

Power Supply Board

Please note that this instruction is continually updated.

Occasionally check www.mollehem.se/doc/instruktioner/Instruction_powercard.pdf for the latest version.

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1 POWER SUPPLY BOARD FOR DECODERS

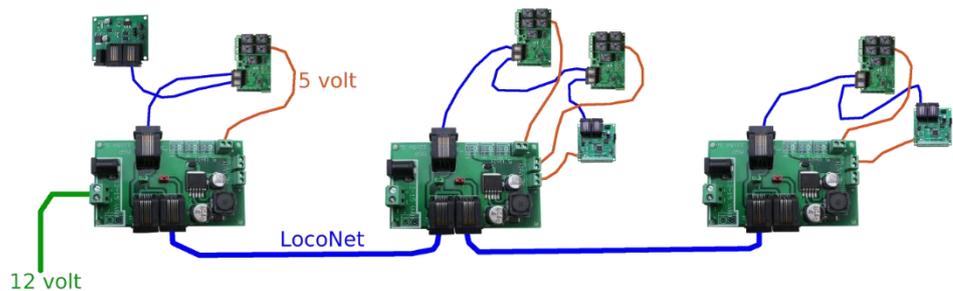
Most decoders from MGP require 5 V DC.

The decoders may be supplied by individual power supplies, or multiple decoders may be connected and supplied by a common power supply unit.

The power supply board use 12 V DC, and supplies both 12 V and 5 V. The board uses “switching technology” to transform 12volt to 5volt, meaning that the transformation is efficient, with minimal losses.

The board also has LocoNet contacts, which can distribute power between multiple boards, such that one board is fed with 12 V, while the other boards are connected either via LocoNet, or a separate power cable, so that the other boards get their power from the same source as the “main board”.

To the right is an image where 12 V is fed to one board, which is then forwarded to the other boards via a LocoNet cable.



1.1 CONNECTIONS

Two versions of the board exist

The old version has two jumpers on the board, as seen in the first image below.

The new version from late 2017 is shown in the second image below.

12 V

For output of 12 V, there is a standard 2.1mm DC contact and either one or two screw terminals, depending on board version.

These contacts can be used for both input and output of 12 V DC.

If multiple boards use the same initial power supply, the boards may be connected using either of the 12 V connections.

5 V

There are normally three pre-mounted screw terminals for supply of 5 V, with the possibility to mount up to three more.

LocoNet

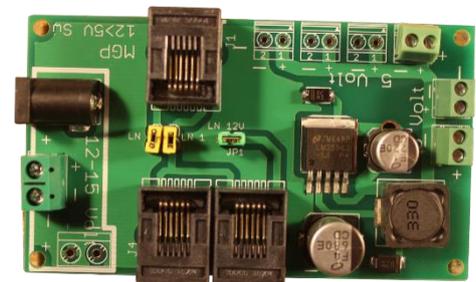
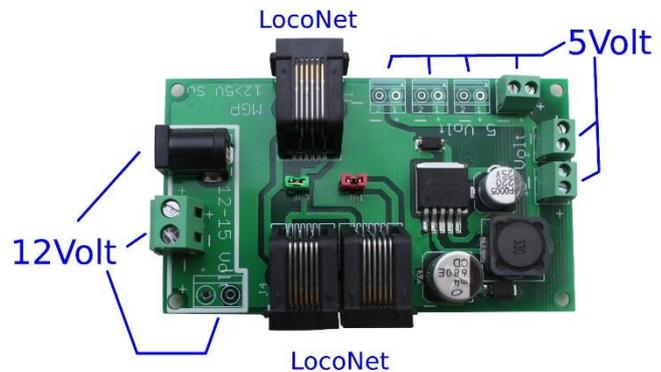
There are three LocoNet contacts.

On the older card, there are two jumpers, "JP1" and "JP3":

- "JP1" (red in the top image) connects the "power cables" ("railsync") from the LocoNet contacts to the power supply of the board. This should ONLY be used if the board is to use LocoNet for its power supply. DO NOT USE this jumper if LocoNet is connected to a train control central!
- "JP3" (green in the top image) connects both of the "railsync" wires in LocoNet. This jumper should normally be used. However, DO NOT USE it if LocoNet is connected to a train control central!

On the newer board there are three jumpers.

- "LN 12volt" connects the "power cables" ("railsync") from the LocoNet connection to the power supply of the board. This should normally be used. If not connected, the boards 12 and 5 volts connections are independent of LocoNet.
- The two jumpers LN1 and LN6 are placed next to each other and should be used together. If both of these are removed, the upper LN connection disconnected from the two "railsync" wires.
If a train control central is to be connected to this LocoNet, connect the central to the upper LN connection on one Power Supply Board. That Power Supply Board should have the LN1/6 jumpers removed.



1.2 POWER RESOURCES

Maximum power output from the 5 V connections

Each board can give up to a total of 2 A from its 5 V outputs.

One servomotor moving needs up to 0.1 A, meaning that 2 A is enough for approx. 20 servos moving simultaneously. A signal decoder powers LEDs, where one LED needs around 20 mA (0.02 A), meaning that 2 A is enough for approx. 100 simultaneously lit LEDs.

Current requirements on the 12 V input

The power in the 5 V outlets is supplied via 12 V. The transformation from 12V to 5 V operates in switched mode, meaning that losses during transformation is minimised.

A current of 2 A at the 5 V side will require an approximate current of 1 A on the 12 V input side.

This means that a power supply giving 1 A at 12 V (approx. 12 W) should be enough for a Power Supply Board. A power supply feeding three fully utilised boards thus requires 3 A (36W).

1.3 CONNECTING MULTIPLE BOARDS

Multiple Power Supply Boards can be supplied from the same power supply.

A train station divided into three separate module sections, each with decoders, should then preferably have one Power Supply Board each, connected to a common power supply.

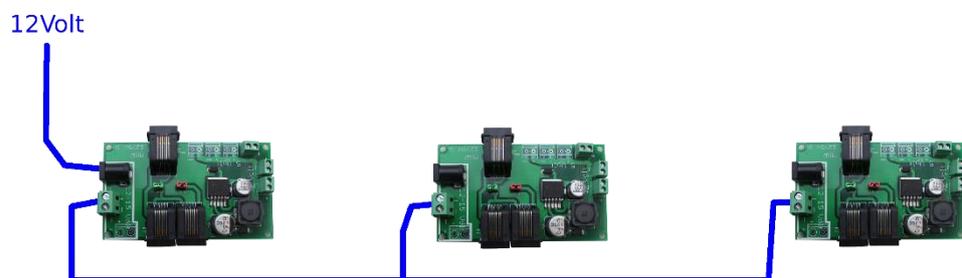
If the LocoNet used for the decoders also needs to be connected to a train control central, the power supplies of the command central and the Power Supply Boards should be kept separated.

However, if the LocoNet used for the decoders is used exclusively for this purpose, and not connected to a train control central, the LocoNet cable may be used to distribute power .

1.3.1 CONNECTING VIA 12 V CONTACTS

In the picture below the boards have a common power supply, via the 12 V. Any of the 12 V contacts can be used in this way.

ATTENTION: When the boards are connected in this way, the jumper "JP1" should be removed! This jumper connects LocoNet with the board's 12 V supply.



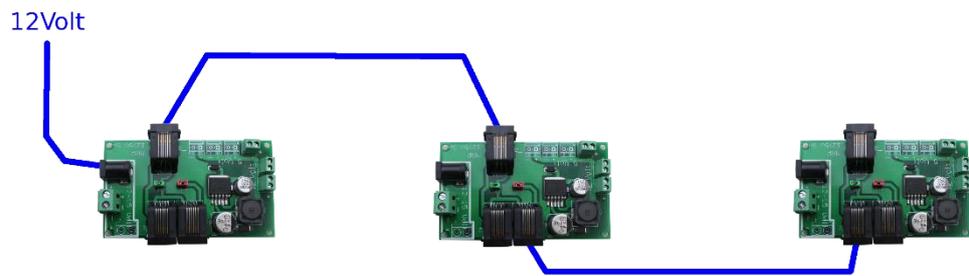
The LocoNet contacts can be used as normal LocoNet branching contacts.

1.3.2 CONNECTING VIA LOCONET

In the image below, the boards have been connected via LocoNet. These may be the same LocoNet cables that connects decoders.

The jumper "JP1" should be connected.

DO NOT connect a train control central to these LocoNet contacts.



The jumper "JP3" should be connected, as it connects two wires in the LocoNet cable, thus doubling the maximum current that can be transported in the cable.

1.3.2.1 MGP'S BOARD "POWER SUPPLY LOCONET"/"LOCONET TERMINATION"

When you use a separate LocoNet, a board for supplying current to the LocoNet signalling is used. The small board from MGP uses 12 V for this.

With the Power Supply Boards connected as in 1.3.2, 12 V is available in the LocoNet cable, and thus the "LocoNet termination" board does not need its own power supply. Connect the board to LocoNet without connecting its own 12 V and make sure that the LED is shining.