Technical & Troubleshooting Guide
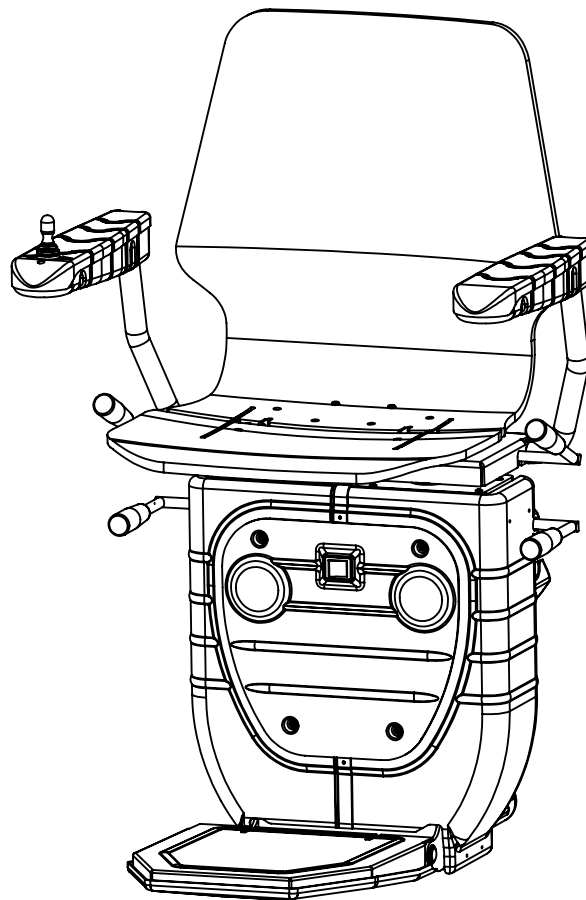
THE INFINITY STAIRLIFT

contents

How is the lift build up

Controls

There are multiple controls the user of the lift needs for operating the lift. In this section the location and usage of each control will be explained.

Joystick

The joystick is located on top of one of the armrests. It can be used to drive the lift, the lift will move in the direction the joystick is activated.
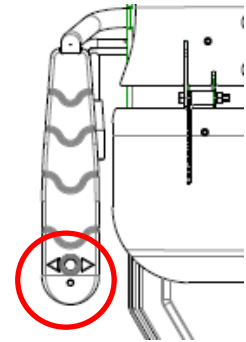
LED

The LED is a green LED that is located in front of the joystick. The LED is used to indicate if the lift is on. While driving the LED will flash.
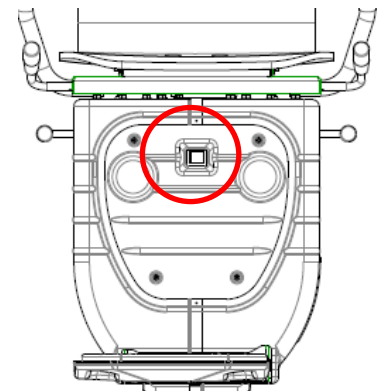
Key switch

The key switch is located on the bottom side of the armrest with the joystick and the LED. The key switch is used to prevent unauthorized usage of the lift. The key switch has an on and an off position and in both positions the key can be removed.
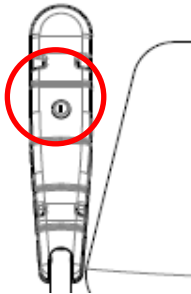
Holiday switch

The holiday switch is located on the front of the carriage and is bright orange. The holiday switch is used to turn off the complete lift. This switch should only be used if the lift will not be used for multiple days.

Buzzer

The buzzer is used to communicate with the user. For example the lift gives an audio signal when starting to move. Or various error codes which we will explain later.

Safety switches

There are multiple safety switches in the lift to ensure safe working of the lift. In this section the location and function of the different safety switches will be explained.

Chair switch

The chair switch is located in the upperpart of the mainframe. The switch checks if the chair is in the neutral position before the lift is allowed to move.

Overspeed Safety Gear (OSG)

The OSG switch is located in the bottom skate. The switch checks if the OSG is in neutral position. When the OSG is engaged the lift is not allowed to make any movement.

Overspeed friction wheel

A reed contact (magnet sensor) is placed to make sure the friction wheel is turning. The reed contact is placed in the bottom skate. There are two magnets in the friction
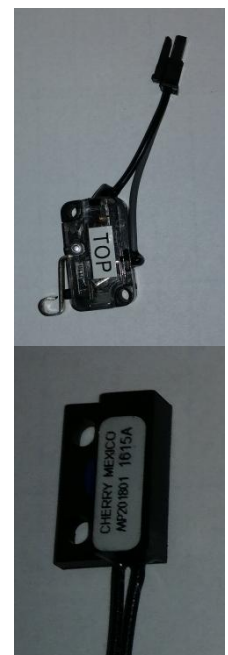
wheel that the reed contact sees, the magnets are turning and the reed contact is stationary. Every time a magnet passes the contact is made.

Safety line left/right

Various switches have been placed throughout the lift on the left and right side. These switches make sure there is no entrapment when moving up or down the stairs. The exact location of each of these switches can be found in the next section about the electrical diagram.

Electronics

The lift is controlled by a printed circuit board (PCB) and a cable harness connects all the controls and switches. In this section the electrical diagram and the important parts of the PCB will be explained.

Electrical diagram

In the diagram on the next page you can see the connectors on the PCB and the color-coded cables. Each connecter and its cable will be explained, also the location of each switch will be shown.

Mainframe

The mainframe connector is a 4-way Molex Mega-Fit. This cable connects the batteries with the PCB. The holiday switch switches the positive wire (red) and the charge point (brown). The ground cable (black) is connected to the frame and to the batteries. A 30A fuse is placed between the batteries.

Mainframe 2

The second mainframe connector is a 6-way Molex Micro-Fit. This cable has three safety lines: the chair (see picture below), left and right safety. The chair safety are the two orange cables and are connected, with the use of a 2-way Molex Micro-fit, to a micro switch. The safety left are the two green cables and are connected to two pushbuttons located on the left side of the mainframe. The safety right are the two blue cables and are connected to two pushbuttons on the right side of the mainframe.
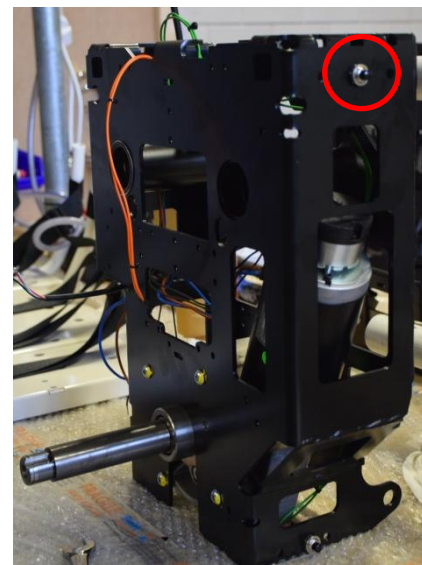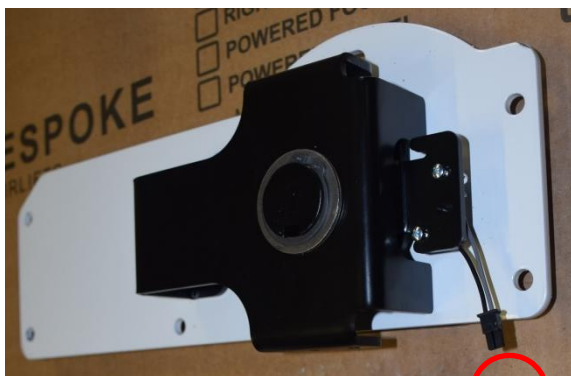
Chair

The chair connector is a 6-way Molex Micro-Fit. This cable is divided in two sections that are connected with again a 6-way Molex Micro-fit. One part is in the mainframe, this piece is made out of 5 separate wires. The other part is attached to the chair and is made out of one cable with five

cores. The cable is divided because the unit and the chair are shipped in separate boxes, during installation the cables need to be connected.

The cable is made up out of 5 wires with the following functions:

- Wire 1/red is the main positive
- Wire 2/green is the joystick left
- Wire 3/black is the ground of the LED
- Wire 4/orange is the ground of the key switch
- Wire 5/blue is the joystick right
- Position 6 is empty in the connector

The main positive wire is split in three wires and is soldered to the joystick, LED and key switch.

Bottom skate

The bottom skate connector is a 10-way Molex Micro-Fit. This cable has three safety lines (OSG (see picture below, sensor placed on the right), left and right), the charge point and a sensor that checks the OSG wheel (see picture below, sensor placed on the left). The OSG safety are the two orange cables and are connected, with the use of a 2-way Molex Micro-fit, to a micro switch. The safety left are the two green cables and are connected to a pushbutton located on the left side of the bottom skate. The safety right are the two blue cables and are connected to a pushbutton located on the right side of the bottom skate. The charge point are the red and black cable and the two grey cables are connected, with the use of a 2-way Molex Micro-fit, to a reed contact.
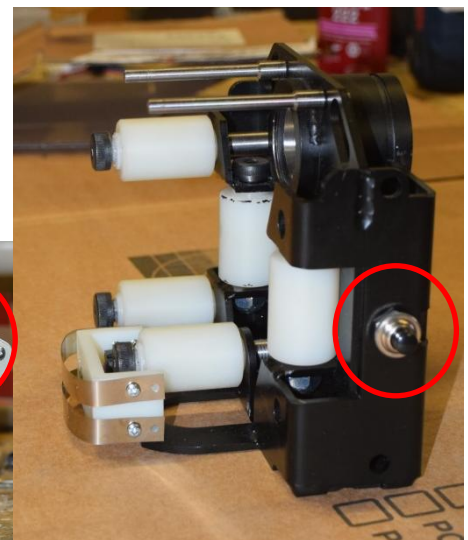
Upper skate

The upper skate connector is a 4-way Molex Micro-Fit. This cable has two safety The safety left are the two green cables and are connected to a pushbutton locat of the upper skate. The safety right are the two blue cables and are connected to a pushbutton located on the right side of the upper skate.
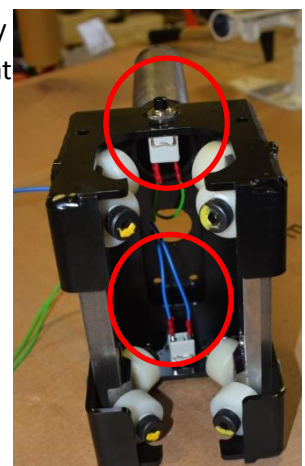
Footrest

The footrest connector is a 4-way Molex Micro-Fit. This cable is made out of one cable with four cores and has two safety lines, left and right. The safety left are wire 1 and 3 and are connected to a pushbutton located on the left side of the footrest. The safety right are wire 2 and 4 and are connected to a pushbutton located on the right side of the footrest.

Traction motor 2

The traction motor 2 connector is a 4-way Molex Micro-Fit. This connector is the encoder of the traction motor. Red is the positive, black is the ground and green and white are the two signal cables.

Traction motor

The traction motor connector is a 4-way Molex Mega-Fit. This connector powers the motor and controls the brake of the motor. The blue and the brown wires are the power wires and the two black wires are for the brake.

Black Groundbattery

Red Battery Positive

Brown Chargingpoint

Brown

Mainframe_2

Blue

Orange

Orange

Blue

Green

Green

MAINFRAME

Safety Chair
Safety Right
Safety Left

Chair

Black nr.2   Joystick left
Black nr.3   LED Ground
Empty
Black nr.5   Joystick right
Black nr.4   Keyswitch Ground
Black nr.1   Main Positive

Red

Bot.Guidance

Red   Chargingpoint positive
Black   Chargingpoint negative
Grey   Encoder
Grey
Orange   Safety OSG
Orange
Blue   Safety Right
Blue
Green   Safety Left
Green

Up.Guidance

Blue
Blue   Safety Right
Green   Safety Left
Green

Footrest

Black nr.2
Black nr.4   Safety Right
Black nr.3   Safety Left
Black nr.1

Tractionmotor

Tractionmotor_2

Green
White
Black
Red

Encoder

Blue   Move 1

Brown   Move 2

M Motor

Black   Brake

B Brake

Black   Brake

PCB

The PCB has nine Molex connectors (three Mega-Fit and six Micro-Fit), two headers, four dipswitches and three buttons.

1. 4-way Mega-Fit for add-ons
2. 4-way Mega-Fit mainframe
3. 6-way Micro-Fit mainframe 2
4. 6-way Micro-Fit chair
5. 10-way Micro-Fit bottom skate
6. 4-way Micro-Fit upper skate
7. 4-way Micro-Fit footrest
8. 4-way Micro-Fit traction motor 2
9. 4-way Mega-Fit traction motor
10. Header for programming main board
11. Header for programming remotes board
12. Dipswitches
13. Pushbuttons
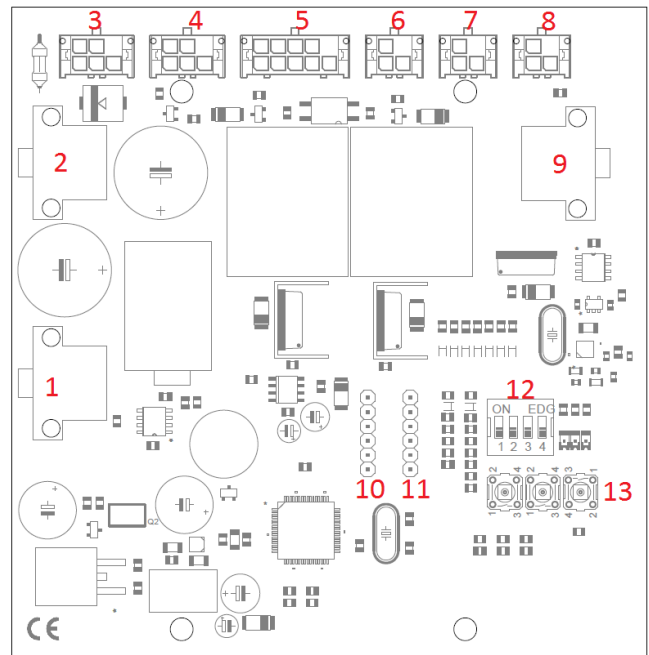
The Mega-Fit for add-ons is to connect add-on PCBs, for example the powered swivel. Connectors 2-9 are explained in the previous section. The two headers (10 and 11) are for updating the software of the main PCB and the part for the remotes.

There are four dipswitches: dipswitch 1 is for future add-ons, dipswitch 2 is to indicate if the lift is left or right-handed, dipswitch 3 is to indicate if there is a powered footrest and dipswitch 4 is to indicate if there is a powered swivel.

There are three pushbuttons: button 1 is used to reset the main PCB, button 2 is for future add-ons and button 3 is used to reset and program the remotes.

How to install the lift

See manual Bespoke.

Updating the lift

If the PCB needs to be updated you will need a Pickit program stick with the new software. Depending on the part you want to update, the main part or the remote part, you need to connect the Pickit to the correct header. Align the arrow on the Pickit and the PCB, the arrow is next to the lower pin on the PCB. Turn on the lift and make sure the Pickit is supplied with a USB power supply, for example a power bank or a USB port on a computer. Press the program button on the Pickit and wait until the LED on the Pickit stops flashing and turns green. After programming the part that is updated needs to be programmed again, the not updated part still remembers it settings.

Troubleshooting

Identifying the problem

The first step is identifying the problem. The flowchart on the next page can be used to find the problem. When the lift gives an error code use the below table to identify the error and try the given solution. Rule out any broken wires in the cable harness using the electrical diagram given previously. Almost all the sensor are normally closed so these can also be checked if they still function, only the reed contact in the friction wheel is normally open and closes when it senses a magnet.

Error list

1	**Continuous beep** *Safety gear is activated* Reset the safety gear and check why the safety gear was activated.
2	**Beeping at 3,5Hz** *Chair sensor is activated or friction wheel not rotating* Set the chair in neutral position or check if the friction wheel is rotating. If the problem persists check the sensor/wire.
3	**Beeping at 2,5Hz** *Safety line is activated* Check the direction the lift can move and see if there are any obstructions on the other side Remove obstructions and test again. If problem persists find the sensor with the override connectors.
4	**Beeping at 2Hz** *Illegal move* For example: lift is at the end of the rail.
5	**Beeping at 0,5Hz** *Lift is not being charged* Put the lift on a charge point and turn on the charge point. If the problem persists check if charge points are making contact
6	**Beeping at 5Hz** *Lift is low voltage* Drive the lift to the charge point and charge the lift If the problem persists there is a problem with the batteries

Problem flowchart

```
Turn on the              Turn on the
holidayswitch   ───────▶  keyswitch
                              │
                              ▼
- Batteries are empty    Armrest LED is
- Fuse is blown      ◀── on
- Broken wire            No
                              │ Yes
                              ▼
                         Opperate the
                         joystick
                              │
                              ▼
                         Lift gives      Yes    Check the error list
                         errorcode   ─────────▶
                              │
                              │ No
                              ▼
Use the remote      No   Lift is moving
                    ◀───
        │                     │ Yes
        ▼                     ▼
Lift is moving           Lift stops after   Yes   Friction wheel isn't
                         10 seconds       ─────▶   turning or sensor is
        │ Yes                  │                   broken
        ▼                      │ No
Check joystick signal         ▼
                         Lift stops        Yes    Lift gives
                                         ─────▶    errorcode
        │ No                   │ No                    │ No
        ▼                      ▼                        ▼
Motor (cable) or         Lift runs over           Problem with the
PCB broken               chargepoint              gear or rail
                    Yes       │ No
Problem with        ◀────     ▼
chargepoints             Problem solved
- Not touching
- No current
- Wrong polarity
```

Solving the problem

The next step is to solve the problem. Depending on the problem try the following solutions:

- Check the error list and try the given solution.
- Rule out broken wires or sensors with the use of the override cables and installation joystick or with a multimeter. Replace wires and/or sensors when necessary.
- If the lift is not charging correctly check the batteries and see if the charge points are still working. Replace batteries if necessary, make sure the charge point polarity is correct and the charge point and lift are making contact.
- Check the rails for deviations: for example points where the lift can get stuck. If this is the case please contact Bespoke.
- Check if all the support wheels are rotating, especially the friction wheel of the OSG. If wheels are not rotating check for any defects and if necessary replace wheels and or axles.
- Turn off the lift with the holiday switch and turn it on again, only use this when the other solutions don't work.
- If all the above doesn't help reset the lift and reprogram it. If this solves the problem it may be temporary so make sure all the other problems are ruled out.

Feedback

To improve the quality of the product and solve future problems better, it is important to get feedback regarding the problems. Filling in the feedback form given below helps in this process.

Lift serial			
Date			
Name			
Location			

		Yes	No	
1	Lift is programmed			
2	Lift worked fine after programming			
3	Lift has been reprogrammed			
4	Charge points are making contact			
5	Lift drives past charge points			
6	Lift gives error code			
7a	Is the error every time on the same spot			
b	Is it in a bend or a straight part of the rail			
c	Inner or outer bend	██████		
d	What is the angle of the rail	██████		
e	Is there any deviation in the rails			
f	Is the upper skate hitting the supports of the rails			

Rule out cable malfunctions with the override connectors

At which point in the flowchart did the problem occurred?

Describe the problem