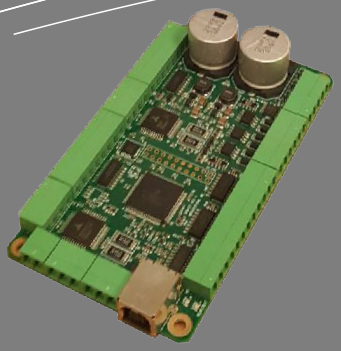
BLC-4TC 4 Axis Pulse/Dir Controller



CUSTOM CONTROLLERS

Define Axis Count
Define Motor Types
Define Feedback Types
Define Analog & Digital I/O
Define Board Shape
Define Connectors / Cables
Define LED Lights/Locations
Further Customization Available

FLEXIBLE HARDWARE

Removable Connectors
Configurable Digital/Analog I/O
Multiple Encoder Types
High Speed Capture
Integrated Amplifier Options
Din-Rail Ready

POWERFUL SOFTWARE

Inspired by MIT's "Scratch"
Simple Drag, Drop, & Edit
Create & Save Custom Blocks
Up to 16 Concurrent Threads
Parameter Test & I/O Viewer
Integrated HMI Console Builder
Customizable Test Scopes

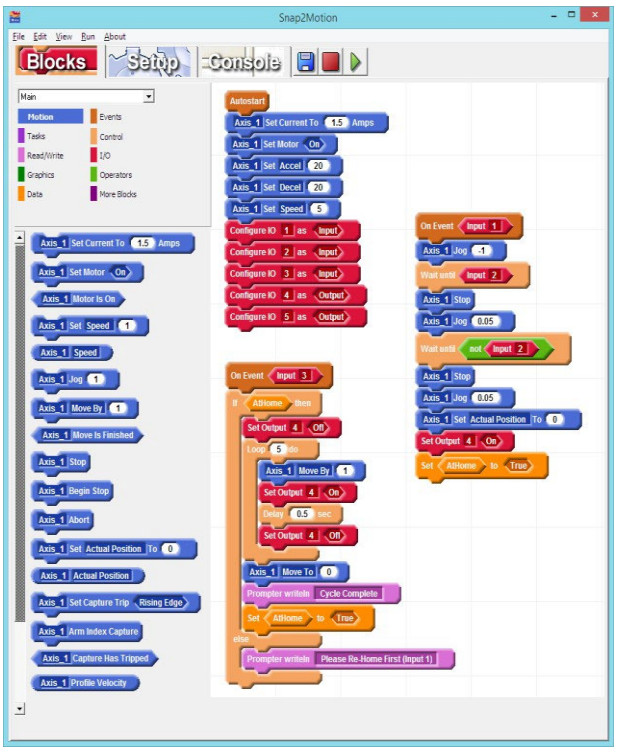
KEY FEATURES:

- 4-Axis Pulse/Dir or Quadrature Controller
- 12-24Vdc Input
- Control (4) Digital Servo or External Stepper Drives
- (16) Digital Inputs (24V PNP or NPN)
- (12) Digital Outputs (24V PNP)
- (6) 16-bit Analog Inputs
- (2) 12-bit Analog Output
- Flexible Encoder Inputs (Single, Quad, Serial, etc.)
- USB for Snap2Motion Programming
- (4) RS-232 Ports for Remote Connections
- DIN Rail Mountable
- Removable Screw Terminal Plugs

The BLC-2TC is a 4 Axis Modular Controller for controlling 2 Digital Servo Drives or 2 External Stepper Drives.

The BLC family of controllers were designed to be a Cost Effective OEM solution for Motion & Machine Control. Each Module has 2x2-axes that are internally coordinated; but with the dual RS- 232 serial ports, multiple units can be daisy chained together for higher axis count applications. All axes are detected and their resources are available during programming without needing to connect to each unit individually.

ModuSystems Snap2Motion™ software was inspired by MIT Media Labs "Scratch" software that was developed to teach the fundamentals and structure of programming



Learn More at: www.ModuSystems.com

Specifications

Controller Power

Description	Value	Units
Logic Input Voltage Range	12-24	volts DC
Logic Input Power, no outputs active, no 5V load, single module	3	watts
5V Out	750	milliamps

Motion System

Property	Value
Microcontroller	Arm Cortex
Sample Rates	Configurable from 1 kHz to 8 kHz
Native Motion Capabilities	Concurrent Motion Coordinated Vector Motion
Application Motion Capabilities	Electronic Gearing Electronic Camming Encoder-Replaces-Time PVT Kinematics Conveyor Tracking Arbitrary Closed Form Equations
Position Range	32 bit
Maximum Encoder Count Rate post quadrature	2 MHz
Maximum Step Rate	2 MHz
Hardware Position Capture	Accurate to an individual count

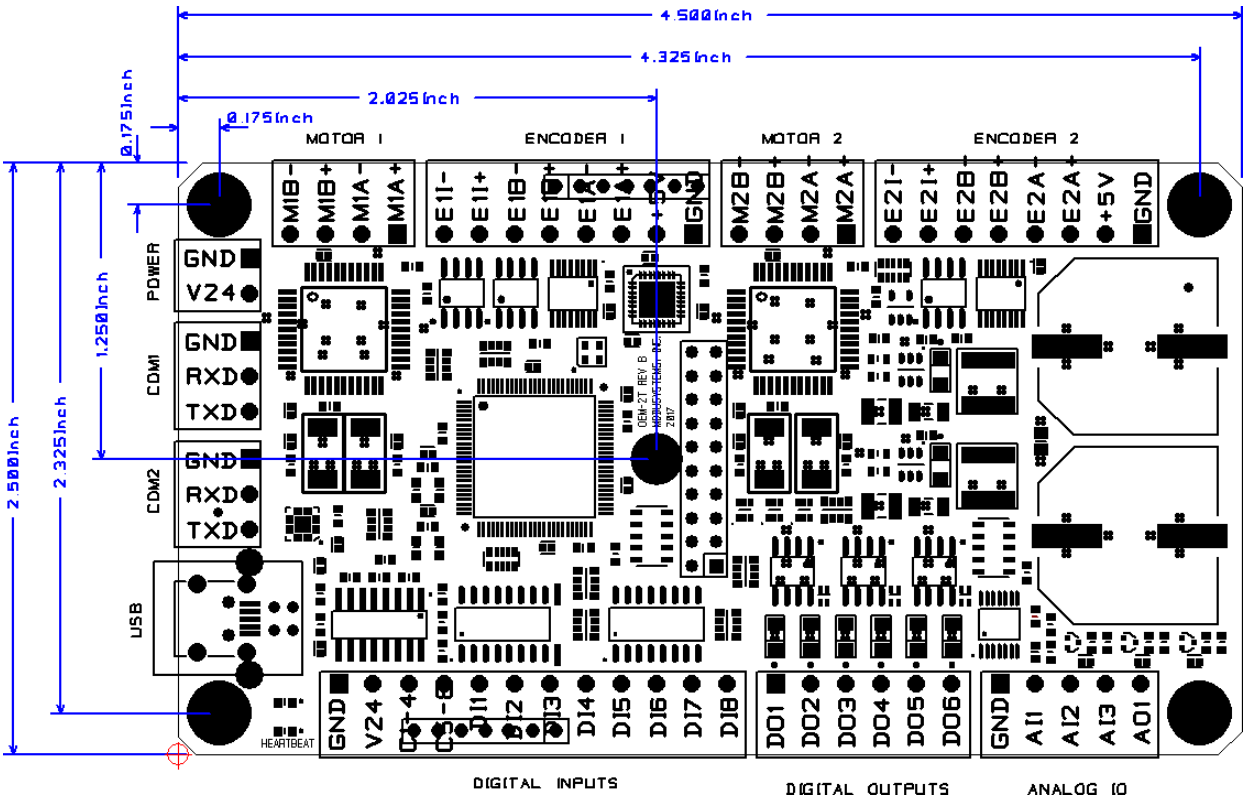
Communication Ports

Description	Type	Connector
Programming Port	USB	USB Standard B
General Purpose Serial	2x RS232	3 pin 3.81 mm Euro Screw terminal

Inputs and Outputs

Resource	Number	Voltage	Description
Digital Inputs	16	5-24	Inputs can be configured as PNP or NPN in groups of 4
Digital Ouputs	12	5-24	Outputs are PNP and can source up to 2A per
Analog Inputs	6	0-20	0-20 volt measurement range. 16 bit resolution
Analog Output	2	0-5	12 bit resolution
Encoder Inputs RS422 Differential Receivers	12	5-24	A, B, and Index channels can be used for encoder input or general purpose inputs

Mechanical



Side Connectors & Indicators

Power Connector - Left Side 2 Position

Power can be connected to the BLC either from the 2-pin Connector on the Left Side of the Unit or on the first 2 pins of the 12-pin Digital Input Connector

Signal	Description
Gnd	Provides Gnd to snapped-together modules. May be used as a general purpose Gnd connection position
V24	12-24VDC Input - Provides Power for Motor & Logic Control

Serial Connectors - Left Side 3 Position Plugs

The serial connectors support RS-232 and can be used to connect to daisy chain additional BLC controllers. They can also be used to connect other peripheral RS-232 devices or receive ASCII commands from a PC or o

Signal	Description
Gnd	Common to all Gnd positions on controller this is used to provide a common Gnd to the serial device
Rx/+	RS232 receive signal should be connected to transmitter of serial device. When configured for RS485 this is the Data+ signal
Tx/-	RS232 transmit signal should be connected to receiver of serial device. When configured for RS485 this is the Data- signal.

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LED Indicators

LED	Description
Green Heartbeat	During normal operation this LED should blink at a rate between 1 Hz and several Hz reflecting the controller sample rate. A hesitation or disruption of the steady heartbeat pattern reflects a possible hardware or software issue. The first diagnostic question support will ask is “Is the Heartbeat LED blinking?”.
Green Application	This indicator is under application program control and has no intrinsic meaning. The Intermodule Slave program, loaded onto controllers that snap onto a left-most master controller, rapidly blink the Green Application LED several times during program startup when the controller is isolated. This pattern indicates that the controller is prepared to communicate to another module.

Top Connectors

Motor Connectors – 4 Position

Signal	Description
Mtr A+	Differential Output Pulse +
Mtr A-	Differential Output Pulse -
Mtr B+	Differential Output Dir +
Mtr B-	Differential Output Dir -

Encoder Connector – 8 Position

Signal	Description
Gnd	Used to power encoder
5V Out	Used to power encoder. If external drive is providing signals this signal might not be required
Enc A+	Encoder A+ channel if differential or A channel if single ended
Enc A-	Encoder A- channel if differential or disconnected if encoder is single ended. Internally pulled to 2V. Do not connect to Gnd
Enc B+	Encoder B+ channel if differential or B channel if single ended
Enc B-	Encoder B- channel if differential or disconnected if encoder is single ended. Internally pulled to 2V. Do not connect to Gnd
Enc I+	Encoder Index+ channel if differential or Index channel if single ended
Enc I-	Encoder Index- channel if differential or disconnected if encoder is single ended. Internally pulled to 2V. Do not connect to Gnd

Bottom Connectors

Inputs Connector – 12 Position

Signal	Description
Gnd	Same as Power Supply Gnd
V24	Same as Power Supply V24
C1-4	Input Common for inputs 1-4. This should be connected to Gnd if inputs switch to power and should be connected to V24 if inputs switch to Gnd.
C5-8	Input Common for inputs 5-8. This should be connected to Gnd if inputs switch to power and should be connected to V24 if inputs switch to Gnd.
DI1	Digital Input 1
DI2	Digital Input 2
DI3	Digital Input 3
DI4	Digital Input 4
DI5	Digital Input 5
DI6	Digital Input 6
DI7	Digital Input 7
DI8	Digital Input 8

Outputs Connector – 6 Position

Signal	Description
DO1	Digital Output 1 Sources Power
DO2	Digital Output 2 Sources Power
DO3	Digital Output 3 Sources Power
DO4	Digital Output 4 Sources Power
DO5	Digital Output 5 Sources Power
DO6	Digital Output 6 Sources Power

Analog Connector – 5 Position

Signal	Description
Gnd	Same as Power Supply Gnd
AI1	Analog Input 1
AI2	Analog Input 2
AI3	Analog Input 3
AO1	Analog Output 1