Operating instructions for the Helvest®FleX KB800 board

1. General product presentation

1.1 KB800 module for push button interfacing

The KB800 board controls digital accessories (such as switches or signals) via pushbuttons alongside digital control via the control unit or PC.

It is a Layout module for the HP100 motherboard and works in conjunction with another Layout module that controls the accessories.

An example of use is shown in figure 1: the "Layout 1" module can be any module of the Helvest FleX system and controls 4 accessories (turnouts or signals). These can be controlled either by DCC (through the DCC100 card) or by buttons connected to the KB800 module.
This can be useful to move turnouts or signals locally in the station (e.g. to perform shunting), or to test accessories during programming or during installation.

The KB800 module must be inserted in a "layout" slot on the HP100 board and is automatically recognised by the board. The system recognises the KB800 module and the other module that controls the accessories on the same board and automatically associates them. No matter which one is in position "1" and which one is in position "2", they can also be swapped with respect to the example in fig. 1.

To insert the module, switch off the power to the HP100 board, ensure that the connectors are aligned and apply gentle pressure until the module is fully inserted into the slot.

1.2 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...).
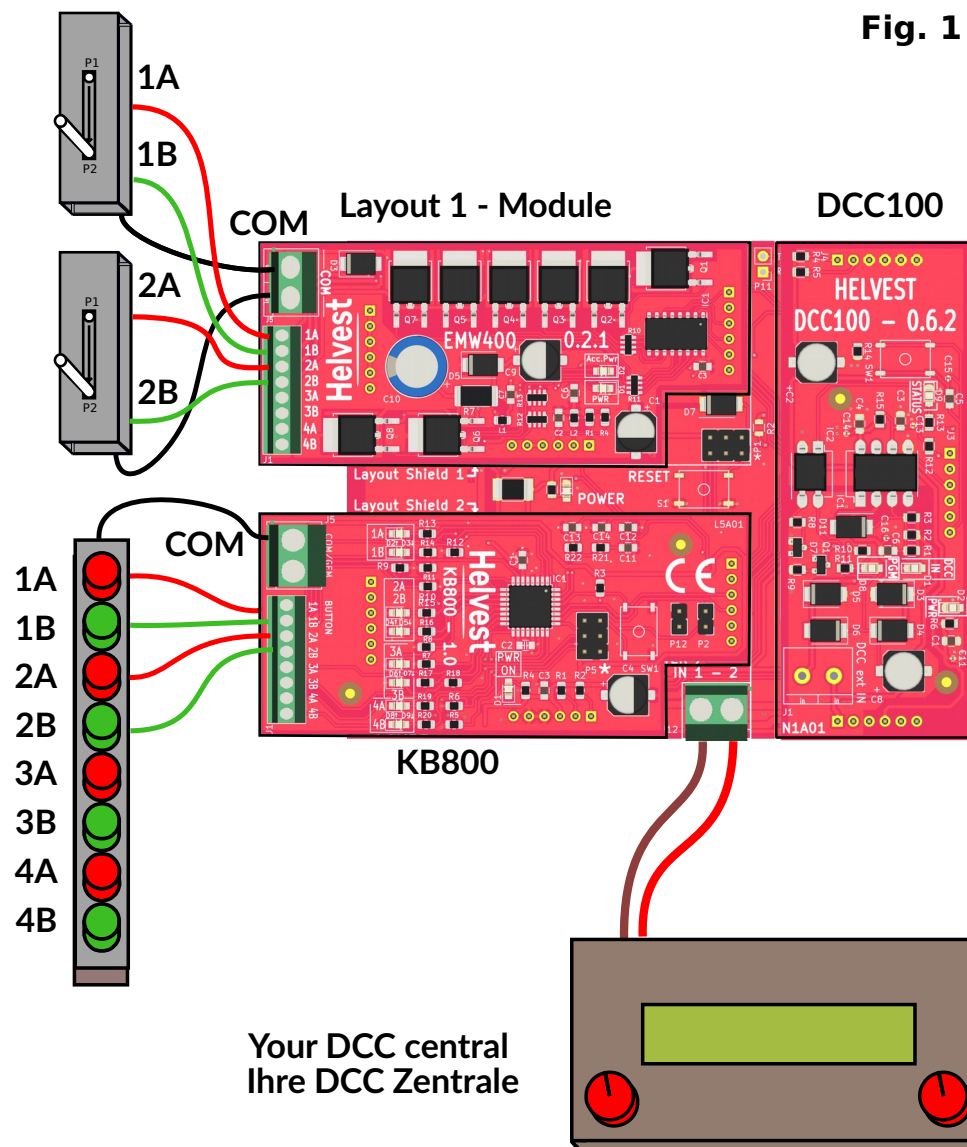

Fig. 1

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 GAW400 module (if additional cards have already been inserted, they can be gently removed without any problems).

1.3 Connecting push buttons

All the following operations must be done with 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 can be connected to the module (i.e. one that is always off except the instant it is held down, such as the doorbell button in houses). A total of eight pushbuttons can be connected, corresponding to four accessories (turnouts, signals, etc.), each of which has two positions (straigh or diverging track, red or green, etc.).

Fig. 2

Fig. 3

The buttons must be connected to connectors 1 and 2 (fig. 3). Figure 4 shows the connection in detail. One pin of each button must be connected in connector 2 to the specific output that has to be controlled (black wires in the figure), while the other terminal must be connected to connector 1 together with all the other buttons of the board (red wires in the figure). The two terminals of connector 1 can be used indifferently (the one with the solid line or the one with the hatching in fig. 4).
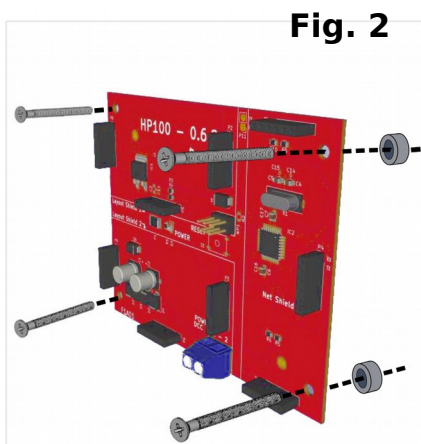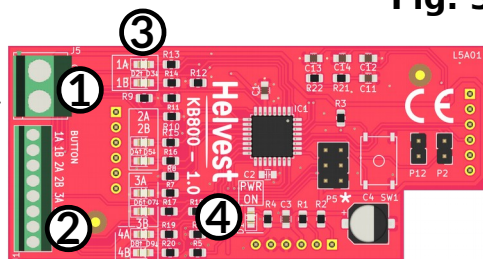
PLEASE NOTE: Only the buttons must be connected to the KB800 board, and NOT the accessories you wish to control.

1.3 Connecting accessories and DCC

Accessories (switches, signals, etc.) are connected to the other Layout 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.
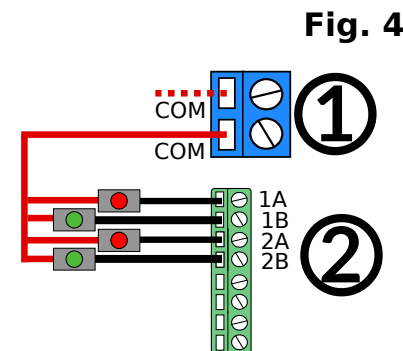The DCC signal must be connected to the terminal block of the HP100 (figure 1).

Fig. 4

2. DCC OPERATION

2.1 Switching on the decoder

Once all connections have been made, power up the decoder. The green LED in position no. 4 "PWR" will light up, indicating that the board is powered. The row of LEDs in position no. 3 lights up briefly, indicating that the system has recognised the module and communication is active.

2.2 Switching accessories.

The accessories can be controlled via the digital control unit, or by pressing one of the buttons connected to the KB100 board. In this case, LED n. 3 in fig.3 corresponding to the activated accessory turns on at the same time.
There is no priority between DCC and pushbuttons: the accessory is positioned according to the last command received, regardless of whether this came from the pushbutton or the DCC.

2.3 Programming

Programming the KB800 module is not necessary. Of course, the addresses of the other installed module must be programmed for operation via the control unit.

3. EXAMPLES OF USE

3.1 Station or freight yard control panel

The KB800 module can be used to directly control turnouts and station signals, via a self-built or commercial control panel.

One of the greatest potentialities is the simplification of shunting: if you control a shunting locomotive with a handheld device, intervening directly on the vehicles to hook and unhook, it is much more comfortable to have buttons at hand.

In complex layouts with automated systems, it is also possible to carry out shunting on secondary tracks while the trains run on the tracks managed by the control unit, software or another operator.

3.2 Accessory testing and setting

Another possibility of use is to test accessories during their installation or while programming them. Let's suppose you have installed a decoder with two modules (8 accessories), and you want to test the accessories and control their movement directly without going back and forth to the control unit. To do this, you only need to temporarily plug in a KB800 module connected to a push-button panel and perform these operations:

1. Disconnect the decoder power supply;

2. Remove the module that you **do not want** to test, and insert a KB800 module in its place: in fig. 5 it is assumed that you want to test the accessories connected to the "Layout 1" module. In this case, the module in the "layout 2" slot is removed and the KB800 module is inserted in its place.

3. Switch on the power supply

Fig. 5
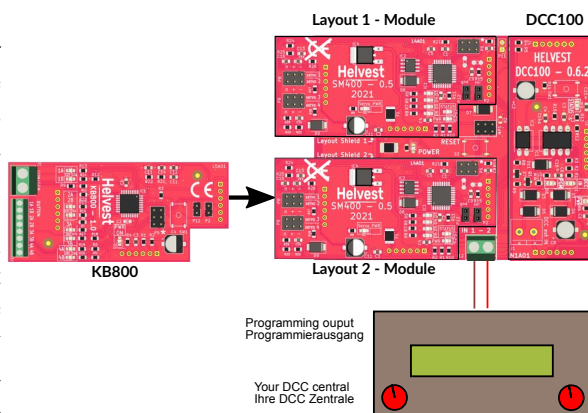
4. Using the control panel, activate the accessories and make any mechanical adjustments or similar.

5. When finished, switch off the power supply, remove the KB800 and restore the removed module.

4 . Troubleshooting

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

Problem	Possible causes
The module is inserted but not responding, and the power LEDs do not light up.	If the HP100 board is powered (green LED on the HP100 is on), the module is not properly plugged in. Check for proper insertion. The board is in contact with metal parts.
The module is plugged in, the power LEDs are on, but the accessories do not move and the yellow LEDs (no.3 fig. 3) are off.	Check if the card is correctly plugged into the HP100. Turn the power off and on again. Check that the pushbuttons are correctly connected.
The module is plugged in, the power LEDs are lit, the yellow LEDs light up when the button is pressed, but the accessories do not react.	The other Layout module might not be inserted properly or the accessories might be connected imperfectly.

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

4 . TECHNICAL SPECIFICATIONS

Board type:	module for accessory control via push buttons, for HP100 motherboard.
Input power for logic circuit:	5V DC, from motherboard.
Operating temperature::	0 °C - 40 °C
Dimensions	80 x 35 mm

Firmware HP100	>1.2