Quadrature Encoder Interface Specification

&

Installation Guide

March 2013

Current Configuration

Date	Signal Mode	Channels	Voltage	Initials
	Differential ☐ Single Ended ☐	Single ☐ Quadrature ☐	5-28VDC	
	Differential ☐ Single Ended ☐	Single ☐ Quadrature ☐	5-28VDC	
	Differential ☐ Single Ended ☐	Single ☐ Quadrature ☐	5-28VDC	
	Differential ☐ Single Ended ☐	Single ☐ Quadrature ☐	5-28VDC	
	Differential ☐ Single Ended ☐	Single ☐ Quadrature ☐	5-28VDC	

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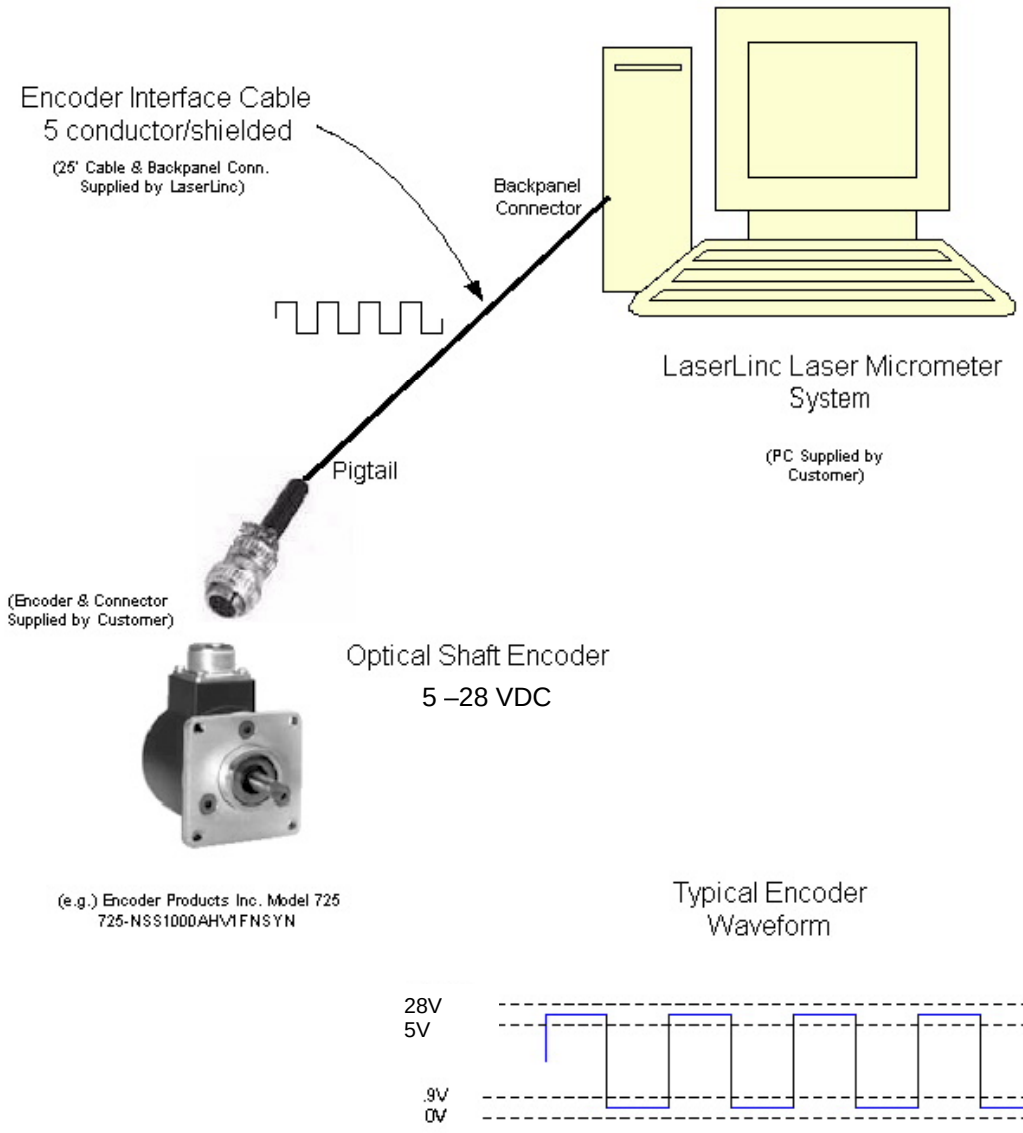


1. Typical Encoder Connector Wiring Diagram

1 Encoder Specification / Installation

1.1 Description

A Line Speed/Length Encoder is an external device that produces pulses to indicate line/product movement. With an encoder connected, the LaserLinc Software continually monitors the incoming pulses to determine line speed or total product footage. Each measurement scan is then tagged with the product footage. The measurement reading and product footage pairs may then be used to compute Pitch measurements (see the *LaserLinc Operator's Manual* for more information), product footage in log files, etc.

Encoder Interface Specification

Input	**Value / Description**
Input Voltage	4.75–28 VDC (Quadrature Module), RS-422 (factory config)
Input Low Voltage Threshold	< .9V
Input High Voltage Threshold	> 1.7V
Input Impedance / Pull-up / Pull down resistors	5VDC, or 12 VDC pull-up or pull-downs positions available. 2.2K ohm recommended if needed, **Factory Default: None**
Input Phase	Single Phase or Quadrature
Input Circuit Types	Single ended or Differential, jumper selectable, Factory Default – differential
Input Signal Type	Square wave
Maximum Frequency	1MHz
Max Cable Length	Consult your encoder manufacturers specification
Encoder / Measurement Correlation	Zero seconds latency between encoder sampling and measurement sampling
Encoder Interface Cable Style	Hirose, HR10A-7P-6P, provided with tinned leads
Back Panel Connector Style	Hirose, HR10A-7R-6S, provided

Outputs	**Value / Description**
Encoder Supply Voltage	5 or 12 VDC only
Supply Current, fused	.150ma continuous maximum

2 Installation Procedure

2.1 Hardware Install

1. If you purchased the encoder option with your system, then proceed to step 7.
2. Power down the PC and remove the TLAser400 card.
3. Select desired signal input type. For 'Single Ended' operation remove jumper J4. For 'Differential' install jumper J4 pins 1-2. (NOTE: refer to the data sheet for your particular encoder part number to determine this option).
4. Install the TLAser400 Encoder Interface in channel 4 of the PCI TLAser400 card. (Channel 4 is the SIMM module marked 'CH 4 J6' on the printed circuit board silkscreen).
5. Install/reinstall the PCI TLAser400 card.
6. Install the encoder input connector / PC bracket in any open rear panel slot and screw down.
7. Make connections to your encoder using the encoder interface cable provided. The leads are labeled and described below.
8. Connect the encoder interface cable to the rear panel connector.

TLAser400 Encoder Signal Description

Signal Names	Description	Signal Source
+5VDC/+12VDC Jumper J7 1-2 12V Jumper J7 2-3 5V	Used to provide power to the encoder. If encoder is already powered, these signals are not used. Insulate and tie off leads.	TLAser400 card
Signal Ground (GND, GRD)	Reference signal for TLAser400 card. This must be connected to the encoder ground regardless of power source.	TLAser400 card
Encoder A (ENC A+) (DATA A)	Encoder output signal for single ended or positive half of differential signal pair.	Encoder
Encoder A' (ENC A-) (DATA Ā)	Encoder output signal for negative half of differential signal pair. If not used, then insulate and tie off this lead.	Encoder
Encoder B (ENC B+) (DATA B)	Encoder output signal for single ended or positive half of differential signal pair.	Encoder
Encoder B' (ENC B-) (DATA B')	Encoder output signal for negative half of differential signal pair. If not used, then insulate and tie off	Encoder

2.2 Encoder Connection

The TLAser400 Encoder Interface connects to encoders from many different manufactures. Please refer to your particular encoder data sheet for pin-out information. FAILURE TO CONNECT THE ENCODER PROPERLY MAY RESULT IN DAMAGE TO THE ENCODER INTERFACE, TLAser400 CARD AND ENCODER!

Your encoder may require pull-up resistors depending on the encoder's output option selected. Consult your encoder manufacturer's data sheet for details. **Failure to employ pull-up resistors when needed will prevent the encoder from generating pulses.** No damage however, will occur. Pull-up resistors may be added to the LaserLinc encoder interface module. Contact LaserLinc technical support for details.

Choose a method for encoder interfacing. The power is either supplied to the encoder from the TLAser400 Encoder Interface (preferred) or the encoder is already powered by another device. If the encoder is powered by another device, determine the voltage level that is used. The TLAser400 Encoder Interface will accept signals up to 28 volts.

Backpanel Hirose Connector Pin Out (strip outer jacket if unsure of pairing)

WIRE LEAD	CONNECTOR	ENCODER FUNCTION
ENC A' (BLK) Paired w/ WHT	PIN 1	SIGNAL Ā (optional, install jumper J4 1-2 (default) on TLAser400 Encoder Interface if used – enables differential signal)
ENC B (GRN)	PIN 2	SIGNAL B (Use for Quadrature Only)
ENC B' (BLK) Paired w/ GRN	PIN 3	SIGNAL B' (Use for Quadrature Only)
GRD (BLK) Paired w/ RED	PIN 4	Supply Common **(must use)**
+5V / +12V (RED)	PIN 5	Power Source (if used, select with Jumper J7)
ENC A (WHT)	PIN 6	SIGNAL A (must use)

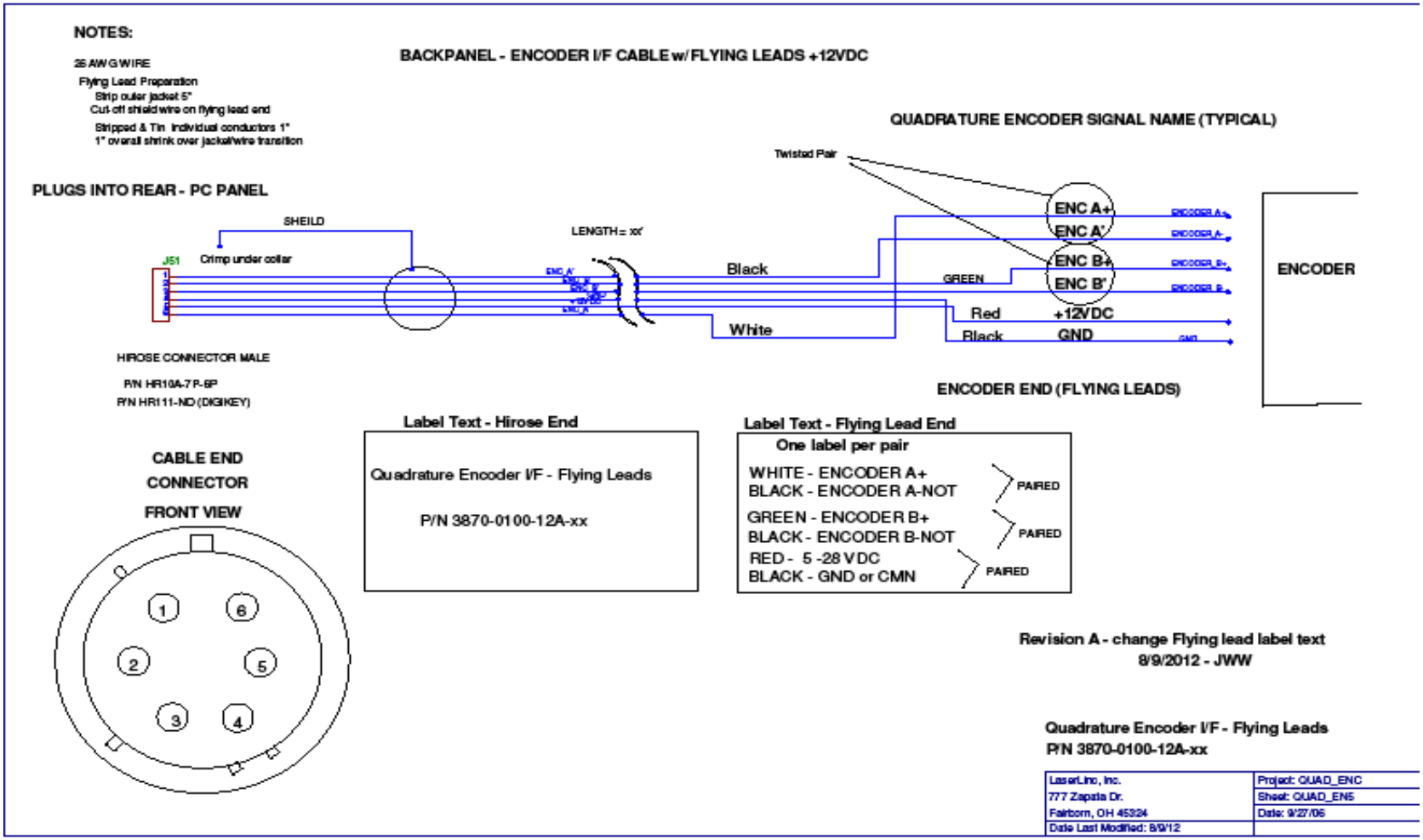
3 Encoder Operation

1) Install the LaserLinc software and configure a scanner and measurement.

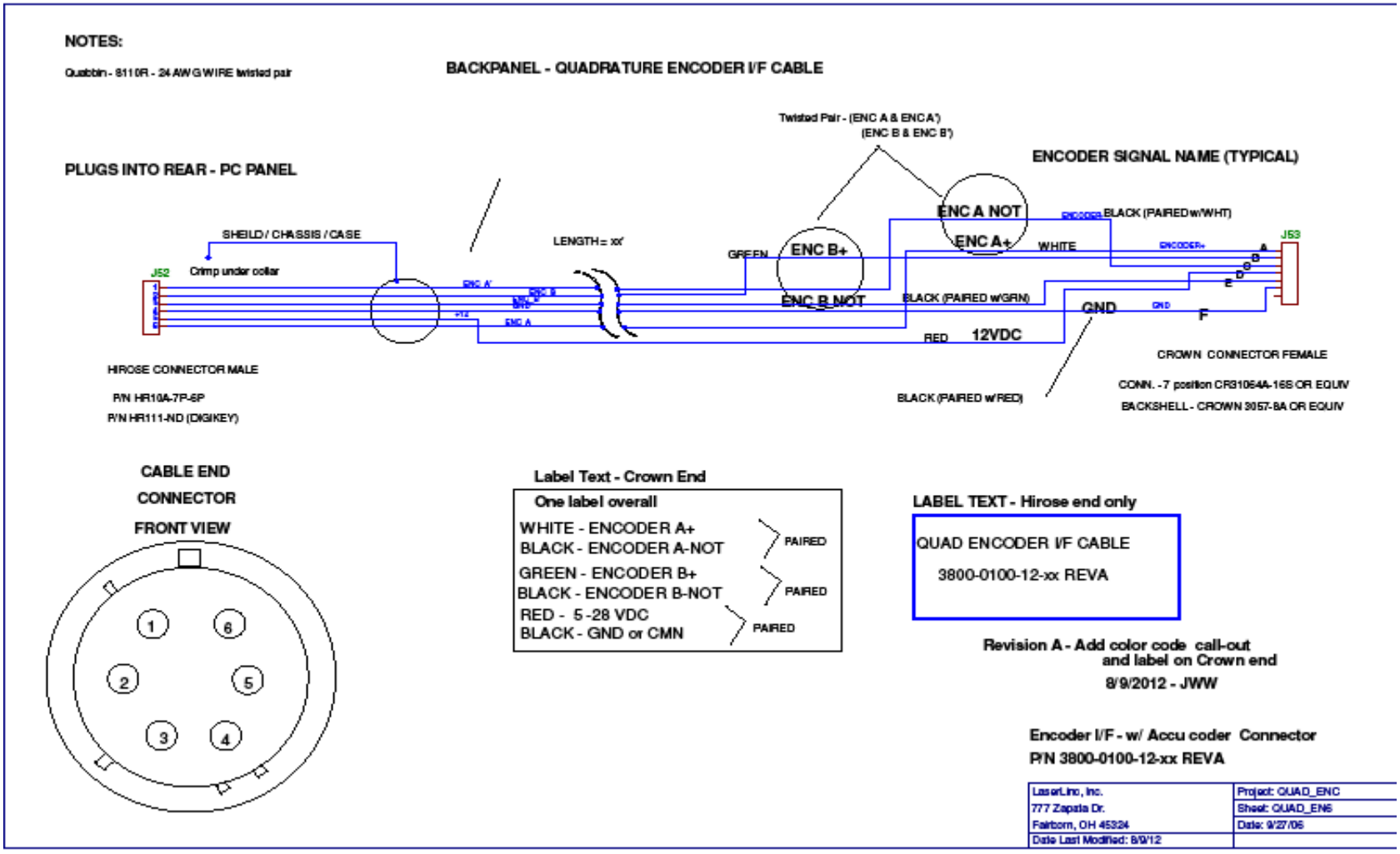
2) Type or click ‘START’ button ‘F2’. **(NOTE: TotalVu Version 4.7.250.303 and prior - TotalVu must be acquiring data before the encoder display will update. 4.7.250.304 and above does not require an operational scanner).**

3) On the main display, double click in any open ‘NAME’ window and select the ‘LENGTH’ measurement. Turn the encoder shaft. The ‘LENGTH’ field should count up as the encoder is turned. Refer to the *LaserLinc Operator’s Manual* for further application set-up.

3.1 Flying Lead Cable Schematic



3.2 Crown Connector - Cable Schematic



3.3 Encoder Products Inc. Model 725-NSS1000AHV1FNSYN Pin Out

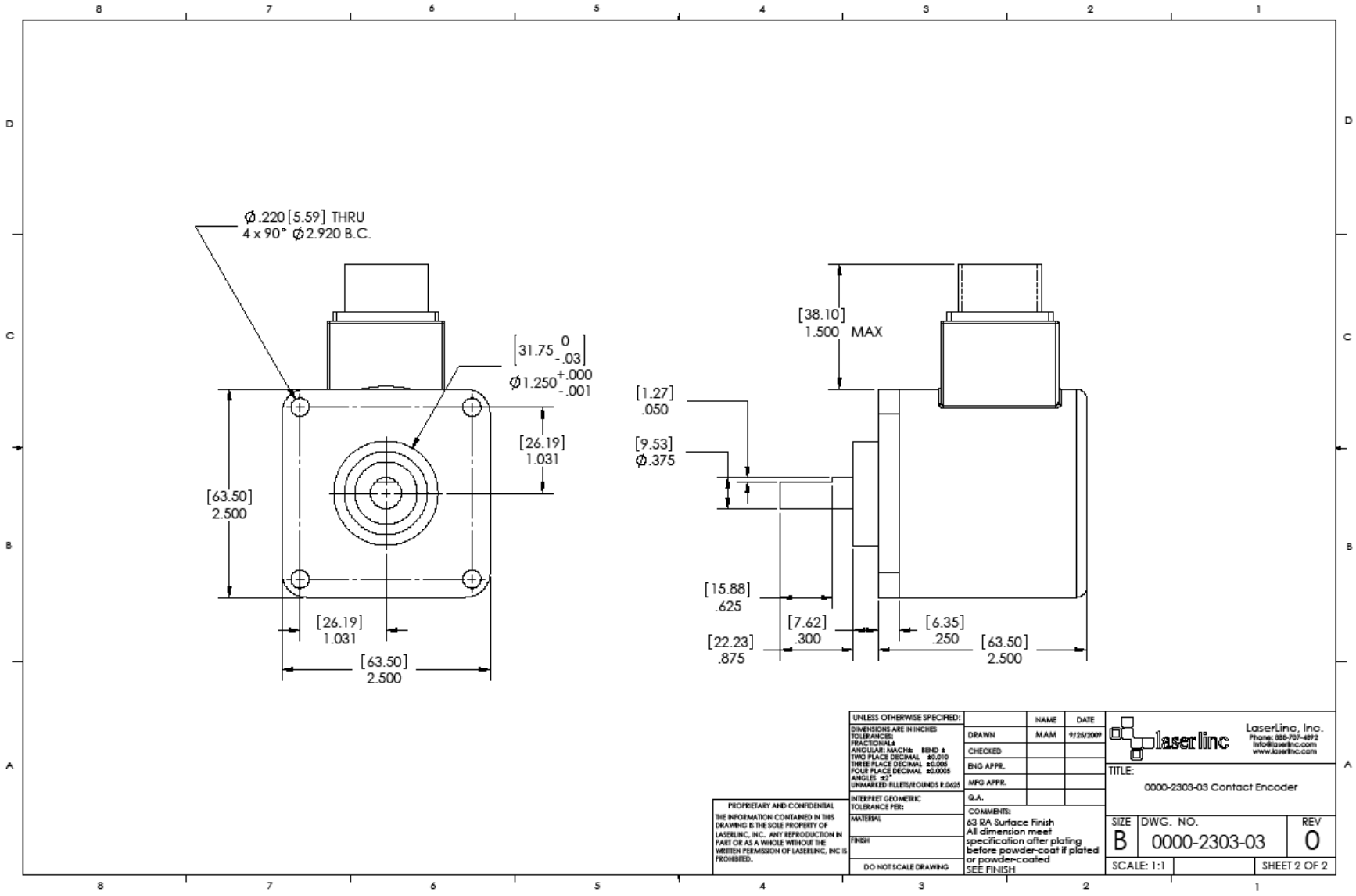
Sample Optical Encoder Wiring for

Model 725 from Encoder Products Co.

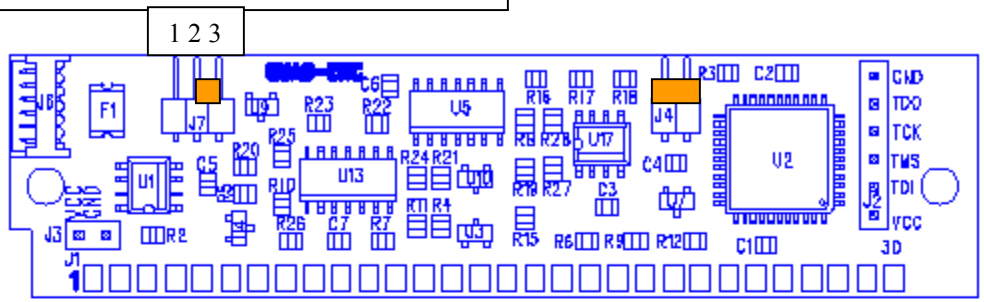
Encoder Pin	Function	LaserLinc Connection
A	DATA A	Signal A / Encoder +
B	DATA B	N/C
C	DATA A'	Signal A' / Encoder - Use only if encoder module on TLAser400 Card has Jumper J4 installed
D	+ VOLTS DC	+5VDC
E	DATA B'	N/C
F	COMMON	Ground
G	CASE	Shield optional
H	NOT USED	N/C
I	NOT USED	N/C
J	NOT USED	N/C

LaserLinc, Inc.	Project: ENC_DOC
125 S. Walnut Street	Sheet: enc_doc2
Yellow Springs, OH 45387	Date: 9/18/03
Date Last Modified: 9/18/3	

3.4 Encoder Mechanical Drawings



Default Jumper Settings
J7 – 2-3 (5V)
J4 – Installed (differential)



LaserLinc
INC.

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QUADRATURE ENCODER	RS274X FORMAT, ASCII, ABSOLUTE 3 INTEGER DIGITS 5 FRACTIONAL DIGITS
Board No.: 3800-1105-01	
REV: A	PRIMARY ASSEMBLY
CDC Technologies Inc. PHONE # (937) 890-8715 FAX # (937) 890-8715 WWW.CDCTECHINC.COM	LAYERS VIEWED FROM PRIMARY SIDE DATE: 1/26/07 CDC JOB NO.: CDC1362