

LED-kort

Note, the documentation is continuously updated..

Check www.mollehem.se/doc/instruktioner/instruction_LEDdrivers.pdf for the latest version.

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1 DRIVER CARDS FOR LED

LEDs and signals used with Panel Cards and Signal Cards must be connected through a special drive card.

The LED cards take care of the power supply to the LEDs and no resistor should be used with the LED.

The brightness can be adjusted from the decoders.

Three different drives are available, one for 3 LEDs, "LED3", one for 6 LEDs, "LED6" and one for 12, "LED12". The cards for 3 and 6 LEDs are intended for the operation of individual signal masts, while the card for 12 LEDs is intended for control panels and if you want to separate a signal mast and its driver.

Functionally, nothing but the number of LEDs differs between the drivers. The LED cards are connected in series and cards of different types can be mixed freely.

The panel and signal decoders can handle a maximum of 64 LEDs.

If more cards are connected than what together gives 64 LEDs, it is the 64 LEDs closest to the decoder that can be used.

1.1 LED3

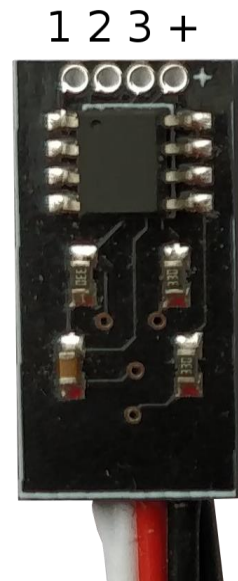
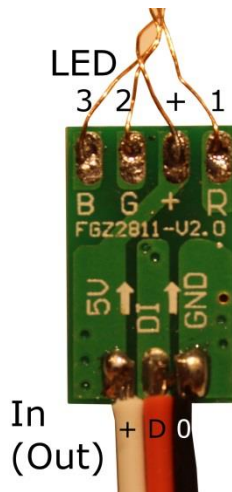
The connections are at the top as holes intended for soldering.

Anode (+) on all three LEDs should be connected to +, while cathode (-) should be connected to 1, 2 or 3.

The LEDs in a signal should normally be connected in numerical order from the top down, so "1" is then connected to the cathode (-) on the top LED.

NOTE, no resistors should be used in series with the diodes!

An older version of the card is shown in the lower picture. These cards have green circuit boards.



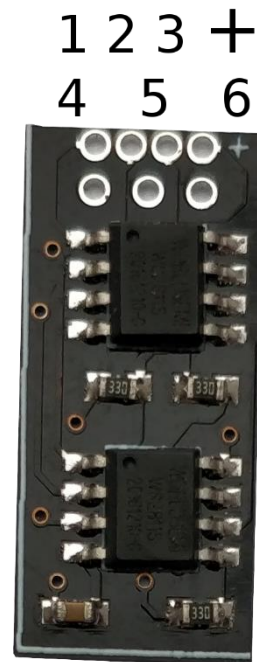
1.2 LED6

The connections are at the top as holes intended for soldering.

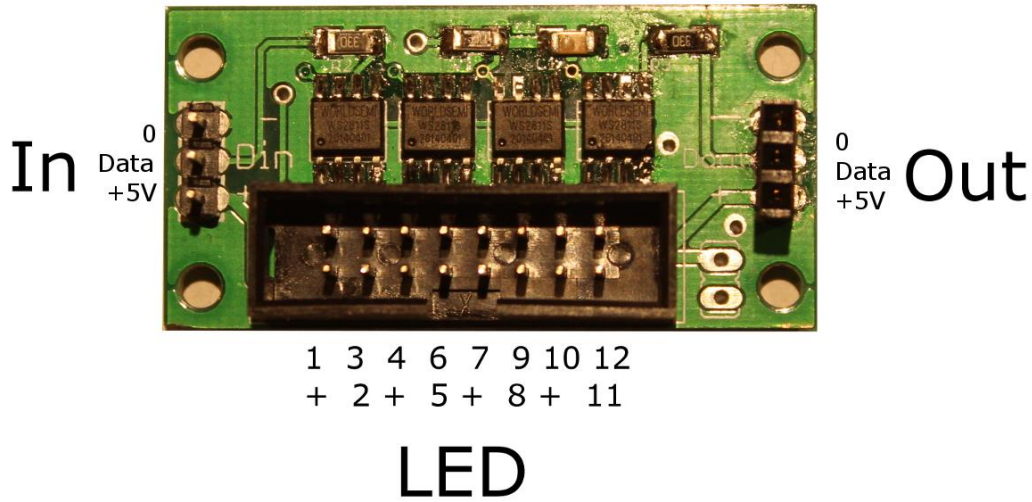
Anode (+) on all three LEDs should be connected to +, while cathode (-) should be connected to 1, 2 or 3.

The LEDs in a signal should normally be connected in numerical order from the top down, so "1" is then connected to the cathode (-) on the top LED.

NOTE, no resistors should be used in series with the diodes!



1.3 LED12

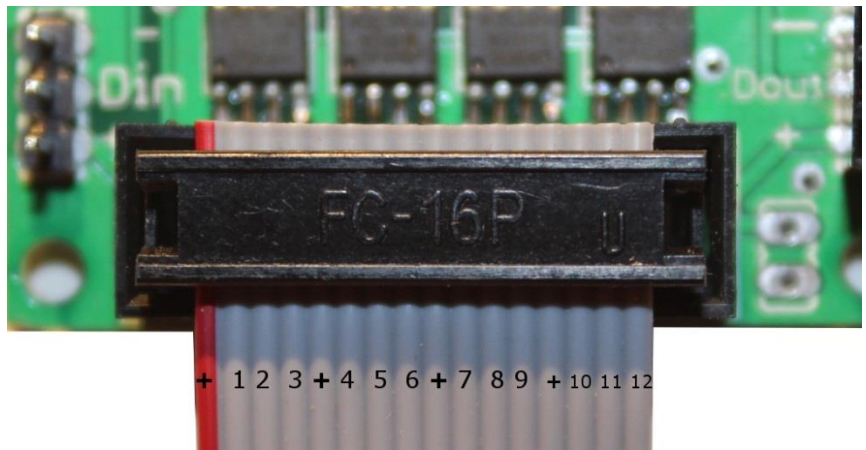


The diode connections are equipped with band cables and placed in groups of 4 (that is wires for 3 individual LEDs and common plus).

The plus wires are the same so you can use one or more of them as suited.

Anode (+) on all three LEDs should be connected to +, while cathode (-) should be connected to 1,2,3,4,5 etc.

NOTE, no resistors should be used in series with the diodes!



1.4 CONNECTION TO THE DECODER

The decoder has an output for LED cards. The connector is the same type as for the common extension cables for servos.

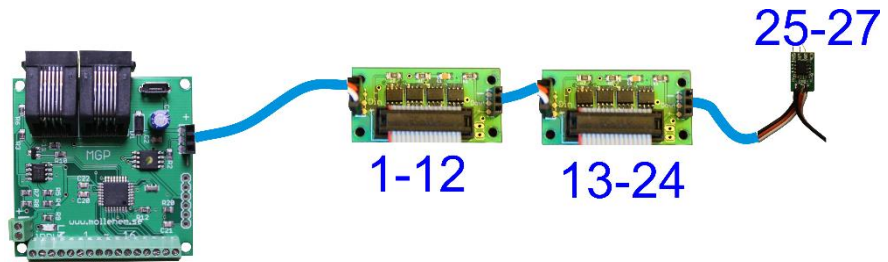
The first decoder is connected to the decoder. The servo cable from the decoder should be placed on the card's input. On LED12 it is marked "in" and on LED3/LED6 it is marked with "In".

The first driver "Out" can then be connected to "In" on the next driver.

Connected LEDs are numbered in order from the decoder, ie the LED on output 1 on the first card corresponds to LED 1 in the decoder settings.

So if for example two "LED12" are connected to the decoder, the first LEDs on the first card will be numbered 1-12, and on the second card they will be numbered 13-24.

This numbering is how the LEDs are referenced in the settings of the decoder.



LED connections on the drive board can be left unconnected but an empty connection is still counted in the numbering for the decoder settings.

1.5 CONNECTING LEDs

LEDs must be connected correctly in terms of plus and minus!

If you look at a LED with legs, one leg is longer than the other. The longer leg is plus and is called "Anode" (the shorter leg is called "Cathode").

The anode connections of the LEDs (long legs) are jointly connected to the 5 V of the drive board.

On LED3, plus is marked "+" and on LED12 it is the red marked wire in the ribbon cable and then every fourth wire.

Cathode (-) is connected to or diode connector on the drive board.

On LED3/LED6, these connections are not labeled, but the holes are starting with "1" from the left (see pictures in previous chapters).

On the older LED3 card (green), the connections are labeled "R", "G", "B" and correspond to LEDs 1, 2 and 3.

Note, no resistor should be used with the LED - the brightness is set via SV in the decoder!

1.6 CONNECTING SIGNALS

Signals to be used must have lights in the form of LEDs.

Since the plus side (anode) of the LED is to be connected to the common plus terminal of the LED boards, the signals must be connected so that it is the plus side that has a common wire, NOT the minus side.

Connecting the plus side (common Anode) is the normal way to build model railway signals, but there might be signals on the market with the opposite connection (common Cathode), so check the signals before buying them.

Many readymade signals have resistors preconnected to one or more wires. These resistors adapt the current to the LED when connected directly to a power source.

When the signal is connected to the LED board, these resistors must be cut off. The LED board itself adjusts the current through the diodes and does not need the resistance.

Begin by soldering the common plus wire of the signal to the plus on the LED driver card.

Then the respective LED's minus-wires are soldered to their connections on the LED board.

The signal lights are normally numbered in order from left to right and from top to bottom.

Thus, on a Swedish 3-light signal, the top LED wire should be connected as the first LED.

On a dwarf signal, 4 white lights sit in an approximate square. Here, "upper left" is connected as the first LED, then "upper right", "lower left" and "lower right".