

Four Channel ADC and Single Channel DAC I2C Device

MK-34765

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IONOTRONICS Corporation

<http://www.ionotronics.com>

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1 Introduction

This User Guide describes the operation and schematic of the MK-34765 4-Channel ADC and single DAC I2C device. The MK-34765 provides an I2C interface four 8-Bit ADC's and a single 8-bit DAC. Each ADC channel has a 4 pin Hirose DF11 series connector. The DAC output is also available through a 4 pin Hirose connector. Two 4-pin Hirose connectors are available for I2C interface and bussing.

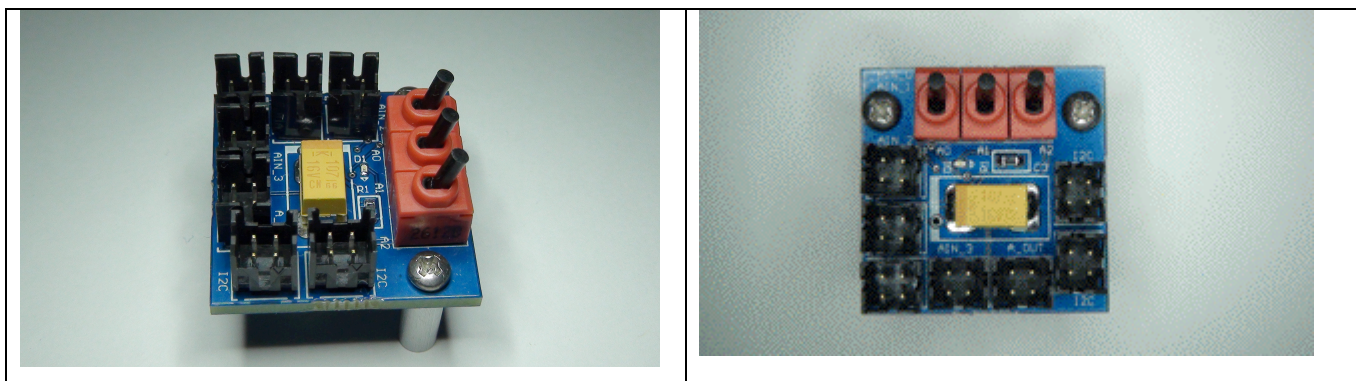


Figure 1 Photos MK-34765 I2C 4-Channel ADC and Single Channel DAC

2 Description

The 4-channel ADC and single DAC I2C device is based on the PCF8591.

.For the datasheet see:

http://www.nxp.com/documents/data_sheet/PCF8591.pdf

The Digikey part number is: 568-1088-2-ND.

The schematic of the MK-34765 is shown in Figure 2.

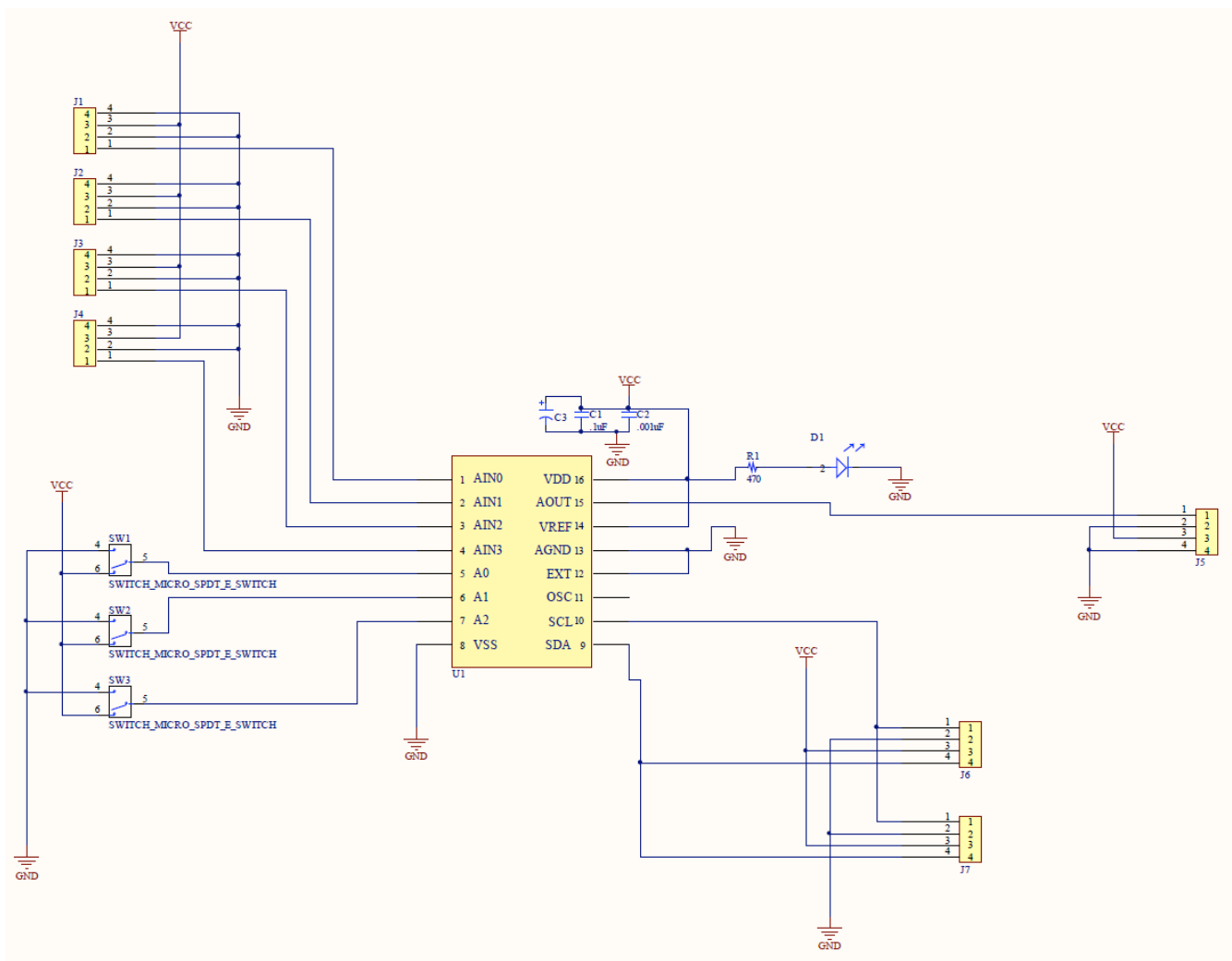


Figure 2 Schematic of the MK-34765

The board dimensions are shown in Figure 3.

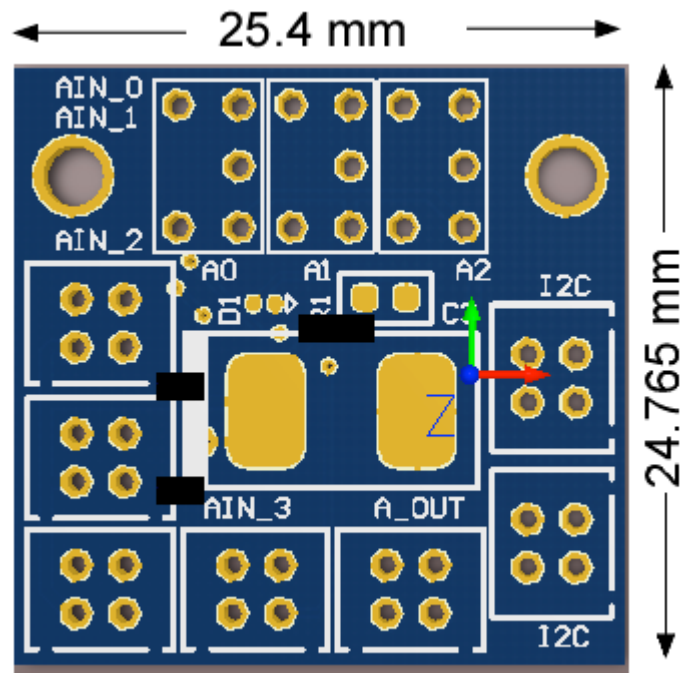


Figure 3 MK-34765 Board Dimensions

The connections to the device are shown in Figure XXXX. The pin outs for the various 4-pin connectors are shown in Figure XXXXX.

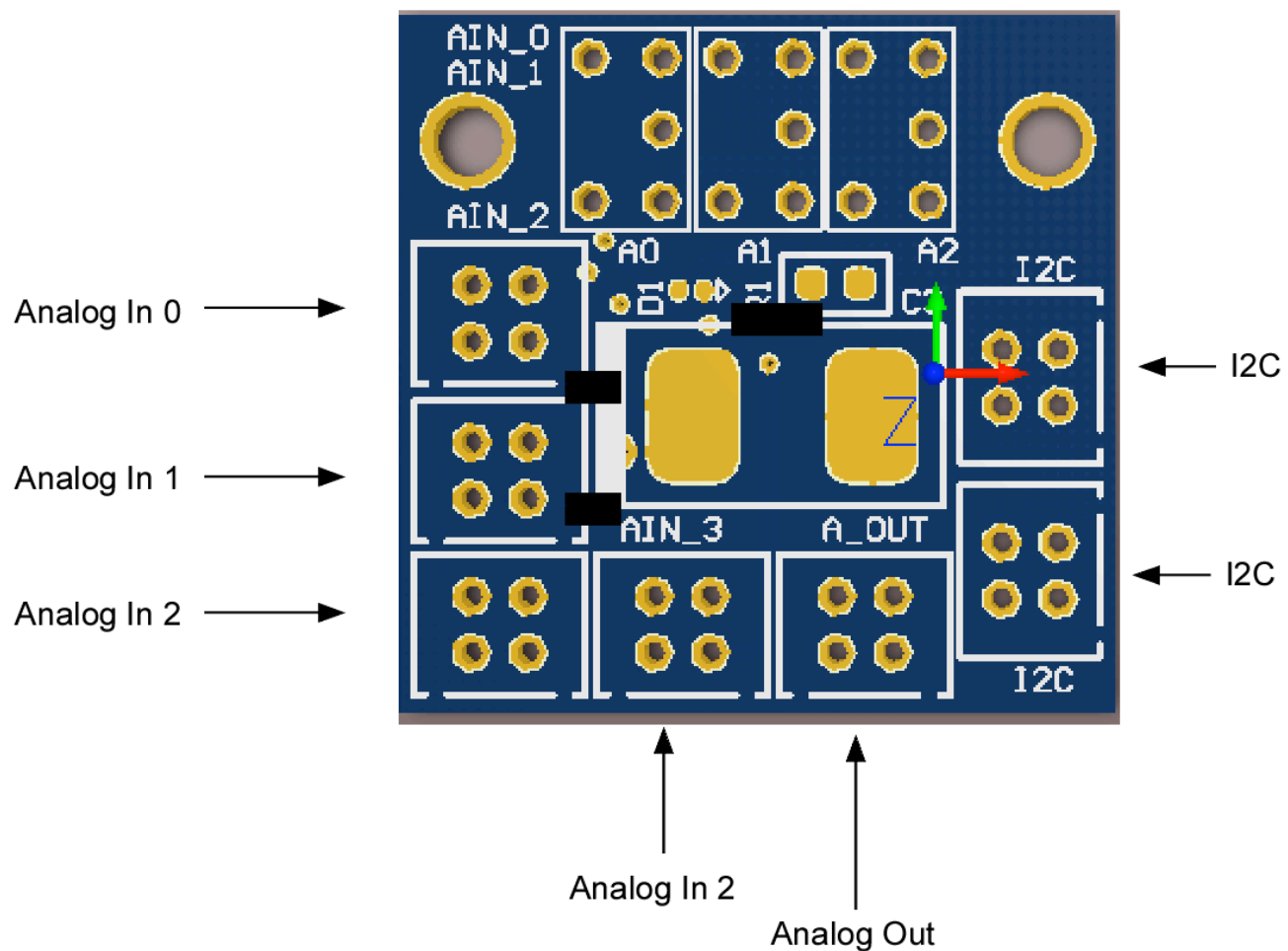


Figure 4 MK-34765 ADC/DAC and I2C Connections and Address Switches

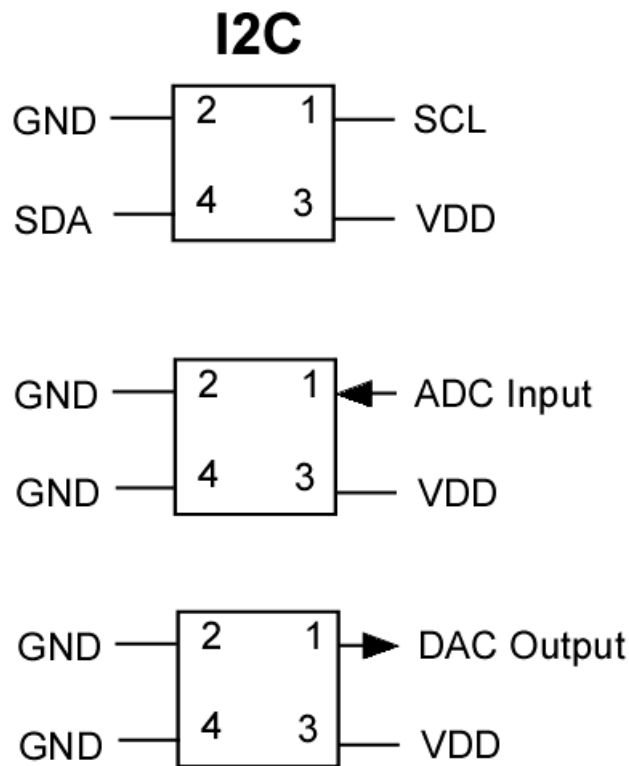


Figure 5 MK-34765 Connectors

3 Software Tools for the MK-34765

All the Java and C Programs described below have been developed by IONOTRONICS and are available as Open Source through the IONOTRONICS WEB Site.

3.1 Java PyroRaptor Application

The Java PyroRaptor Graphical User Interface is a Java application developed by IONOTRONICS for the PyroRaptor USB/I2C/SPI/GPIO Bridge device (MK-11009). It also supports the MK-34765 4-channel ADC/DAC I2C device.

Figure 6 shows the result of scanning the I2C bus with three MK-34765 devices hooked up in series to the I2C bus and the PyroRaptor USB/I2C as the I2C Master. Each device is set to a different address using the convenient switches on the MK-34765 devices. It also shows the reading of the ADC channel 0 on the device with Address 0x4e.

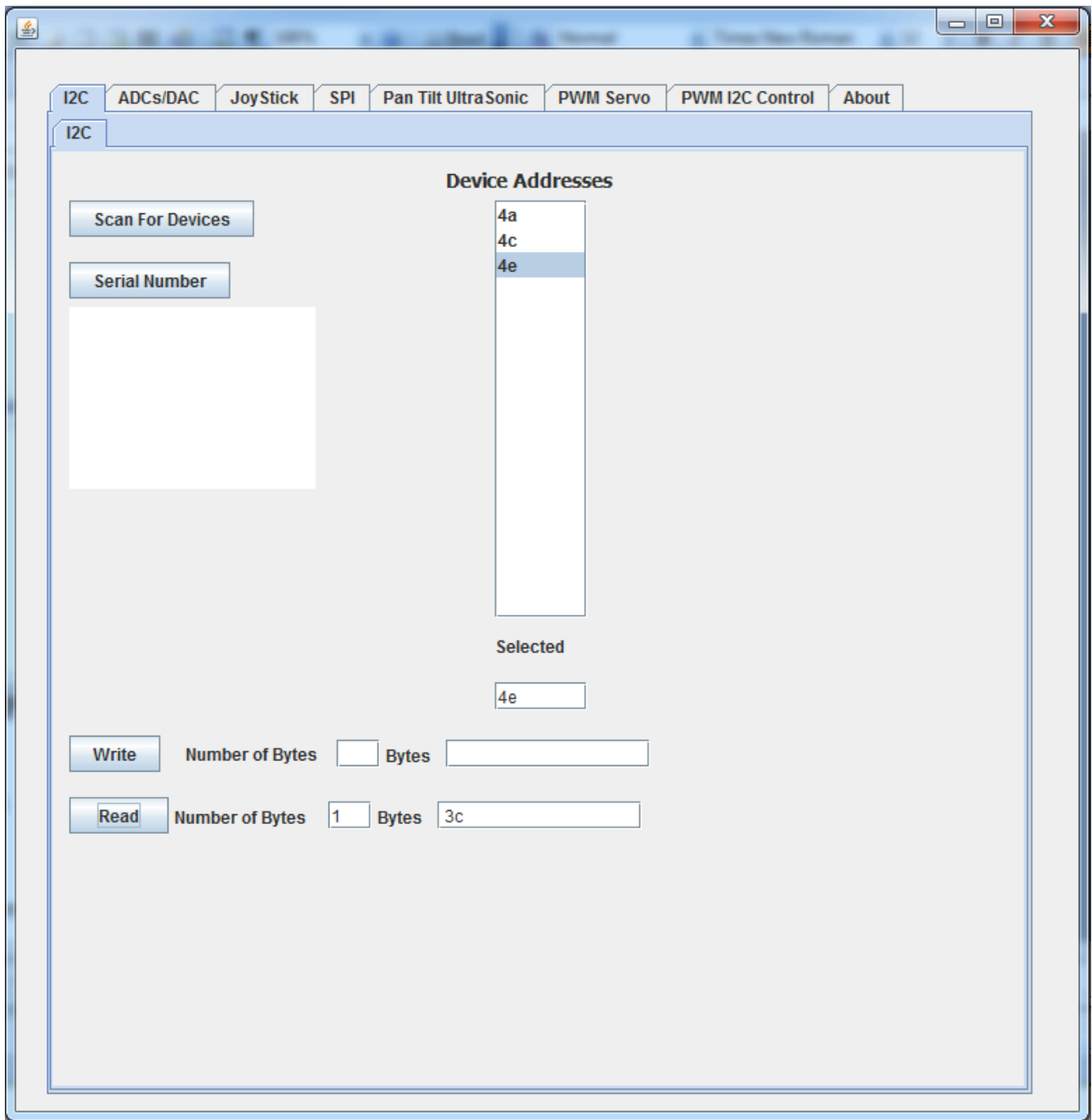


Figure 6 Java Pyraptor Application I2C Scan Showing Three MK-34765 Devices at Different I2C Address

Additionally the Java Pyraptor Application includes a Tab that measures and simultaneously shows the measured voltage on all 4 analog channels. The DAC output can also be set. Figure 7 shows the simultaneous measurement of 3 analog accelerometer axis (MK-56209).



Figure 7 4-Channel ADC Single Channel DAC TAB in the Pyroraptor Java Application for the MK-34765 Device

3.2 Java TCP/IP Robot Controller

The Java Wireless TCP/IP Robot Controller, See Figure 8, developed by IONOTRONICS supports the MK-34765 through a number of Tabs in the Graphical User Interface. Using the Java Native Interface (JNI) the application interfaces with a the MK-34765 4-Channel ADC's. The TAB for the Wireless TCP/IP control of a Rover is shown in Figure 9. In this case we provide the I2C address of a MK-34765 device on the I2C bus (interfaced using the Pyroraptor USB/I2C Bridge). We connect a 3-Axis Industrial Strength Joystick with a Fire Button the MK-34765 device so we can read the X,Y, and Z Joystick positions. We also read the fire button. We can control the Rover using the Joystick (Twist to Tank, go Forward and Backwards etc). The Java applications read the Joystick values using the MK-34765 and sends commands via the Wireless TCP/IP link to the Rover. Visit the IONOTRONICS WEB Site for Video demonstrations.

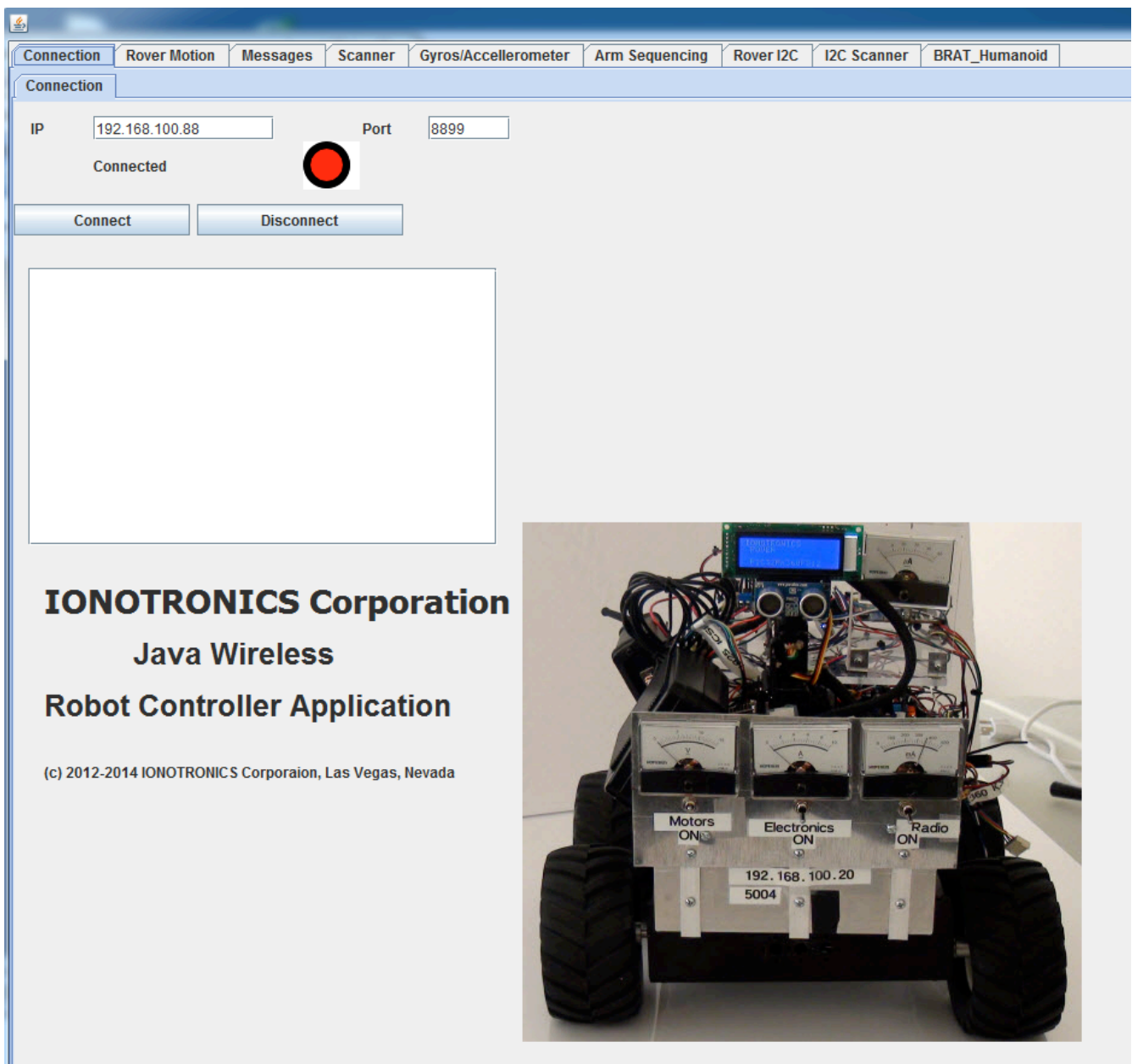


Figure 8 IONOTRONICS Java Application for Wireless TCP/IP Robot Control

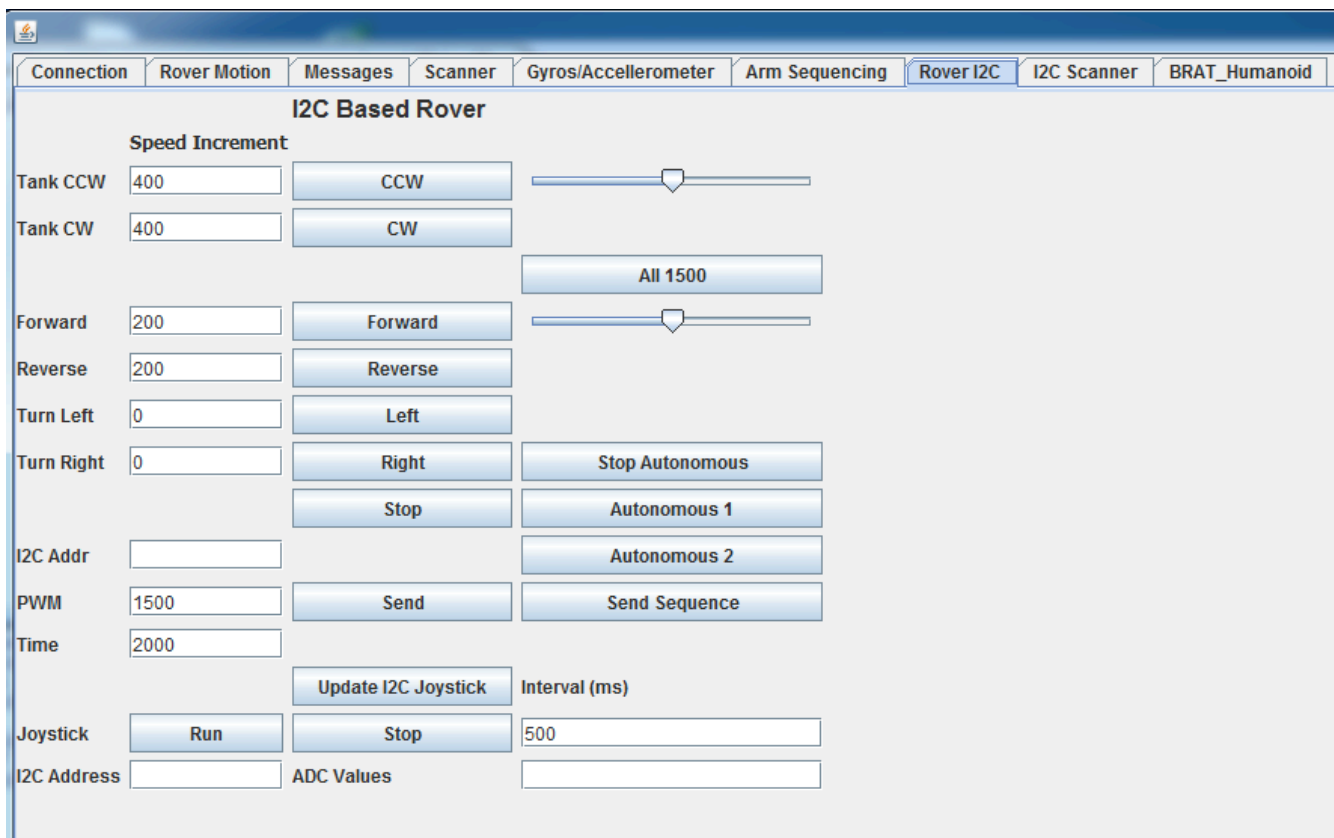


Figure 9 The TAB for Controlling the Rober with a Joystick Connected to the MK-34765 4 Channel ADC.

3.3 C Programs Using the C API for USB/I2C Bridge for the MK-34765

IONOTRONICS also offers a C program written with Microsoft Visual C++ and using the Diolan C API that demonstrates robust C Applications for interfacing and using the MK-34765.

For example, we can connect potentiometers to the ADC channels and a Meter (50 uAmp via 100 KOhm resistor to the DAC) to the MK-34765. See Figure 10. Using the Pyraptor as the I2C master we can write C programs to read the ADC values (potentiometer positions) and output them to the meter via the DAC.

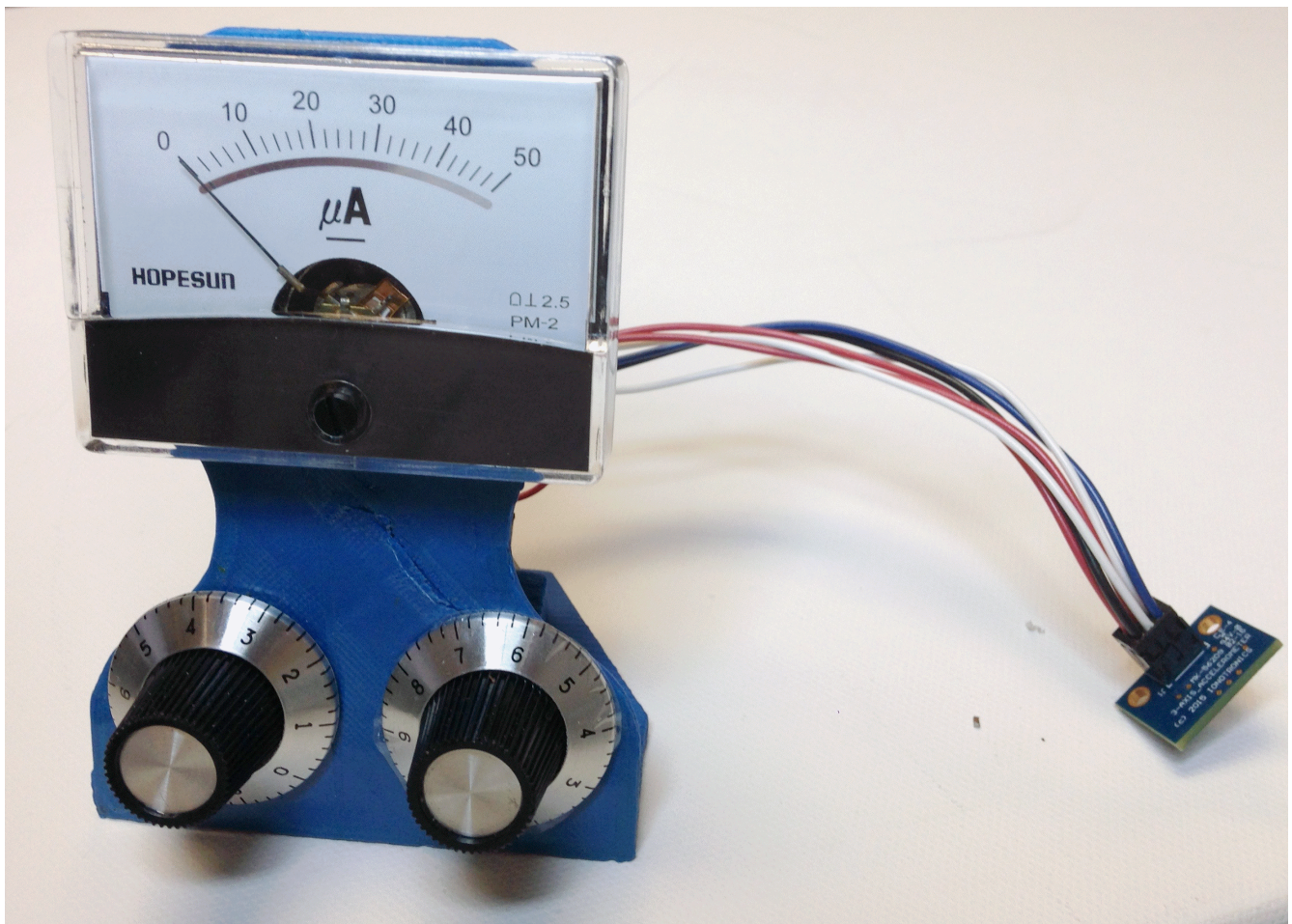


Figure 10 Potentiometers and Meters Interfaced to the MK-34765

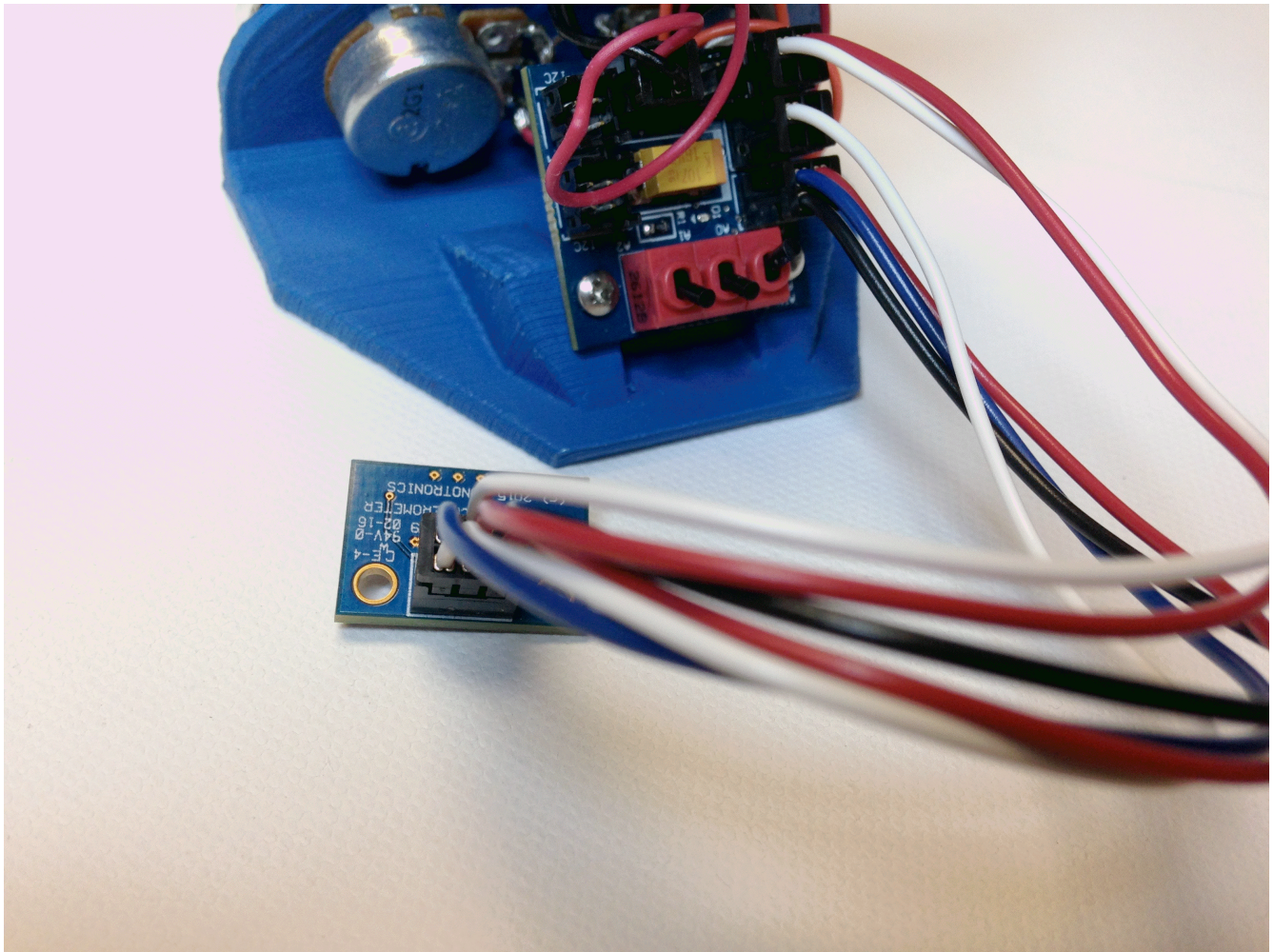


Figure 11 Rear View of MK-34765 Potentiometer/Meter

4 Hirose DF11 Series Connectors

Figure 11 shows a 12 pin Hirose DF11 Series connector. This is useful when building cabling systems. Note pin 1 marker and numbering scheme.

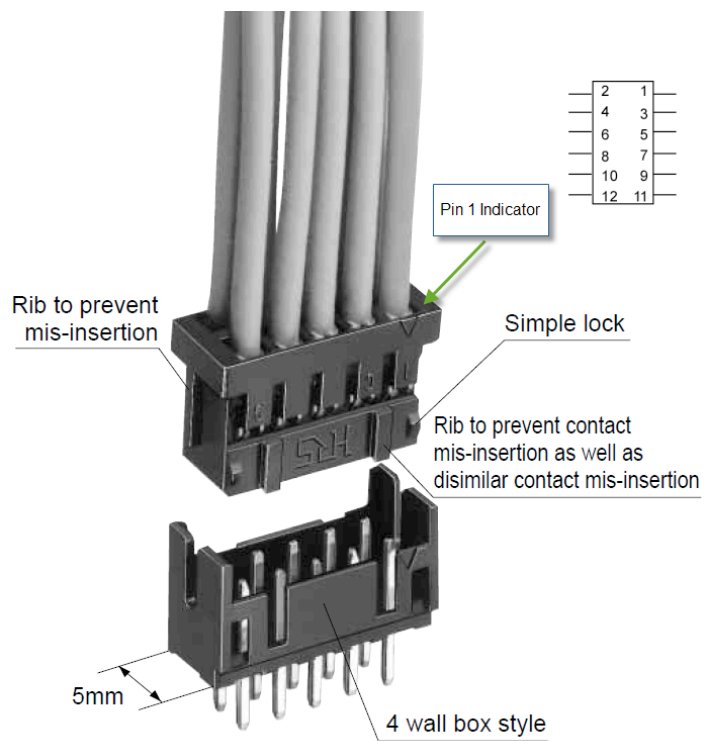


Figure 12 Guide to the Hirose DF11 series connector

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