

Helvest® Flex EMW400 module - User manual

1. General product presentation

1.1 EMW400 module for turnout coils

The EMW400 board drives up to 4 electromagnetic coils (or solenoids) for model railroading switches. Electromagnetically controlled coils are among the most popular methods for turnout switching. The PL-10W motors from Peco*, the from Piko*, the Roco-Line motors, the Fleischmann 640000 drives, and many others move with this technology. The motors you use with this board must be specifically designed for digital operation.

This is a "layout" module for the HP100 motherboard. It must be plugged into the specific "layout" connectors of the HP100 board and is automatically identified by it. To insert the module, turn off the HP100 card power, make sure the connectors are aligned and press lightly until the module is fully inserted into the slot.

1.2 Electrical Connections

All of the following operations must be carried out with the power supply switched off.

The module automatically provides a DC voltage coming from the HP100 board and suitable to drive most of the available turnout drives, as far as they are designed to be powered by a digital decoder.

With a few simple modifications the module can be adapted for separate power supply (see DCC100 module instructions).

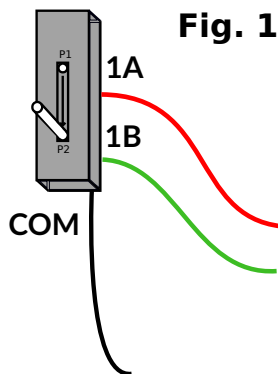


Fig. 1

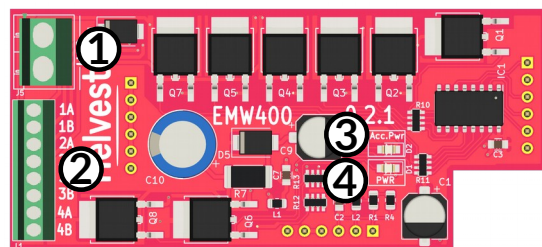


Fig. 2

The common pole (labeled with "1" in figure 2) is the same for all motors and must be connected to terminal no. 1. Both inputs of the terminal can be used for this connection.

The selection of movements depends on terminal block no. 2 in Fig. 2. The wires relative to the two positions of the same turnout must be inserted in the two outputs A and B. (e.g. 1A and 1B, or 2A and 2B and so on). To insert the wire, strip it by about 5 mm, loosen the screw in the connector, insert it into the housing and tighten the screw firmly.

Check the instructions of your motor/drive for the wires or contacts needed to power it.

WARNING: NEVER supply accessories with other power sources when connected to the EMW module, even when the EMW module is switched off!

1.3 Mounting the PCB on the layout

The complete board must be mounted in such a way that it DOES NOT touch anything during operation. In particular, it must not come into contact with any metallic or flammable material.

For temporary installations, it can be placed on a non-flammable insulating surface (plastic, glass, ceramic floor, etc...). For fixed layouts, mount it on the structure by screwing the HP-100 onto a wooden surface with the screws and spacers provided. (figure 3). This operation must be done before inserting the EMW400 module (if additional cards have already been inserted, they can be removed gently without any problems).

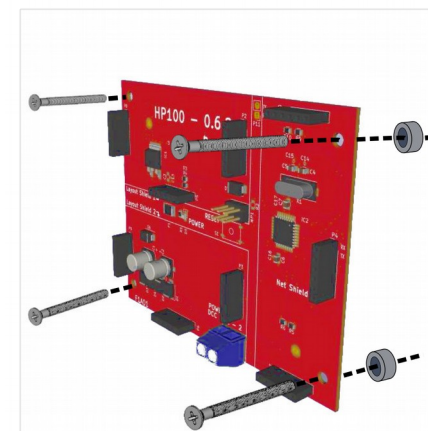


Fig. 3

2. MODULE OPERATION

2.1 Normal operation

Once all connections have been made, power up the circuit board. Green LEDs 3 and 4 indicate that the power supply is correct.

The operation modes, switching time etc. are adjustable but they depend on the installed "net" module, so check the instructions of your "net" module.

2.2 Current absorption and protection

The module supports actuators designed for digital operation. Older motors or motors designed for other uses can absorb higher currents and therefore the board does not drive them.

In any case, the module is equipped with protections against excessive current consumption; if you use a motor that requires too much current, the module does not get damaged but removes or reduces the power supply. After the interruption, the module restores its normal functionality in a few seconds.

2.3 Sequenza di movimento degli azionamenti

Il modulo esegue i comandi singoli in tempo reale, ovvero appena questi vengono ricevuti. Qualora vengano inviati più comandi contemporaneamente o in rapida successione allo stesso modulo, questi vengono eseguiti in sequenza (cioè aziona un motore alla volta nell'ordine in cui ha ricevuto i comandi).

Questo accorgimento da un lato aumenta il realismo (nella realtà gli scambi non vengono azionati in contemporanea) e dall'altro evita squilibri nell'assorbimento di corrente degli accessori evitando che l'impianto elettrico del plastico subisca dei sovraccarichi.

Drive Movement Sequence

The module executes the individual commands in real time, i.e. as soon as they are received. If several commands are sent simultaneously or in rapid succession to the same module, they are executed in sequence (i.e. it drives one motor at a time in the order in which it received the commands).

On the one hand, this measure increases realism (in the real world, the switches are not operated at the same time) and, on the other hand, it avoids unbalances in the current absorption of the accessories, preventing the electrical system of the layout from being overloaded.

3 . Troubleshooting

To troubleshoot power/wiring issues, etc., please see troubleshooting of HP100 motherboard.

Problem	Possible causes and solutions
The module is plugged in but not responding, and the power LEDs remain off.	If the HP100 board is powered (green LED on the HP100), the module is inserted incorrectly. Check for correct insertion. The module is in contact with metal parts.
Module is plugged in, power LEDs are lit, but one or more motors do not move	Check the correct connection of the motors and the insertion of the wires in the connectors. There are problems with the address assigned to the board. See troubleshooting the NET card. The motor is not working properly. If necessary, try removing the contacts and testing it with a separate power supply (battery, modeling AC transformer, etc.). NEVER try the motor with an external power supply while this is connected to the decoder! For large installations, the power provided by DCC may not be sufficient. The decoder must be powered by an external power source: see section 4.
The motor works but does not reach the end of its range	Check for mechanical obstructions on the turnout blades or moving apparatus in general. For large installations, the power provided by DCC may not be sufficient. The decoder must be powered by an external power source: see section 4.

4 . ADVANCED USE (for experienced users)

4.1 External drive power supply

When the module is used with the DCC system, the turnouts draw power from the DCC cables by default.

For large size layouts with a lot of accessories and thus many decoders, it makes sense to supply the turnouts and signals with another power source.

For this purpose it is possible to modify the DCC100 module: The procedure is explained in the DCC100 module manual in section 5.2.5. **TECHNICAL SPECIFICATIONS**

Board Type: Power module for solenoid model railroading motors,
for HP100 motherboard

Power supply:	supplied by the motherboard.
Signalling LED:	presence of voltage, presence of accessory power supply.
Voltage supplied:	Voltage from DCC, rectified in double half-wave.
Max. rated current:	2A for every actuator
Firmware HP100	>1.2

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