

HANOVER
DISPLAYS LIMITED



Flip-Dot

Sign System Manual



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Contents

Contact List

Contact List-----	4
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Flip-dot Sign Systems

Introduction & Sign Types-----	5
Sign System Wiring-----	6&7
Eric+/Deric+ Sign Controller Wiring-----	8

Dot-boards

Types of dot-boards-----	9&10
--------------------------	------

Lighting

LED Lighting-----	11-13
Halogen Lighting-----	14

Sign Processors

7070 / 7080 & 7090 Sign Processors -----	15 &16
7070 / 7080 & 7090 Diagrams-----	17

Control Unit

Introduction & Software-----	18
------------------------------	----

Installation of Equipment

Controller installation	19
Sign Installation	20&21

Sign Information Sheets: (Standard Sign Examples)

M023ECO	16x96-4	LED-----	22
F064	8x84-4	LED-----	23
R015	14x20-4	LED-----	24
D200D	Deric+	-----	25
E400F	Eric ++	-----	26

Appendices

A. Connectors & Pins-----	27
B. Setting destination codes (Eric++) -----	28
C. Setting destination codes (Deric+) -----	29
D. Setting the test function (Eric+) -----	30
E. Setting the test function (Deric+) -----	31

Trouble Shooting

Trouble Shooting-----	32&33
Trouble Shooting Chart-----	34
Quick checks if sign/s are not responding-----	35

If you would like sign information sheets on your equipment please do not hesitate to contact Hanover Displays Ltd.

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Flip-dot Signs

Introduction

The scope of this guide is to provide basic information regarding Hanover's standard sign systems. It has been written with all operators in mind and outlines the identification, installation and operation of the standard flip-dot signs and control units supplied by Hanover Displays Ltd.

It is not a detailed technical document. Should any further information be required, please contact Hanover Displays Ltd.

Hanover signs are manufactured using electromagnetic flip-dots. Each, individual dot contains a permanent magnet, under which two coils of wire and a diode are situated. Depending on the direction of the current through the coils, so the polarity of the resulting electromagnetic field changes. This causes the dot to turn. Once set the dot requires no energy to keep it in that position.

All the displays are fully electronic and are housed in sealed, aluminium cases to prevent the ingress of dirt and moisture. A range of display sizes are available.

Messages are programmed using Hanover's windows-based sign editor. The messages can then be downloaded to the Deric+ Data-Loader or Key-lo using a suitable computer.

Example of standard sign destination types:

Product Code (Hanover part no).	Description	Max. character height	Maximum dimensions (length x height x depth)
M023ECO	Front Dest 96x16-4	243mm	1520mm x 334mm x 99mm
F064	Side Dest 84x8-4	122mm	1316mm x 219mm x 101mm
R015	Side & Rear 20x14-4	213mm	365mm x 309mm x 67mm

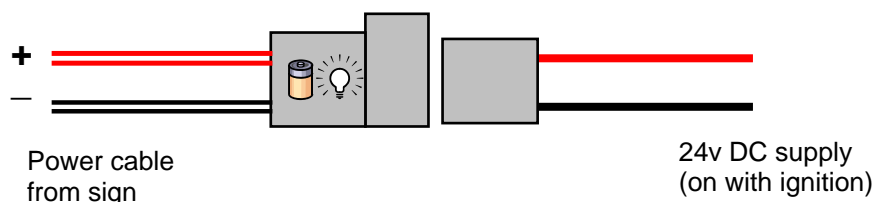
Sign System Wiring

Please refer to the diagram on the following page which illustrates the system wiring.

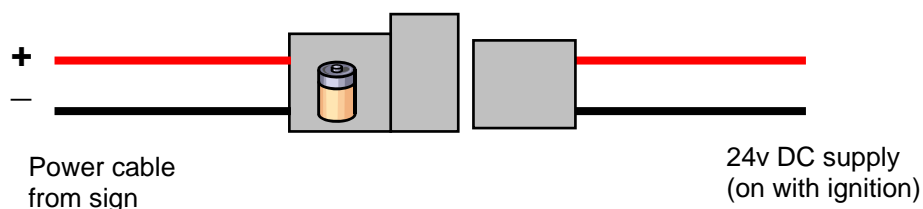
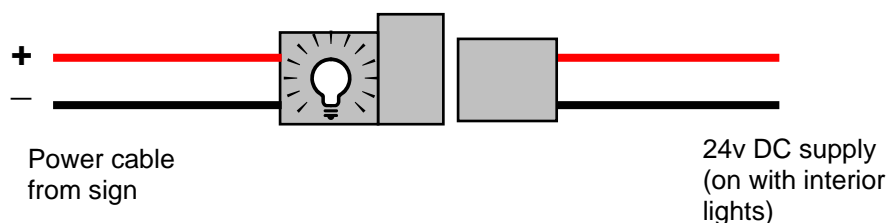
All signs are supplied with 2 communications cables: an input and an output. The only exception is on the rear sign, where typically only a communications input is necessary. The comms output is left available for future use if needed.

There are either 1 or 2 power input cables connectors from each sign. Where there are two power inputs then one cable is for the display, the other for the lighting. If only one power input is available then power and lighting is joined. See diagram below for both types:

Where lighting and display power are joined



Where lighting and display power are separate



The lighting and display power connectors from the signs are clearly marked with a light bulb and battery symbol respectively.

Sign Wiring Information

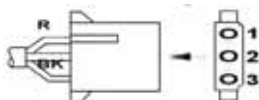


Connections to Destination Controller



NB: Eric comms pins are 1 Black - & 2 Red +
Deric comms pins are 1-Red + & 2 Black -

3-way plug is power

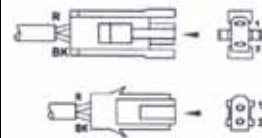


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HOUSING ONLY

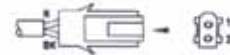
2-way plug is



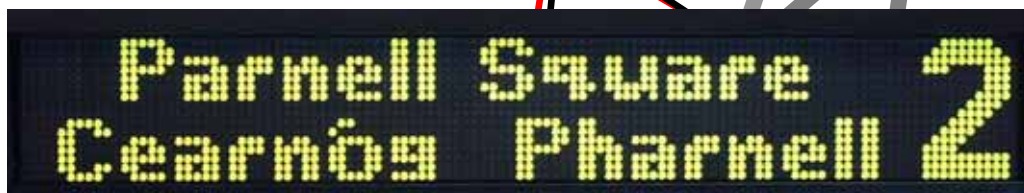
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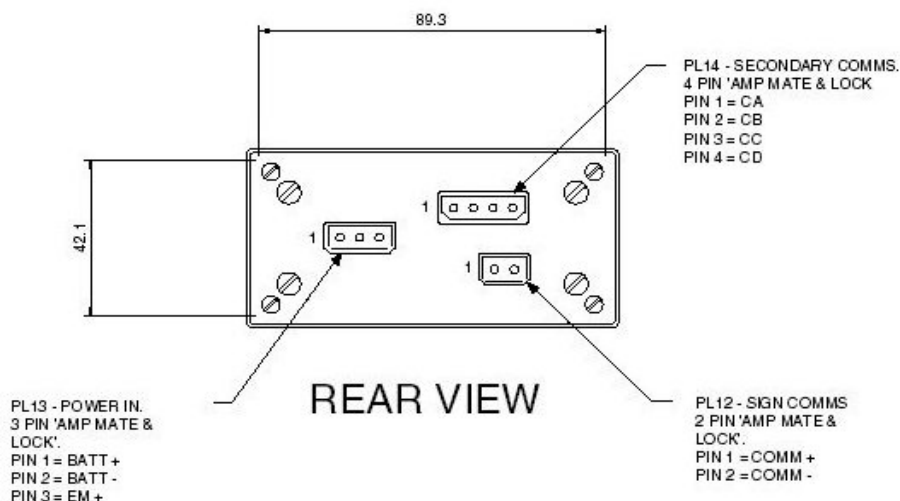
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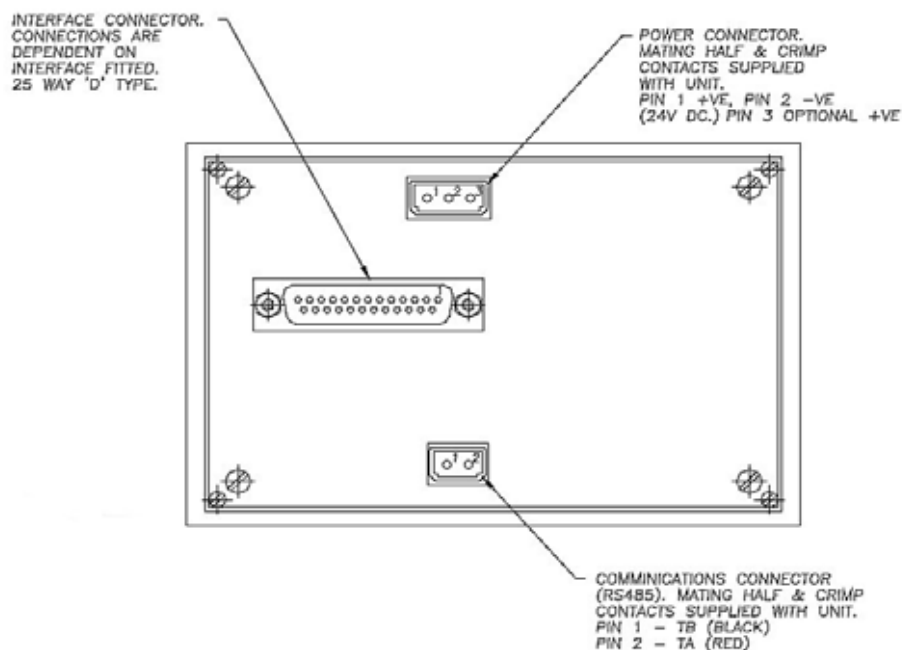


Deric+ controller rear view connections

*NB: On the Eric +/++ controller
the communications pins are
PIN 1 = COMMS - (BLACK)
PIN 2 = COMMS + (RED)*



Eric+ controller rear view connections



Dot-boards

Types of dot-board

Each sign contains at least 1 dot-board which displays the sign messages. Dot-boards are made up of a continuous matrix of flip-dots, yellow on one side & black on the other. The following table shows a few examples of different dot-boards used in various signs. If you require details on other signs and their dot-board sizes (10mm & 22mm) please refer to the Hanover Resource or exhibition CD under information sheets.

Dot-board, Product code	Display size: No. dots long x no. dots high	Used in
DB233	32 x 16	M023-ECO
DB223 & DB123	32 x 16	M023 & M018
DB226	84 x 8	F064
DB225	84 x 7	F055
DB129*	28 x 16	M412
DB199	20 x 7	S303 & S301
DB120*	20 x 14	R014 & R015

* These dot-boards have been upgraded so that their ICs are located on the top of the pcb. The new boards are entirely compatible with the original boards:

- DB129 – replaced with DB232,
- DB120 – replaced with DB221.

The route number signs use only 1 dot-board. The front signs use at least 3 dot-boards:

96x16-4 (M023-ECO, M023 & M018) = 3 dot-boards per sign.

84x8-4 (F064) = 3 dot-boards per sign.

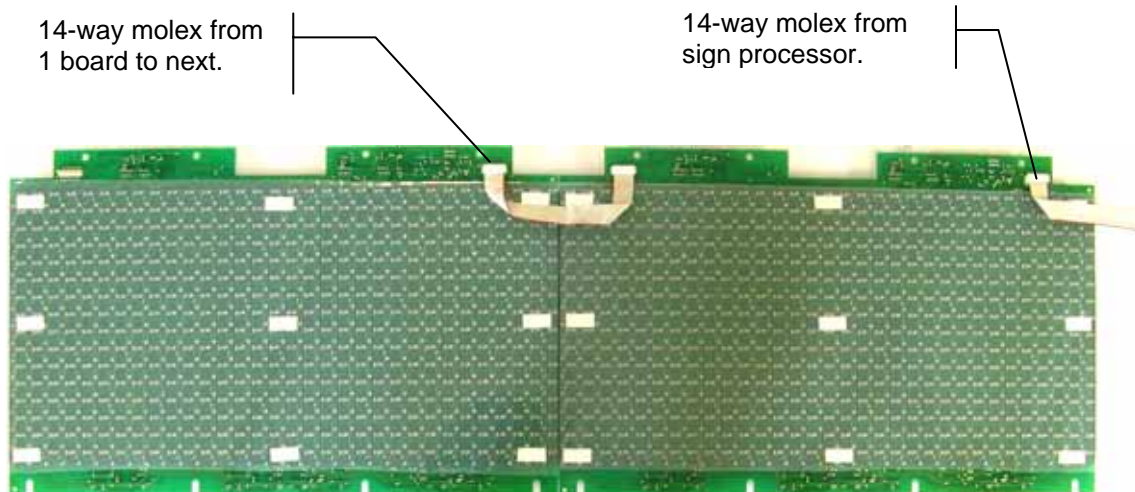
20x14-4 (R015) = 1 dot-board per sign.

Note! DB233/PC089 used in M023-ECO sign has the orange plug-in connectors as described in the Sign Lighting section of this manual (page 11).

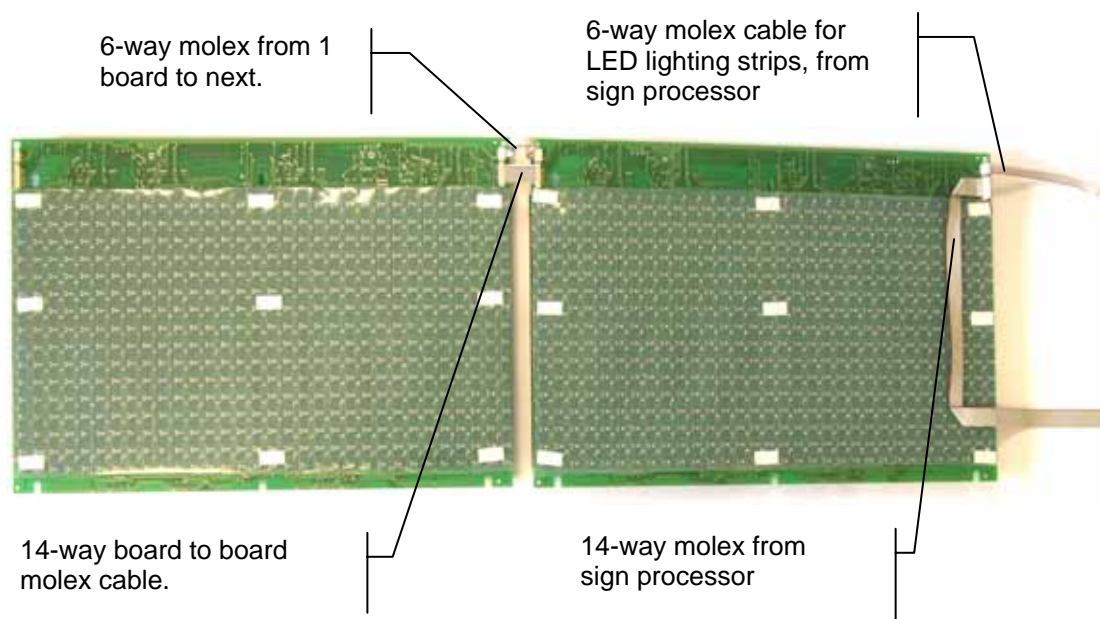
Operation of dot-boards

Each sign receives messages from the sign controller via the RS485 communications link. The messages tell the signs what to display. A message for a particular sign is picked up by the processor card set to the same address as contained in the message. The processor converts the message into a set of control signals, which determine which flip-dots turn yellow & which turn black. These control signals are routed from the processor to the first dot-board via a 14-way molex cable. They are then passed from one dot-board to the next via a short, 14-way molex connection cable.

DB223 Dot-board rear view (Examples of multiple boards & connections)



DB233 Dot-board rear view



Sign Lighting

All Hanover signs supplied use white LEDs to light their displays. The white LED's are positioned on pcb's to make LED lighting strips, these are located inside the signs above the dot-boards.

Types of LED lighting

The LED lighting strips come in various sizes according to the size of sign. There are 2 basic variants of LED lighting strips:

- "Bolt-in" LED strips – these are either
 - a) mounted direct to the sign casing via a metal stud/pillar or
 - b) mounted to a small metal bracket, which in turn is fixed to the sign casing.
- "Plug-in" LED strips - fitted with orange connectors. These strips plug directly into the dot-board via the orange connectors.

The table below lists examples of different LED strips used in the signs.

LED Strip, Product code	Type	Number of LED's per strip	Used in
PC089	"Plug-in"	48-way	M023-ECO
PC035	"Bolt-in"	48-way	M023 & M018
PC036	"Bolt-in"	44-way	F055, F064
PC037	"Bolt-in"	28-way	S303, S301 & R014/5

Operation of LED lighting

Power to all LED strips comes from the processor card. The power output from the processor is a regulated voltage (16v DC) from either the TB3 connector (on all 7080 processors or 7090 processors in route number signs) or the PL4 connector (on 7090 processors in front signs).

The power is fed to the LED strips via a 6-way molex cable. Note, the red wire on the 6-way molex cable should be connected to the '+' terminal on TB3. With "bolt-in" LED strips this cable connects to either CONN1 or CONN2 on the LED strip itself. With "plug-in" LED strips the 6-way molex cable connects to the dot-board and power to the LED strips is routed through the orange connectors.

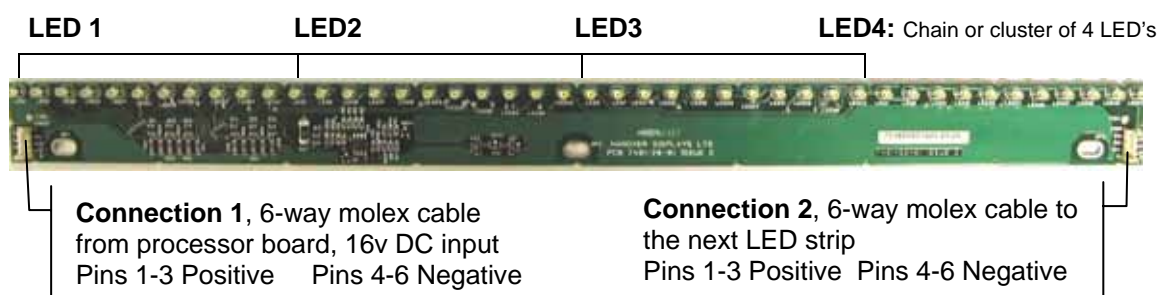
The route number signs only require a single LED strip. In the front signs individual LED strips are daisy-chained together using 6-way molex cables.

The LEDs themselves are also daisy-chained on each individual LED strip in groups or "clusters" of 4. If 1 LED in a cluster fails then the remaining 3 in the cluster are switched off (note other clusters would still be on). The clusters of 4 are marked on the LED strips so that the 1st cluster contains LED1, LED2, LED3 & LED4; the 2nd cluster contains LED5, LED6, LED7 & LED8 and so on. LEDs within a cluster are not adjacent to each other, but they are evenly spaced across the LED strip – this is to minimise the effect of an LED failure.

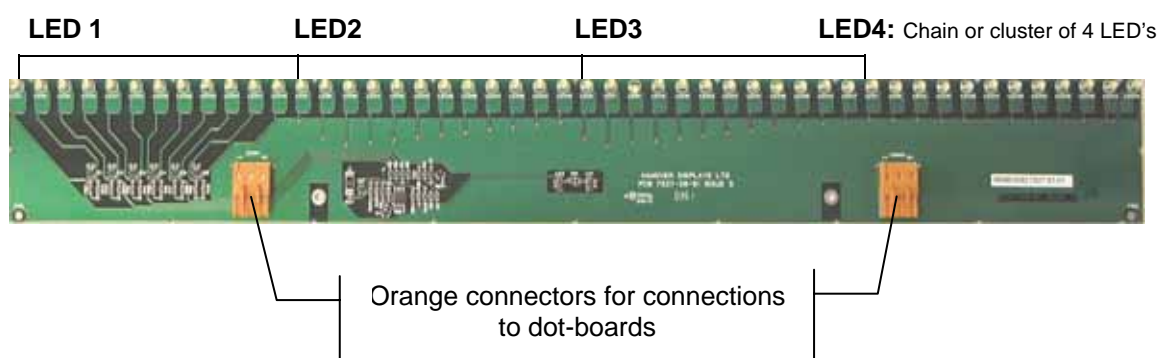
The output from the LEDs is regulated by an ambient heat sensing resistor. As the ambient temperature inside the sign increases, so the output from the LEDs decreases. This is to preserve the life of the LEDs.

Connections & Key Components on LED strips

Example - PC036 “Bolt-in” 44-Way lighting strip (M412, 112x16-04)



Example - PC089 “Plug-in” 48-Way lighting strip (M023-ECO, 96x16-04)

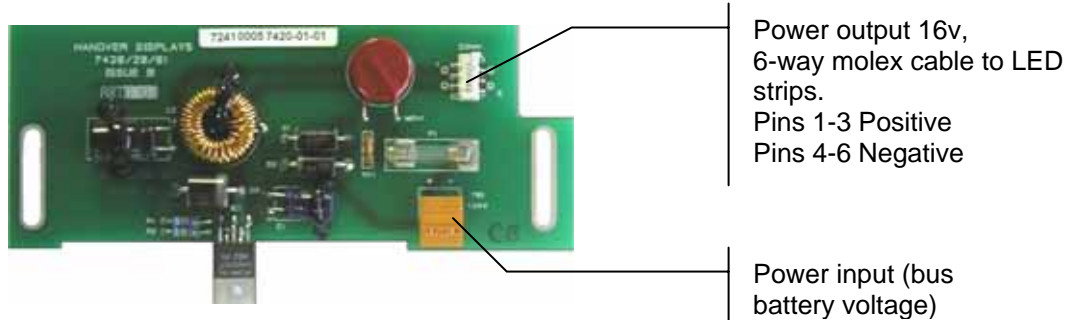


LED Lighting Fault Finding

- Check bus lighting is on.
- Check power is going to the processor card (red LED's should be lit, or check with voltmeter).
- If a 7090 processor is fitted, check the link on LK7 is fitted correctly (link B should be fitted), see page 15. Note, if this link is fitted incorrectly when the sign is powered up there is a strong possibility that the LED lighting strips will have blown.
- Check the output voltage from the processor (to the LED strips) is 16v DC. If the processor is receiving power but there is no output voltage then replace the processor card.
- Check the 6-way molex cable from the processor to the LED strip (or to the dot-board on M023-ECO) is secure & the connections at both ends are good. Replace the molex cable &/or LED strip as required.
- Note, if just 1 LED strip has failed but other strips in the sign are still working, then simply replace the molex cable to (not from!) the failed strip &/or the strip itself.

LED regulator board

Front signs fitted with a 7080 processor may have an additional pcb to power the LED lighting – an LED regulator board (Product code PC027). This board receives power direct from the external lighting input, so this should be bus battery voltage. The board then provides a regulated 16v DC supply to the LED strips via a 6-way molex cable, see below.



Fault Finding:

- Check voltage input to the LED regulator is 24v DC (bus battery voltage).
- Check voltage output from the LED regulator to the LED strips is 16v DC.
- Follow the instructions on the previous page & replace the regulator, molex cables or LED strips as required.

Lighting – if there is an LED regulator in the sign turn off power to the sign, then either:

- ~ leave the LED regulator in-circuit and leave the 7090 lighting terminals unconnected, or
- ~ connect the 6-way molex cable from PL4 on the 7090 to either CONN1 or CONN2 on the LED strip making sure that LK7 has link B fitted & then remove the LED regulator.
- ~ Reconnect the power & comms plugs.

Halogen signs

The larger destination signs (M016, M16x96-4 and M505, M07x84-6) use two 12 volt / 20 Watt 35mm dichroic bulbs.

Hanover Part No. 30-2105 - 0001 - 00

The route number display (S300, M07x20-6) uses a single, small halogen capsule bulb, 12 volt / 20 watt.

Hanover Part No. 30-2105 - 0022 - 00

In addition, all the new models of these signs use only 1 internal circuit board, namely the 7080 processor *. The 7080 receives information from the controller and transmits it to the dot-board. It also regulates the output voltage to the halogen bulbs. The advantage of this processor over earlier models is that its standard software is capable of running any size of sign.

There are 2 variants of the 7080:

- 12v output for powering a single halogen bulb (S300, M07x20-6). **Labelled “12v HALOGEN ONLY”.**
- 24v output for powering 2 halogen bulbs (M016, M16x96-4 and M505, M07x84-6). **Labelled “24v HALOGEN ONLY”.**

On power up the 7080 checks the size of sign to which it is connected. Initially you will see a vertical column being drawn on the display, followed by a horizontal line before the sign clears and waits to receive a message.

Fault Finding for Halogen Lighting

- Description of fault - lighting does not work.

Action:

1. check wiring is correct, and that bus lighting supply is on. (see page 6).
2. check output voltage from 7080 to bulbs, this should be either 12v dc or 24v DC depending on which 7080 is fitted.
3. change bulb or 7080 as necessary.

BE CAREFUL - halogen bulbs can get very hot!!

NB: Do not touch bulbs with bare hands even when cold.

7070 & 7080 Processors

1) LED Usage

The 7080 and 7070 sign processors are provided with a number of LEDs which indicate the state of their operation. They are very useful for checking that the sign system is functioning correctly.

LED 1	Heartbeat
LED 2	Comms
LED 3	Sign Drive



When the sign is powered up LED 1 and LED 2 turn on together for a brief period. After this initialisation phase the LEDs function as follows:-

LED 1 turns on and off once per second. This shows that the processor is running (i.e. not crashed).

LED 2 lights in the following three ways:-

- brief flash when the sign receives a valid comms message addressed to it.
- long flash if the sign receives a message with bad contents.
- permanently on if the sign has not received a valid message within the previous 60 seconds. Note that even with a static message, the sign processor and the Deric are continuously communicating with each other. Therefore if LED 2 is permanently on, this would indicate a fault.

LED 3 lights when the processor is driving the dot boards. This will occur :-

- when the processor receives a message that requires a display on the dot-board i.e. a text message, a graphics message, or sign test.
- during the initialisation phase when the sign size is being measured and the sign is cleared.

2) Links Usage of pluggable links:-

LK3-A	Not used
LK3-B	Fit to enable bold fonts
LK3-C	Not used
LK3-D	Swap colour of display dots black<=>yellow
LK3-E	If fitted before power up the sign is upside-down



- Fit this link if you have to mount the sign upside down. After power-up, the act of inserting this link will put the sign into self-test.

3) SW2 Address Switch

This is a rotary switch. Every programmed sign has an “address” or “switch setting”, typically the front sign = 0, side = 1 and rear = 2.



4) Software

The standard variant of software fitted to the 7080 is “ECO”.
The standard variant of software fitted to the 7070 is “STD”.



7090 Processor

As previously mentioned the 7090 processor will replace all variants of the 7080 processor, as well as the LED lighting regulator. The 7090 can therefore be used as a replacement processor in all signs.

IMPORTANT: CHECK LINKS ARE IN CORRECT POSITION BEFORE POWERING UP 7090 BOARD (REF: LINK SETTINGS BELOW)

1) LED Usage

Same as the 7080 and 7070 sign processors, but there is no LED 3.

2) Lighting Connections

The 7090 can power both halogen & LED lighting. It has two connections to provide power to the lighting, both of which have the same output voltage:

- TB3, a 2-way terminal block, for halogen or LED lighting.
- PL4, a 6-way molex connector, for LED lighting.

3) Links

LK3: as on the 7070 & 7080 processor.

LK7: this determines output voltage to the lighting. This is the most important link & you must check that it is fitted in the correct position before turning on the power: (refer to link settings)

LK9: this allows the operator to detect lighting failures, which are shown as a status error on the drivers display.

Link settings

PC058A	7090-01-02	Replacement for LED lit signs-LK7'B', LK9'DE' fitted.
PC058B	7090-01-03	Replacement for single halogen bulb route no signs- LK7'A', LK9'DE' fitted.
PC058C	7090-01-04	Replacement for dual halogen front / side signs LK7'C', LK9'DE' fitted.

4) SW2 Address Switch

As on the 7080 and 7070 sign processors.

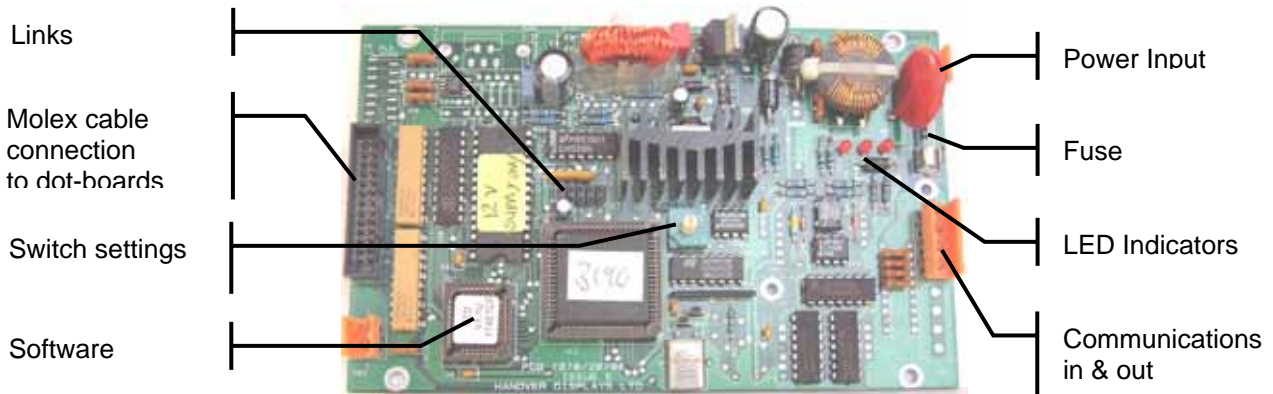
5) Software

The standard variant of software fitted to the 7090 is "STD".

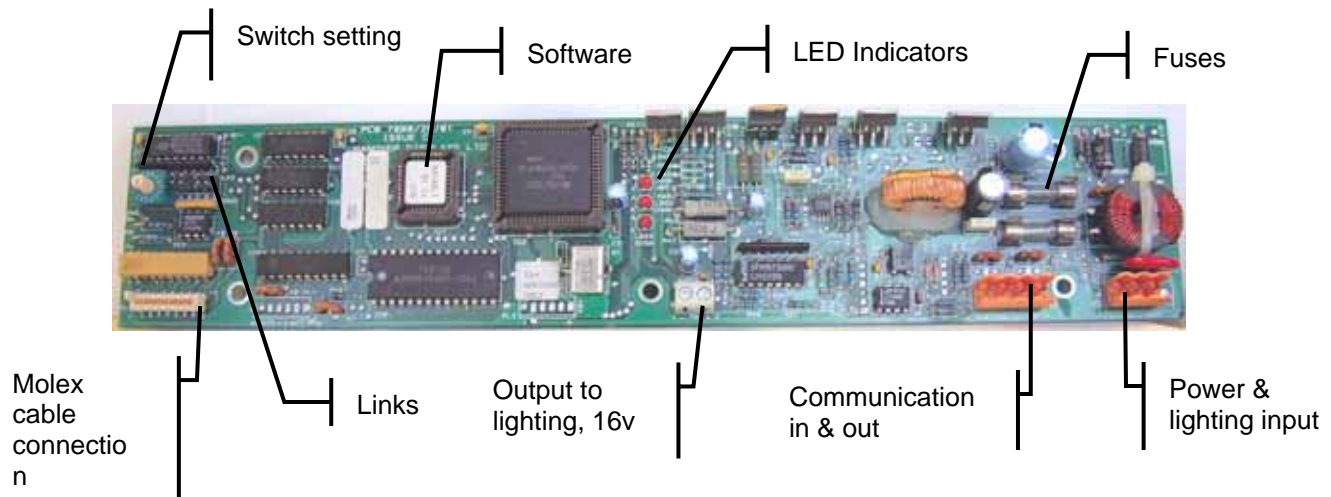
6) Replacing 7080 processors with a 7090 processor

- Disconnect power & comms plugs.
- Make sure the correct link is fitted on the 7090. (ref link settings)
- Replace the 7080 with a 7090.
- Lighting – if there is an LED regulator in the sign either
 - ~ leave the LED regulator in-circuit and leave the 7090 lighting terminals unconnected, or
 - ~ connect the 6-way molex cable from PL4 on the 7090 to either CONN1 or CONN2 on the LED strip & then remove the LED regulator.
- Reconnect the power & comms plugs.

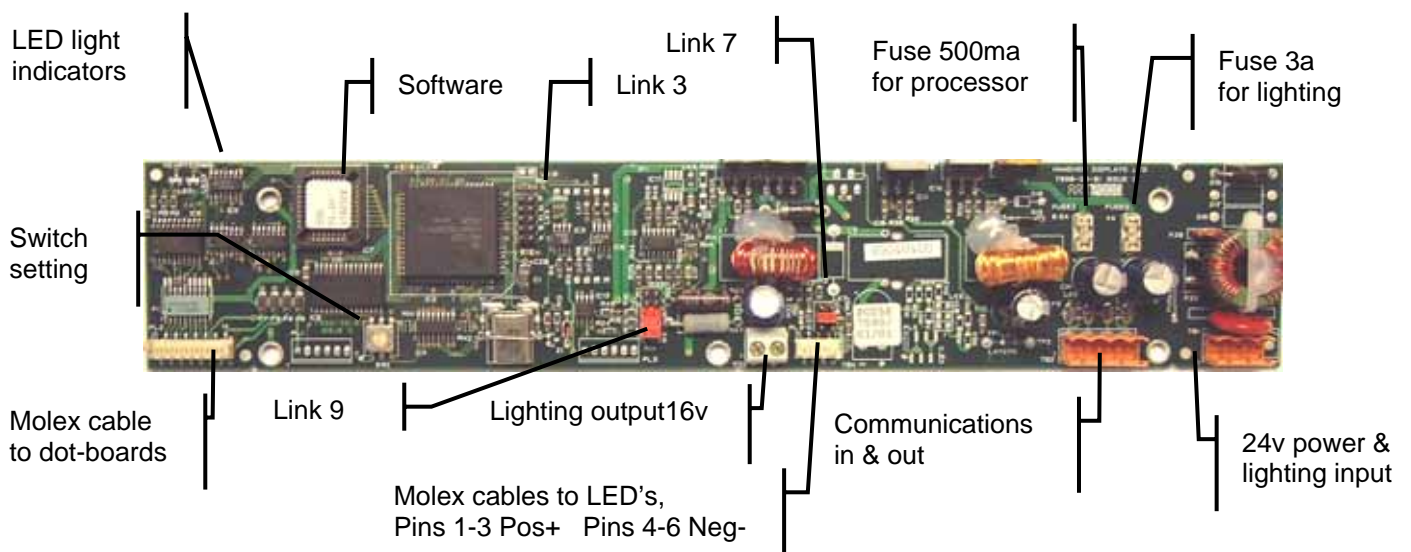
7070 Processor Board



7080 Processor Board



7090 Processor Board



Eric+ and Deric+ Control Unit

Introduction

The Eric+ and Deric+ control units essentially run the signs to which it is connected, communicating the messages that are to be displayed. Messages are transmitted via RS485 to each individual sign on any given vehicle.

The standard Eric+ Controller is:

- E400F 2Mb on board memory which stores all programmed messages.

The standard Deric+ Controller is:

- D200E 1Mb on board memory which stores all programmed messages.

(Note that the final letter given in the product codes above, i.e. "E" or "F" refers to the size of flash memory. Other flash sizes exist: A=64k, B=128k, C=256k & D=512k).

Product Code (Hanover part number)	Software	Description
D200E (Deric+)	Std.	<ul style="list-style-type: none"> • LCD display • Two lines of 16 characters • 3 button keypad • 1 serial port & 1Mb memory
E400F (Eric+/++)	Std.	<ul style="list-style-type: none"> • Full graphic LCD driver display • Full alphanumeric key-pad • 4 serial ports available • Up to 4Mb memory available

For further information on controllers refer to manuals on the Hanover Resource CD which is available free of charge from Hanover Displays Ltd.

Controller Installation

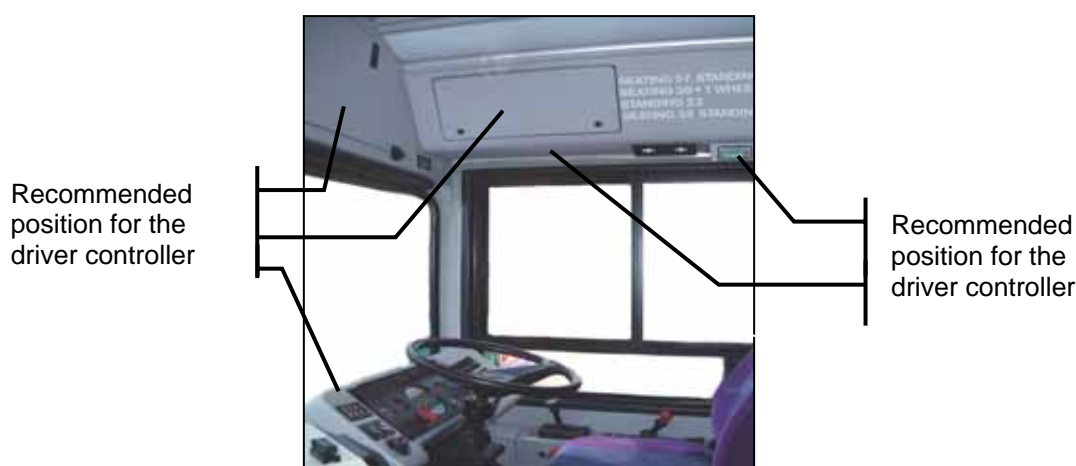
The controller can be flush mounted or boxed according to the type of bus or the end users preferences.

Position

Usual positioning for the controller is the right or left hand side on the dash, above the drivers head in the sign pod, above drivers window or below the drivers window.

Considerations when installing

- Control units are not waterproof so take care not to position the unit below a window where water may get onto or in the unit or where liquids may be spilt over the controller.
- Power and communication cables plug into the rear of the control unit so care must be taken to ensure enough space is provided.
- Easy access and visibility of the control unit for the drivers should be taken into consideration when positioning.



Pros & Cons to position

Position	Advantages	Disadvantages	Drivers
Above driver's window.	This area usually has sufficient space to accommodate the control unit & the cabling and also easy access to service regularly.	More awkward for drivers to change than a controller positioned on the dash.	Warning: Drivers should never attempt to change controller whilst driving.
Left or right on the dash.	Visibility & access to control unit is good. Wiring to controller is normally easy & servicing also.	Sufficient depth of space on modern vehicles is usually difficult to find.	Viewing and access to unit is very good for driver but is not recommended whilst driving.

Recommended sign installation

The positioning of the sign unit is extremely important for maximum legibility of the unit from all angles. It is recommended that all sign units be positioned as vertically as possible and installed with a 'minimum clearance' from the front glass.

Masking the window

Ideally a rubber strip should be fitted around the sign so that the sign can abut the window. This rubber strip also then serves as a seal to the inside of the vehicle screen and the outside surface of the sign window keeping them both dust free. When a rubber strip is used around the front of the sign, the rubber strip should ideally be up to 6mm in thickness, and a maximum of 8mm.

Front, side and rear signs

Hanover signs are sufficiently well finished that masking is generally unnecessary. Masking reduces the contrast of the sign by reducing the amount of sunlight falling on the display surface. If masking is undertaken it should not be aligned to the display area, but should be enlarged to be at least to the outer dimensions of the sign case.

If, for good reason the sign is not mounted as recommended with a minimum clearance from the window, then any masking must be correspondingly larger to prevent loss of visibility.

The dot display area should be viewable from every conceivable angle, e.g. front (head-on), side (from the pavement etc), without compromise.

Masking too close to the edge of the dot face will result in the legibility of the character fonts displayed being compromised.

Excess and unnecessary masking of the front windscreen will also cause the side viewing angle of the sign to be reduced.

Mounting of signs

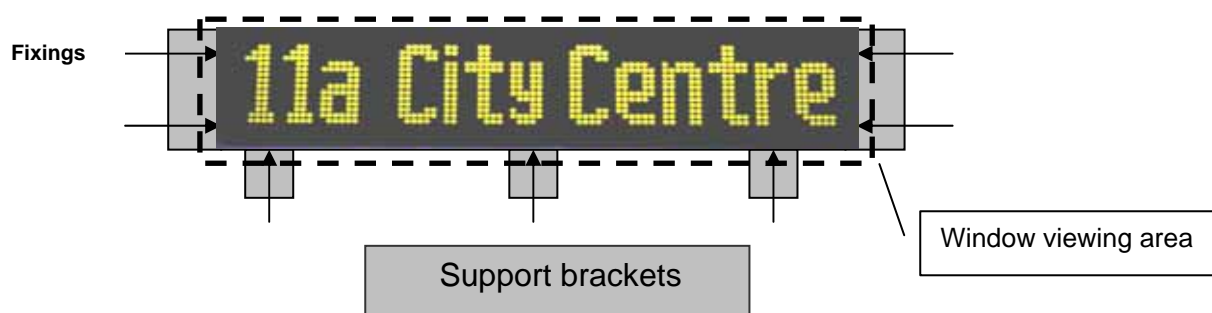
Front signs

As the majority of front signs are at least 1300mm or greater in length, Hanover recommend that all signs mounted in the front of the vehicle, are mounted using their top and bottom fixing points. This will ensure that the sign has support along its entire length.

The sign can be mounted by its side fixing points, however in this case it is strongly recommended that additional support is added to the bottom of the sign.

Brackets

Sign bracketry should be attached in such a manner as not to restrict the release of the sign displays rear panels and should be made of steel and of a thickness no less than 3mm.

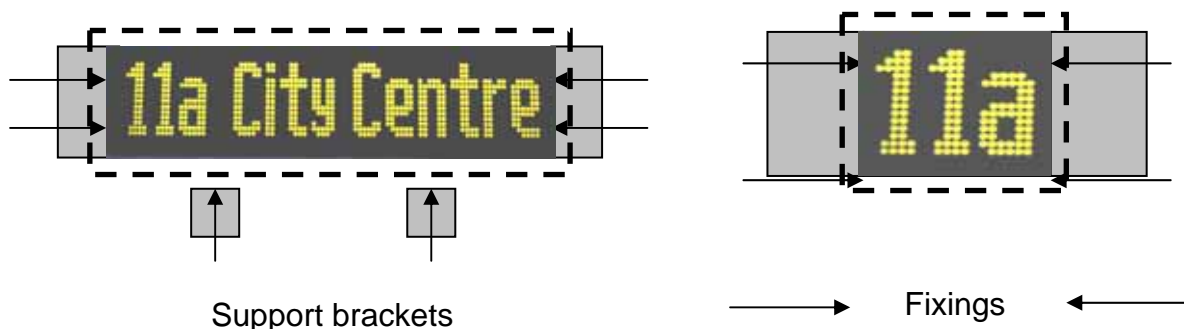


Side and rear signs

Side and rear signs, providing they are under 1300mm in length, can be mounted by their side fixing points.

As with the front sign, sign bracketry should be attached in such a manner as not to restrict the release of the sign displays rear panels.

The interior or exterior masking around the sign equipment must be sufficiently wider and higher than the sign itself to be able to view all the rows of dots from all reasonable angles. This will vary according to how close the sign has been installed into the vehicle.



HANOVER

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Product Code: **M023 ECO (GLASS WINDOW)**

Sign Size:	96 x 16-15mm
Lighting Type:	LED (PLUG IN MODULE)
Weight:	15 kg
DDA Compliant:	Front/Side/Rear
Maximum Character height:	243mm
Maximum Characters:	15+ characters



Dimensions: W1520 x H334 x D99

No	Part No	Product Code	Description	Qty
1	5025-20-01		96*16-4L ECO CASE	1
2	5025-20-06		96*16-4L ECO CTR REAR COVER	1
3	5025-20-07		96*16-4L ECO LH & RH REAR COVER	2
4	7527-01-01	PC089	PLUGIN LED LIGHT 48W STRIP	3
5	5025-20-09		96*16-4HT2 CLEAR GLASS WINDOW	1
6	7090-01-01	PC058A	7090 SIGN PROCESSOR	1
7	7526-01-01	DB233	32*16-4 ECO PLUGIN DOT-BOARD	3
8	0005-05-01		6W-150MM MOLEX CABLE	2
9	0001-05-07		14W-1100MM MOLEX CABLE	1
10	0005-05-07		6W-875MM MOLEX CABLE	1
11	0001-05-01		14W-45MM MOLEX CABLE ASSY	2

TECHNICAL INFORMATION

Operating voltage	18 – 32 volts DC
Power consumption	1.3 Amps @ 24v DC (32 watts approx)
Standard communications	RS 485 – other options available
Temperature Range	-20C to + 60C
Storage Temperature Range	-20C to + 80C
Humidity (operating)	80% max
Shock	5g max
Vibration	2g / 5-15 Hz



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0020/54/0245/D



HANOVER

DISPLAYS LIMITED



Product Code:	F064 (GLASS WINDOW)
Sign Size:	84 x 8-15mm
Lighting Type:	LED
Weight:	10 kg
DDA Compliant:	Side
Maximum Character height:	122mm
Maximum Characters:	3 No's & 15+ characters



Dimensions: W1316 x H219 x D101

No	Part No	Product Code	Description	Qty
1	0116-20-01		84*8-4 CASE	1
2	0116-20-03		84*8-4 REAR COVER	1
3	0115-20-09		84*8-4 WINDOW	1
4	7401-01-01	PC036	LED LIGHTING 44W STRIP	3
5	7506-01-01	DB226	28*8-4 DOT-BOARD	3
6	7090-01-01	PC058A	7090 PROCESSOR	1
7	0005-05-01		6W-150MM MOLEX CABLE	2
8	0005-05-04		6W-750MM MOLEX CABLE	1
9	0001-05-01		14W-45MM MOLEX CABLE	2
10	0001-05-03		14W-706MM MOLEX CABLE	1

TECHNICAL INFORMATION

Operating voltage	18 – 32 volts DC
Power consumption	1.3 Amps @ 24v DC (32 watts approx)
Standard communications	RS 485 – other options available
Temperature Range	-20C to + 60C
Storage Temperature Range	-20C to + 80C
Humidity (operating)	80% max
Shock	5g max
Vibration	2g / 5-15 Hz



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0020/54/0042/B

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Product Code: **R015** (GLASS WINDOW)

Sign Size: 20 x 14-15mm
 Lighting Type: LED
 Weight: 3.5 kg
 DDA Compliant: Rear
 Maximum Character height: 213mm
 Maximum Characters: 3



Dimensions: W365 x H309 x D67

No	Part No	Product Code	Description	Qty
1	0603-20-14		20*14-4 CASE	1
2	0603-20-17		20*14-4 BACK COVER	1
3	0603-20-16		20*14-4 WINDOW	1
4	7402-01-01	PC037	LED LIGHTING 28W STRIP	1
5	7030-01-01	DB221	20*14-4 DOTBOARD	1
6	7090-01-01	PC058A	7090 SIGN PROCESSOR	1
7	0005-05-03		6W-485mm MOLEX CABLE	1
8	0001-05-01		14W-45mm MOLEX CABLE	1

TECHNICAL INFORMATION

Operating voltage	18 – 32 volts DC
Power consumption	1.3 Amps @ 24v DC (32 watts approx)
Standard communications	RS 485 – other options available
Temperature Range	-20C to + 60C
Storage Temperature Range	-20C to + 80C
Humidity (operating)	80% max
Shock	5g max
Vibration	2g / 5-15 Hz



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0020/54/0045/B

HANOVER

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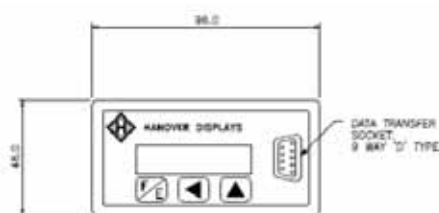


Product code: **D200D/E** (D200E HAS 1MB MEMORY)

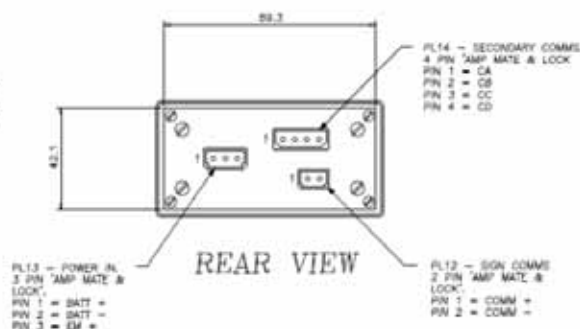
Product: Deric+
 Weight: 0.3 kg
 Screen: LCD
 Maximum lines of text: 2
 Maximum character height: 5mm



Case dimensions: W96mm x H48mm x D124.5mm
 Cut out: W92mm x H45mm x D114.5mm



FRONT VIEW



REAR VIEW

No	Part no	Product code	Description	Qty
1	3500-06-07	DS201	DERIC BACK PANEL	1
2	3500-06-10	DS207	DERIC FRONT PANEL	1
3	7163-01-01 or 7163-01-02	DS114A or DS114B	DERIC CPU + 512K or DERIC CPU + 1MB MEMORY	1
4	7150-01-01	DS100	DERIC PSU PCB	1
5	30-6500-0004-00	DS204	DERIC FIXING CLAMPS	2
6	30-6500-0005-00	DS202	DERIC CASE & BEZEL	1
7	30-3015-0000-02	DS205	9W D-TYPE DUST COVER	1

TECHNICAL INFORMATION

Operating voltage	18 – 32 volts DC
Normal operating power consumption	0.5 Amps @ 24v DC
Standard communications	RS 485 – other options available
Temperature range	-20C to + 60C



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0020/54/0210/E



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Product code: **E400F (2MB)**

Product: Eric++

Weight: 0.9 kg

Screen: LCD

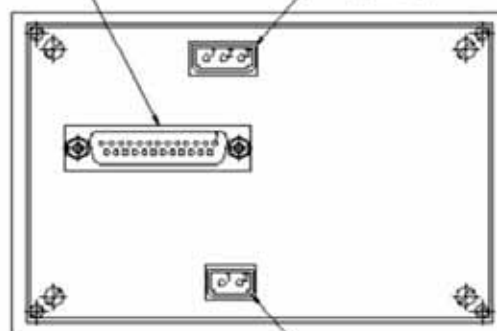
Maximum lines of text: 2

Maximum character height: 15mm



Interface connector
25 way 'D' type

Power connector
Pin 1 + VE
Pin 2 - VE
Pin 3 optional
(24v DC)



Communications connector
(RS 485)
Pin 1 - TB (Black)
Pin 2 - TA (Red)

Case dimensions: W144mm x H96mm x D120mm

Cut out: W138mm x H92mm x D150mm

No	Part No	Product Code	Description	Qty
1	3005-06-01	EP200	ERIC+ FRONT PANEL WITH LCD	1
2	3000-06-12	ES201	ERIC+ REAR PANEL PCB	1
3	7123-01-03	ES206C	ERIC+ POWER SUPPLY PCB	1
4	7529-01-01	ES207	ERIC++ PROCESSOR	1
5	30-6500-0002-00	ES202	CASE & BEZEL	1
6	30-6500-0004-00	ES204	PAIR OF FIXING CLAMPS	2

TECHNICAL INFORMATION

Operating voltage	18 – 32 volts DC
Normal operating power consumption	0.5 Amps @ 24v DC
Standard communications	RS 485 – other options available
Temperature range	-20C to + 60C



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0020/54/0233/E



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Connectors & Pins

Pins & housing for power:



Sign Power Female Pins
30-3021-0000-02



Sign Power Female
30-3021-5002-00

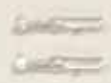


Sign Power Male Pins
30-3021-0000-01



Sign Power Male Connector
30-3021-0002-00

Pins & housing for Deric rear:



Sign Controller Pins
30-3005-5000-00



Sign Controller 2-way
Comm Connector
30-3005-5002-00



Sign Controller Pins
30-3005-5000-00



Sign Controller Plug
3-way
30-3005-5003-00

Trident Pins & Housing plugs:



Sign Communications
Male Trident Pin:
30-3020-0000-01



Sign Communications
Male Trident Connector:
30-3020-0002-00



Sign Communications
Female Pins:
30-3020-0000-02



Sign Communications
Female Trident Connection
30-3020-5002-00

Sign Processor Connectors:



4-way
30-3006-5004-00



3-Way
30-3006-5003-00



2-Way
30-3006-5002-00



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0020/54/0076/G



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Setting Eric+ Destination Number Guide



Setting destination 51:

- Press & 'Dest No:' will appear:
- Press number key and 5 will appear on screen
- Press number key and the display will show '51'
- Press key and selected destination will appear



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0020/54/0053/B



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Setting Deric+ Destination Number Guide





Setting destination 59:

Press  until 'Dest No:' appears:

Press  key until 5 appears

Press  once, the display will show '50'

Press  key until 9 appears

Press  to enter the number displayed.



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0020/54/0102/D





Setting Eric+ Sign Test Function



- Press F key: the display will show "Lock code".
- Press  (Note this is a default setting, this lock code can be changed)
- Press  the displays shows "SHOW STATUS"
- Press  once, the display shows "Test Signs?"
- Press  button once, display flashes "Testing..."

When the controller is flashing 'Testing...' all signs that are correctly connected (on any switch setting) should display a repeating test sequence. Failure to display this test sequence indicates that power and/or communications are not present & cables may have been incorrectly connected.

Exterior & interior LED signs will display scrolling text similar to that shown below, followed by a series of horizontal & vertical line test patterns:

Example: ELD v2.07 (X1.05) #0 144x19 (C=0510) P=100/100.

ELD v2.07 = the sign software version

(X1.05) = scrolling software version (Super X)

#0 = what switch setting the sign displaying is set to.

144x19 = the sign size

P= 100/100=brightness of the display where 100/100 is max (100%) & 10/100 is min (10%)

Flip-dot signs will only display the horizontal & vertical line test patterns.



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0020/54/0225/F








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Setting Deric+ Sign Test Function



- Press  until display requests an unlock code:
- Press  key once display shows '0'
- Press  key once to display '00'
- Press  key once to display '01'
- Repeat this until '0101' is displayed then press 
- The screen should now display 'Show Status?'
- Press  key until 'Test signs?' is displayed
- Press  to initiate test function and the display will flash 'Testing...'

When the controller is flashing 'Testing...' all signs that are correctly connected (on any switch setting) should display a repeating test sequence. Failure to display this test sequence indicates that power and/or communications are not present & cables may have been incorrectly connected.

Exterior & interior LED signs will display scrolling text similar to that shown below, followed by a series of horizontal & vertical line test patterns:

Example: ELD v2.07 (X1.05) #0 144x19 (C=0510) P=100/100.

ELD v2.07 = the sign software version

(X1.05) = scrolling software version (Super X)

#0 = what switch setting the sign displaying is set to.

P= 100/100=brightness of the display where 100/100 is max (100%) & 10/100 is min (10%)

144x19 = the sign size

Flip-dot signs will only display the horizontal & vertical line test patterns.



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0020/54/0087/D



Trouble Shooting

If a fault occurs firstly ensure that the sign is receiving power. This can quickly be ascertained by either:

- measuring the input voltage to the sign,
- checking that the processor LED's are lit.

Check also the special function SHOW STATUS on the Eric controller. Ensure that there is a "status digit" for each sign on the bus. If, for example, the status display is a line of dots but no digits, this means that no sign messages have been downloaded to the controller - so the signs will be blank.

1. Sign Lighting does not work

- check that the bus lights are on.
- is the sign and/or lighting connector/s receiving power.
- Check input & output voltage to CPU.
- Check molex LED cables are secure.

2. If only one sign is blank and / or not updating

- set the controller to TEST MODE, see page 30/31:
If the sign "tests", (but does not display, or update, a message) this indicates that the power and communications wiring to the sign is OK.
- check that the LED's on the processor board are lit and functioning correctly, under normal operation:
LED 1 will flash once about every 2 seconds.
LED 2 will flash more briefly than LED 1 every time the processor receives a signal from the control unit.
LED 3 will flash every time the processor (7070 & 7080 only) sends a signal to the dot-display. In "test" mode it will be permanently on as the processor is continually driving the display.
- check that all connections to and from the processor board are secure: power in (3 way); comms in / out (4 way) and the ribbon cable to the dot-board - take care when re-connecting this cable as it is easy to short the pins together. Check the fuses on the processor board.
- check the address switch is set to the correct number / letter - see page 15.
- change the processor board if necessary.

If the signs do not "test", it is likely that there is a fault with the wiring:

- check the sign is receiving power (24v DC).
- check that the orange power and comms. plug-in connections to the processor boards are secure.
- check the comms. cable is not broken by testing its continuity - unplug the comms. cable at both ends, bridge the 2 wires at one end and "buzz test" the other end.

If the cabling is OK, but the signs do not test, change the processor board, making sure that the address switch is set correctly - see page 15.

3. More than one or all signs are blank and / or not updating

- set the controller to TEST MODE, see page 30/31:
If the signs “test”, (but do not display, or update, a message) this indicates that the power and communications wiring to the sign is OK.

Note if all signs are blank it is possible that a single faulty processor (in either front, side or rear signs) is bringing the whole system down. Start by disconnecting the front sign to side sign comms cable and check if the front sign now works. If it does not work, there is a fault in the front sign – see point 2. If the front sign does work, then reconnect the front – side comms and disconnect the side – rear comms. If both front and side signs now work, the fault is in the rear sign.

When you have established where the fault lies follow the instructions in point 2.

If the signs do not “test”, it is likely that there is a fault with the wiring or control unit – follow instructions in point 2.

4. Part of Sign Display is scrambled / not updating

- check the molex cable from the processor to the dot-boards (and the cables between the dot-boards) are secure.
- change the dot-board or molex cable as required.

5. Faulty control unit

In most instances a fault on the control unit will be immediately apparent. For example, the driver's display may be blank or illegible, or there may be no response from the key panel.

If you suspect a fault, simply replace the control unit with a new one.

Error messages on the control unit:

“Bad Destination”

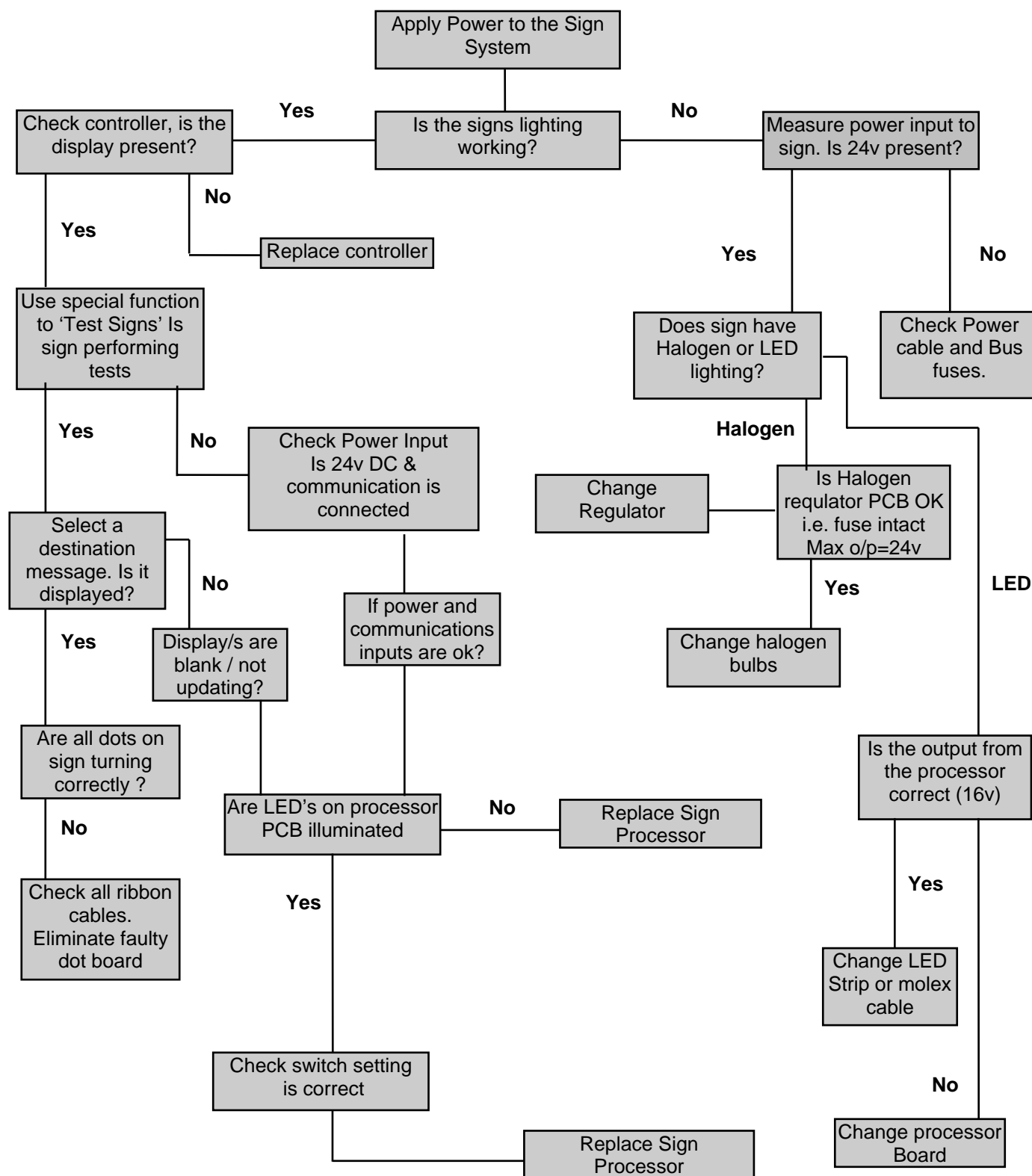
An invalid destination code has been entered - enter a valid number. Or the unit may have been downloaded with a file in the wrong format.

“Bad Memory Data”

This normally indicates that the flash memory board has failed - change the control unit.

Remember! If in any doubt, please do not hesitate to contact Hanover Displays.

Troubleshooting Chart



Quick checks if signs are not responding

1. Check all the vehicle switches are in the correct position for powering up the sign system
2. Initiate "Test Mode" in controller to check power and communications are working correctly (refer to appendices).
3. Check sign controller and all signs are receiving power (24v DC)
4. If there is no power to sign/s, check vehicle fuse box & sign processor for blown fuse/s (see pages on 7070/7080/7090 processor board for fuse locations).
5. Check all communications wiring between sign controller and signs are connected correctly and wiring is not faulty.
6. Check if a rear or side unit is faulty and bringing down the front unit by firstly disconnecting the side and rear from the front sign, then re-connecting in sequence if the front sign starts working.
7. If the system has just been installed check Deric+ controller communications is Red pin 1+ / Black pin 2 -. If Eric controller Black pin 1 - / Red pin 2+

If a new list has just been loaded and signs are no longer responding

8. Check list is appropriate to signs on the vehicle. If mixed technology list, check your list of signs in the Helen software editor to make sure their switch settings match the sign system on the vehicle and the signs match the list.
9. Check your list has loaded correctly and new destinations are there by entering the new codes.
10. Check controller configurations are appropriately set for your type of list (e.g. for a destination list with a browse facility make sure the 10 digit click box is high lighted when downloading from Helen sign editor to your loader (Refer to Helen sign Editor manual for further information).
11. If loading via a laptop and a 3-way white downloading cable make sure the Helen sign editor is ready to transfer data before you set up the controller to receive data. This prevents the controller "Timing Out" before the data is sent.