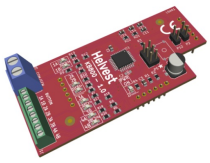
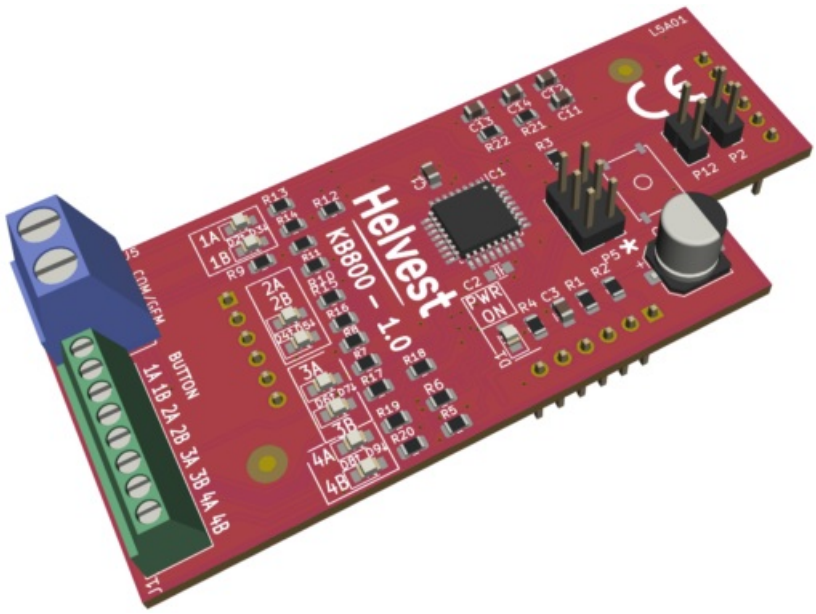


Helvest KB800-L FleX Layout Module User Manual

Contents

Helvest

Helvest KB800-L FleX Layout Module



General product presentation

KB800-L push-button and indicator lamp interface module

The KB800-L board allows digital accessories (such as switches or signals) to be controlled via pushbuttons in addition to digital control via the control unit or PC. The status of the accessory is also indicated by an indicator light (to be wired to the appropriate connectors).

It is a Layout Module for the HP100 motherboard. With DCC connection it works in conjunction with another Layout module that manages the accessories. With MVnet connection it can also manage a module on a distant decoder.
Figure 1 shows an example of use: The “Layout 2” module can be any “Layout” module of the Helvest FleX system and handles up to 4 accessories (switches or signals). Shown as an example is a module which switches a turnout.
Switches can be controlled in two ways:

- By a command signal from the control unit (DCC) or from the computer (MVnet);
- By buttons connected to the KB800-L module. In this case, a backlit pushbutton (green light) moves the turnout to the correct track, and a second pushbutton (red light) moves the turnout to deviation.

  Both the indicator light and the accessory respond to the last command received, regardless of whether it comes from the control unit, the computer or the button.

  Thus, up to 8 pushbuttons can be connected that control 4 accessories with 2 positions each, and 8 lights that indicate these positions.

This can be useful for locally moving switches or signals in the station (e.g. to perform shunting), for testing accessories during programming or during assembly, for a synoptic panel, etc.
The KB800-L module must be plugged into the “layout” connectors of the HP100 board and is automatically recognised by it.
To insert the module, switch off the HP100 board’s power supply, ensure that the connectors are aligned, and apply light pressure until the module is fully inserted into the housing.

Mounting the board on the layout

The complete board must be mounted so that it does NOT touch anything during operation. In particular, it must not come into contact with any metal material.

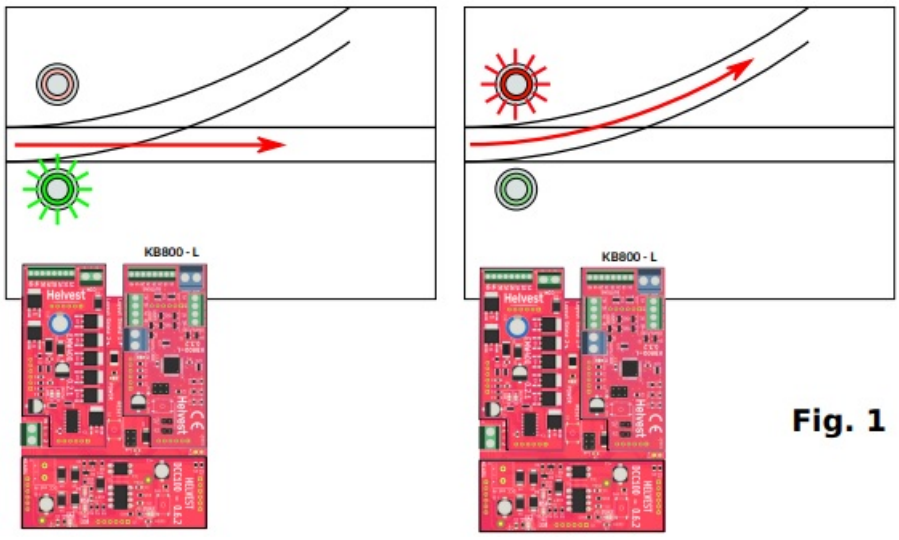


Fig. 1

For temporary installations, it can be placed on a non-flammable insulating surface (plastic, glass, ceramic floor, etc.).
For fixed model rallways, it is recommended to mount it on the layout by screwing the HP-100 onto a wooden

surface with the screws and spacers provided. This should be done before inserting the KB800-L and other modules (if additional boards have already been inserted, they can be removed gently without any problems).

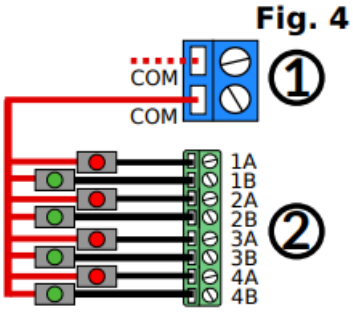
Electrical Connections

Connecting the buttons

All the following operations must be carried out with the power switched off.
Insert the module on the HP100 board, taking care to align the connectors correctly and inserting the board without forcing it.

Any type of ‘normally open’ button (i.e. one that is always off except at the instant it is held down, such as the doorbell button on houses) can be connected to the module. Eight push-buttons can be connected, corresponding to four accessories (switches, signals, etc.), each of which has two positions (straight or diverging track, red or green, etc.). The pushbuttons are connected to connectors 1 and 2 (fig. 3), as shown in figure 4. One pin of each pushbutton is to be connected in connector 2 to the specific output to be managed (black wires in the figure), while on the other side the outputs are to be connected all together and connected to connector 1 (red wires in the figure). The two terminals of connector 1 can be used indifferently (the one with the solid or the one with the hatching in fig. 4).

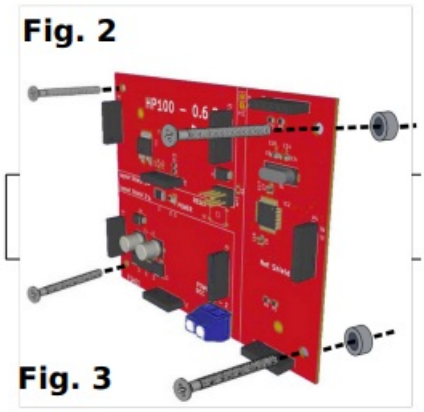
Fig. 4

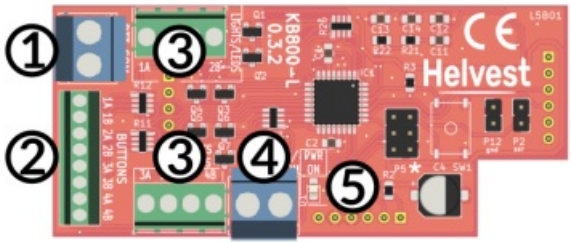


WARNING: Only pushbuttons must be connected to the KB800-L board, NOT the accessories you wish to control.

Connecting the lights

The indicator lamps showing the position of the accessory must be connected to connectors 3 and 4 (fig. 3) as shown in detail in fig. 5. Connector 4 is the common, which, for LEDs, is the positive pole. If you use bulbs, the polarity is irrelevant.
The other pole of the lights should be connected to the two “3” connectors, in the contact corresponding to the accessory it should indicate. Contact 1A corresponds to the accessory controlled by button 1A, contact 1B to the accessory controlled by 1B, and so on.





- The output for the lights provides a voltage of 12V: for the LEDs, a series resistor must be applied.
- When the decoder is switched on, these lights remain off: they are only switched on after the first movement of the accessory, either with the control unit or with the buttons.

WARNING: NEVER exchange the contacts of the accessories (terminal blocks 1 and 2) with the contacts of the lights (terminal blocks 3 and 4). This can damage the board permanently.

Connecting Helvest BT10 buttons
Each backlit BT10 series button should be connected as follows:

- One of the two black wires to connector 1 (COM): it does not matter which one.
- The other black wire to connector 2 (BUTTONS), to the desired contact 1A, 1B, 2A, 2B etc.
- the white wire to the corresponding light output of connector 3 (LIGHTS/LEDS) 1A, 1B, 2A, 2B etc.
- the blue wire to connector 4.

BOARD OPERATION IN DCC

Decoder assembly for DCC operation

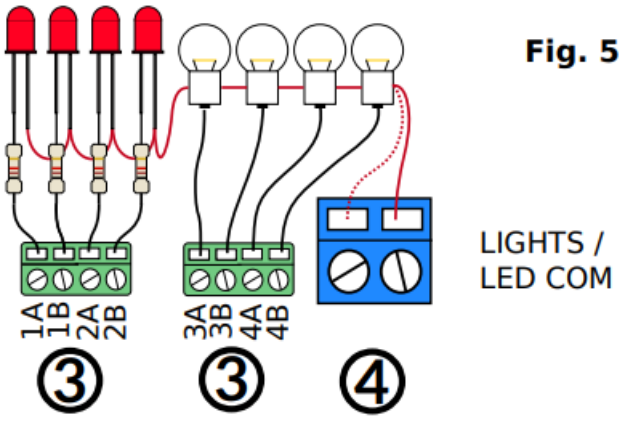


Fig. 5

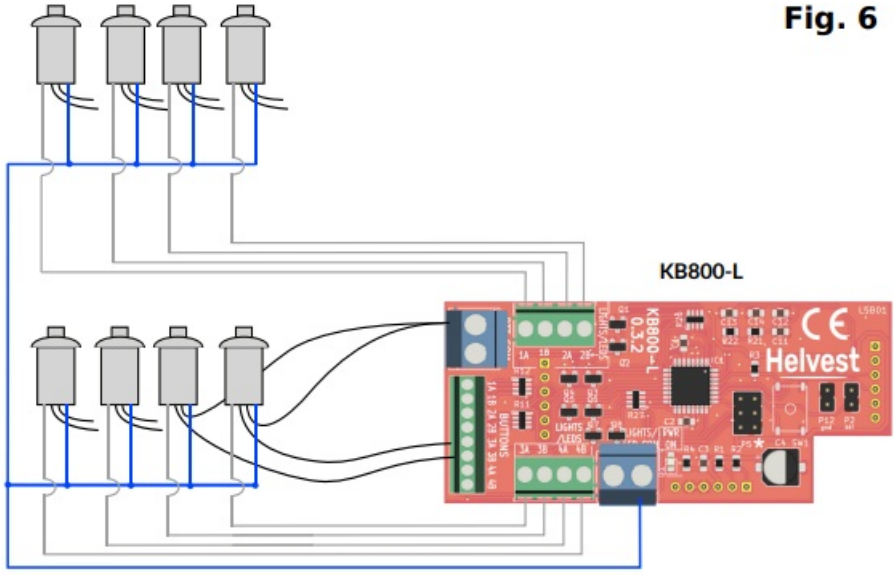
- To operate in DCC, the board must be composed as follows: HP100 motherboard;
- A DCC100 or DCC100-E module to be inserted in the “net” slot;
- A “Layout” module to manage the desired accessories (switches, servomotors, signals, etc.) (inserted in slot 1 of figure 2);
- KB800-L module (inserted in slot 2 of figure 2).

The system recognises the KB800-L module and the other module controlling the accessories on the same board and automatically associates them. It does not matter which of them is in position “1” and which in position “2”, they can also be swapped with respect to the example shown in fig. 7

The correspondence between buttons and accessories is always made in such a way that button 1A moves contact 1A of the other module, 1B moves contact 1B and so on, regardless of the DCC address assigned. Accessories (switches, signals, etc.) are to be connected to the other installed module. Buttons in position 1A and 1B will be associated with accessory 1 of the other module, those in position 2A and 2B with accessory 2, and so on.

Switching on the decoder
After having made all connections, power up the decoder. The green LED at position no. 5 ‘PWR’ lights up, indicating that the power supply has arrived correctly. The connected warning lamps all light up for an instant, indicating that the system has recognised the module and communication is active.

Fig. 6



Switching accessories.
Accessories can be switched via the digital control unit. or by pressing one of the buttons connected as above. In this case, the light corresponding to the actuated accessory is switched simultaneously.
There is no priority between DCC and push buttons: the accessory is switched according to the last command received, regardless of whether this came from the push button or the DCC.
The activation of the light indicates which command was received, it does not indicate that it was actually executed! (e.g. if a turnout motor was faulty).

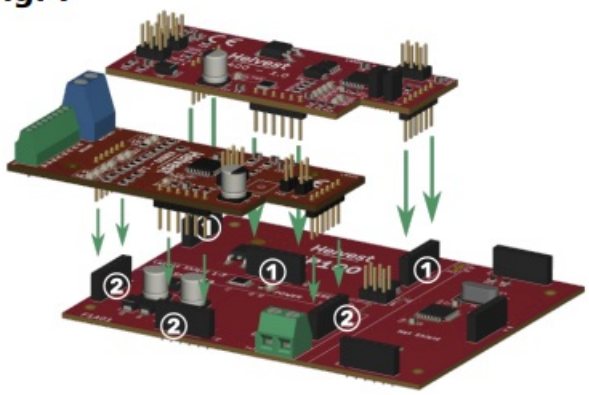
Programming
Programming the KB800-L module is not necessary. It is of course necessary to programme the addresses of the other module installed, for operation via the control unit. 4. BOARD OPERATION WITH MVnet

Decoder assembly

To operate with MVnet, the KB800-L module can be mounted on any HP100 motherboard connected to the MVnet network. The presence of a second module of any type is totally irrelevant.

Pairing of buttons with the address to be controlled
When the network is started up, the board with the KB800-L module is identified by the Lochaus To operate with MVnet, the KB800-L module can be mounted on any HP100 motherboard connected to the MVnet network. The presence of a second module of any type is totally irrelevant.

Fig. 7



Pairing of buttons with the address to be controlled
When the network is started up, the board with the KB800-L module is identified by the Lochaus

- You want to associate push-buttons 1A and 1B to an electromagnetic switch driven by a GAW400, with an output that has address 71: assign address “71” to output “1” of the KB800-L.
- You want to associate push buttons 2A and 2B with a signal driven by an ES400, with the output having address 24: assign the address “24” to output “2” of the KB800-L.
- – You want to make one push-button move three different accessories at the same time (e.g. a pair of switches and a signal): give all three accessories and the output of the KB800-L the same address.
  If you want to configure the pushbuttons to drive accessories with different addresses, such as to build routes, you must do this with your computer using your favourite management software.

Turning on the decoder
When powering up the decoder, the green LED at position no. 5 “PWR” lights up, indicating that the power supply is coming on correctly. The connected warning lamps all light up for an instant, indicating that the system has recognised the module and communication is active.

Troubleshooting

To solve power supply/connection issues etc., see HP100 board troubleshooting.

Problem	Possible causes
The module is	If the HP100 board is powered (green LED illuminated on the
switched on but does	HP100), the module is incorrectly inserted. Check for correct
not respond, and the	insertion.
power LEDs remain	The board is in contact with metal parts.Check that the card is
off.	properly inserted on the HP100.
	Switch the power off and on again.
	Check that the buttons are correctly connected.
The module is	Check that the card is properly inserted on the HP100.
plugged in, the power	Switch the power off and on again.
LEDs are lit, but the	Check that the buttons are correctly connected.
accessories do not	
move.	
The module is	The problem occurs with the other Layout module: it may not be
plugged in, the power	inserted properly, or the accessories may not be connected
LEDs are lit, the lights	properly.
switch, but the	

accessories do not react

If the above suggestions do not work, please contact us via the form on helvest.ch.

TECHNICAL SPECIFICATIONS

- **Board type:** module for accessory control via push buttons, for HP100 motherboard Input power supply for
- **logic circuit:** 5V DC, supplied by the motherboard 12V DC for lights, common anode.
- **Signalling LED:** voltage presence, Operating temperature: 0 °C – 40 °C Dimensions 80 x 35 mm
- Firmware HP100 >3.0

Documents / Resources

	Helvest KB800-L FleX Layout Module [pdf] User Manual KB800-L FleX Layout Module, KB800-L, FleX Layout Module, Layout Module, Module

References

- Helvest – Model railroading innovation