ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *OMRON / Adept Technology SmartController EX* at our website: *Click HERE*

Table 3-10. DIO Input Circuit Specifications (XDIO connector)

Operational voltage range	0 to 30 VDC
"Off" state voltage range	0 to 3 VDC
"On" state voltage range	10 to 30 VDC
Typical threshold voltage	V_{in} = 8 VDC
Operational current range	0 to 7.5 mA
"Off" state current range	0 to 0.5 mA
"On" state current range	2.5 to 7.5 mA
Typical threshold current	2.0 mA
Impedance (V_{in}/I_{in})	3.9 K Ω minimum
Current at V_{in} = +24 VDC	$I_{in} \leq$ 6 mA
Turn-on response time (hardware) Software scan rate/response time	5 µsec maximum 1 ms scan cycle/ 1 ms max response time
Turn-off response time (hardware) Software scan rate/response time	5 µsec maximum 1 ms scan cycle/ 1 ms max response time

NOTE: The input current specifications are provided for reference; voltage sources are typically used to drive the inputs.

NOTE: When the program task priorities are properly set, there is a 1 ms maximum latency for the fast inputs when used with the eV+ INT.EVENT instruction.

In the following figure, example 1 shows inputs (1001 to 1004) with a negative common, example 2 shows inputs (1005 to 1008) with a positive common, and example 3 shows inputs (1009 to 1012) with an independent power supply (no common).

NOTE: These are examples. Either method can be used on any channel.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

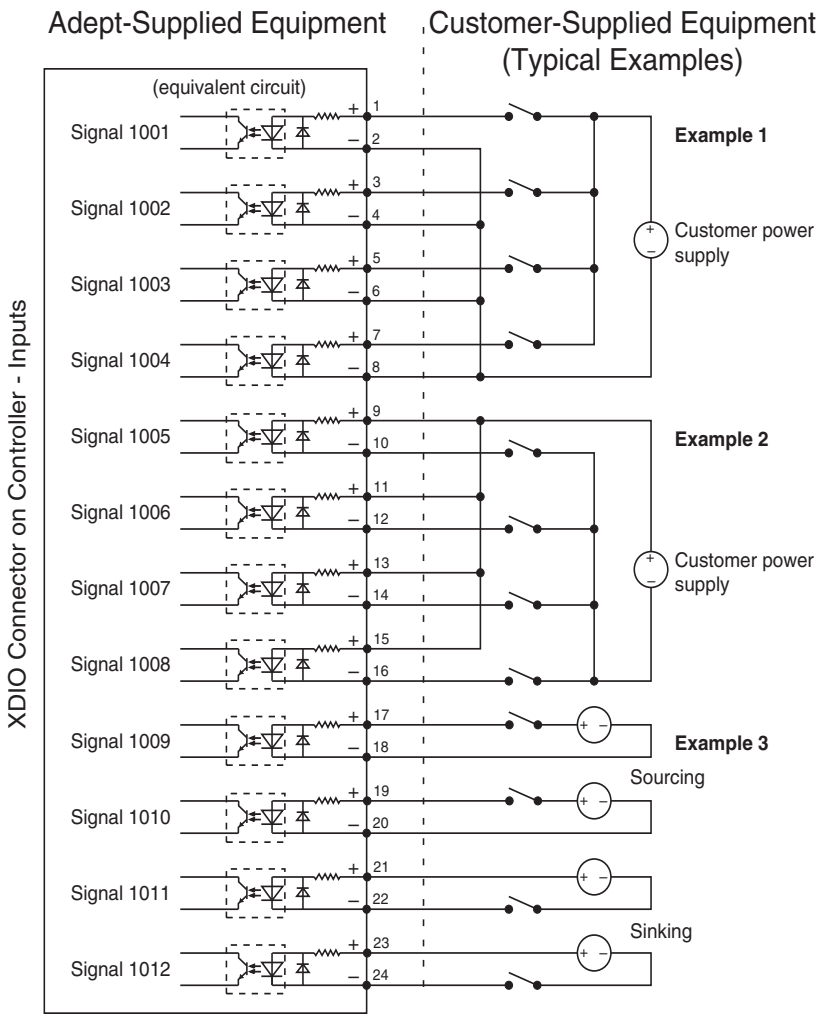


Figure 3-6. Digital Input Wiring for XDIO Connector

NOTE: Power from pins 41-44 and 47-50 can be substituted for the customer power supply. See the figure Digital Output Wiring for XDIO Connector on page 49 and the table DIO Input Circuit Specifications (XDIO connector) on page 46 for additional information.

REACT Input Signals 1001 to 1012

Inputs 1001 to 1012 (only) may be used by the eV+ REACT and REACTI instructions. See the eV+ *Language Reference Guide* for information on these instructions. If you are going to use these instructions, you should plan your digital I/O channel usage accordingly.

In addition to functioning as normal input signals, all input signals can have the following special uses:

- Fast DIO eV+ Interrupt Events (INT.EVENT)
- Robot and Encoder Position Latch

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Fast DIO interrupt events (using INT.EVENT) require the optional eV+ Extensions License. When the program task priorities are properly set, there is a 1 ms maximum latency for the fast inputs when used with the eV+ INT.EVENT instruction.

See the eV+ *Language Reference Guide* for a description of the INT.EVENT instruction.

Output Signals

The XDIO connector handles output signals 0001 to 0008. Refer to the following table for output specifications. The locations of the signals on the connector are shown in the table XDIO Digital I/O Connector Pin Assignments on page 49. The XDIO connector provides separate positive and negative connections for each channel (no internal common connections). This allows the choice of wiring for current-sourcing or current-sinking modes.

Table 3-11. DIO Output Specifications (XDIO connector)

Operating voltage range	0 to 24 VDC
Operational current range, per channel	$I_{out} \leq 100$ mA, short-circuit protected, 1 A total at 24 V
V drop across output in "on" condition	$V_{drop} \leq$ 2.7 V at 100 mA $V_{drop} \leq$ 2.0 V at 10 mA
Output off leakage current	$I_{out} \leq$ 600 µA
Turn-on response time (hardware) Software scan rate/response time	3 µsec maximum 1 ms scan cycle 1 ms max. response time
Turn-off response time (hardware) Software scan rate/response time	200 µsec maximum 1 ms scan cycle 1 ms max. response time

The figure Digital Output Wiring for XDIO Connector on page 49 shows two examples of different connections to the digital outputs on the XDIO connector. The examples are negative common and positive common using the internal 24 V and ground connections.

Example 1: outputs 0001 to 0004 are shown with positive common.

Example 2: outputs 0005 to 0008 are shown with negative common.

> **NOTE:** These are examples. Either method can be used, in any combination, on any channel. Also, an external customer-provided power supply could have been provided instead of the power provided on the XDIO connector.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

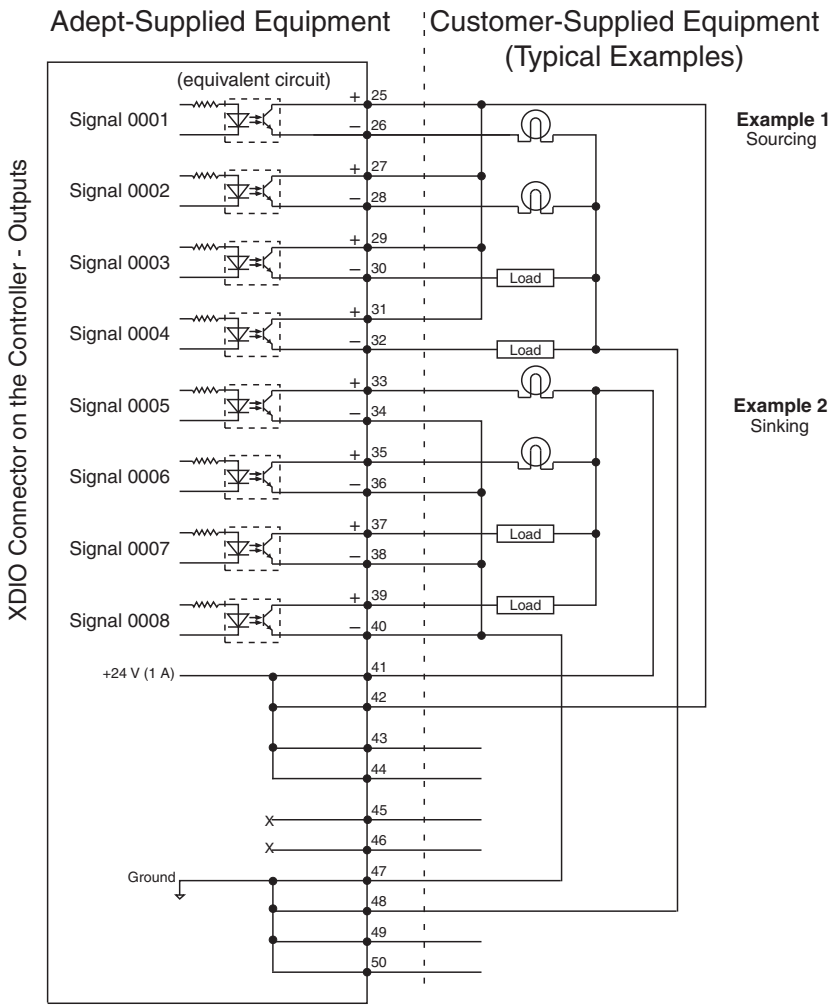


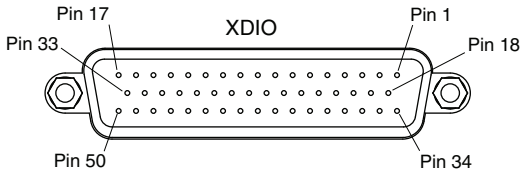
Figure 3-7. Digital Output Wiring for XDIO Connector

Table 3-12. XDIO Digital I/O Connector Pin Assignments

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	Input 1001	2	1001 return	25	Output 0001+	26	Output 0001–
3	Input 1002	4	1002 return	27	Output 0002+	28	Output 0002–
5	Input 1003	6	1003 return	29	Output 0003+	30	Output 0003–
7	Input 1004	8	1004 return	31	Output 0004+	32	Output 0004–
9	Input 1005	10	1005 return	33	Output 0005+	34	Output 0005–
11	Input 1006	12	1006 return	35	Output 0006+	36	Output 0006–

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
13	Input 1007	14	1007 return	37	Output 0007+	38	Output 0007–
15	Input 1008	16	1008 return	39	Output 0008+	40	Output 0008–
17	Input 1009	18	1009 return	41	24 V Output[a]	42	24 V Output[a]
19	Input 1010	20	1010 return	43	24 V Output[a]	44	24 V Output[a]
21	Input 1011	22	1011 return	45	eV+ High Power On Indicator +	46	eV+ High Power On Indicator –
23	Input 1012	24	1012 return	47	24 V return	48	24 V return
				49	24 V return	50	24 V return



[a]Limited to combined total of 1 A of current.

Digital I/O Connectors

The XDIO connector on the controller is a 50-pin, standard-density D sub-miniature female socket. The user-supplied cable must terminate in a suitable 50-pin male D-sub plug. The plug is not supplied by Adept.

Screw-Terminal Field-Wiring Adapter Blocks

Several manufacturers make screw-terminal field-wiring blocks, usually DIN-rail mountable. These can be connected to the XDIO via a suitable shielded 50-pin cable (user-supplied).

3.7 Belt Encoder Interface

For use with conveyor tracking, the Adept SmartController EX motion controller supports four independent external belt encoders through a 26-pin, female, D-sub connector. The pin assignments for the Belt Encoder connector are shown in the following table. See the figure Belt Encoder Typical Input Circuit on page 53 for a typical input circuit drawing.

> **NOTE**: An adapter cable (Adept P/N: 09550-000) is available to split the 26-pin Adept SmartController EX motion controller connector into two 15-pin connections, compatible with the SmartController CX. The 15-pin adapter is Adept P/N: 09443-000. Each 15-pin adapter provides two M12 connections.

All encoder inputs for the Adept SmartController EX motion controller use a scheme similar to an RS-422 differential receiver based on industry standard 75175 integrated circuits. The dif-

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

ference is that a custom resistor network and two differential receivers are used on each of the A and B inputs. See the figure Belt Encoder Typical Input Circuit on page 53 for a schematic.

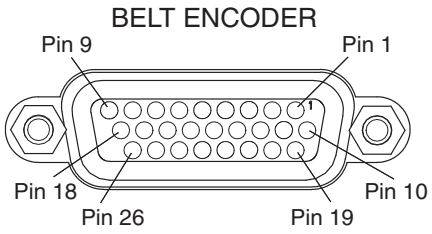
Adept strongly recommends using differential encoder outputs for maximum noise immunity. See the *Adept ACE User's Guide* for more information on setting up and programming a conveyor-tracking application.

> **NOTE:** Conveyor tracking requires the eV+ Extensions License, which can be obtained from Adept.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 3-13. Belt Encoder Connector Pin Assignments

Signal	Pin	Signal	Pin
Encoder 5 V Out	1	ENC2_B-	14
Encoder Ground	10	ENC3_B+	15
ENC1_A+	2	ENC3_B-	16
ENC1_A-	3	ENC4_B+	17
ENC2_A+	4	ENC4_B-	18
ENC2_A-	5	ENC1_Z+	19
ENC3_A+	6	ENC1_Z-	20
ENC3_A-	7	ENC2_Z+	21
ENC4_A+	8	ENC2_Z-	22
ENC4_A-	9	ENC3_Z+	23
ENC1_B+	11	ENC3_Z-	24
ENC1_B-	12	ENC4_Z+	25
ENC2_B+	13	ENC4_Z-	26



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

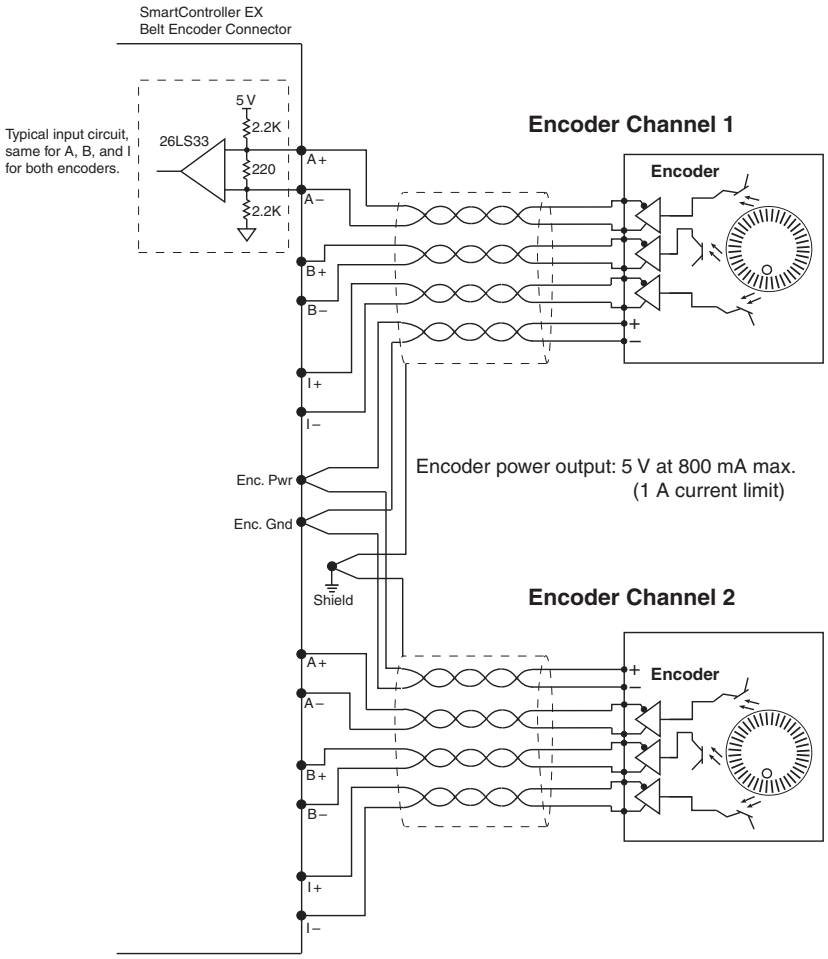


Figure 3-8. Belt Encoder Typical Input Circuit

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

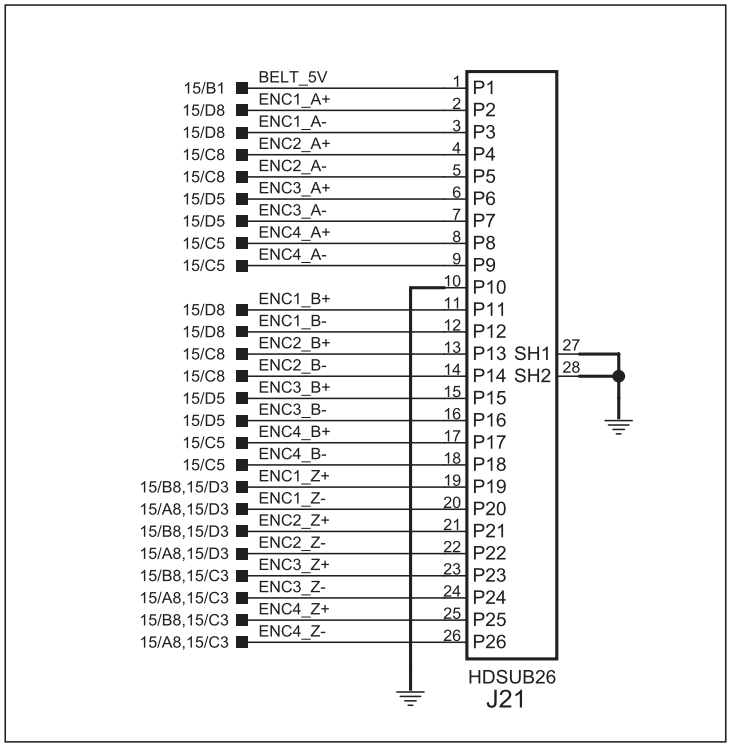


Figure 3-9. Belt Encoder Connector

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 4: Maintenance

4.1 Changing the Lamp in the Front Panel High-Power Indicator

The system is equipped with circuitry to detect the potentially dangerous condition of a burned-out High Power indicator on the Front Panel. If this lamp is burned out, you cannot enable high power until the lamp has been replaced. Follow this procedure to replace the High Power indicator lamp. The Adept part number for the lamp is 27400-29006.



WARNING: Lockout and tagout power before servicing.



WARNING: The procedures and replacement of parts mentioned in this section should be performed only by trained, authorized personnel. The access covers on the Adept SmartController EX motion controller are not interlocked – turn off and disconnect power if covers have to be removed.

1. Turn off system power to the controller.
2. Disconnect the cable between the Front Panel and the controller.
3. Remove the Front Panel from its mounting location.
4. Remove the two screws on the back of the Front Panel.
5. Carefully pull the front cover away from the body of the Front Panel.

   You will encounter some resistance, as there are three plug-type connectors that you need to disconnect as you pull the front cover away from the body.

NOTE: Separate the cover from the body slowly to avoid damaging the two wires that go between the LED and the PC board inside the body. Pull the front cover as straight away as possible. You do not have to disconnect the wires from the PC board, although you can if needed.

6. Locate the lamp body in the center of the back side of the front cover. Turn the lamp body approximately 20° in either direction and then pull straight back.
7. The lamp body is now free. You can remove the old lamp and insert a new one.
8. Replace the lamp body by pushing it straight into the lamp housing receptacle. Make sure the contacts on the lamp body are properly oriented, as shown in the following figure.
9. Make sure to reconnect the wires from the LED if you disconnected them earlier.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

10. Push the front cover into the body, taking care to align all of the plug-type connectors. Verify that the wires do not get crimped as you reinstall the cover.
11. Replace the two screws on the back of the body.
12. Reinstall the Front Panel in its mounting.
13. Reconnect the cable between the Front Panel and the controller.

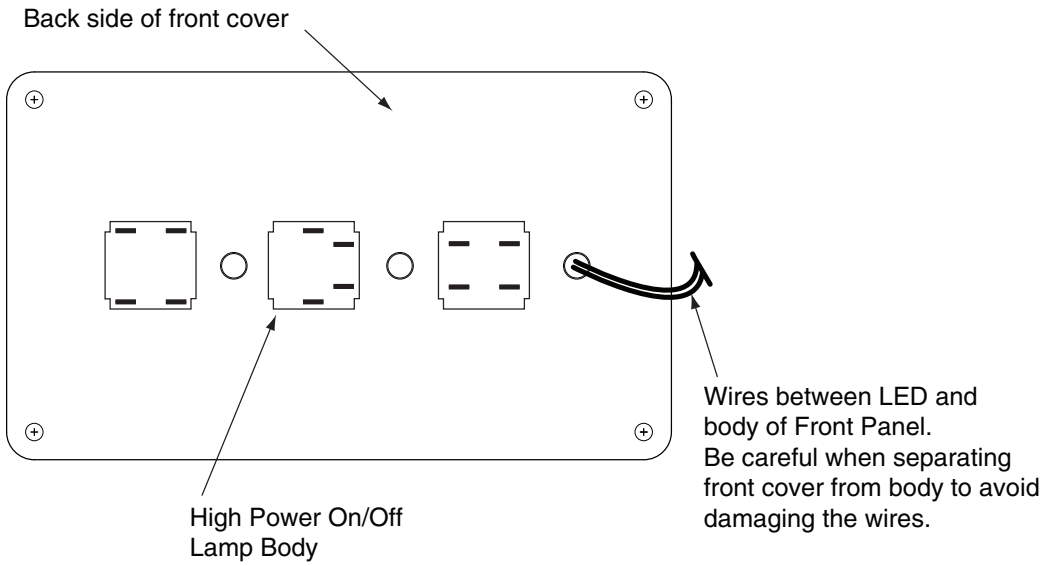


Figure 4-1. Lamp Body Contact Alignment

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 5: Technical Specifications

This chapter shows the dimensions of the Adept SmartController EX motion controller, sDIO module, Adept Front Panel, and T20 pendant.

5.1 Adept SmartController EX Motion Controller Dimensions

NOTE: The dimensions for the CS and CX SmartController motion controllers were the same as these.

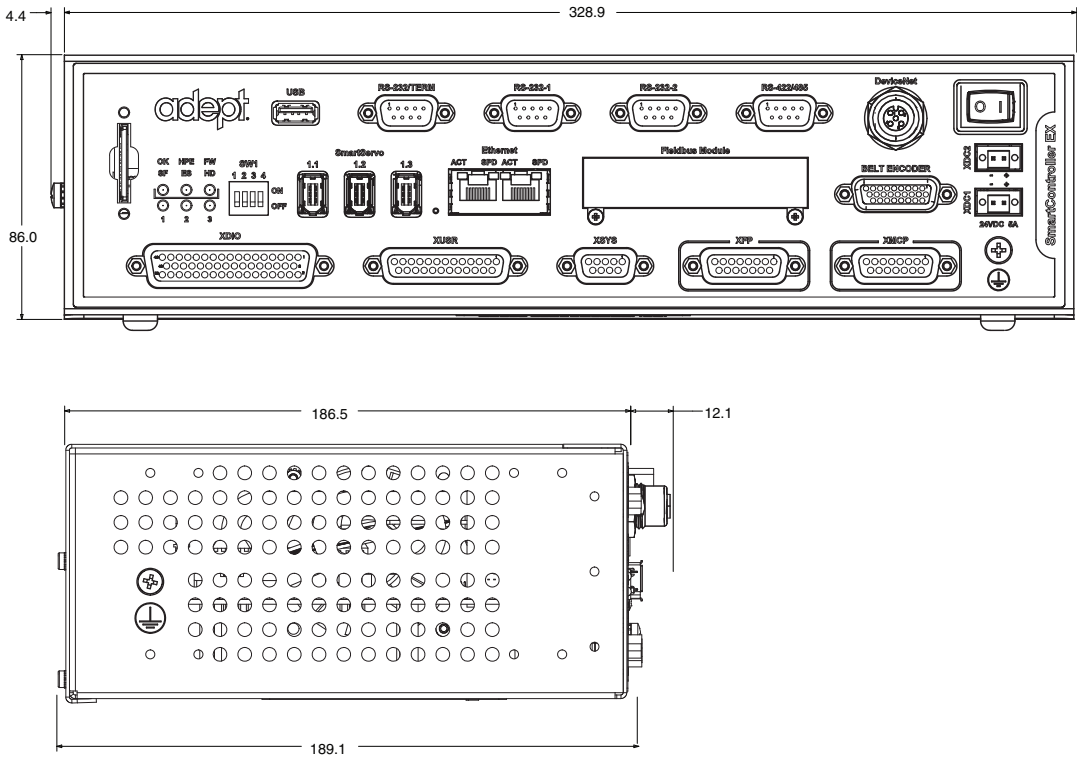


Figure 5-1. Adept SmartController EX Motion Controller Dimensions

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.2 sDIO Module Dimensions

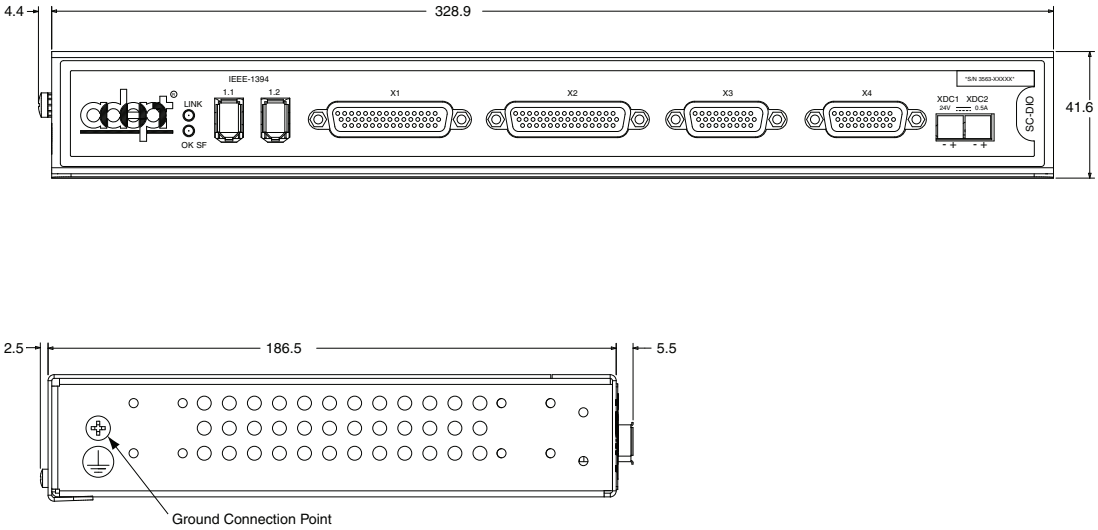


Figure 5-2. sDIO Module Dimensions

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.3 Adept Front Panel Dimensions

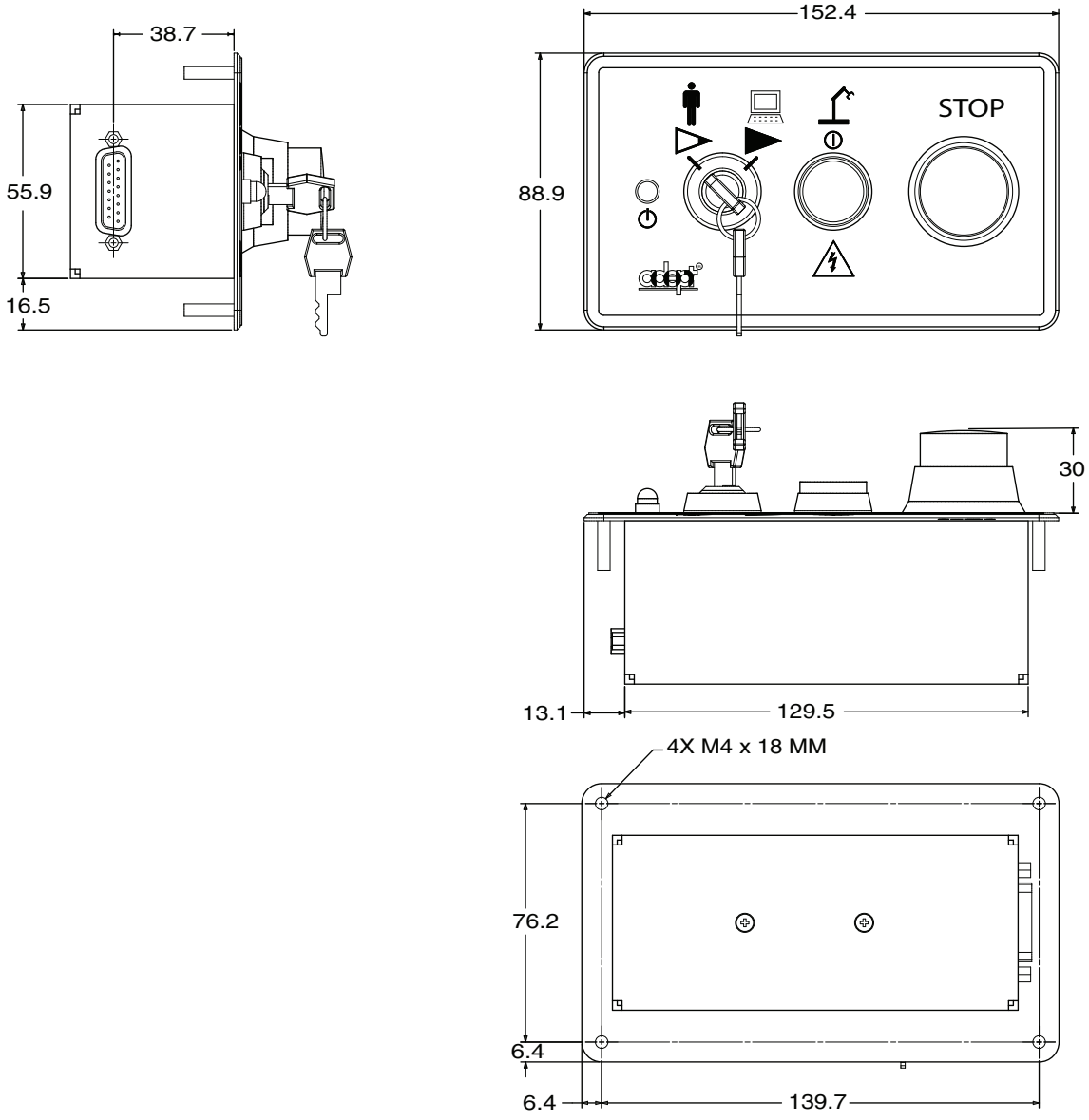


Figure 5-3. Adept Front Panel Dimensions

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5.4 Adept T20 Pendant Dimensions



Figure 5-4. T20 Pendant Dimensions

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 6: sDIO Module

The sDIO expansion module provides 32 optically-isolated digital inputs, 32 optically-isolated outputs, and an IEEE 1394 interface.

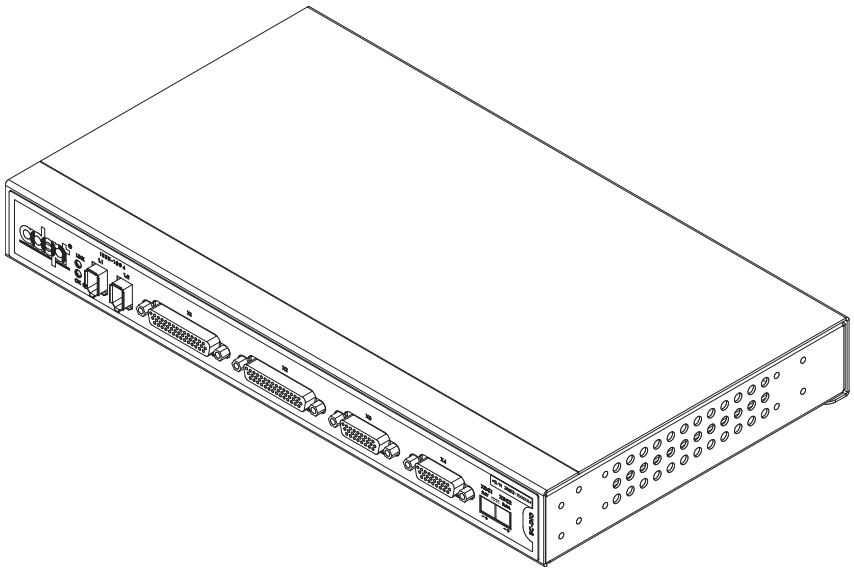


Figure 6-1. sDIO Module

6.1 Mounting the sDIO Module

The following mounting options are available for the sDIO module:

- Rack mounting
- Panel mounting
- Table mounting
- Stack mounting

NOTE: To maintain compliance with local and national standards, the mounting of the sDIO and all terminations at the sDIO must be performed in accordance with those standards.

Rack-Mounting the sDIO Module

To rack-mount the sDIO module in a standard 19-inch equipment rack, you must first install the mounting brackets on each side of the unit, as shown in the following figure.

NOTE: These brackets must be ordered separately. They do not come with the sDIO module.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

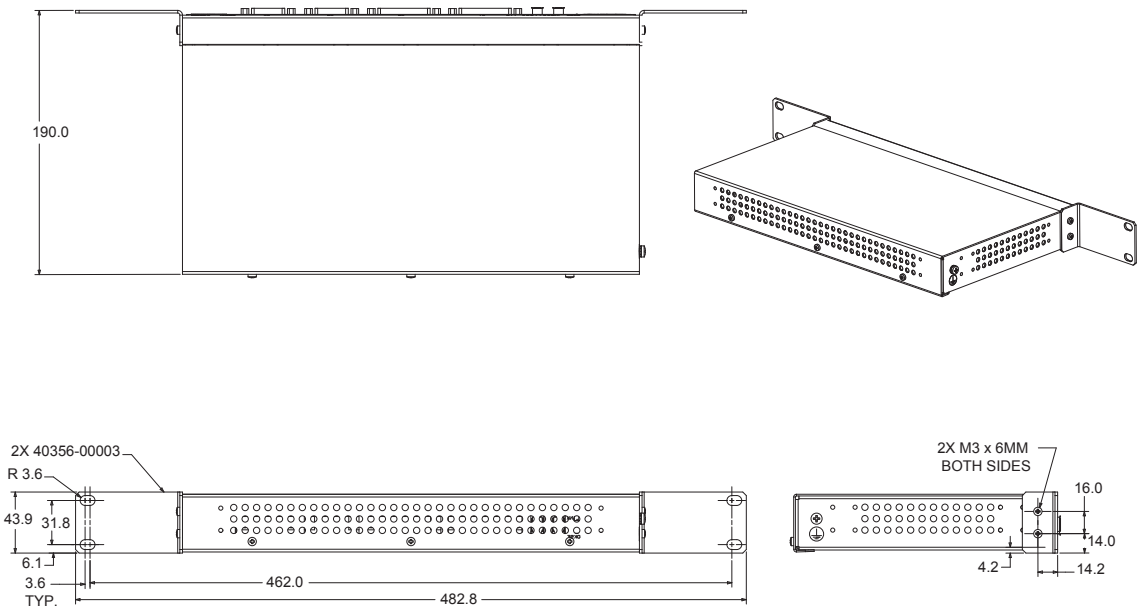


Figure 6-2. Rack-Mounting the sDIO Module

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Panel-Mounting the sDIO Module

To panel-mount the sDIO module, install one bracket on each side of the back of the unit, as shown in the following figure. Use the screws from the accessories kit.

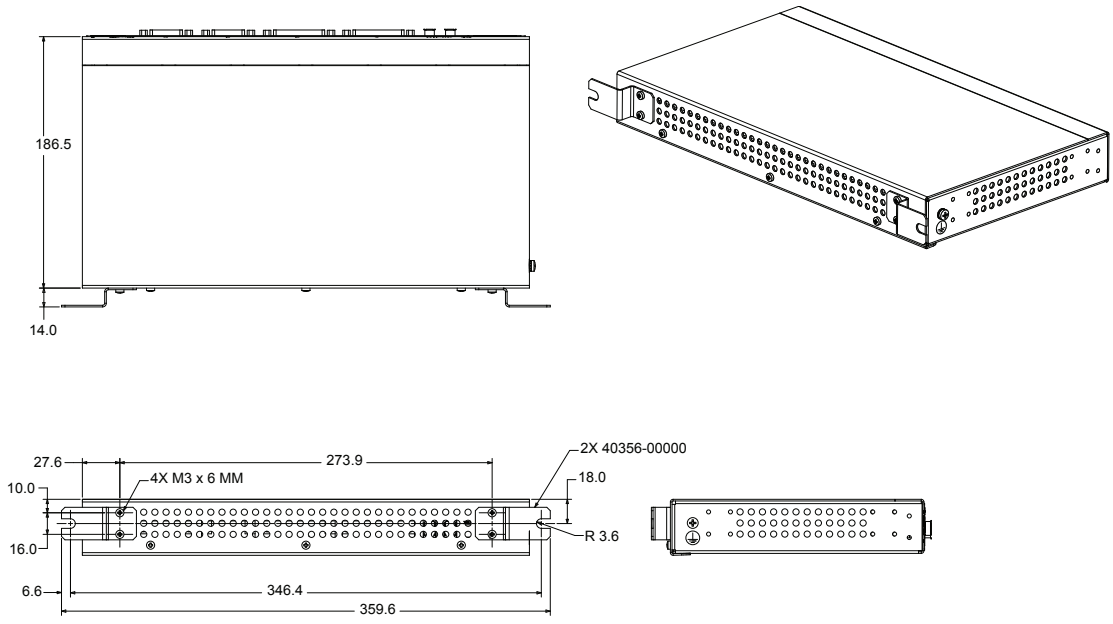


Figure 6-3. Panel-Mounting the sDIO Module

Table-Mounting the sDIO Module

To table-mount the sDIO module, install two brackets on each side near the bottom of the unit, as shown in the following figure.

NOTE: These brackets must be ordered separately. They do not come with the sDIO module.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

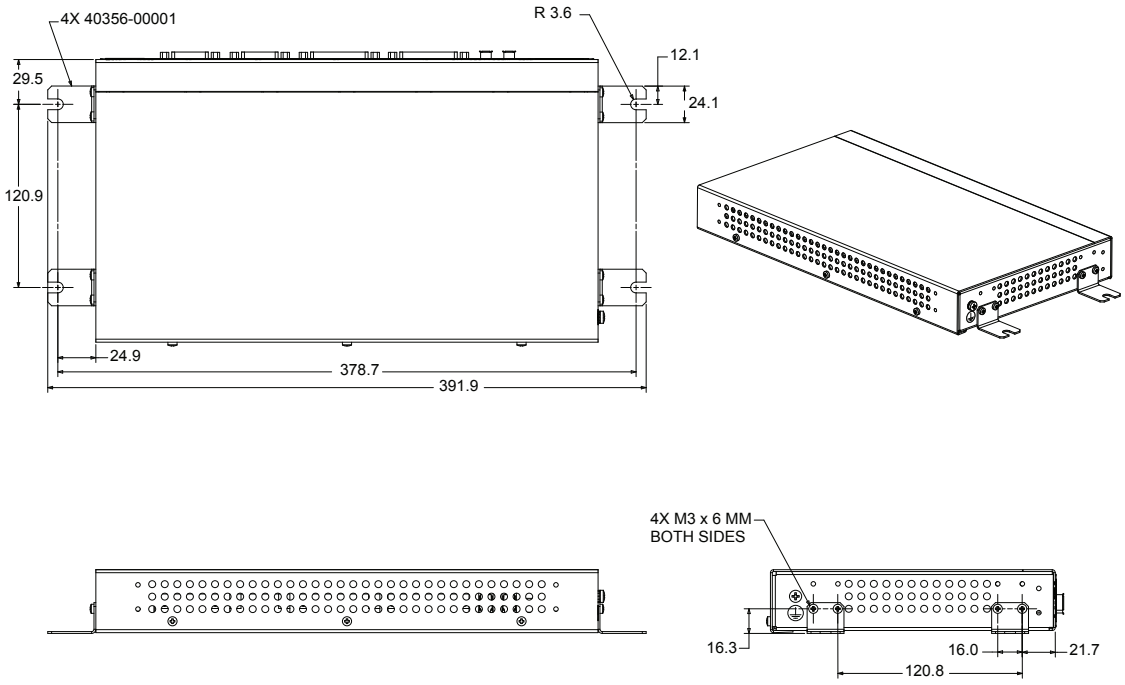


Figure 6-4. Table-Mounting the sDIO Module

Stack-Mounting the sDIO Module

See Stack-Mounting Components on page 18 for information on stack-mounting the sDIO module and controller.

6.2 Installing the sDIO Module

The following procedure details the steps required to install the sDIO module.

To install the sDIO module:

1. Remove the sDIO module from its box and mount it as described in Mounting the sDIO Module on page 61.
2. Ensure that the 24 VDC input power to the controller is disconnected.
3. Connect a 24 VDC cable from the unused XDC port on the controller to the XDC1 port on the sDIO module. Continue to daisy-chain the input power from each sDIO module to the next. See Connecting Power on page 21 for cabling requirements.
4. Connect an IEEE 1394 cable from one of the SmartServo ports on the controller to one of the IEEE 1394 ports on the sDIO module. Continue to daisy-chain IEEE 1394 cables from each sDIO module to the next.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

WARNING: Remove power from the controller before plugging in or unplugging any IEEE-1394 cables to SmartServo IEEE-1394 connectors. Failure to remove power could result in unpredictable behavior by the system.

5. Connect a user-supplied ground wire to earth ground on each sDIO module.
6. Connect the 24 VDC input power to the controller.

6.3 sDIO Module Connectors and Indicators

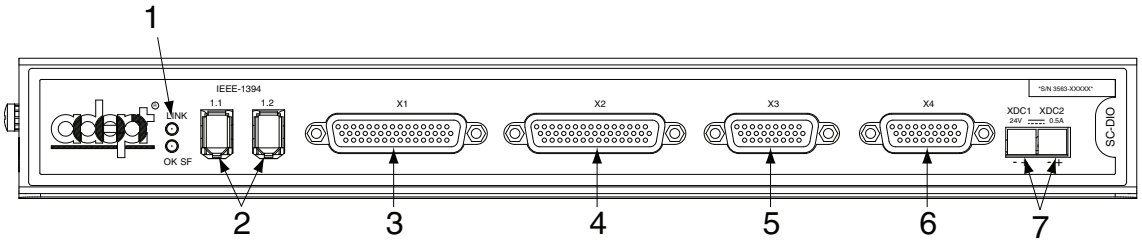


Figure 6-5. sDIO Connectors and Indicators

1. **Status LEDs**.

   Two LEDs indicate link status of the IEEE 1394 connection and system status.

   LINK: Green LED = communication with another device over IEEE 1394 connection OK.

   OK/SF: Red LED = output driver fault detected due to excessive temperature or current (output is automatically shut down), solid green LED = communication with controller OK, blinking green = not configured in software.

2. **IEEE 1394 ports**: Connects to one of the SmartServo ports on controller or IEEE 1394 ports on additional sDIO modules.
3. **X1 Output:** 44-pin female D-sub connector, for digital output signals 0033-0048.
4. **X2 Output**: 44-pin female D-sub connector, for digital output signals 0049-0064.
5. **X3 Input**: 26-pin female D-sub connector, for digital input signals 1033-1048.
6. **X4 Input**: 26-pin female D-sub connector, for digital input signals 1049-1064.

NOTE: For installations that use two or more sDIO modules, the above signal numbers apply to the signals for the first sDIO module. See Modifying the Default sDIO Configuration on page 66 for information on configuring two or more sDIO modules.

7. **Two 24 VDC connectors**: Connect power from the unused XDC connector on the Smart-Controller to the XDC1 connector on the sDIO module (see Connecting Power on page 21 for power specifications).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6.4 Configuring an sDIO Module

The Adept SmartController EX motion controller is preconfigured to support two sDIO modules. Its configuration is based upon an I/O block assignment method that uses 4 bytes per block and 8 signals per byte, so each byte within a block represents a range of eight Input or Output signals.

Block numbers for general digital I/O can range from 16 to 31. The default block is 16 for sDIO #1, and 17 for sDIO #2. Input blocks and output blocks are numbered independently, so you can use the same number for both an input and an output block. You must be sure that the block number you specify is not used for the same type of block (Input or Output) in any other sDIO module or IO Blox devices in your system.

Default sDIO I/O Configuration

Two sDIO modules can be used with the default I/O signal configuration and no additional signal configuration is required. The default configuration consists of the settings shown in the following table. The first sDIO module can use the default configuration; additional modules must be assigned unique block numbers, between 16 and 31. To use the default signal configuration for the second sDIO module, you need to assign it to block 17 for input and output.

Table 6-1. Default I/O Configuration for sDIO Modules #1 and #2

	Input Signal Numbers	Block	Byte		Output Signal Numbers	Block	Byte
sDIO #1	1033 to 1040	16	1		0033 to 0040	16	1
	1041 to 1048	16	2		0041 to 0048	16	2
	1049 to 1056	16	3		0049 to 0056	16	3
	1057 to 1064	16	4		0057 to 0064	16	4
sDIO #2	1065 to 1072	17	1		0065 to 0072	17	1
	1073 to 1080	17	2		0073 to 0080	17	2
	1081 to 1088	17	3		0081 to 0088	17	3
	1089 to 1096	17	4		0089 to 0096	17	4

Modifying the Default sDIO Configuration

Blocks 1-15 are typically reserved for robot signals. Blocks 1-6 are preconfigured for Robots 1-6 for the 3000 series hand control signals, including the signals used by the eV+ OPEN, OPENI, CLOSE, CLOSEI, RELAX, RELAXI statements. See the eV+ documentation for more details about these statements.

In the following situations, you must go through a configuration process to modify the sDIO modules:

- when you have more than two sDIO modules
- when you choose not to use the default I/O configuration (blocks 16 and 17)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

- when you replace an sDIO module in either of the two preceding situations

NOTE: The first two sDIO modules can use the default signal configuration, with blocks 16 and 17; each additional sDIO module must be assigned unique block numbers.

In these cases you will use Adept ACE Configuration Tools to select the block number and to assign the Input and Output signals. Refer to the *Adept ACE User's Guide*, Digital I/O Configuration, for details on configuring nodes and gadgets.

From the Adept ACE software:

1. Double-click on the controller in the tree structure pane.

   This will open the object editor for the controller.

2. Click the Configure tab, check Configure Controller, and click Next.

3. Click the Configuration tab.
   - Select DIGITAL_INPUT to modify the input settings.
   - Select DIGITAL_OUTPUT to modify the output settings.

4. Modify or add signal ranges, as needed.
   - If a signal range is not present, click Add to add it.
   - Modify existing values with Edit.

   The following table describes the items on the Add/Edit Statement editor window.

Field	Description	
	Input	Output
Statement Type	input_signal	output_signal
Item Values		
signalid	1001 - 1999	1 - 999
id[1]	0 - 31	0 - 31
bit	0 - 31	0 - 31
length	1-32	1 - 32
signaltype	adept for sDIO module; devicenet for DeviceNet connection	
Composed Statement	Provides a preview of the statement, based on the current settings in the Item Values field.	
1 id is either the input block or output block for Adept 1394 I/Os		

5. When you have configured all of the I/O, click Done.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

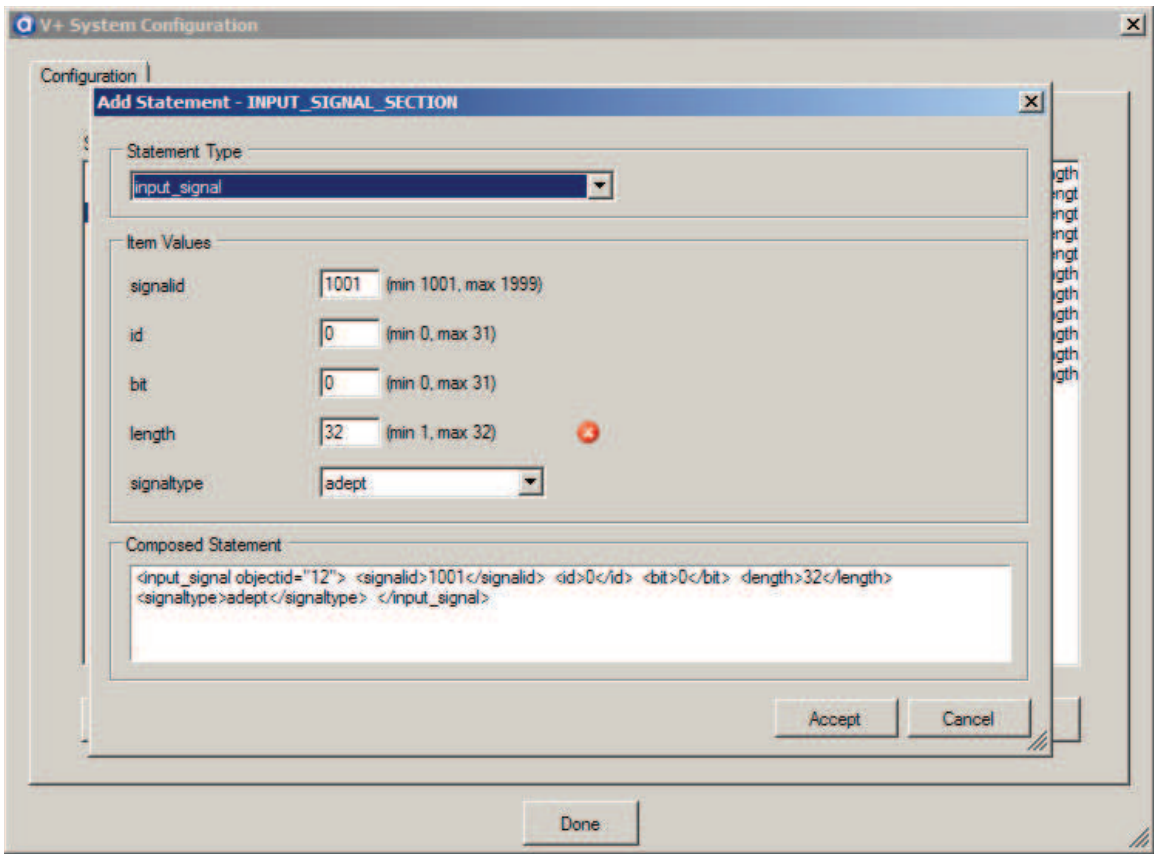


Figure 6-6. Controller Configuration Screen, Digital Input

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

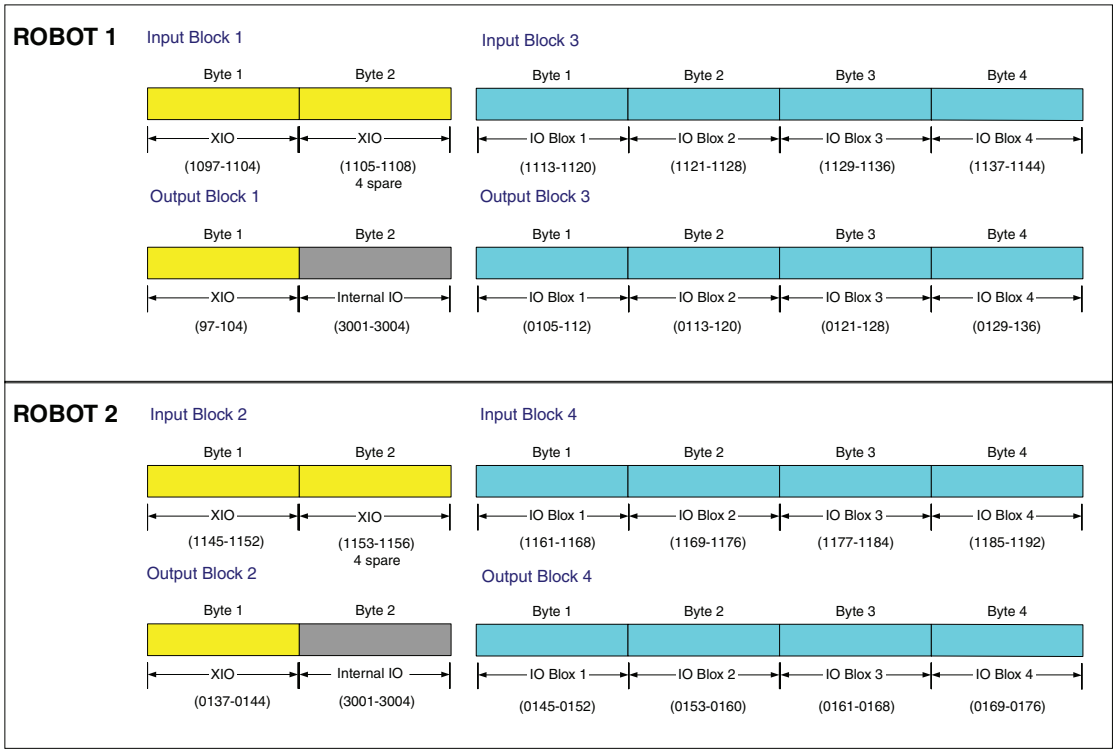


Figure 6-7. Input/Output Block Configuration in Dual-robot Systems

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com



Figure 6-8. Input/Output Block Configuration for Optional sDIO Modules

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6.5 Installing Multiple sDIO Modules

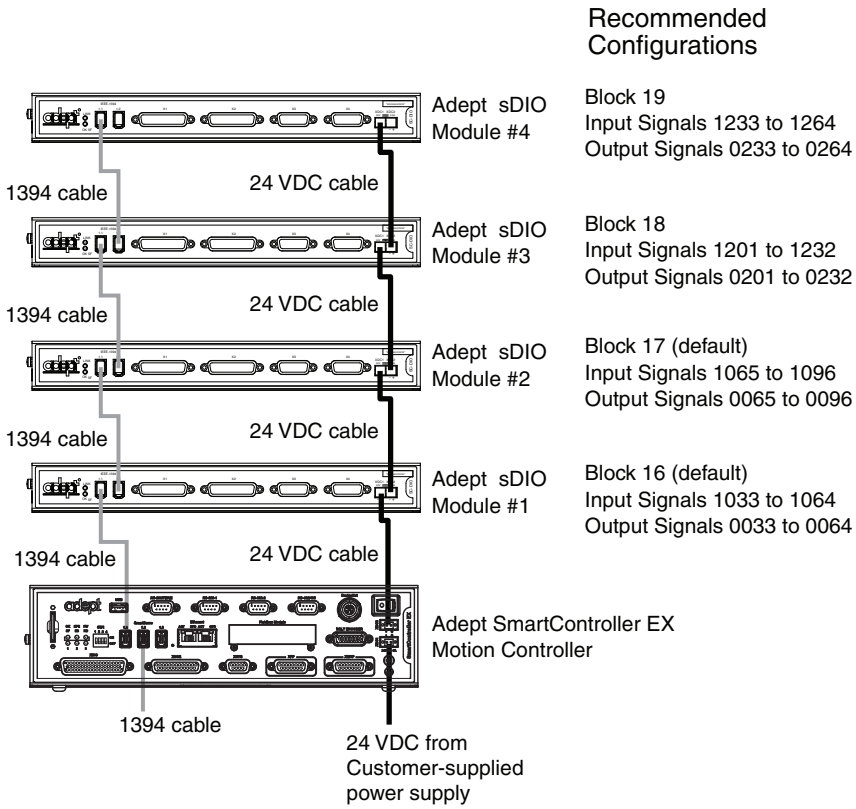


Figure 6-9. Using Multiple sDIO Modules

NOTE: When adding additional sDIO modules, each additional sDIO module must be grounded per all applicable regulations.

Configuring Multiple sDIO Modules

Up to eight sDIO modules can be added to a system. The first sDIO module occupies the first 4 bytes of block 16. The second sDIO module uses block 17. Additional sDIO modules need to be configured. Refer to Modifying the Default sDIO Configuration on page 66, and the values in the figure Input/Output Block Configuration for Optional sDIO Modules on page 70.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6.6 sDIO Digital I/O Signals

The sDIO module's digital I/O signals are 64 optically-isolated digital I/O channels (32 output and 32 input). They are wired to connectors X1 through X4, which are located on the front of the sDIO module (see the figure sDIO Connectors and Indicators on page 65). The electrical specifications for the inputs are similar to the XDIO inputs, but have a different wiring configuration. The sDIO inputs cannot be used for REACTI programming or high-speed interrupts. See the *eV+ Language User's Guide* for information on digital I/O programming.

> **NOTE:** The signals on the sDIO connectors can be superseded by another sDIO module that is installed and addressed as sDIO #1. To use two sDIO modules, address the first as sDIO #1 and the second as sDIO #2.

sDIO Inputs

The 32 input channels are arranged in four groups of eight. Each group is electrically isolated from the other groups and is optically isolated from the sDIO module's circuitry. The eight inputs within each group share a common ground.

The inputs are accessed through the two female 26-pin D-sub input connectors on the front of the sDIO module. Each connector provides access to two input groups. Each group requires ten pins: eight input signals, and two ground references. An input is activated by providing a positive potential on its input pin relative to the ground pin of its group. This type of input is considered sinking. That is, current must flow into the input pin to turn it on.

Table 6-2. sDIO Input Specifications

Operational voltage range	0 to 30 VDC
"Off" state voltage range	0 to 3 VDC
"On" state voltage range	10 to 30 VDC
Typical threshold voltage	V_{in} = 8 VDC
Operational current range	0 to 7.5 mA
"Off" state current range	0 to 0.5 mA
"On" state current range	2.5 to 7.5 mA
Typical threshold current	2.0 mA
Impedance (V_{in}/I_{in})	3.9 K Ω minimum
Current at V_{in} = +24 VDC	$I_{in} \leq$ 6 mA
Turn on response time (hardware) Software scan rate/response time	5 µsec maximum 1 ms scan cycle/ 1 ms max response time
Turn off response time (hardware) Software scan rate/response time	5 µsec maximum 1 ms scan cycle/ 1 ms max response time

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

NOTE: The input current specifications are provided for reference. Voltage sources are typically used to drive the inputs.

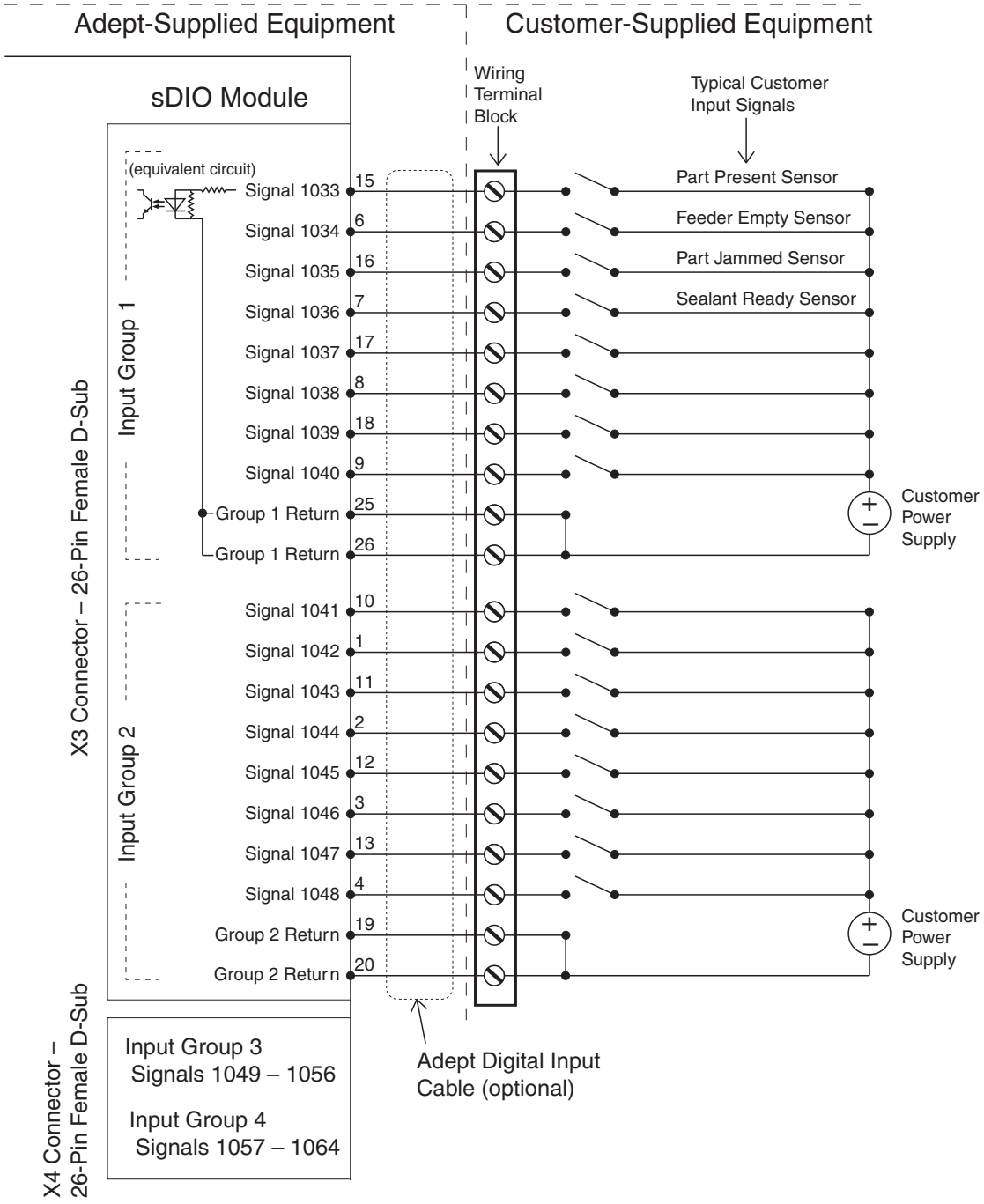


Figure 6-10. Typical sDIO Input Wiring

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

NOTE: The off-state current range exceeds the leakage current of sDIO outputs. This guarantees that the inputs will not be turned on by the leakage current from the outputs. This is useful in situations where the outputs are looped-back to the inputs for monitoring purposes.

sDIO Outputs

The 32 output channels are arranged in four groups of eight. Each group is isolated from the other groups and is optically isolated from the sDIO circuitry. The eight outputs within each group share a common power supply and a common ground.

The outputs are accessed through the two female 44-pin D-sub output connectors on the front of the sDIO module. Each connector provides access to two output groups. Each group requires 19 pins: 8 output signals, 1 test signal, 9 power supply (all tied together), and 1 power supply ground reference. When an output is on, current will flow in through the power supply pins and out through the output pins. This type of output is considered sourcing, that is, in the On condition, current flows out of the output pin. See the figure Typical sDIO Output Wiring on page 77 for details on typical digital output wiring.

Testing sDIO Outputs

Like many solid-state I/O systems, when an output is off, a small leakage current will flow out of the output. This will raise the potential of the output to the power supply voltage level if there is no load. With a load connected, the output will function normally. However, if you need to test the output with a voltmeter with a load disconnected, you will get a false reading. The test signal provides a bias that can be used as a pull-down resistor for system-level troubleshooting. When this is connected to an output, the output will assume the ground potential when it is off.

sDIO LEDs

A pair of two-color LEDs on the sDIO module indicate link status over the IEEE 1394 connection and system status. The upper LED lights green when an IEEE 1394 connection is established. The lower LED blinks green when the software is active and switches to solid green after the controller software has found and configured the DIO block. The lower LED lights solid red whenever an output fault (excessive current or temperature) is detected on any of the 32 outputs. Refer to the following table for information about the LEDs and the figure sDIO Connectors and Indicators on page 65 for information on their location.

NOTE: A fault indication is the result of an over-temperature or over-current condition on one or more of the outputs, usually due to a short-circuit. As a result, the output driver IC will oscillate on and off as the chip tries to drive the load.

Note that this red fault LED is active only when:

- An extended output (for example, a SIGNAL in the range of 33 to 64) has been turned on by an eV+ command.
- An activated output has a thermal-overload problem, usually due to a short in the user's wiring from the output pin to the user's ground.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 6-3. sDIO Chassis LEDs

Illumination	Upper LED (LINK)	Lower LED (OK SF)
None	No IEEE 1394 link	Local software not running
Blinking Green	Not Applicable	Local software active, not configured in eV+
Solid Green	IEEE 1394 link good	Local software active, and configured in eV+
Blinking Red	Not Applicable	Output fault
Solid Red	Not Applicable	Output fault

A diagnostic software indicator is not available for the XDIO outputs. In a short-circuit condition, the XDIO outputs will simply fold back, supplying the maximum short-circuit current to the output pin.

sDIO Output Power Supply Current Selection

The nine power pins for each group are connected together on the sDIO module's board, and the current supplied from the output pins is drawn from these power pins. The number of power pins used in a particular application depends on the total current supplied through that group's outputs. A total of nine power pins are provided to allow for more wire connections to decrease the voltage drop across the power supply wires.

The supply current should be limited to a maximum of one amp per power pin. Use this limitation to select the number of power pins you need.

For example, each output can source up to 700 mA, giving a maximum total current (for a group of eight outputs) of 5.6 A that will be required from the power supply. In this case, a minimum of six power pins should be used. If you experience an excessive voltage drop, make connections to additional power pins.

The ground connection should connect to the power supply directly, not the ground connection of the load. This will isolate the board from any voltage drop across the ground return for the load.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 6-4. sDIO Output Circuit Specifications

Parameter	Value
Power supply voltage range	10 VDC ≤ V_{sup} ≤ 30 VDC
Under voltage shutdown	5 VDC ≤ V_{usd} ≤ 8 VDC
Power supply ground current	I_g ≤ 60 mA
Operational current range, per channel	I_{out} ≤ 700 mA
On state resistance (Iout = 0.5 A)	Ron ≤ 0.32 W @ 85° C (Ron 0.4 W @ 125° C)
Output leakage current	I_{out} ≤ 25 µA
Turn on response time	175 µsec. max., 80 µsec typical (hardware only)
Turn off response time	60 µsec. max., 28 µsec typical (hardware only)
Output voltage at inductive load turnoff (Iout = 0.5 A, Load = 1 mH)	(Vsup - 65) ≤ Vdemag ≤ (Vsup - 45)
DC short circuit current limit	0.7 A ≤ ILIM ≤ 2.5 A
Peak short circuit current	Iovpk ≤ 4 A



CAUTION: The above specs. apply only to the output channels on the sDIO module. See the table DIO Output Specifications (XDIO connector) on page 48 for specs. on the XDIO connectors' digital output channels.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

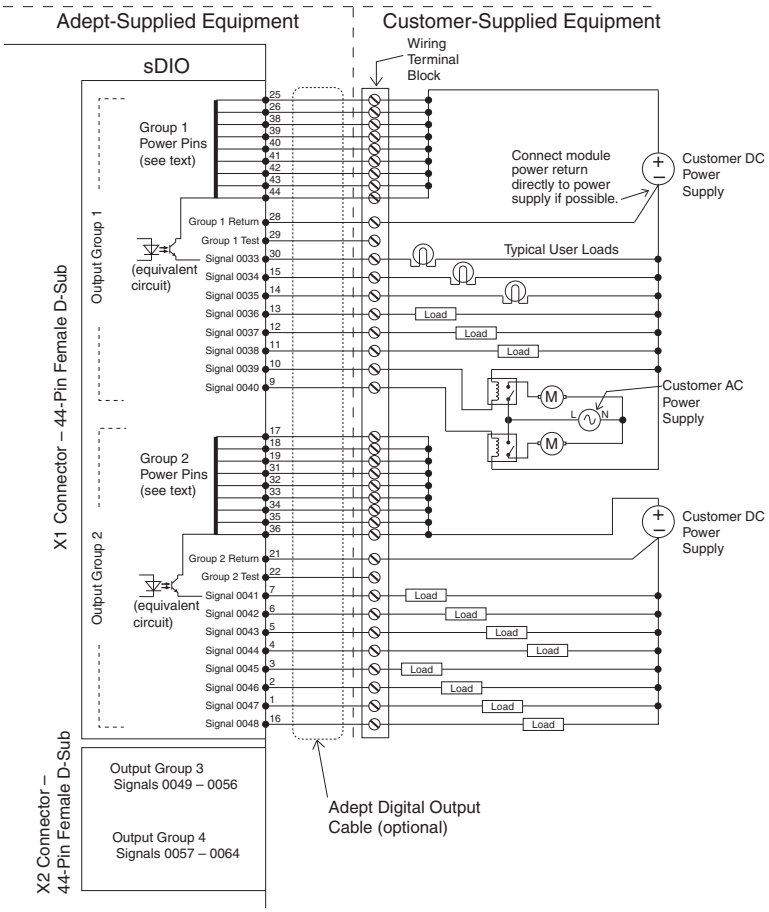


Figure 6-11. Typical sDIO Output Wiring

Optional DIO Cables

The cables that connect to the input and output connectors on the sDIO module can be ordered as a set of four cables: two input cables and two output cables. These cables have a mating plug on one end and unterminated flying leads on the other end. The wire size of the Adept cables is 0.18 mm^2 (24 AWG). You can use these cables to connect to the digital inputs/outputs in your system or to a wiring block.
The cable set is Adept P/N: 90330-01080.

To comply with IEC 1131, if you choose to supply a wiring block, it should be capable of accepting wire in the range of 0.18 mm^2 (24 AWG) to 2.0 mm^2 (14 AWG).

Labeling Cables

The X3 and X4 input connectors on the front of the sDIO module are similar except that X3 handles the group 1 and group 2 input signals and X4 handles the group 3 and group 4 input signals. The optional digital input cables can be connected to either X3 or X4. Make sure to clearly label the cables once you have completed your installation so that the cables do not get swapped by mistake. See the warning that follows.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The X1 and X2 output connectors are also similar except that X1 handles the group 1 and group 2 output signals and X2 handles the group 3 and group 4 output signals. The optional digital output cables can be connected to either X1 or X2. Make sure to clearly label the cables once you have completed your installation so that the cables do not get swapped by mistake. See the warning that follows.



WARNING: Clearly label the X1 to X4 digital I/O cables so that they are always plugged into the correct connectors. Swapping the X3 and X4 or X1 and X2 cables could cause damage to your equipment. Depending on the installation, this could potentially cause injury to personnel in the area.

Input and Output Cable Wiring Information

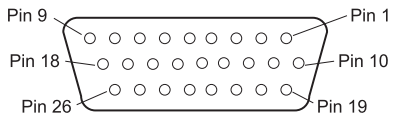
The pinouts, signal names, and wire color information for the input and output cables are shown in the next four tables.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 6-5. X3 Input Cable Pin Assignments

Pin Number	Signal Group	Signal Name	Wire Color
X3–15	1	1033	red/white
X3–6	1	1034	orange
X3–16	1	1035	green/white
X3–7	1	1036	blue
X3–17	1	1037	blue/white
X3–8	1	1038	white/black
X3–18	1	1039	black/red
X3–9	1	1040	red/black
X3–25	1	group 1 return	blue/red
X3–26	1	group 1 return	red/green
X3–10	2	1041	green/black
X3–1	2	1042	black
X3–11	2	1043	orange/black
X3–2	2	1044	white
X3–12	2	1045	blue/black
X3–3	2	1046	red
X3–13	2	1047	black/white
X3–4	2	1048	green
X3–19	2	group 2 return	white/red
X3–20	2	group 2 return	orange/red

X3 26-pin female input connector on sDIO module

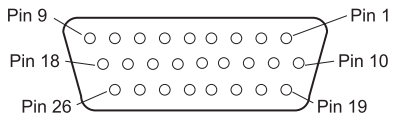


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 6-6. X4 Input Cable Pin Assignments

Pin Number	Signal Group	Signal Name	Wire Color
X4–15	3	1049	red/white
X4–6	3	1050	orange
X4–16	3	1051	green/white
X4–7	3	1052	blue
X4–17	3	1053	blue/white
X4–8	3	1054	white/black
X4–18	3	1055	black/red
X4–9	3	1056	red/black
X4–25	3	group 3 return	blue/red
X4–26	3	group 3 return	red/green
X4–10	4	1057	green/black
X4–1	4	1058	black
X4–11	4	1059	orange/black
X4–2	4	1060	white
X4–12	4	1061	blue/black
X4–3	4	1062	red
X4–13	4	1063	black/white
X4–4	4	1064	green
X4–19	4	group 4 return	white/red
X4–20	4	group 4 return	orange/red

X4 26-pin female input connector on sDIO module



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 6-7. X1 Output Cable Pin Assignments

Pin Number	Group Number	Signal Name	Wire Color
X1–30	1	0033	green/black/white
X1–15	1	0034	green/white
X1–14	1	0035	red/white
X1–13	1	0036	black/white
X1–12	1	0037	blue/black
X1–11	1	0038	orange/black
X1–10	1	0039	green/black
X1–9	1	0040	red/black
X1–25	1	power	orange/green
X1–26	1	power	black/white/red
X1–38	1	power	orange/black/green
X1–39	1	power	blue/white/orange
X1–40	1	power	black/white/orange
X1–41	1	power	white/red/orange
X1–42	1	power	orange/white/blue
X1–43	1	power	white/red/blue
X1–44	1	power	black/white/green
X1–28	1	group 1 return	white/black/red
X1–29	1	group 1 test	red/black/white
X1–7	2	0041	white/black
X1–6	2	0042	blue
X1–5	2	0043	orange
X1–4	2	0044	green
X1–3	2	0045	red
X1–2	2	0046	white
X1–1	2	0047	black
X1–16	2	0048	blue/white
X1–17	2	power	black/red
X1–18	2	power	white/red

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Pin Number	Group Number	Signal Name	Wire Color
X1–19	2	power	orange/red
X1–31	2	power	orange/black/white
X1–32	2	power	blue/black/white
X1–33	2	power	black/red/green
X1–34	2	power	white/red green
X1–35	2	power	red/black/green
X1–36	2	power	green/black/orange
X1–21	2	group 2 return	blue/red
X1–22	2	group 2 test	red/green

X1 44-pin female output connector on sDIO module

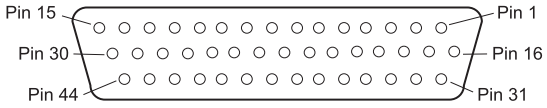


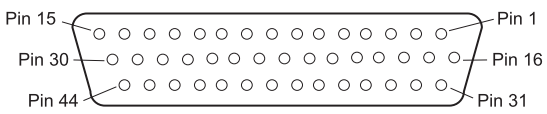
Table 6-8. X2 Output Cable Pin Assignments

Pin Number	Group Number	Signal Name	Wire Color
X2–30	3	0049	green/black/white
X2–15	3	0050	green/white
X2–14	3	0051	red/white
X2–13	3	0052	black/white
X2–12	3	0053	blue/black
X2–11	3	0054	orange/black
X2–10	3	0055	green/black
X2–9	3	0056	red/black
X2–25	3	power	orange/green
X2–26	3	power	black/white/red
X2–38	3	power	orange/black/green
X2–39	3	power	blue/white/orange
X2–40	3	power	black/white/orange

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Pin Number	Group Number	Signal Name	Wire Color
X2–41	3	power	white/red/orange
X2–42	3	power	orange/white/blue
X2–43	3	power	white/red/blue
X2–44	3	power	black/white/green
X2–28	3	group 3 return	white/black/red
X2–29	3	group 3 test	red/black/white
X2–7	4	0057	white/black
X2–6	4	0058	blue
X2–5	4	0059	orange
X2–4	4	0060	green
X2–3	4	0061	red
X2–2	4	0062	white
X2–1	4	0063	black
X2–16	4	0064	blue/white
X2–17	4	power	black/red
X2–18	4	power	white/red
X2–19	4	power	orange/red
X2–31	4	power	orange/black/white
X2–32	4	power	blue/black/white
X2–33	4	power	black/red/green
X2–34	4	power	white/red/green
X2–35	4	power	red/black/green
X2–36	4	power	green/black/orange
X2–21	4	group 4 return	blue/red
X2–22	4	group 4 test	red/green

X2 44-pin female output connector on sDIO module



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 7: Adept DeviceNet

DeviceNet is a low-cost communications link that connects industrial devices to a network and eliminates expensive hard-wiring. The direct connectivity provides improved communication between devices as well as important device-level diagnostics not easily available using hard-wired I/O interfaces.

7.1 DeviceNet Specifications

Adept Technology is a member of the Open DeviceNet Vendor Association (ODVA), which is independently run and operated and not directly associated with any one company. The ODVA controls DeviceNet technical specifications with help from Special Interest Groups (SIGs). Each SIG develops device profiles for one line of product features to ensure interoperability. These profiles become part of the technical specifications.

The DeviceNet Specification is divided into two volumes and defines the following elements:

Volume 1

- DeviceNet Communication Protocol and Application (Layer 7 - Application Layer[1])
- Controller Area Network (CAN) and its use in DeviceNet (Layer 2 - Data Link Layer)
- DeviceNet Physical Layer and Media (Layer 1 - Physical Layer)

Volume 2

- Device profiles to obtain interoperability and interchangeability among like products

DeviceNet incorporates CAN, which defines the syntax or form of the data transmitted. The DeviceNet application layer defines the semantics or meaning of the data transmitted. For more information on the basics of a DeviceNet cable system, contact ODVA at:

ODVA Technology and Training Center
4220 Varsity Drive, Suite A
Ann Arbor, MI 48108-5006 USA
Phone Number: 1-734-975-8840
Fax Number: 1-734-922-0027
www.odva.org

[1]These layers are based on the Open Systems Interconnect (OSI) model.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

7.2 Limitations of the Adept DeviceNet Scanner

The DeviceNet Scanner that Adept has incorporated into the Adept SmartController EX motion controller hardware and the eV+ operating system currently supports only a subset of full DeviceNet functionality. The following is a summary of the DeviceNet implementation:

- Implemented the *Master-Slave* operation. This is a complete subset of Peer-to-Peer operation.
- Implemented the *Unconnected Message Manager* (UCMM) in its DeviceNet Scanner to establish connections.
- UCMM is used to establish *I/O Connections*.
- The Adept DeviceNet Scanner can be a *Client* or a *Server* on the network.
- The Adept DeviceNet Scanner currently does **not** support *Cyclic* or *Change-of-State* connections.
- Only *I/O Messaging* is supported. I/O messages contain only data.
- Currently, only the *Message Group 2* of the *Predefined Master/Slave Connection Set* is supported.
- Adept Message Group 2 I/O connections support only the *I/O Poll Command/Response Message* of the possible message types.

7.3 DeviceNet Port on the Controller

The DeviceNet port on the Adept SmartController EX Motion Controller has the following configuration:

Micro-style 12 mm thread DIN connector (female). See the following table for pin assignments.

Table 7-1. DeviceNet Signal-to-Pin Locations

Pin Number	Signal Name
1	Drain
2	V+
3	V-
4	CAN_H
5	CAN_L

See the figure DeviceNet Connector Pinouts on page 93 for a drawing of the connectors.

Connecting DeviceNet Hardware to the Controller

To connect DeviceNet components to the controller, connect a drop line to the female Micro-style 12 mm thread DIN connector on the front of the controller. Then you must configure the DeviceNet Scanner correctly using the Adept ACE Configuration Tools.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

NOTE: Adept does not supply 24 V on the controller to power the DeviceNet bus. A separate power supply is required to power the components on the DeviceNet bus.

NOTE: It is important that devices connected to the network have a terminating resistor connected between CAN-H (white) and CAN-L (blue). See Termination of the DeviceNet Network on page 91

Configuring DeviceNet

The Adept SmartController EX motion controller has a default configuration such that, if you plug in a DeviceNet module configured with MAC_ID 1 and a baud rate of 125 kbps, the first 64 inputs and 64 outputs will automatically be mapped as signals 1289 to 1352 and 257 to 320, respectively. This makes the DeviceNet plug and play.

For other configurations, use the Adept ACE software for software setup. This assigns the controller signals to the physical ports of the DeviceNet nodes. Refer to the Adept ACE User's Guide for details on configuring DeviceNet.

NOTE: The local setting baud rate must match the DeviceNet node's setting.

7.4 DeviceNet Physical Layer and Media

The DeviceNet physical layer and media specifications are published in the ODVA manual, chapter 9, volume 1. It describes possible topologies and components of the physical layer of the DeviceNet.

The figure Trunk Lines and Drop Lines Made of Thick and Thin Cable on page 88 shows several possible topologies. The DeviceNet specifications also specify system grounding, mixing of thick and thin cable media, termination, and power distribution.

The basic topology is the trunkline-dropline topology. This topology uses separate twisted-pair buses for the distribution of signals and power. The specifications allow trunk lines and drop lines made of thick or thin cable. The baud rate, maximum distance from end-to-end of the network, and cable size are dependent on each other. See the table Features of a DeviceNet Network on page 88 for further details.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

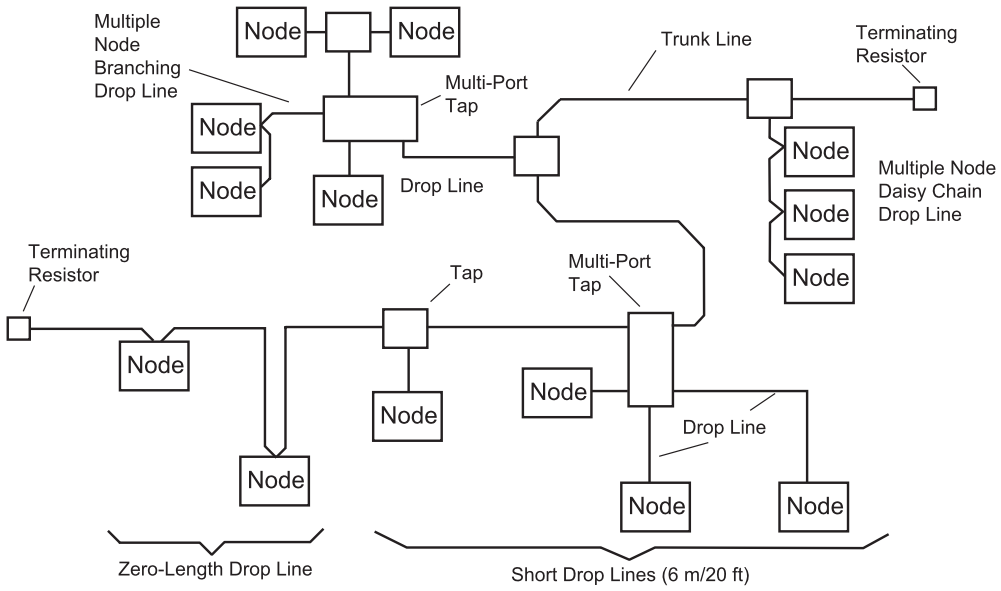


Figure 7-1. Trunk Lines and Drop Lines Made of Thick and Thin Cable

DeviceNet allows devices to be powered directly from the bus, and devices can use the same cable to communicate with other devices on the bus. DeviceNet nodes are hot-pluggable — you can remove or add components on the bus without powering down the network.

> **NOTE:** This hot-pluggable feature is not fully supported. If you add a new component to the network, you must make changes in the Adept ACE Configuration Tools. Those changes are not active until you reboot the Adept SmartController EX motion controller.

The power distribution on the network/bus does not need to be in one place. The distribution of power supplies needs to be well planned because there are certain constraints on the power supply. In general, power supplies can be placed at any point in the network. The maximum current rating of a trunk line is 8 amps. DeviceNet allows opto-isolated, externally powered devices (e.g., AC drive starters and solenoid valves) to operate on the same bus cable. For detailed information, see the DeviceNet Technical Specifications.

Table 7-2. Features of a DeviceNet Network

Network Size	**A maximum of 64 nodes [0...63]**
Network Length	Selectable, end-to-end network distance varies with speed
Baud Rate	Distance (thick cable)
125 Kbps	500 m (1,640 ft)
250 Kbps	250 m (820 ft)
500 Kbps	100 m (328 ft)
Data Packets	0-8 bytes

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Network Size	A maximum of 64 nodes [0...63]
Bus Topology	Linear (trunk line/drop line); power and signal on the same network cable
Bus Addressing	Multi-Master and Master/Slave special case; polled
System Features	Removal and replacement of devices from the network under power not supported by Adept

The baud rate of the system depends on the length of the network (end-to-end) and the type of cable. The following table shows how cable selection and trunk line length affect the maximum data rate on the network. The figure DeviceNet Thick Cable on page 89 shows a thick cable, and the figure DeviceNet Thin Cable on page 90 shows a thin cable.

Table 7-3. DeviceNet Data Rates Relative to Cable Type and Length

Data Rates	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)
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)

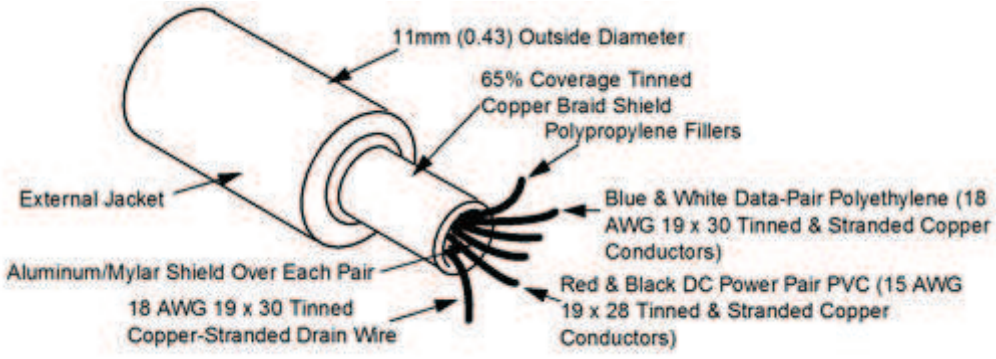


Figure 7-2. DeviceNet Thick Cable

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

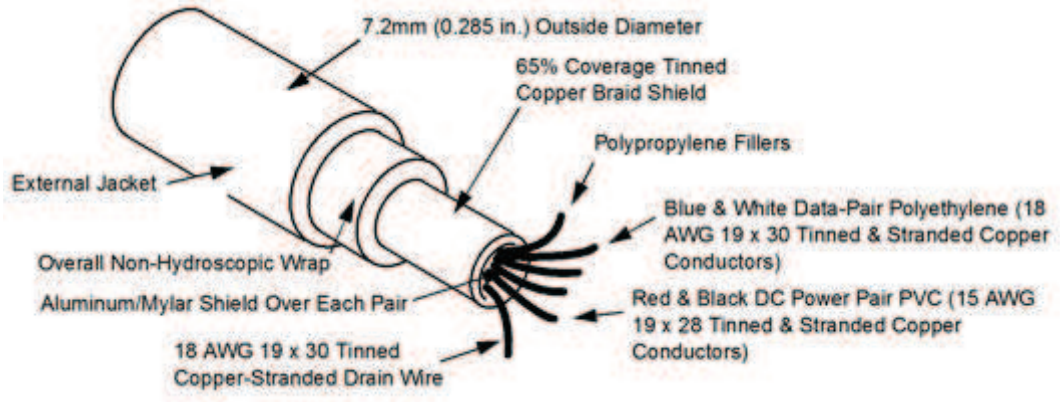


Figure 7-3. DeviceNet Thin Cable

DeviceNet Connectors

DeviceNet allows different connectors, which may be grouped into open and sealed connectors. The open connectors are available with screw or with crimp connectors. The sealed connectors are available in mini-style and micro-style sizes. See the following figure and table for more details.

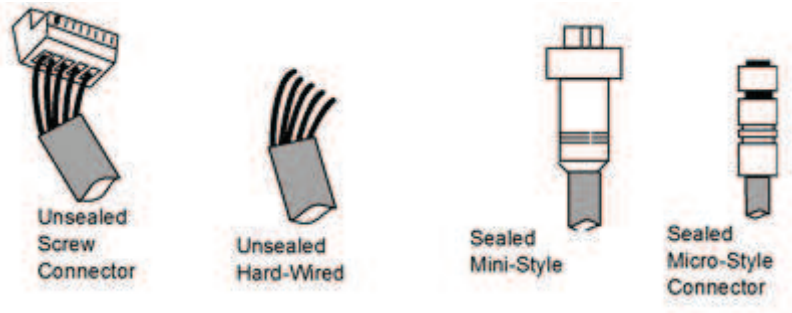


Figure 7-4. DeviceNet Connectors

Table 7-4. DeviceNet Connector Styles

Connector	Description
Unsealed screw connector	Uses screws to attach cable wires to a removable connector
Unsealed hard-wired	Uses wires attached directly to screw terminals
Sealed mini-style	Attaches to taps and thick or thin cable
Sealed micro-style	Attaches to thin cable only – has a reduced current rating

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Termination of the DeviceNet Network

The DeviceNet network uses the Controller Area Network (CAN) bus as the physical layer. This requires that the trunk line of your DeviceNet network be terminated with a resistor at each end. This terminates the signal lines.

The terminating resistor:

- Prevents reflection of communication signals on the network.
- Connects the two signal conductors.
- Must be sealed if the end node uses a sealed tee.
- Must be open if the end node uses an open-style tap.

When using the open-style terminating resistor, connect a 121 ohm, ¼ W resistor to CAN_H and CAN_L (between blue and white data-pair wires).

NOTE: A terminating resistor must also be used whenever a short drop line exceeds 6 m (20 ft).

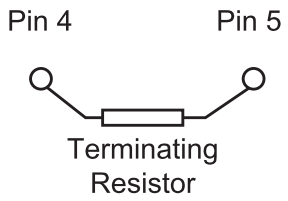


Figure 7-5. Example of a Terminating Resistor Installation on a DeviceNet Bus

Power Supply and the DeviceNet Bus

The DeviceNet network allows distribution of power supplies on the network cable system. Follow these general rules to achieve safe and reliable operation:

- Use power supplies rated at 24 V.
- Minimize installation problems by using a single power supply with sufficient current to operate all the attached nodes. This must comply with national and international safety standards.
- Make sure that each power supply incorporates current-limit protection.
- Make sure each power supply is temperature compensated.
- Provide over-current protection for each segment of your DeviceNet cable installation.

NOTE: Adept does not supply the 24 V operating voltage for the DeviceNet bus on the SmartController or any other Adept component.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Power Capabilities of a DeviceNet Cable System

A DeviceNet cable system has several power rating constraints. The cable type and the length of the cable specify the maximum current on a cable. Thick and thin cable have:

- 24 VDC power rating
- Optional power-supply tabs

If the power supplies are equipped with Schottky diodes, the optional power supply tabs must be protected from bus back-feeding of current among the power supplies on the bus. We also recommended the use of fuse protection for every trunk line in the cable system.

The maximum current rating of a thick cable trunk line is 8 A. Verify that this complies with your national and international standards. It might be necessary to limit the maximum current to a lower value if standards in the U.S. or Canada apply. The maximum current value is a theoretical value. The cable size supports a higher current than 8 A. Depending on the topology of nodes relative to the power supply, higher currents might be possible. See the DeviceNet technical specifications for further information.

The maximum current rating of a thin cable trunk line is 3 A. If you use the thin cable on a long line, the resistance of the cable decreases the maximum current value. See the following table and the DeviceNet technical specifications for further information.

Table 7-5. Maximum Current on a Drop Line Relative to its Length

Length of Drop Line	Maximum Current
1.5 m (5 ft)	3 A
2.0 m (6.6 ft)	2 A
3.3 m (10 ft)	1.5 A
4.5 m (15 ft)	1 A
6 m (20 ft)	0.75 A

For the calculation of the maximum current at a specific length, use the following formula:

$$i = \frac{4.57}{l}$$

Where:

l= Length of the drop line in meters (m)

i= Maximum current in amps

This calculation applies to the sum of the currents of all the nodes on the selected drop line. The length (l) is not the cumulative length of the drop line; it is the maximum distance from any node on the drop line to the trunk line.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

It is important to note that voltage differences between the V– and V+ conductors need to be between 11 V and 25 V. The common-mode voltage between any two places on the V– wire must not exceed 5 V.

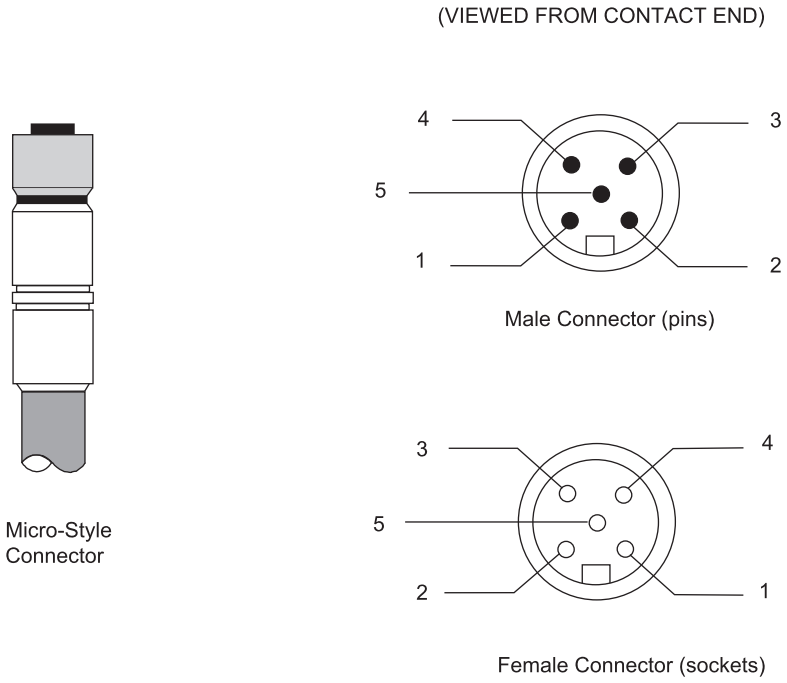


Figure 7-6. DeviceNet Connector Pinouts

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com



5960 Inglewood Drive
Pleasanton, CA 94588
925·245·3400

P/N:11069-000 Rev. B

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP