

Switch-Control

Unofficial manual

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Switch-Control Manual

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1 Switch-Control - Ability

Switch-Control is connect to a LocoNet central, for instance, an Intellibox or Daisy System, and a transformer with 12-16 V AC. It detects the state of up to 10 closing contacts, and converts this to accessory commands on LocoNet, which may in turn throw switches, signals or whole train routes, or signal LocoNet states free/occupied. Switch-Control may also monitor such commands on LocoNet, and turn on/off up to 10 lamps or LEDs reflecting the state of such accessories.

Switch-Control is therefore especially suitable for use with Switch boards, when turnouts and signals are controlled digitally. But it's also usable for own designs of automatic or semi automatic operation, just like how it was done before digital control.

1.1 Requirements

Switch-Control needs LocoNet, including a LocoNet central, for instance, Uhlenbrock Intellibox or Daisy, Fleischmann Twin Center, or a Digitrax central, or a Märklin 6021 with an adapter. A LocoNet cable is supplied with the Switch-Control, which has two sockets for connection.

The connected transformer may power several Switch-Controls, and also lights etc which are isolated from the other circuits, but may not have any connection with the digital system, nor the track.

Every event in Switch-Control generates one single LocoNet commands. If you want to affect several addresses because of one event, you must use train routes, available through Intellibox or IB-Switch.

Switch-Control is configured/programmed, either through a "simple programming" procedure, or through LocoNet programming. "Simple programming" can be done with any LocoNet central, and has restricted functionality. LocoNet programming requires an Intellibox with software 1.3 or later, a Twin-Center with software 1.1, or an IB-Control with software 1.550. When programming has been done, operation is possible with any LocoNet central (not Fleischmann LokBoss I think).

Switch boards may be bought for example from HEKI or S.E.S, but is also very easy to do yourself. A thin board, a black pen, some pushbuttons, LEDs and resistors for these is everything that is needed. In my opinion the simplest switch boards, is far superior to any row of keyboard buttons for operation.

1.2 Functions

To any of the 10 input connection a contact is connected which when operated closes the circuit to the connection "Masse". The operation may be manual or automatic, and when finished, the circuit is opened again. These input may be used so that a single press and release causes an event. But buttons may also be pressed in pairs, the first press constituting the "start", the second the "goal". This means 100 different events in all.

Each event may trigger either

0. Set an accessory to red. Address 1-2000 can be used for this, 2001-2024 may be used for routes in Intellibox.

1 Set an accessory to green, else as 1.

2 Report "free" on LocoNet for feedback address 1-2048. This may trigger routes in IB-switch.

3 As 3 but report "occupied"

4 As 1 or 2, but the state is toggled between red and green or vice versa. This may be used to save input ports, or to automatically select way in a turnout every second turn.

To each of the 10 outputs a light bulb or a LED with resistor may be connected. Each port is configured what LocoNet event (red, green, free or occupied for an address) will turn it on, and what event will turn it off. The lamps should be powered through the IB-switch.

If you use "Simple programming", the functionality is restricted. The inputs are used in pairs, as well as the outputs, so that 5 accessory addresses in series are controlled and indicated.

2 Connection

2.1 Cables etc

Connect one LocoNet cable (for instance, the included) to one of the two LocoNet sockets of the unit, and further, to a LocoNet central directly or via distributors.

Connect one transformer with 12-16 V AC, to the connections "16 V ~". This transformer may power several Switch-Control, and also lights which don't have any electrical connection with the track, nor the Digital System. **It's important that the transformer is not powering the Intellibox, Daisy nor a booster.**

The contacts used for input, should be connected between "Masse" (=ground) and any of the "Taster 1"- "Taster 10". Of course any type of instant contact may be used, manual buttons, or reed contacts, but the contacts should be isolated from the track. For instance; the contact track of Märklin C-track may be used if the return cable is connected properly, but not "home made" axle contact tracks or the like. In this case an extra relay, optocouplers, etc, be used.

Lamps and LEDs are connected between '+' and any of the outputs "Lampe 1"- "Lampe 10". The voltage of the lamps should be suitable for the transformer used.

If LEDs are used, each must have a resistor in series, with approx 1.5 kOhm. And the LED, must have the cathode (shorter leg) towards the "Lampe x" output.

As described in 4.1, All inputs and outputs belong to the same circuit. In 4.1 is described how alternating lights can be arranged using only one output connection.

2.2 Factory settings

When delivered, Switch-Control is configured so that input 1-2 control address 1, where input 1 sets "red" and 2 sets "green". Output 1 and 2 indicate these states.

The following inputs and outputs handle address 2-5 correspondingly.

This is the same setting as achieved with "simple programming" at address 1, or LocoNet programming with 10001 in LNCV 6.

3 Programming

The unit can be configured by "simple programming", or using LocoNet programming. The latter requires Intellibox, Twin-Center or IB-Control+LocoNet central, and allows for all functions. The first can be used with all other LocoNet units, and allows only for setting 5 addresses in series.

3.1 Adresses etc in LocoNet

Here we only have interest in accessory commands, and feedback signals.

Accessories, typically turnouts and signals, have addresses 1-2000. Up to 2048 is allowed. And several LocoNet centrals only handles 1-256. Addresses 2001-2024 are used to trigger routes as defined in Intellibox, if this has the add on required.

Feedback signals can typically be generated by a module monitoring a track segment and detecting any occuring train. These signals may typically be used to trigger event in an IB-switch or a computer, connected to the LocoNet. The signals can also be generated as a result of other events, for instance, in a Switch-Control or Lissy unit. The addresses used for feedback are 1-2048.

Normally a digit after the address indicates if it is a commands or a feedback signal. 0 means command red, 1 means command green, 2 means feedback "free", and 3 means feedback "occupied".

3.2 Simple programming

1. Connect Switch-Control with LocoNet of a digital system, where the first wanted accessory address may be manually controlled.
2. Disconnect the transformer from Switch-Control
3. Close the contact at input 1, and keep it closed.
4. Connect the transformer. The lamp 1 should blink now. Button 1 may be released.
6. Send a manual command to the first of 5 addresses in a series, that should be denoted to this Switch-Control
7. Now lamp 1 should be on. The programming is finished.

Example: address 7 was given:

| Address | State | Input | Output |
|---------|-------|-------|--------|
| 7 | Red | 1 | 1 |
| 7 | Green | 2 | 2 |
| 8 | Red | 3 | 3 |
| 8 | Green | 4 | 4 |
| 9 | Red | 5 | 5 |
| 9 | Green | 6 | 6 |
| 10 | Red | 7 | 7 |
| 10 | Green | 8 | 8 |
| 11 | Red | 9 | 9 |
| 11 | Green | 10 | 10 |

3.3 LocoNet programming, general

LocoNet programming 2004 requires an Intellibox with software 1.3 or later, a Twin-Center with software 1.1, or an IB-Control with software 1.550. When programming has been done, operation is possible with any LocoNet central (not Fleischmann LokBoss I think). LocoNet programming is done without disconnecting anything. However, each module connected to LocoNet must have an unique module address. The module address is factory set to 0; it's recommended to change this immediately, so that the address 0 will be free for use with the next added module of that kind. It can be a good idea to write this address on the module housing, in order not to loose the key to speaking to it.

When programming, select "LocoNet programming" at the menu. Article number is 53400, press [Enter]. Module address (0 first time), press [Enter].

From now so called LNCV number may be given to the left, and [Enter] pressed, showing the current value of that variable. It is possible to move to the right, change the value and press [Enter], and so change the value. Please note that if you go from left to right without [Enter], the value isn't read from that variable.

LNCV means "LocoNet Configuration Variable", and these variables are the ones that contain the values of the configuration.

Thorough explanation follows. AAAA means the address of an accessory, or feedback signal. In LNCV 100-199 also 2001-2024 be used for Routes in Intellibox.

E means events on LocoNet, where

- 0: If a "red" command is heard, the lamps should be turned on/off
- 1: If a "green" command is heard, the lamps should be turned on/off
- 2: If a "free" signal is heard, the lamps should be turned on/off
- 3: If a "occupied" signal is heard, the lamps should be turned on/off

C means commands to LocoNet, where

- 0: Set address to red
- 1: Set address to green
- 2: Set feedback address to free
- 3: Set feedback address to occupied
- 4: Set address to red if it was green, and to green if it was red.

| LNCV | Description | Factory set |
|-------|--|---|
| 0 | Module address | 0 |
| 1 | Programming aid contact 1+2 and lamp 1+2: | Write only |
| 2 | Programming aid contact 3+4 and lamp 3+4 | Write only |
| 3 | Programming aid contact 5+6 and lamp 5+6 | Write only |
| 4 | Programming aid contact 7+8 and lamp 7+8 | Write only |
| 5 | Programming aid contact 9+10 and lamp 9+10 | Write only |
| 6 | Programming aid general | Write only |
| 10 | Lamp 10 on: AAAAE | 51 |
| 11-19 | Lamp 1-9 on: AAAAE | 10,11,20,21...50 |
| 20 | Lamp 10 off: AAAAE | 50 |
| 21-29 | Lamp 1-9 off: AAAAE | 11,10,21,20,...51 |
| 1xx | Single press x triggers function: AAAAC | 10,11,20,21,..50,51 for x=1,2,3,4,...9,0 |
| 1xy | Press x plus y triggers function: AAAAC x,y are different, 0 means button 10. | 0 |

3.4 Commands

If one input contact is pressed/closed, and then another, and then both released, a start-goal operation has been performed. The first contact is called start contact, the second goal contact. It obviously makes sense to use this on a switch board, just press from where to where, and the system knows your needs, and routes may be set. As there are 10 inputs, and each may be combined with 9 others, there are 90 such combination. In addition, the 10 obvious single press functions may be used as well, making 100 combinations. Switch Control is able of producing different command for each of these combinations. I have my doubts if you have capacity of configuring that number of routes, and probably not all makes sense. A simple turnout for example, what does it mean with a route from one branch to the other?

LNCVs for commands are from 100-199; first digit is 1, second is start, and third is goal.

If start and goal is the same digit, it means a single press function. And 0 stands for input 10. So the single press commands are set in LNCV 111,122,133,144,155,166,177,188,199 and 100, as address followed by 0-4, see 3.3

3.5 Turn lamps on and off for indication

Switch-Control listens on LocoNet for accessory commands and feedback signals. If such a command or signal matches LNCV 10-19, the corresponding lamp output is set on, and any connected lamp lights up.

If a command or signal matches LNCV 20-29 instead, the corresponding lamp output is set off, and any connected lamp goes dark.

Notes that this is fully independent of what how the inputs are configured. You may for example control turnouts at addresses 20,22,25,26,29, and let the output which of the signals 30-39 that show red, or which feedback signals 77-86 show "occupied".

Note also, that the LNCV number tells what input/output we speak about, 11-19 and 21-29 correspond to 1-9 and 10/20 correspond to no 10.

3.6 Programming aid

There are shorthands available for standard setups. LNCV 1-5 are used if you want to use inputs as pairs and outputs as pairs to control each one accessory. Just enter an accessory address 1-2024 in LNCV 1-5 to tell what pair 1-5 should handle.

For example, if address 7 is written to LNCV 2, input 3+4 and output 3+4 are affected, described as

| LNCV | Value | Description |
|------|-------|--|
| 13 | 70 | If address 7 gets "red" command, lamp 3 goes on |
| 14 | 71 | If address 7 gets "green" command, lamp 4 goes on |
| 23 | 71 | If address 7 gets "green" command, lamp 3 goes off |
| 24 | 70 | If address 7 gets "red" command, lamp 4 goes off |
| 133 | 70 | Contact 3 sets address 7 to "red" |
| 144 | 71 | Contact 4 sets address 7 to "green" |

LNCV 6 is used for reset, and some other general settings.

| LNCV 6 | Description |
|--------|---|
| 1-10 | Reset all LNCVs that describes input 1-10, and output 1-10. That is, if 3 is entered, LNCV 13,23,13x and 1x3 are cleared. |
| 11 | Resets/clears all values except module address (LNCV 0) |
| 1AAAA | Programs the module so that the modules contacts and lamps are used in pairs for address AAAA to AAAA+4. This is the same as is achieved with "simple programming". |
| 2AAAA | Programs the module so that the modules contacts operates address AAAA to AAAA+9 by toggling between red and green. The lamps are on when "red". |

4 Hints

In the German manual there are two useful figures, explained here.

4.1 Single button indication

Using C=4 in LNCV 100-199 saves money, as a single button operates a double coil accessory, by toggling. In order to show the state of these 10 possible accessories, 20 lamps are needed, but only 10 outputs available. The schema shows a way to have two lamps on one output so that either the red is shown, or the green. Only a cheap transistor and resistor is needed. The circuit depends on that that all inputs and outputs (except the AC ~) form an electric circuit.

The circuit works so that when the output is on, that is, drains the current from + through the red lamp, which is lit. The output also set the base of the transistor to near 0 V, which blocks it.

When the "output" is off, it is open, letting a little current through the red lamp to the transistor base make the transistor leading, which allows a significant current to flow through the green lamp.

4.2 Lamp shared by several routes

The last figure show a circuit where there are four possible routes, and the four lamps are lit by each two of these routes. The lamps show the routes rather than the position of the turnouts. The problem is solved simply (and cheaply) by using 8 diodes. Variations possible of course.