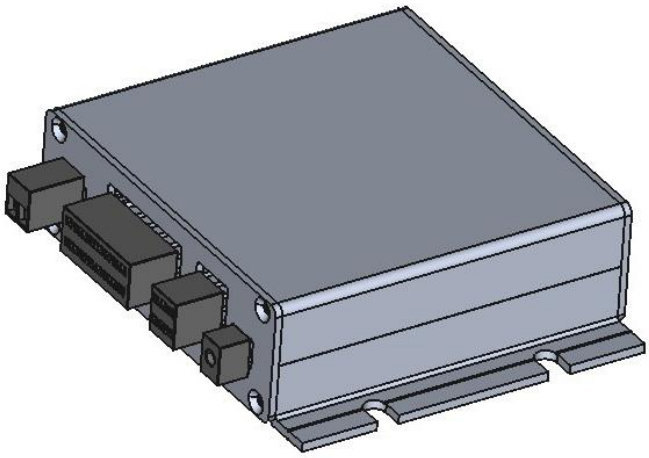
Motor Drive Controllers for

LAF Autofocus Sensors



LAF-C2 & LAF-C3E

CE

Manual

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INTRODUCTION

METROLOGY SENSORS GmbH, Lilienthalstrasse 9, D 66740 Saarlouis, Germany
Tel +49 6831 4877110 , info@metsens.com

EQUIPMENT CARE

METROLOGY SENSORS instruments are precision optical tools used for obtaining precise measurements and must therefore be treated with care.

CHANGES TO METROLOGY SENSORS PRODUCTS

METROLOGY SENSORS reserves the right to improve, change or modify its products without incurring any obligations to make changes to METROLOGY SENSORS equipment previously sold.

WARRANTY

METROLOGY SENSORS warrants its equipment provided that it is installed exactly as defined in associated METROLOGY SENSORS documentation.

Prior consent must be obtained from METROLOGY SENSORS if non-METROLOGY SENSORS equipment (e.g. power supply and/or cabling) is to be used or substituted. Failure to comply with this will invalidate the METROLOGY SENSORS warranty.

CE Marking

The CE Marking (EMC Directive) is affixed to the product is accordance with EN standards.

Installation Conditions (EN Standard)

This product is to be used as a component within other equipment.

Overvoltage category: I

Pollution degree: Class II

Protection against electric shock: Class III

For EMC Directive

This product has received EMC compliance under the conditions specified in 4.5.1.

The compliance of the final machinery with the EMC Directive will depend on such factors as the configuration, wiring, layout and risk involved in the control-system equipment and electrical parts.

It therefore must be verified through EMC measures by the customer of the machinery.

Applicable Standards

EMI Emission Tests

Radiated Emission Test

EN61000-6-4

EN55011 Group1 ClassA

EMS Immunity Tests

Radiation Field Immunity Test

Electrostatic Discharge Immunity Test

Fast Transient / Burst Immunity Test

Conductive Noise Immunity Test

EN61000-6-2

EN61000-4-3

EN61000-4-2

EN61000-4-4

EN61000-4-6

Hazardous Substance

RoHS (Directive 2002/95EC 27Jan.2003) compliant

FCC (USA)
This equipment has been tested and found to comply with the limits for a Class A digital device (FCC section 15.105), pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generate, use and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio Communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Information to user (FCC section 15.21)

The user is cautioned that any changes or modifications not expressly approved by METROLOGY SENSORS or an authorised representative could void the user's authority to operate the equipment.

Special accessories (FCC section 15.27)

The user is also cautioned that any peripheral device installed with this equipment such as a Computer, must be connected with a high-quality shielded cable to insure compliance with FCC limits.

1 SAFETY

1.1 ENVIROMENTAL REQUIREMENTS

The following environmental conditions are specified for the LAF

Indoor use	IP40
Altitude	Up to 2000m
Working temperature	20°C to 30°C
Storage temperature	-10°C to 50°C
Relative humidity	Up to 80% relative humidity; non-condensing

2 MOTION CONTROLLER LAF-C2 & LAF-C3E

2.1 DIMENSIONS LAF-C2

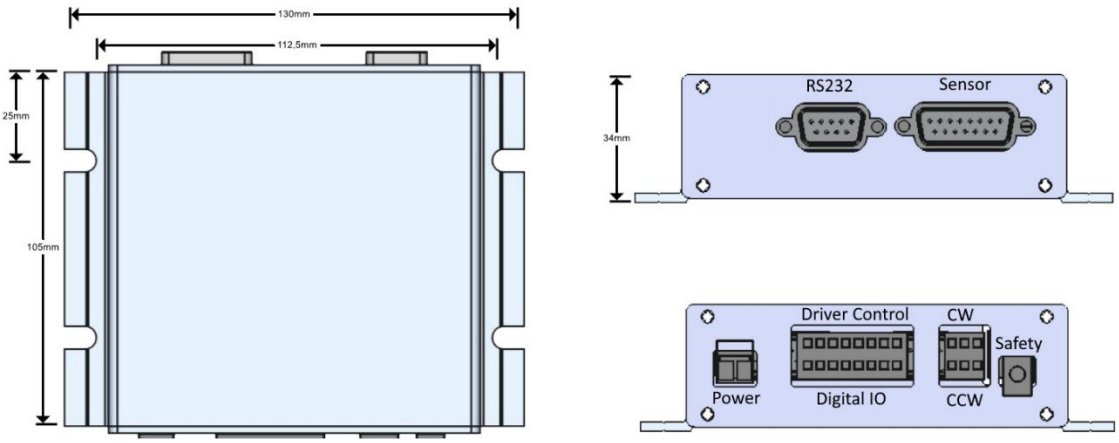


Figure 1

2.2 DIMENSIONS LAF-C3E

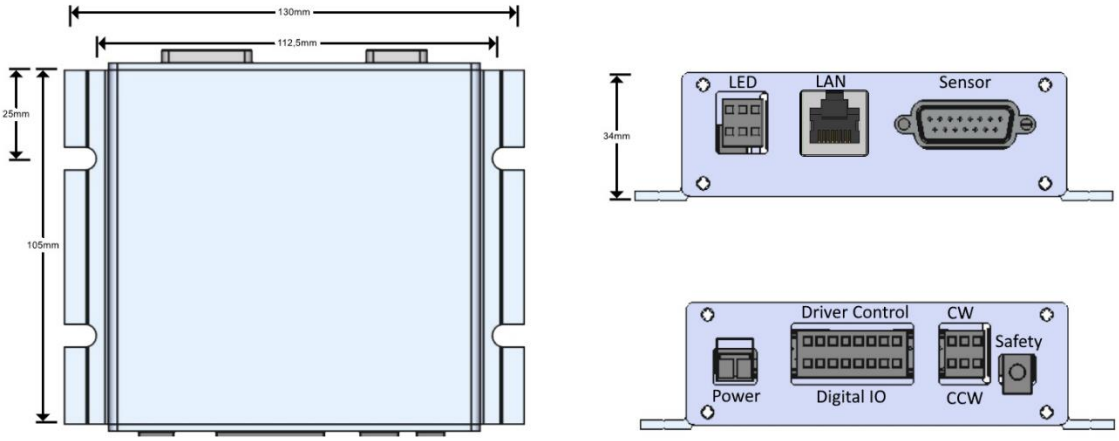


Figure 2

2.3 TERMINAL BLOCKS AND PINS LAF-C2

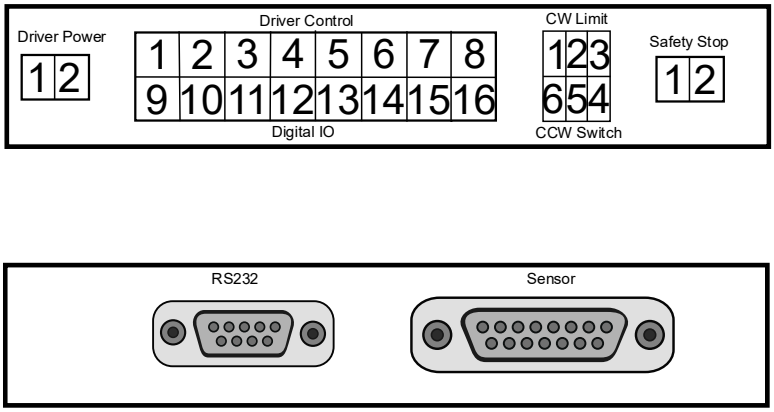


Figure 3

2.4 TERMINAL BLOCKS AND PINS LAF-C3E

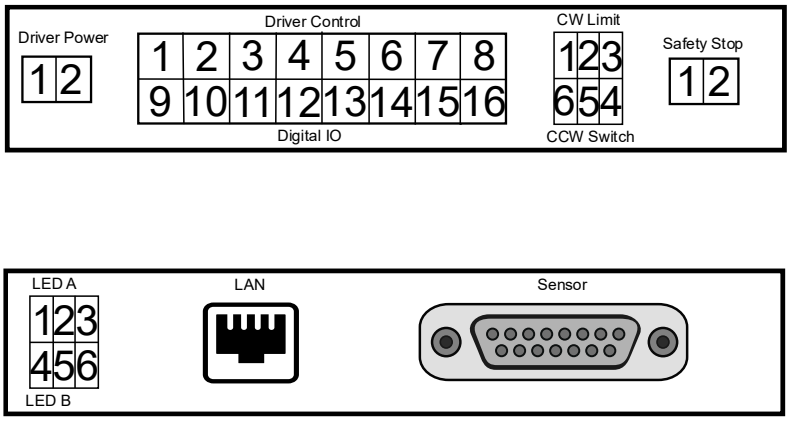


Figure 4

2.5 LIMIT SWITCH INPUT SETUP (TERMINAL BLOCK CW & CCW)

Remove LAN board (LAF-C3E only)

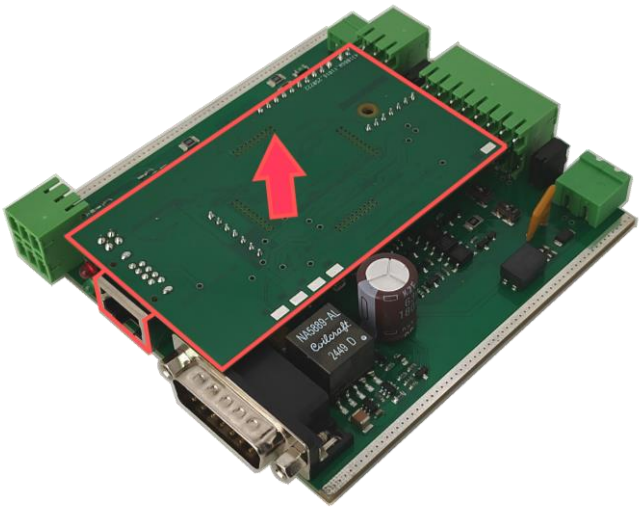


Figure 5 (LAF-C3E only)

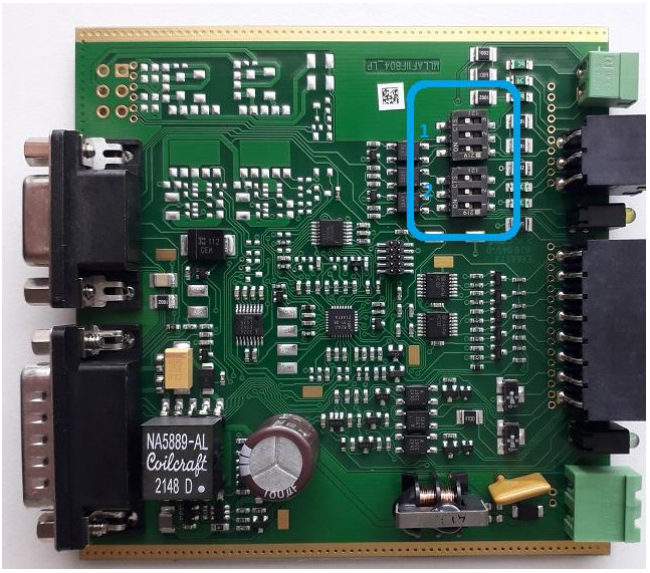


Figure 6

DIP Switch 1	NO	NC	
SW1	ON	OFF	
SW2	OFF	ON	
SW3	ON	OFF	
DIP Switch 2	NO	NC	
SW1	ON	OFF	
SW3	OFF	ON	
SW3	ON	OFF	

Table 1

2.6 MOTOR CURRENT ON (TERMINAL BLOCK DRIVER CONTROL PIN 1 & 2)

PIN 1 & 2 on Driver Control Terminal is set as Motor Current On function by default.

The dip switches 3 & 4 are set as shown in the Figure 7

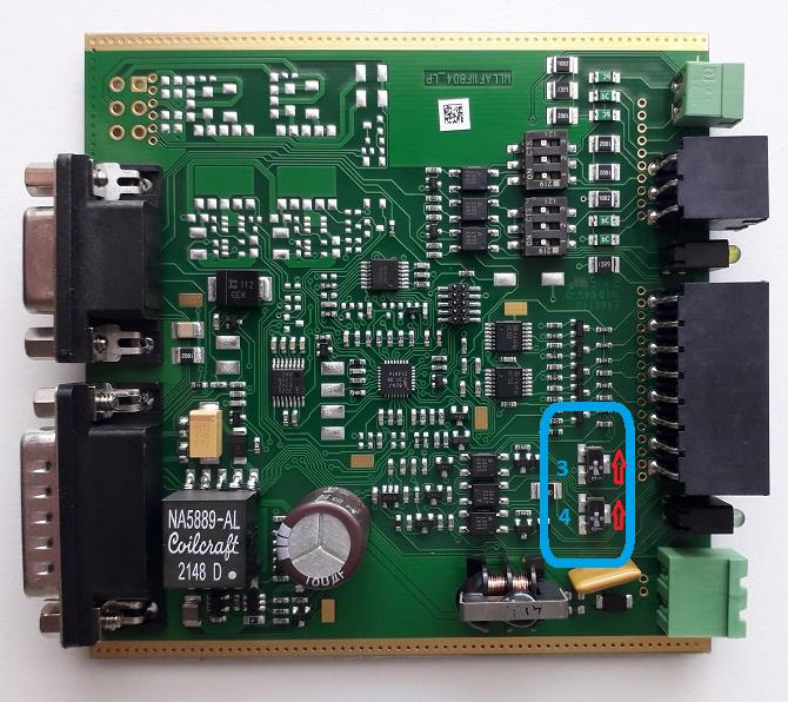


Figure 7

2.7 ANALOGUE DISTANCE SIGNAL (TERMINAL BLOCK DRIVER CONTROL PIN 1 & 2)

PIN 1 & 2 on Driver Control terminal block can be enabled to output the distance signal (0-10V).

The dip switches 3 & 4 must be set as shown in the Figure 8

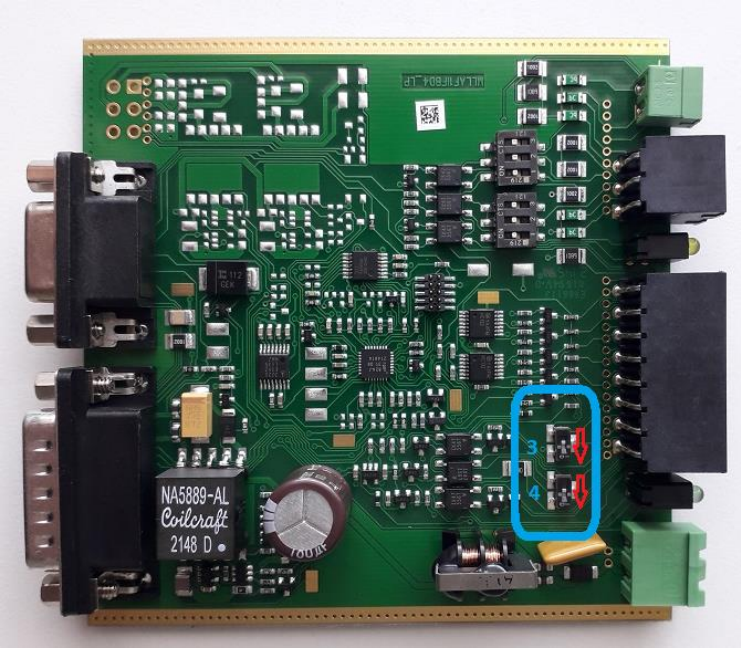
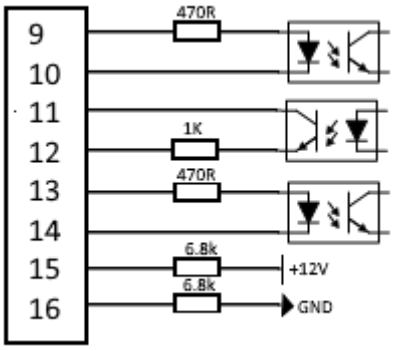


Figure 8

2.8 PIN ASSIGNMENT LAF-C2 & LAF-C3E

DRIVER POWER	PIN	SIGNAL	
V in	1	+24V to +48V, less than 7W, less than 20W for LAF-C3	
V in	2	0V Return	
DRIVER CONTROL	PIN	SIGNAL	
Motor current on + or Analogue Distance	1	Pin 1, 3 & 5 = 3-12 Voltage compliance via series resistor for short circuit protection Pin 2,4,6,8 & 8 = 10mA current sink to drive photo coupler Connect the photo coupled input pairs of the motor driver to the according +/- signals.	
Motor current on – or Analogue Distance	2		
Motor direction +	3		
Motor direction -	4		
Motor Pulse +	5		
Motor Pulse 1 -	6		
Motor Pulse 2 -	7		
Motor Pulse -	8		

DIGITAL IO	PIN	SIGNAL
Laser enable+	9	Pin 9 & 13 Opto-isolated inputs, 3-48V DC 5mA current, polarity protected Pin 11 Opto-isolated (NPN Transistor) Output, max. 5mA 
Laser enable -	10	
Signal Good +	11	
Signal Good -	12	
Sync +	13	
Sync -	14	
+12V	15	
GND	16	
CW LIMITSWITCH	PIN	SIGNAL
Limit switch CW V in	1	V in on Pin 1 is the 24..48V operating voltage via a short circuit protection resistor, can be used for operating photo interrupters. GND is the signal ground also via a short circuit protection resistor. For switching between NC (normally closed = default shipping state) or NO (normally open) limit switch operation mode 0R resistors need to be changed inside the LAF-C2 as shown in figure 18.
Limit switch CW input	2	
Limit switch CW GND	3	

CCW LIMIT SWITCH	PIN	SIGNAL	
Limit switch CWW V in	4	V in on Pin 4 is the 24..48V operating voltage via a short circuit protection resistor, can be used for operating photo interrupters. GND is the signal ground also via a short circuit protection resistor. For switching between NC (normally closed = default shipping state) or NO (normally open) limit switch operation mode 0R resistors need to be changed inside the LAF-C2 as shown in figure 18.	
Limit switch CWW input	5		
Limit switch CWW GND	6		
SAFETY STOP	PIN	SIGNAL	
	1	Connect a normally closed safety switch. Current is between 2-5mA. If this connection is left open it indicates a safety stop, so the laser will be off and motor will not move.	
	2		
RS232	PIN	SIGNAL	**RS232**
9 PIN D-SUB FEMALE			
	2	TxD	RS 232 Level
	3	RxD	RS 232 Level
	5	RS232 Ground	
SENSOR	PIN	SIGNAL	**Sensor**
15 PIN D-SUB MALE			
	1-15	-----	LAF sensor cable

LED	PIN		
	1	Positive LED A	Isolated voltage 2.5-7V, max 3.5W
	2	Negative LED A	
	3	Positive gate signal	0-48V max. consumption 5 mA
	4	Positive LED B	Isolated voltage 2.5-7V, max 3.5W
	5	Negative LED B	
	6	Negative gate signal	0-48V max. consumption 5 mA

3 MOTOR WIRING (CONTROLLER LAF-C2 & LAF-C3E)

3.1 MOTOR WIRING FOR PULSE & DIRECTION OPERATION

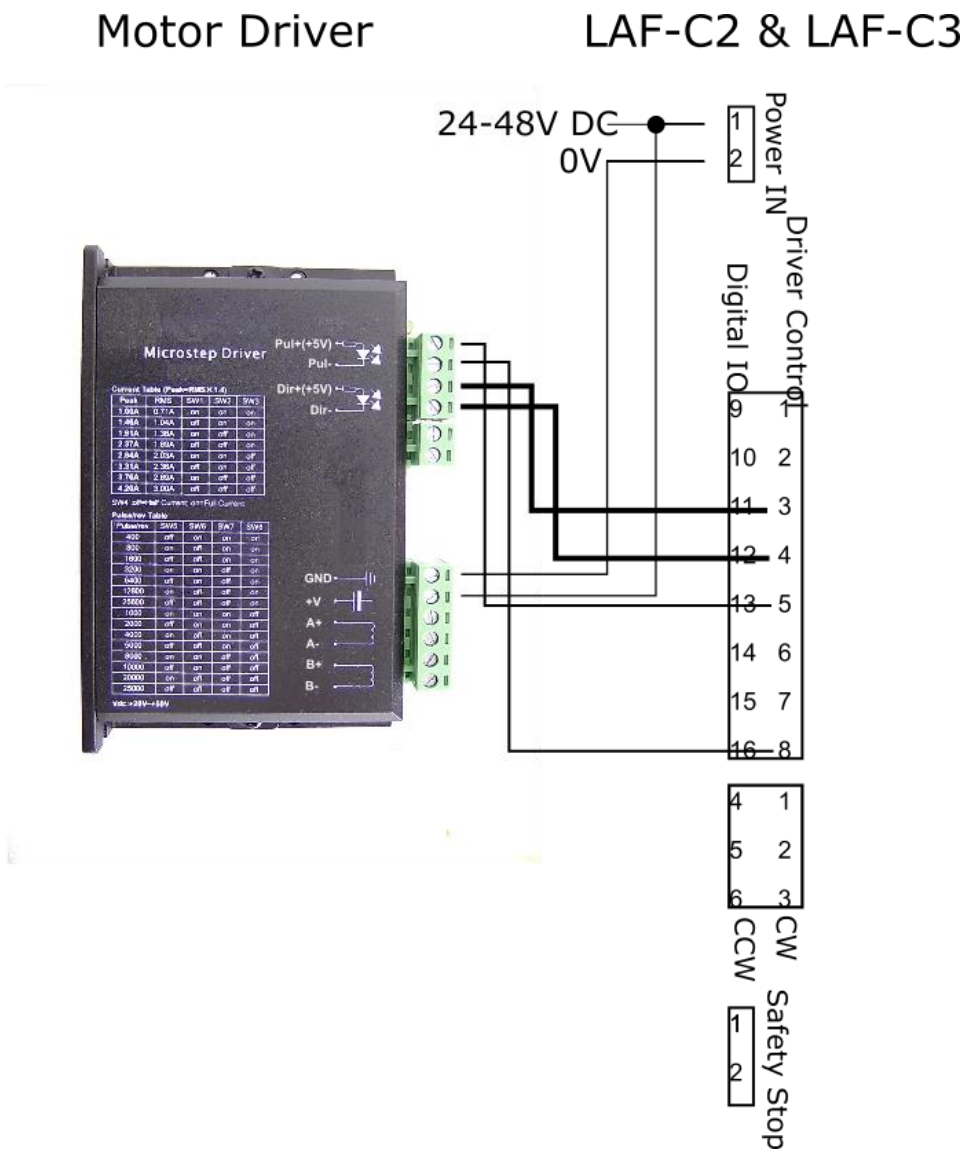


Figure 9 Pulse & Direction operation

3.2 MOTOR WIRING FOR PULSE 1 & PULSE 2 OPERATION

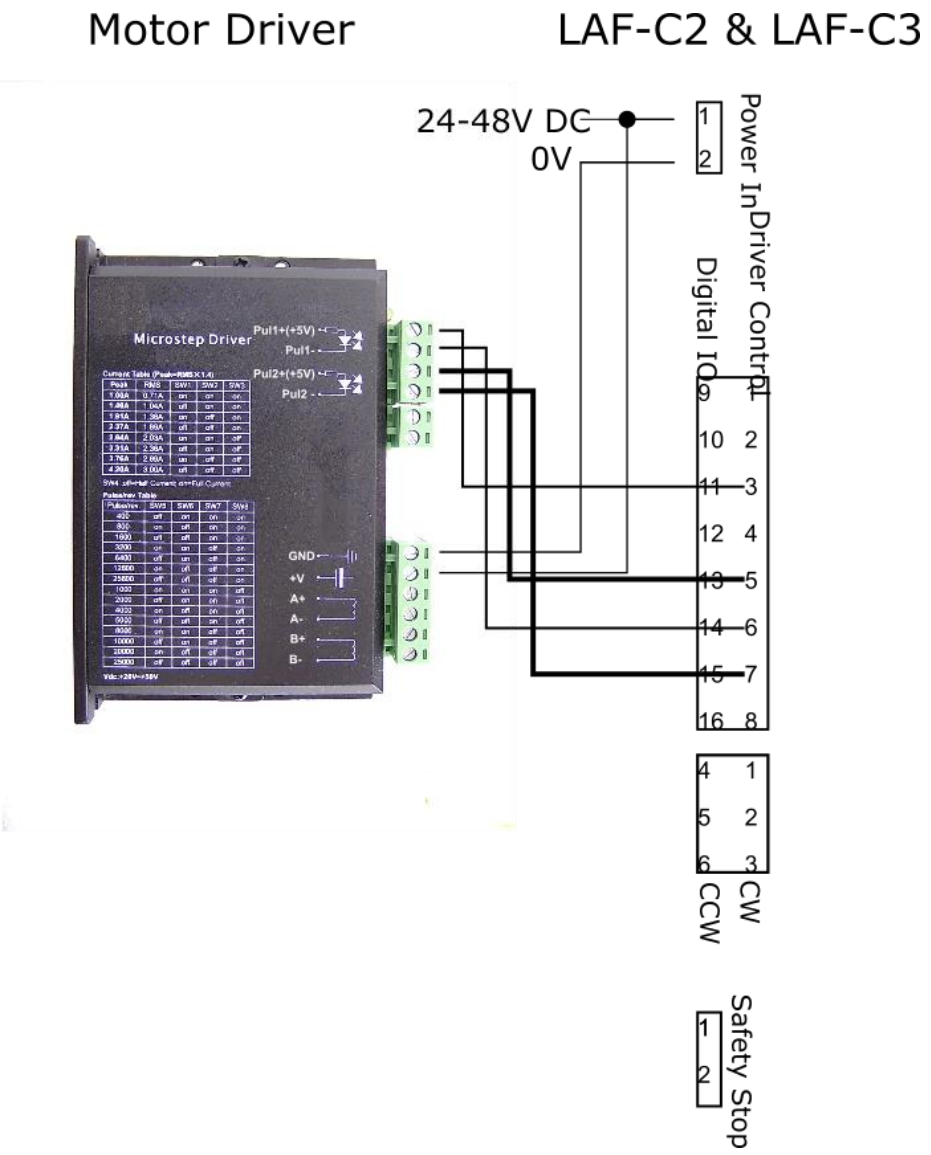


Figure 10 Pulse 1 & Pulse 2 operation

3.2.1 Examples for Laser enable & Laser sync. wiring to

Compliance Range is 3V to 30V (-3V to -30V)

Laser enable

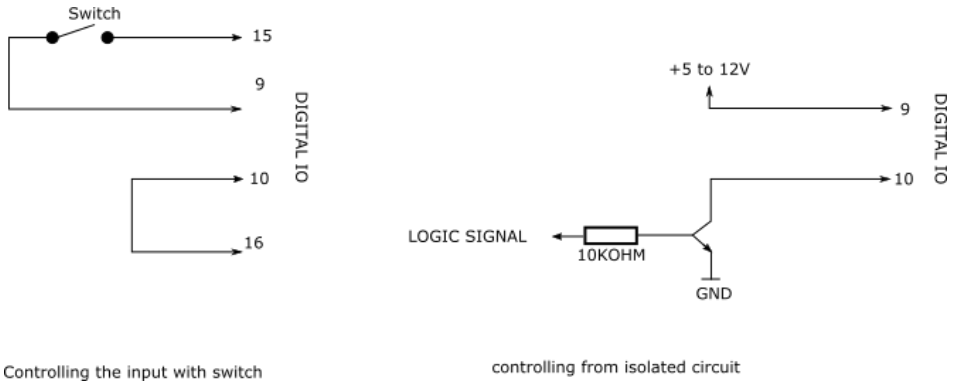


Figure 11

Sync (not connected if not in use)

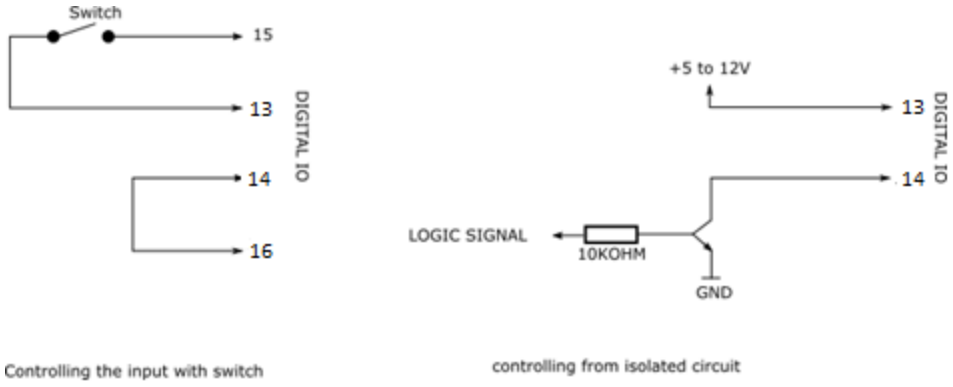


Figure 12

3.2.2 Quality Signal wiring information

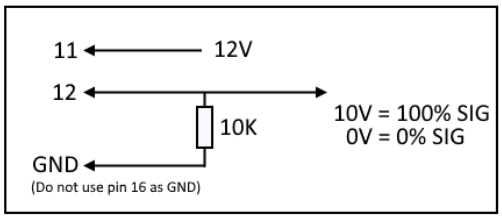


Figure 13

This should be in an isolated circuit. The 0-10V reading are taken between pin 12 and GND.