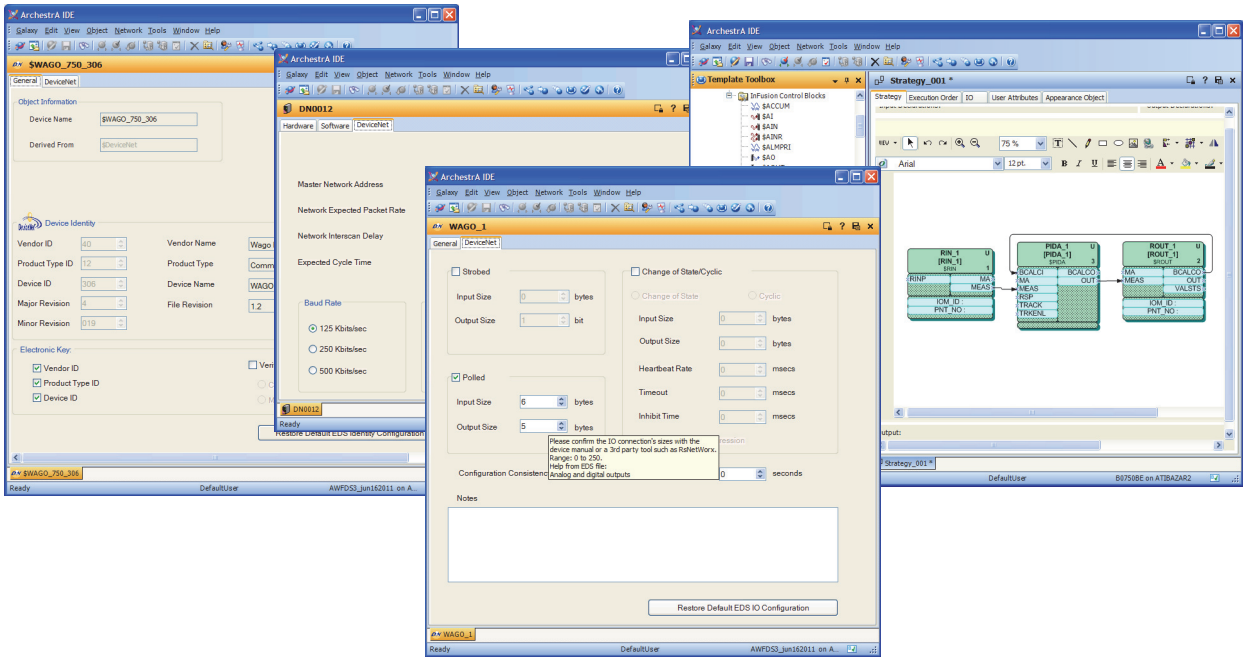
Foxboro™ DCS

Foxboro DCS DeviceNet™

PSS 41S-10DEVNET

Product Specification

July 2019



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Legal Information

Features

The Foxboro DCS DeviceNet allows Engineers and Technicians to change and maintain the configuration of the FBM229 in its communications to DeviceNet™ networks and devices.

The Foxboro DCS DeviceNet is a software application that adds functionality to the EcoStruxure™ Foxboro DCS Control Editors to provide system configuration for DeviceNet slave devices and integration of DeviceNet networks into the EcoStruxure™ Foxboro™ DCS system.

The slave devices are connected to the control system via the FBM229 (described in *FBM229, DeviceNet™ Communication Module* (PSS 31H-2Z29)). The FBM229 operates as a DeviceNet master exchanging I/O messages with the slave devices for process value updates. Devices are individually configured to use one of four I/O modes to connect to the FBM:

- Strobed, Polled, Change of State or Cyclic. The FBM229 also supports explicit message connections for acquiring device diagnostic and maintenance data.

The Foxboro DCS DeviceNet's graphical user interface opens inside the Control Editors, and provides easy-to-use tools for selecting the I/O mode and specifying device verification criteria, based on the device's Electronic Data Sheet (EDS) file. The device configuration is maintained in a Wonderware Galaxy database, where it is integrated with other control system elements such as control strategies and Distributed Control Interface (DCI) blocks.

Key features of the Foxboro DCS DeviceNet include:

- Integration of the device configuration into the control database
- EDS-informed editing tools for device I/O configuration
- Configuration of the FBM229 as a DeviceNet Master, including definition of the FBM229 scan list
- Device templates that enable re-use of engineering for multiple tags of the same device type
- Convenient links to editors for the host control station and EcoStruxure™ Foxboro Fieldbus Module
- Integrated with the Network view and other application windows in the Control Editors, which enable quick creation, assignment, tagging and deployment of devices.

Foxboro DCS DeviceNet Templates

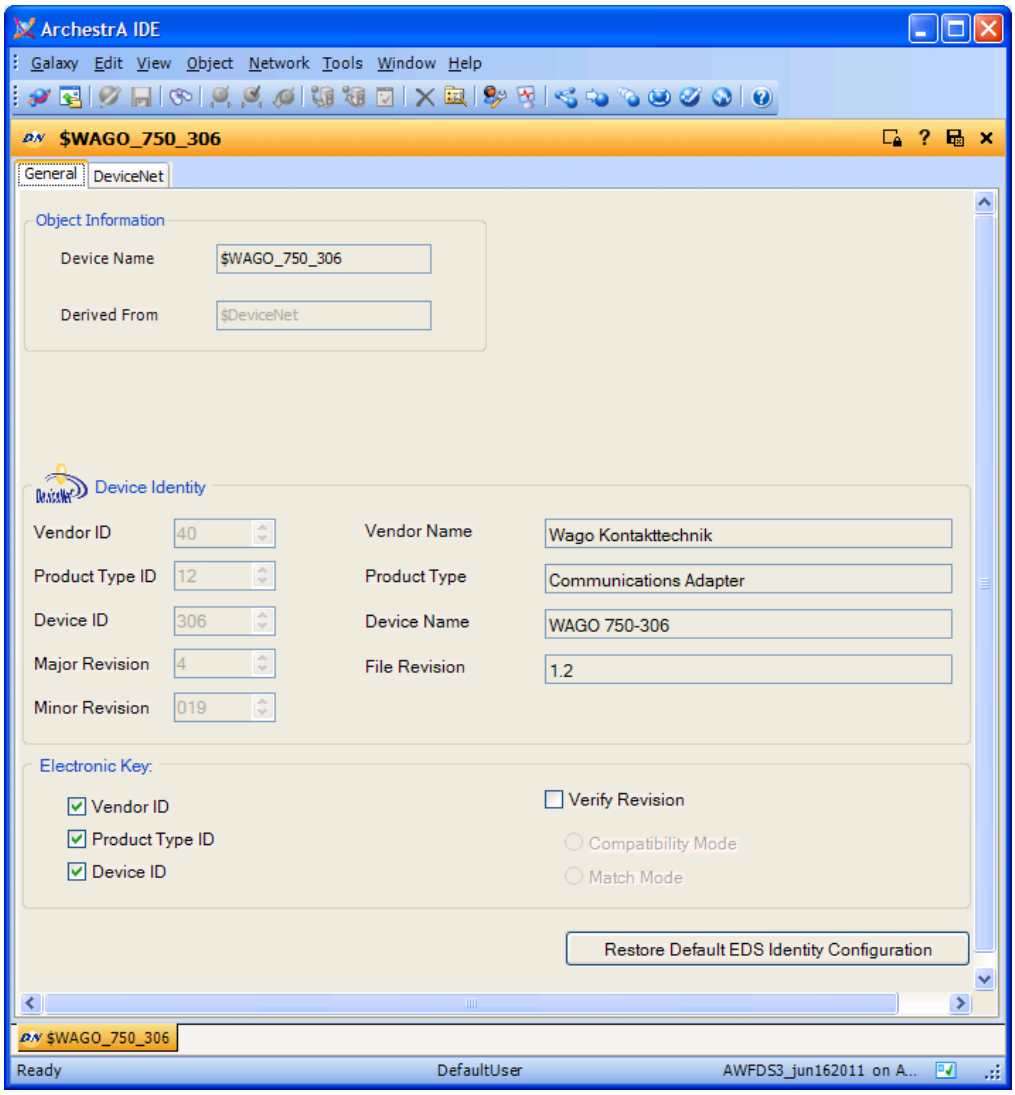
Foxboro DCS DeviceNet is based on electronic data sheets. The user imports an EDS file into a copy of a DeviceNet device template. The EDS file, which is bound to the template, provides device identity information and defines the device's supported I/O modes and data sizes.

The user then opens the device template in Foxboro DCS DeviceNet, which displays the device identity information extracted from the EDS file (see the figure below), including:

- Vendor name and vendor DeviceNet ID
- Device type
- Product name and product DeviceNet ID
- Device revision (major and minor)
- Revision level of the EDS file

The editor allows the user to edit descriptive text strings that are not used in device verification.

Figure 1 - General Tab for a Template Shows Device Identity and Electronic Key Options

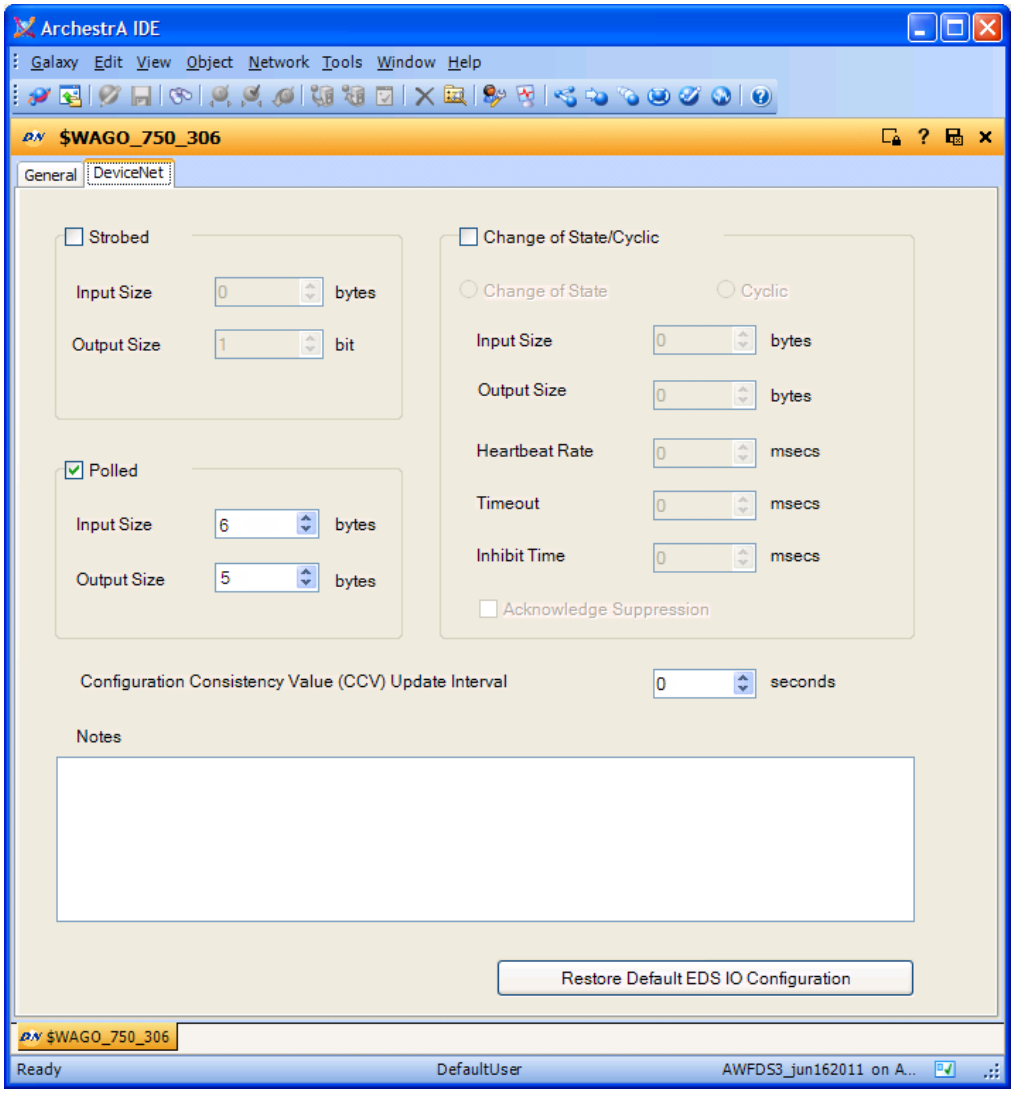


The checkboxes in the Electronic Key group in the lower portion of the display specify the criteria the FBM229 will use to verify the identity of an instance of the device type at a specific address on the DeviceNet network.

The editor's DeviceNet tab (see the figure below) enables the user to select the predefined I/O mode (Strobed, Polled, Change of State or Cyclic) to be used with the device, specify the input and output data sizes, and configure mode-specific timing parameters such as Heartbeat Rate for Change of State mode and Send Rate for Cyclic mode.

The device template provides the ability to engineer a typical field device type once, and propagate the I/O configuration to each tag of the same device type. At the same time, the editor allows the user to edit individual device configurations, overriding selections copied from the template. The revised configurations are always device-appropriate as the configuration remains linked to the EDS file for device description.

Figure 2 - The I/O Mode Selection Made in the Template Can be Edited at the Device Level



Creating DeviceNet Slave Devices

To begin configuration of a DeviceNet slave device in the EcoStruxure™ Foxboro™ DCS Control Software, the user simply drags the appropriate device template to the Network View (Figure 3), where the device is named and assigned to an FBM229.

The Foxboro DCS DeviceNet deals only with the device information that the FBM229 requires to communicate with the slave device using the desired I/O mode. Use Rockwell Automation's RSNetWorx® for DeviceNet (or a similar ODVA compliant configuration tool) to configure device parameters and commission the device.

The user then double-clicks the new device to open it in Foxboro DCS DeviceNet (*Adding a Slave Device, page 6*), enters the address that was configured for the device during device preparation, and then views and modifies the I/O configuration copied from the template (*Setting the Device Address, page 6*).

Figure 3 - Adding a Slave Device

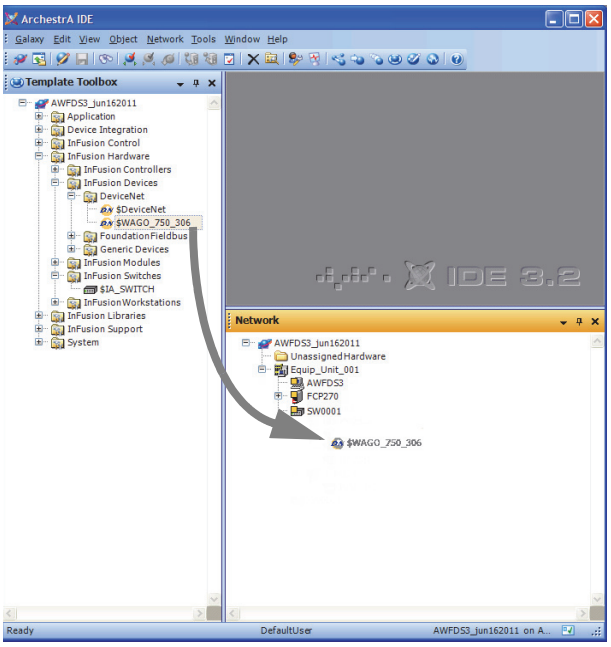


Figure 4 - Setting the Device Address

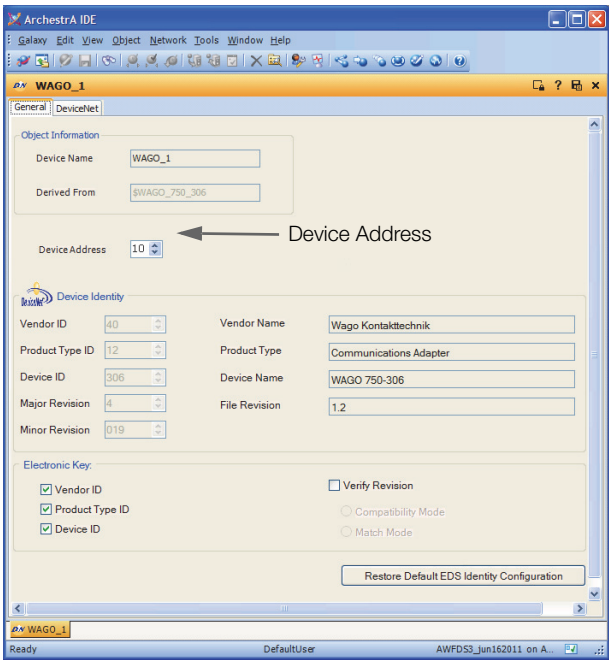
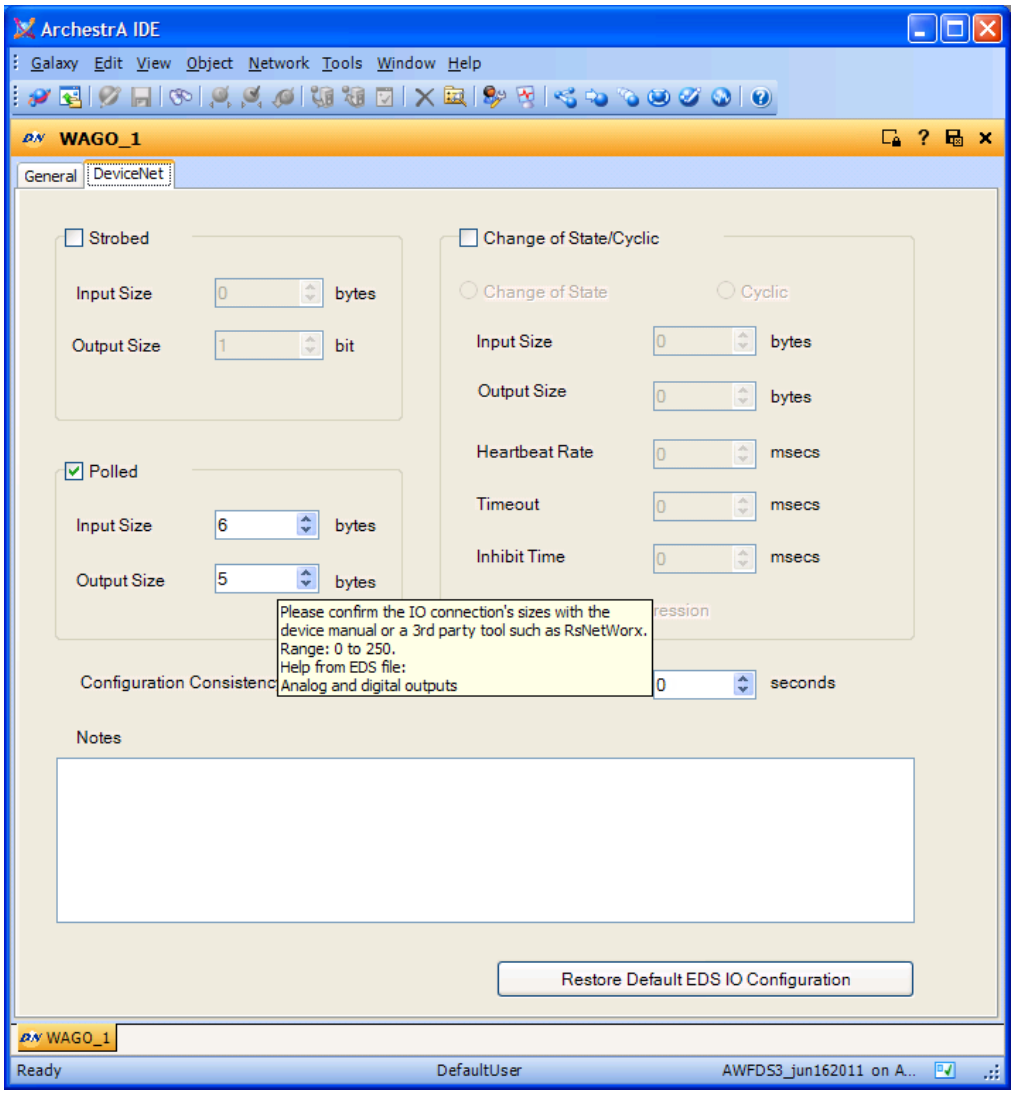


Figure 5 - Editing I/O Configuration



When the slave device is deployed its I/O configuration is downloaded to the FBM229 to build the FBM scan list. For example, with the configuration shown in *Adding a Slave Device, page 6* and *Setting the Device Address, page 6*, the FBM229 will poll the slave device at address 10 (WAGO_1) each scan cycle, writing 5 bytes of data to the device and reading 6 bytes of input data.

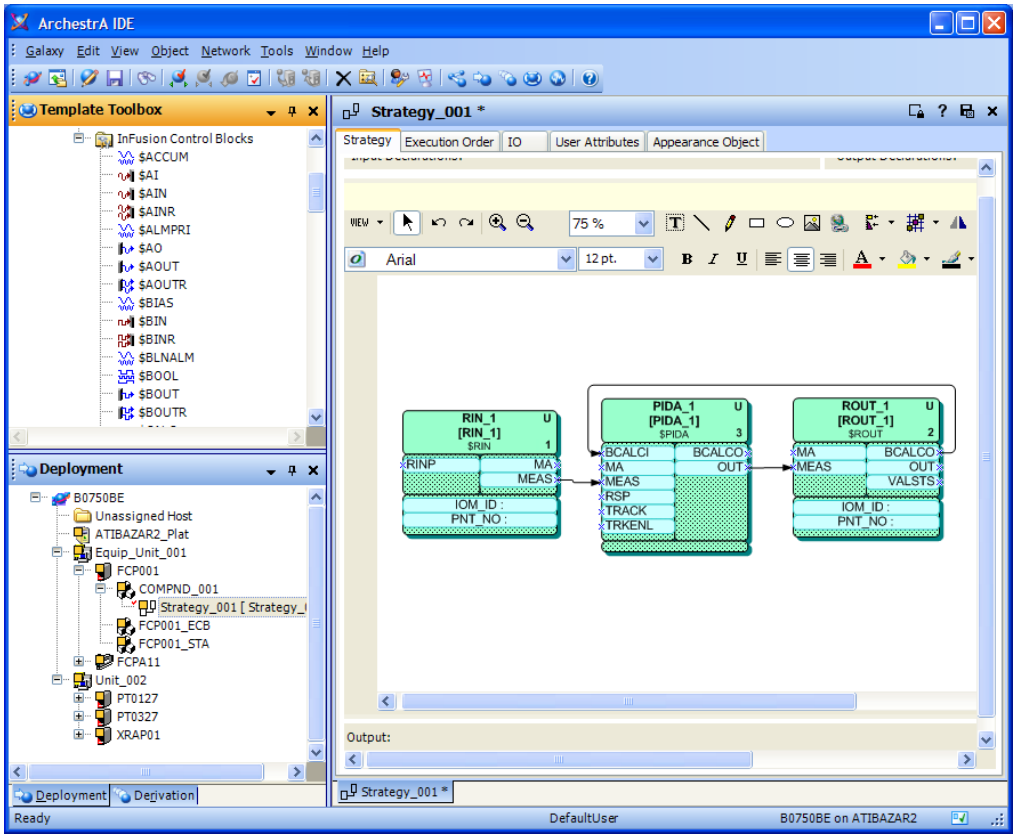
As part of the device creation, the Control Software sets up an equipment control block (ECB201) that represents the device in the EcoStruxure™ Foxboro DCS Control Core Services. The device's context menu in the Network view provides a link to an editor for the device ECB, where the user can specify block display settings, configure parameters for collection by the Control Software History component, and set runtime access permissions.

Control Configuration for DeviceNet Slave Devices

DeviceNet slave devices are connected to Foxboro DCS control blocks using Distributed Control Interface (DCI) blocks. DCI block types include input and output blocks for common data types such as integer and floating point.

The Strategy Editor provides graphical tools for adding DCI blocks to a control strategy, linking them to control blocks, and specifying how the DCI blocks will parse the data in the DeviceNet I/O messaging for use in the control scheme.

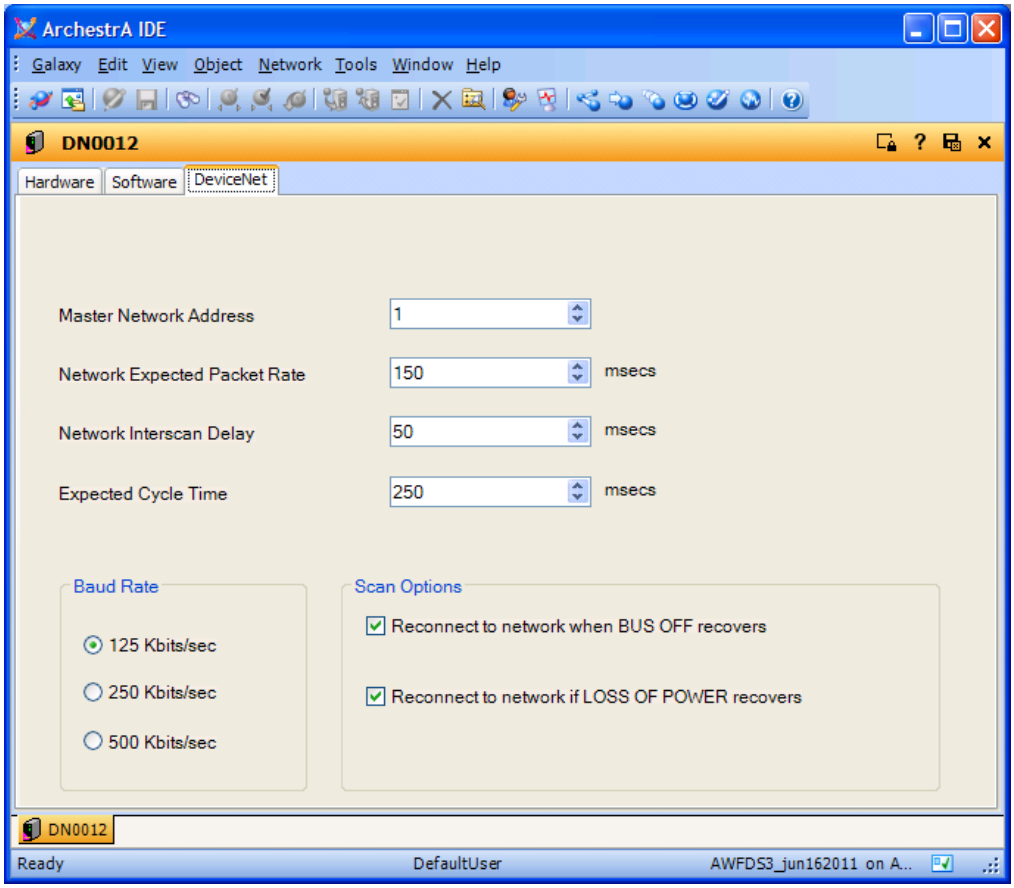
Figure 6 - DCI Blocks in a PID Strategy Provide Input from and Output to DeviceNet Slave Devices



FBM229 Master Configuration

The Foxboro DCS DeviceNet is also used to configure the FBM229 as a DeviceNet master, including setting the FBM229 DeviceNet address, selecting the baud rate for the DeviceNet segment, and configuring scan-cycle parameters such as Network Expected Packet and Interscan Delay.

Figure 7 - Configuring the FBM229 as a DeviceNet Master



Deployment of DeviceNet Device Configurations

The device configurations are deployed to the Foxboro DCS system as part of a control database deployment, which also downloads the host FBM229 configuration and the DCI and control blocks contained in the various control strategies. The FBM229 uses the downloaded configurations to initialize the connected devices and message exchange between the devices and the control station. After the initial deployment, the Control Software provides a more selective deployment in which later changes to the device configurations can be made with minimal interruption to the process.

Hardware and Software Requirements for Foxboro DCS DeviceNet

Computer Requirements

- Should be installed on an H90/P90 or H92/P92 workstation running the Control Editors, v3.1-v4.x and the Control Software v5.0 or later

System Hardware Requirements

- The EcoStruxure™ Foxboro DCS Control Network-connected station committed as AW70 or WSTA70 at I/A Series software v8.7-v8.8 or Control Core Services software v9.0 later
- ZCP270 or FCP270 at I/A Series software v8.7-v8.8 and Control Core Services software v9.0 later, with FBM229

Media

- Foxboro DCS - DeviceNet Software V1.0.2 media kit (K0201HS).

Licenses

- Control Editors require user license S56, S57 or S58

Sizing Guidelines

The Foxboro DCS DeviceNet along with the FBM229 provide the following capacity limits:

- 64 nodes per DeviceNet network (including the FBM229 master, slave devices and RSNetWorx host PC), per ODVA specification
- 1,000 DCI blocks per FBM
- 150 ECBs per compound

Related Product Specification Sheets

PSS Number	PSS Title
PSS 31H-2S200	Standard 200 Series Subsystem Overview
PSS 31H-2Z29	FBM229, DeviceNet™ Communication Module

Recommended Open Device Vendor Association Documents

Publication Number	Title
PUB00026-R1	DeviceNet Technical Overview
PUB00027-R1	Planning and Installation Manual: DeviceNet Cable System
PUB00147-R0	Plant Floor Troubleshooting Guide

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