

MR-E-2 OEM Version

- Graphic user interface *Optotune Cockpit* for control via USB
- Communication interfaces:
 - USB, UART
 - SPI (I²C available on request)
 - Analog input (± 5 V)
- Software SDKs for Python and C# available.
- RoHS, REACH and CE certified

Mechanical specifications

Dimensions carrier board (L x W)	0 x 0	mm
Dimensions proxy board (L x W)	0 x 0	mm
Dimensions CPU board	0 x 0	mm
USB connector	Micro B	
Accepted DC Barrel Plug	2.1 I.D. x 5.5 O.D. x 10.0	mm
Cable length	1	m
Cable diameter	45	mm

Analogue input

Voltage range	-5 V to +5 V	mm
Resolution	12	bit
Sampling rate	10	kHz
Weight	420	g

Electrical specifications

Supply voltage range	15 to 28	Vdc
Total power consumption (max)	12	W

Thermal specifications

Storage temperature	-40 to +85	°C
Operating temperature	0 to 40	°C

Current output stage

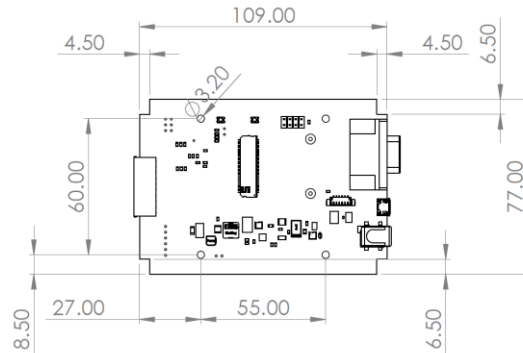
Current source type	linear	
Number of channels	2	
DAC resolution	12	bit
DAC sampling rate	10	kHz
DC current	500	mA
Peak current	700	mA

Position feedback

Number of channels	4	
Resolution	14	Bit
Sampling rate	25 to 50	kHz
Latency	100	μ s
Control loop frequency	10	kHz

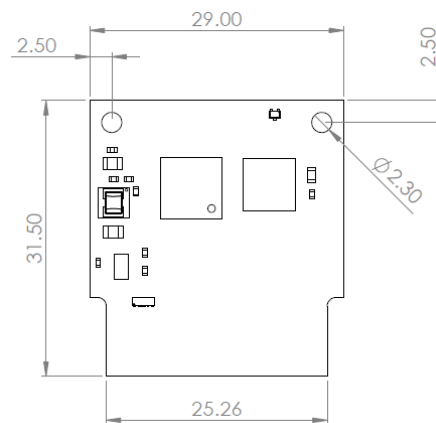
Description and Features

Carrier Board

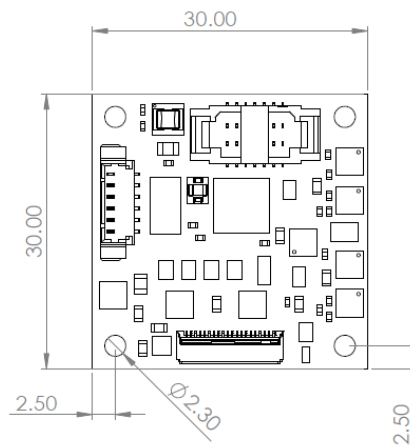


Optotune provides full schematics and manufacturing data for the carrier board on request. For further information, please contact sales@optotune.com.

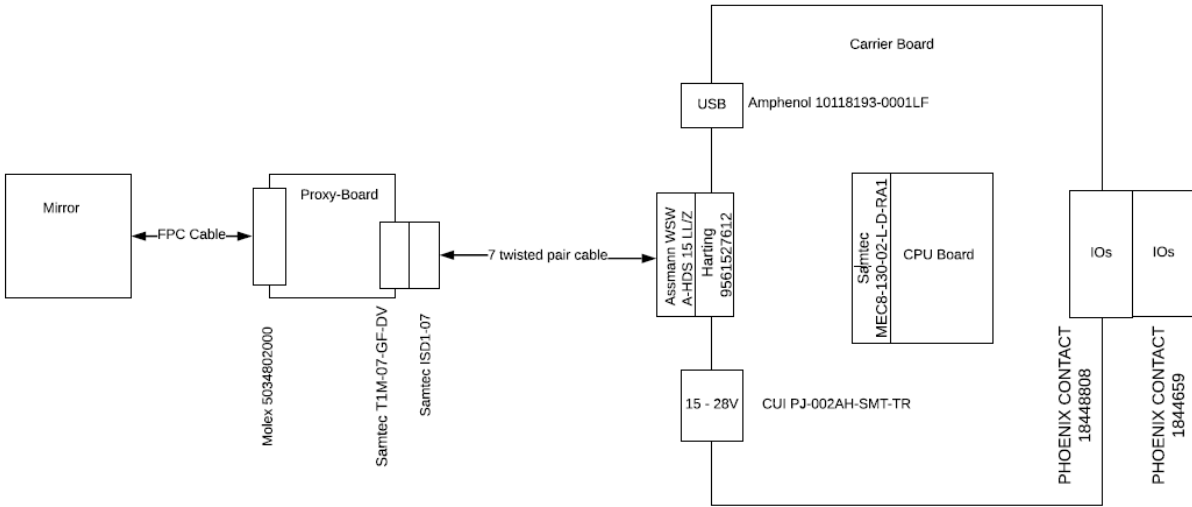
CPU Board



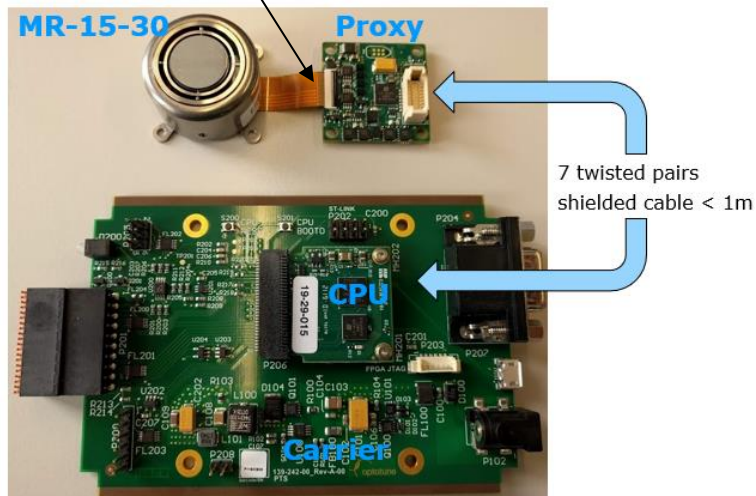
Proxy Board



Assembly and Connector Block Diagram



Do not connect FPC cable upside down. Orientation must be as shown. Wrong orientation will result in permanent damage!

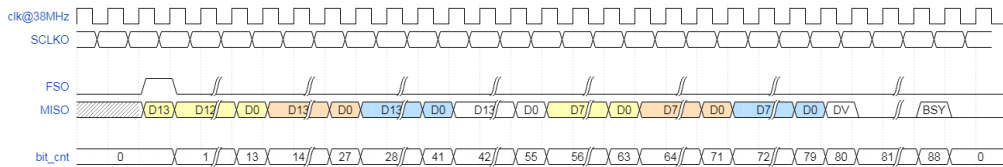
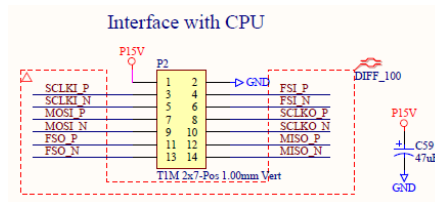


CPU <-> Proxy Serial Link

Serial link runs at 38 MHz, 3 LVDS pairs per direction, power and ground to proxy.

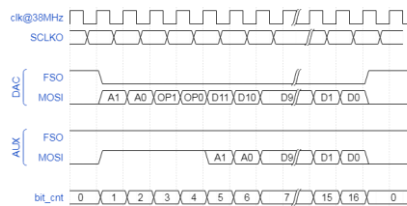
Proxy sends status to CPU:

- 4 photodiode ADCs readout (4 x 14 bits)
- 2 temperature sensors (2 x 8 bits)
- EEPROM read followed by data valid flag (8 +1 bits)
- EEPROM write status (8 bits)

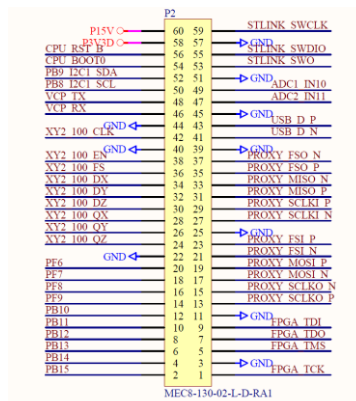


CPU sends commands to proxy:

- Set X and Y drive current values (write to DAC)
- Set IR LED current (write to DAC)
- Enable EEPROM dump
- Control proxy red LED
- Write to EEPROM



CPU Interface with Carrier



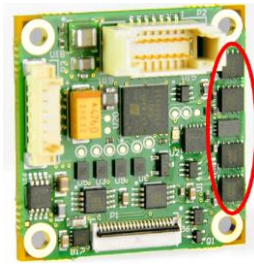
Thermal Management

MR-15-30

- Heat from actuator is conducted away through backside
- Mount mirror firmly on a heat-conductive plate (copper or aluminum)
- Maximum dissipated power at max. static deflection is 0.25W/channel (0.5W total)
- For fast oscillations with high duty cycle the dissipated power is 4-5W.
- Max. operating temperature is 85°C

MR-E-2 proxy board

- Maximum dissipated power at max. static deflection is 2W/channel (4W total)
- Maximum operating temperature is 85°C
- Capability of the heatsink always depends on the maximum specified ambient temperature and the maximum allowed operating temperature of the device.
- If we have 4 Watts that need to be dissipated and an ambient temperature of 45 °C, then the heatsink must have at least 10 °C/W thermal resistance so that proxy operates at its absolute maximum limit which is 85 °C (Maximum power dissipation = Difference in temperature / thermal resistance).
- The heatsink should be designed to have a reasonable margin and the proxy should not be operated at the absolute maximum rating. The components circled red need to be cooled.



Overview of Available Standard Products

Standard Product	Mirror type included	Components included
MR-E-2 Base unit	N/A	MR-E-2 Base unit controller box Power supply USB cable
MR-E-2 Mirror head gold	MR-15-30-G-25x25D	Mirror head (incl. mirror and cable) Protection cap Heatsink
MR-E-2 Mirror head silver	MR-15-30-PS-25x25D	
MR-E-2 Mirror head custom	MR-C-15-30 (custom mirror) or resonant mirror MR-10-30-G/MR-10-30-PS	