

<b>Sercalo</b> <i>microtechnology ltd</i>  Landstrasse 151, 9494 Schaan Principality of Liechtenstein	Product Specification	Page 1 of 6
		Revision 1.3
	EBMM Driver board for MM product	Product Number: EBMM

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# EBMM

## Driver board for the magnetic mirrors manual

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Revision 1.3  
September, 2017

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## Scope

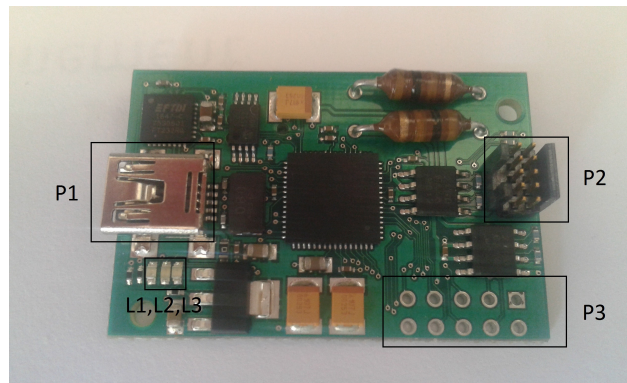
This document introduces the driver board for the magnetic mirrors EBMM functionalites.

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## 1 Overview of the electronics

The EBMM electronics is illustrated in **Figure 1**. The size of the board is 41x27 mm. The board can be fixed using two M2 screws. The main parts of the board are summarized in **Table 1**. The **sercalo** MMInterface and MMserver softwares are used to control the electronics (more details are available in the Principle of operation section).




**Figure 1** – Picture and connector positions of the EBMM 60-1070-04

Part	Description
P1	USB link (mini USB)
P2	Mirror(s) link
P3	Extension connector (not mount on the standard version)
L1	Power supply indicator
L2,L3	Indicator LEDs

**Table 1** – Main parts of the driver board

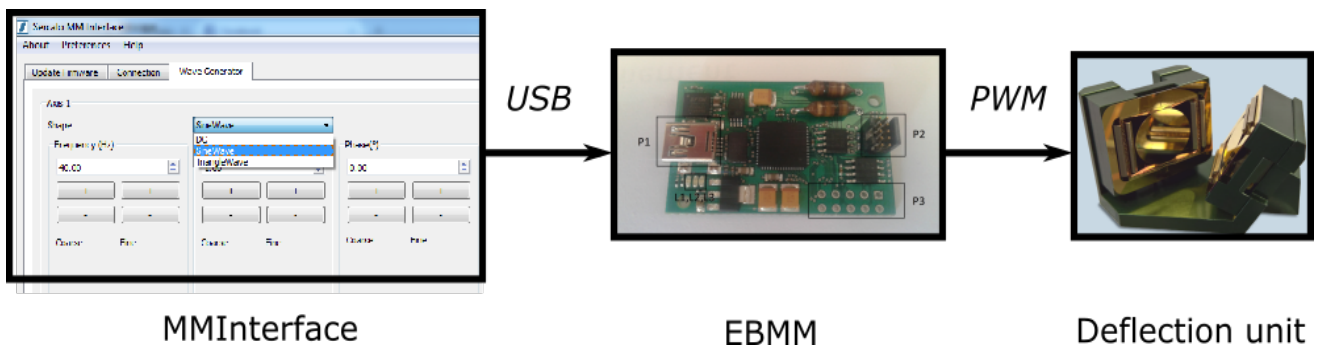
Part	Description
Supply voltage	5 V (USB powered electronics)
Power consumption	1 W (EBMM only, without deflection unit)
PWM resolution @ 30 kHz	16 bits
PWM frequency	30 kHz
Sampling frequency	15 kHz
User AC signal minimal frequency	0.1 Hz
User signal AC maximal frequency	- (Limited by the deflection unit)

**Table 2** – EBMM main Specifications

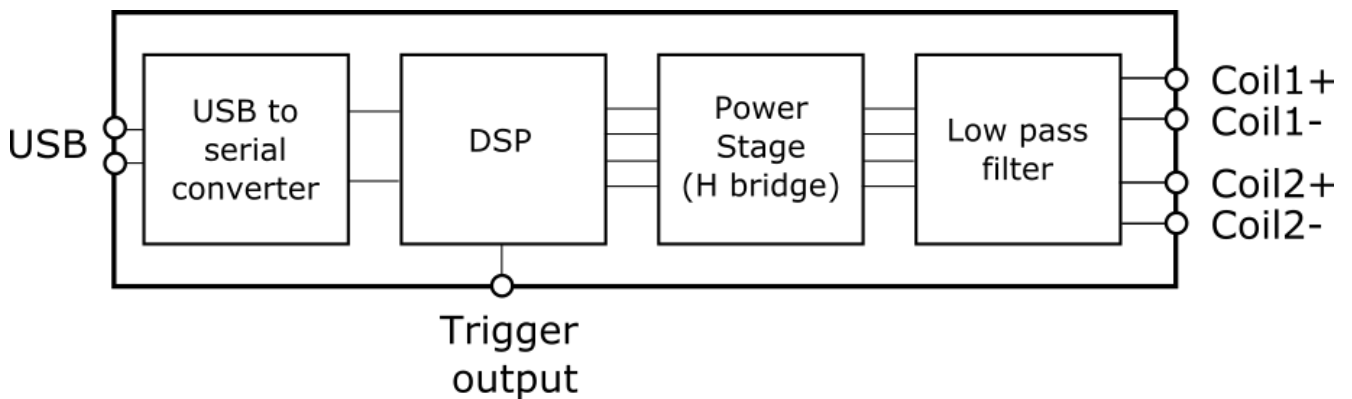
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## 2 Principle of operation

The user sets the shape to be generated via the MMInterface software. Alternatively, the MMServer can be used if the user intends to script the shapes using its own software. More details are available in the software dedicated documentation. The software computes for the driver the list of the points to drive the deflection unit. The results are sent to the EBMM via the USB interface. The EBMM generates and amplifies the list of point to drive the deflection unit. An overview of the system is illustrated in **Figure 2**. A block diagram of the EBMM is presented in **Figure 3**.




**Figure 2 – Overview of the system**



**Figure 3 – Block diagram of the EBMM**

## 3 Connection to the computer

The driver board can be used with the **sercalo MMInterface** and **sercalo MMServer** softwares. The connection to the host computer is achieved using the USB connector P1. If the operating system does not recognize the EBMM, the drivers can be manually downloaded here: [www.ftdichip.com/Drivers/VCP.htm](http://www.ftdichip.com/Drivers/VCP.htm).

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## 4 Connector pinouts

The connector P2 is used to connect the deflection unit to the electronics. The cable to connect P2 to the deflection unit is provided with the electronics.


Pin	Description
1	Positive terminal of mirror or axis 1
2	Negative terminal of mirror or axis 1
3	Positive terminal of mirror or axis 2
4	Negative terminal of mirror or axis 2
others	Reserved

**Table 3 – Pinout of the connector P2**

Pin	Description
1	5V Pin
2	Trigger pin
3	I2C SCK pin (not used with standard firmware)
4	I2C SDA pin (not used with standard firmware)
5	SPI SCLK pin (not used with standard firmware)
6	SPI MOSI pin (not used with standard firmware)
7	SPI MISO pin (not used with standard firmware)
8	SPI CS pin (not used with standard firmware)
9	MCLR (system reset) pin
10	GND

**Table 1 – Pinout of the connector P3**

- The MCLR pin can be used to perform a system reset (not necessary for standard use). The pin must be held to 0 to set the electronics to its reset state and set to 3.3V or in high impedance state to release the electronics from its reset state.
- A pulse is output on the trigger pin on each period of the signal sent to the deflection unit.

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## 5 Contact Information

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