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TECHNICAL MANUAL
FOR THE ALMEGA
MICROPROCESSOR SYSTEM
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1) Introduction

The ALMEGA microprocessor has been designed using surface mount component technology to be small and compact as possible. The main processor is one of the latest technologies that incorporates many features and peripherals, as well as being the fastest of its range. The packaging is based upon a modular rack system and its size is flexible according to the size of the job required (i.e. more floors or more IO, add on another module, else the system can be one module big if less floors/IO are used). A unit configured up to a maximum of 48 floors fits comfortably inside a typical control panel cabinet.

The modular rack system allows variable lift configurations to be implemented, which can be tailor made to suit the application and be cost effective according to the number of floors, system type and IO used. Also each rack plug in board has on board identification (plug and play), which is used to provide information and help set-up the board.

A large trans-reflective 128*64 dot Graphical LCD display has been used to provide a clear bright display for all light conditions. It also provides the user with a simple and easy to use interface, plus much more useful features such as a description for the events and trace events, Lift Viewer(s) show a graphical representation of the lifts' status/position/doors etc., and an Input/Output viewer to show the status of each input/output, what it is configured for, as-well as providing IO diagnostics.

A keypad switch panel has been included to allow the user to change parameters and settings to suit the lift installation. The simple layout of the keypad and easy to use menu interface allows changing of parameters with very little effort. However passwords are required to change certain parameters, and may be given upon request.

LED indication is provided on each input/output of all plug in cards into the IO rack. The general colour coding is RED for Input and GREEN for Output. Also the CPU has LED indication for CPU status and Communications. The power supply has LED indication for each supply, and associated fuse protection.

The microprocessor will connect directly to the TC3 serial indicator and speech units, providing full programmability of up to 48 floors and many messages and features. Separate messages are included for doors opening, doors closing, going up and going down, mind the doors and arrival gongs. The messages have priorities to differentiate between levels of importance i.e. "Lift Overloaded" would have a higher priority than "Lift on Fire Control". These priorities also eliminate the need for extra relays in the control panel. All these are fully re-programmable via the microprocessor. Information is transmitted serially to the units using CAN (Controller Area Network) technology.

Windows application software is available to allow the user to change parameters and settings to suit the lift installation. The software will work on any IBM compatible P.C. or laptop (250MHz or higher) with windows version 98 or higher. The software has been designed to encourage and allow the user to change the lift installation set-up as required, and to reduce the need for special software. However special software may be issued upon request.
Other features include:
Direct serial communication to drives, also direct to floor control (when using a drive with positional control).
Despatcherless Group systems.
Adjustment of slowing distance / floor levels via software.

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2) Manual Supplements

There are a range of manual supplements available for specific information regarding the Almega lift control system. The information in these supplements are additions for special / specific lift functions that would not normally required within the scope of this manual. Some supplements available are Internet connectivity, serial communications with an inverter drive, and Emergency supply operation etc. Contact Lester Controls for availability, or visit the web site to download those currently available.

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3) List of Equipment

1) ALMEGA Microprocessor Box with rack enclosure, power supply board, back-plane board(s), IO cards and keypad interface.

2) Digital Indicators (if fitted)

3) Speech Synthesiser (if fitted)

4) Lap top / P.C. for programming the processor (if desired)

5) 1 Serial Communication Cable (RS232 (non-crossed Male/Female) link between processor & laptop).

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4) Switching onto TEST Operation for the first time

The Lift Viewer or Input Output Viewer from the main menu may be used at this stage to aid with testing.

Installation state:
The Motor, Thermistors, Fan and Brake etc. have been connected to the Control Panel.
The safety and lock circuit are in a state where the door contacts, emergency stops etc., are making contact providing continuity through terminals:
(**OTL - OSG - PSW - G1 - G2 - G3 - G4**), for a Hydraulic Lift, and
(**OTL - OSG - G1 - G2 - G3 - G4**), for a Traction Lift.
The wiring has been checked and all cables are connected correctly.
The fuses are in their correct places and of the correct size and type.
The lift is switched to **TEST** via the Car Top Control or manually by leaving the connection between **TTS** and **TS** open circuit, also continuity is made from terminals **TTS** and **TS1**.
Check there are no obstructions in the lift shaft.
Provisionally set the lift and door motor overloads.
Check that the car and landing doors are closed fully (if fitted at this stage).

The lift can now be switched on:
Check the incoming three-phase sequence is correct (PFRR relay is energised)
Check the LED's **EMER**, **CARL**, **LOCK** are illuminated on the mains input board, or look on the LCD display (i.e. INPUT VIEWER), or check the LCD display default screen.

Making the following temporary connections can now drive the lift:
To travel UP = **TF** to **TU**
To travel DOWN = **TF** to **TD**

The following checks should be made before continuing with moving the lift:
1) Check that the Emergency stop buttons, Locks and Safety circuit (if applicable) will stop the lift instantaneously shortly after the lift motor starts to rotate.

2) Run the lift and check that the direction of rotation is correct.

3) Run the lift and check that the brake and ramp voltages are correct

4) Check the door operation (if fitted) by using the car top control buttons to make contact between terminals:

CLOSE = **DTF** and **DC**
OPEN = **DTF** and **DO**

5) Check selector stepping and levelling switches are in place and are functional.

6) After Test operation move the lift to the lowest level possible, park with doors closed and switch off the control system.

Note:
If you have any problems at this stage please refer to the fault finding section of this manual.

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5) Switching onto NORMAL Operation for the first time

The Lift Viewer or Input Output Viewer from the main menu may be used at this stage to aid with testing.

Installation state:
The lift installation is complete and is to be operated normally for the first time. The tape head, door operator, Emergency stop buttons, locks, safety circuit, shaft switches, proximity and levelling signals have been checked on TEST control as previously instructed and are operating correctly. The pulsing and levelling signals are in the correct sequence as on the shaft and vane layout drawing. The lift is at the lowest floor level with the reset signal energised.

The lift is switched to **TEST** via the Car Top Control or manually by leaving the connection between **TTS** and **TS** open circuit, also continuity is made from terminals **TTS** and **TS1**.

The lift is switched onto NORMAL operation via the car top control, i.e. a connection should be made between terminals **TTS** and **TS**, and open circuit from terminals **TTS** and **TS1**.
The lift should not be on any other form of independent service, i.e. Fire or Service control.
Ensure no shaft obstructions exist. The lift can now be switched on, and the following suggested test procedures maybe carried out:

1) Purging of the Event Logger:
Whilst in the menu **Event History**, pressing ➔ and ↑ on the keypad, clears/purges all events stored in the Event Logger.

2) Testing the pulsing and levelling signals (STU/STD & STEP):
This can be achieved by placing calls to each floor in turn, in both the UP and DOWN direction, ensuring correct selector stepping and stopping sequence. Correct any problems with the vanes before proceeding to the next stage. Once correct, run the lift to the terminal floors in both directions to check vane operation.

3) Testing of Slowing switches:
Press **CPT** button to register a top car call and, then press **MODE and MENU** under constant pressure to inhibit the signal STEP, thus forcing the lift to slowdown via the slowing limit. Press **CPB** to register a bottom car call and repeat the above process.

4) Testing of Terminal switches:
Press **CPT** button to register a top car call and then press **MODE and ESC** under constant pressure to inhibit the signals STU and STD, thus forcing the lift to stop on the terminal limit. Press **CPB** to register a bottom car call and repeat the above process.

Note:
If you have any problems at this stage please refer to the fault finding section of this manual.

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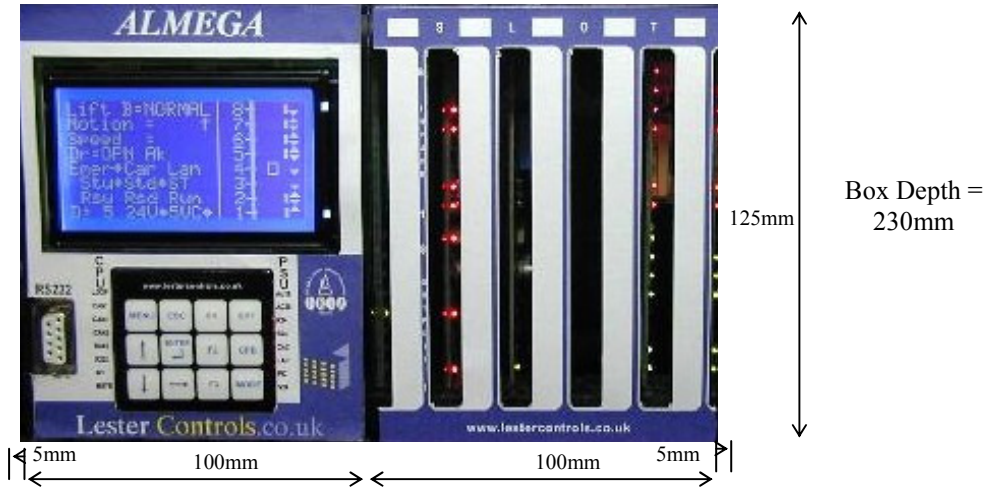
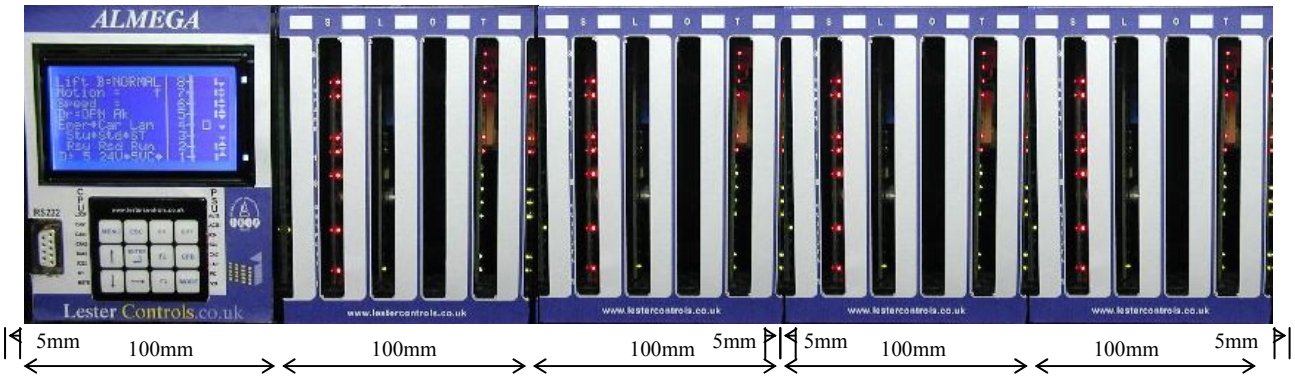
6) ALMEGA Microprocessor Modular Rack drawing

Almega Microprocessor System Incorporating 5 Slots of IO.



Almega Microprocessor System Incorporating 20 Slots of IO.



The ALMEGA lift controller is housed in a modular rack as shown above. Modules can be added on, 5 IO slots at a time, making the system flexible for 5, 10, 15 and 20 IO slots as required. The main purpose of the rack is to provide location and housing for the boards within it, or will plug into it. The slot bars have grooved slots so that IO boards can slide in and out as required. Specific board stopper pegs are used to hold the CPU and Power supply boards firmly in place. These stoppers can also be used to hold the other boards in place especially during Transit, however when on site, fitted and located in the Back-plane, the need decreases somewhat. The front lids are used for identification of all LED's and IO etc., also the main lid houses the LCD display, Keypad and RS232 connector.

The CPU and Power Supply boards are mounted behind the main lid.
The CPU provides interface with the LCD display/Keypad and communications for CAN (Controller Area Network) i.e. CAN1, CAN2 and CAN3. Also communications for RS232, RS422 and RS485 are provided.
The Power Supply provides several supplies for 24V (regulated and unregulated) and 5V supplies (regulated only). Fusing for each supply is mounted on board and LED indication for each fuse.

Back-plane/Motherboards are fixed within IO rack providing slot sections (1-5, 6-10 / 11-15 and 16-20) as required. They also provide connection from the IO cards to the CPU board, and power connections from the Power Supply Board. This modular approach keeps space/hence control cabinet size down to a minimum.

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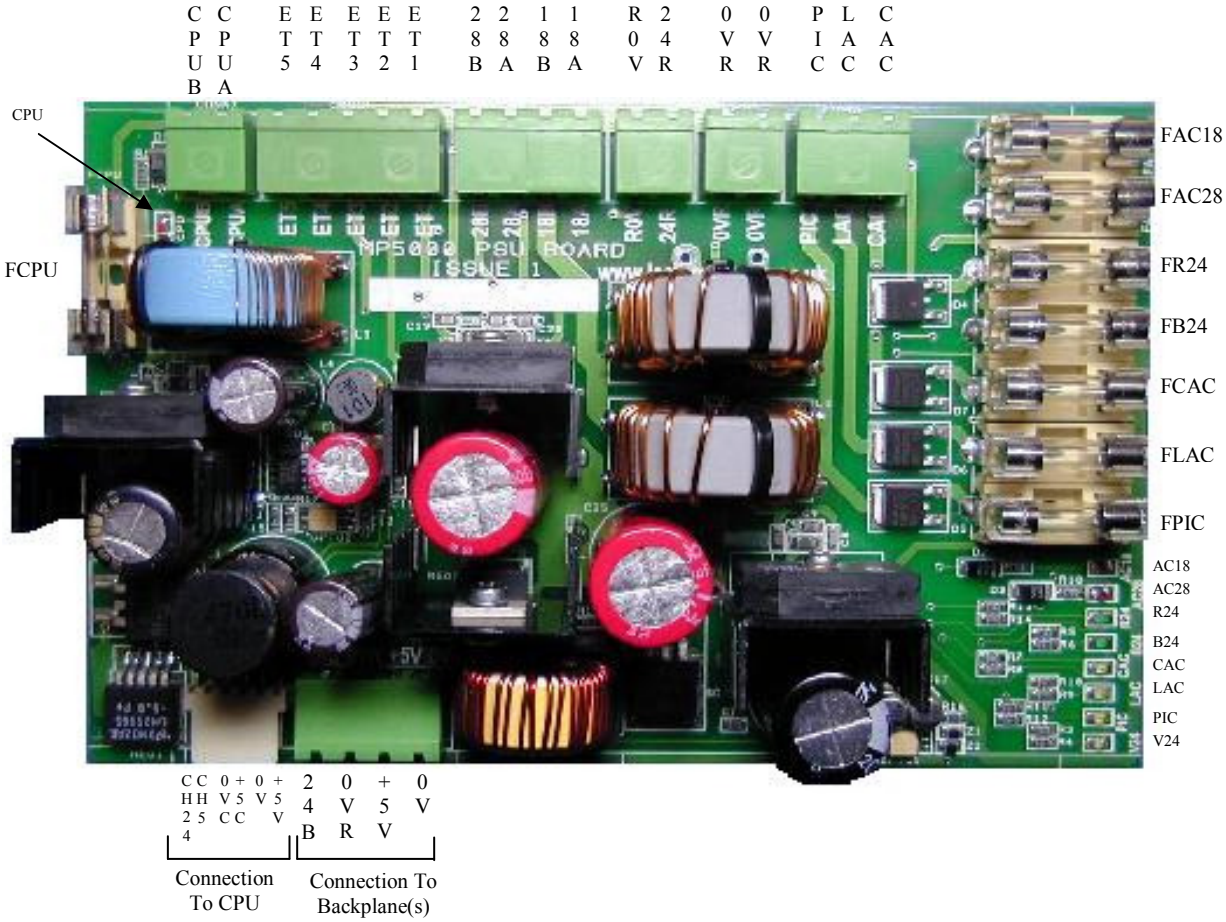
7) Power Supply



The Power Supply board as shown above is normally located on the right hand side of the main processor CPU board within the rack. The Connections are:

Connection Type	Description	Voltage
CPUA, CPUB	CPU AC Power Input	18V
ET1-ET5	Earth Connections: Filters, Comms, Logic, OVR, 24VRegulated	NA
28A, 28B	24V Regulated AC Power Input	28V
18B, 18A	24V Un-regulated AC Power Input	18V
24R, R0V	24V Regulated DC Power Output (+/- 5%)	24V
0VR, 0VR	0V Return For 24V Unregulated DC Output	NA
PIC	Position Indicator 24V Unregulated DC Output	18-28V
LAC	Landing Acceptance 24V Unregulated DC Output	18-28V
CAC	Car Acceptance 24V Unregulated DC Output	18-28V
24B	Back-plane 24V Unregulated DC Output	18-28V
0VR	As above	
+5V	+5V CPU & Logic Regulated Supply for Back-plane	+5V
0V	0V Return for 5V CPU & Logic	NA
CH24	24V Unregulated DC Power Output Check (to CPU)	0-5V
CH5	5VComms DC Power Output Check for (to CPU)	0-5V
0VC	0V Return for 5V Comms (to CPU)	NA
+5C	5VComms DC Power Output (to CPU)	+5V
0V	0V Return for 5V CPU & Logic (to CPU)	NA
+5V	5V CPU & Logic DC Power Output (to CPU)	+5V

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7.1) Power Supply Outputs

The Power Supply board as shown previous provides power supplies as detailed below:

Supply Type	Derived From	Norm Rating	Max Rating
24V Un-Regulated	18V AC, Dedicated Winding	4A	6A
24V Regulated	28V AC, Dedicated Winding	2A	3A
5V CPU & Logic	18V AC, Dedicated Winding	3A	3A
5V Communications	CPU & Logic supply	0.5A	0.5A

The 24V Un-Regulated supply is intended to feed external equipment with a wide supply tolerance range, i.e. Call accepted indicators, Position Indicators / Units etc. It also is used to supply the Back-plane and 24V for the IO cards. It is also considered a "Dirty" supply.

The 24V Regulated supply is intended to feed external equipment with a narrow supply tolerance range, i.e. Positional Devices (shaft encoder), hydraulic equipment and some door edge devices. It is also considered a "Dirty" supply.

The 5V CPU and logic supply feeds the main microprocessor and input output cards. It is also considered a "Clean" supply.

The 5V communication supply feeds all communication ports i.e. RS232, CAN ports etc., it is also considered a "Dirty" supply, and should never be connected to the CPU and logic supply.

Separate Earth connections are provided to ensure the lowest path of resistance to Earth. The function of each Earth connection is detailed previous. Terminal connections are provided to transfer power from the power supply to the IO Back-plane(s) i.e. 24V and 5V logic supplies.

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7.2) Power Supply Fuses and Indication.

The Power Supply has on board fusing that protects the circuits as detailed below. The associated LED indication is also given:

Fuse Type	Supply Protection	Norm Rating	Max Rating	LED Indication
FCPU	18V AC Input, CPU LOGIC.	1.25A, Qblow	1.25A, Qblow	CPU
FAC18	18V AC Input, 24V Unregulated.	4A, Qblow	6A, Qblow	AC18
FAC28	28V AC Input, 24V Regulated.	2A, Qblow	3A, Qblow	AC28
FR24	24V DC, 24V Regulated Output.	2A, Qblow	3A, Qblow	R24
FB24	Back-plane Output, 24V Unregulated.	2A, Qblow	6A, Qblow	B24
FCAC	Car Acceptance Output, 24V Unregulated.	2A, Qblow	4A Qblow	CAC
FLAC	Car Acceptance Output, 24V Unregulated.	2A, Qblow	4A Qblow	LAC
FPIC	Position Indicator Output, 24V Unregulated.	2A, Qblow	4A Qblow	PIC

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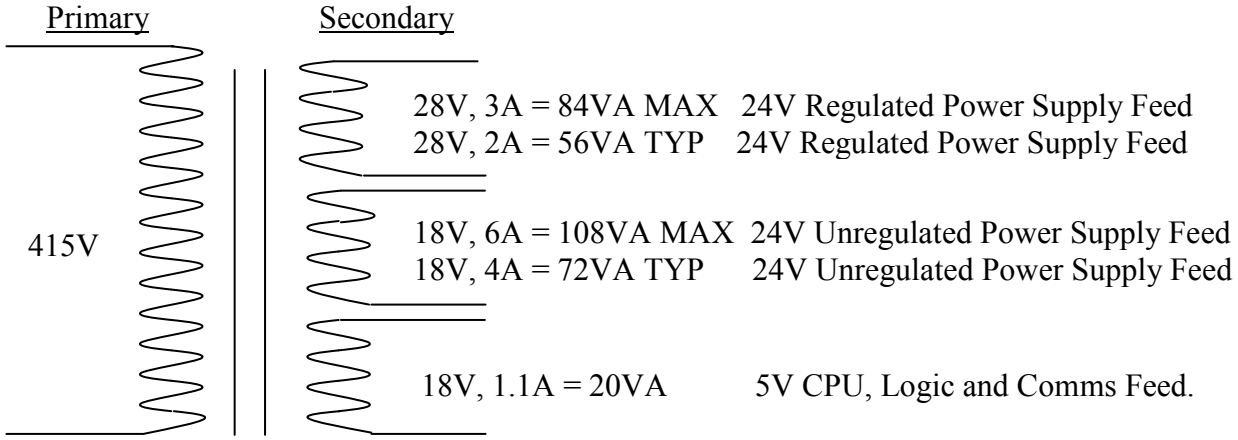
7.3) Power Supply External Transformer Inputs

The Power Supply External transformer is derived from the 415V supply and provides outputs as below:



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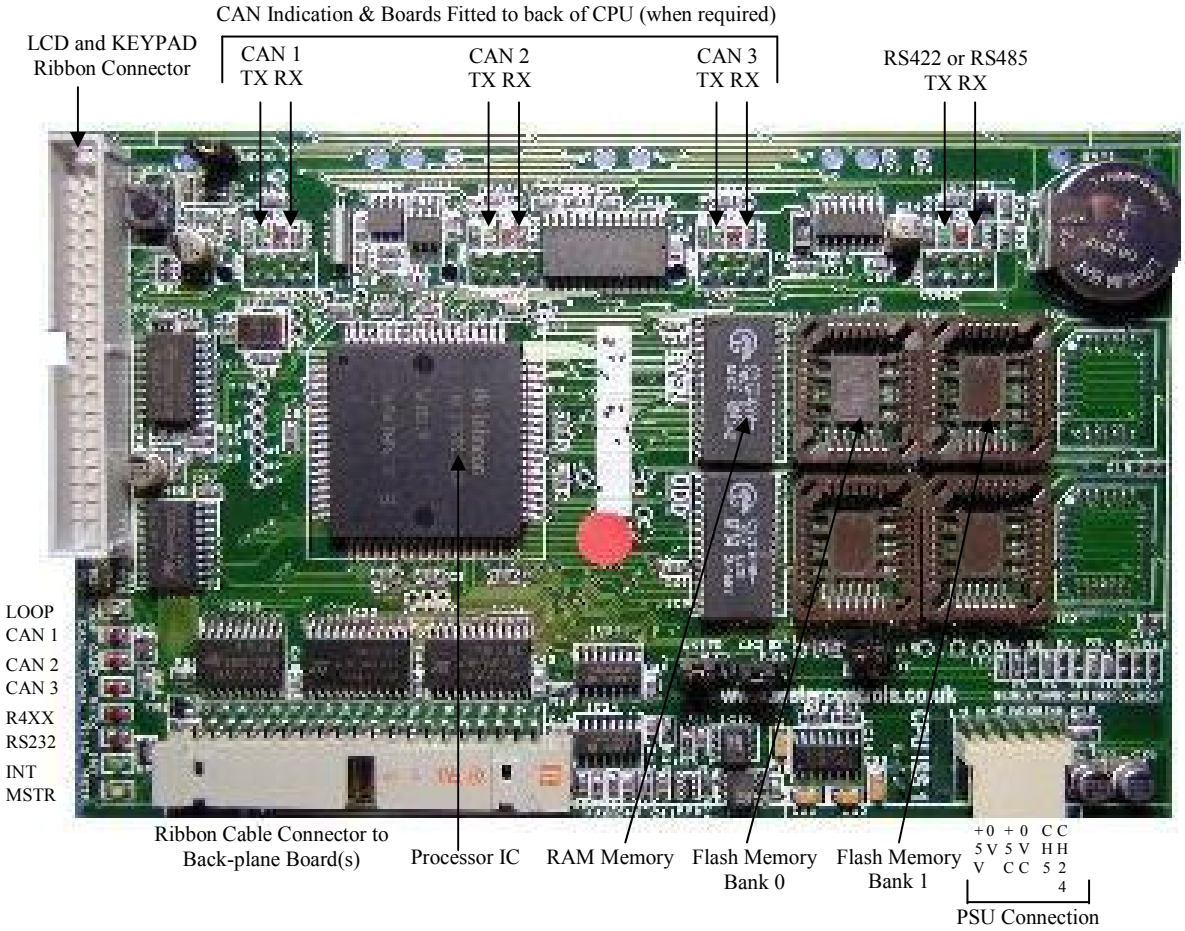
8) CPU Board



The main CPU Processor board (shown above) provides control and indication for the lift. The Graphical LCD display combined with the keypad provides the user with an easy to use menu interface for displaying lift and IO information, and changing parameters.

LED indication is provided for system functions i.e. Program Loop, Communications and Master light etc. The table below gives the appropriate functions:

LED	FUNCTION	FLASH SPEED / FUNCTION
LOOP	Processor Program Loop	5 Times a second Approx
CAN1	CAN1 Communications	Upon Message Activity (TX/RX)
CAN2	CAN2 Communications	Upon Message Activity (TX/RX)
CAN3	CAN3 Communications	Upon Message Activity (TX/RX)
R4XX	RS485/422 Communications	Upon Message Activity (TX/RX)
R232	RS232 Communications	Upon Message Activity (TX/RX)
INT	Processor IO Interrupts	Every 20 Milliseconds
MSTR	MASTER	On all the time when LIFT=MASTER

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The program memory is located in sockets “Flash Memory Bank 0” for access when changing software (if required). “Flash Memory Bank 1” is reserved for future use and will not normally be fitted. The program memory must be removed carefully with a proper EPROM removing tool (“hook / double hook types”). Very little force is required to remove the

memory devices or else damage to the memory sockets may occur. When inserting the new memory devices ensure that the ODD and EVEN devices (as marked) are inserted as ODD and EVEN markings on the board. Also the slanted edges match the slanted edges of the sockets. Once correct, the device should be pushed firmly into the socket until it cannot go any further.

Various connections are provided for serial communication to serial devices (see also Communications section of the manual). The RS232 connection (fitted as standard) provides communication to a P.C. or lap top computer. This in conjunction with the Windows software allows the user to view and change parameters as required. Also the RS232 connection may be used to connect to a Modem or a hand held computer device (when required).

CAN (Controller Area Network) connections are provided to enable communication to lift serial devices and other lifts. CAN 1 connection provides communication to per lift devices i.e. serial Indicators/Speech Unit etc. CAN 2 (fitted on Duplex boards only) provides communication to other lifts i.e. Duplex, Triplex, Group etc. CAN 3 (when fitted) provides communication to motor drives and shaft encoder.

The RS485/RS422 connection is mainly used as a dedicated motor drive serial communication port.

Connection to the Power Supply is achieved using the plug and socket as shown. Connection details are:

Connection Type	**Description**	**Voltage**
CH24	24V Unregulated DC Power Output Check (to CPU)	0-5V
CH5	5VComms DC Power Output Check for (to CPU)	0-5V
0VC	0V Return for 5V Comms (to CPU)	NA
+5C	5VComms DC Power Output (to CPU)	+5V
0V	0V Return for 5V CPU & Logic (to CPU)	NA
+5V	5V CPU & Logic DC Power Output (to CPU)	+5V

Connection to the IO Back-plane board(s) is achieved via the Ribbon Cable Connector as shown. The Ribbon starts at the CPU and terminates at the last Back-plane board.

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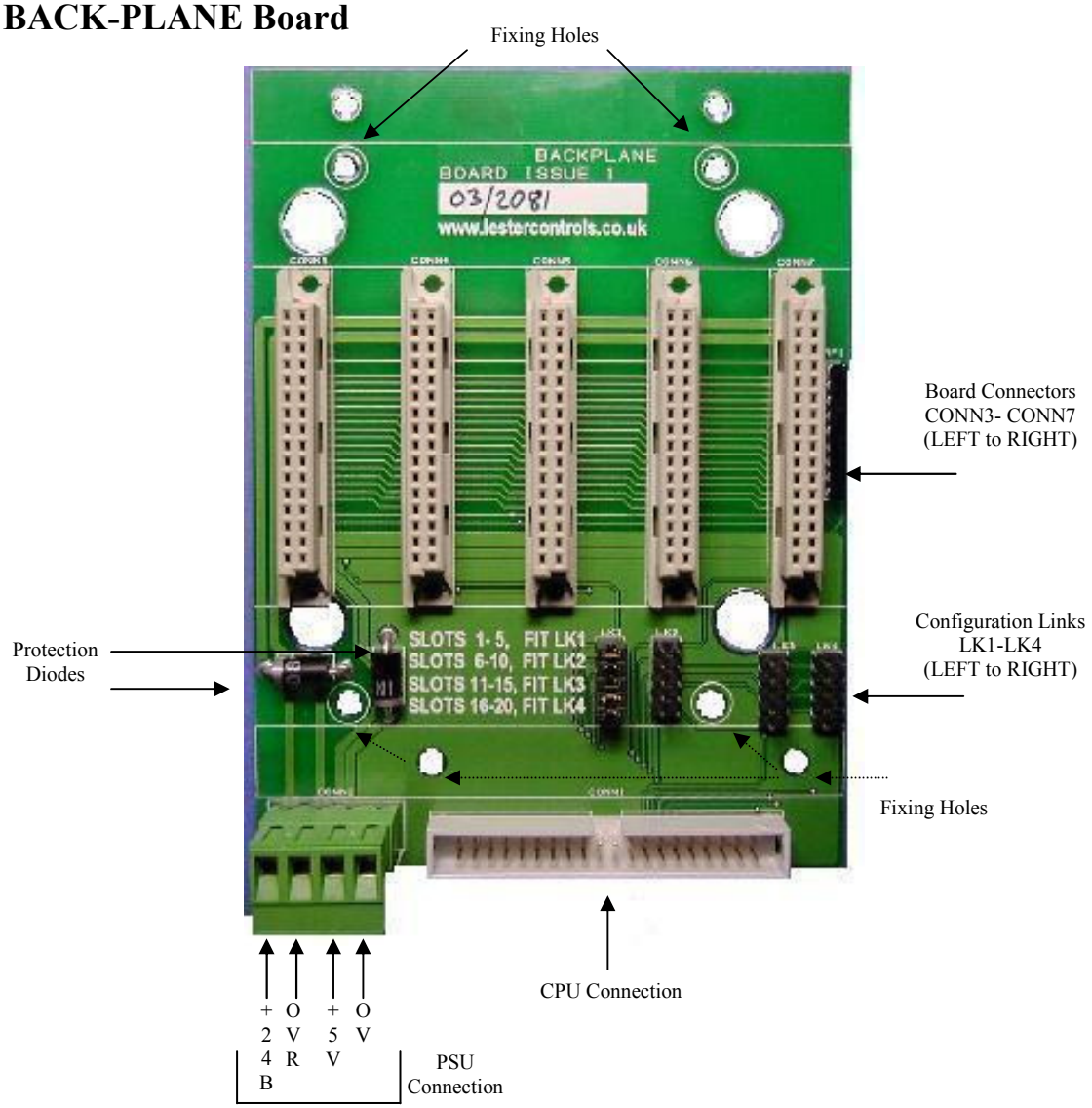
9) BACK-PLANE Board



The Back-plane board above provides a connection between Input/Output devices and the CPU via the Ribbon Cable Connector as shown. Up to a maximum of 4 back-plane boards can be used on a system, to provide 20 IO slots (5 per back-plane). Ribbon cable connections start at the CPU and daisy chain (if necessary) until the last back-plane board. Each board has to be configured for the required IO slot numbers, i.e.

FIT LK1 (link Row 1) for Slots 1-5
FIT LK2 (link Row 2) for Slots 6-10
FIT LK3 (link Row 3) for Slots 11-15
FIT LK4 (link Row 4) for Slots 16-20

The Back-plane board also provides a connection between Input/Output devices and the Power Supply via the PSU Connector as shown. Power connections start at the PSU and daisy chain (if necessary) until the last back-plane board. Protection Diodes are provided to protect the IO cards against reverse polarity supply.

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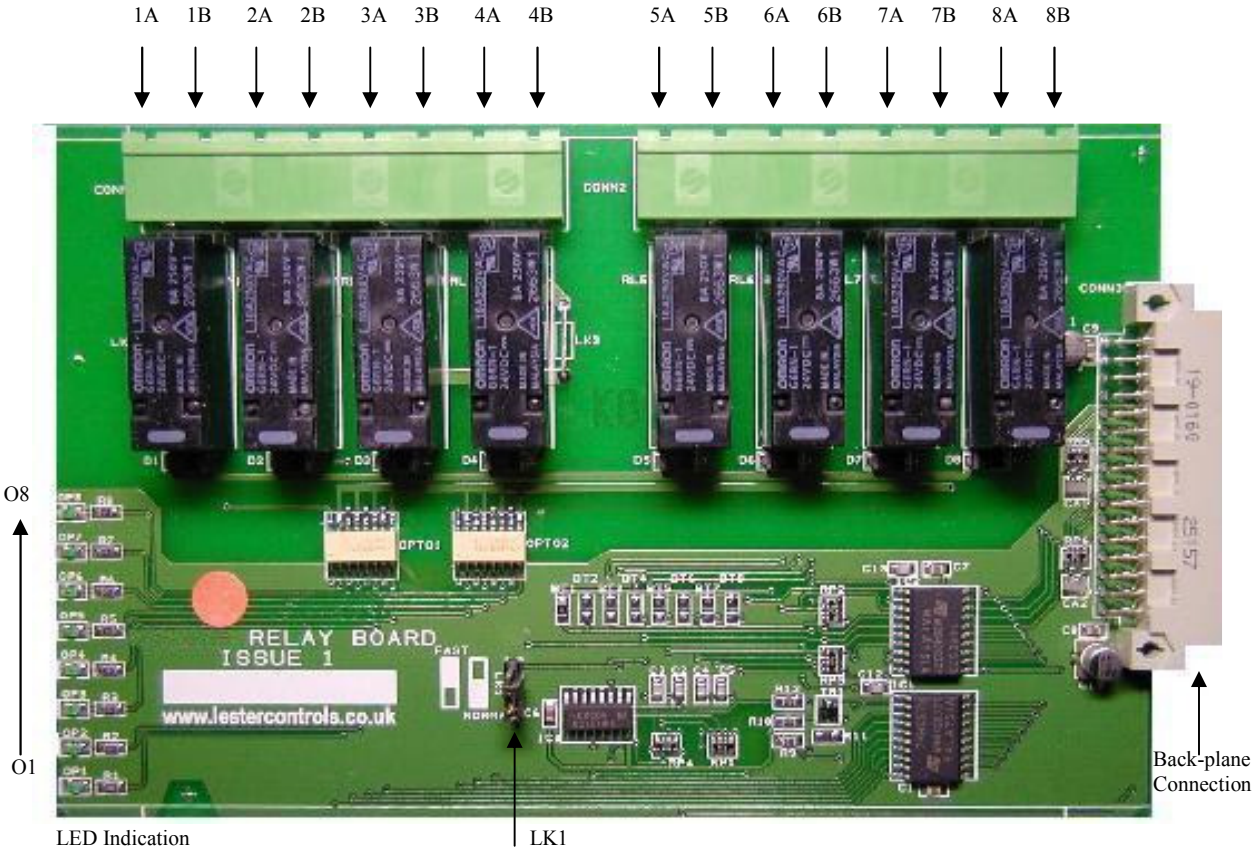
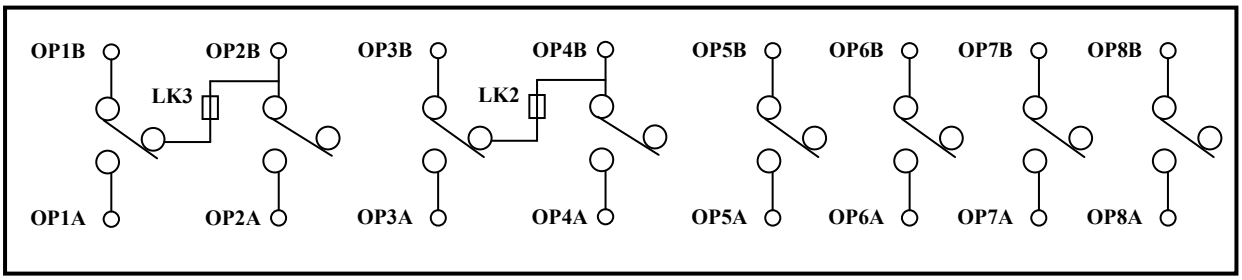
10) RELAY Board



The Relay Output board provides 8 normally open volt free relay contacts that can be configured as required. The contacts are rated up to (5A@30Vd.c.) and (8A@250Va.c.)
As Standard, **Outputs 5 to 8** are not common and must be wired to each side of the contact i.e. A and B, as shown below.
As Standard, **Outputs 1 to 4** have a common link as shown below, but removing LK2/LK3 allows the commons to be removed.



Output connections are shown above. LED indication for each output is provided at the edge of the board i.e. GREEN for outputs.

LK1 when set to FAST, links output 8 to the processor (via opto-isolation), to give a fast output used as HSR. This output can then be used to provide accurate and predictable delays when changing from high speed to low speed for use with motor drives, in gaining accurate floor levels i.e. Direct to Floor Control.
LK1 when set to NORM, acts as a standard software configurable output.

The Back-plane Connection provides both Power and Data.

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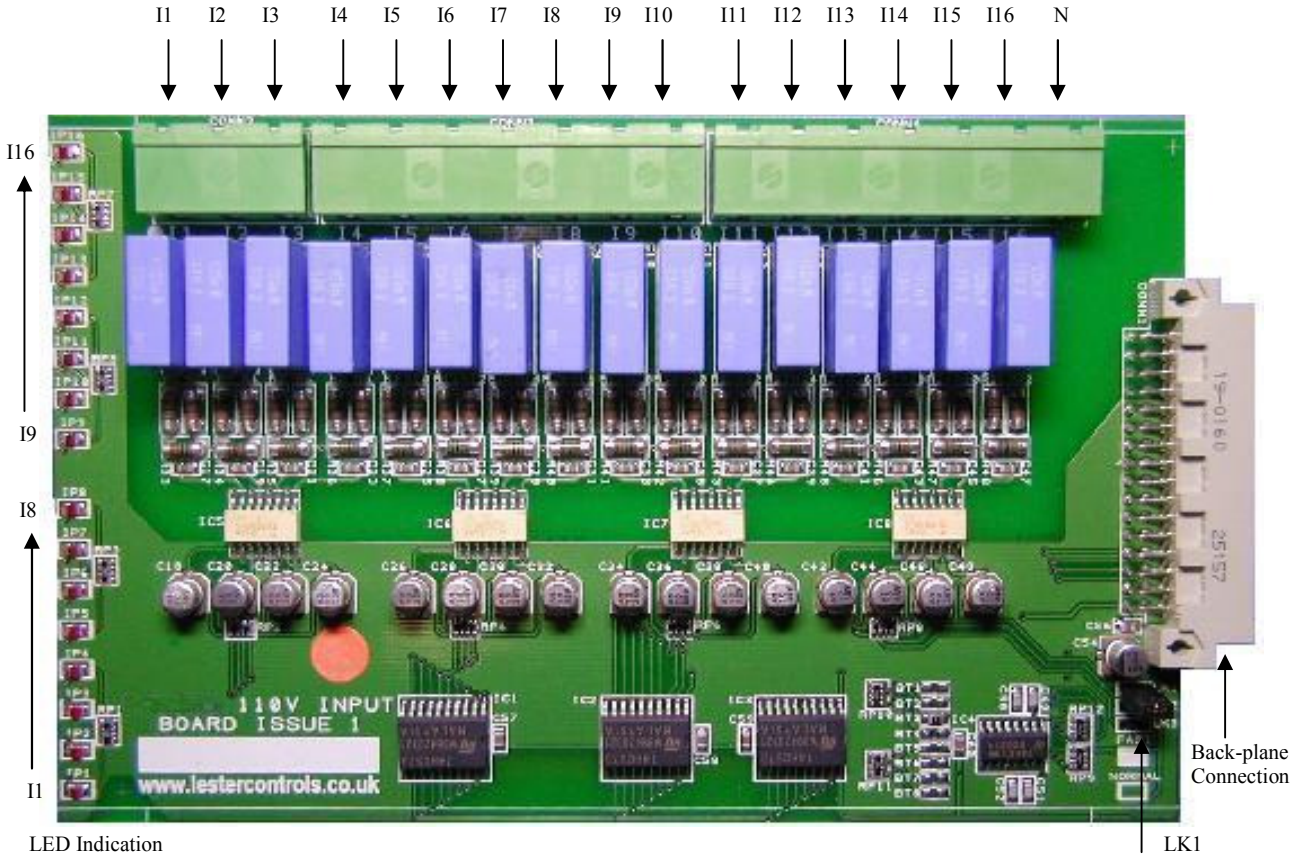
11) MAINS Input Board (16-AC Inputs)



The Mains Input board provides 16-AC inputs (I1-I16) that can be configured as required. Each input conducts a current of 3.5mA@110VAC typically. Each input return path is common to the terminal "N".

Input connections are shown above. LED indication for each input is provided at the edge of the board i.e. RED for inputs.

LK1 when set to FAST, links input 1 to the processor (via opto-isolation) to give a fast input used for STEPPING. This input can then be used to provide accurate and predictable delays when changing from high speed to low speed for use with motor drives, in gaining accurate floor levels i.e. Direct to Floor Control.

LK1 when set to NORM, acts as a standard software configurable input.

The Back-plane Connection provides both Power and Data.

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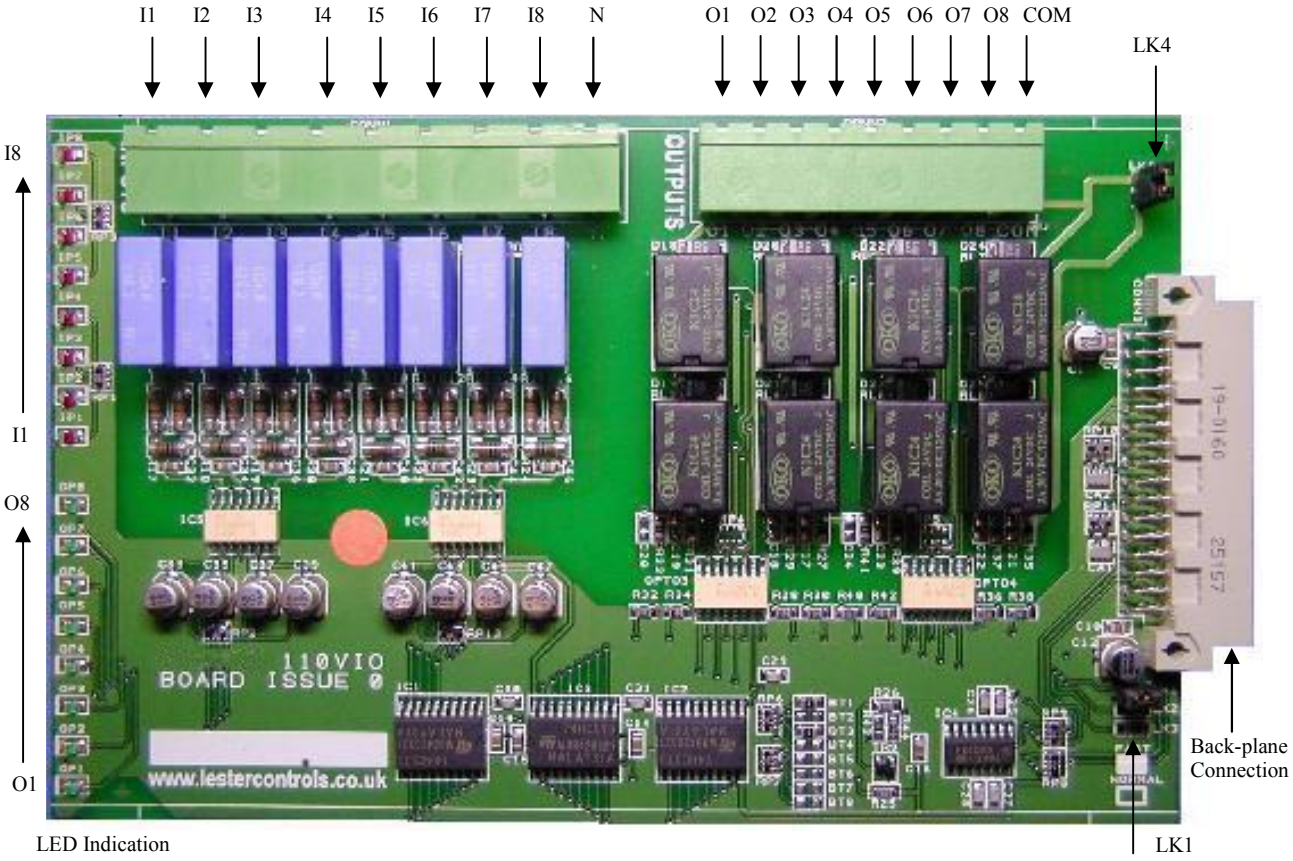
12) 110V IO Board



The 110V Input / Output board provides 8-AC inputs (I1-I8) that can be configured as required. Each input conducts a current of 3.5mA@110VAC typically. Each input return path is common to the terminal "N".

The 110V Input / Output board also provides 8 common normally open volt free relay contacts that can be configured as required. The relay common is connected to terminal "COM". The contacts are rated up to 3A@24Vd.c/110VAC.

Input and Output connections are shown above. LED indication for each input/output is provided at the edge of the board i.e. RED for inputs, and GREEN for Outputs.

LK1 when set to FAST, links input 1 to the processor (via opto-isolation) to give a fast input used for STEPPING. This input can then be used to provide accurate and predictable delays when changing from high speed to low speed for use with motor drives, in gaining accurate floor levels i.e. Direct to Floor Control.
LK1 when set to NORM, acts as a standard software configurable input.

LK4 when set, connects the relay contact commons to 0VR (24V unregulated power return)

The Back-plane Connection provides both Power and Data.

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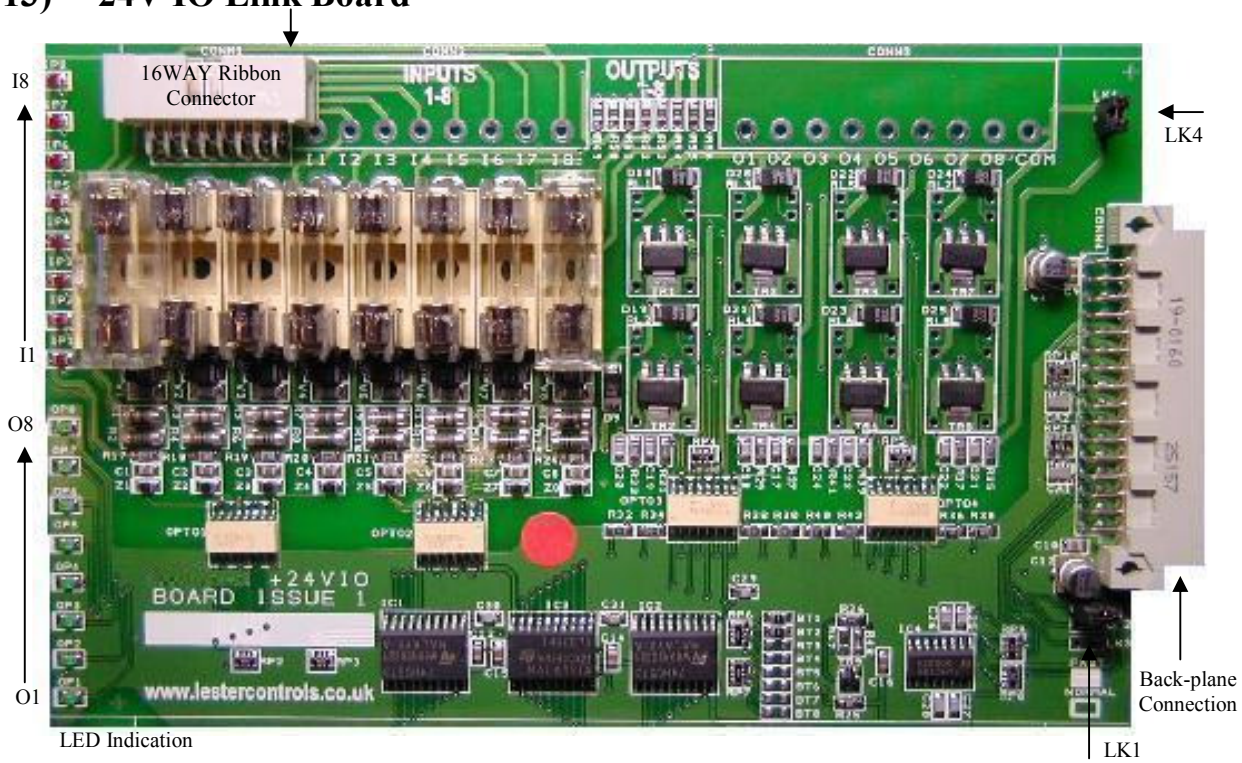
13) 24V IO Link Board



The 24V Input / Output LINKED board provides 8-24V inputs (I1-I8) and 8-24V outputs (O1-O8) that can be configured as required. The main use of the board is for car and landing call inputs that require a 3wire push system. Therefore the outputs are LINKED to the inputs, which provide a call acceptance output.

Each input conducts a current of 14mA@24VDC typically. Inputs are negative switched i.e. Grounded (0VR) when ON. Outputs are achieved using transistors and both input and output are protected as below.

As standard the board is fitted **with** over-voltage and mains input protection. The inputs/outputs are protected against over-voltage of typically greater than 30V and mains voltage up to 240V A.C. If an input/output is subjected to a high voltage then the relevant fuse will blow. This fuse is rated at 250mA quick blow and should be replaced with the same.

Input/Output connections are shown above. A 16way Ribbon cable is used to connect from the board to the control panel terminal rail. Input 1 of the ribbon is marked with a RED insulated wire. Each input/output requires 2 ribbon wires (i.e. “Doubled Up”), resulting in 8 pairs.

LED indication for each input/output is provided at the edge of the board i.e. RED for inputs, and GREEN for Outputs.

LK1 when set to FAST, links input 1 to the processor (via opto-isolation) to give a fast input used for STEPPING. This input can then be used to provide accurate and predictable delays when changing from high speed to low speed for use with motor drives, in gaining accurate floor levels i.e. Direct to Floor Control.
LK1 when set to NORM, acts as a standard software configurable input.
LK4 when set, connects the transistor common return to 0VR (24V unregulated power return).

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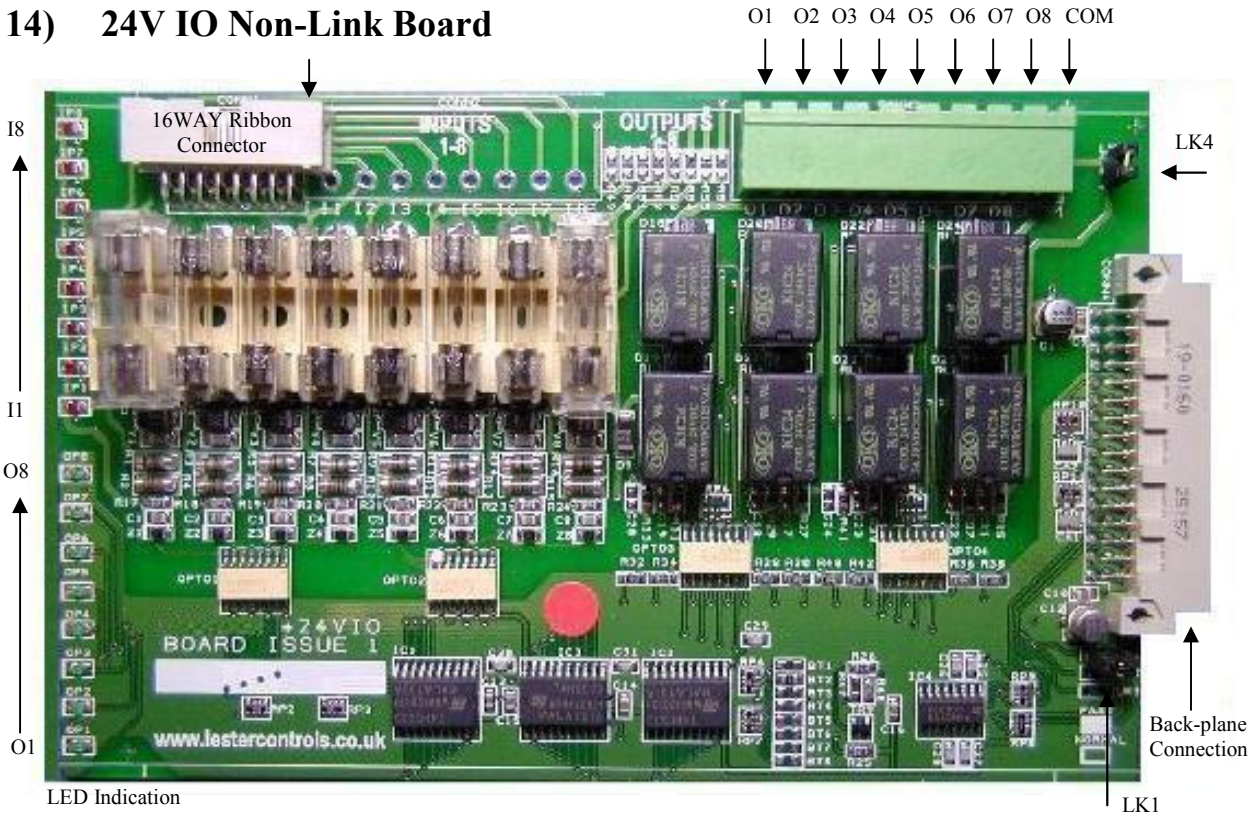
14) 24V IO Non-Link Board



The 24V Input / Output NON-LINKED board provides 8-24V inputs (I1-I8) and 8-24V outputs (O1-O8) that can be configured as required. The main use of the board is for car and landing call inputs that require a 4wire push system, i.e. the call acceptance voltage is different to the input voltage. Therefore the outputs are volt free relay outputs and are NOT LINKED to the inputs.

As standard the board is fitted **with** over-voltage and mains input protection. The inputs are protected against over-voltage of typically greater than 30V and mains voltage up to 240V A.C. If an input is subjected to a high voltage then the relevant fuse will blow. This fuse is rated at 250mA quick blow and should be replaced with the same.

Input connections are shown above. A 16way Ribbon cable is used to connect from the board to the control panel terminal rail. Input 1 of the ribbon is marked with a RED insulated wire. Each input requires 2 ribbon wires (i.e. “Doubled Up”), resulting in 8 pairs.
Each input conducts a current of 14mA@24VDC typically. Inputs are negative switched i.e. Grounded (0VR) when ON.
Outputs provided comprise of 8 normally open volt free relay contacts that can be configured as required. The relay common is connected to terminal “COM”. The contacts are rated up to 3A@24Vd.c/110VAC.

LED indication for each input/output as shown i.e. RED for inputs, and GREEN for Outputs.

LK1 when set to FAST, links input 1 to the processor (via opto-isolation) to give a fast input used for STEPPING. This input can then be used to provide accurate and predictable delays when changing from high speed to low speed for use with motor drives, in gaining accurate floor levels i.e. Direct to Floor Control.
LK1 when set to NORM, acts as a standard software configurable input.
LK4 when set, connects the relay contact commons to 0VR (24V unregulated power return)

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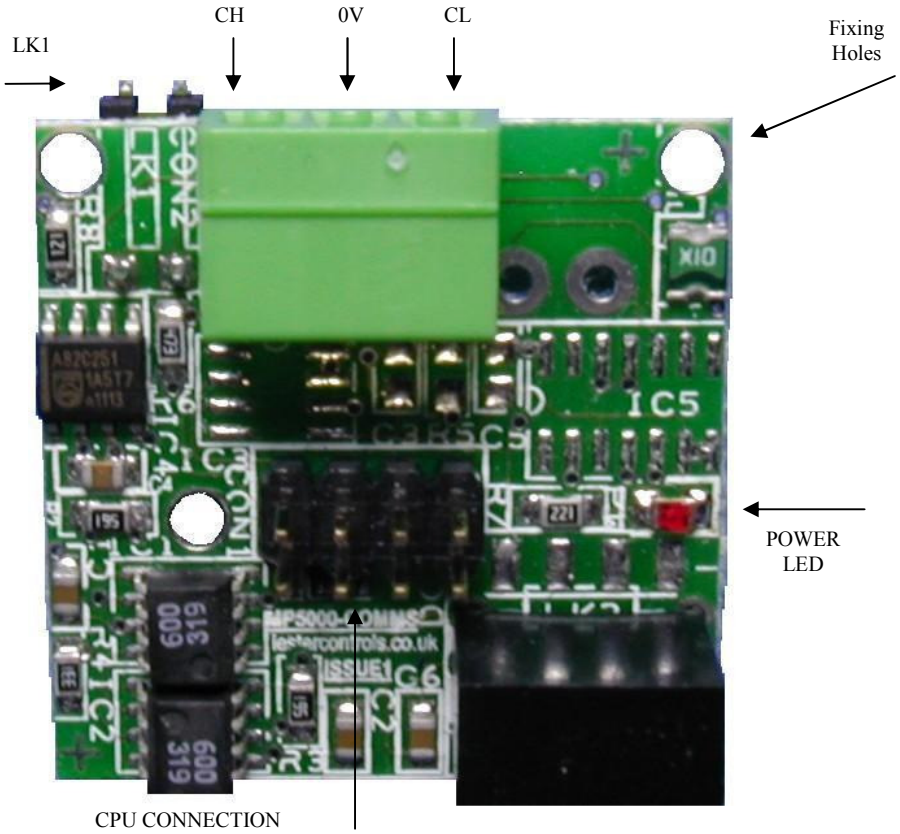
15) CAN Communications Board



Each CAN (Controller Area Network) Board is mounted on the back of the CPU board and provides communications to lift serial devices and other lifts. Connection to the CPU is via the pin connector as shown. Also snap in fixings (in the fixing holes), ensure the board is firmly fixed.

External Connections to the 2 part terminal block are detailed below:

Connection Type	Description	Voltage
CH	CAN HIGH Communications	0-5V
0V	Isolated Communications 0V Return, i.e. cable screen	NA
CL	CAN LOW Communications	0-5V

CAN 1 connection provides communication to per lift devices i.e. serial Indicators/Speech Unit etc.
CAN 2 (fitted on Duplex boards only) provides communication to other lifts i.e. Duplex, Triplex, Group etc.
CAN 3 (when fitted) provides communication to motor drives and shaft encoder.

LK1 when fitted acts as a BUS termination Resistor.

LED indication for TX (transmit) RX (receive), CAN1, CAN2 and CAN3 activity is provided on the CPU (see CPU Board).

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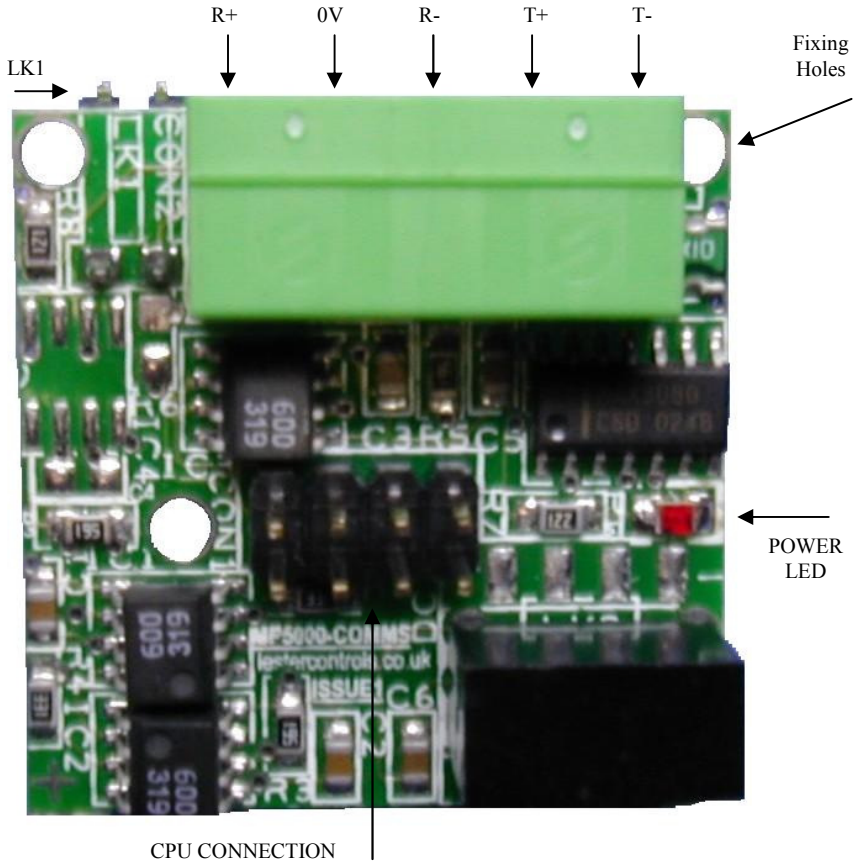
16) RS422/RS485 Communications Board

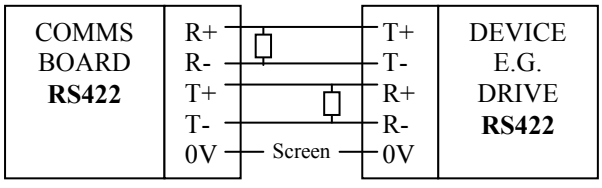


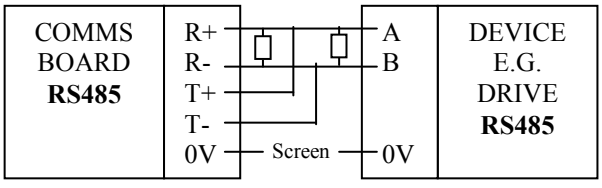
The RS422/RS485 Board is mounted on the back of the CPU board and is mainly used as a dedicated motor drive serial communication port. Connection to the CPU is via the pin connector as shown. Snap in fixings (in the fixing holes), ensure the board is firmly fixed.

External Connections to the 2 part terminal block are detailed below:

Connection Type	Description	Voltage
R+	Receive Channel Positive	±13V
0V	Isolated Communications 0V Return, i.e. cable screen	NA
R-	Receive Channel Negative	±13V
T+	Transmit Channel Positive	±13V
T-	Transmit Channel Negative	±13V

The following shows connections for RS422/485 respectively (with BUS terminations):





LK1 when fitted acts as a BUS termination Resistor.
LED indication for TX (transmit) RX (receive), RS4XX activity is provided on the CPU (see CPU Board).

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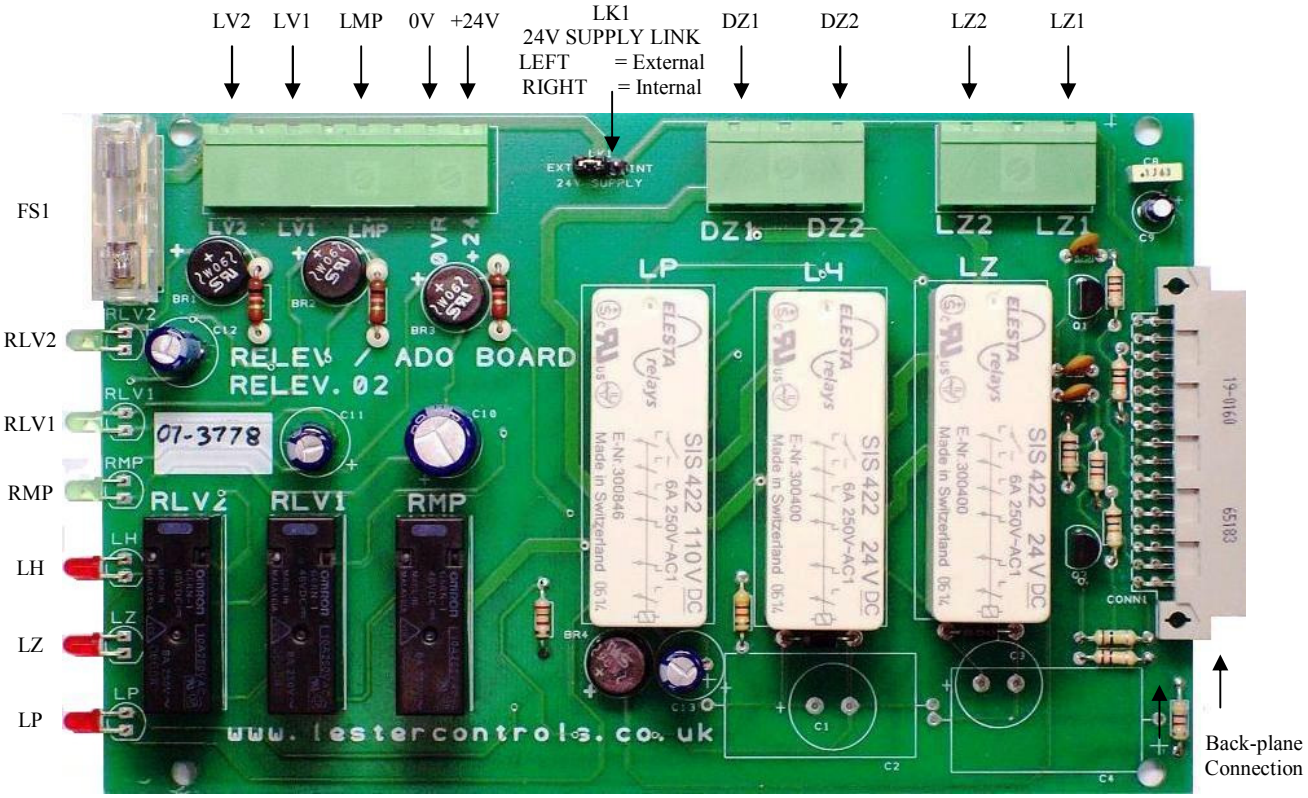
17) Re-Levelling and Advance Door Opening Board

(See also Re-Levelling, and Advance Door Open Control)



The Re-levelling and Advance Door Opening Board is a safety critical board that checks for correct vane information (also stuck vanes) and ensures that safety circuits (car / landing lock circuits) are only bridged, when the conditions are correct. The safety critical board in conjunction with the physical shaft vane information (re-level proximity vanes), is designed to conform to BS/EN81 standards. The Board may be used in conjunction with the Almega rack system, or another system such as MP2G i.e. "Stand alone".

LK1 = supply source i.e. "internal = from backplane", or "external = terminals"

Inputs

LV1 = Re-level / ADO sensor 1 (1st sensor - tape-head / proximity switch-110VAC)
LV2 = Re-level / ADO signal 2 (from micro processor re-level / ado output-110VAC)
LMP = Re-level / ADO pilot input from micro processor (110VAVC).
0VR = Supply Return for +24V supply (stand alone mode only)
+24V = +24V D.C supply (60mA max) (stand alone mode only)

Outputs

LZ1-LZ2 = Level Zone: n/o Contact (6A@250VAC) for bridging lock safety circuit.
DZ1-DZ2 = Door Zone: n/o Contact (6A@250VAC) to be wired into a processor input for feedback or in Series with Door Open Contactor circuit.

LED Indication

RLV1-2/RMP = Indication for relay coils RLV1, RLV2, and RMP respectively.
LH/LZ/LP = Indication for relay coils LP, LZ, and LP respectively.
Note when locks are bridged LED's RLV2, RLV1, RMP, LH and LZ should all be lit.

Protection FS1= Fuse protection for +24V supply input (internal or external, 250mA Q-blow)
The Back-plane Connection provides both Power and Board Identification.

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18) Menu List Description

A typical Menu list is shown below. Each menu list item has a purpose to either view lift information or view and change lift parameters according to the password entered. Each Menu List Item contains a relevant block of parameters i.e. all Door parameters are in Door Set-up and all Door times are in Door Times etc. All parameters will be set according to the job specification before being despatched from Lester Controls. A brief description of all the menu items is shown below.

EVENT HISTORY
ENGINEERS SELECTION
ENTER CALLS
LIFT VIEWER
INPUT OUTPUT VIEWER
GROUP / WAITING TIMES
JOB DETAILS
EXTERNAL DEVICES

HOMING SETUP
IO SETUP
SYSTEM DETAILS
DOOR SETUP
DOOR TIMES
GENERAL PARAMETERS
GENERAL TIMES
TRAVEL SETUP

OUT OF SERVICE SETUP
HYDRAULIC SETUP
ANTI NUISANCE SETUP
FIRE CONTROL SETUP
SPECIAL SERVICE SETUP
SPECIAL SERVICE 2
SPECIAL SERVICE TIMES
FLOOR SPEED SETUP

STEPPING DELAYS SETUP
PREVIOUS STEP SETUP
ETA PARAMETERS
GROUP SETUP
FLOOR CALLS/ALLOCS
ADVANCING SELECTOR
EVENT TRACE BUFFER
TRACE SETUP

DATE TIME SETUP
GENERAL INFORMATION
MODIFIED PARAMETERS
PARAMETER CONTROL

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EVENT HISTORY

All current event History (up to last 100 events) can be viewed from within this menu. The data can be viewed in list format, or as detailed information with description, time and date etc.

ENGINEERS SELECTION

This provides a selection of the most common parameters to be used by Lift site Engineers, in comparison to the many parameters in the whole set.

ENTER CALLS

The user can enter specific or patterned calls from within this menu with the option of repeating and viewing the calls with the Lift Viewer. Individual Car, Up, and Down calls can be entered in conjunction with the Lift Viewer.

LIFT VIEWER

A graphical representation of the lift can be viewed showing lift position, status, door status, vane information, safety / lock circuit, calls and much more.

INPUT OUTPUT VIEWER

A graphical representation of the inputs and outputs can be viewed from this menu, as well as the boards fitted within the IO rack (board types).

GROUP / WAITING TIMES

Intended for group applications, a graphical representation of up to five lifts at once can be viewed showing lift position, status, door status, calls and more. Also waiting times and current Group Algorithm can be viewed.

JOB DETAILS

Job details such as Customer Name, Job Number and LCD default message etc, can be viewed and changed if required.

EXTERNAL DEVICES

External devices specific to the lift are intended to be set-up from here, i.e. serial devices such as Speech Unit and Digital Indicator. All positions, messages, phrases, enables etc, are configurable via this menu.

HOMING SETUP

Homing parameters/times such as Homing floors, Homing time and Homing ON/OFF can be viewed and changed as required.

IO SETUP

All Input/Output parameters such as Call inputs, Relay outputs and General inputs etc, can be viewed and changed as required. Boards fitted within the IO rack can also be viewed.

SYSTEM DETAILS

System details such as Number of floors, Drive type and Collective type etc, can be viewed and changed if required.

DOOR SETUP

Door parameters can be viewed and changed as required such as Park open, Nudging enabled and Disable doors etc.

DOOR TIMES

Door time parameters can be viewed and changed as required such as Door Dwell times and Nudging time etc.

GENERAL PARAMETERS

General parameters such as Pre Flite Checking and Pulse HLR etc can be viewed and changed if required.

GENERAL TIMES

General times such as Self Test time and Dive time etc can be viewed and changed if required.

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TRAVEL SETUP

Travel parameters/times mostly associated with the drive control can be viewed and changed as required, such as Brake Lift/Release times, Stop time and Journey time etc.

OUT OF SERVICE SETUP

The Out Of Service Indicator can be configured to show out of service for a variety of conditions such as Landing Lock Failure, Car Lock Failure, Fire Control and Service Control etc.

HYDRAULIC SETUP

Hydraulic Lift parameters such as Hydraulic Homing Required, Hydraulic Homing Time and Re-level period etc, can be viewed and changed as required.

ANTI-NUISANCE SETUP

Anti nuisance parameters such as Forward car call dumping, Reverse car call dumping and Door Open push held car call dumping etc, can be viewed and changed as required.

FIRE CONTROL SETUP

Fire control parameters such as Door Control, Fire return floor and Fire type (i.e. Fire Fighting) etc, can be viewed and changed as required.

SPECIAL SERVICE SETUP

Parameters referring to mainly Priority Service 1, 2 and 3 can be viewed/changed as required.

SPECIAL SERVICE 2

Parameters referring to mainly Service Control, Prepare to Test and Shutdown Control can be viewed/changed as required.

SPECIAL SERVICE TIMES

Parameters referring to Special Service Times i.e. door dwell times can be viewed and changed as required.

FLOOR SPEED SETUP

Floor Speed parameters for UP and DOWN direction and for various multi floor runs can be viewed and changed as required.

STEP DELAYS SETUP

Proximity pulse delay (STEP Delay) parameters for UP and DOWN direction and for various speeds can be viewed and changed as required.

PREVIOUS STEP SETUP

Parameters for slowing on a previous stepping vane can be set here. This feature provides a solution for varying and short floor heights. Parameters for UP and DOWN direction and for various speeds can be viewed and changed as required.

ETA PARAMETERS

When the system is set for Duplex, Triplex or Group, parameters can be viewed and changed as required to alter the Estimated Time of Arrival calculations e.g. Lift High Speed, Door timing and Motion timing etc.

GROUP SETUP

Mainly group Algorithm configuration can be set here, when used in conjunction with a despatcherless Group system.

FLOOR CALLS/ALLOCS

Setting of individual call allocations (Car, Up, Down and Homing) can be set/restricted here. This also can be achieved at set times via the “time clock” settings.

ADVANCING SELECTOR

Advancing Selector parameters for use with a high speed lifts can be viewed and changed if required.

EVENT TRACE BUFFER

All current Trace History can be viewed from within this menu. The data can be viewed in list format, or as detailed information with description, time and date etc. Trace history is a log of certain events or information that is usually viewed for diagnostic purposes.

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TRACE SETUP

This is the Trace history set-up menu; whereby items can be selected for trace i.e. vane info or door info or communications info or all if required. Once set-up entering Trace History will display the information.

DATE TIME SETUP

The settings of time and date associated with the real time clock can be viewed and changed if required.

GENERAL INFORMATION

General information for the lift can be viewed here. E.g. Software Version, Number of Journeys Count, Number of Door Cycles etc.

MODIFIED PARAMETERS

A list all relevant Parameters that have been modified can be viewed from within this menu. The data can be viewed in list format, or as detailed information showing the default value that the parameter has changed from.

PARAMETER CONTROL

Password Entry and the control of parameters are accessed here. A password is first required to enable the user to change parameters. Parameters can be stored and loaded as required, to be either Factory/User settings, First time Defaults or Current/Normal parameters.

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19) Engineers' Entry, Password Entry, and Parameter Control

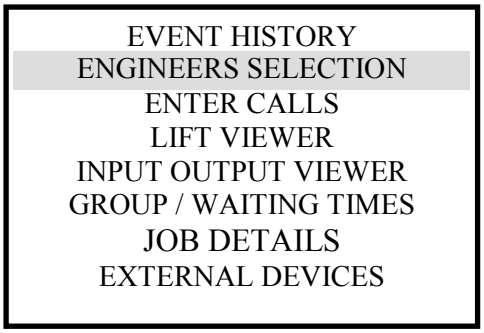
19.1) Engineers' Entry

Before any parameters can be changed, the Engineer must "log on" by initiating the event **Engineer Present** to record his/her entry. This entry is achieved by pressing MODE and ENTER simultaneously on the keypad. This will then set **password level 1** and the Engineer will be able to change certain parameters e.g. door dwell times, homing times/floors etc. The Engineer present mode will allow **password level 1** for a time period of 24 hours or until **Engineer Leaving** is asserted from the keypad. This entry is achieved again by pressing MODE and ENTER simultaneously on the keypad. Indication of Engineer Present is shown on the LCD Default message.

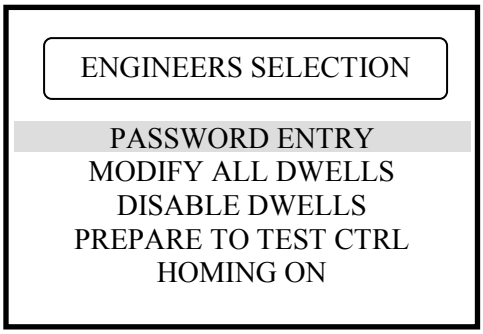
19.2) Password Entry

Higher Level passwords are achieved by entering an actual password, which can be obtained from Lester Control Systems when required. Again the Engineer Present mode must be asserted to allow a password to be entered at all. The password is entered from the menu PARAMETER CONTROL in the main menu list, or from ENGINEERS SELECTION as below:

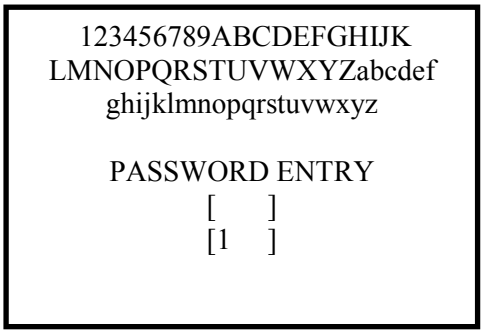
1) The keypad keys (🡅 and 🡇) can be used to scroll through the menu list as below:



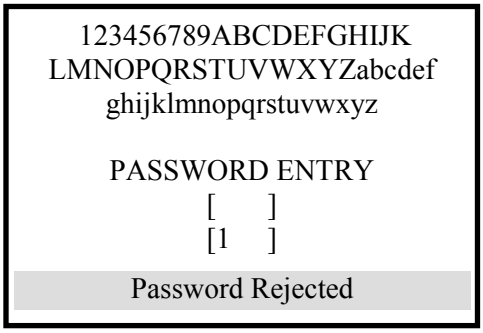
2) On pressing ENTER the Engineers Selection will be displayed as follows:



3) On pressing ENTER again, the Password Entry will be displayed as below:



4) The top 3 lines of the display, show the list of possible characters. The keypad keys (🡅 and 🡇) will scroll through the list of possible characters for the password. Pressing 🡆 will move onto the next character and will loop back to the beginning once at the end. Pressing ENTER will submit the entry as displayed upon the screen. If it is the correct password, a message "**Password Level X OK**" will be displayed (where X is the level to be obtained). Otherwise a message "**Password Rejected**" will be displayed.



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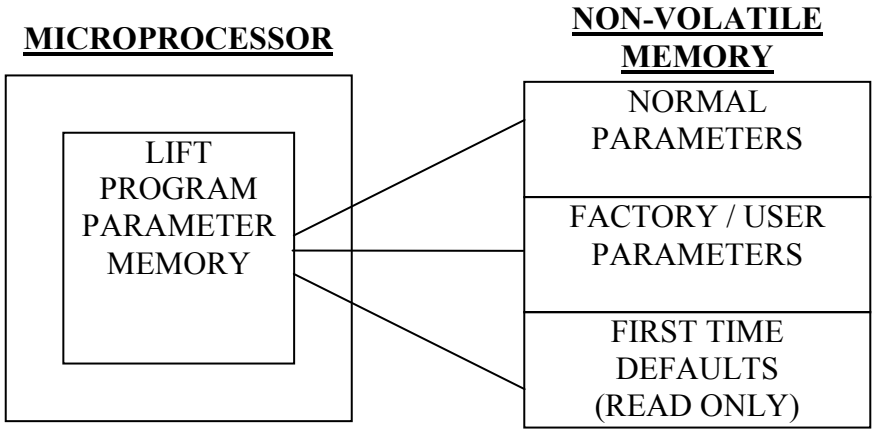
19.3) Changing the Password

Selecting a different PASSWORD MODIFIER number can change the password. This can be achieved by selecting PASSWORD MODIFIER from the menu list. The number can be changed from 0 to 6 and has the effect of modifying the password in a pre-defined sequence. Once changed, Lester Control Systems will have to be contacted to obtain the new password. The main reason for changing the password is to provide security for a new user who wishes to inhibit the use of any previously known passwords.

19.4) Parameter Control

There are three sets of parameters, which are: **first time defaults**, **factory/user settings**, and **normal/current parameters**. These three sets are identical in every way apart from their values. First time defaults are typical job parameters that are loaded upon first time power up of the processor board. The factory set parameters are the ones set prior to despatch from Lester Control Systems (i.e. customer specific). The current parameters are ones that are currently available from the menu. When required, it is possible to load and save factory settings, or load first time defaults into the lift program memory. The diagram below illustrates the process of parameter control:



As can be seen parameters can be stored from the lift program parameter memory as Normal or Factory/User defaults. However Normal, Factory/User or First Time Defaults can be loaded into the program memory as required.

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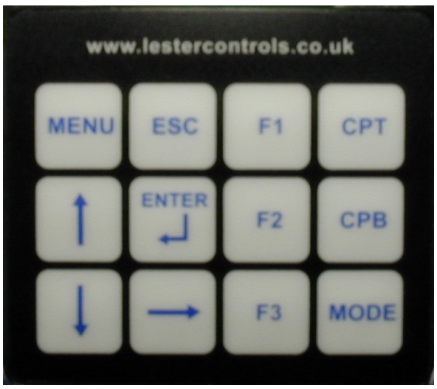
20) Setup / Programming via the Keypad Interface



The lift parameters should be setup as specified, before being despatched from Lester Control Systems. However when required, programming of the lift controller is achieved by setting parameters from within the menu on the LCD display. The main menu is a list of menu items, which contain blocks of data associated with various parts of the lift program. These data blocks known as parameters can be changed to manipulate the lift program into performing a task in the desired way, e.g. changing door dwell times and homing times/homing floor etc.

Note the parameters are protected by the use of PASSWORDS (see PASSWORD ENTRY), which are required before a parameter may be changed. Different passwords are required to access different levels of parameters. Up to certain levels of password will be given upon request, higher levels will only be given at the discretion of Lester Control Systems.

By the use of the keypad keys: mainly ↑, ↓, ENTER, ESC, → and MENU, parameters can be viewed and easily changed as desired.

Parameters are selected by first moving the scroll bar over the menu item list and pressing ENTER. This will access the user into a further section, which details the parameters in that menu item list. Again by moving the scroll bar over the required parameter and pressing ENTER, the details of that parameter are revealed. Changing the parameter is then achieved by using the ↑, and ↓ arrows of the keypad to select a different value for that parameter. Pressing ENTER once again will store the new value of the parameter and a message will be displayed to indicate that the parameter has been updated successfully.

Parameters once changed are stored in non-volatile memory (i.e. not affected by power down)

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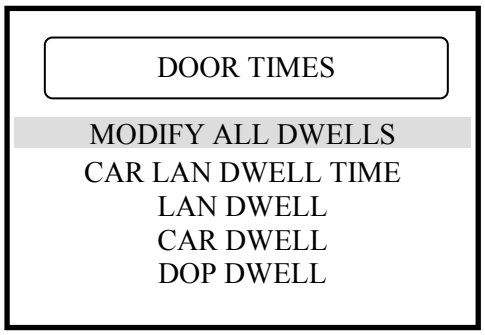
20.1) Example Of Changing a Parameter

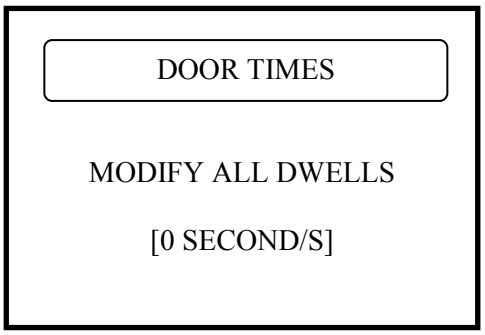
The example below shows how to increase all door dwell times by 5seconds. Before any parameters can be changed, the Engineer must "log on" by initiating the event **Engineer Present** to record his/her entry. This entry is achieved by pressing **MODE** and **ENTER** simultaneously on the keypad, hence **Password level 1** will be set.

Move the menu scroll bar down to the Door Times with the down arrow 🡻 on the keypad as shown. Note the inverting of the text indicates the scroll bar position. Once over the Door Times as shown, press **ENTER** on the keypad to enter that menu.

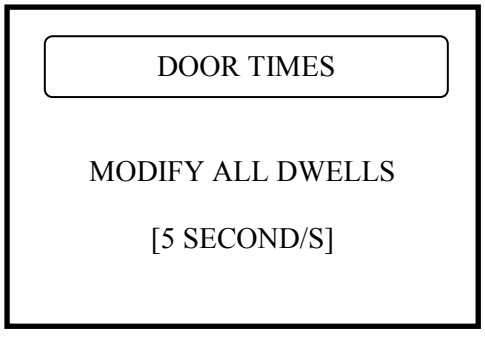
1) The Door Setup should reveal the following Sub Menu.



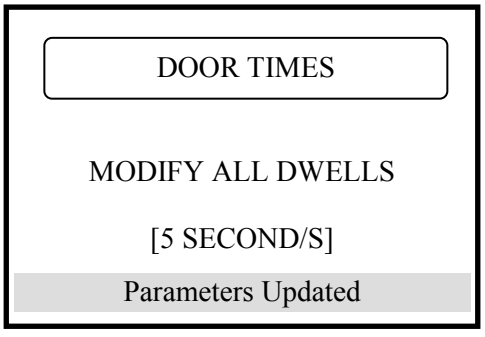
2) Press Enter to reveal the parameter and its value as shown:



3) Change the parameter value by using the 🡹, or 🡻 arrows on the keypad. Note the value will alternate between **–60 and 60 Seconds** typically**.** Set the parameter for **5 Seconds** as below:



4) Finally press Enter on the Keypad to change the parameter value and store it in memory. If the parameter has been accepted the message "**Parameters Updated**" will appear on the bottom of the LCD display for 1 second approximately and then disappear. However if there is an error for some reason the message "**Parameter Write Error**" will appear. Lester Control Systems should be contacted if this message persists.



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20.2) Keypad Operation and Short Cut Keys

1)	Car call top	CPT
2)	Car call Bottom	CPB
3)	All Car calls once	MODE + CPT
4)	All Lan calls once	MODE + CPB
5)	All UP Lan calls once	MODE + F1
6)	All DN Lan calls once	MODE + F2
7)	Engineer Present / Leaving.	MODE + ENTER
8)	Service Visit (when in main menu)	MODE + ↑
9)	STEP Override	MODE + MENU
10)	Stopping Vane Override	MODE + ESC
11)	Straight to Lift Viewer	F1
12)	Straight to IO Viewer	F2
13)	Straight to Travel Set-up	F3
14)	Straight to General Pars	→ + F1
15)	Straight to System Details	→ + F2
16)	Straight to Modified Parameters	→ + CPT
17)	Straight to General Information	→ + CPB
18)	Logger RAM Purge (when in Event History)	→ + ↑
19)	Page UP	↑ ↑ (Double Click)
20)	Page DN	↓ ↓ (Double Click)
21)	Straight to Password Entry	MENU + ↑
22)	Straight To Prepare to Test	MENU + →
23)	Straight To Enter Calls	MENU + ↓
24)	Straight To IO Set-up	MENU + F2
25)	Reset IO Board Detect Error	MENU + CPB

Other Special Operations

MODE + ↑, has several other uses, i.e. when in Lift Viewer screen changes to All Calls Viewing and Timers Viewing are made by pressing MODE + ↑. Also in many other screens it acts as a pointer selector.

→, is used as a pointer selector in DATE TIME SETUP, PASSWORD ENTRY, and other text set-up screens.

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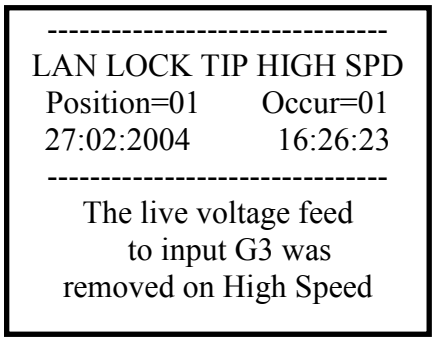
21) Lift Event History and Fault Logging

The ALMEGA processor has full Event History Logging, providing many events for lift faults and occurrences. These events are stored in non-volatile memory (i.e. not affected by power down). A maximum of 100 events can be stored which includes the number of occurrences the event has occurred, time/date of the last occurrence, the position at which it occurred and a full description of the event. Events are displayed as they happen as long as menu item is not selected (i.e. at the main menu). Otherwise they will be stored and then displayed shortly after coming out of the menu item, or by pressing the ESC / MENU button on the keypad.

A typical Fault event will be displayed as below:



Access to view the events can be gained by selecting **Event History** from the main menu (or by pressing MENU). A complete list of all the events can be viewed from the start of the buffer to the end of the buffer, scrolling up and down by pressing the keypad direction arrows. Also by pressing enter over the event, the whole event can be viewed with all its other details and description. Scrolling up and down may be continued whilst viewing the event in the detailed mode.

Some typical events can be categorised as follows:

i) Normal Events:

POWER INITIATION	power has been restored to the lift
PROCESSOR OFF/STOPPED	processor turned OFF/stopped at this time.
90% LOADED BYPASS	lift is 90% loaded
SELECTOR RESET TOP	lift has reset to the top floor
SELECTOR RESET BOTTOM	lift has reset to the bottom floor
TOP FLOOR SELF TEST	lift self test to the top floor
BOT FLOOR SELF TEST	lift self test to the bottom floor

ii) Power Supply Events: e.g.

+24V SUPPLY LOW/LOST	main +24V is either less than 18V or lost.
+24V SUPPLY RESTORED	main +24V is now restored.
+5V COMMS SUPPLY LOST	+5V communication supply is lost.
+5V COMMS SUPPLY REST	+5V communication supply is restored.

iii) Processor Events:

Contact LESTER CONTROL SYSTEMS if any of these appear in the Fault Logger!

RAM FAILURE
CPU NMI TRAP ERROR
STACK OVERFLOW TRAP
STACK UNDERFLOW TRAP
CPU HARDWARE TRAP
CPU WATCHDOG TRIPPED
RTC READ ERROR
RTC WRITE ERROR
EEPROM WRITE ERROR
I2C CLOCK 0V TIMEOUT
I2C SDATA 0V TIMEOUT

iv) Communication Events e.g.

A LIFT COMMS LOST	communications to A lift are lost.
A LIFT COMMS RESTORED	communications to A lift are now restored.
ERROR: 2 LIFTS MASTER	two lifts have same lift number and are Master.
ERROR IN CONTROL TYPE	lift number is greater than control type.
ERROR: 2 LIFTS SAME	two lifts have same lift number and are Master.
CAN 1 BUS OFF ERROR	physical error on CAN1 bus lines CH1 or CL1.
CAN 2 BUS OFF ERROR	physical error on CAN2 bus lines CH2 or CL2.
CAN 3 BUS OFF ERROR	physical error on CAN3 bus lines CH3 or CL3.

Purging of the Event Logger:
Whilst in the menu **Event History**, pressing ➔ and ↑ on the keypad, clears/purges all events stored in the Event Logger.

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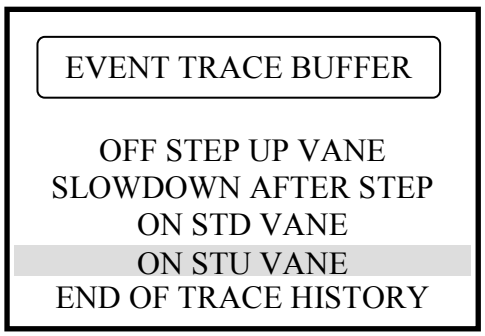
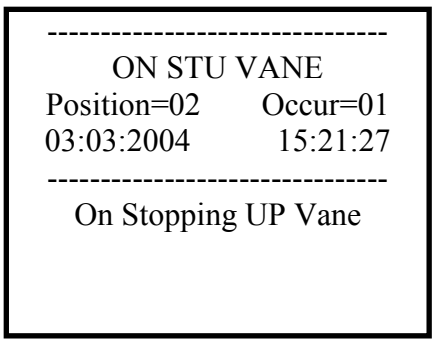
22) Lift Trace Event Fault Logging

The ALMEGA processor has a Trace Event History Logging feature, providing many extra events for lift diagnostics. These events are stored in volatile memory and will be erased after loss of power or processor re-boot. A maximum of 50 events can be stored which includes the time/date the last occurrence occurred, the position at which it occurred and a full description of the event. A typical event will be displayed as below:





The trace buffer is setup by selecting **Trace Buffer Setup** from the main menu. Within this menu parameters can be enabled / disabled to select different trace viewing options as detailed below.
Access to view the events can be gained by selecting **Event Trace Buffer** from the main menu. A complete list of all the events can be viewed from the start of the buffer to the end of the buffer, scrolling up and down by pressing the keypad direction arrows. Also by pressing enter over the event, the whole event can be viewed with all its other details and description. Scrolling up and down may be continued whilst viewing the event in the detailed mode.

Some typical Trace Buffer Setup options are:

Door Task Event:	allows the trace of the door status i.e. Doors Opening, Doors Closing, Doors Opened etc.
Door Edge Devices:	allows the trace of the door edge devices i.e. DOP, SE, and DE.
Selective Door Info:	Information directly related to Selective Doors Control.
Travel Task Event:	allows the trace of the lift travel status i.e. Starting, Slowing, Levelling etc.
Travel Vanes:	allows the trace of the lift vanes during travel i.e. Stepping and Stopping Vanes.
Fire Fighting Info:	Information directly related to Fire Fighting Control.
Emergency Supply Info:	Information directly related to Emergency Supply Control.

Purging of the Trace Event Logger:
Whilst in the menu **Event Trace Buffer**, pressing ➔ and ↑ on the keypad, clears/purges all events stored in the Trace Event Logger.

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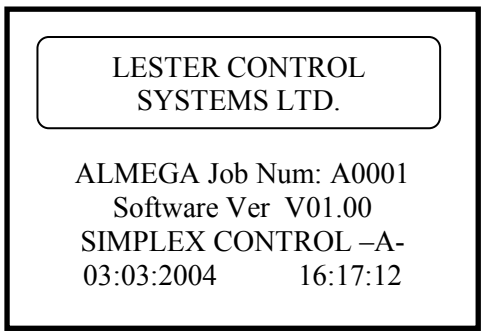
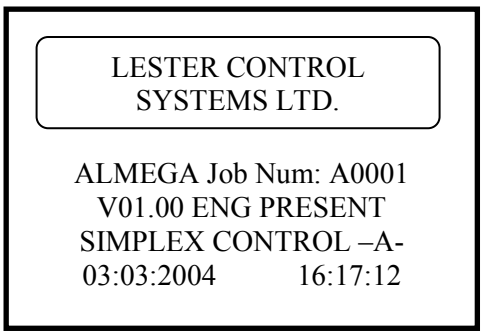
23) LCD Default Message and Out of Service Messages / Warnings

The Default Message on the LCD display provides the user with useful information without the need to search through various menus to find it. The default message can be configured to show selective information or the **Lift Viewer**. (See Default Msg Select parameter, in **Job Details** from the main menu).

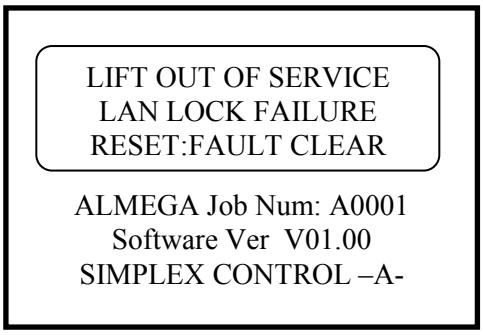
The message will not be displayed when within a menu item, however it will be displayed shortly after LCD and keypad activity has ceased. Priority is given to Events, which will be displayed immediately and held for a short time period prior to the default message being re-displayed.

The typical default message will be displayed as below (with and without Engineer Present):

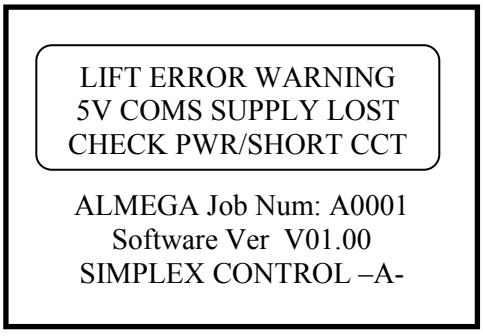




If the lift is out of service for any reason, the default message changes slightly to give details of the out of service condition. Also a suggestion is given to help rectify the out of service condition. If the lift is out of service for more than one reason, then the processor prioritises the message displayed.



Similar to the Out Of Service Message, a Warning message may be given as below:



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24) Lift Viewer

The Lift Viewer has been designed to be a useful diagnostic tool for the Lift Engineer. Once selected from the main menu (or by pressing F1 on the keypad) the lift status, position, doors, calls, vanes and other information can be viewed instantly from the Graphical representation of the lift. Below is a typical example of the lift viewer showing an 8-floor lift.

The lift is going in the **UP** direction from floor 1, to answer an up call, car call and a homing call at floor 2. Indication **D** also shows that the Destination of the lift is to floor 2.

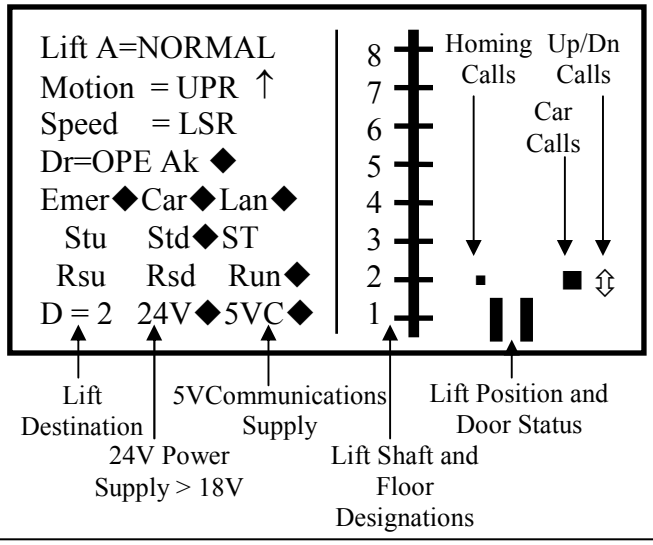
The doors are pre-opening (advance door opening) as shown by the lift and door status/ Ack, signal. The safety circuit is "bridged" (via a safety critical circuit); hence, car locks and landing lock circuits are made (**Emer**, **Car** and **Lan** are on).

The lift is nearly at floor level i.e. **Std** is on and **Stu** is about to come on. When the lift reaches a stepping proximity vane, ST will be on.

The processor has feedback from the direction relays or brake circuit since **Run** is on. The lift is levelling into floor level i.e. speed = **LSR**.

The Power supplies to the lift are present since **24V** and **5VC** are on. Also the lift is in NORMAL operation i.e. not on any special service i.e. Overloaded, Service or Fire etc.

Lift Status
Motion / Direction Arrow
Speed
Door Status
Safety cct, Car Locks, Landing Locks
Floor Stop vanes (UP/DN), Stepping
Reset UP/DN and RUN feedback



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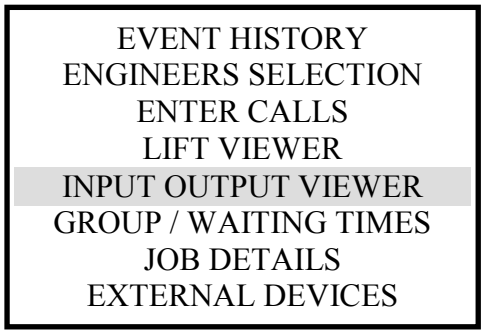
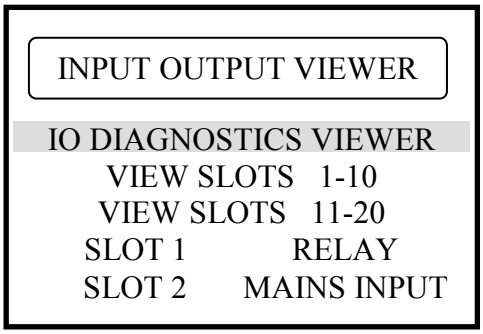
25) Input Output Viewer

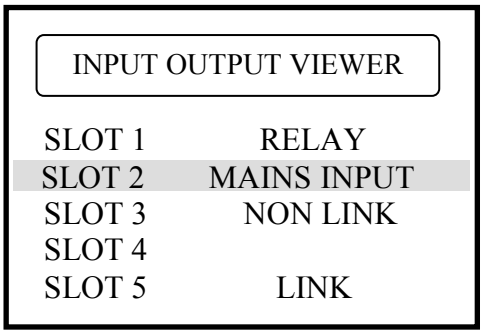
The Input Output Viewer has been designed to be a useful diagnostic tool for the Lift Engineer. The viewer allows the user to view all inputs/outputs to the lift microprocessor. Detailed Inputs and outputs can be viewed showing one card slot at a time. Inputs / Outputs are viewed as they are configured via the Input Output parameters. E.g. if Slot 1, Output 1= UP RELAY then the output viewer will show UP RELAY as output 1.

From the main Menu list selecting INPUT OUTPUT VIEWER (or by pressing F2 on the Keypad) will display a screen similar to the following:

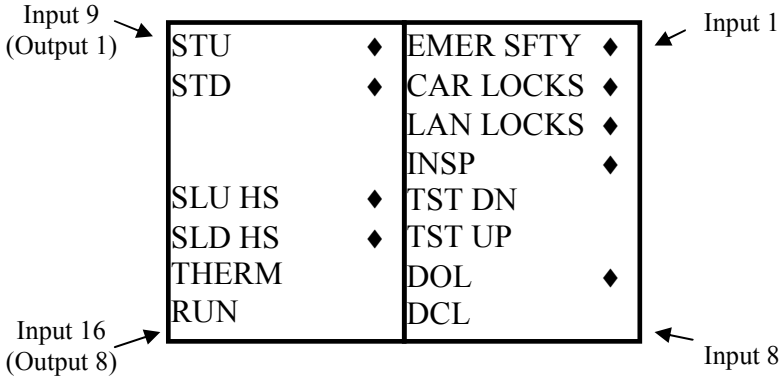




By scrolling down the remaining IO slots can be selected as shown. The Board Type is displayed next to the slot number i.e. RELAY, NON-LINK, LINK or MAINS INPUT etc. A blank indicates that no board is fitted or detected. The Mains Input board has been selected in this example:



Once the required slot has been selected a display of 16 inputs will be shown as follows: Typically for all other boards Outputs are on the left and Inputs to the right:



From the above information, it can be seen that the safety cct and locks are “made”, lift is on Normal (i.e. INSP=ON), Doors are closed (i.e. DOL= “made”, DCL = “broken”), lift is at floor level (i.e. STU and STD are ON), lift is between slowing limits (SLU and SLD are ON). Thermistor has not tripped and lift is not running (i.e. RUN = OFF).

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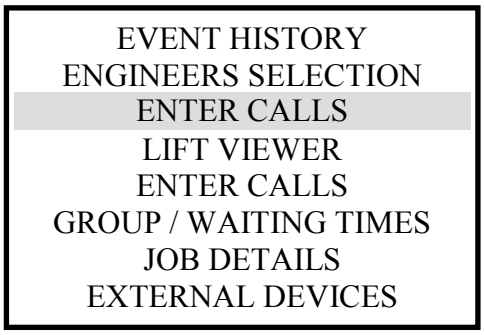
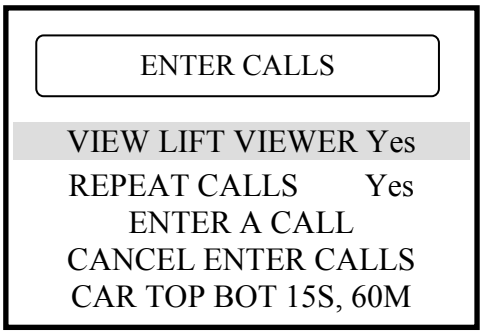
26) Enter Calls

Enter calls option allows the user to enter calls to their specific pattern or use the pre-defined patterns such as all calls, Odds and Evens etc. An option is included to switch the lift viewer on, once a call pattern has been selected. However, the lift Viewer automatically comes on when the option ENTER A CALL is selected. When the Repeat option is set to Yes, calls will be repeated for a period of 60 minutes approx (car Top/Bot repeated automatically) before the option is terminated. Various options are also given for car calls Top/Bot.

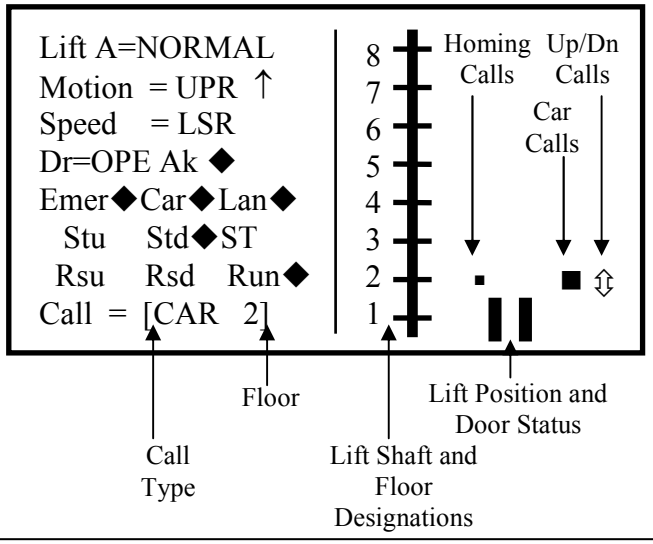
From the main Menu list select ENTER CALLS (or by pressing MENU + 🡻 on the Keypad) and a display similar to the following will be shown. As can be seen the lift viewer and repeat option is selected at this stage. By placing the scroll bar over the desired option and pressing ENTER the option can be selected or de-selected as required.





To enter one or more specific calls as required, the menu option ENTER A CALL should be selected as shown below. Once selected, the lift viewer will be displayed automatically as below with the bottom left hand side modified to allow the user to select Car, Up landing or Down landing calls (as required).

Lift Status
Motion / Direction Arrow
Speed
Door Status
Safety cct, Car Locks, Landing Locks
Floor Stop vanes (UP/DN), Stepping
Reset UP/DN and RUN feedback



By pressing the right arrow ➔ on the keypad the call type is changed from CAR, UP or DN calls. By pressing the up and down arrow keys (🡹 or 🡻) the floor will change up/dn as required. Finally pressing Enter will enter the call. In the above example a Car call to 2 would be entered.

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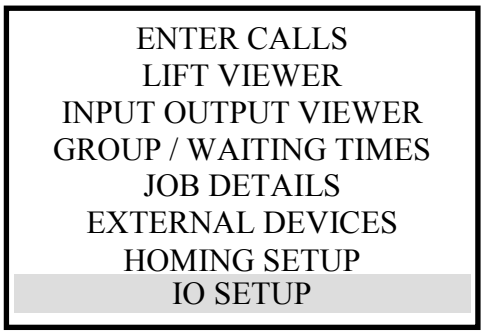
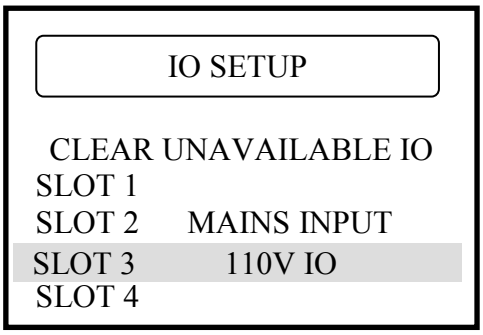
27) Input Output Setup

The Input Output Setup has been designed to allow the configuration of Inputs and Outputs to be changed or added, mainly on site by the Lift Engineer. First a slot should be selected to view the current configuration of the Inputs and Outputs, also displayed next to the slot is the board type. Outputs may be repeated as required, i.e. if it is required to have multiple UPR outputs, many outputs can be configured as UPR. Multiple Inputs are not allowed, and if configured will cause intermittent problems.

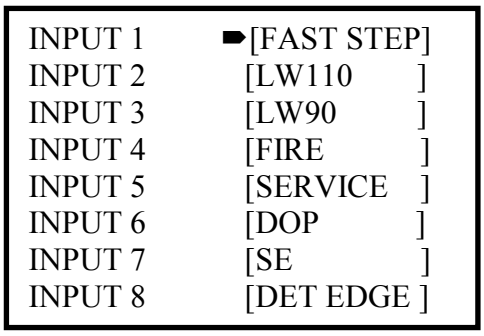
A control to CLEAR UNAVAILABLE IO has been included, which clears Inputs and Outputs that are unavailable. E.g. Inputs on a card that has only Outputs, Outputs on a card that has only Inputs, and Inputs/Outputs on a card that has neither (i.e. empty slot or RELEV/ ADO board). Inputs / Outputs may have become unavailable due to configuration changes, and the user has say forgotten to clear some IO first.

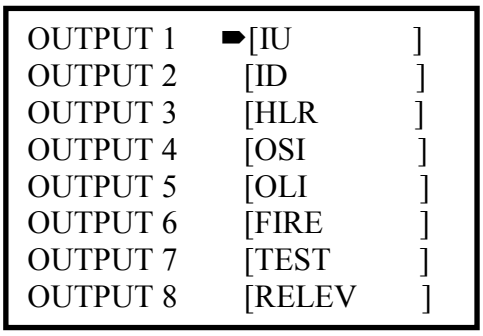
From the main Menu list select INPUT OUTPUT SETUP (or by pressing MENU + F2 on the Keypad) and a display similar to the following will be shown:





By pressing ENTER over the 110V IO slot as shown, the following screen(s) will be displayed:





The pointer to the current parameter is shown by the dash "➡" above. To move the pointer use the keypad keys MODE and ↑. This will move the pointer upwards until it reaches the top, before resetting to the bottom. With the pointer over the selected parameter, scroll through the available parameters using the keys ↑ and ↓ until the desired input / output is found (Note see list of inputs / outputs section). By pressing ENTER the parameter will be stored, also a message will be displayed for 1 second to acknowledge the entry.

Pressing ➔ whilst within the parameter screen will switch between Inputs and Outputs if the Board has both.

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28) Fault Finding and Callouts

The microprocessor and circuitry can help the engineer in fault finding because it remembers each fault in turn, which floor it was at, how many times it has occurred and the date and time it happened. See **Event History** (or by pressing MENU key on the keypad) in the main menu for the events and their descriptions. See also **Lift Viewer** and **Input Output Viewer** for detailed information of the lifts' status.

Typical Checking procedure

1) Check the 3 phase incoming supply to the controller.
2) Check motor overloads/circuit breakers etc.
3) Check the various voltages at the Primary and Secondary of each transformer with respect to their terminals and not earth.
4) Check the LED indication associated with each fuse on the power supply (see Power Supply) and the voltage going into and out of each fuse in the control panel, making sure they match and visually inspect where possible for a blown fuse. Avoid switching off if possible to check fuses as this may clear the problem, but it may return at a later date causing another callout.
5) Input **EMER** = Safety Circuit should be on within the IO rack, if not check live feeds in order to terminals (**OTL - OSG - PSW - G1 - G2**), for a Hydraulic Lift, and (**OTL - OSG - G1 - G2**), for a Traction Lift.
6) Input **CARL** = Car Lock Circuit should be on within the IO rack, if not check live feeds in order to terminals **G2** and **G3**.
7) Input **LANL** = Landing Lock Circuit should be on within the IO rack, if not check live feeds in order to terminals **G3** and **G4**.
8) Check through the following functions, identifying correctly ON or OFF as required:
   a) **OSI** output, should be OFF
   b) **TEST** input, illuminated on Normal, OFF on TEST.
   c) **LW90** input**, LW110** input **& OLI** output, illuminated when the lift is 90% or 110% loaded.
   d) **THERM**, illuminated when the motor or machine room thermistor has tripped.
   e) **RET1, 2 or 3**, illuminated when on Emergency Recall/Shutdown 1, 2 or 3.
   f) **SHUTDOWN**, illuminated when on Shutdown Control.
   g) **SERV**, illuminated when on Service control.
   h) **FIRE**, illuminated when on Fire Control.
   i) **HYD OTL** input, illuminated when Hydraulic lift has over travelled.
   j) **PTT Control,** Prepare To Test within processor, and should be OFF.
   k) **SE, DOP** and **DRL** are illuminated when the Safe edge, Door open Button and Door light Ray are activated respectively, which may prevent the doors from closing.
   l) The **Thermistor and Phase Sequence** LED'S on the phase failure and reversal relay (**PFRR**) must not be illuminated.

If all circuits appear to be O.K, there is a possibility of a coil burning out on a relay, contactor, the brake, ramp or a valve coil may have burnt out. If further help is required whilst fault finding, please make a note of the following before contacting Lester Control Systems.

i) LED's that are illuminated,
ii) A full report of the state of the contactors and relays etc.
iii) A full report of the lift fault.
iv) A full report from the fault logger.

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28.1) Common Faults

Detailed below, is a list of common faults. To assist with fault finding see **Event History** in the main menu for the events and descriptions, see also **Lift Viewer** and **Input Output Viewer** for detailed information of the lifts' status.

A) Lift car out of step with the controller
i) Stepping input FAST STEP must pulse once ON and once OFF between every floor.
ii) Check Tapehead unit/floor selection switches operate correctly.
iii) Check car/landing calls are being entered to the correct floors.

B) Doors remain open and will not close
i) Check safe edge, door open button and detector edge are not operated.
ii) Check door open limit has operated.
iii) Check the LCD display is not reporting Door Open Protection Timeout Fault.
iv) Check that the parameter "PARK OPEN" within **Door Setup** has not been set.
v) Check Terminal limits.
vi) Check Pre-Flite check has not failed, i.e. locks are short circuited, whilst on the door open limit.
vii) Note under Fire control, Service control, and 90% overload bypass the lift doors remain open typically and will only close by initiating a car call.

C) Doors closed and will not open
i) Check Stopping vanes STU and STD are not both on from start of a journey until the end of the journey (i.e. Stuck On).
ii) Check lift is stopping on at least one Stopping vane when at floor level (STU or STD), however both are required for correct operation i.e. (STU and STD).
iii) Check that the parameter "DISABLE DOORS" within **Door Setup** has not been set.

D) Doors closed lift will not run
i) Check car and landing locks are made LED's **EMER** and **CARL and LOCK** on the CPU board.
ii) Check door limits.
iii) Check shaft Terminal limits.
iv) Check any drive fault conditions.
v) Check Phase Failure (PFRR) and Thermistors have not tripped.

E) Lift stops in travel
i) Car or Landing Lock "tipped".
ii) Journey timer operated.
iii) Run signal feedback fault i.e. input RUN.
iv) Slowing switch incorrectly set.
v) Lift slowed and stopped in mid travel, Tapehead/Proximity switch malfunctioning or set incorrectly.

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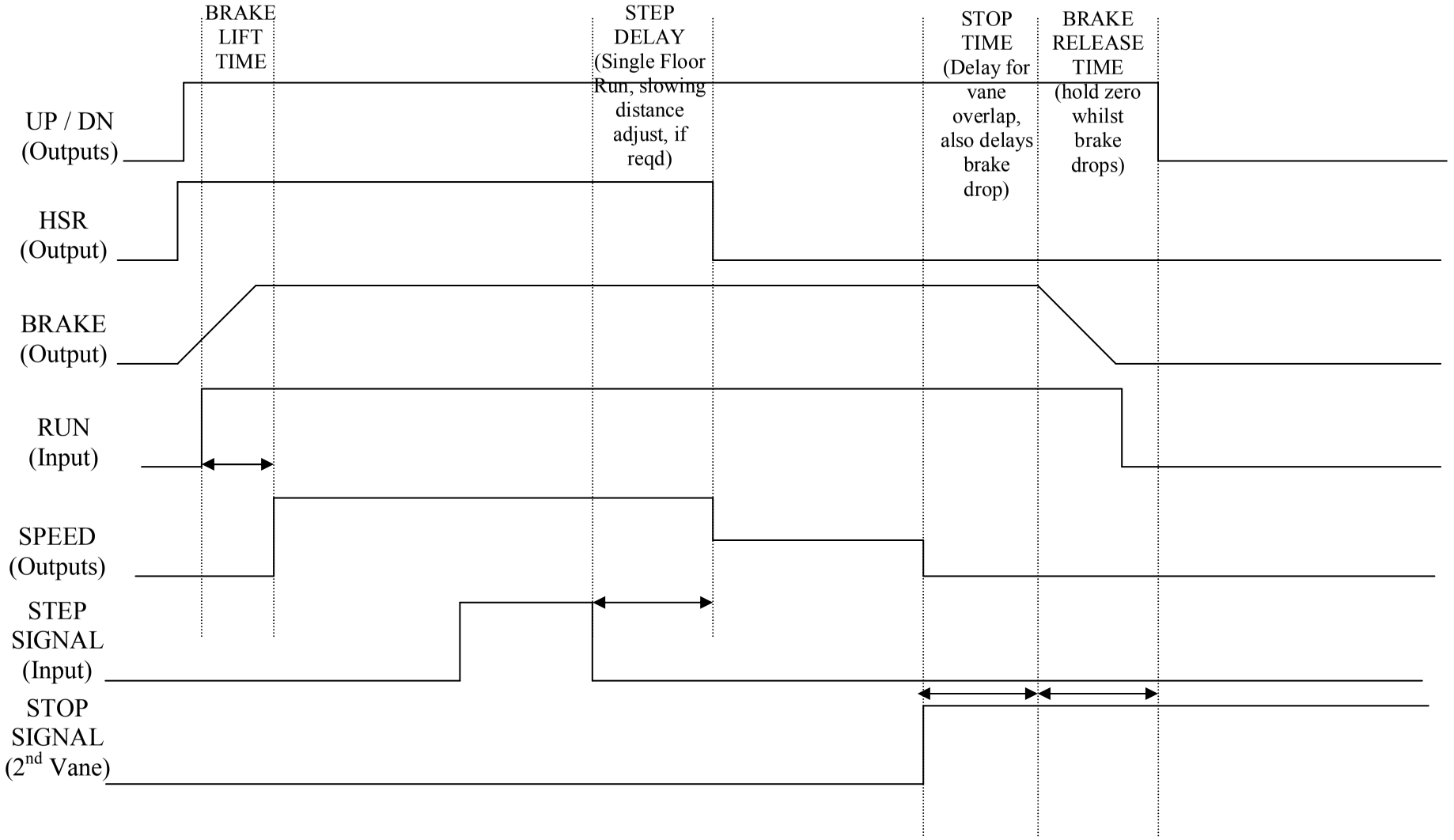
29) Microprocessor Drive & Stopping Sequence



Above shows a typical Drive and Stopping Sequence, highlighting the main parameters for Speed, Stepping and stepping control that the Almega can provide.

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30) Lift Special Services Operation

Prepare To Test:
The prepare to test feature is enabled by pressing MENU + ➔ on the keypad, through the Engineers Selection menu, or through Special Service2 Setup. This feature has the effect of preparing the lift for full test control by inhibiting any further landing calls, preventing the lift from homing to the main floor, and picking up any further passengers. Any passengers remaining in the lift will still be able to register car calls to their destination. Options are given for disabling the doors and low speed timer whilst on Prepare To Test.

Service Control:
The Service Control Feature is selected by asserting the **SERV** input. When selected, the service control feature renders the lift out of service and transfers all landing calls to other members of the group (if any). The control of the lift is then from the car only, and it is assumed that an attendant would operate the lift in a manual fashion as the car call buttons now become constant pressure buttons. The advantage of such control is for the loading and unloading of goods whereby the attendant has full control of the lift e.g. a porter in a Hotel. Parameters found in **Special Service2 Setup** provide options for enabling/disabling constant pressure door control.

Fire Control:
The Fire Control feature is selected by asserting the **FIRE** input. When selected, the fire control feature renders the lift out of service and transfers all landing calls to the other members of the group (if any). There are many different types of Fire control but generally the lift is interrupted from its normal direction of travel to its destination (any car calls being immediately cancelled) and called automatically to a specific floor as a matter of urgency for a fireman. Once the lift has reached this floor, full control of the lift and the doors is assigned to the fireman via constant pressure call buttons and the door open button. Parameters found in **Fire Control Setup** provide options for enabling/disabling constant pressure door control and selecting fire floor etc.

Load Weighing 110% Overloaded:
The 110% overload function becomes active when the lift is stationary (during travel has no effect) and the **LW110** input is asserted. The event 110% overload is generated, doors are parked open, and the lift is then marked out of service.

Load Weighing 90% Overload/Bypass:
The 90% overload function is active when the lift is either moving or stationary and the **LW90** input is asserted. The operation of the lift changes such that landing calls are bypassed, therefore reducing the chance of another person entering the lift and fully overloading it. Instead car calls are only answered, so that passengers will leave the lift car thus reducing the weight and relieving the 90% overload condition. Once this is achieved landing calls are resumed and the lift is ready to pick up passengers once again as normal.

Thermistor Tripped:
The Thermistor Tripped function becomes active when the lift is stationary and the **THERM** input is asserted. The event Thermistor Tripped is generated, doors are parked open, and the lift is then marked out of service.

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Priority Service Controls (1,2&3):
The Priority Service Control Features are selected by asserting the **PRIORITY SERVICE 1/2/3** inputs as required. When selected, the lift is rendered out of service and transfers all landing calls to other members of the group (if any). The lift is interrupted from its normal direction of travel to its destination (any car calls being immediately cancelled) and called automatically to a specific floor as a matter of urgency. Once the lift has reached this floor, full control of the lift is assigned to the user. Parameters found in **Special Service Setup** provide options for enabling/disabling constant pressure door control, enabling/disabling car calls etc.

Shutdown Control:
The Shutdown Control Features are selected by asserting the **SHUTDOWN** input as required. When selected, the lift is rendered out of service and transfers all landing calls to other members of the group (if any). The lift may be interrupted from its normal direction of travel to its destination (any car calls being immediately cancelled) and called automatically to a specific floor as a matter of urgency. Parameters found in **Special Service2 Setup** provide options for return controls (i.e. return floor), enabling/disabling constant pressure door control, enabling/disabling car calls etc.

Automatic Service:
Automatic Service Control is selected by asserting the **AUTOMATIC SERVICE** input as required. When selected, the lift is rendered out of service and transfers all landing calls to other members of the group (if any). Automatic service can be used for a variety of applications e.g. lift floor to floor testing, and Automatic control that requires no human interaction of pressing call buttons. The lift will run continuously in an automatic fashion answering one single car call at a time. The lift can be configured to answer calls in the UP, DN, or both directions. The frequency of operations is measured in starts per hour (parameter settable). The number of starts per hour should not exceed the rated motor starts per hour. Parameters found in **Special Service1 Setup / Special Service Times** provide options for clearing calls upon operation of the switch; park open door control, enabling/disabling car calls, and landing call re-open etc.

Hospital Priority Service “Code Blue”:
Hospital Priority Service “Code Blue” has been designed to work in a hospital environment allowing personnel a dedicated and custom priority service.

Code Blue Control is selected by asserting code blue inputs as required. An extra set of landing pushes are therefore required. Code Blue priority calls are entered at the landing entrances via a momentary action key-switch. Upon receipt of the call, the lift is rendered out of service and transfers all landing calls to other members of the group (if any), and makes an immediate return to the floor where the call was made. In the event the lift has to reverse its direction to the call, the lift will slow and stop at the next available landing before returning.

Upon arrival at the landing, the lift will remain on Code Blue control for a period of typically 15 seconds (parameter settable). This is to allow the user time to take control of the lift, otherwise after this time period the lift will return to normal operation, or answer the next Code Blue call (if any). Control is taken by putting the lift in the state of “Code Blue Held”, this is achieved by asserting the Service Control key in the lift (or alternatively the “code blue hold” input (if configured)). Once control is established the user may take the lift to its desired destination via the entering of car calls.

Switching back to normal operation; requires the release of "code blue held", i.e. switching off the Service Control Key switch.

Code Blue control can be achieved by various methods, i.e. within a group of lifts whereby Code Blue calls are shared and dispatched to the nearest lift(s). Otherwise an isolated lift within the group may be configured for Code Blue control only (i.e. independent operation).

A Multiple calls option allows multiple code blue return calls to the same floor, e.g. if a lift has been called to a floor, another lift would **not** normally be allowed to be called to the same floor until the existing one has gone. However the multiple calls option allows another lift to be called whilst the existing one is still there. Note two or more lifts will not return at the same time to the same floor, only one. However two or more lifts may be returning to two or more different floors at the same time.

Parameters found in **Special Service1 Setup / Special Service Times** provide options for enabling/disabling constant pressure door control; park open door control, independent control, allowing multiple calls, and code blue hold / dwell times etc.

Code Blue, some General Points:

i) Lift(s) answer calls in the order of 1st come 1st served.
ii) If a call is not answered in the allotted time, the lift times out, the allocation is un-assigned, and another lift may take the call if available.
iii) Code Blue priority calls are answered upon a successful return.
iv) If no lifts are available, calls are cleared after a specified time period.

Evacuation Control:

Evacuation control is implemented as an extension of Fire control. The basic operation assists in the evacuation of a building, by providing information to an operator within the lift car of persons waiting on a landing. The information is transferred by users on the landing pressing a landing call button, which in turn flashes the car call acceptance illumination within the car. The operator within the lift car may then pick up passengers and take them to an evacuation point (floor), in an orderly fashion as described by the buildings evacuation procedure. Knowledge of passengers waiting is indicated by the flashing car call acceptance illumination. The operator enters a car call to pick up passengers from the destination. The car call illumination then stays on permanently to indicate the car call has been accepted, it will completely extinguish when the call is answered.

Since the car call operation and car call illumination have separate functionality, they cannot be linked together as in a 3wire system. Therefore car calls must be wired as a 4 wire system (Non Link Boards). The landing calls however, may be wired using a 3 wire system.

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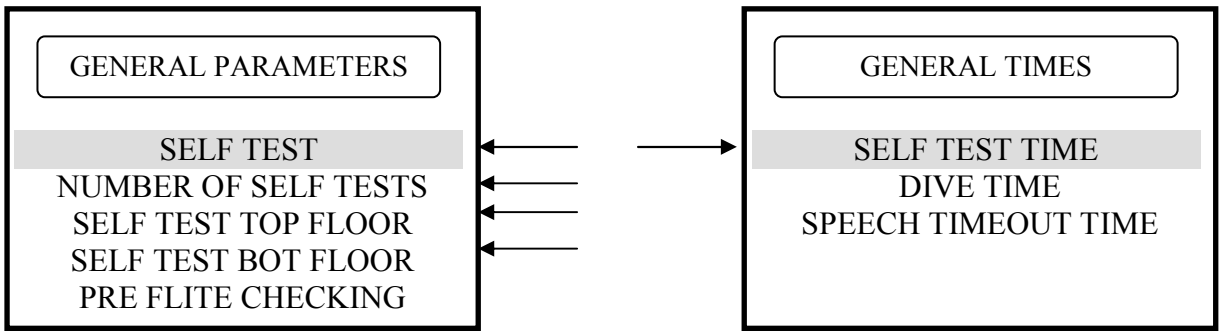
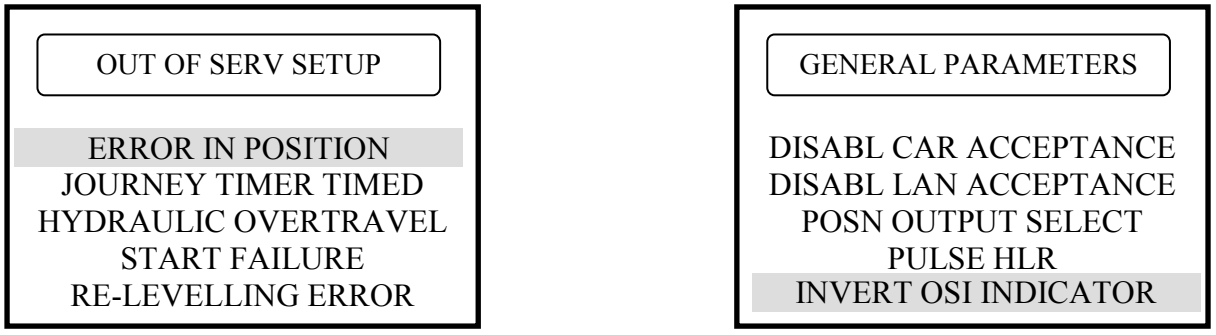
31) Lift Self Test Operation and Out Of Service Setup

Self Test Operation (Demand Request):
The self test feature automatically inserts terminal floor car calls (i.e. Top and Bottom or settable via parameters) typically 120 seconds after lift inactivity following a fault condition, e.g. door open/close protection time, lock failure, failure to start etc. This cycle will be repeated every 120 seconds up to a maximum of ten attempts (parameter settable) or until the lift is back in service. After the last attempt, self test will be inhibited until the system is returned to normal operation via passenger intervention. Events will be generated indicating a self test to Top or Bottom, and whether or not the self test Passed or Failed. Parameters found in **General Parameters and General Times** provide options for Self Test as shown below:



Out of Service Setup:
The Out Of Service output **OSI** can be configured as required via the parameters found in the **Out Of Service Setup.** A list of failures and service modes can be selected / de-selected. Also by setting the parameter INVERT OSI INDICATOR (Lift in Service Indicator) in **General Parameters** the Out of Service Indicator is inverted and becomes a Lift in Service Indicator.



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32) Lift Anti Nuisance Control

Anti-Nuisance features have been included to enhance the operation of the system and help reduce waiting times. All features are configurable by the parameters in the **Anti Nuisance Setup** but typical values are given below. Also the features described below are all disabled during any not-normal service operations, i.e. Fire and Service control.

Reverse Car Call Dumping:
When the lift slows for its last call in the established direction of travel then reverse car call dumping is established. Reverse car call dumping causes the cancellation of reverse direction car calls if typically 3 or more car calls exist.

Forward Car Call Dumping:
If the lift has arrived at typically 3 or more destinations without breaking the detector edge/light ray, and there are typically 3 or more car calls still remaining, then these remaining calls will be cancelled (dumped).

Door Open Push Held Car Call Dumping:
The remaining car calls will be cancelled and the event "**OPEN PUSH HELD**" will be recorded when the door open push has been held constantly for more than typically 20 seconds.

Safe Edge Held Car Call Dumping:
The remaining car calls will be cancelled and the event "**SAFE EDGE HELD**" will be recorded when the safe edge has been held constantly for more than typically 20 seconds. However this is not active when the door nudging control is enabled.

Detector Edge / Light Ray Override:
If the detector edge / light ray has been held for more than typically 20 seconds the event "**DETECTOR EDGE OVERIDE**" will be recorded and the lift doors will close regardless of the detector edge input. However this is not active when the door nudging control is enabled.

Stuck Hall Push Detection:
The " **STUCK UP LAN BUTTON** ", and " **STUCK DN LAN BUTTON** " events (UP and DOWN landing call buttons) will be recorded typically 10 seconds after the microprocessor has attempted and failed to cancel the respective hall call. The respective stuck hall call is now ignored but will be eligible for operation after the stuck condition has been removed. However, to provide lift service to the floor with the stuck hall push or pushes, the microprocessor will reinstate the call (if still stuck), typically 240 seconds from when originally detected.

Stuck Car Push Detection:
The " **STUCK CAR BUTTON** " event will be recorded typically 10 seconds after the microprocessor has attempted and failed to cancel a car call. The stuck car call is now ignored but will be eligible for operation after the stuck condition has been removed. However, to provide lift service to the floor with the stuck car call push, the microprocessor will reinstate the call (if still stuck), typically 240 seconds from when originally detected.

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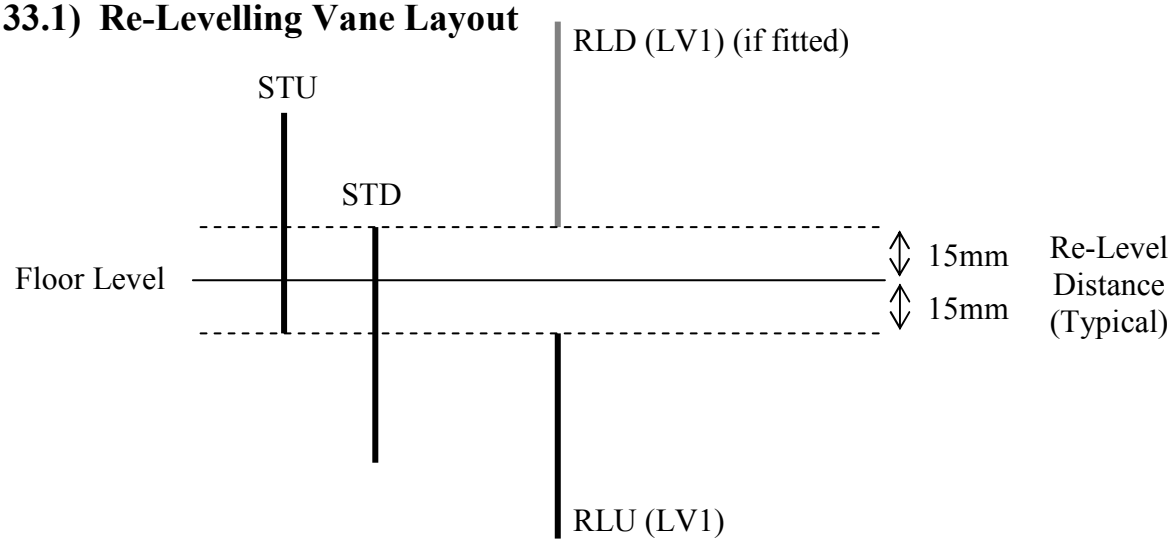
33) Lift Re-Levelling (V2)

(See also Re-Levelling and Advance Door Opening Board)

V2 re-levelling refers to Version 2 re-levelling which was introduced in software version 2.13 and above. For the previous version of re-levelling refer to Technical Manual issue 2 or less. V2 re-levelling system is not compatible with the previous version, however the software is backwards compatible via a software switch found in Hydraulic setup, for jobs with previous version hardware fitted. The main difference between the 2 systems is V2 requires only one shaft re-level vane LV1, whereas the previous version requires two, LV1 and LV2.

Lift re-levelling control is achieved using the combination of software, and a safety critical Re-Levelling / Advance Door Opening Board. The software provides functionality by analysing vane information, producing outputs to re-level, checking for stuck vanes, reporting and acting upon error conditions etc, whereas the safety critical board, checks for correct vane information (also stuck vanes) and ensures that safety circuits (car / landing lock circuits) are only bridged, when the conditions are correct. The safety critical board in conjunction with the physical shaft vane information (re-level proximity vanes), is designed to conform to BS/EN81 standards.

33.1) Re-Levelling Vane Layout



The Lift will re-level within the re-level distance (as shown). The distance may be varied to be smaller or larger (as required). However if it is too small instability / errors may occur, also if it is too large, the step between the lift car and landing entrance may be excessive before it re-levels. Overlap between re-level vanes and stopping vanes at the re-level point is not necessary since it requires both LV1 to energise and STU to release, to start re-levelling in the up direction for example. The order of the vanes is not important, however for predictable operation, setting both vanes the same distance is recommended.

Re-Level Up Sequence

1. Lift sinks onto RLU, and at (or about) the same time comes off the trailing edge of STU.
2. The micro processor initiates the start sequence by energising the re-level output.
3. The re-level output signals the re-level board to bridge the lock circuit.
4. The micro processor monitors the lock circuit and a feedback contact from the re-level board before energising the UP relay and other associated controls.
5. Re-levelling Up now commences.
6. The micro processor monitors the vane information and re-levelling starts to terminate upon release of RLU. (If a fault occurs, re-levelling may be terminated for various other conditions.)
7. A delay off timer set by parameter RELEV_UP_STOP_TIME determines the re-level distance and ultimately the floor level after re-levelling.
8. The micro processor performs a final check to ensure the feedback contact has released.

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33.2) Hydraulic Normal Stopping Sequence

The stopping sequence during normal operation has an effect on the re-levelling setup regarding vane setup, vane overlap, and ultimately re-levelling distance. Related parameters set within the factory will suit most installations, but an appreciation of this could be regarded as necessary. The UP stopping sequence is divided into 2 stages, and applies to Hydraulic systems which:

1. Release the valves firstly then the pump.
2. Release the pump first, then the valves.

Stopping Sequence (valves 1st, pump 2nd)		Stopping Sequence (pump 1st, valves 2nd)
i)	Stop vanes STU and STD both operate.	Stop vanes STU and STD both operate.
ii)	Stop timer, starts timing	Stop timer starts timing.
iii)	Stop timer timed?	Stop timer timed?
iv)	**Release Valve (UP pilot relay).**	**Release Pump (UP pilot relay).**
v)	Enable release timer, starts timing.	Enable release timer, starts timing.
vi)	Enable timer timed?	Enable timer timed?
vii)	**Release Motor (Enable pilot relay).**	**Release Valve (Enable pilot relay).**

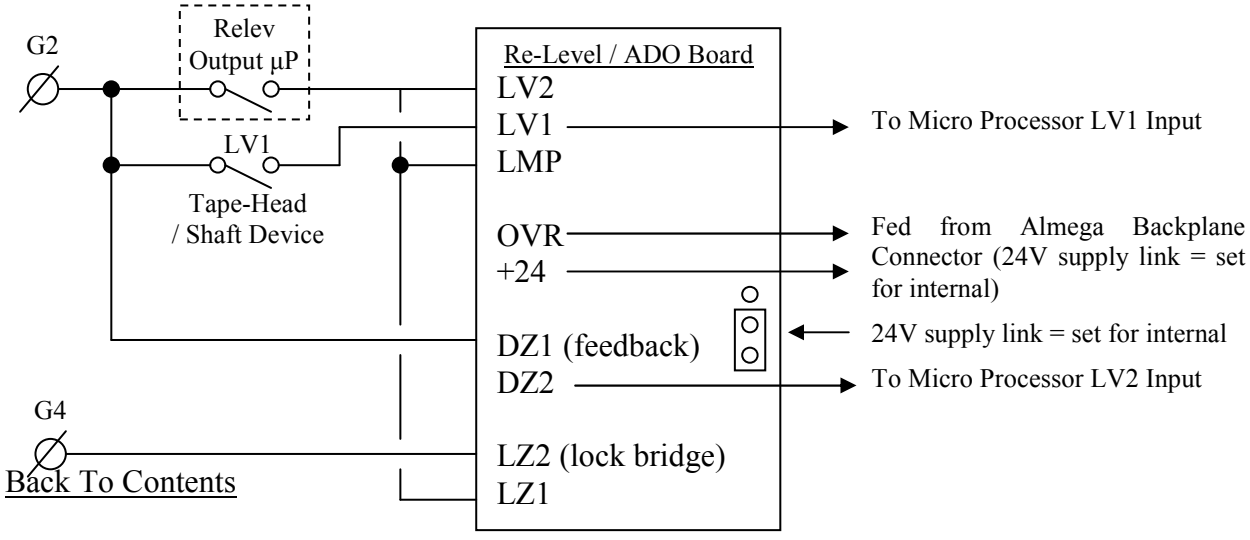
The pressure within the hydraulic system is applied by the motor in the UP, and is released at the appropriate time in accordance with the valve release sequence. In the DOWN the pressure is applied constantly by the weight of the lift, and the release of the valve determines stopping.

Parameters STOP TIME and ENABLE RELEASE TIME can be found in TRAVEL SETUP from the menu. They are settable in milliseconds (0-3000).

A typical setting for STOP TIME is derived from the levelling speed of the lift:
Level Speed = 0.06m/s = 60mm/s, Therefore to stop within 15mm, a time of (15/60) = **250mS** is required. Taking into account distance for the lift to reach zero speed from level, we may allow 10mm approx. This gives an approximate time of 10/60 = 166mS.
Therefore typical STOP TIME = (250-166) ≈ 100mS

A typical setting for ENABLE RELEASE TIME that allows pump run on after the valve has released is 500mS. This has the effect of keeping maintaining a constant pressure when the valve closes, and thus should provide a predictable, and softer stop.
Typical ENABLE RELEASE TIME = 500mS

Re-Level IO and Board Interface



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33.3) Re-Level Warnings

A Re-level Warning is given for the following conditions:

1. Wrong vane sequence (i.e. wrong vane sequence release)
2. Re-level timeout.
    a. Maximum re-level time exceeded.
3. Re-level Lock Bridge faults (check for locks bridged when re-levelling).
    a. Locks not bridged before re-levelling
    b. Lock Bridge removed whilst re-levelling. (If floor level is not reached, re-level timeout will be generated 1st, otherwise lock bridge warning).
4. Re-level board feedback fault.
    a. Feedback contact not made up before re-levelling.
    b. Feedback contact not released after re-levelling.
5. Emergency stop whilst re-levelling (re-levelling terminates, event generated).
6. Re-levelling Pump up / Sunk down control.
    a. If lift sunk down off Stopping vanes STU / STD, and not re-levelled UP.
    b. If pumped /moved up past Stopping vanes STU / STD, and not re-levelled DN.

After a warning, re-levelling is inhibited for 5 seconds, to allow for last run to terminate (i.e. contactors and backup timer to de-energise). After 5 seconds, a recovery call is made to another floor, in an attempt to eliminate conditions specific to the floor that caused the warning i.e. faulty vanes / tight guides etc. The recovery call preference, is to send the lift down a floor, however if this is not possible it will go UP. If the fault is not floor specific, further warnings will be reported until a warning limit is reached. After this warning limit is reached re-level failure is initiated.

The warning level is incremented **(typically by 10)** every time a warning is generated. Otherwise if re-level was successful, the warning level is decremented **(typically by 2)**. The warning level maximum typically set at 30 would allow 3 successive re-level warnings before failure.

33.4) Re-Level Failures

A Re-level failure occurs for the following conditions.

1. Stuck vane / signal
    a. Either LV1 vane, or LV2 signal.
    b. or BOTH.
2. Error warning level exceeds warning limit.
3. Sunk down and unable to recover.
    a. The lift has sunk down and a warning is generated. Normally the lift will attempt a recovery call. However if the lift cannot recover due to conditions such as excessive overload, locks open when constant pressure close doors etc, a re-level failure is generated.
4. Re-level Yoyo Error.
    a. Excessive re-level operations (see yoyo operation)

Under failure any run is terminated, calls are cleared, and an attempt to return the lift to the lowest floor is made. Whereby it stays out of service, until the processor is reset (i.e. power removed / restored).

An exception to this condition is Fire Control whereby the condition is suspended to allow the fireman full control of the lift. After fire operation is complete, the lift will then return and hence stay out of service.

Re-level Yoyo Detection

Re-levelling operations can be monitored, and a fault trigger can be programmed when an excessive amount have been reached. The term yoyo, relates to the "yoyo toy" whereby the motion is a continuous UP / DN. Excessive re-levelling cycles can be due to overheating hydraulic oil or faulty proximity switches etc. Faults such as this (if ignored) may place the lift in a dangerous condition. Programming is achieved by setting the number of yoyo's allowed within a given time period. Typically this is set at 12 within a 60 minute period. A re-count is made for every minute. If the number of yoyos exceeds these settings, re-levelling is terminated, and the lift is returned to the bottom as described in the re-level failure sequence.

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33.5) Re-Level Parameters

Re-levelling parameters are found in Hydraulic setup (not specific to Hydraulic, but generally), and allow typical programming as below:

RELEVEL REQUIRED	Yes / No switch for re-levelling
MAX RELEV PERIOD	Max time allowed for re-levelling
RELEV YOYO COUNT	Number of Yoyo's within Yoyo period
RELEV YOYO PERIOD	Period for detection of number of Yoyo's
RELEV UP STOP TIME	Stop UP delay after re-levelling UP.
RELEV DOWN STOP TIME	Stop DN delay after re-levelling DN.
RECOVERY TIMEOUT TIME	Time allowed for recovery call to be completed
RELEV START TIME	Start delay before re-levelling.

33.6) Re-Level Event Recording

Below is a list of events that will appear in the fault logger if any errors occur with the re-levelling system. Errors will be reported by one or more events during the sequence state, i.e. during Re-level Start, Run, or Stop. The fault may occur for various reasons i.e. Timed (timeout), STU / STD lost, Board Feedback, or Lock Bridge etc. Checking the logger and event sequence will provide useful information in establishing the reason for the fault.

EMERGENCY STOP RELEVL

RELEV_START_FAULT_UP
RELEV_START_FAULT_DN

RELEV_RUN_FAULT_UP
RELEV_RUN_FAULT_DN

RELEV_STOP_FAULT_UP
RELEV_STOP_FAULT_DN

RELEV_ERR
RELEV_YOYO_ERR
RELEV_HYDOTL_ERR

RELEV_TIMED

RELEV_STU_STD_LOST
RELEV_STU_LOST
RELEV_STD_LOST

RELEV_SUNK_DN_ERR
RELEV_PUMPED_UP_ERR

RELEV_LOCK_BRIDGE
RELEV_BOARD_FEEDBACK

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33.7) Specific Hydraulic Operations

Hydraulic Homing

Hydraulic homing is a requirement of BS/EN81, relating to "Electrical Anti-Creep (EN81-2-1998:14.2.1.5)" which states that "the car shall be dispatched automatically to the lowest landing, within 15 minutes of the last normal journey".
Therefore, if the lift is idle and not at the bottom floor, the Hydraulic Homing timer will start to expire (typically 10 minutes). When the timer expires, a homing call to the bottom floor is made. If the normal homing floor is programmed to any other floor than the bottom, the lift will first return to the homing floor as programmed, and then Hydraulic home to the bottom after 10 minutes.

Hydraulic Over-travel Detection

Over-travel detection is a requirement of BS/EN81, relating to "Method of operation of final limit switch (EN81-2-1998:10.5.3)" which states that "After the operation of the final limit switch, car movement in response to car / landing calls shall no longer be possible, even in the case of the car leaving the actuation zone by creeping. The return to service of the lift shall not occur automatically (10.5.3.2)".
An input to the microprocessor is specifically reserved for Hydraulic over-travel detection.
Following this condition, and identical to re-level failure, any run is terminated, calls are cleared, and an attempt to return the lift to the lowest floor is made. Whereby it stays out of service, until the processor is reset (i.e. power removed / restored).
An exception to this condition is Fire Control whereby the condition is suspended to allow the fireman full control of the lift. After fire operation is complete, the lift will then return and hence stay out of service.

Thermistor Operation when Hydraulic

When the motor / machine room thermistors have tripped, the lift cannot move in the upwards direction, therefore an attempt to return the lift to the lowest floor is made. Re-levelling is inhibited at this point. The lift stays out of service until the thermistors have reset.

Journey Timer Operation

Journey timer operation is slightly different for Hydraulic lifts, whereby an attempt to bring the lift to the bottom is made before placing the lift out of service. This applies to when the lift was travelling in the UP direction, and not the DN.

If the lift journey timer times in the UP direction, the run is terminated and a journey timer event is reported. An attempt to return the lift to the lowest floor is made. If journey timer times during this run, lift movement is disabled and it stays out of service, until the processor is reset (i.e. power removed / restored).

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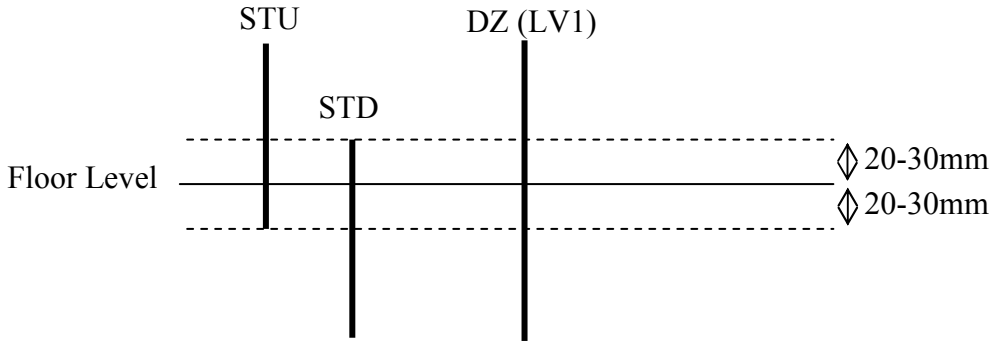
34) Advance Door Opening V2 (without Re-levelling)

(See also Re-Levelling and Advance Door Opening Board (relev / ado board))

V2 advance door opening refers to Version 2 which was introduced in software version 2.13 and above. For the previous version of advance door opening refer to Technical Manual issue 2 or less. V2 advance door opening system is not compatible with the previous version, however the software is backwards compatible via a software switch found in Door setup, for jobs with previous version hardware fitted. The main difference between the 2 systems is V2 requires only one shaft DZ vane LV1, whereas the previous version requires two, LV1 and LV2.

Similar to re-levelling, Advance Door Open control is achieved using the combination of software and a safety critical Re-Levelling / Advance Door Opening Board.
The main differences are below:

1. The vane layout is different (as shown below) whereby the Door Zone is a continuous vane, instead of 2 separate vanes (RLU / RLD).
2. For a traction lift, The STOP TIME is generally greater; hence the vane overlapping distance.
3. An Advance Door Open Output (from the μP) may be used instead of a re-level output (however the Re-level output also energises when advance opening.)



Advance Open Sequence (UP direction)

1. Lift approaches floor level on levelling speed.
2. Vane DZ (LV1) is energised, and at the same time STD. (**Note seeing STD before DZ will generate errors, however the processor allows a tolerance of 10mm approx)**
3. The micro processor starts the sequence by energising the advance open output.
4. The advance open output signals the relev / ado board to bridge the circuit between LZ2 and LZ1 on the re-level / ado board.
5. The micro processor monitors the lock bridge circuit via a feedback contact from the re-level board before starting the ADVANCE OPEN DELAY TIMER.
6. When the ADVANCE OPEN DELAY TIMER times, DOR energises and the doors advance open.
7. The micro processor monitors the vane information and advance opening terminates upon seeing both stop vanes STU / STD. (If a fault occurs, advance opening may be terminated for various other conditions.)

The sequence for DN is almost identical to UP, except the states of STU / STD are substituted.

The parameter "ADVANCE OPEN DELAY" (0-3000ms), found in DOOR TIMES, determines the amount of advance door opening, i.e. the shorter the delay, the more the doors will have opened before stopped, and the greater the delay less the doors will have opened.

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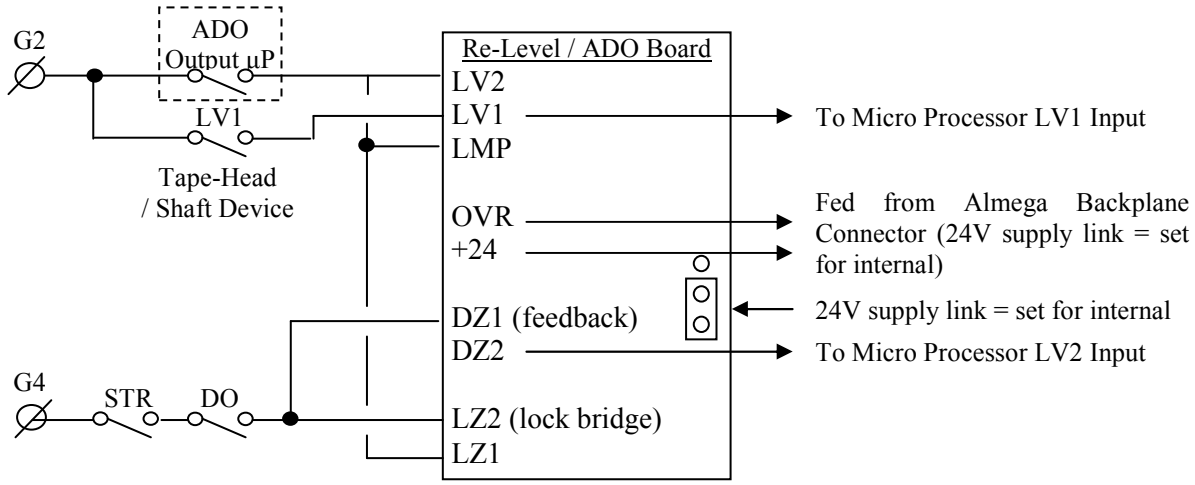
Advance Open IO and Board Interface



34.1) Conditions Affecting Advance Door Opening

1. If the door zone vane (DZ) to processor input LV1 has not energised when seen a stopping vane. The event "RELEV/ADO VANE1 MISSN" will be generated.
2. If the DZ feedback to processor input LV2 has not energised when the relev / ado board has been signalled to bridge the circuit between LZ2 and LZ1. The event "ADO LOCK BRIDGE FAIL" will be generated.
3. Any stuck vanes / signals will inhibit advance opening. Events in the logger such as below may be generated:
   a. "RELEV/ADO VANE1 STUCK"
   b. "RELEV/ADO VANE2 STUCK"
   c. " STU AND STD STUCK "
   d. "   STU STUCK   "
   e. "   STD STUCK   "
4. The wrong stopping vane sequence will inhibit advance opening. Events in the logger such as below may be generated:
   a. " STOP VANE FAULT UP "
   b. " STOP VANE FAULT DN "
5. Other conditions which will inhibit advance door opening are:
   a. When not set for advance door open (DOOR PAR, advance door open = NO)
   b. When not normal service i.e. Fire / Fire Alarm Recall.
   c. When constant pressure open i.e. Service Control.
   d. When doors are disabled.
   e. When Open on switches are disabled:
      i. Open on Init
      ii. Open on Reset
      iii. Open on Homing etc.
   f. When on High Speed.
   g. When not arrived at destination.

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35) Despatcherless Group Control

The ALMEGA processor has the capability and performance to provide a fast and efficient lift despatching service from Duplex up to many cars in a lift Group. This service is provided without an external despatcher.

The despatching service is based upon an "Estimated Time of Arrival" (ETA) algorithm, which calculates an estimated arrival time for each landing call. The calculations are based mainly upon lift speed, acceleration/deceleration times, door opening/closing times etc., and even down to the fine details such as car preference time and door dwell time. The accuracy of the ETA increases despatching efficiency/performance, but at the same time provides the processor with a heavy burden of calculations, thus for an application with many floors and many lift cars, an external despatcher may be required.

The ETA's are modelled within the microprocessor to allow the user to select the type of response required. Also parameters may be set to give an accurate representation of lift door timings; furthermore parameters may be set to measure accurately against times set, for Optimum performance. All these parameters can be found in the menu **ETA Parameters.**

The Despatcherless system operates whereby one lift becomes the Master of the group. The decision of who is master is based upon the lowest lift number of the lifts that are connected. If two lifts have the same lift number an error will be recorded in the fault logger. Correct setting of the lift numbers i.e. parameter MY LIFT NUMBER in **System Details** will ensure trouble free operation. If the Master is removed from operation for any reason, then service continues since another lift will take over control, and this passing control would continue up to the last car remaining.

The Master receives information from each lift and calculates an estimated time of arrival for each lift to every call. The Master then allocates calls to each lift based upon the ETA's. The calls are despatched and updated many times a second. Homing calls are also controlled by the Master, and lifts are despatched to the homing floors based upon the nearest, as and when required.

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35.1) Group Algorithms

UP CALLS UP PEAK
When the number of up landing calls within the lift system is greater than the UP PEAK threshold (typically half the number of floors). The ALMEGA detects an UP CALLS UP PEAK condition and reacts by strategically parking lifts within the Group, to give a faster response to the likelihood of further up calls. It achieves this by detecting the lowest up call and parking the available lifts from this floor upwards in anticipation.

DN CALLS DN PEAK
When the number of down landing calls within the lift system is greater than the DN PEAK threshold (typically half the number of floors). The ALMEGA detects a DN CALLS DN PEAK condition and reacts by strategically parking lifts within the Group, to give a faster response to the likelihood of further down calls. It achieves this by detecting the highest down call and parking the available lifts from this floor downwards in anticipation.

BALANCED HEAVY TRAFFIC
When the number of down landing calls within the lift system is greater than the DN PEAK threshold, and the number of up landing calls within the lift system is greater than the UP PEAK threshold. The ALMEGA detects a BALANCED HEAVY TRAFFIC condition, and reacts by strategically parking lifts within the Group, to give a faster response to the likelihood of further up and down calls. It achieves this by detecting the lowest up call and highest down call, and parks the available lifts from these floors upwards and downwards respectively in anticipation.

MAIN FLOOR UP PEAK
When the main flow of traffic is from the main floor up to various destinations, i.e. during the population of a building, the ALMEGA detects a MAIN FLOOR UP PEAK condition. It reacts by strategically parking lifts within the Group to the main floor so that persons wishing to travel from the main floor have a significantly reduced waiting time. It achieves this by load sensing whilst the lifts are travelling from the main floor, and when a threshold is reached all available lifts park at the main floor.

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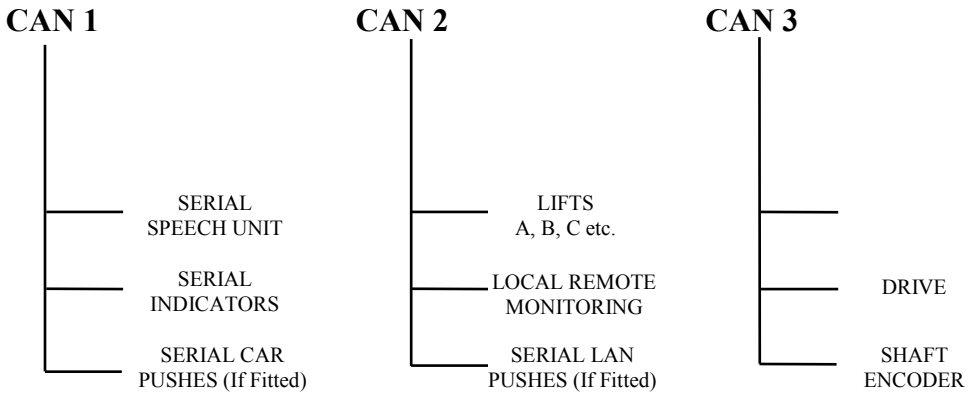
36) Serial Communication Types

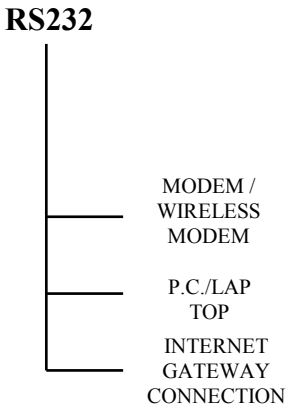
The ALMEGA has been designed with many types of on board communications. These different types of communications allow a wide range of uses for interfacing to the processor. Typical uses, are detailed below:

CAN Communications (Controller Area Network)

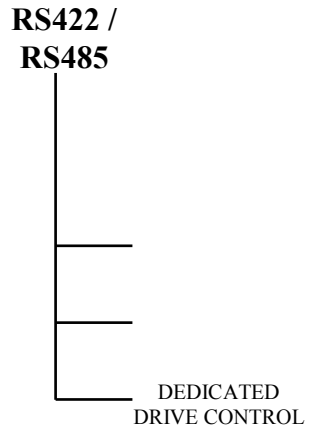
The CAN communication ports provide interface to a range of serial products including Lester Controls Serial Speech Unit and Indicators. Also communications between lifts, specific drives, and Shaft Encoder are carried out over the CAN bus. Below is detailed the uses of the CAN buses:



RS232 Communications



RS422 / RS485 Communications



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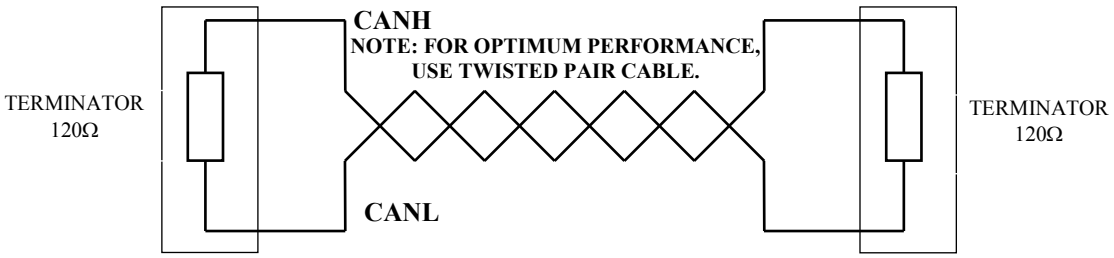
37) CAN Physical Layer Connections

Bus Connections

The CAN field bus consists of two wires named CAN HIGH (**CANH**) and CAN LOW (**CANL**). These two wires carry all the serial information, and must be wired correctly for proper operation of the CAN field bus. In the event of a wiring error however, they can withstand short circuits to either +24V supply or 0V supply.

Importance of Bus Terminators

It is vital for correct operation that the **bus terminators** (settable via links) are connected to either end of the CAN field bus as shown below. These terminators are simply resistors of value 120Ω which are used to match the impedance of the cable.



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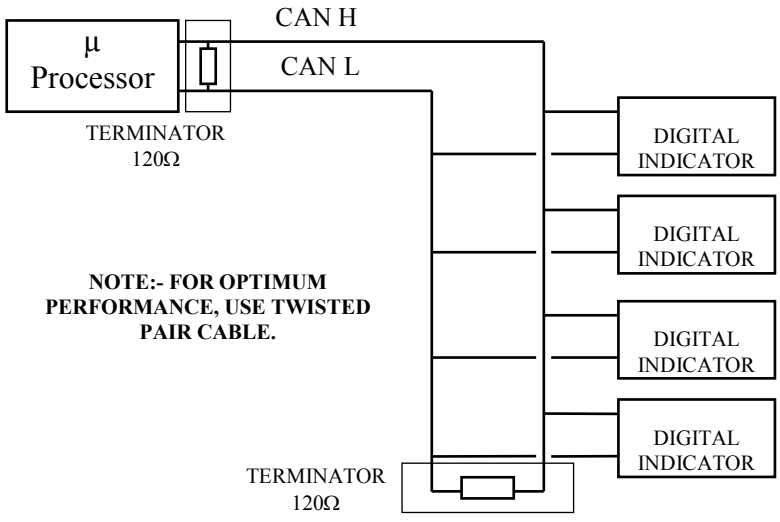
37.1) CAN 1 Connection Variations

Bus incorporating Microprocessor & CAN1 landing devices only

When there are no devices in the lift car, the microprocessor is positioned at the beginning of the bus; therefore LK1 must be closed on CAN1 communication board. The other terminator must be placed at the end of the bus, i.e. the terminating link on the last indicator must be closed.



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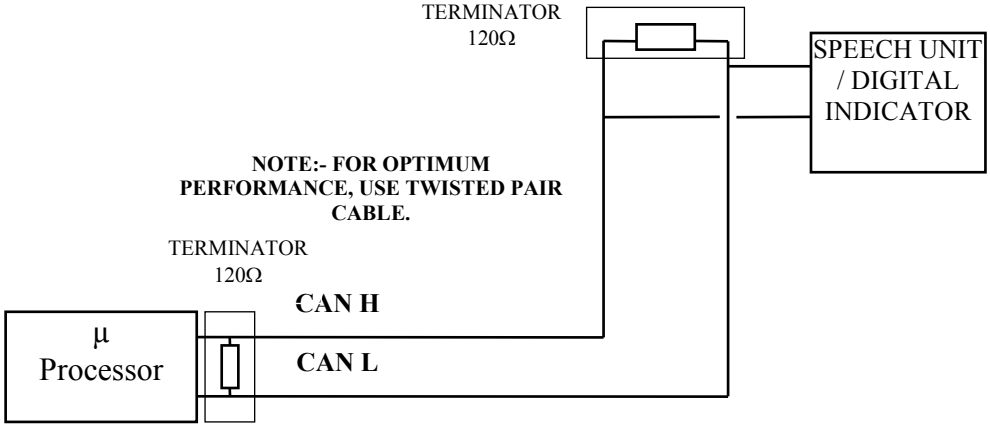
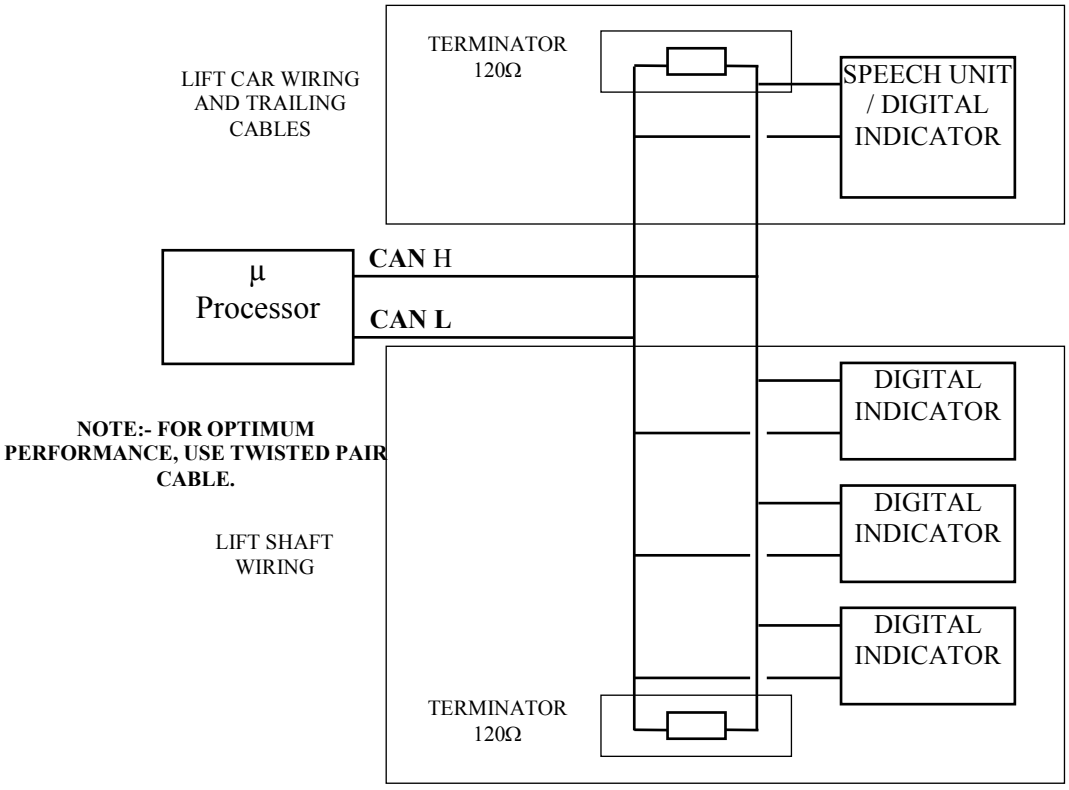
Bus incorporating Microprocessor & CAN 1 lift car device(s) only.

When there are no devices on the lift landings, the microprocessor is positioned at the beginning of the bus; therefore LK1 must be closed on CAN1 communication board. The other terminator must be placed at the end of the bus, i.e. the terminating link on the device within the lift car must be closed.



Bus incorporating Microprocessor, CAN 1 lift car & landing device(s).

When there are devices on the lift landings and in the lift car, the microprocessor is positioned in the middle of the bus, therefore the terminating links must be closed on the last device in the car, and last device on the landing, as shown:



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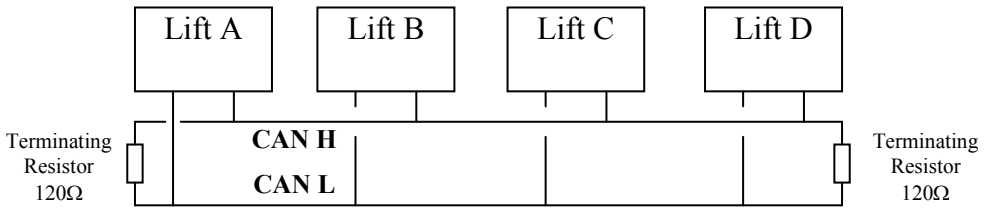
37.2) CAN 2 Connections

Bus incorporating 4 Car Group

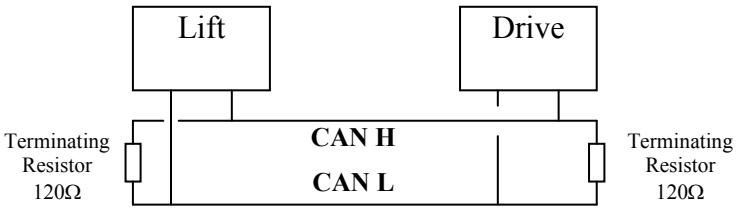
Below shows an example of a 4 car group, whereby field bus terminating resistors are fitted at Lift A and Lift D, i.e. LK1 must be closed on CAN 2 communication boards for Lift A and D, but open on Lifts B and C:



37.3) CAN 3 Connections

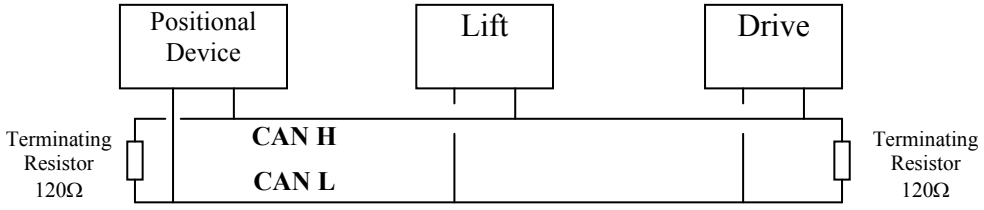
Bus incorporating Simplex Lift connected to a Drive via CAN

Below shows an example of a Simplex Lift connected to a drive via CAN, whereby field bus terminating resistors are fitted at the Lift, i.e. LK1 must be closed on CAN 3 communication board, and the Drive (termination depends upon drive).



Bus incorporating Simplex Lift connected to a Drive, and Shaft Encoder via CAN

Below shows an example of a Simplex Lift connected to a drive and a Positional Device (shaft encoder) via CAN, whereby field bus terminating resistors are fitted at the shaft encoder and the drive ends (termination depends upon drive / positional device).



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37.4) CAN field bus Fault Finding

The CAN field bus driver components that reside on each of the communication boards are very robust, as they can withstand short circuits to each other (CH to CL), and short circuits to either supply rail i.e. 0V & 24V. However they are not indestructible, and the fault finding procedure below, is intended for the rare case that one or more driver components may have got damaged, on one or more of the serial products.

Firstly, if there is a fault, the chance of anything working correctly on the bus is rare, and the majority of the time communication will cease. Within the Event History menu, an event such as below will indicate a CAN problem:

CAN 1 BUS OFF ERROR (CAN1 communications connection/short circuit error)

Also LED indication on the CPU board can help, i.e. CAN LED's TX and RX should flash on frequently and mostly together. Either one of these flashing on its own, or staying ON will indicate a problem.

Identify a fault on a TC3 Indicator / Speech unit can be relatively simple, as the LED indication on each of the boards will flash in a specific way to indicate a CAN bus fault. The "COMMS" LED, which is "RED" in colour will flash faster than normal (every 40milliseconds) to indicate a CAN bus fault. The LED should flash "ON" at a rate of once per second (if data is not changing i.e. position / doors etc.) if **normal** and once every 40milliseconds if there is a **fault**.

The following will establish whether or not a device is faulty:

1) Remove the power from that device.
2) Remove the CAN connections from that device (i.e. CH & CL).
3) Re-connect the power.
4) If the LED "C" is not flashing, that device is OK!
5) If the LED "C" is flashing "ON" once every 40milliseconds, that device is FAULTY!

This procedure should be repeated for all devices on the bus, until all faulty devices have been identified. Faulty devices cannot be repaired easily on site and should be returned to Lester Control Systems for repair.

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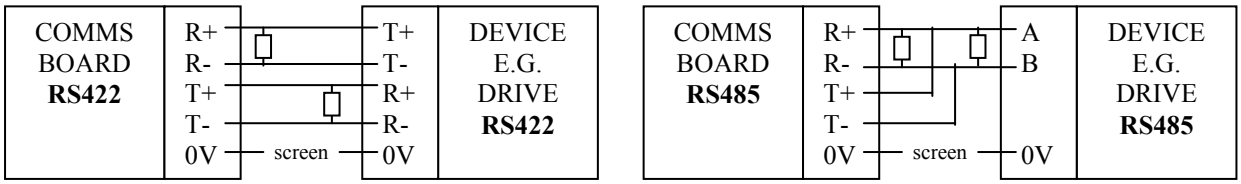
38) RS422 / RS485 Connections

Similar to the CAN field bus, RS422 and RS485, also require **bus terminators** connected to either end of the field bus. These terminators are simply resistors of value 120Ω which are used to match the impedance of the cable.

The following shows connections for RS422/485 respectively (with BUS terminations):



LK1, when fitted, acts as a BUS termination Resistor on each RS422 / RS485 Comms Board:

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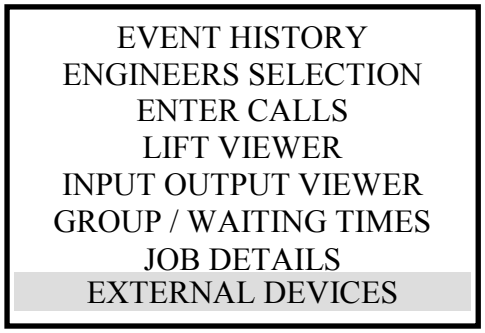
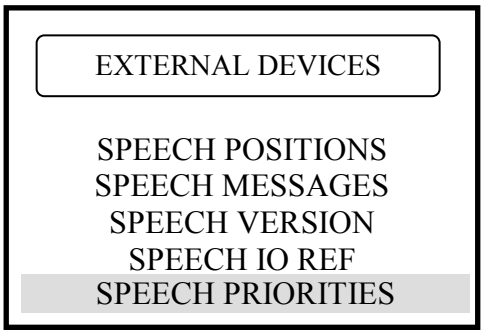
39) Serial Indicator and Speech Unit Controls Overview

The Almega has many features and controls applicable to the TC3 Indicator and Speech unit. These controls, settable via parameters, provide a user-friendly interface, and increase flexibility, making factory and site setup/modifications relatively simple. The Almega is able to interface directly to the TC3 products, without an interface unit.

Using a P.C, or laptop, is the most user friendly way for programming / setup, however this also can be achieved using the Almega keypad by selecting EXTERNAL DEVICES from the main menu as below:

To be able to access the full features of the Almega control, the TC3 Speech / Indicator have to be fitted with the correct software version. Otherwise only a limited choice of configuration is available. Mostly the Almega will interface to the full feature version, but in the case of a new Almega control panel being fitted to existing TC3 equipment, the best option is to upgrade the TC3 software, otherwise the control will be limited.





39.1) Serial Indicator

A brief overview is given below of the TC3 Indicator setup:

Floor Position Text:
This is programmable from 2 characters to 16 characters. Any text over 2 characters will scroll from right to left, direction arrows will be inserted at the start and end of the scrolling position.

Message Text:
Messages can be controlled from the Almega, or can be setup manually as required. Messages 1-6 are for manual setup, whereas message 7 is reserved for Almega control only.

i) Messages setup by the Almega:
Messages are displayed on the Indicator according to the condition of the processor. Priority control of each processor message is NOT required, since the Almega works it out. However overall priority in conjunction with messages 1-6, needs to be considered.

Condition	Message Text
INSPECTION	INSPECTION CONTROL
LW110	LIFT OVERLOADED
FIRE	FIRE CONTROL

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ii) Messages setup Manually:
Messages are displayed on the Indicator according to the condition associated with the message. This condition can be referenced to a selected Almega condition, or just to a separate Input. Priority control is required, and the Almega helps with this, by allowing each message priority to be programmed, as required. Messages 1-6 are used for manual setup, whereas message 7 is reserved for Almega control only.

Message Number	Condition	Message Text	Priority
1	SERVICE CONTROL	SERVICE CONTROL	3
2	LW110	LIFT OVERLOADED	2
3	ALARM INPUT	ALARM ACTIVATED	1

Priorities and IO references:
Priorities for each message can be set i.e. 1 to 7, whereby 1 is the highest priority and 7 is the lowest. IO references can be set for messages 1-6 only. A specific list of inputs and outputs are given, which when set, triggers that message according to its priority.

Control Enables:
A number of control enables can be set / inhibited as below:

i) Almega TC3 control.
When this is NOT set, only a limited number of controls are available. This should only be turned off when interfacing to a limited version of TC3 Indicator (i.e. a new Almega controller with existing Indicator(s)). However a TC3 indicator software upgrade is the recommended option.

ii) Hall Lantern.
If set, Hall Lanterns will appear on the appropriate indicator, set for the correct floor, otherwise direction arrows will only be displayed.

iii) Processor Specific Message.
If set, the processor will output a message according to the condition of the processor. Otherwise messages 1-6 will determine the messages.

iv) Freeze Arrow When Stopped.
If set, the direction arrow on the indicator will stop scrolling when NOT moving, otherwise it will scroll all the time.

v) Show Next Direction
If set, the direction arrows will display the intended next direction of the lift. Otherwise the direction arrow will indicate the lift direction, i.e. Up or Down.

vi) Colours
POSITIONS, MESSAGES, UP DIRECTION (arrow and Hall Lantern), and DOWN DIRECTION (arrow and Hall Lantern), can be programmed to be either RED, GREEN, or AMBER, as required:

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39.2) Serial Speech Unit

Setup for the Speech unit is based upon choosing phrases, from the phrase list that it stored within the TC3 Speech Unit. The phrase list may be standard, or a special list as required, and can contain up to 127 phrases. Phrases are selected, and joined together (up to a maximum of 5) to give outputs for Positions, Messages and Door statements etc. A brief overview is given below of the TC3 Speech setup:

Position Phrase Examples:

1st Phrase	2nd Phrase:	3rd Phrase	4th Phrase	5th Phrase
FLOORX	ONE			
SUB BASEMENT	XFLOOR			
CAR PARK	LEVELX	ONE		

Doors, Direction and Gongs Examples:

1st Phrase	2nd Phrase:	3rd Phrase	4th Phrase	5th Phrase
DOORS OPENING				
GOING UP				
BING	BONG			

Message Phrase Examples:
Messages can be controlled from the Almega, or can be setup manually as required. Messages 1-6 are for manual setup, whereas message 7 is reserved for Almega control only.

i) Messages setup by the Almega:
Messages are announced, according to the condition of the processor. Priority control of each processor message is NOT required, since the Almega works it out. However overall priority in conjunction with messages 1-6, needs to be considered.

E.g., when the lift is on FIRE, the following will be announced.

1st Phrase	2nd Phrase:	3rd Phrase	4th Phrase	5th Phrase
THIS LIFT IS RETURNING UNDER	FIRE CONTROL OPERATION	TO THE	GROUND	XFLOOR

ii) Messages setup Manually:
Messages are announced according to the condition associated with the message. This condition can be referenced to a selected Almega condition, or just to a separate Input. Priority control is required, and the Almega helps with this, by allowing each message priority to be programmed, as required. Messages 1-6 are used for manual setup, whereas message 7 is reserved for Almega control only.

Message Number	Condition	Priority
1	PRI_SERVICE1	3
2	LW110	2
3	ALARM INPUT	1

E.g., when the lift is on Priority Service 1, the following will be announced.

1st Phrase	2nd Phrase:	3rd Phrase	4th Phrase	5th Phrase
THIS LIFT IS UNDER	PRIORITY SERVICE	ONE		

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Priorities and IO references:
Priorities for each message can be set i.e. 1 to 7, whereby 1 is the highest priority and 7 is the lowest. IO references can be set for messages 1-6 only. A specific list of inputs and outputs are given, which when set, triggers that message according to its priority.

Control Enables:
i) Special Speech Vocabulary.
If set, the speech unit vocabulary is not standard and the standard phrase list text is not valid. Instead, phrases are selected by number only.

ii) Processor Specific Message.
If set, the processor will output a message according to the condition of the processor. Otherwise messages 1-6 will determine the messages.

iii) Mind the Doors.
If set, the processor will output a message typically "Mind the Doors", before the doors start to close. When the speech unit has finished saying the message, it sends a confirmation to the Almega, which in turn, closes the doors.

iv) Speech between Floors.
If set, the processor will announce all speech positions, even during travel, else positions will only be announced as the lift slows for a specific floor.

v) Direction on Closing.
If set, the processor will announce the intended direction, just after saying the Doors Closing message.

vi) Gongs.
If set, the processor will output the arrival gong message, as the lift slows for a specific floor.

vi) Hush Times.
The Almega provides 2 independent "Time Clock" settings, which can be used for silencing speech messages at certain times i.e. "Hush Times". This feature is useful for night time operation when speech announcements may be considered a nuisance.

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40) List of Configurable Inputs

Below is a Typical list of configurable Inputs.

EMER SFTY
CAR LOCKS
LAN LOCKS
TST UP
TST DN
HYD_OTL
DRIVE_LEV
RLV1/ADO1
RLV2/ADO2
RLV LOCKS
IP11
IP12
IP13
IP14

DOL
DCL
DOC
REAR DOL
REAR DCL
REAR DOC
IP21
IP22
IP23
PLELL DOORS
DISABL DR

SLU HS
SLD HS
SLU MS3
SLD MS3
SLU MS2
SLD MS2
SLU MS1
SLD MS1
IP34
IP35
IP36
IP37
IP38

FAST STEP
STU
STD
RUN
RESET UP
RESET DN
BRAKE MON
IP46
IP47
IP48
IP49

DOP
SE
DET EDGE
DCP
DOOR HOLD
FRONT DZ
IP56
IP57
IP58
IP59
IP60

REAR DOP
R SE
R DET EDG
R DCP
R DHOLD
REAR DZ
IP67
IP68
IP69
IP70
IP71

THERM
INSP
FIRE
SERVICE
PRI SRV 1
PRI SRV 2
PRI SRV 3
SHUTDOWN
LW110
LW90
ALARM
ESUP
ESUP RUN
ESUP HPI
CD BLUE H
FF CAR SW
AUTO SRV
NORM SUPP
IP90

SCH MSG 1
SCH MSG 2
SCH MSG 3
SCH MSG 4
SCH MSG 5
SCH MSG 6
SCH HUSH
IP98
IP99
IP100
IP101
IP102

IND MSG 1
IND MSG 2
IND MSG 3
IND MSG 4
IND MSG 5
IND MSG 6
IND HUSH
IP110
IP111
IP112
IP113

CALL TAB1
CALL TAB2

IP116
IP117
IP118
IP119

FF RES PA
FF RES PB
FF RES PC
FF RES PD
FF RES PE
FF RES PF
IP126
IP127
LIFTA HLY
LIFTB HLY
LIFTC HLY
LIFTD HLY

LIFTE HLY
LIFTF HLY
LIFTG HLY
LIFTH HLY
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41) List of Configurable Outputs

Below is a Typical list of configurable Outputs.

UP RELAY
DN RELAY
HSR
LSR
RELEVEL
RET RAMP
STAR
DELTA
OP9
OP10
OP11

IU
ID
HLR
REAR HLR
GONG
REAR GONG
OP18
OP19
OP20

DOR
DCR
NUDGE
ADV OPEN
REAR DOR
REAR DCR
REAR NUG
OP28
OP29
OP30
OP31
OP32

BRAKE LR
DRIVE EN
DRIVE BBK
BIN SPD A
BIN SPD B
BIN SPD C
DRIVE TOP
QK SLOWDN
ST 2 VANE
OP42
OP43
OP44
OP45
OP46

OSI
OLI
LW90
FIRE
FFIGH RES
TEST
SHUTDOWN
PTT
THERM TRP
ESUP OP
ESUP PRI
ESUP SEL
PR SRV1 I
PR SRV2 I
PR SRV3 I
NORM SERV
IN SERV

SE HELD
DOP HELD
DLR HELD
DOP_SE_DE
DOP LAMP
CBLUE IND
FIRE WARN
AUTO SRV
SERV IND
OP73

GATE OPEN
LOCK ALRM
LKTIP HI
LKTIP LOW
STRT FAIL
STK B_FLR
DO PROT
DC PROT
GATE LOCK
MOTN FAIL
EMER STOP
UNABLE OP
ERROR POS
JT TIMED
HYD_OTL
RELEV ERR
24V LOST
PREFLITE
IO BRD CH
STUCK CAR
STUCK LAN
IOCONFERR
CARCAL PR
LANCAL PR
IN USE
AUTO CAR PREF

CAN1_BOFF
CAN2_BOFF
CAN3_BOFF
STU OUTPT
STD OUTPT
WITHIN FL
LIFT FAIL
LIFT HLY

CALL TAB1
CALL TAB2

SPEECH TRIGGER
BIN POS A
BIN POS B
BIN POS C
BIN POS D
BIN POS E
BIN POS F
OP117
OP118
OP119

ALLOC_REVS_EXD
OP121
OP122
OP123
OP124
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