CAN-X⁺ Absolute Shaft Positioning System Manual
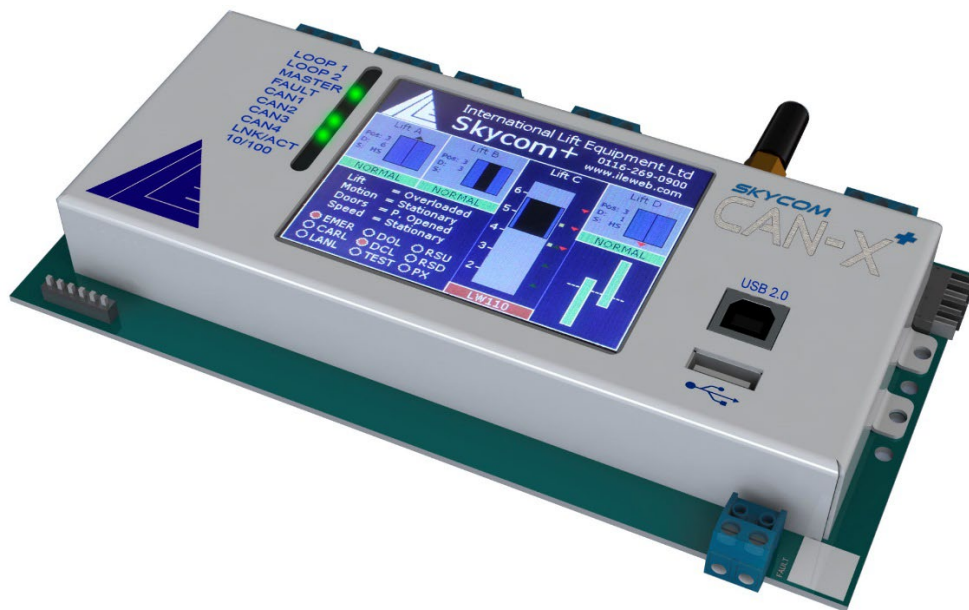

Version 1.1 – 06/12/2023 - Last technical change 30/03/2015

Contents

Introduction

This manual gives details on the Skycom CAN-X+ absolute shaft positioning system, detailing the hardware that makes up the system along with instructions for the setup of the lift.

The absolute positioning system consists of a CAN encoder card and an absolute CAN Open encoder driven directly from the lift car. The CAN encoder card sits on the CAN 3 network within the CAN-X+ control system as a control panel node.

The CAN-X+ processor has a full colour 3.5" TFT touch screen and all operations necessary to diagnose, setup and configure the absolute positioning system are carried out via this TFT touch screen.

There is a female D9 connector to connect to the CAN Open encoder and an on board USB B connector for connection to a PC.*

This manual is worded under the presumption that the CAN encoder kit being used is the Wachendorff belt drive kit supplied by ILE as part of the package.

The Hardware

The CAN encoder card is a single processor device and has 2 CAN ports. 1 CAN port connects the device to the CAN port of the CAN-X+ CPU and the other is an isolated extension of this port allowing peripheral devise such as the HW2013 hand wind position unit to be mounted remotely without have any detrimental effect on the control panel CAN network. The general layout of the board is shown below.

Basic board layout
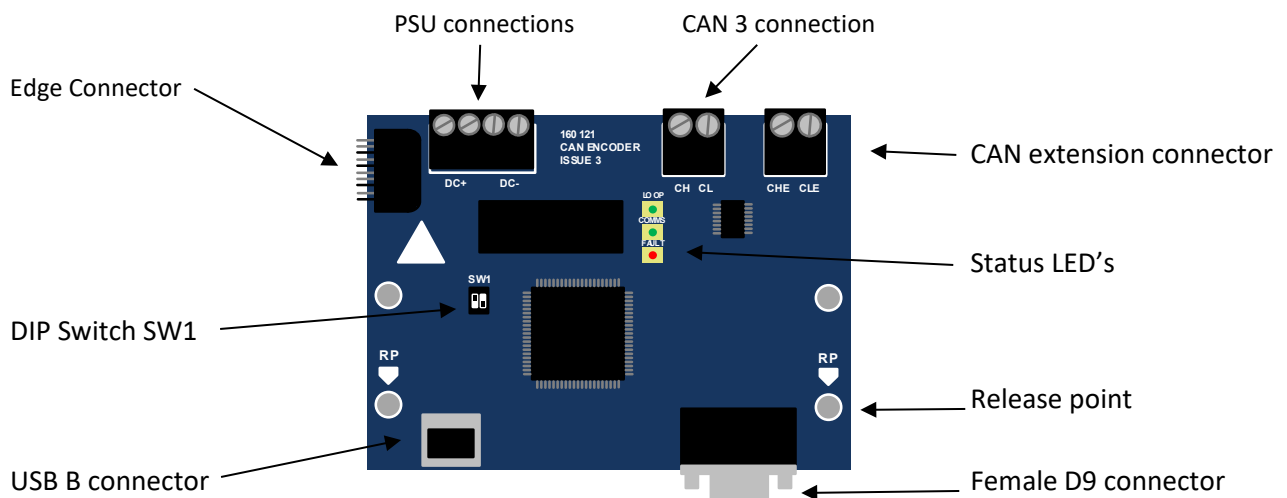
Connections/Port details

CAN3 connection, & edge connector

CAN 3 connections CH and CL. These are used for communication with the control panel network. These connections are also reproduced via the edge connector.

PSU Connections

The PSU connections DC+ and DC-. These are used to supply the CAN encoder board. They are supplied with 24VDC from the battery backed supply within the CAN-X+ controller. These connections are NOT reproduced in the edge connector.

CAN Extension connector

The CAN extension connector is used for connecting to the HW2013 hand wind position unit. These connections are where the user will plug in this unit. Once plugged in (if it is set to the correct mode) the HW2013 will get all floor text data from the CAN-X+ CPU automatically so no programming of floor data is necessary. Once connected the HW2013 unit will show the speed and direction of the lift as well as floor position.

Female D9 connections

The D9 connection is where the user will connect the absolute CAN Open encoder. The pin outs are as follows;

- PIN 6: 24VDC supply positive
- PIN 9: 24VDC Supply negative
- PIN 8: CAN High
- PIN 4: CAN Low
- Outer casing: Cable screen

USB B connector

The USB B socket is for connection to a computer for loading/saving parameters to a PC.

Release point

To release the CAN encoder board from the DIN rail insert a screwdriver into the release point (marked RP) and exert upwards pressure.

Status LED's

The status LED's have the following functions;

LOOP LED (green)

○ LED off. The CAN encoder board has no power or has a terminal fault with the hardware.

☀ LED rapid flashing (25mS on – 50mS off). The virtual node for the I/O system is not yet configured.

☀ LED normal flashing (500mS on – 500mS off). The CAN encoder board is operating normally.

☀ LED slow flashing 80mS on – 3S off). The CAN encoder board has power but is not communicating with the CAN-X$^+$ controller generally this is when the controller is powered down and the CAN encoder board is fed from the battery supply. (Hand wind mode)

COMMS LED (green)

☀ LED flashing. The comms LED flashes when CAN messages are transmitted or received.

Fault LED (red)

○ LED off. No fault, CAN encoder board ready for operation.

☀ LED Flashing rapidly (25mS on – 125mS off) The CAN encoder board is searching for encoders at different baud rates and with different Node IDs.

☀ LED Flashing normally (200mS on – 200mS off). The CAN encoder board has no valid lift data. A learn run is required.

☀ LED Flashing slowly (80mS on - 2.5s off). The current lift position is out of step with the actual lift position. Generally this means a recovery run must take place to re-synchronise the shaft encoder system.

DIP Switch settings

The CAN encoder board has a 2 pole DIP switch fitted, the purpose of the 2 switches is as follows;

Switch Function	Firmware load mode (used during manufacture)
DIP number 1	1
DIP number 2	0

CAN encoder board position	Middle of network	End of network
DIP number 1	0	0
DIP number 2	0	1

Menu System

All the menus for the CAN encoder board are accessed via the CAN-X⁺ 3.5" TFT touch screen. All button functions required to scroll through the menus are reproduced on screen. After a period of inactivity the TFT screen switches off to save energy, a touch of the screen switches it back on.

Basic menu structure and button functions

The menu structure is split up into 3 areas;

1) Title bar of current menu: ──────▶ The title bar shows the name of the menu that the user has entered.

2) Main display area: The main display area shows all the parameters or functions available in the menu the user has entered. The parameters are then highlighted yellow once they have been selected.

3) Button function area:

When buttons become available they appear in the button function area. So if you can only navigate downwards the up arrow is not displayed etc.

Doors	
Stop Closing on Lks	N
Adv Door Opening	N
Quick Close	Y
Park Open	N
Relax Locks	N
SE Count	04
DLR Count	00

ENT

ESC ◀ ▶ Help (?)
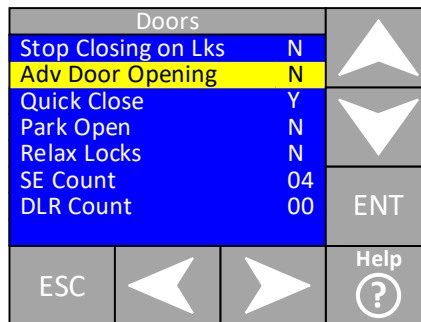
A parameter or function can be highlighted using arrow buttons or by relevant parameter The parameter can by touching the hig parameter again or **ENT** button. The **ES** the user back 1 step

Enter Password L2					ks	N	
					g	N	
1	2	3	4	5		Y	
						N	
						N	
6	7	8	9	0		04	ENT
						00	
EXIT	DELETE	ENTER				Help	

The **help** button appears if there is an audio help file available to explain the highlighted function*

Passwords and password entry

Certain menus and the changing of all parameters are password protected. There are various levels of password dependent on how they can affect the performance of the lift. So if something simple like speech unit volume would have a lower level password than something in the I/O structure. There a 3 levels of password;

- Level 1: Password level 1 is the minimum protection, this password is the same for all the CAN-X+ controllers. The value is **111111**
- Level2: Password level 2 protects all user adjustable parameters that sit above the password level 1 category. This parameter is contract specific and is generated using the 4 digit contract number that is programed into the CAN-X+ CPU. To obtain this password the user must call the ILE technical support team and give the team member the 4 digit contract number.
- Level 3 or factory level password: This is a software version specific password and is used to access hidden menus within the CAN-X+ to help our technical support engineers diagnose issues. This password may be given to a site engineer by one of technical support team over the phone but should NOT be written down anywhere as the whole system can be set back to defaults once this has been entered.

After a password has been entered the relevant level is unlocked until the power to the CAN-X+ CPU is cycled or after 30 minutes of inactivity.

When the user tries to edit a highlighted parameter, dependent on the type of parameter, one the following screens is displayed;

This screen is displayed if the parameter to be changed is a simple YES/NO

Doors	
Stop Closing on Lks	N
VIEW ONLY L1	
Quick Close	Y
Park Open	N
Relax Locks	N
SE Count	04
DLR Count	00

Password

Help

This screen is displayed if the parameter to be changed has a range that can Be adjusted.

SE Count	
[0004]	
Min: 0000	
Max: 0030	VIEW ONLY L1
Default: 0004	
Current: 0004	

Password

Help

To enter the password the password shortcut key should be pressed.

The screen below is then displayed.

Once in the password entry

If the password is correct this

Information	
Correct Password : Level 1 Access Set	

screen type in the relevant 6 digit password & press **ENTER** back to

screen will be displayed for a few seconds reverting the chosen parameter.

```
┌─────────────────────────┬──────┐
│      Shaft Encoder       │      │
│ Event Log                │      │
│ Clear Event Log          │      │
│ Parameters               │ ▼    │
│ Floor Levels             │      │
│ Shaft Learn              │      │
│ Recovery Run             │      │
│ Upload / Download        │ ENT  │
├──────┬──────┬──────┬─────┤      │
│ ESC  │      │      │ Help │     │
│      │      │      │  ?   │     │
└──────┴──────┴──────┴──────┴─────┘
```

For more detail on how to change parameters consult the CAN-X⁺ manual.

I/O architecture of CAN encoder board.

The CAN encoder board is just another type of I/O board. It takes absolute distance CAN data via the D9 and converts it into the required signals to control the position of the CAN-X⁺ controllers. In the same way an 8 way I/O node or 4 way relay node has to be addressed and programmed so does the CAN encoder board.
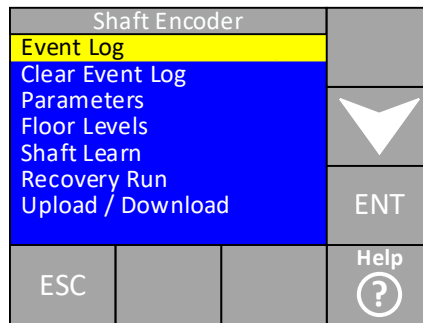
Addressing

The CAN encoder board has a fixed address of control panel node type, unique address 8. When viewed in the I/O viewer of the CAN-X⁺ it is seen as an 8 way I/O card. (We only ever program the input side, as the CAN encoder board can view all the outputs via the CAN 3 port). A typically programmed shaft encoder board is shown below.

```
┌─────────────────────────┬──────┐
│ View Connected P8  (8) I/O│     │
│ I │   UPV    │ NI-NL      │      │
│ I │   DNV    │ NI-NL      │      │
│ I │  F VDZ   │ NI-NL      │      │
│ I │  R VDZ   │ NI-NL      │      │
│ I │ ENC RUN  │ NI-NL      │      │
│ I │  CRPLS   │ NI-NL      │      │
│ I │ LAST 2M  │ NI-NL      │      │
│ I │ TOP HLF  │ NI-NL      │      │
├──────┬──────┬──────┬──────┤      │
│ ESC  │      │      │ Help │     │
│      │      │      │  ?   │     │
└──────┴──────┴──────┴──────┴─────┘
```

Accessing shaft encoder menu

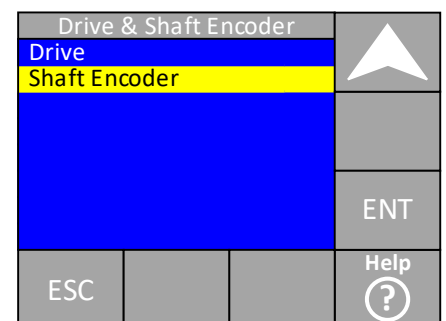To access the shaft encoder menu follow the steps below.

Local lift > **ENT** / Drive & Shaft Encoder > **ENT** / Shaft Encoder > **ENT**

Shaft encoder menu

From this menu all parameters, set up and event logs for the shaft encoder are accessed. The menu is shown below.

```
┌─────────────────────────┬──────┐
│       MAIN MENU          │      │
│ Local Lift               │      │
│ Landing Risers           │      │
│ Grouping                 │ ▼    │
│ Advanced Settings        │      │
│                          │      │
│                          │ ENT  │
├──────┬──────┬──────┬─────┤      │
│ ESC  │      │      │ Help │     │
│      │      │      │  ?   │     │
└──────┴──────┴──────┴──────┴─────┘
```

```
┌─────────────────────────┬──────┐
│  LOCAL LIFT MAIN MENU    │ ▲    │
│ Event History            │      │
│ Parameters               │      │
│ I/O                      │ ▼    │
│ Lift Viewer              │      │
│ Speech & Ind             │      │
│ Allocations              │      │
│ Drive & Shaft Encoder    │ ENT  │
│ Parameter Control        │      │
├──────┬──────┬──────┬─────┤      │
│ ESC  │      │      │ Help │     │
│      │      │      │  ?   │     │
└──────┴──────┴──────┴──────┴─────┘
```

```
┌─────────────────────────┬──────┐
│  Drive & Shaft Encoder   │ ▲    │
│ Drive                    │      │
│ Shaft Encoder            │      │
│                          │      │
│                          │      │
│                          │ ENT  │
├──────┬──────┬──────┬─────┤      │
│ ESC  │      │      │ Help │     │
│      │      │      │  ?   │     │
└──────┴──────┴──────┴──────┴─────┘
```
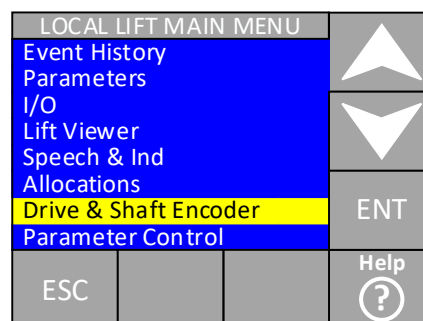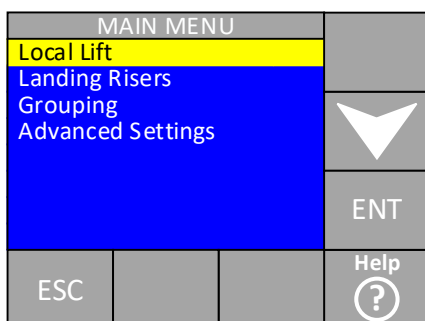
- **Event Log:** All events relating to the shaft encoder are displayed here. (Up to 50 events). The events are held on-board the CAN encoder board so are loaded into the CAN-X+ when this menu is entered.
- **Clear Event Log:** Event log is cleared by entering this menu. When entered the CAN-X+ deletes the event log stored in the CAN encoder board.
- **Parameters:** All parameters related to the shaft positioning are stored and changed here. (See parameter section of this manual for more detail)
- **Floor Levels:** The adjustment of the floor levels are carried out in this menu. (See floor levels section of this manual for more detail)
- **Shaft Learn:** From this menu the initial learn of the shaft is carried out. (See shaft learn section of this manual for more detail)
- **Recovery Run:** From this menu a recovery run is initialised. The recovery run is necessary after the encoder has been changed or its absolute position with the car has changed. (See recovery run section of this manual for more detail)
- **Upload / Download:** From this menu the CAN encoder board's parameters can be uploaded and stored to the CAN-X+ memory. (See recovery run section of this manual for more detail)

Parameters

The parameters for the CAN encoder board are broken down into 4 sub menus.

1. System: All parameters for the system are displayed or entered here, they are
   - **Board software version:** This is where the software version of the CAN encoder board can be viewed.
   - **Board Serial Number:** This is where the CAN encoder board serial number is stored in the CAN-X+ memory. If the board serial number has changed the CAN-X+ will say that the "board serial number has changed do you want to save the new one" this should be entered. (If a CAN encoder board is changed this operation should be carried out)
   - **Encoder Make:** The CAN encoder board reads the encoder make directly from the encoder itself and stores that here.
   - **Encoder Type:** The CAN encoder board reads the encoder type directly from the encoder itself and stores that here.
   - **Encoder Number:** The CAN encoder board reads the encoder serial number directly from the encoder itself and stores that here.
   - **Encoder resolution**: Here the distance the lift travels for 1 revolution of the encoder is store and entered. The Wachendorff belt driven CAN Open encoders resolution is 401mm.

2. Operation: All parameters for the correct operation of the CAN encoder board are displayed or entered here, they are;
   - **Operational Mode:** This is where the operational mode can be set. As default it set as standard.*
   - **Status:** Within this menu the status of the system is displayed here it shows if there is a board fault **Y/N**, and encoder present **Y/N**, a recovery needed **Y/N** or if a learn run is needed **Y/N**.
   - **Number of floors:** Here we can view the number of floors learnt during the learn run. If a learn run has not been completed the message "parameter not available" will be displayed.
   - **Distance to next floor:** Within this menu the current distance to a known floor is displayed. If the lift is at a floor level it will display "At Flr XX" (XX being the floor it is at) if it is between floors it will show the distance to the floor above and below current position.
   - **Current altitude:** This shows the current position of the lift with reference to the terminal floor stop limits.

3. Control: All parameters related to the control of the lift are displayed, entered and adjusted here, they are;
   - **Plausibility status:** After a learn run has been completed the basic plausibility of the learn run can be checked here. It shows if the level vanes and stop distance are plausible **Y/N** and if the slowing vanes and slowing distance are plausible **Y/N**.
   - **Stopping distance:** This is the distance from the drive system (hydraulic or traction) being told to stop, to it actually achieving zero speed. (See vane layout diagram and speed chart for more detail)

- **Slowing distance:** This is the distance from the slowing point to floor level. (See vane layout diagram and speed chart for more detail)
- **Floor vane length:** This is the length of the vanes that are virtually positioned at floor level. (See vane layout diagram and speed chart for more detail)
- **Slowing vane length:** This is the length of the vanes that are virtually positioned at slowing points. (See vane layout diagram and speed chart for more detail)
- **Non relevelling dist:** This is the distance the lift is allowed to move out of floor level before it initiates a re-level. (if relevelling is set to **YES** in the CAN-X⁺ CPU's parameters)
- **Overspeed:** This can be set to initiate the tripping of the CAN-X⁺ CPU's fault contact in case of overspeed.*
- **Stopping recommended:** Once a learn run is complete and the lift has been run to at least 1 floor in both diretions a recommended stop distance will be displayed here. If this recommended distance is then programmed as the stop distance the floor levels will be at the same point from floor level in both directions. (See vane layout diagram and speed chart for more detail)

4. Advanced: All of this data is for technicians that have advanced knowledge of the CAN encoder board. All data in here is view only.* They are listed below;
    - **Floor data:** This shows the data for each learnt floor, this includes the floor height and the on/off points of the front and rear door zones. **NOTE:** The bottom terminal stop limit is given a notional height of 2000mm this is so the door zones and limit positions are never shown as negative positions so all heights need to have 2000mm subtracted from them.
    - **Limit Switch:** This shows the learnt position of the top and bottom terminal stop limits and reset zones.
    - **T Insp slowdown distance:** This is the distance at which the lift will slow down or stop before the lift reaches the top of the shaft in accordance with EN81-20.*
    - **B Insp slowdown distance:** This is the distance at which the lift will slow down or stop before the lift reaches the bottom of the shaft in accordance with EN81-20.*
    - **Door Zone Details:** This shows details of the learnt door zones. It shows the average measured door zone length and the amount of front and rear door zones found in the top and bottom reset zones.
    - **I/O outputs:** ILE use only.
    - **I/O inputs:** ILE use only.

Floor levels.

The floor levels menu is where the learnt floor levels are adjusted. It is broken down into 4 sub menus.

1. **Up Stop:** This is where an up stop for a particular floor can be adjusted, once entered the desired floor is chosen and the desired amount in mm is entered. (See page 19 for further information)
2. **Down stop:** This is where a down stop for a particular floor can be adjusted, once entered the desired floor is chosen and the desired amount in mm is entered. (See page 19 for further information)
3. **Both up and down stops:** This is where the up and down stops for a particular floor can be adjusted, once entered the desired floor is chosen and the desired amount in mm is entered. (See page 19 for further information)
4. **All stops:** This is where the up and downs stops for all floors can be adjusted simultaneously, once entered the desired floor is chosen and the desired amount in mm is entered. (See page 19 for further information)

Shaft learn

This menu is where shaft learns are performed. The CAN encoder board can be learnt automatically or manually. If this menu is entered by mistake choose the NO option in the menu will take it back to the main menu. (See shaft page 19 of this manual for more detail)

Recovery Run

If an encoder is changed, or the belt that drives the encoder is changed, or if the absolute position between the encoder and the lift car is changed for any reason a recovery run will be required. The recovery run is the way the system resets the absolute position. It is an automated process but has to be initiated by the user via this menu. If a recovery run is needed the red LED on

the CAN encoder board will blink accordingly (see page 5 of this manual) or it will say recovery needed **Y** in the operation menu under status.

Upload / download

Within this menu the CAN encoder board parameters can be saved to the CAN-X⁺ CPU's memory. There are 2 different memory locations available. After the Can encoder board has been successfully setup and all levels adjusted it is recommended that the parameters are saved to 1 of the locations. If a CAN encoder board ever needs changing then it will just need the saved information transferring to the new board and no setup or learn run will be necessary. The screen below highlights the process.

1st Choose upload / down load and Press the **ENT** button.

2nd Choose the type and location in this Case SE (shaft encoder) to CAN-X upload to location number 1.
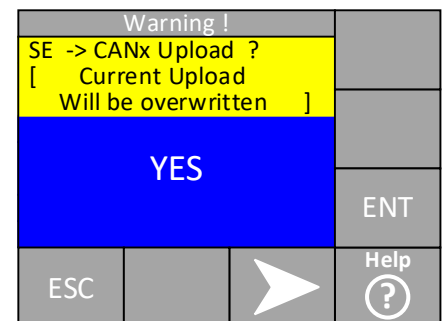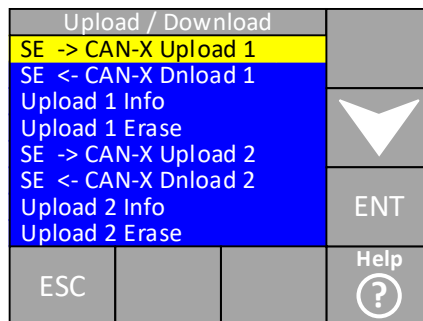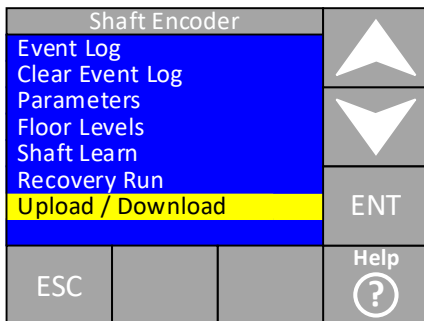
3rd Confirm the action by pressing **ENT** button.

This will now upload the CAN encoder board's parameters and learn information to location 1 within the CAN-X⁺ CPU's memory. The same procedure can be used for location 2.

The upload information shows the time and date of the upload and the board serial number that it was uploaded from. This can be used to compare which of the 2 saved locations has the latest data and to see if the board matches the current board as displayed in system parameters.

The data saved in each location can be erased by selecting upload erase.

Virtual vane, proximity switch and limit layout

Like a tape head or proximity switch system the CAN-X⁺ CPU requires vane information for stepping, slowing, stopping and door zone. When running with the CAN encoder board this information is still needed but all the signals are generated by the board

Shaft Encoder		Upload / Download		Warning !	
Event Log	▲	SE -> CAN-X Upload 1		SE -> CANx Upload ?	
Clear Event Log		SE <- CAN-X Dnload 1		[Current Upload	
Parameters		Upload 1 Info		Will be overwritten]	
Floor Levels	▼	Upload 1 Erase	▼		
Shaft Learn		SE -> CAN-X Upload 2		YES	
Recovery Run		SE <- CAN-X Dnload 2			
Upload / Download	ENT	Upload 2 Info	ENT		ENT
		Upload 2 Erase			
ESC	Help ?	ESC	Help ?	ESC ▶	Help ?

from the CAN encoder information. These signals can still be thought of in the same way as a tape head so the layout diagram for a CAN encoder board system and tape head are very similar, apart from the "virtual" signals generated from the CAN encoder. The system also requires the following "actual" signals;

- **Door Zone:** A normally open proximity switch is provided to confirm the actual door zone (either front or rear) this is also used on a learn run so should be placed as accurately as possible.
- **Reset Zone:** A Bi-Stable proximity switch is provided to confirm the lift is inside the top and bottom reset zones. (The reset zone is common for both floors)
- **Terminal stop limits:** These switches are set 25mm below the bottom floor and 25mm above the top floor. The CAN encoder uses these as reference points to find the extremities of the shaft. It is critical that these are set correctly as adjustment afterwards will have an effect on the recovery mode and the reported position above / below limits.

NOTE: It is best to run the lift on EEO control on to the limits and then physically measure the distance above/below floor level the lift actually is. This is best done with a balanced load so the lift does not roll when the limit is actuated.

Top of shaft magnet, limit and virtual magnet layout

The shaft layout at the top of the shaft is shown below. The virtual floor vanes, virtual slow vanes and virtual door zones are generated by the CAN encoder board. The Door zone (DZ) and RS signals are from the aforementioned proximity switches. To open the doors the CAN-X⁺ CPU needs both the virtual door zone and the actual door zone signals to be present. For stepping the virtual door zone is used. As shown the reset zone starts 50mm after the virtual slowing point.
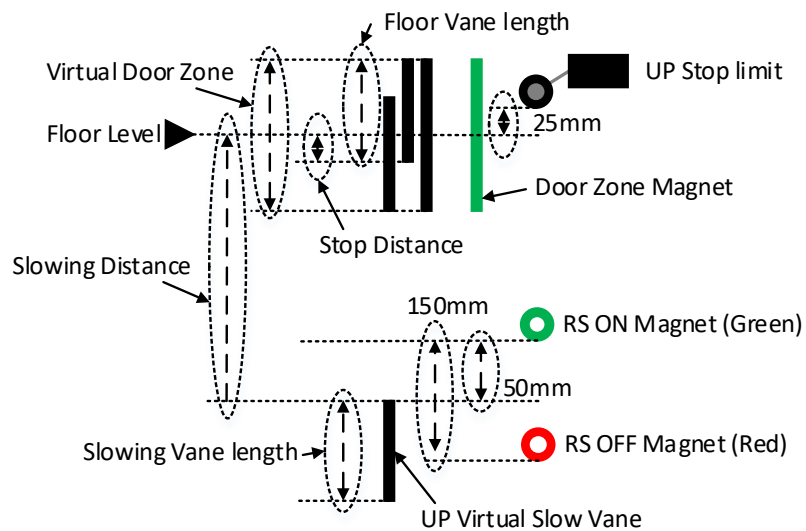
Bottom of shaft magnet, limit and virtual magnet layout

The shaft layout at the bottom of the shaft is shown below. The virtual floor vanes, virtual slow vanes and virtual door zones are generated by the CAN encoder board. The Door zone and RS signals are from the aforementioned proximity switches. To open the doors the CAN-X⁺ CPU needs both the virtual door zone and the actual door zone signals to be present. For stepping the virtual door zone is used. As shown the reset zone starts 50mm after the virtual slowing point
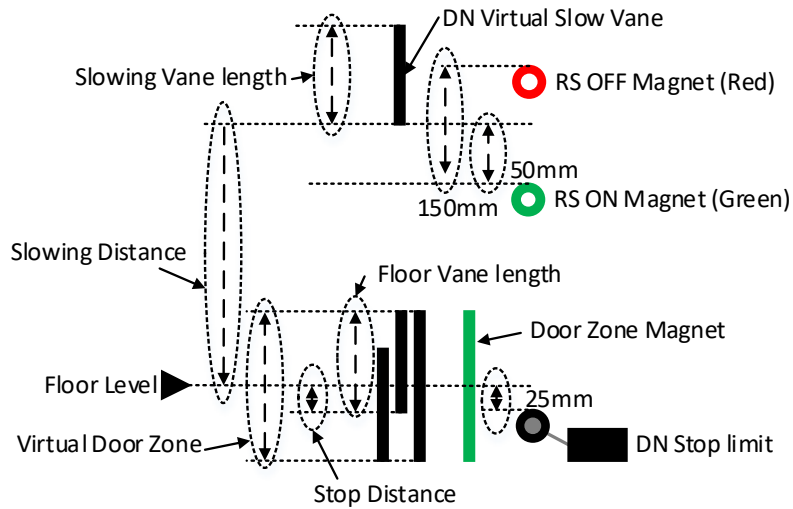
Intermediate floors

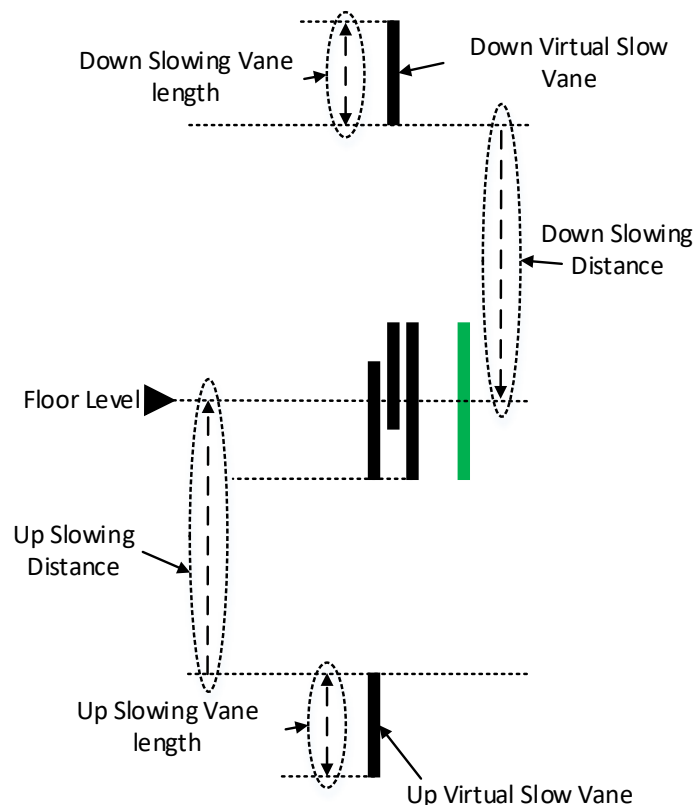The intermediate floors use the same principles as the terminal floors but without the reset zones and limits.

Recommended

When carrying out a CAN needs to be told the slowing

slowing distances

encoder setup the board distance and stop distance to

generate the virtual vane signals. The speed the lift is travelling and the ramp and jerk rates within the motor or valve control units have an effect on the desired virtual slowing distances. The chart below gives an indication of slowing distances. These are based on the Fuji drive running default jerk and deceleration rates and assuming the motor will be running at its maximum speed and allowing 150mm travel in levelling speed.

Speed (m/s)	Slowing Distance (mm)	RS Zone distance (mm)	Levelling Speed (m/s)	Stop Distance (mm)	Slowing vane length (mm)	Stopping vane length (mm)
0.5	800	750	0.05	18	100	150
0.63	980	930	0.06	22	100	150
0.75	1140	1090	0.07	27	125	150
1.0	1475	1425	0.1	36	150	150
1.25	1800	1750	0.12	45	150	150
1.5	2200	2150	0.15	54	150	150
1.6	2300	2250	0.16	57	150	150

The above distances are a rough guide only and if any of the default drive parameters are changed for ride comfort the affected slowing distance will need altering to suit.

Setting up

Preparing for lift for learn run.

Before starting a learn run, be it an automated run or a manual one the fundamental things below need to be set. Failing to set up the fundamental items could result in having to carry out extra learn runs. Follow the fundamental flow chart below.

```
        ┌─────────────────────┐
        │ Ready lift for learn │
        │         run          │
        └──────────┬──────────┘
                   │
                   ▼
        ┌─────────────────────┐    NO    ┌─────────────────────┐
        │ Is the Controller   │─────────▶│ Remove the shorts   │
        │ free of shorts and  │          │ and check all       │
        │ all circuits working?│         │ circuits for correct│
        └──────────┬──────────┘          │ functionality       │
                   │ YES                 └─────────────────────┘
                   ▼
        ┌─────────────────────┐  NO  ┌────────────────┐      ┌───────────┐  NO  ┌──────────────┐
        │ Have the stop       │─────▶│ Drive the lift │─────▶│ Stopping  │─────▶│ Adjust the   │
        │ limits been checked │      │ onto limits and│      │ as per    │      │ limits and   │
        │ and Measured?       │      │ measure the    │      │ diagram?  │      │ re-check     │
        └──────────┬──────────┘      │ distance above/│      └─────┬─────┘      └──────────────┘
                   │ YES             │ below floor    │            │ YES
                   ▼                 └────────────────┘
        ┌─────────────────────┐  NO  ┌────────────────┐      ┌───────────┐  NO  ┌──────────────┐
        │ Has the reset       │─────▶│ Drive the lift │─────▶│ RS signals│─────▶│ Adjust       │
        │ Signal been checked │      │ to terminal    │      │ present   │      │ proximity    │
        │ and measured?       │      │ floor until RS │      │ and       │      │ switches and │
        └──────────┬──────────┘      │ is shown in the│      │ correct?  │      │ magnets and  │
                   │ YES             │ lift viewer and│      └─────┬─────┘      │ re-check     │
                   ▼                 │ measure        │            │ YES        └──────────────┘
        ┌─────────────────────┐  NO  └────────────────┘      ┌───────────┐  NO  ┌──────────────┐
        │ Have the door       │─────▶┌────────────────┐─────▶│ DZ signals│─────▶│ Adjust       │
        │ Zone magnets been   │      │ Drive the lift │      │ present at│      │ proximity    │
        │ fitted and checked? │      │ from top to    │      │ all floors?│     │ switches and │
        └──────────┬──────────┘      │ bottom checking│      └─────┬─────┘      │ magnets and  │
                   │ YES             │ DZ signals in  │            │ YES        │ re-check     │
                   ▼                 │ the lift viewer│                         └──────────────┘
        ┌─────────────────────┐      └────────────────┘
        │ Ready for learn run  │
        └─────────────────────┘
```
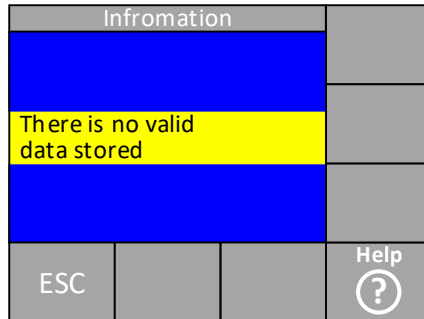
Learn run

When the CAN encoder board leaves ILE it will have had its parameters blanked. This is because the controllers are tested on simulation rigs in the ILE test department, so the data would look odd if it was left in and may be confusing to the set up engineer.

If the CAN encoder board is blank when any of the control parameters are entered the following screen will be displayed.

```
          Infromation

    There is no valid
    data stored


         ESC              Help
                           ?
```

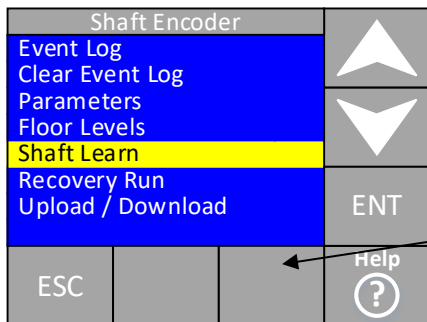All vane lengths, slowing distances and stop distances are inputted **AFTER** the learn run.

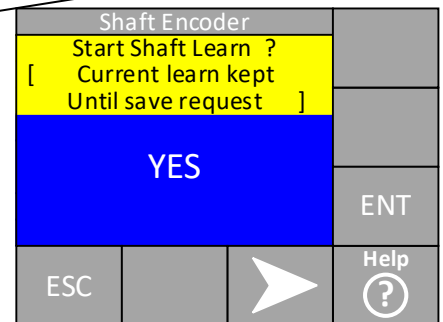### *Automatic learn run*

Follow the steps shown on the screen shots below.
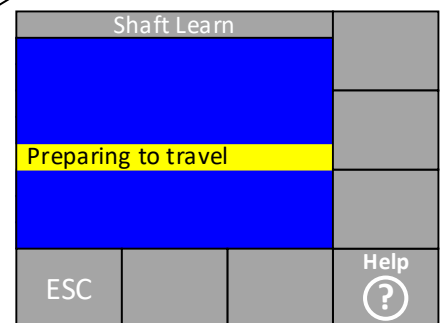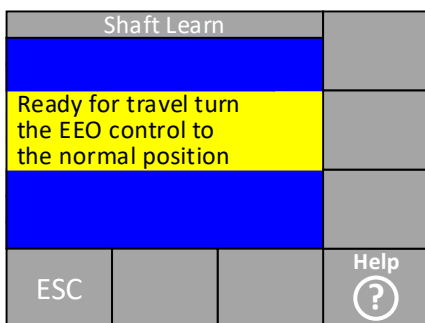
Scroll down to shaft learn and press the **ENT** button.

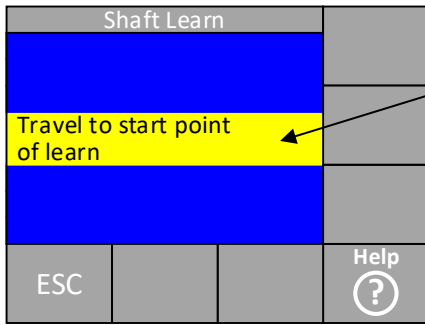Press the **ENT** to accept the start of the learn run (Change **YES** to **NO** to exit)

```
        Shaft Encoder
    Event Log
    Clear Event Log
    Parameters
    Floor Levels
    Shaft Learn
    Recovery Run
    Upload / Download        ENT

      ESC              Help
                        ?
```

The following message is displayed. Now turn the EEO control to the NORMAL position.

```
        Shaft Encoder
    Start Shaft Learn  ?
    [   Current learn kept
       Until save request    ]

           YES                  ENT

     ESC          ▶      Help
                          ?
```

Once the EEO is turned to the normal position this is displayed. The CAN-X⁺ CPU now assesses the position of the lift and prepares to travel.

```
        Shaft Learn

    Ready for travel turn
    the EEO control to
    the normal position


      ESC              Help
                        ?
```

```
        Shaft Learn



    Preparing to travel


      ESC              Help
                        ?
```

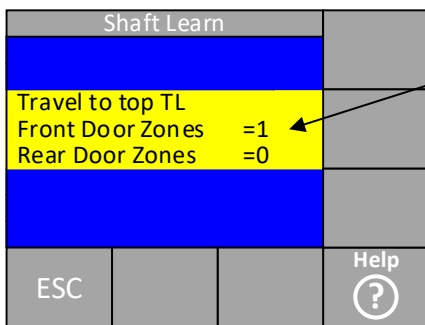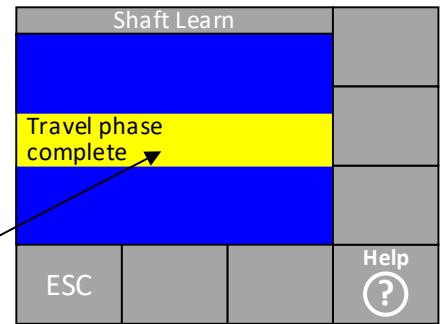| Shaft Learn	
Travel to start point of learn	
ESC	Help ?

The lift will now move on a reduced speed to the start point of the learn run.

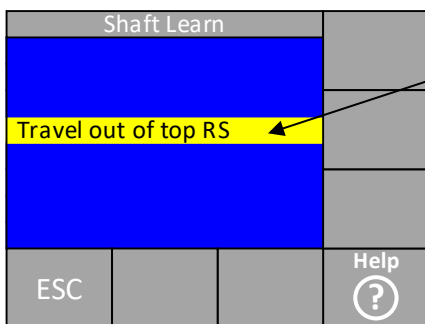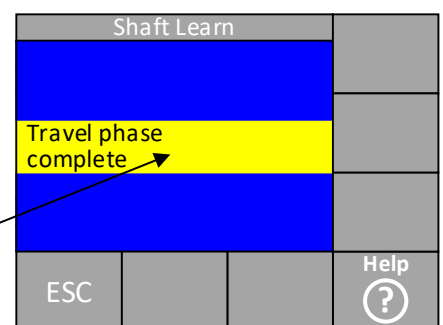Once this phase of travel is complete this screen is shown.

Shaft Learn	
Travel phase complete	
ESC	Help ?

Shaft Learn	
Travel to bottom TL	
ESC	Help ?
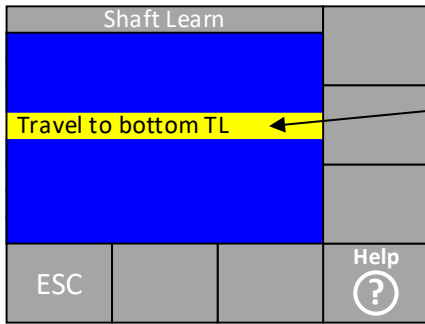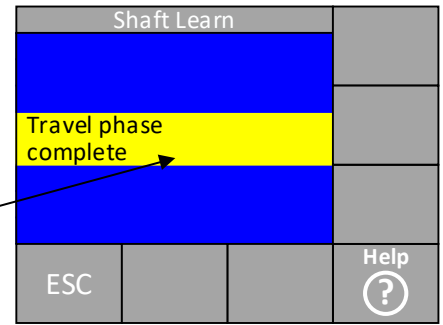
The lift will now travel down to find the bottom floor terminal stop limit.

Once this phase of travel is complete this screen is shown.

Shaft Learn	
Travel phase complete	
ESC	Help ?

| Shaft Learn	
Travel to top TL Front Door Zones =1 Rear Door Zones =0	
ESC	Help ?

The lift will now start travelling up the lift shaft counting front and rear door zones as they are detected the count is incremented by 1.

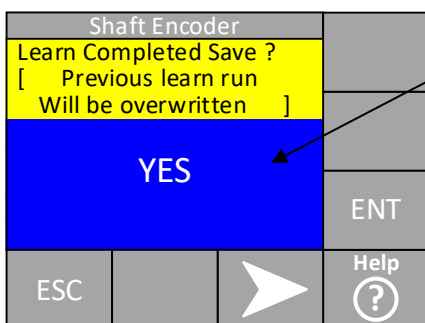Once this phase of travel is complete this screen is shown.

Shaft Learn	
Travel phase complete	
ESC	Help ?

Shaft Learn	
Travel out of top RS	
ESC	Help ?

The lift will now travel out of the top floor reset zone.

Once this phase of travel is complete this screen is shown.

| Shaft Learn	
Travel phase complete	
ESC	Help ?
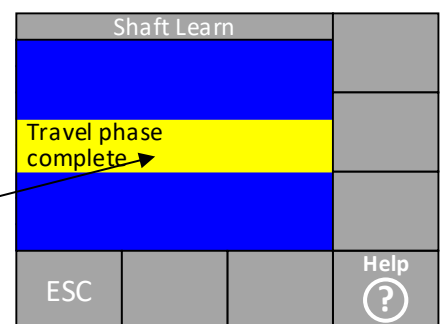
Once completed you are prompted to save the learn run with **YES** displayed press **ENT** to save.

Once entered the conformation of the save is displayed.

Shaft Encoder	
Learn Completed Save ? [Previous learn run Will be overwritten]	
YES	ENT
ESC	▶ Help ?

Once prompted to do so turn the EEO control back to the EEO position.

Once turned back to EEO the conformation that the learn run is completed is displayed. Press **ESC** to get back to the main menu.

Shaft Learn	
Learn Completed and Saved	
ESC	Help ?

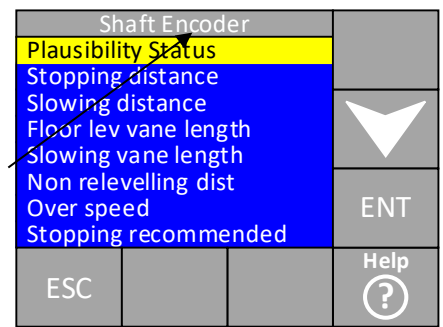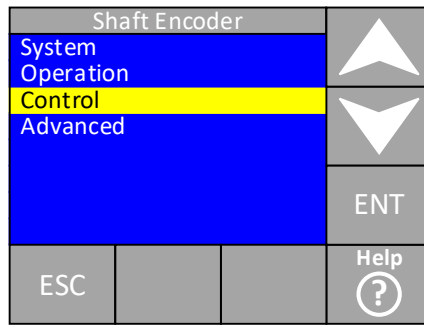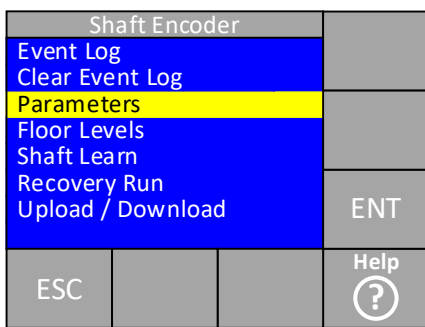| Shaft Learn	
Turn the EEO control To the EEO position	
ESC	Help ?
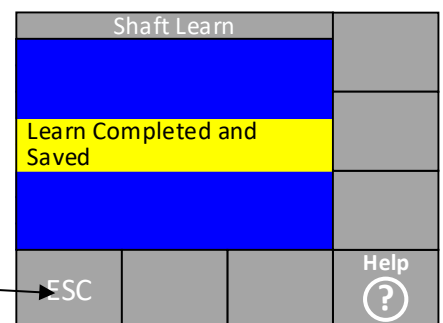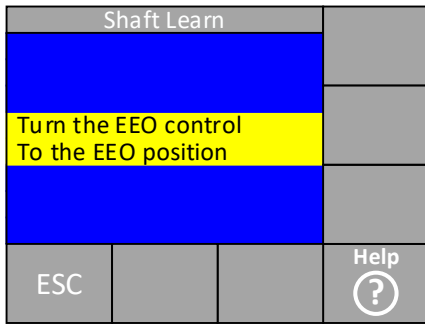
After carrying out a learn run the vane lengths, slowing distance and stopping distance should be checked and adjusted to suit the speed of your installation.

After entering the shaft encoder main menu go through the following sequence.

Shaft Learn	
Learn Completed	
ESC	Help ?
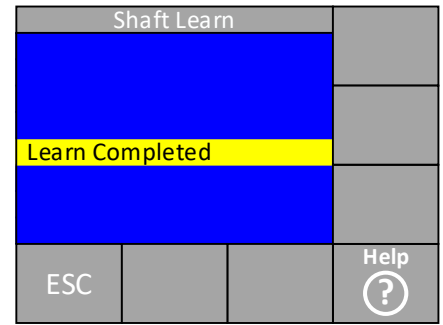
Once in this screen set the desired stopping distance, slowing distance, floor level vane length and slowing vane length should be set in accordance with the chart on page 14.

After setting the desired slowing distances the plausibility status can be checked. This will tell you if the slowing distances are

Shaft Encoder	
Event Log	
Clear Event Log	
Parameters	
Floor Levels	
Shaft Learn	
Recovery Run	
Upload / Download	ENT
ESC	Help ?

Shaft Encoder	
System	▲
Operation	
Control	
Advanced	▼
	ENT
ESC	Help ?

Shaft Encoder	
Plausibility Status	
Stopping distance	
Slowing distance	
Floor lev vane length	
Slowing vane length	▼
Non relevelling dist	
Over speed	ENT
Stopping recommended	
ESC	Help ?

within the floor levels and that all the floor level vanes are in the correct position. If both values are plausible the lift is ready to run on normal. If either are shown as **N** contact the ILE technical support department.

1st run on normal.

Dependent on how the CAN-X+ has the shaft encoder mode set the lift will react in one of 2 ways when switching to normal.
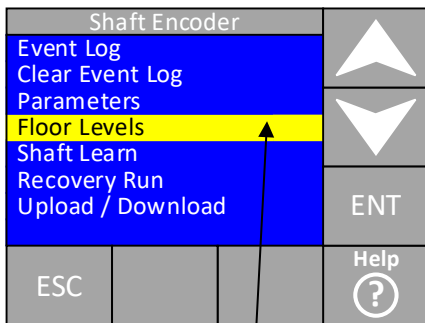
1. **With the shaft encoder mode set as "Disabled":** The lift will run on normal to the bottom reset zone, slow down and stop at floor level. Once floor level is achieved it will be in service.
2. **With the shaft encoder mode set as "SFR" (single floor recovery):** The lift will level to the nearest available floor and stop at floor level. Once floor level is achieved it will be in service.
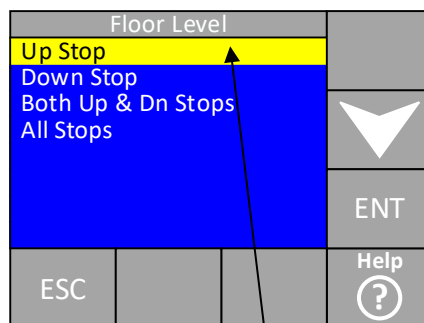
Setting floor levels

Setting floor levels after learn run.

Before setting floor levels the lift should be run to various floors in both directions to check slowing and stopping operation. The deceleration distance can be changed in the shaft encoder menu or if the ride quality needs adjusting the drive can be adjusted to suit. Once at least 1 floor has been visited in both directions there will be a "recommended stopping distance" value is the control parameter menu of the shaft encoder. If this value is then entered as the stop distance the lift will be stopping in the same absolute value in both the up and down direction. This means that if the lift is 10mm low in in the up direction it will be 10mm low in the down direction.

When the user is ready to set levels the floor level menu needs to be entered.

Shaft Encoder	Floor Level	Floor Level
Event Log	Up Stop	Floor 2
Clear Event Log	Down Stop	Floor 3
Parameters	Both Up & Dn Stops	Floor 4
Floor Levels	All Stops	Floor 5
Shaft Learn		
Recovery Run		
Upload / Download		

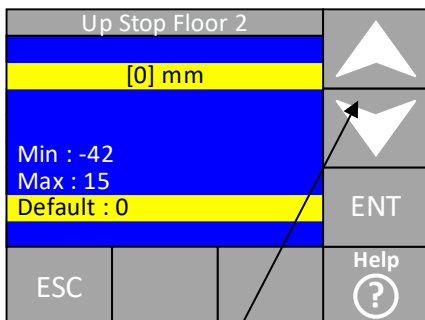Scroll down to floor levels and press **ENT** button.

Choose the type of stop to adjust and press the **ENT** button.
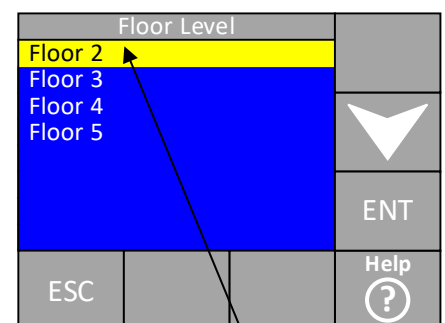
Choose the desired floor to change the and press the **ENT** button.

NOTE: In this example the ups stops were chosen so no floor 1 is displayed if the down stops were chosen no floor 5 would've been displayed.

Once entered the following screen is displayed.

Up Stop Floor 2	Up Stop Floor 2	Up Stop Floor 2
[0] mm	[10] mm	[-10] mm
Min : -42	Min : -42	Min : -42
Max : 15	Max : 15	Max : 15
Default : 0	Default : 0	Default : 0
	Car Will Stop Higher	Car Will Stop Lower

Once in this screen use the **UP** & **DN** arrow buttons to select the desired value and press the **ENT** button.
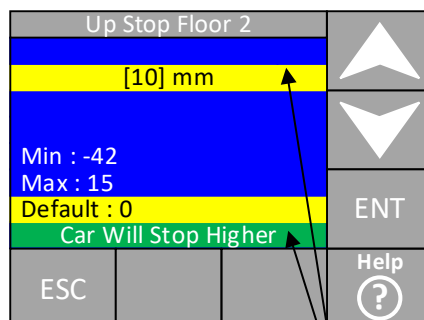
If the car is low enter a positive figure the green area at the bottom reminds you that the car will stop higher.
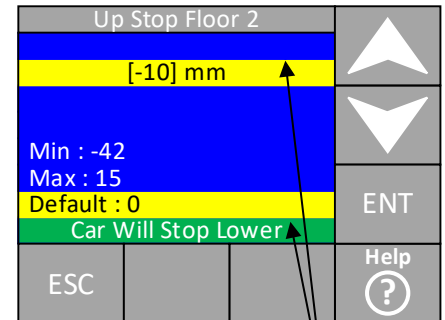
If the car is high enter a negative figure the green area at the bottom reminds you that the car will stop lower.
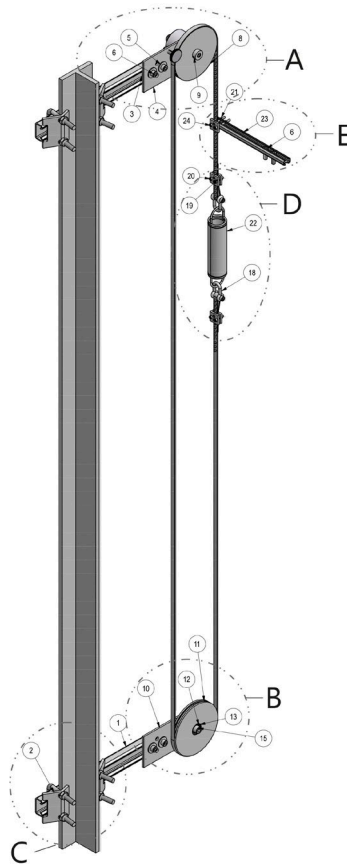
Minimum and maximum ranges are displayed these are set to keep you within the real door zone. If you need to adjust the level outside of this range the door zone magnet will need moving and a new learn run initiated.

Manual learn run

There is a manual learn run option. This is accessed via the level 3 (factory) password so should only be done in conjunction with a member of the ILE technical support team who will talk the user through the process. So no details of how it is carried out is detailed here.

Wachendorff belt driven encoder.

The kit we recommend to interface with the CAN encoder board is the silent move kit made by Wachendorff. We supply this as a complete kit with an encoder optimised for our system. This kit includes a 10m lead that plugs directly into the CAN encoder board. An example of the kit in question is shown below. The kit comes with a complete installation guide which is in English only and comes with every kit. All spare parts for the kits are stocked by ILE in Leicester. Quote the part number the replacement part when ordering. (Listed in the Wachendorff manual)

Appendix A – Shaft encoder events list

Event	Description
EVENT LOG CLEARED	The event log was cleared at the recored time
POWER UP	The shaft encoder board was powered up
WATCHDOG TIMER	A watchdog timer was reset
NO ENCODER AT PWRUP	No encoder was detected when the board was powered up
ENCODER COMMS LOST	Communication with the encoder failed
COMMS WITH LIFT LOST	Communication with the lift CPU failed
MISPLACED DOOR ZONE	Door zone location does not agree with stored value
ENCODER FOUND	Communications with the encoder re-established
LEARN STARTED	Lift shaft learn run started
LEARN FAILED	Lift shaft learn run failed or was aborted
LEARN COMPLETED	Lift shaft learn run was successful
CORRECTION AT TOP	Correction to encoder was made at the top of the lift shaft
CORRECTION AT BOTTOM	Correction to encoder was made at the bottom of the lift shaft
RESTART LIFT COMMS	Communication with lift controller resumed
CHANGED ENCODER	A different encoder to that connected last time detected
DATA UPLOAD	Details of changed encoder have been stored

DATA DOWNLOAD	New encoder has been detected and details stored
STOP ZONE WITH NO DZ	Lift stopping zone with door zone signal absent
ENC RESET STARTED	Encoder reset run started (to re-sync the encoder)
ENC RESET FAILED	Encoder reset run failed or not completed
ENC RESET COMPLETED	Encoder reset run completed successfully

Version	Changes	Date	Author	Checked	Approved
V1.0	Initial Version	08/04/2015	J. Colquhoun	J. Miller	J. Colquhoun
V1.1	Site feedback	12/05/2015	J. Colquhoun	J. Miller	J. Colquhoun