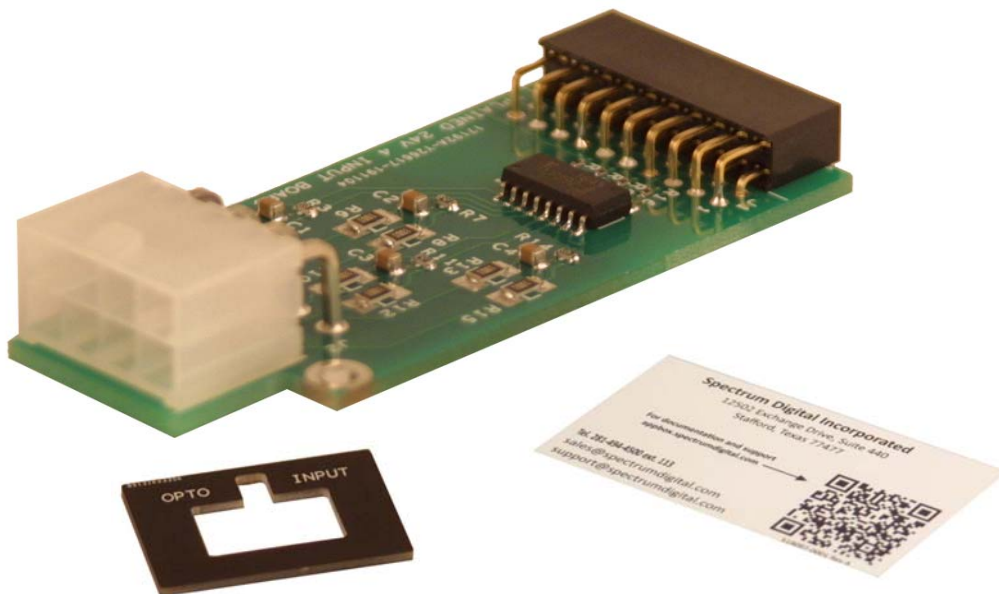




AppIO 4 Channel Opto Input Module System User's Guide



Specializes in designing with Microchip products

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Mailing address:

Spectrum Digital, Inc
PO Box 1559
Sugar Land, TX. 77487-1559

Web site: www.spectrumdigital.com
Sales: sales@spectrumdigital.com
Support: support@spectrumdigital.com

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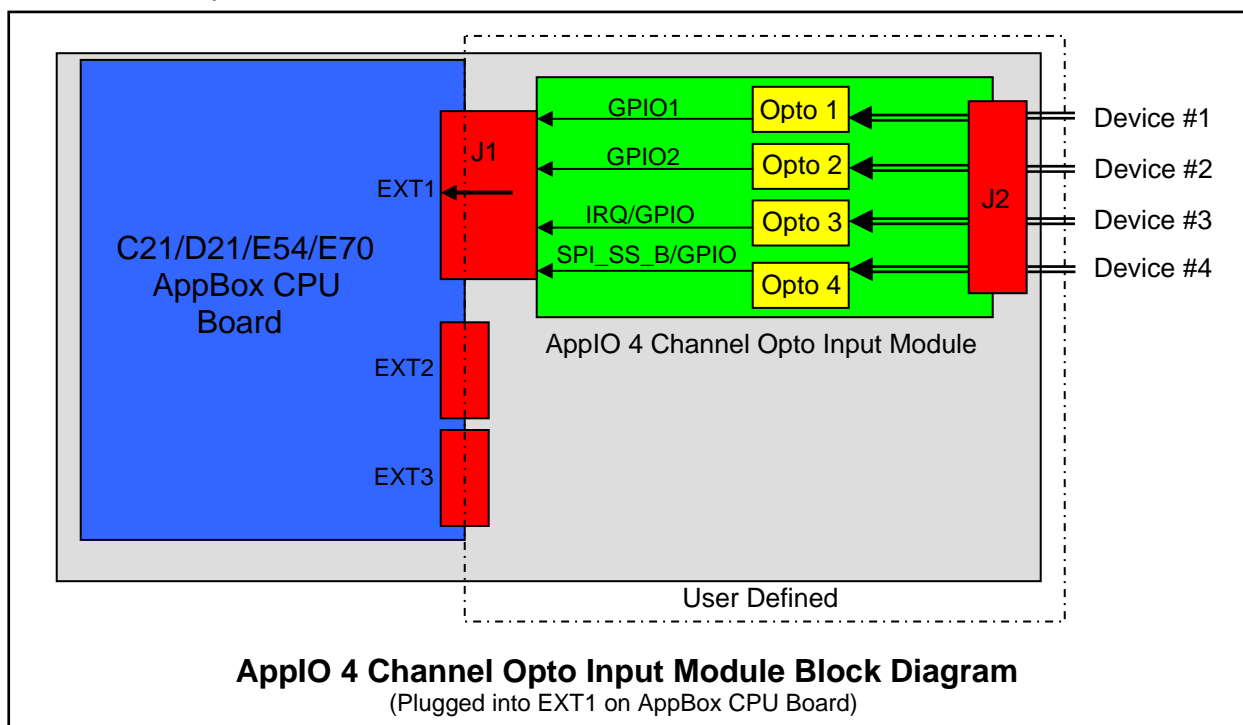
1.0 Introduction

This document describes the features of the AppIO 4 Channel Opto Module. The AppIO 4 Channel Opto Input Module is designed to be used with a Spectrum Digital AppBox in an industrial application. The AppIO 4 Channel Opto Input Module can be plugged into any of the 3 expansion connectors (EXT1, EXT2, or EXT3) on the AppBox.

1.1 AppIO 4 Channel Opto Input Module Features

This AppIO 4 Channel Opto Input Module has the following features:

- Provides four (4) optically isolated inputs (+24 vdc)
- Compatible with Spectrum Digital AppBoxes C21, D21, E54, E70 and Atmel X PLAINED processor boards
- Power provided by AppBox CPU Board
- Operates 0 - +70C



1.2 AppIO 4 Channel Opto Input Module Applications

The AppIO 4 Channel Opto Input Module can be used in the following applications:

- Allows the AppBox to input and optically isolate 4 DC (up to +24VDC) levels
- An AppBox can be configured with up to 12 inputs
- Brings DC voltage levels into IoT applications as a new edge device

1.3 AppIO 4 Channel Opto Input Module Product Contents

The following items are contained in the AppIO 4 Channel Opto Input Module (Part/SKU #: 702929) product:

- AppIO 4 Channel Opto Input Module
- Mating connector for J2
- Knock out panel for relay output connector
- 2 mounting screws
- Product information card

1.4 AppIO 4 Channel Opto Input Module Accessories

The following AppBox products can be used with the AppIO 4 Channel Opto Input Module and ordered from Spectrum Digital or authorized resellers:

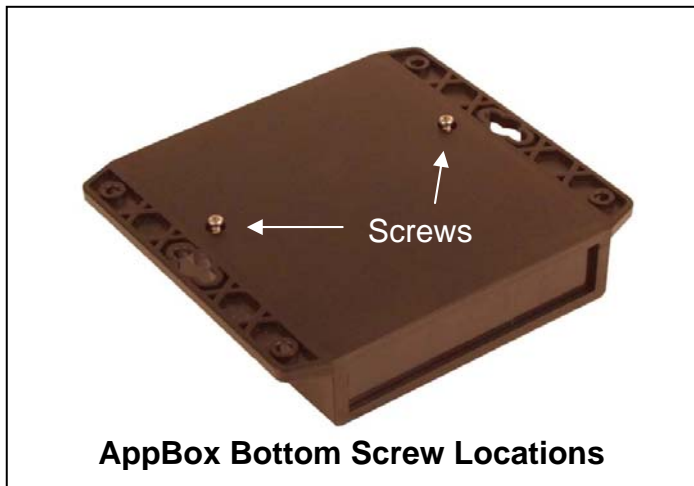
Accessory Description	Part/SKU Number
AppBox C21	703909-0001
AppBox D21	703910-0001
AppBox E54	703919-0001
AppBox E70	703911-0001

2.0 Installation

2.1 Installation of the AppIO 4 Channel Opto Input Module

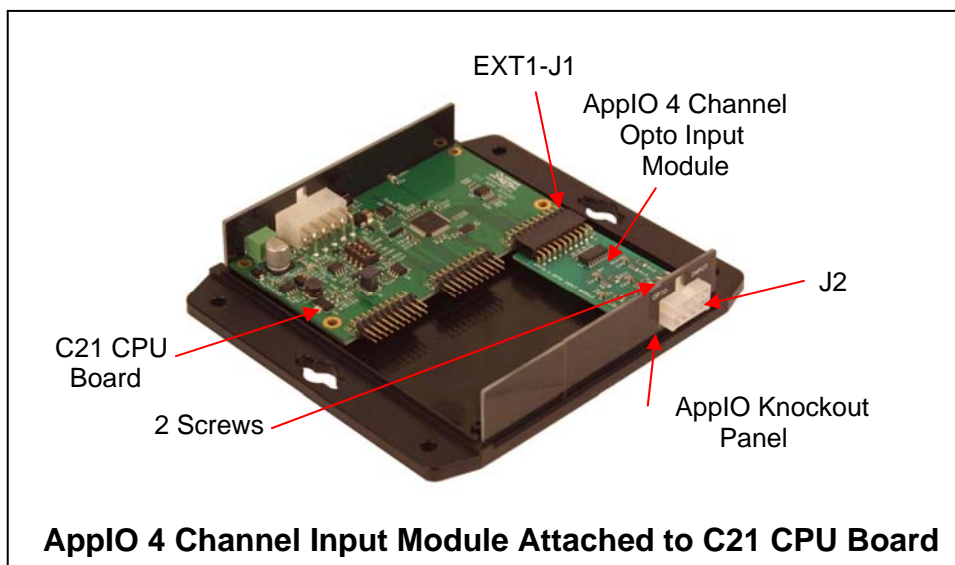
Listed below are the steps to install the AppIO 4 Channel Opto Input Module in an AppBox C21/D21/E54/E70:

1. Remove **ALL** power to the enclosure
2. Remove all interface connections attached to the installed AppIO Modules
3. Remove the connections (CAN/RS-485/LIN/USB/Enet) to the AppBox CPU Board
4. Turn the AppBox over and remove the 2 screws from the bottom of the enclosure as shown below



5. Turn the AppBox back over (label showing) and lift the top off the enclosure being careful not to lose the knockout panels
6. If necessary remove one or more existing AppIO Modules

7. Plug the AppIO 4 Channel Opto Input Module into an AppIO Module expansion connector (EXT1, EXT2, or EXT3)



8. Insert the included knock out panel associated with the AppIO 4 Channel Opto Input Module
9. Secure the AppIO Module to the AppBox base with the 2 provided screws
10. Insert the knock out panels in any unused positions
11. Place the cover back over the AppBox CPU Board and AppIO Modules. Make sure the cover closes tight on both sides
12. Turn the AppBox over and insert the 2 screws back in and tighten until snug, do not over tighten/strip the screws

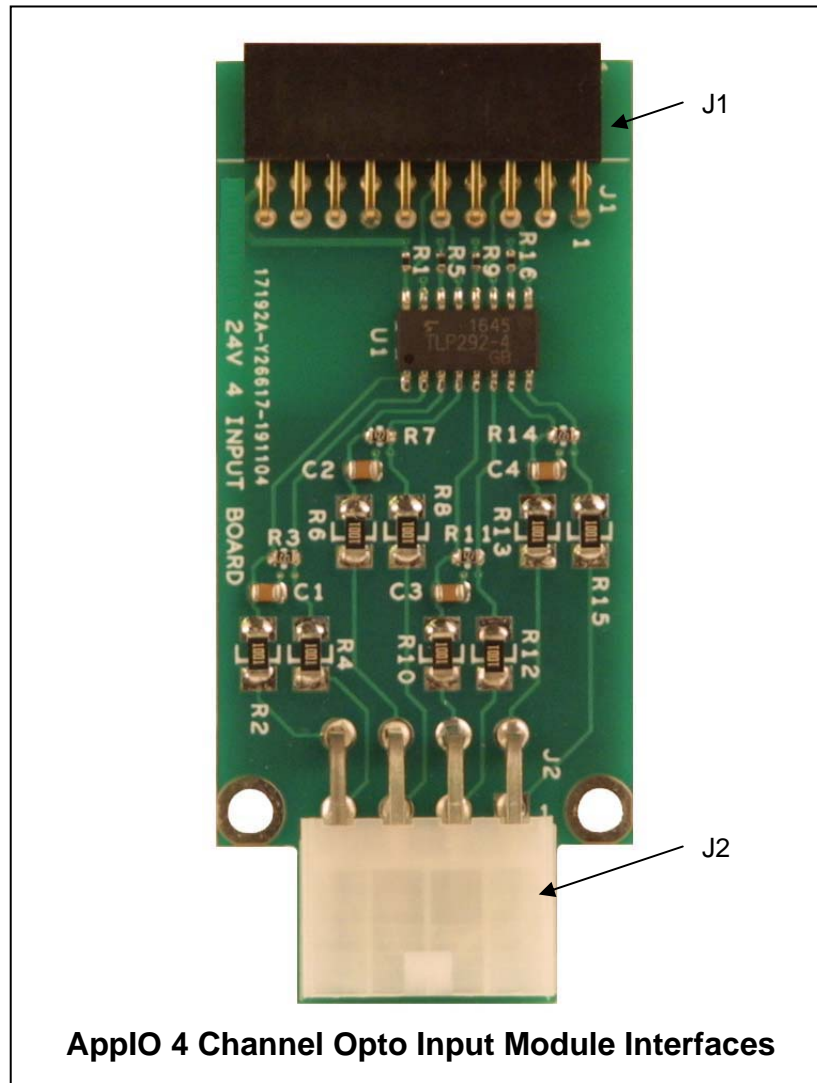


13. Re-attach the connections (CAN/RS-485/LIN/USB/Enet) to the AppBox CPU Board
14. Re-attach all interface connections to the AppIO Modules
15. Apply power to the AppBox

3.0 Interfaces

This section describes the interfaces on the AppIO 4 Channel Opto Input Module. These interfaces include the connectors, and jumpers. The jumpers are shown in section 3.2.

The location of each of these interfaces is shown in the figure below:



The table below lists all the interfaces on the AppIO 4 Channel Opto Input Module.

AppIO 4 CHANNEL OPTO INPUT MODULE INTERFACES	
INTERFACE NAME	TYPE OF INTERFACE
J1	Connector to AppBox CPU Board
J2	Connector from opto-couplers
JP1	SMT jumper(bottom)
JP2	SMT jumper(bottom)
JP3	SMT jumper(bottom)
JP4	SMT jumper(bottom)

3.1 Connectors

The following section describes the connectors on the AppIO 4 Channel Opto Input Module.

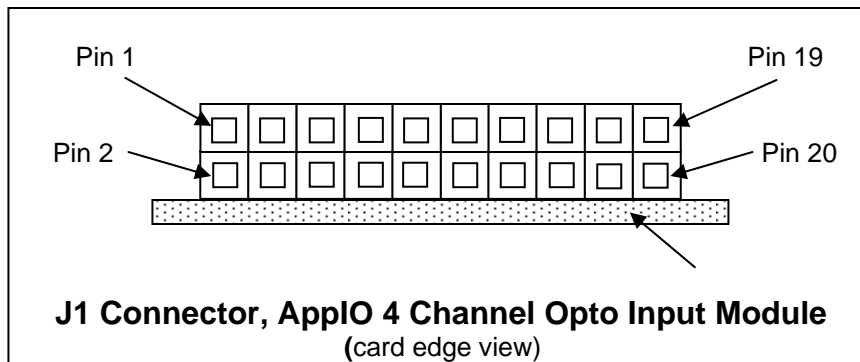
INTERFACE NAME	TYPE OF INTERFACE
J1	Connector to AppBox CPU Board, 20 position, 2 x 10
J2	Connector to relays, 8 position, 2 x 4

A connector kit for connector J2 is available from Spectrum Digital under part/SKU number: 703920-0008.

3.1.1 J1 Connector, AppBox CPU Board Interface

The J1 connector on the AppIO 4 Channel Opto Input Module can be plugged into any one of the 3 expansion connectors (EXT1, EXT2, or EXT3) on the C21/D21/E54/E70 AppBox CPU boards. The J1 connector is a 20 pin, 2 x 10 double row female right angle connector with centers on .1 inch (2.54 mm) centers.

The following diagram shows the physical layout of the J1 connector.

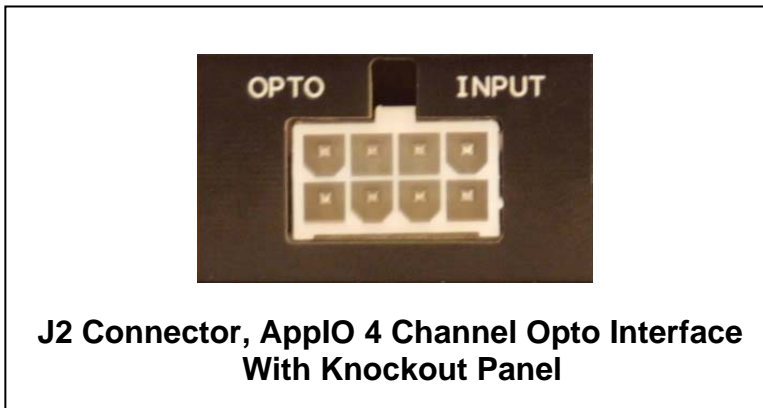


The following table shows the signals present on the J1 connector.

J1 Connector, AppIO 4 Channel Opto Input Module			
Pin #	Signal Name	Function	Shared Functionality
1	No connect		
2	DGND	Ground	Ground
3	No connect		
4	No connect		
5	GPIO1	Input from Opto 1	
6	GPIO2	Input from Opto 2	
7	No connect		
8	No connect		
9	IRQ/GPIO	Input from Opto 3	
10	SPI_SS_B/GPIO	Input from Opto 4	
11	No connect		
12	No connect		
13	No connect		
14	No connect		
15	No connect		
16	No connect		
17	No connect		
18	No connect		
19	DGND	Ground	Ground
20	VDD_3V3	Positive voltage for AppIO Module	VDD_3V3

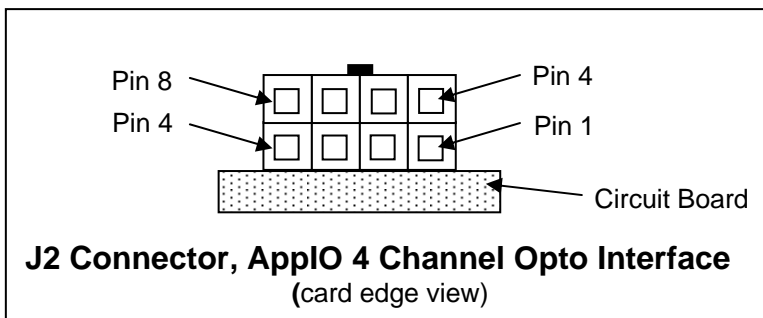
3.1.2 J2 Connector, 4 Channel Opto Input Interface

This section describes J2, the signal connector. This connector has the 4 pair of inputs to the opto-couplers. Each input can handle a voltage up to +24 VDC. The J2 connector is shown with its knockout panel in the diagram below.



This is a 8 position (2 rows by 4 pins each) male connector. The bottom row of pins (1, 2, 3, and 4) have the signals “B” side of each of the input pair. The top row of pins (5, 6, 7, and 8) have the “A” signals for each input pair.

The diagram below shows the physical layout of the J2 connector.

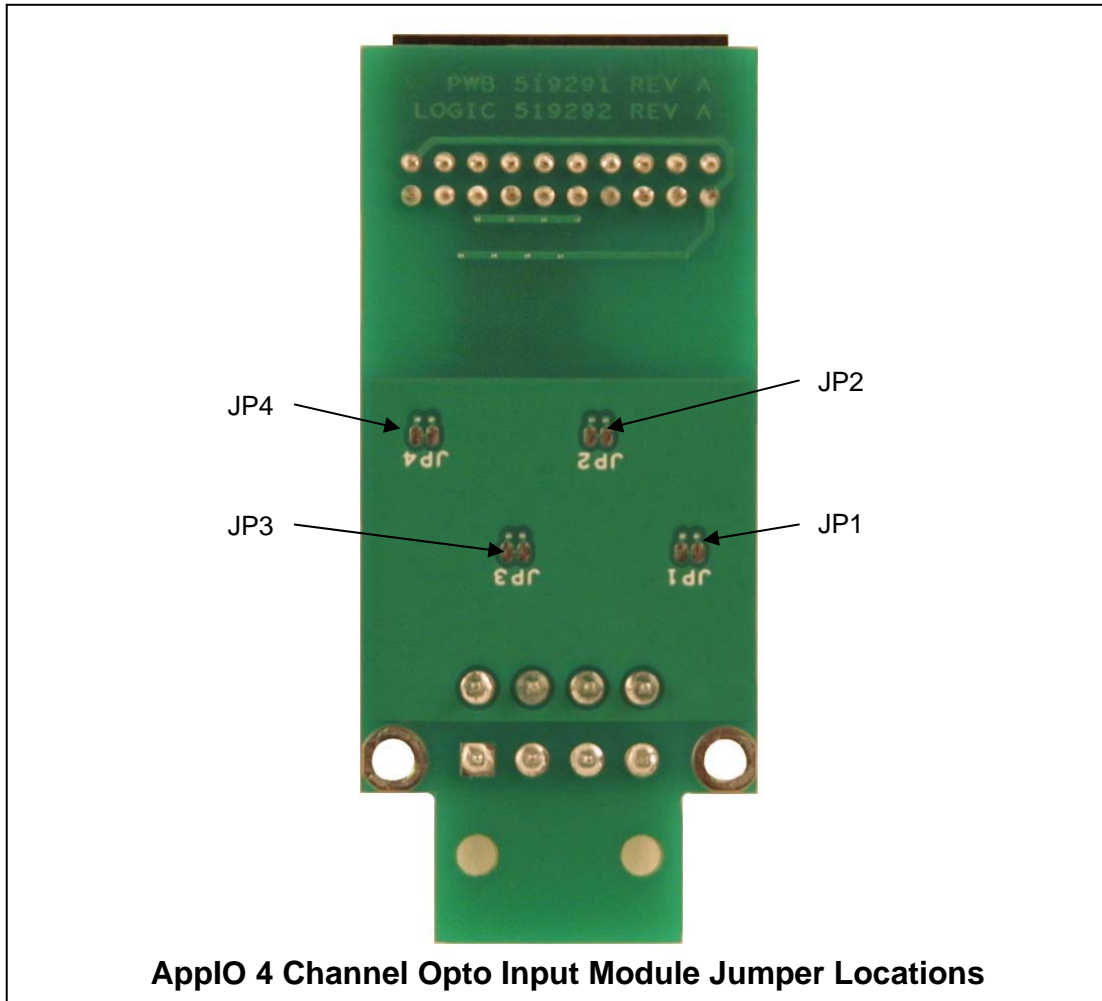


The following table shows the signals present on the J2 connector.

J2 Connector, 4 Channel Opto Input Interface	
Pin number	Signal name
1	IN1(B)
2	IN2(B)
3	IN3(B)
4	IN4(B)
5	IN1(A)
6	IN2(A)
7	IN3(A)
8	IN4(A)

3.2 Jumpers

This section describes the jumpers on the AppIO 4 Channel Opto Input Module. All jumpers are located on the bottom side of the Module. All jumpers are surface mount jumpers. The figure below shows the location of each jumper.



The table below describes the jumpers on the AppIO 4 Channel Opto Input Module.

JUMPER NAME	POSITION DESCRIPTION	FACTORY SHIPPED POSITION
JP1	Installed = Isolation capacitor installed between inputs of channel 4	Installed
JP2	Installed = Isolation capacitor installed between inputs of channel 3	Installed
JP3	Installed = Isolation capacitor installed between inputs of channel 2	Installed
JP4	Installed = Isolation capacitor installed between inputs of channel 1	Installed

4.0 Physical Characteristics

The physical characteristics of the AppIO 4 Channel Opto Input Module are described below:

AppIO 4 Channel Opto Input Module (without connectors): L: 2.25 in. (57.15 mm.) x
W: 1.20 in. (30.48 mm.)

AppIO 4 Channel Opto Input Module (width with connectors): L: 2.75 in. (69.85 mm.)

AppIO 4 Channel Opto Input Module (maximum height): H: 0.62 in. (15.75 mm.)

Weight of 4 Channel Opto Input Module: .416 ounces (.011 kg.)

Operating Temperature: -0C to +70C

Storage Temperature: -40C to +85 C

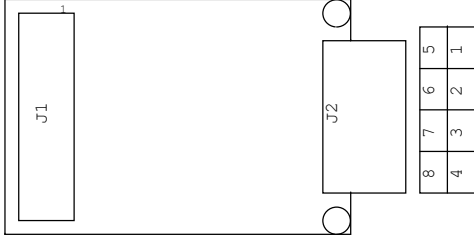
Relative Humidity: 0 to 90% (non-condensing)

Maximum power consumption of controller Module: 500 ma. at +12 volts

RoHS Compliant: Yes

5.0 Schematics

The following pages have the schematics for the AppIO 4 Channel Opto Input Module.



SPECTRUM DIGITAL INCORPORATED			
Title:	AppIO 4 Opio Input Module		
Page Contents:	TITLE		
Size: B	DWG NO	519282	Revision: C
Date:	Tuesday, March 31, 2020	Sheet 1	of 2

Spectrum Digital, Inc
PO Box 1559
Sugar Land, TX. 77487-1559

Web site: www.spectrumdigital.com
Sales: sales@spectrumdigital.com
Support: support@spectrumdigital.com

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