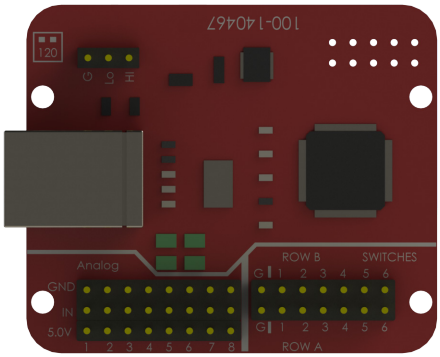
USB+CAN-Bus INTERFACE CARD (SAE J1939)

The USB+CAN-Bus Interface card provides users with the ability to rapidly build their own custom USB Joystick controller and or SAE J1939 joystick controller. This interface can handle up to eight analog inputs and 36 buttons. Simultaneously, Along with the USB pre-defined mapping any of the SAE J1939 CAN-Bus messages on pages 4 and 5 can be assigned to the inputs using the CTI-USB Initialization Editor software which is provide. The small profile allows for the USB / CAN-Bus controller card to be integrated within most control units. Also a one to one expansion board is available for extremely easy wiring and component replacements.

100-140467-01 USB+CAN-Bus Interface Card

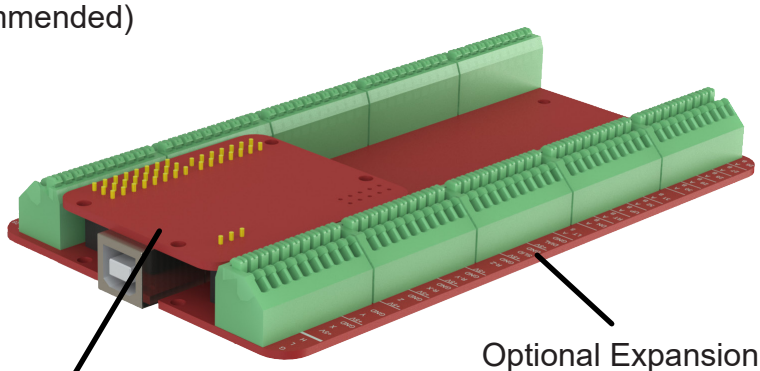


FEATURES

- 8 Analog Inputs with 12 Bit Resolution
- 32 Buttons Inputs + 4 Way Hat Switch (36 in all)
- Analog Inputs Filtering
- Powered from a USB port or from a 5volt USB Adaptor.
- Supported by Windows
- Full-Speed 12Mb USB connection 250 position reports per second
- Standard 0.10” Header Pins
- Dimensions (2.0”×1.70”)

USB / CAN-Bus Expansion Board (100-140467-E1)

Our optional expansion board is designed to allow the USB+CAN-Bus controller card (100-140467-01) to simply plug into it removing the need for a diode matrix. 100 spring loaded terminal slots speed up wiring and eliminate the need for soldiering connectors. (20-26 AWG wire recommended)



Optional Expansion Board
100-140467-E1

USB+CAN-Bus controller card
(100-140467-01)

1.800.621.8754
1.503.620.2285
Fax: 1.503.620.8580
sales@cyber-tech.net

www.cyber-tech.net

Established 1982

Switching

Full 6x6 Matrix Connection (Fig 1)

Connect up to 36 switches by using the Row A and Row B pins on the controller card
Add diodes if there will be more then 3 contacts activated simultaneously.
First 32 buttons are standard buttons.
Last 4 contacts input make up a 4 way hat switch (coolie).
If diodes are required 1N4148 or 1N4004 are recommended.

Simple 12 Switch Connection (Fig 2)

You can use up to 12 switches by directly connecting to one of the pins in Row A and Row B and terminating to any of the G / GND pins. No diodes are required.

Analog

Connect up to 8 potentiometers and/or Hall Sensors by using the 3-Pin analog Inputs. **(Fig3)**
Uses standard Windows gaming device calibration.
Analog range can be fine tuned with the CTI-USB Initialization Editor.exe and DIView.exe software

KEY POINTS

36 Buttons, (6x6 Matrix Wiring)
12 Buttons, (Simple Wiring)
8 Analog Inputs
Uses Standard USB Port

Powering the Interface Card

Plug into a regulated USB port (500mA min) using a Standard USB Type A to B cable

Note: If using this controller as a standalone CAN-Bus interface it must still be powered through its USB Type B port using a 5volt regulated USB power supply.

An optional 5volt regulator can be installed per request.

36 Switch, 6x6 Matrix Wiring and USB Mapping

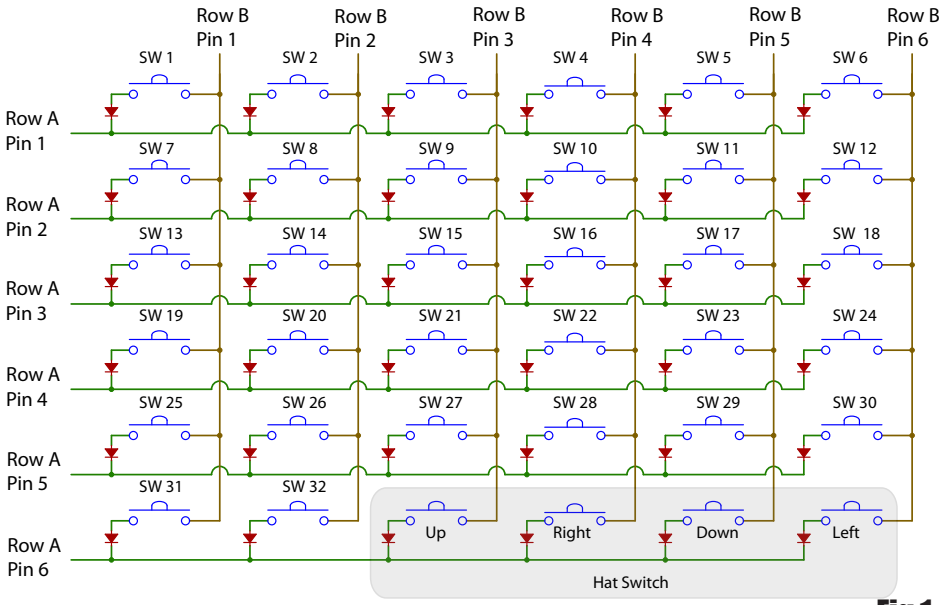


Fig 1

12 Switch, Simple Wiring and USB Mapping

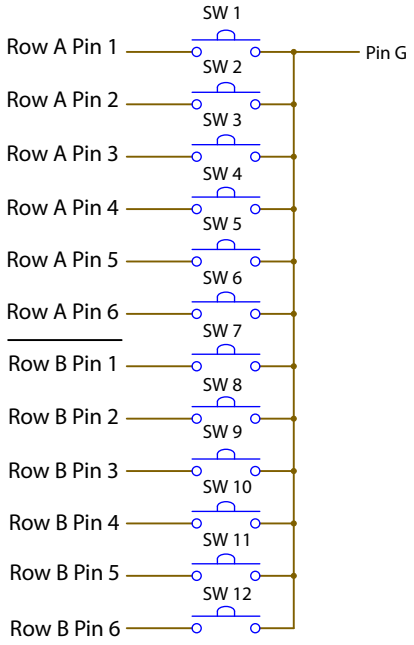


Fig 2

Analog Wiring and USB Mapping

Pins				USB Channel
1	Gnd	In	5.0V	X
2	Gnd	In	5.0V	Y
3	Gnd	In	5.0V	Z
4	Gnd	In	5.0V	X Rotate
5	Gnd	In	5.0V	Y Rotate
6	Gnd	In	5.0V	Z Rotate
7	Gnd	In	5.0V	Slider
8	Gnd	In	5.0V	Dial

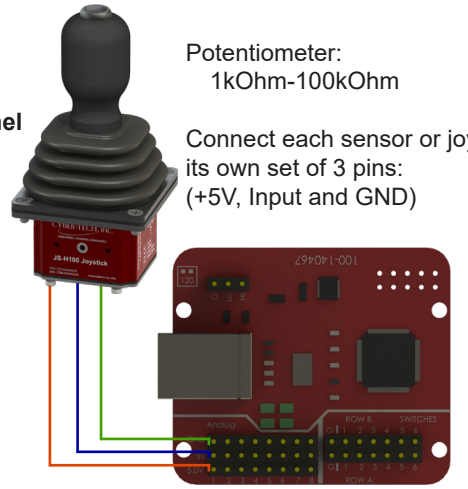
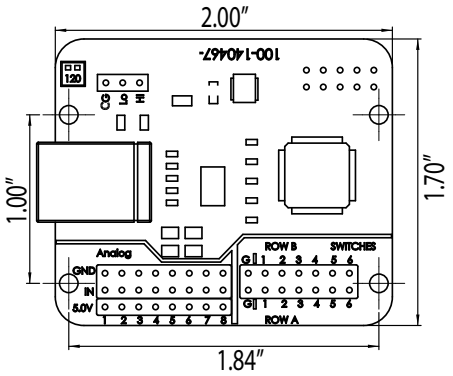


Fig 3

Potentiometer:
1kOhm-100kOhm

Connect each sensor or joystick to its own set of 3 pins:
(+5V, Input and GND)

General Dimension



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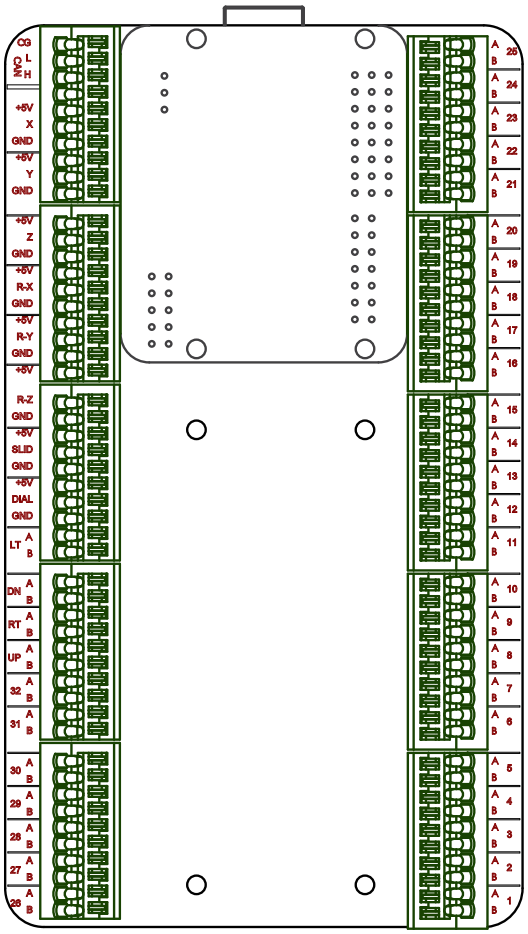
Established 1982

KEY POINTS

Spring Loaded Terminals
No Soldering or Connectors Needed
Easy Component Replacement

USB / CAN-Bus Expansion Board (100-140467-E1)
(Shown with 100-140467-01)



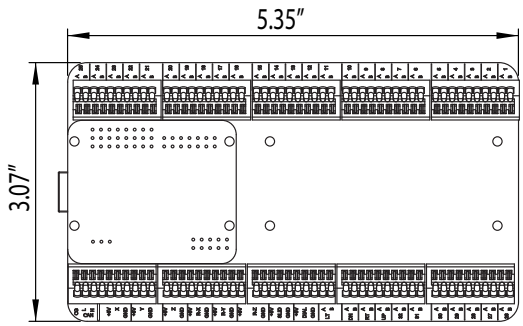
All 36 button inputs have their own terminals for Ground and the Signal inputs.

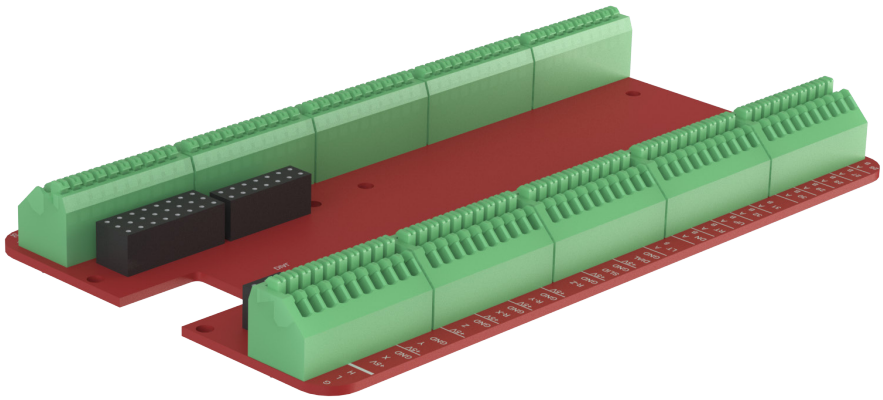
All 8 analog inputs have their own +5 Volt, Ground and Signal input terminals.

CAN terminals include High, Low and Ground.

(An optional 120 Ohm resistor can be added to the Expansion Board if required)

General Dimension





USB / CAN-Bus Expansion Board (100-140467-E1)

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The below SAE J1939 CAN-Bus messages can be assigned to any of the controller cards inputs using CTI-USB Initialization Editor Utility

Joystick 1 Messages

J1939 Description	SPN	PGN
Button 1 Pressed Status	2685	64982
Button 2 Pressed Status	2686	64982
Button 3 Pressed Status	2687	64982
Button 4 Pressed Status	2688	64982
Button 5 Pressed Status	2689	64982
Button 6 Pressed Status	2690	64982
Button 7 Pressed Status	2691	64982
Button 8 Pressed Status	2692	64982
Button 9 Pressed Status	2693	64982
Button 10 Pressed Status	2694	64982
Button 11 Pressed Status	2695	64982
Button 12 Pressed Status	2696	64982
X-Axis Position	2660	64982
X-Axis Lever Right Positive Position Status	2665	64982
X-Axis Lever Left Negative Position Status	2670	64982
X-Axis Neutral Position Status	2675	64982
X-Axis Detent Position Status	2680	64982
Y-Axis Position	2661	64982
Y-Axis Lever Forward Positive Position Status	2666	64982
Y-Axis Lever Back Negative Position Status	2671	64982
Y-Axis Neutral Position Status	2676	64982
Y-Axis Detent Position Status	2681	64982

Extended Joystick Messages

J1939 Description	SPN	PGN
Grip X-Axis Position	2662	64983
Grip X-Axis Lever Right Positive Position Status	2667	64983
Grip X-Axis Lever Left Negative Position Status	2672	64983
Grip X-Axis Neutral Position Status	2677	64983
Grip X-Axis Detent Position Status	2680	64982
Grip Y-Axis Position	2663	64983
Grip Y-Axis Lever Forward Positive Position Status	2668	64983
Grip Y-Axis Lever Back Negative Position Status	2673	64983
Grip Y-Axis Neutral Position Status	2678	64983
Grip Y-Axis Detent Position Status	2683	64983
Theta-Axis Position	2664	64983
Theta-Axis Clockwise Positive Position Status	2669	64983
Theta-Axis Counter Clockwise Negative Position Status	2674	64983
Theta-Axis Neutral Position Status	2679	64983
Theta-Axis Detent Position Status	2684	64983

Joystick 2 Messages

J1939 Description	SPN	PGN
Button 1 Pressed Status	2722	64984
Button 2 Pressed Status	2723	64984
Button 3 Pressed Status	2724	64984
Button 4 Pressed Status	2725	64984
Button 5 Pressed Status	2726	64984
Button 6 Pressed Status	2727	64984
Button 7 Pressed Status	2728	64984
Button 8 Pressed Status	2729	64984
Button 9 Pressed Status	2730	64984
Button 10 Pressed Status	2731	64984
Button 11 Pressed Status	2732	64984
Button 12 Pressed Status	2733	64984
X-Axis Position	2697	64984
X-Axis Lever Right Positive Position Status	2702	64984
X-Axis Lever Left Negative Position Status	2707	64984
X-Axis Neutral Position Status	2712	64984
X-Axis Detent Position Status	2717	64984
Y-Axis Position	2698	64984
Y-Axis Lever Forward Positive Position Status	2703	64984
Y-Axis Lever Back Negative Position Status	2708	64984
Y-Axis Neutral Position Status	2713	64984
Y-Axis Detent Position Status	2718	64984

Extended Joystick Messages

J1939 Description	SPN	PGN
Grip X-Axis Position	2699	64985
Grip X-Axis Lever Right Positive Position Status	2704	64985
Grip X-Axis Lever Left Negative Position Status	2707	64985
Grip X-Axis Neutral Position Status	2712	64985
Grip X-Axis Detent Position Status	2719	64985
Grip Y-Axis Position	2700	64985
Grip Y-Axis Lever Forward Positive Position Status	2705	64985
Grip Y-Axis Lever Back Negative Position Status	2710	64985
Grip Y-Axis Neutral Position Status	2715	64985
Grip Y-Axis Detent Position Status	2720	64985
Theta-Axis Position	2701	64985
Theta-Axis Clockwise Positive Position Status	2706	64985
Theta-Axis Counter Clockwise Negative Position Status	2711	64985
Theta-Axis Neutral Position Status	2716	64985
Theta-Axis Detent Position Status	2719	64985

If other SAE J1939 messages are needed that are not included here please call 1-800-621-8754 or email us sales@cyber-tech.net for a custom solution.

Joystick 3 Messages

J1939 Description	SPN	PGN
Button 1 Pressed Status	2759	64986
Button 2 Pressed Status	2760	64986
Button 3 Pressed Status	2761	64986
Button 4 Pressed Status	2762	64986
Button 5 Pressed Status	2763	64986
Button 6 Pressed Status	2764	64986
Button 7 Pressed Status	2765	64986
Button 8 Pressed Status	2766	64986
Button 9 Pressed Status	2767	64986
Button 10 Pressed Status	2768	64986
Button 11 Pressed Status	2769	64986
Button 12 Pressed Status	2770	64986
X-Axis Position	2734	64986
X-Axis Lever Right Positive Position Status	2739	64986
X-Axis Lever Left Negative Position Status	2746	64987
X-Axis Neutral Position Status	2749	64986
X-Axis Detent Position Status	2754	64986
Y-Axis Position	2735	64986
Y-Axis Lever Forward Positive Position Status	2742	64987
Y-Axis Lever Back Negative Position Status	2745	64986
Y-Axis Neutral Position Status	2750	64986
Y-Axis Detent Position Status	2755	64986

Extended Joystick Messages

J1939 Description	SPN	PGN
Grip X-Axis Position	2736	64987
Grip X-Axis Lever Right Positive Position Status	2741	64987
Grip X-Axis Lever Left Negative Position Status	2746	64987
Grip X-Axis Neutral Position Status	2751	64987
Grip X-Axis Detent Position Status	2756	64987
Grip Y-Axis Position	2737	64987
Grip Y-Axis Lever Forward Positive Position Status	2705	64985
Grip Y-Axis Lever Back Negative Position Status	2747	64987
Grip Y-Axis Neutral Position Status	2752	64987
Grip Y-Axis Detent Position Status	2757	64987
Theta-Axis Position	2738	64987
Theta-Axis Clockwise Positive Position Status	2743	64987
Theta-Axis Counter Clockwise Negative Position Status	2748	64987
Theta-Axis Neutral Position Status	2753	64987
Theta-Axis Detent Position Status	2758	64987

Joystick Button Status
00 Button Not Pressed
01 Button Pressed
10 Error Indicator
11 Not Available

Joystick Positive Position Status
00 Not on Positive Side of Neutral
01 On Positive Side of Neutral
10 Error Indicator
11 Not Available

Joystick Negative Position Status
00 Not on Negative Side of Neutral
01 On Negative Side of Neutral
10 Error Indicator
11 Not Available

Joystick Neutral Position Status
00 Not on Neutral Side of Neutral
01 On Neutral Side of Neutral
10 Error Indicator
11 Not Available

Joystick Axis Position Status

Data Length:	10 Bits
Resolution:	0.1%/bit, 0 offset
Data Range:	0 to 102%
Operational Range:	0.0 to 100.0%
Type:	Measured

Joystick Axis Position Status

Data Length:	2 Bits
Resolution:	4 states/2 bit, 0 offset
Data Range:	0 to 3
Type:	Measured

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