

ENCEXP 140206 User Guide

Updated 11/20/17

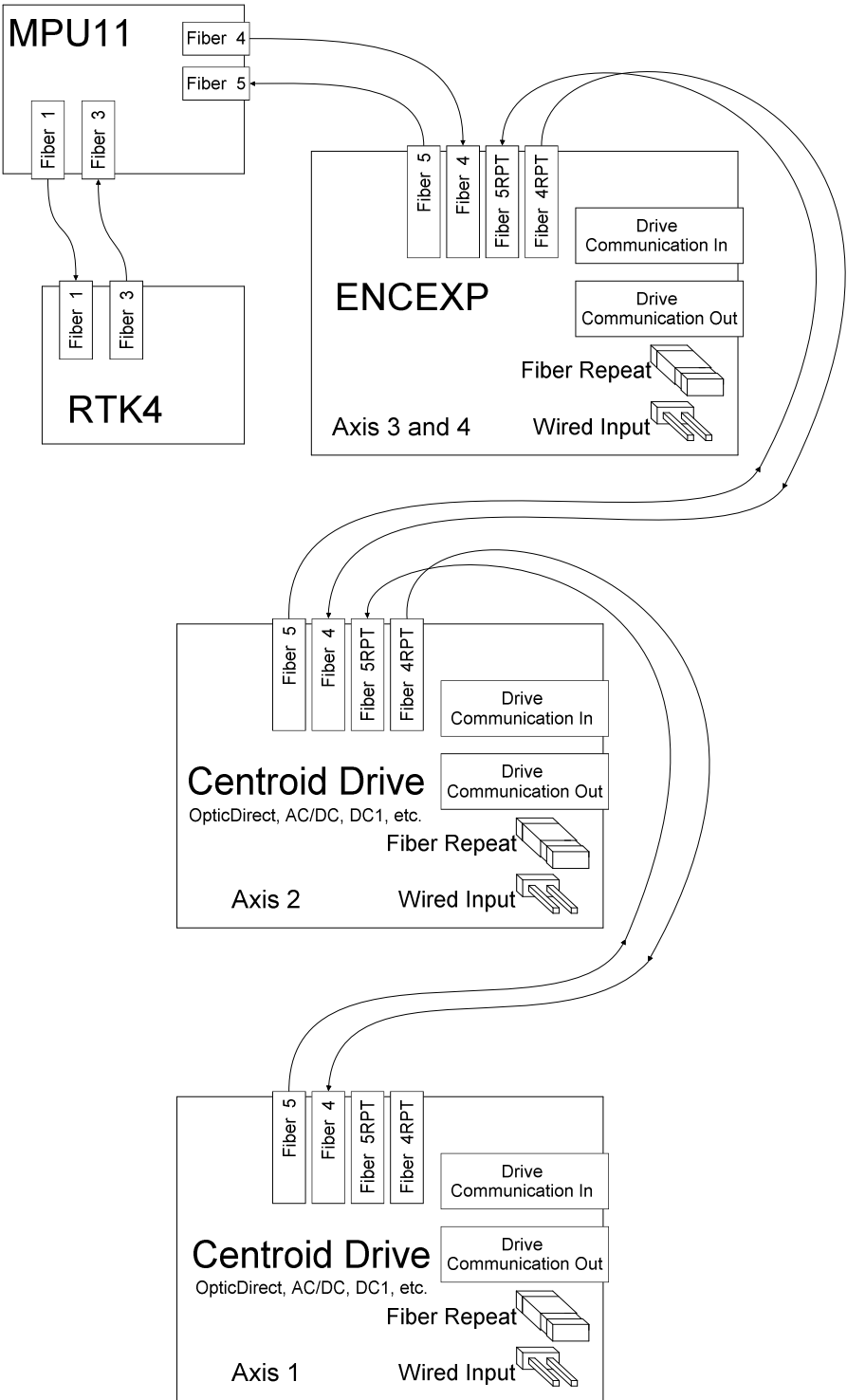
Overview

ENCEXP is an encoder expansion board for use with MPU11 based controls. It allows additional encoder information to be transmitted to MPU11 over the DriveBus drive protocol.

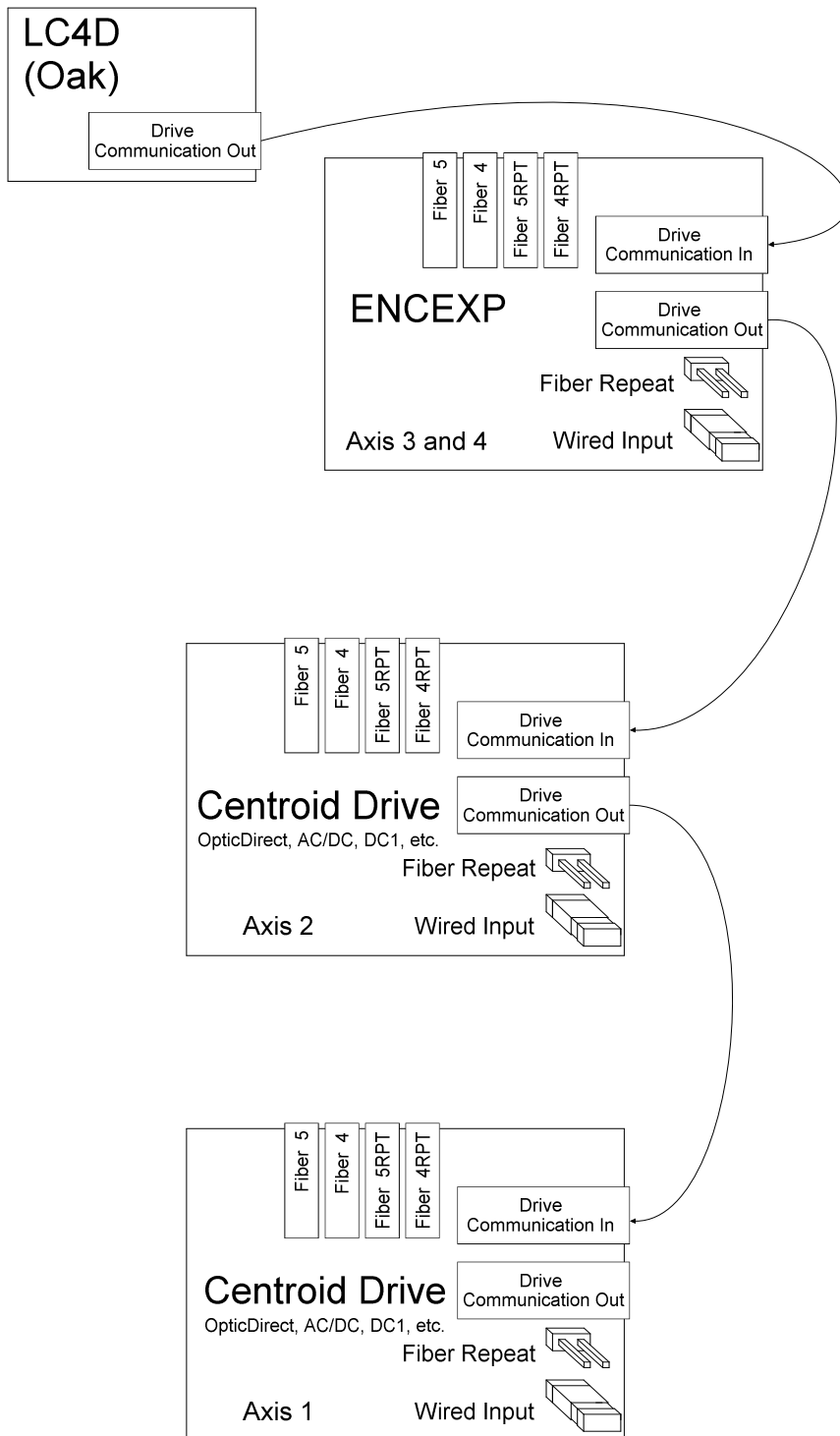
ENCEXP Features

Application:	Encoder Reading
Maximum number of encoders:	6
Supported encoder types:	Incremental (Differential A, B, and Z channels), BiSS B, and BiSS C
Communication:	DriveBus Protocol
Dimensions (W*D*H):	12 * 5 * 0.75 inches

ENCEXP Typical Connections with Fiber Optic Communication



ENCEXP Typical Connections with Cable Communication



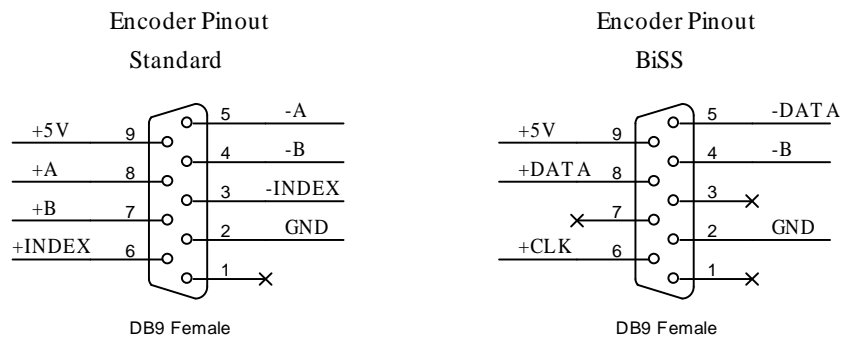
ENCEXP Communication

The DriveBus protocol is used by the ENCEXP board. DriveBus is a protocol designed for Centroid servo drives. Up to 8 axes can be supported. In order to take up the least amount of space in the communication protocol, ENCEXP packs the information for three encoders into one DriveBus axis (or channel). Therefore, ENCEXP will normally take two DriveBus axes to communicate information from 6 encoders. The “Single Channel” jumper on ENCEXP will force the use of only one DriveBus axis and transmit information only for the first three encoders. This option is useful if 7 other axes are already connected to DriveBus. Also note that if 7 axes plus ENCEXP are connected, and ENCEXP is nearest MPU11 in the communication chain, single channel mode will be active automatically (axis 9 data is ignored).

ENCEXP Encoder Support

ENCEXP can support standard differential quadrature encoders or BiSS serial protocol encoders. Standard encoders must have output levels compatible with the specifications in the “ENCEXP Specifications” table. Standard encoders have “A” and “B” signals to transmit position information. A signal edge must be produced for every count of position change, which may limit the top speed, particularly on high resolution models. Check both the encoder’s maximum frequency and “quadrature encoder input frequency” in the “ENCEXP Specifications” table to determine the maximum RPM an encoder is capable of before use.

BiSS is a serial protocol that overcomes the counts versus frequency issue encountered with traditional quadrature encoding. Because high resolution does not limit speed with this protocol, BiSS encoders are typically very high resolution devices. ENCEXP supports B and C revisions of the BiSS protocol.



ENCEXP Specifications

Characteristic	Min.	Typ.	Max.	Unit
5 Volt Supply Current*	1.0	2.0	-	A
12 Volt Supply Current	0	0	-	A
Quadrature encoder channel input low	0	-	0.5	V
Quadrature Encoder channel input high	3.5	-	5	V
Quadrature Encoder input frequency (per channel)	0	-	1500	khz
Size: 12 * 5 * 0.75 (W*D*H)				Inches

*ENCEXP uses about 0.25A, but encoders are often 0.1A to 0.5A each – make sure supply is sufficient for connected encoders

ENCEXP Troubleshooting

Symptom	Possible Cause	Corrective Action
+5V LED not lit	No power	Check connections to POWER header
+3.3V LED not lit	No power or internal fault	If +5V is lit, return for repair
FPGA OK LED not lit	ENCEXP not ready	Wait for ENCEXP to start and enter run mode
	Internal Fault	Return for repair
Encoder connection bad	Bad encoder or wiring	Check or replace encoder and cable
	Return not connected	Connect return line. If the encoder is not powered by ENCEXP's +5V, this is sometimes overlooked.
	Encoder plugged in with power on	Restart ENCEXP. The board must detect encoder type at power up because it supports multiple encoder types.

LED1 Error Codes

Error Number	Meaning	Cause	Corrective Action
1	Communication Failure	ENCEXP has lost communication from the MPU11	Make sure MPU11 is connected and running. Check fiber 4 or wired connection. Make sure "WIRED INPUT" jumper is set properly.
2	Not Used		
3	Not Used		
4	Not Used		
5	Not Used		
6	Not Used		
7	Not Used		
8	Not Used		
9	Not Used		

ENCEXP Connections and Mounting Footprint

