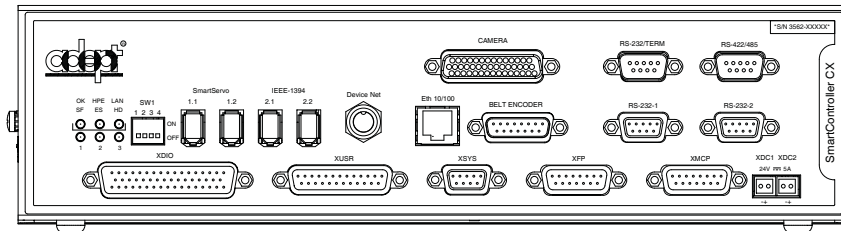


# Configuring an Adept SmartController CX as a Slave Device Allen-Bradley ControlLogix Controller with a 1756 DeviceNet Scanner Card



Rev. A  
June 2007



3011 Triad Drive • Livermore, CA 94551 • Phone (925) 245-3400 • Fax (925) 960-0452

Otto-Hann-Strasse 23 • 44227 Dortmund • Germany • Phone (49) 231.75.89.40 • Fax (49) 231.75.89.450

41, rue du Saule Trapu • 91882 • Massy • France • Phone (33) 1.69.19.16.16 • Fax (33) 1.69.32.04.62

---

## Copyright Notice

The information contained herein is the property of Adept Technology, Inc., and shall not be reproduced in whole or in part without prior written approval of Adept Technology, Inc. The information herein is subject to change without notice and should not be construed as a commitment by Adept Technology, Inc. The documentation is periodically reviewed and revised.

Adept Technology, Inc., assumes no responsibility for any errors or omissions in the documentation. Critical evaluation of the documentation by the user is welcomed. Your comments assist us in preparation of future documentation. Please submit your comments to: [techpubs@adept.com](mailto:techpubs@adept.com).

Copyright © 2007 by Adept Technology, Inc. All rights reserved.

Adept, the Adept logo, the Adept Technology logo, AdeptVision, AIM, Blox, Bloxview, FireBlox, Fireview, HexSight, Meta Controls, MetaControls, Metawire, Soft Machines, and Visual Machines are registered trademarks of Adept Technology, Inc.

Brain on Board is a registered trademark of Adept Technology, Inc. in Germany.

ACE, ActiveV, Adept 1060 / 1060+, Adept 1850 / 1850 XP, Adept 540 Adept 560, Adept AnyFeeder, Adept Award, Adept C40, Adept C60, Adept CC, Adept Cobra 350, Adept Cobra 350 CR/ESD, Adept Cobra 550, Adept 550 CleanRoom, Adept Cobra 600, Adept Cobra 800, Adept Cobra i600, Adept Cobra i800, Adept Cobra PLC server, Adept Cobra PLC800, Adept Cobra s600, Adept Cobra s800, Adept Cobra s800 Inverted, Adept Cobra Smart600, Adept Cobra Smart800, Adept DeskTop, Adept FFE, Adept FlexFeeder 250, Adept IC, Adept iSight, Adept Impulse Feeder, Adept LineVision, Adept MB-10 ServoKit, Adept MC, Adept MotionBlox-10, Adept MotionBlox-40L, Adept MotionBlox-40R, Adept MV, Adept MV-10, Adept MV-19, Adept MV-4, Adept MV-5, Adept MV-8, Adept OC, Adept Python, Adept sDIO, Adept SmartAmp, Adept SmartAxis, Adept SmartController CS, Adept SmartController CX, Adept SmartModule, Adept SmartMotion, Adept SmartServo, Adept sMI6, Adept sSight, Adept Viper s650, Adept Viper s850, Adept Viper s1300, Adept Viper s1700, AdeptCartesian, AdeptCast, AdeptForce, AdeptFTP, AdeptGEM, AdeptModules, AdeptMotion, AdeptMotion Servo, AdeptMotion VME, AdeptNet, AdeptNFS, AdeptOne, AdeptOne-MV, AdeptOne-XL, AdeptRAPID, AdeptSight, AdeptSix, AdeptSix 300, AdeptSix 300 CL, AdeptSix 300 CR, AdeptSix 600, AdeptTCP/IP, AdeptThree, AdeptThree-MV, AdeptThree-XL, AdeptTwo, AdeptVision, AVI AdeptVision, AGS AdeptVision GV, AdeptVision I, AdeptVision II, AdeptVision VME, AdeptVision VXL, AdeptVision XGS, AdeptVision XGS II, AdeptWindows, AdeptWindows Controller, AdeptWindows DDE, AdeptWindows Offline Editor, AdeptWindows PC, AIM Command Server, AIM Dispense, AIM PCB, AIM VisionWare, A-Series, FlexFeedWare, HyperDrive, IO Blox, IO Blox, 88, MicroV+, MotionBlox, MotionWare, ObjectFinder, ObjectFinder 2000, PackOne, PalletWare, sAVI, S-Series, UltraOne, V, V+ and VisionTeach are trademarks of Adept Technology, Inc.

Any trademarks from other companies used in this publication are the property of those respective companies.

---

# Table of Contents

---

---

<b>1 Introduction .....</b>	<b>9</b>
<b>1.1 How Can I Get Help? .....</b>	<b>9</b>
<b>2 Safety .....</b>	<b>11</b>
<b>2.1 Notes, Cautions, and Warnings .....</b>	<b>11</b>
<b>3 Configuration.....</b>	<b>13</b>
<b>3.1 Introduction.....</b>	<b>13</b>
<b>3.2 Adept SmartController Startup .....</b>	<b>13</b>
<b>3.3 DeviceNet Setup .....</b>	<b>13</b>
<b>3.4 Adding the AB PLC Scanner Card.....</b>	<b>15</b>
Setting Up EDS Information .....	16
Building the DeviceNet List on the ControlLogix Controller .....	20
Setting Up the Scanner Card .....	21
<b>3.5 Testing the Configuration.....</b>	<b>25</b>



---

---

# List of Figures

---

---

Figure 1. DeviceNet Not Configured ..... 13

Figure 2. PLC Scanner Not Configured ..... 14

Figure 3. Default Graph Screen in RSNetWorx for DeviceNet ..... 15

Figure 4. RSNetWorx for DeviceNet Screen – AB DeviceNet Scanner Card ..... 16

Figure 5. EDS Wizard - Startup Screen..... 16

Figure 6. EDS Wizard - Options Screen..... 17

Figure 7. EDS Wizard - Device Description Screen..... 18

Figure 8. EDS Wizard - Input/Output Screen..... 19

Figure 9. EDS Wizard - Change Graphic Image Screen..... 19

Figure 10. EDS Wizard - Final Task Summary Screen ..... 20

Figure 11. RSNetWorx for DeviceNet Screen – Adept Slave ..... 20

Figure 12. RSNetWorx for DeviceNet Screen – Adept Slave Assigned MACID of 2 ..... 21

Figure 13. Scanner Card Setup - Module Pane..... 22

Figure 14. Scanner Card Setup - Scanlist Pane..... 22

Figure 15. Scanner Card Setup - Input Pane..... 23

Figure 16. Scanner Card Setup - Output Pane..... 23

Figure 17. Scanner Card Setup - Module Pane..... 24

Figure 18. Communications Path..... 25

Figure 19. DeviceNet Command Executed After Configuration ..... 25

Figure 20. IO Command Executed ..... 26

Figure 21. Local:2:I.Data[0] Value Set to 15 ..... 26

Figure 22. Local:2:I.Data[0] Value Set to 255 ..... 27

Figure 23. Adept System Test Using IO Command..... 28



---

# List of Tables

---

---

Table 1.	Device Description .....	17
Table 2.	Input/Output .....	18



---

# 1 Introduction

---

---

This document describes how to configure the Adept SmartController CX to operate as a slave device to an AB (Allen-Bradley) ControlLogix Controller with a 1756 DeviceNet scanner card.

## 1.1 How Can I Get Help?

Refer to the *How to Get Help Resource Guide*, Adept P/N 00961-00700, for details on getting assistance with your Adept software or hardware. Additionally, you can access the following information sources on Adept's corporate web site:

- For Contact information: <http://www.adept.com/main/contact/index.html>
- For Product Support information: <http://www.adept.com/main/services/>
- For further information about Adept Technology, Inc.: <http://www.adept.com/>



---

## 2 Safety

---

---

### 2.1 Notes, Cautions, and Warnings

There are four levels of notation used in this manual. They are:



**DANGER:** This indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING:** This indicates a potentially hazardous situation which, if not avoided, could result in serious injury or major damage to the equipment.



**CAUTION:** This indicates a situation which, if not avoided, could result in minor injury or damage to the equipment.

**NOTE:** This provides supplementary information, emphasizes a point or procedure, or gives a tip for easier operation.



---

# 3 Configuration

---

## 3.1 Introduction

This chapter describes how to configure the Adept SmartController as a slave device to an AB ControlLogix Controller with a 1756 DeviceNet scanner card. Testing to confirm the configuration is also described.

## 3.2 Adept SmartController Startup

To begin configuring the Adept SmartController:

1. Start up the Adept SmartController.
2. Connect to the SmartController with AdeptWindows.
3. When you boot up for the first time, the system is NOT configured for DeviceNet. If you type the “devicenet” command at the monitor prompt at this point, you will receive the following message.

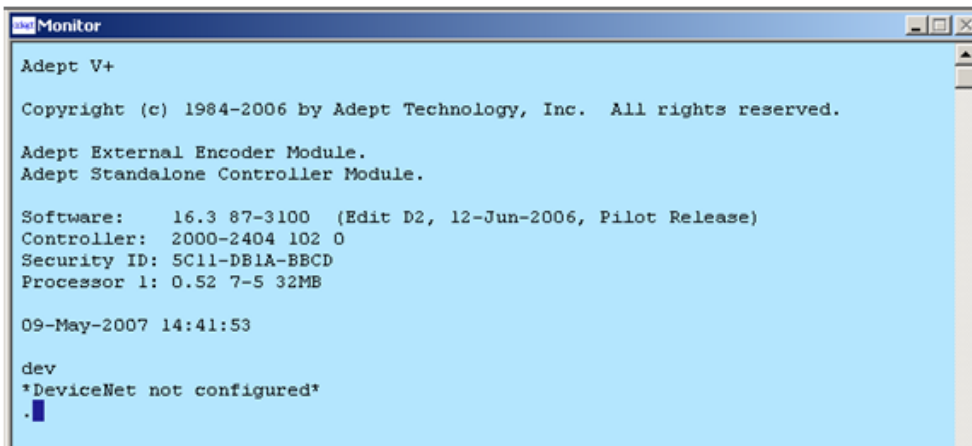


Figure 1. DeviceNet Not Configured

## 3.3 DeviceNet Setup

1. Start up the CONFIG\_C utility program by typing the following at the prompt:

```
LOAD D:\UTIL\CONFIG_C  
EXE 1 a.config_c
```

2. Set up the DeviceNet configuration as follows:

```
LOCAL = "/MACID 2 /BAUD 125"  
MAPPING 1 = "/MACID 2 /BYTE 1 /BIT 1 /BIT_LENGTH 8 /SIGNAL 161"  
MAPPING 2 = "/MACID 2 /BYTE 1 /BIT 1 /BIT_LENGTH 8 /SIGNAL 1161"
```

---

The /SIGNAL qualifier in the MAPPING statement associates DeviceNet IO with V+ signals. It specifies the starting number of a range of V+ signals that receive/transmit status information from/to the selected node. The range is specified by the number in bit\_len.

The V+ signal number specified establishes whether the bits being mapped are for output or input. If the number is for a V+ output signal (1 through 512), the bits are used for outputs. If the number is for a V+ input signal (1001 through 1512), the bits are used for inputs.

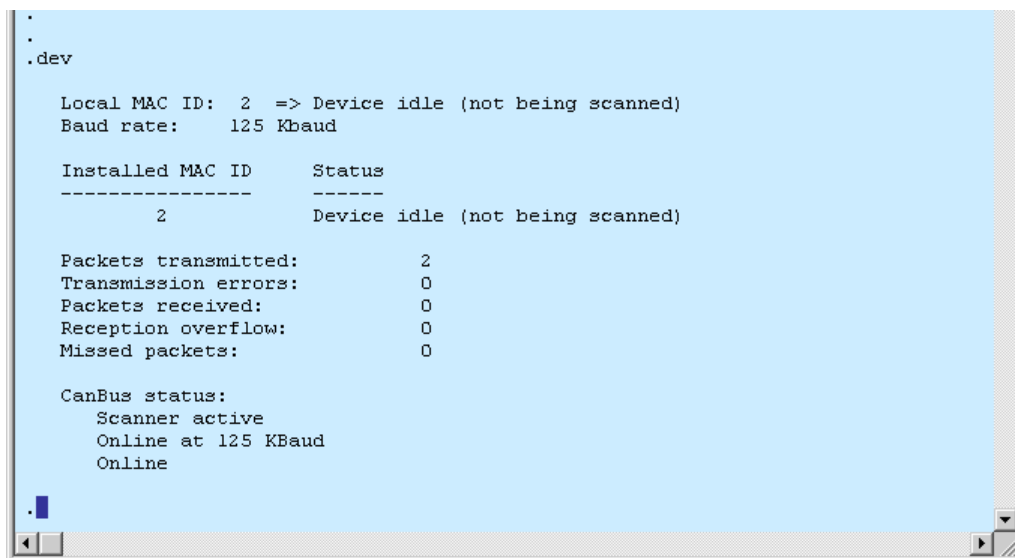
Starting signal numbers must be specified as follows:

- Specify starting output signals as integers in the range: 1, 9, ..., 505 – that is, 1 plus Nx8, where N is 0, 1, 2, ..., 63
- Specify starting input signals as integers in the range: 1001, 1009, ..., 1505 – that is, 1001 plus Nx8, where N is 0, 1, 2, ..., 63.
- Make sure the specified signals do not conflict with any other I/O signals defined in CONFIG\_C .
- Make sure signal numbers do not extend beyond 512 (output) or 1512 (input).

See the [DeviceNet Statements in V+ Configuration Data](#) online help and the *Adept SmartController User's Guide* for more information on signal mapping and DeviceNet.

### 3. Reboot the Adept SmartController.

Until the PLC (Programmable Logic Controller) scanner is set up, there is no activity on the DeviceNet network. After the SmartController starts up, typing “devicenet” at the monitor window (before the PLC scanner is set up) would display a screen similar to Figure 2.



```
.
.
.dev

Local MAC ID:  2 => Device idle (not being scanned)
Baud rate:    125 Kbaud

Installed MAC ID   Status
-----
                2   Device idle (not being scanned)

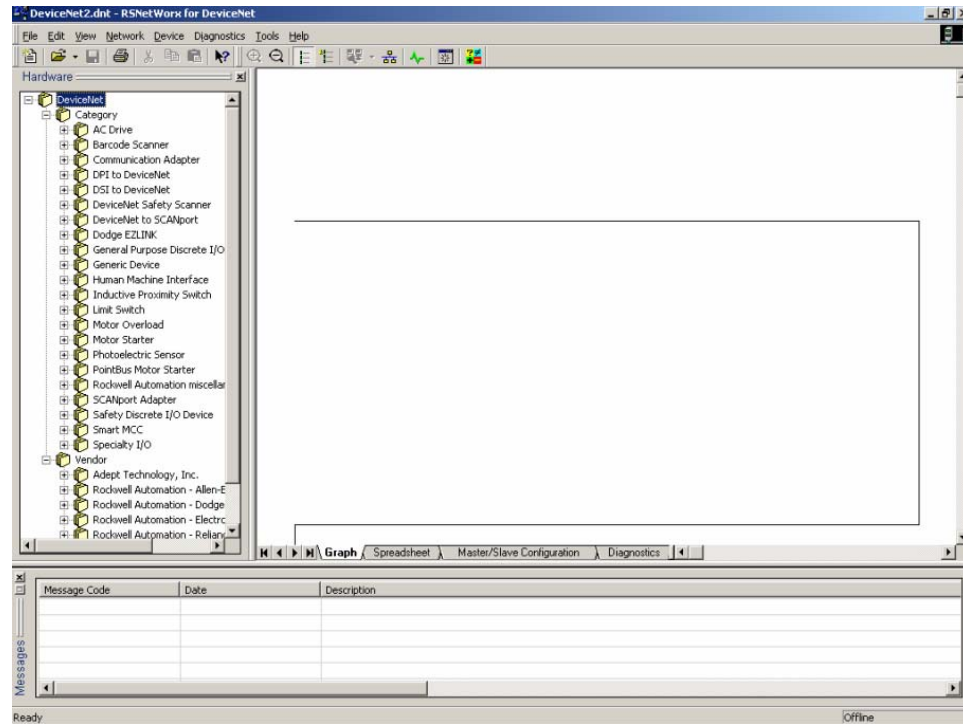
Packets transmitted:      2
Transmission errors:     0
Packets received:        0
Reception overflow:      0
Missed packets:          0

CanBus status:
Scanner active
Online at 125 KBaud
Online
```

**Figure 2. PLC Scanner Not Configured**

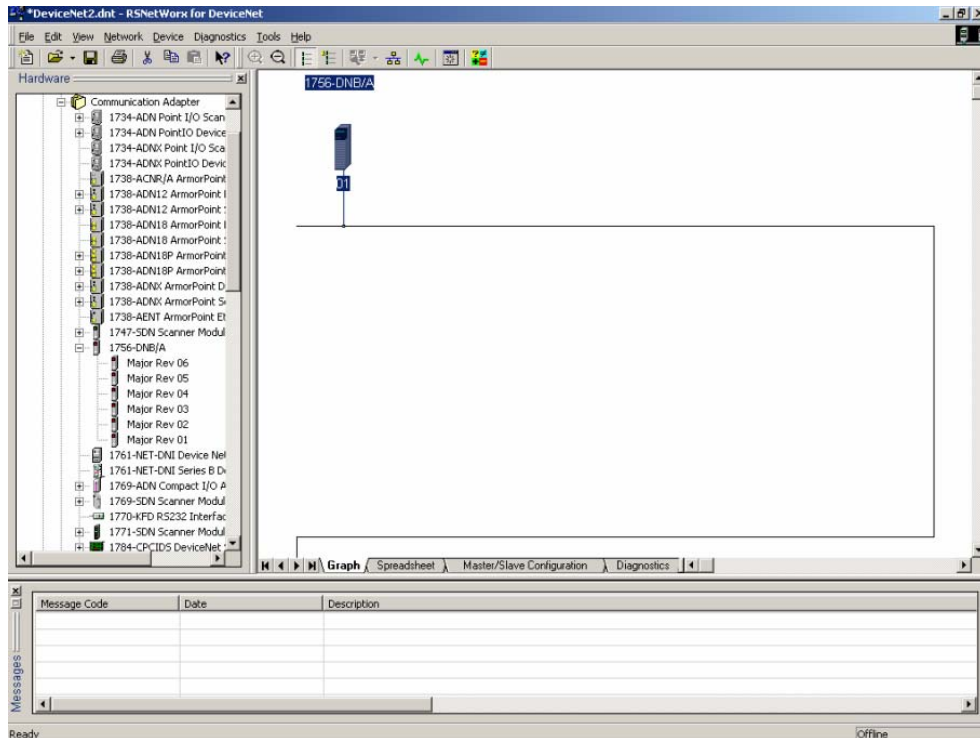
## 3.4 Adding the AB PLC Scanner Card

1. Start up the RSNetWorx for DeviceNet program. The default “Graph” view screen is displayed.



**Figure 3. Default Graph Screen in RSNetWorx for DeviceNet**

2. Add in the AB DeviceNet scanner card from the “Communication Adapter” list.
3. Once the AB DeviceNet scanner card is displayed, set the MACID address for the scanner card (the example below uses a MACID of 1).



**Figure 4. RSNetWorx for DeviceNet Screen – AB DeviceNet Scanner Card**

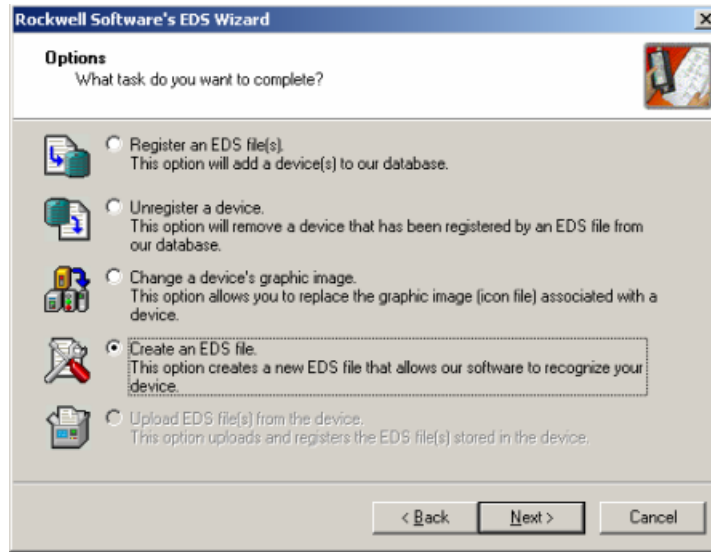
## Setting Up EDS Information

1. Open the Tools menu and select EDS Wizard. The EDS Wizard is displayed. Follow the prompts to fill out the information in the wizard.



**Figure 5. EDS Wizard - Startup Screen**

2. Select Create an EDS file and then click Next.

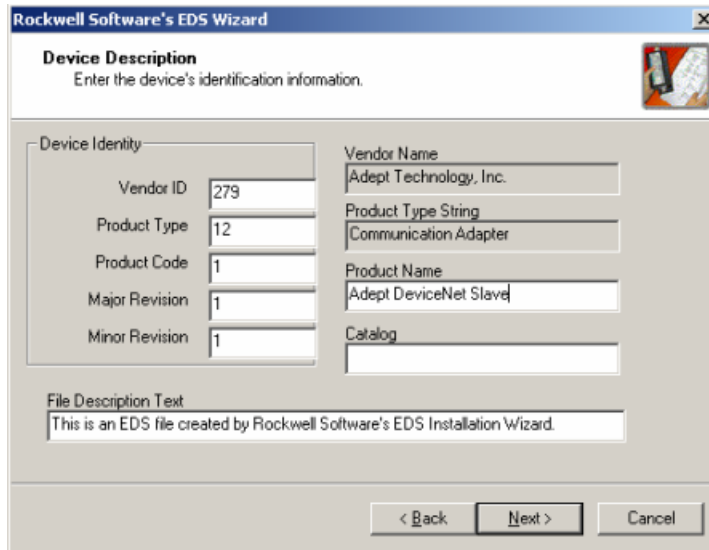


**Figure 6. EDS Wizard - Options Screen**

3. Enter the following Adept EDS information in the Device Description screen.

**Table 1. Device Description**

Field Name	Description
Vendor ID	279
Product Type	12
Product Code	1
Major Revision	1
Minor Revision	1
Product Name	Adept DeviceNet Slave

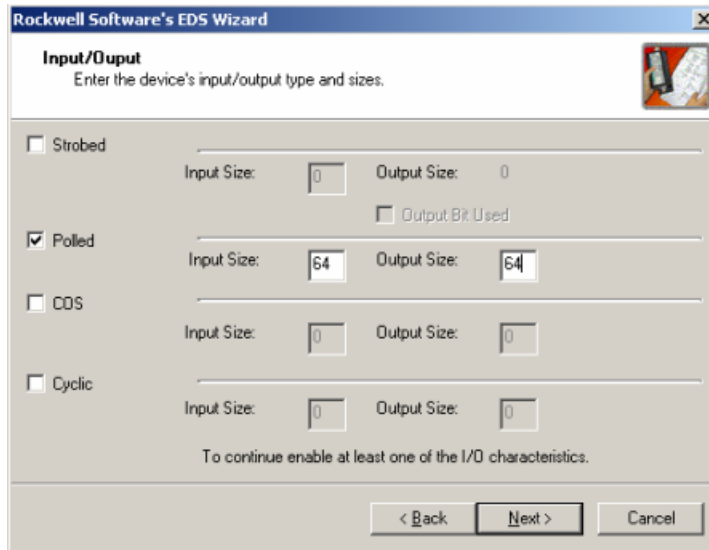


**Figure 7. EDS Wizard - Device Description Screen**

4. Click Next.
5. Enter the following information in the Input/Output screen. This will create an object for the Adept Controller.

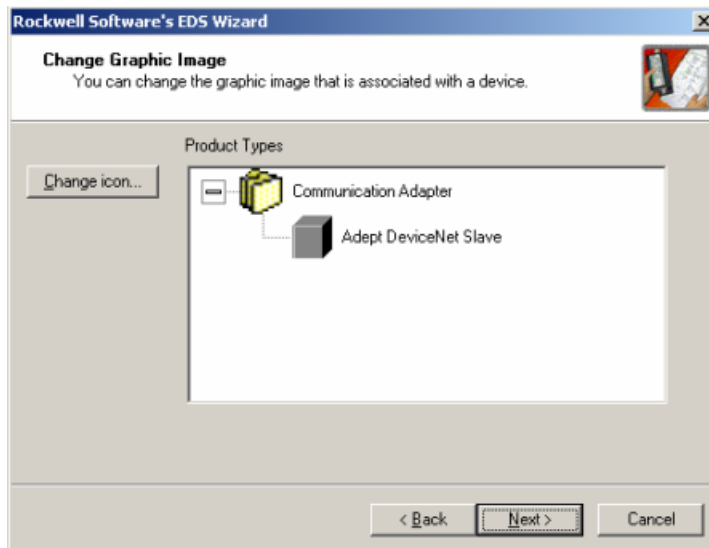
**Table 2. Input/Output**

Item	Description
Polled	Selected
Input Size	64
Output Size	64



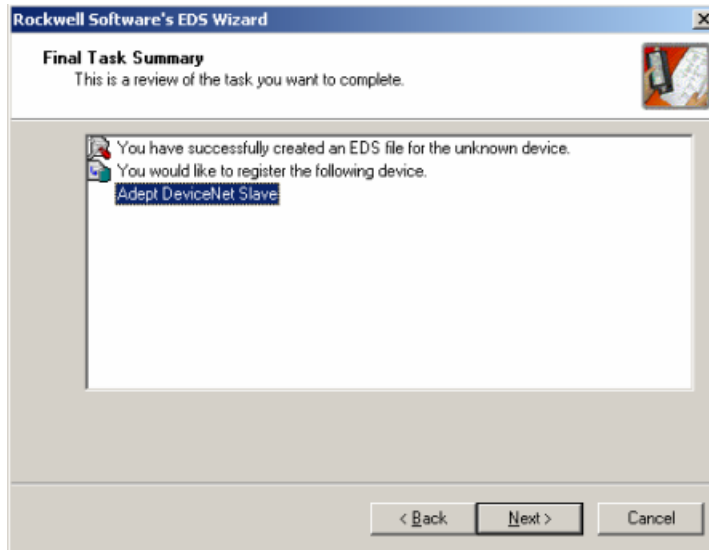
**Figure 8. EDS Wizard - Input/Output Screen**

6. Click Next.



**Figure 9. EDS Wizard - Change Graphic Image Screen**

7. Select Adept DeviceNet Slave and then click Next to register the device.

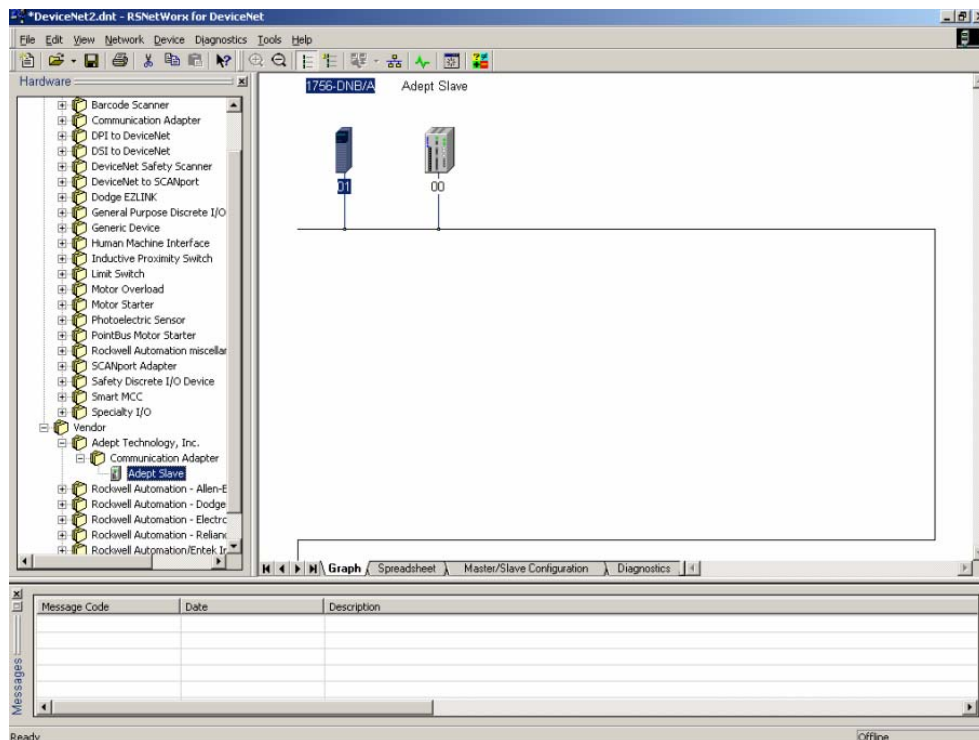


**Figure 10. EDS Wizard - Final Task Summary Screen**

This completes the EDS Wizard for the Adept setup.

### Building the DeviceNet List on the ControlLogix Controller

The Adept slave will be added to the device list. Add the Adept slave to the DeviceNet network in the Graph view.



**Figure 11. RSNetWorx for DeviceNet Screen – Adept Slave**

1. Set the MACID address of the Adept Slave to match the value you entered earlier in the CONFIG\_C utility (the example below uses a MACID of 2).

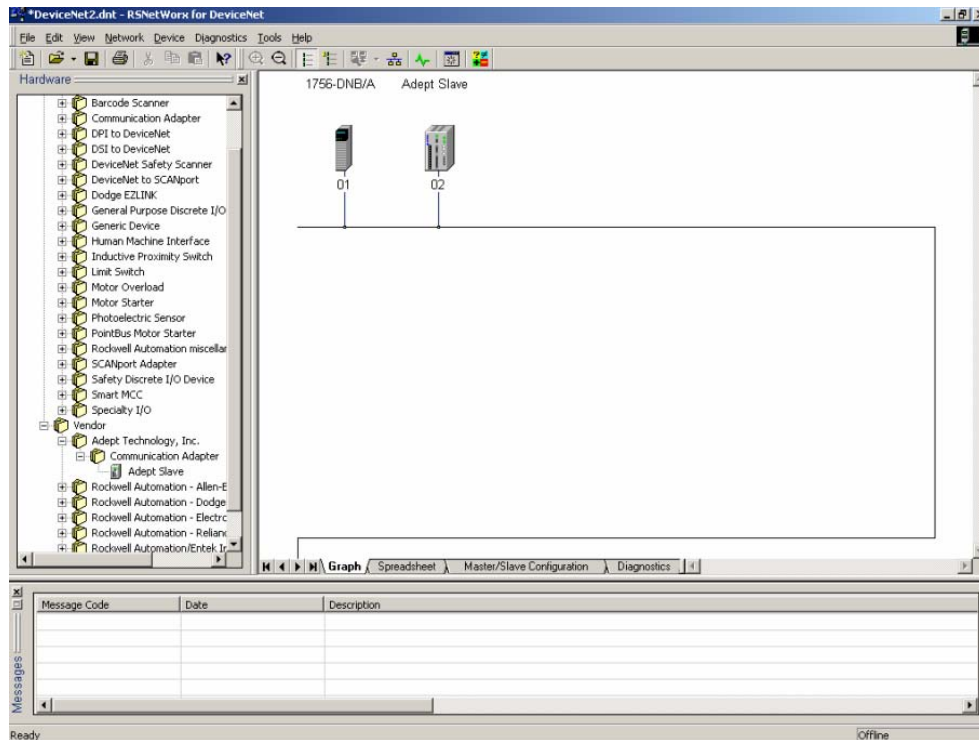
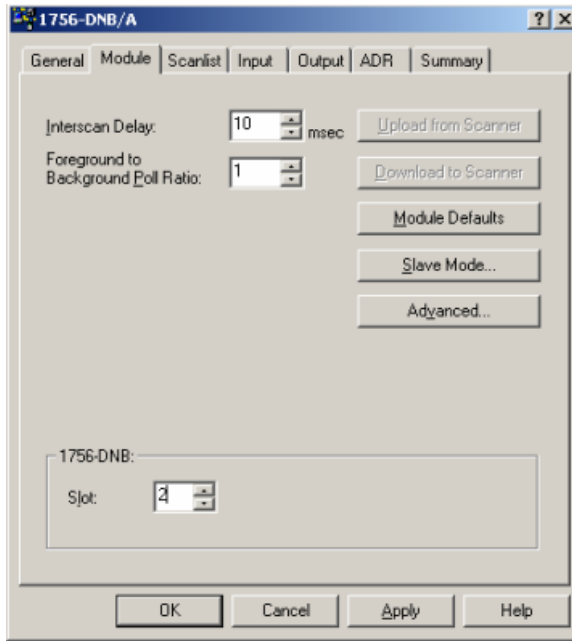


Figure 12. RSNNetWorx for DeviceNet Screen – Adept Slave Assigned MACID of 2

## Setting Up the Scanner Card

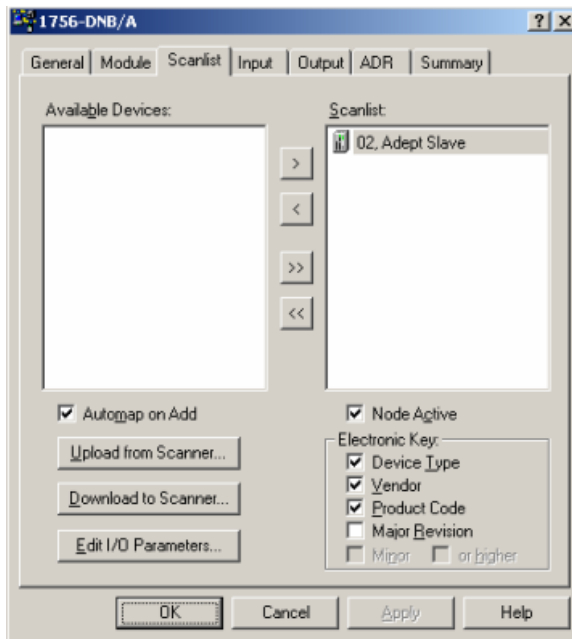
The next step is to set up the scanner card.

1. Make sure the slot number is correct. The slot number should correspond to the physical slot number in which the card is plugged into the PLC rack.



**Figure 13. Scanner Card Setup - Module Pane**

2. Add the Adept slave to the Scanlist. Select it from the list of Available Devices and click the right arrow (>) to move it to the Scanlist.



**Figure 14. Scanner Card Setup - Scanlist Pane**

- Click the Input tab at the top of the screen and check the input settings. Make sure that the Adept SmartController shows up properly in the list.

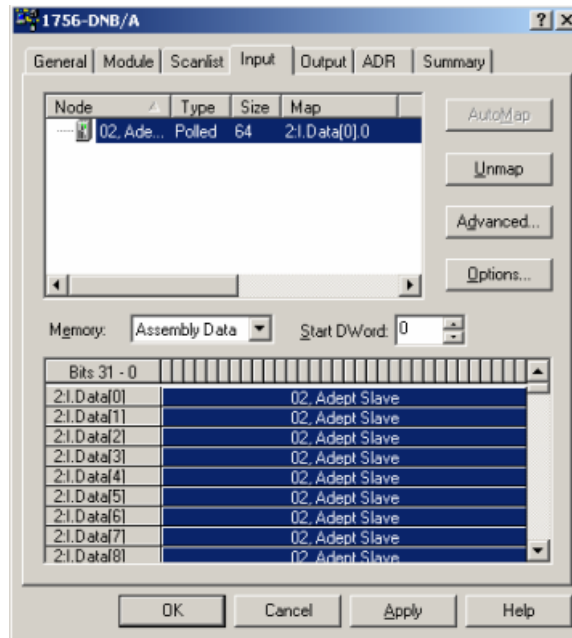


Figure 15. Scanner Card Setup - Input Pane

- Click the Output tab at the top of the screen and check the output settings. Make sure that the Adept SmartController shows up properly in the list.

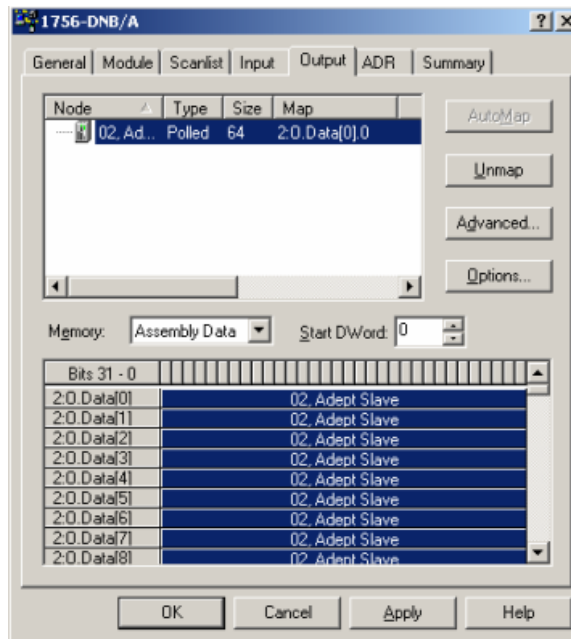
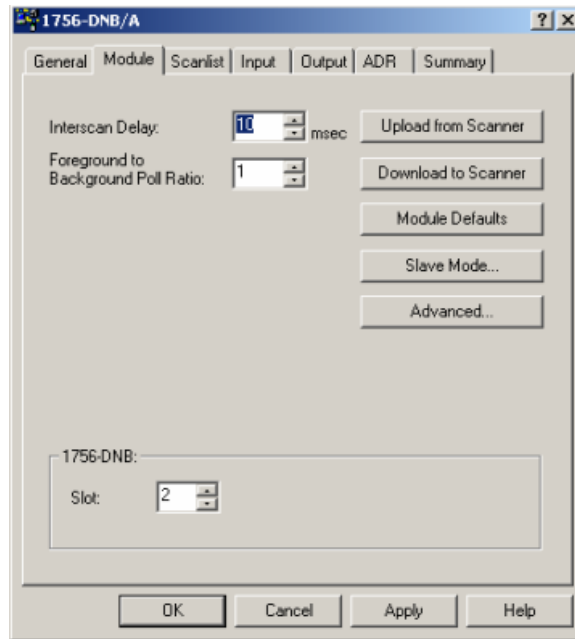


Figure 16. Scanner Card Setup - Output Pane

5. Click the Module tab at the top of the screen.
6. Click the Apply button to apply the changes.
7. Click the Download to Scanner button to download the changes to the device.



**Figure 17. Scanner Card Setup - Module Pane**

8. Click OK to save the changes.
9. Connect to the ControlLogix controller with the RSLogix software. This will allow you to test the setup and verify the configuration on the PLC side. Specify the communications path shown below.

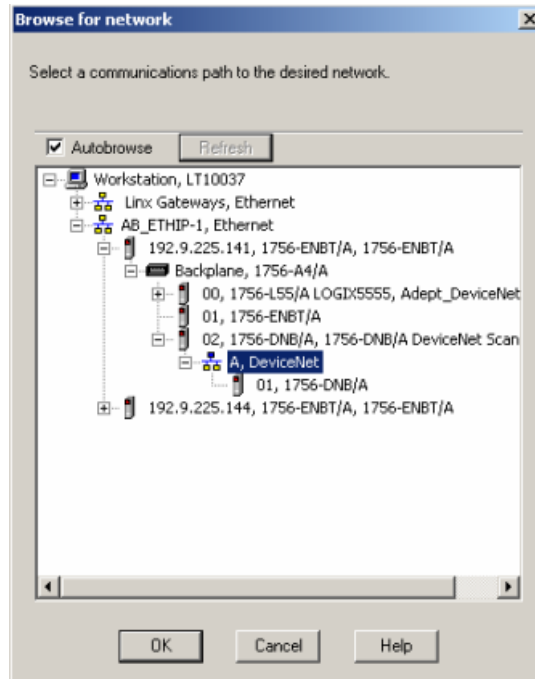


Figure 18. Communications Path

### 3.5 Testing the Configuration

1. Once you've configured these settings, type "devicenet" at the monitor window. A screen similar to Figure 19 will be displayed.

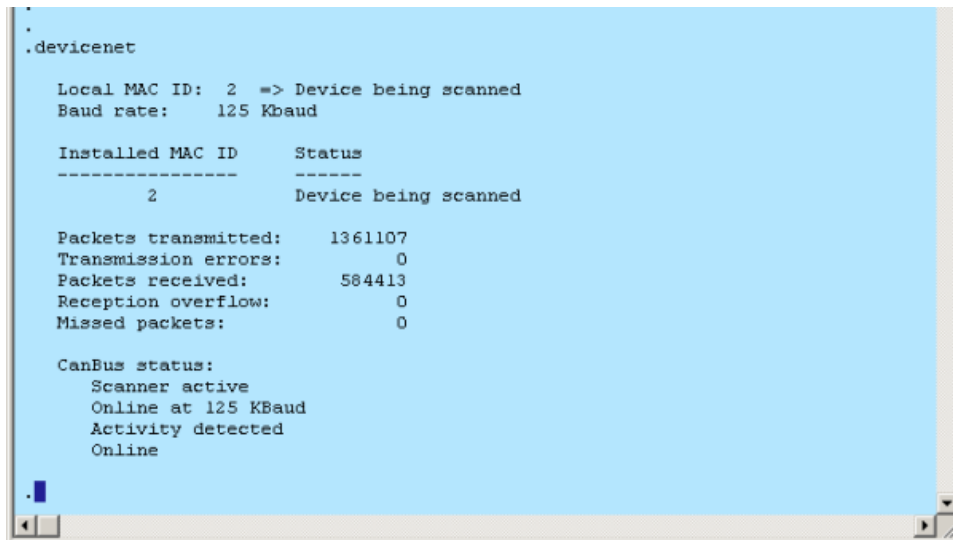


Figure 19. DeviceNet Command Executed After Configuration

**NOTE:** Make sure that the ControlLogix controller is in RUN mode (the PLC outputs to the Adept inputs will *NOT* work unless this is done).

- Turn on signals on the Adept side (using the “BITS” or “SIGNAL” monitor command) and view the I/O (using the “IO” command) to verify.

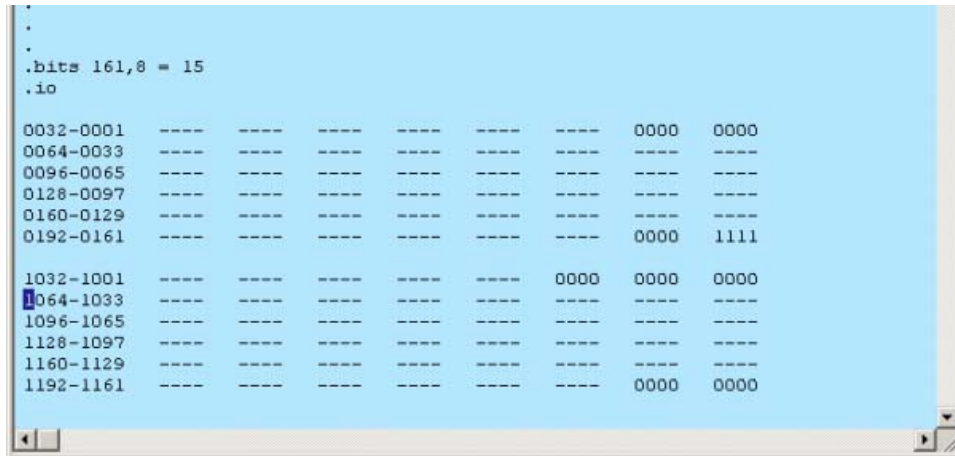


Figure 20. IO Command Executed

- On the AB DeviceNet scanner card side, the screen should display the settings shown in Figure 21, with the Local:2:I.Data[0] value displayed as 15.

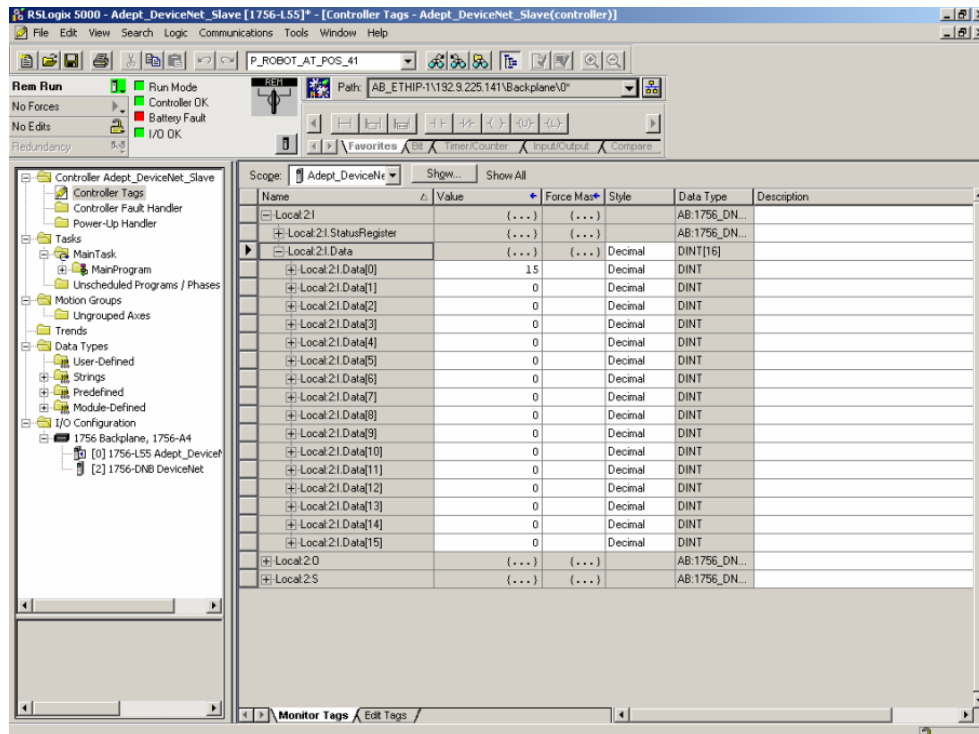
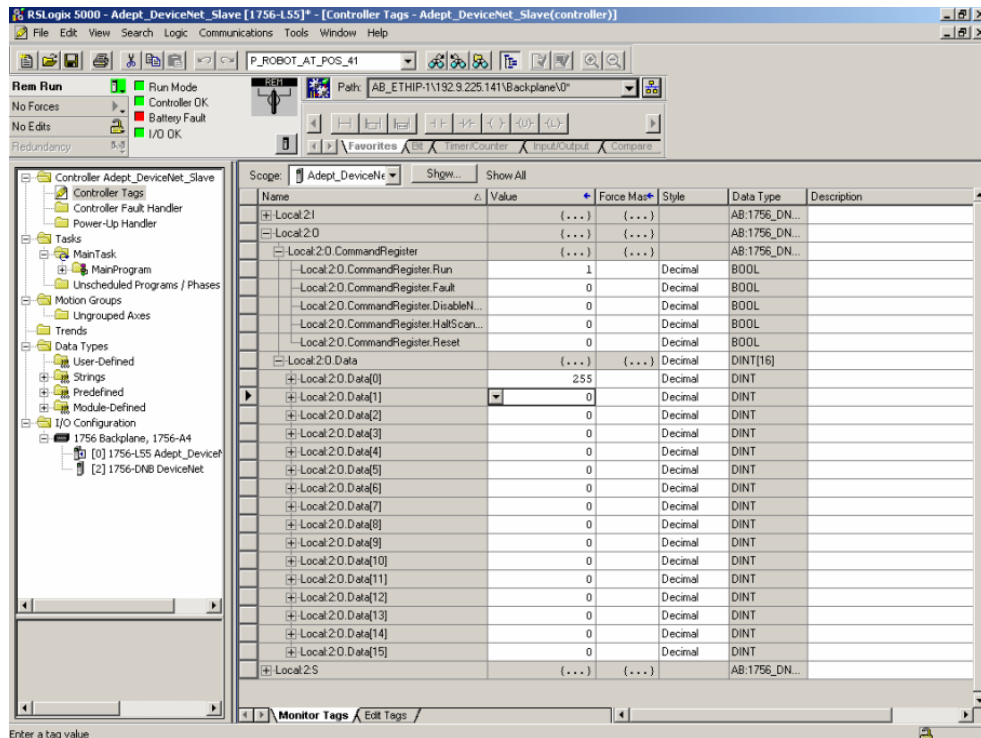


Figure 21. Local:2:I.Data[0] Value Set to 15

- Test the input to the Adept SmartController from the AB DeviceNet scanner card by setting Local:2:0.[0] to some value (for example, 255).

**NOTE:** The Local:2:0.CommandRegister.Run must be set to 1, and the ControlLogix controller must be in RUN mode for this to work.



**Figure 22. Local:2:I.Data[0] Value Set to 255**

- In the previous step, we turned on the signals on the ControlLogix controller side, so now we need to check them on the Adept SmartController side, to make sure that the Adept SmartController sees them. Use the IO command to verify that the inputs to the Adept SmartController (that is, the outputs from the ControlLogix controller) are on.

```
.  
.  
.io  
0032-0001 ---- ---- ---- ---- ---- ---- 0000 0000  
0064-0033 ---- ---- ---- ---- ---- ---- ---- ----  
0096-0065 ---- ---- ---- ---- ---- ---- ---- ----  
0128-0097 ---- ---- ---- ---- ---- ---- ---- ----  
0160-0129 ---- ---- ---- ---- ---- ---- ---- ----  
0192-0161 ---- ---- ---- ---- ---- ---- 0000 1111  
  
1032-1001 ---- ---- ---- ---- ---- 0000 0000 0000  
1064-1033 ---- ---- ---- ---- ---- ---- ---- ----  
1096-1065 ---- ---- ---- ---- ---- ---- ---- ----  
1128-1097 ---- ---- ---- ---- ---- ---- ---- ----  
1160-1129 ---- ---- ---- ---- ---- ---- ---- ----  
1192-1161 ---- ---- ---- ---- ---- ---- 1111 1111
```

**Figure 23. Adept System Test Using IO Command**



**Rev. A**

**adept**<sup>®</sup>

3011 Triad Drive  
Livermore, CA 94551  
925•245•3400