

FEATURES

Compact Form Factor
USB Control Plug And Play
Expandable Through I2C Bus

APPLICATIONS

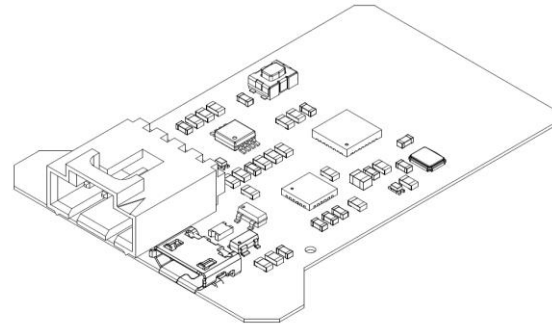
Test Fixtures
Industrial Automation

DESCRIPTION

This USB Controller Board is used for controlling all boards connected to this board. Other IOBrick™ boards such as the Digi-Selector, High power relay board and others can be strung together to this control board for independent control.

The control board is the interface between the PC and all the boards connected to the I2C bus. Commands are sent over USB and decoded on the controller board before being sent to the corresponding board in the I2C string. This allows the boards last 2 or 3 I2C address bits to be set on

Figure 1: USB Controller Board



add-on boards using dip switches and then controlling it with a simple command with the number address such as "HPR3 XX". The HPR prefix identifies the High Power Relay board and the 3 identifies that the command is for that board with the bits set to '3'. This control setup simplifies the fixture setup and operation by not requiring detailed setup of the rest of the I2C protocol to control all boards on the I2C bus string.

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REVISION HISTORY

1/8/2022 – Revision 1.0: Initial Release

Setting up the Board

Connect the Selector relay board to the main controller board using an I2C Jumper cable and to the Selector board 'IN' labeled connector. The cable supplies power and the I2C bus to the board. The selector board has 2 I2C connectors with labeled as 'IN' and 'OUT' which signifies I2C bus direction (since the bus is buffered on some boards). In the final installation, use as short I2C cables as possible.

NOTE: Board Startup Behavior

During board startup because of the way that the controller on the board is set up, selection 7 on both banks of the Digi-Selector board is enabled for a couple hundred milliseconds while the board is being initialized. After initialization, the selection set it to 0 (none enabled). Caution should be taken to verify that the specific use case would not be affected by selection 7 being enable briefly during the startup initialization process.

```
Firmware:v1.4  
BOARD ID: 4.93->Controller Board  
scanning...  
Digital Selector Board Dected! SS2 enabled  
done  
  
Initialize Digital Selector Board SS2  
Initialize Complete!
```

Note: you may need to restart the control board to detect any new devices if the address switches are changed while the board stack is powered on.

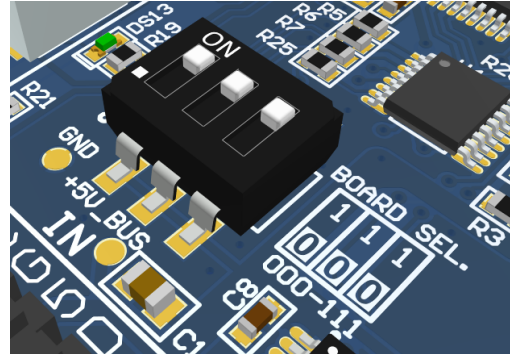


Figure 2: Address set switches

Controlling the Board

USB Board Control & Baud rate

Commands can be sent to the USB Controller board using a serial terminal such as Tera Term or any other preferred serial terminal.

Baud rate: 115200

Enable “Local Echo” to be able to see the commands while typing if keys are not showing up.

If you are not getting any response back from the controller board when sending a command, modify the new line settings in the serial terminal you are using.

New-Line:

Transmit: CR +CF

Controller Commands

HELP

Display basic help instruction and commands for connected device

SEARCH

Display search result of i2c devices connected

RESET

Self reset and reset all external modules.

ENABLE

Power ON for all extend modules

DISABLE

Power OFF for all extend modules

CFSAVE

Save changes configurations to memory, configuration is automatically at startup/reset

CFRESET

Factory reset all configuration value.

Multi-Purpose Relay Board Commands

SR

SR <HHHH>: Set Relay

Where:

HHHH are Hex values range from 0000-FFFF, each Hex corresponds to bank 1-4

Example:

- **SR 0F0F** : Turn on all relay for bank 2 and 4, bank 1 and 3 turn off.
- **SR F030** : Turn on all relays for bank 1, turn on relay 1 and 2 for bank 3, all other off.

SR +<#,#,#,...> : Set Relay, turn on specific relay, set all other off.

Where:

is the relay number between 1 and 16. All other relay turns off.

Example:

- **SR +1,5,13,16** This will turn on relay 1,5,13 and 16. All other turns off.

Digital Selector Board Commands

SS

SS<#> <BV> : Set Selector Value

Where:

is the selector board id range from 1-7.

*note: If only 1 selector detect **SS** can be use without id.

Example : **SS 12** instead of **SS1 12**

B is the bank value range from 1-2

V is the select location range from 1-7

Example: *Depend on mode

On Mode 1 : Dual Mode (Default)

- **SS1 12** : on bank 1 switch to position 2.
- **SS1 24** : on bank 2 switch to position 4.

On Mode 2: Single Mode

- **SS1 12** : on bank 1 switch to position 2, turn off bank 2. (position 2)
- **SS1 24** : on bank 2 switch to position 4, turn off bank 1. (position 12)

On Mod 3 : Mirror mode

- **SS1 12** : set both bank 1 and 2 to position 2
- **SS2 23** : set both bank 1 and 2 to position 3

SS MODE

SS<#> MODE<M>:

Where :

M:Mode value 1-3

1: Dual Mode, able to control relay bank 1 and bank 2 at the same time

2: Single Mode, only 1 relay from each bank can turn on

3: Mirror Mode, two relay on from each bank, mirror other bank

Example:

- **SS1 MODE2** : Set selector board 1 to mode 2
- **SS3 MODE3** : Set selector board 3 to mode 3

High Power Relay Board Commands

HPR

HPR<#> <HH> : Set High Power Relay

Where:

H(1):Hex Value 0-F. Control Relay 1-4

H(2):Hex Value 0-F. Control Relay 5-8

HPR<#> +#, -#, +#, ...

+/-: turn on(+) or off(-) relays.

#: relay number between 1 and 8.

Use ',' to separate relays, support up to 10.

Digital Potentiometers Board Commands

Description: 4 Digital Potentiometer(100- 20K Ohm, Scale down is possible with parallel resistor)

SP

SP VHHH : Set Single potentiometers

SPA

SPA HHH : Set All 4 potentiometers

V:Select control potentiometer range from 1-4

HHH: Hex value range from 000-3FF *1023 steps

Mechanical Dimension

