



**SL-50 ACCESS CONTROL**  
**INSTALLATION GUIDE**

The SL-50 is an access control unit based on iButtons™ (touch memories). To install the complete system you will need the following parts:

- The SL-50 controller itself (this is a populated PCB (OEM version) or a metal cabinet with or without the AC power stage)
- MASTER iButton (only for SL-50A)
- one or more DS1990A iButtons
- touch contact
- reed sensor for monitoring the door
- pushbutton
- electric door strike
- a SNUBBER network
- SL-50 installation guide (this)
- SL-50 user manual

The installation method depends on the version of the unit. We will start with the most complicated, the OEM version.

## INSTALLING THE OEM VERSION

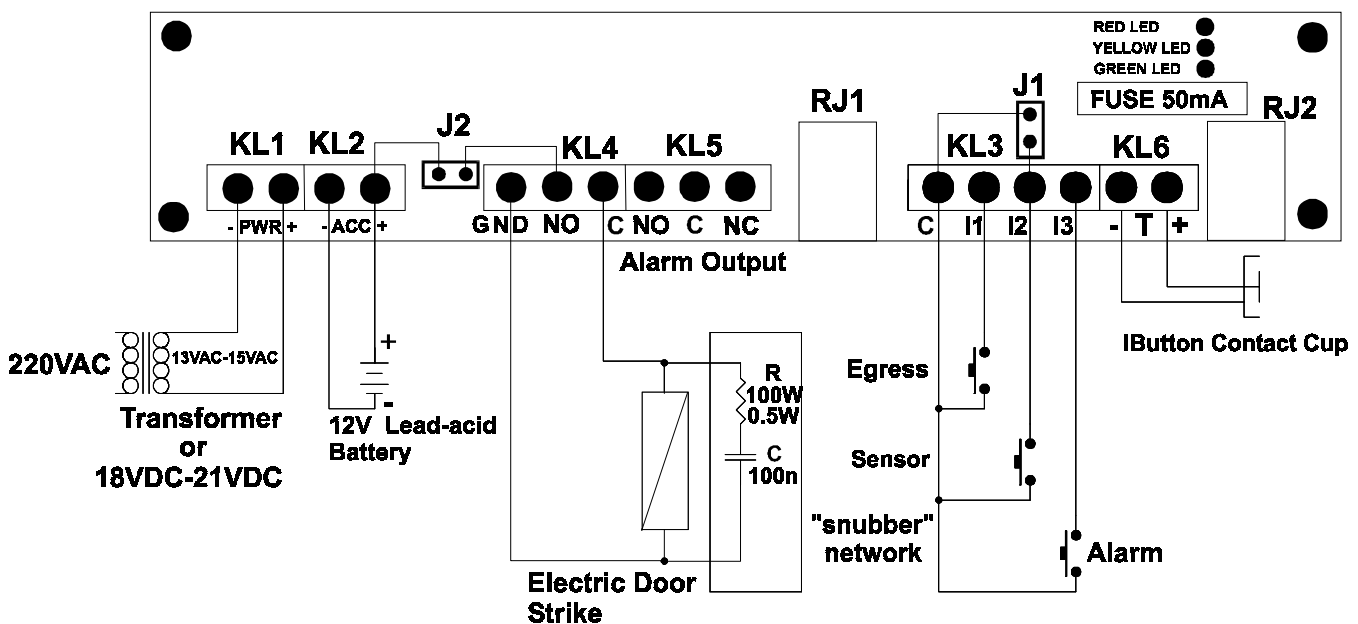
The OEM version contains only the populated PCB of the SL-50 controller board. The board has to be connected in the following way:

### 1. MOUNTING THE BOARD

There are four mounting holes in the corners of the board, which should be used to fix it in place. It's a tightly packed PCB so take care not to make any short circuits with the screws or nuts. You should always use insulating washers under the screw heads.

### 2. BATTERY

A 12V lead-acid battery should be connected to the terminals marked ACC taking EXTREME care of the polarity. The capacity should be at least 1.3Ah but preferably higher, if you want a longer autonomous working period.



### 3. POWER

Power is applied to the screw terminals marked PWR (either AC or DC).  
 DC voltage: 18VDC to 21VDC  
 AC voltage: 13VAC to 15VAC

If the voltage is lower than indicated, the battery will not be charged properly and the unit may stop working right after a power cut.

If it is higher, the voltage stabilizer may overheat, causing thermal shutdowns, which again lead to longer charging times.

#### 4. CONNECTING THE ELECTRIC DOOR STRIKE

The electric door-lock (strike) is connected to the terminals 'NO C'. These two terminals are the common 'C' and normally open 'NO' contacts of the relay. This means that a suitable external voltage needs to be supplied. It is simplest to use a 12VDC door strike mechanism, then the existing 12V battery can be used to power the lock with RELAY1 breaking or closing the circuit. If it isn't important for the lock to work during power cuts, then an AC voltage could be used. The advantage of this is that the open state of the lock would be clearly audible.

##### 4a. POWERING THE DOOR STRIKE FROM THE MAIN BATTERY

One side of the door strike solenoid is connected to the screw terminal marked GND (KL4), the other to the one marked (C). The jumper marked J2 should be set in this case, since this connects the NO pin of the relay to the 12VDC of the battery. If the solenoid of the door strike has a built in flyback diode then it is important to note its polarity and connect the solenoid accordingly. The (C) is the positive, (GND) is the negative terminal.

**IMPORTANT:** INDUCTIVE LOADS (I.E. DOOR STRIKE SOLENOIDS) GENERATE LARGE VOLTAGE SPIKES (ELECTROMAGNETIC INTERFERENCE) WHEN THE CURRENT THAT GOES THROUGH THEM IS BROKEN. THIS CAN CAUSE THE CONTROLLER (AND ANY OTHER PROCESSOR-BASED SYSTEM IN THE VICINITY) TO "FREEZE". THE ONLY REMEDY IS TO DISCONNECT THE POWER AND THE BATTERY FOR A FEW SECONDS AND THEN RECONNECT. IN ORDER TO AVOID THESE MALFUNCTIONS IT IS NECESSARY TO CONNECT A SO-CALLED "SNUBBER" NETWORK PARALLEL TO THE DOOR STRIKE SOLENOID. THE SNUBBER SHOULD BE MOUNTED NEXT TO THE SOLENOID, NOT NEXT TO THE CONTROLLER BOARD. THIS NETWORK IS MADE UP OF A 100ohm RESISTOR AND 100nF CAPACITOR CONNECTED IN SERIES. (THIS IS SUPPLIED WITH THE UNIT.)

##### 4b. POWERING THE DOOR STRIKE FROM A SEPARATE SOURCE

If the door strike solenoid (or other actuator) is powered from a different source, you should take off the short from jumper J2. The NO (normally open) and C (common) contacts of or relay RL1 are used to make or break the current.

#### 5. THE IBUTTON CONTACTS

The terminals marked '- T +' are for the iButton contact. The center of the contact should be connected to the '+' terminal, the edge to the '-' terminal.

### INSTALLING VERSION 2

In the case of version 2 (without the 220VAC stage), the installation consists of steps 3, 4 (4a or 4b) and 5 from the previous section (installing the OEM version). At the end, you should attach the cabinet to the wall. This should be done by marking the places on the wall where the mounting holes will come and drilling holes. The holes should be  $\phi 8\text{mm}$  for concrete (with wall-plug) and  $\phi 3\text{mm}$  for wood.



### INSTALLING VERSION 1

In the case of version 1 (with the 220VAC/14VAC stage), the installation includes the following steps from the previous stage: 4 (4a or 4b) and 5. When you've done this, you have to connect 220VAC (with protective ground). The cable should be fed through hole HL (Fig. 3). The live wire should be connected to the screw terminal (ST) marked with the letter F. The neutral wire to the terminal marked with '0', the protective ground to

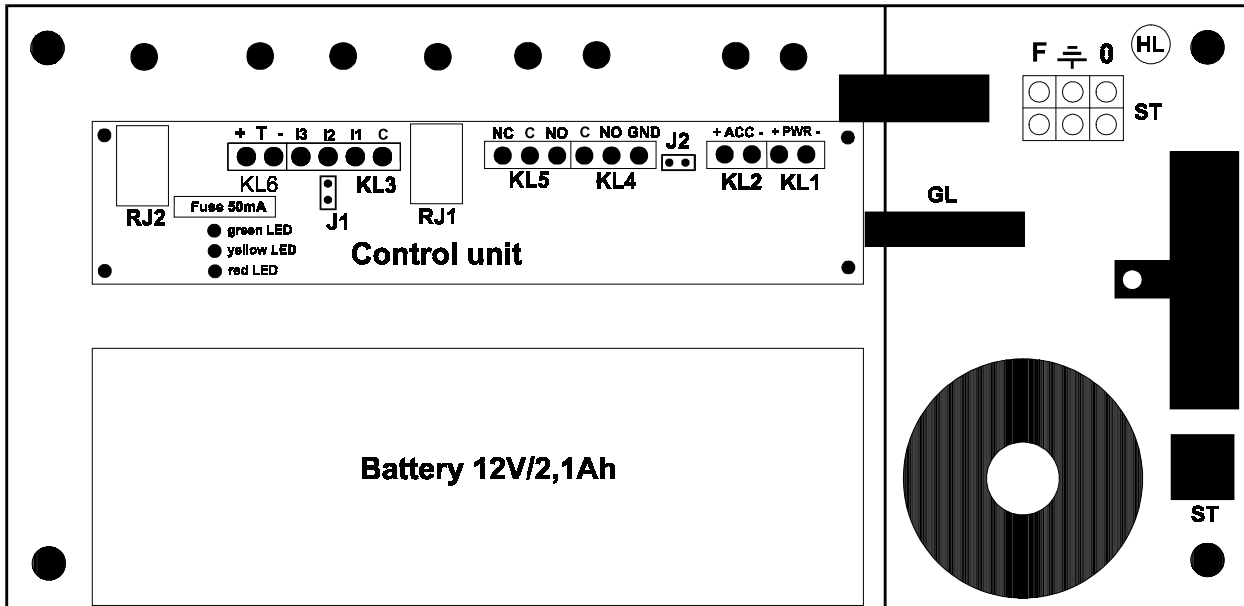


Fig. 3.

the middle screw terminal marked with the ground signal. DO NOT CONNECT THE OTHER END OF THE POWER CABLE TO 220V UNTIL YOU HAVE DONE ALL THE PREPARATIONS DESCRIBED HERE. As a final step affix the cabinet to the wall as described earlier. Now you can connect the far end of the power cable to 220V. If you did everything correctly, the signal lamp (GL) should start to glow. If this doesn't happen, have a look at the troubleshooting section at the end of this manual.

## THE INPUTS AND THE ALARM OUTPUT

### INPUTS

The input terminals have the following markings:

- I1 EGRESS (unconditional activation of the door-relay)
- I2 SENSOR (door status)
- I3 ALARM input

Do not connect any external voltages to these inputs. The state of each input is determined by whether it is connected (shorted) to the common terminal 'C' which is next to the I1 terminal.

#### I1: EGRESS INPUT

A short circuit on this input has the effect of activating the door strike relay. The relay will be activated for around 5 seconds or until the door is opened (whichever comes first). The EGRESS input does not have to be shorted for the whole duration the lock is open, a short pulse is enough. This input is meant to be used with a push-to-make button.

#### I2: THE DOOR-SENSOR INPUT

Connect a reed-sensor or microswitch here. The input should be a short circuit when the door is closed and open when the door is ajar. If the sensor input is not used, it should be shorted with a piece of wire. This is very important because the door-lock relay will not be activated if the door is sensed to be 'open'. (This is to conserve battery power.)

#### I3: ALARM INPUT

This input is to be used with a push-to-make pushbutton. Shorting this input will unconditionally activate the ALARM output.

## RELAY1 (DOOR-LOCK)

This relay has an N.O. (normally open) contact.

It is activated in the following cases:

- An active iButton is touched to the contact (active = in the table)
- The EGRESS input is shorted

In both cases the relay is activated for approximately 5 seconds unless the door is opened sooner (the sensor input is opened).

**IMPORTANT:** IF THE SENSOR INPUT IS NOT USED IT SHOULD BE SHORTED (JUMPER J1). THE DOOR-LOCK RELAY WILL NEVER BE ACTIVATED IF THIS IS NOT DONE !!

## RELAY2 (ALARM)

Both the N.O. and N.C. contacts are used. It is activated in the following cases.

- The door-sensor is open but the door-lock relay had previously not been activated either by an active iButton or the EGRESS switch
- The alarm input is active (shorted)

## TROUBLESHOOTING

<b>Symptom</b>	<b>What to check?</b>	<b>What to do?</b>
you connected the power cable to the ST screw terminal but the signal lamp doesn't glow	Did you connect the other end to 220VAC?	Connect the other end of the power cable to 220VAC with protective ground lead.
the unit is definitely connected to 220VAC but the signal lamp doesn't glow	Is there a fuse in the fuse holder?	Put a fuse in the fuse holder (300mA slow)
There's a fuse in the fuse holder but the signal lamp doesn't glow.	Check the fuse. Has it blown?	Put a good fuse into the fuse holder.
The fuse is OK but the lamp still doesn't glow.	Disconnect the unit from the main voltage and check all the connections in the power stage.	If you found nothing suspicious contact us.
The lamp glows but the unit is not working as expected.	Check the voltage on KL1 – it should be around 17VAC.	If the voltage is substantially lower than 17VAC, either the transformer is faulty or the mains voltage is lower than 220VAC
The lamp is glowing, the voltage on KL1 is 17VAC but the unit is not working.	Check the voltage on KL2 – it should be between 10.5VDC and 13,5 DC.	If the voltage is less than 10.5VDC the battery is very flat (wait to see if it will rise eventually) or faulty.
The unit doesn't read iButtons.	Check the fuse on the PCB.	If it has blown, replace it (50mA, fast)