LED Destination Display

Basic Fault Finding Guide

PASSENGER INFORMATION SYSTEMS

Hanover Displays Inc. 1601 Tonne Road, Elk Grove Village, IL 60007 T: +1 (773) 334 9934

Revision History

Revision	Date	Notes
1-540874-1	06/17/2016	First version - New template
1-540874-2	08/24/2018	Updates of: Status options

Please note that this document is subject to continual updating: please ensure you are using the latest edition.

This edition: **August 24, 2018**

CONTENTS

1. Introduction

This manual contains important information concerning basic fault finding of your LED destination display.

The aim of this document is to explain the basic diagnostics to be carried out in order to deduce faults down to a specific unit within the system.

It is strongly recommended that you read this manual and familiarise yourself with its contents before commencing any procedures contained within this document.

2. Sign Test – Controller

2.1 Sign test instruction

This tests the hardware and (communications) wiring and will work irrespective of any settings or destination list configurations in the sign and in the controller. The controller sends a message via the communications network and activates the sign's internal test mode. This test can be used to determine the source of a problem, i.e. hardware, address settings or programming.

In test mode, a sequence of test patterns and software information is shown, as indicated below. There will be some variation in what is scrolled across the sign, depending on firmware, sign size etc., but the key areas will be the same.

Example: **OLED v1.15 (X1.15) #0 144x19 C=3D00 P=65/100**.

OLED v1.15 = the sign's base software type and version

(X1.15) = application software version (Super-X)

#0 = sign address

144x19 = sign size in LEDs (number of columns x number of rows)

(C=3D00) = for Hanover engineer

P= 65/100 = brightness of sign. 100/100 is max (100%) while 5/100 is min (5%).

2.2 Using the DG3 controller to run the sign's test mode

- Press F/E until LOCK CODE appears.
- Enter lock code (default is 0101) using ◀ and ▲ buttons.
- Press F/E – SHOW STATUS will appear.
- Press ▲ once to show SIGN TEST.
- Press F/E to show 'Testing' (test message can be viewed on signs).
- Press F/E to cancel when message viewed.

2.3 Using the EG3 controller to run the sign's test mode

- Press F until LOCK CODE appears.
- Enter lock code (default is 9876) using the alphanumeric buttons.
- Press ENT – SHOW STATUS will appear.
- Press ▲ once to show SIGN TEST.
- Press ENT to show 'Testing' (test message can be viewed on signs).
- Press ENT to cancel when message viewed.

2.4 Using the Deric+ and DLC200 controller to run the sign's test mode

- Press F/E until LOCK CODE appears.
- Enter lock code (default is 0101) using ◀ and ▲ buttons.
- Press F/E – SHOW STATUS will appear.
- Press ▲ once to show SIGN TEST.
- Press F/E to show 'Testing' (test message can be viewed on signs)
- Press F/E to cancel when message viewed.

2.5 Using the Eric++ controller to run the sign's test mode

- Press F key – sign will show LOCK CODE.
- Enter lock code (default is 9876 or 0101) using the keypad.
- Press Ent – SHOW STATUS will appear.
- Press ▲ once to show SIGN TEST.
- Press Ent to show 'Testing' (test message can be viewed on signs)
- Press Ent to cancel when message viewed.

Note: For a factory reset (default factory value is 9876) of the lock code for the Eric++ controller:

- switch off power

- hold both up and down arrow keys

- switch on power while maintaining up and down arrow keys pressed for at least 3 seconds.

3. Link Jumper E

3.1 How to activate the sign's test mode using the link jumpers

It is possible to force the sign into test mode by placing a link jumper on the processor board. Use this test when the controller is not able to trigger the test or when a controller is not present.

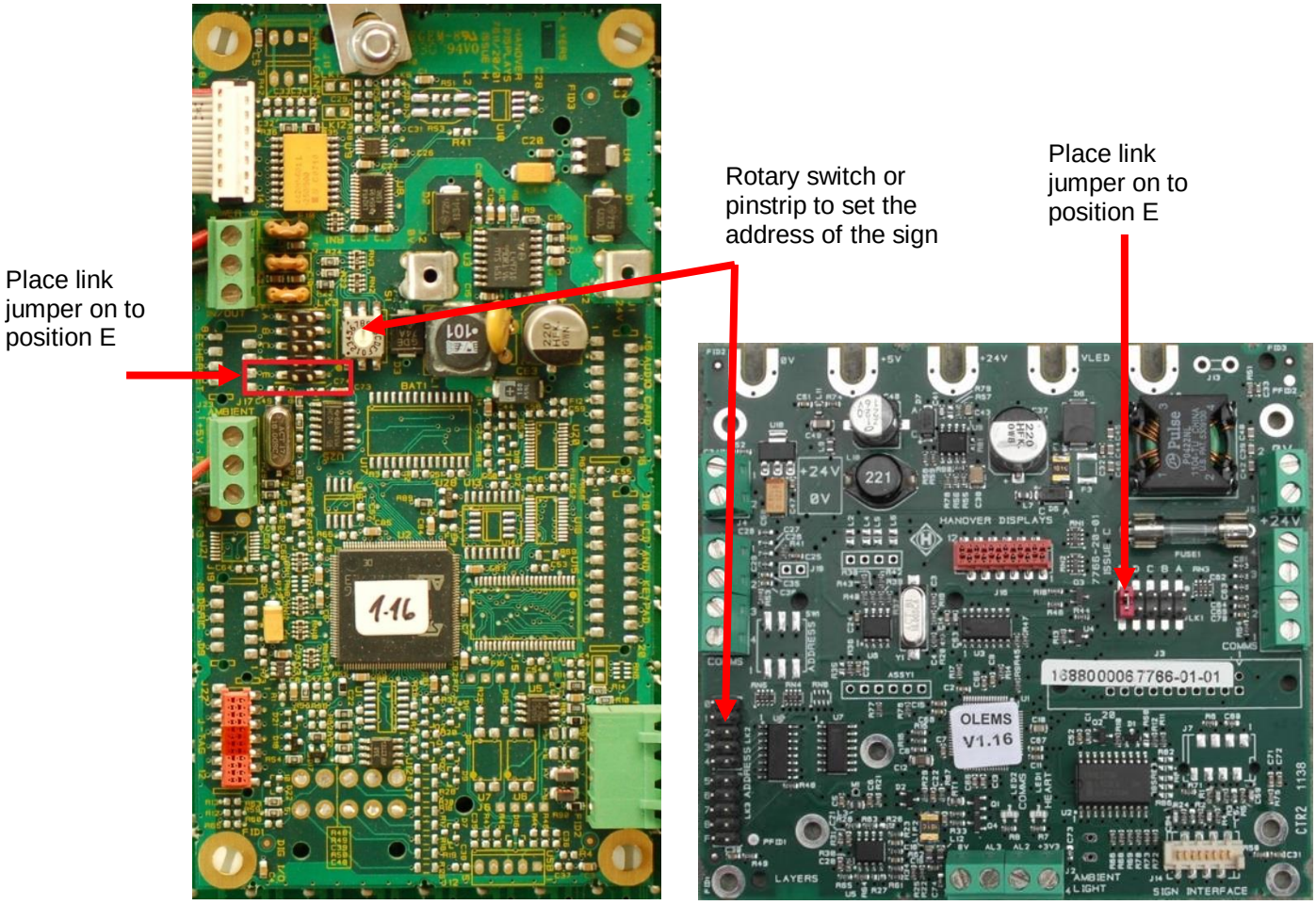
First, unplug the sign from the communications network. Refer to section 6.2 How to check communication signals and cable for how to do this.

Remove the rear access panel(s) to locate the sign processor. On larger models, depending on the variant, the processor is most likely to be in the centre or to the left as viewed from the rear.

On the processor (7611 for OL-series or 7766 for DD-series), there is a 5-position pinstrip marked A-E. To activate sign test mode, place a link jumper on to position E. This must be done whilst the sign is running or the presence of the jumper will be ignored.

Note: there may already be a jumper in place in another position; it is not necessary to remove it.

To stop test mode, remove the link jumper.



7611 sign processor for OL-series

7766 sign processor for DD-series

Note: Each processor has an address for the sign so that it can receive the correct data for its location. For the 7611, the address is set using a rotary switch on the board. The 7766 has a pinstrip where the address is set according to the position of a link jumper.

4. Status Options

This option provides access to information about the status and configuration of the controller and the signs connected to it.

'Status options' feature is available for all controllers but its access will vary according to the controller being used.

4.1 DG3 controller

The two ways to access this option are:

- either by holding down the F/E key for about 3 seconds. The HANCIS menu will be displayed first if connected. Then, press the up arrow key to access the status option.
- or by entering the lock code. 'Show status?' can be found from within the list and then selected using the F/E key. Use the up and down arrow keys to navigate between each one.

Note: If accessing the status options by holding down the F/E key, the status options screen will be displayed temporarily (only for a few seconds) and the DG3 will revert to its previous state. Whereas via the lock code, the status options screen will remain displayed until the user presses on the left arrow key or F/E key to quit this option.

The following table shows all functions available in the status options:

No.	Figure	Description
1	DERIC-G3 V1.2701 Ok Name 4 4 4 4 4 4 4 . - -	• **DERIC-G3**: software name • **V1.27.01**: software version number • **Ok**: indicates database loaded successfully (otherwise, error code shown) • **Name**: name set in profile of controller config in HELEN (optional) • **4 4 4 4 4 4 4 .**: status of individual signs[1] • **- -**: 2 external voltage signal inputs (**#** = active; **-** = inactive)

[1] This code monitors the status fed back from up to 8 passenger information signs that can be connected to the RS485 port. Each digit corresponds to one sign. The possible values and their meanings are:

.	No sign connected
0	Sign connected and working correctly
1	Message content error
2	Checksum error
3	Halogen bulb failure (applies to flip dot signs only but not to LED type signs)
4	No response from sign
5	Bad status reply
6	Communications error

Note: If the digit flashes between values 0 and 4, it means that two signs may have the same sign address.

No.	Figure	Description
2	9516( ) 8.0Mb RTC 07C809 00-02:45 25\04\2014 01:13	• **9516( )**: database file size in bytes (value in brackets no longer used) • **8.0Mb**: flash memory capacity (needs to accommodate both download file and operational database file) • **RTC**: Real Time Clock (optional) • **07C809**: database file checksum value • **00-02:45**: timer / clock showing length of time in use since last reboot (DD-HH:MM = days-hours:minutes) • **25\04\2014**: date (is displayed only if RTC is fitted and enabled) • **01:13**: time (is displayed only if RTC is fitted and enabled)
3	PF=0 (Name)	• **PF**: controller profile[2] • **PF=X**: where X indicates the value of the profile • **Name**: name set in profile of controller config in HELEN (optional)
4	1: L, 160 x 19 #0 2: L, 96 x 8 #1 3: L, 32 x 17 #2 4: L, 144 x 19 #3 5: L, 144 x 19 #4 (HANCIS) #5	• **1:, 2:, 3:, 4:, 5:, etc.:**: sign numbers (+1) as set by HELEN software[3] • **L**: indicates route number set to left of sign (R=right) • **(HANCIS)**: sign options • **160 x 19**, **96 x 8, 32 x 17**: sign sizes (LED columns x LED rows) • **#X**: X is the sign address as determined by its physical switch setting[4]

[2] This is a feature that makes it easy to manage a fleet of vehicles fitted with many different signs but all using the same destination list. Full details are given in HELEN sign-editing software - operating manual (ref. 540125).
[3] HELEN allocates numbers to each destination (and internal) sign configured by the software. By convention, these start at 0. However, within the controller, 0 is reserved for the driver's sign on the front of the controller itself so all these numbers are incremented by 1.
[4] There may be other signs with different switch settings included in the controller's configuration; in this example, these signs are not currently connected to the controller and are thus 'inactive'.

No.	Figure	Description
5	Network: ID 2 IP static 0.0.0.0 FTP 10.0.0.10	• **Network:** refers to the unit ID assigned by the user to the unit that is used when it connects to the FTP server. If for example, the ID is 2, it will navigate to the folder “2” on the FTP server and carry out relevant FTP tasks (upload a status file, download any pending updates etc.) • **IP:** static or DHCP followed by the IP address assigned to the unit. Static = fixed and DHCP = dynamically assigned IP address. If no DHCP server is present, it will show 0.0.0.0. “DHCP-“ will be displayed if the unit has not detected a DHCP server and “DHCP+” will be displayed if it has received its IP from a DHCP server. • **FTP:** displays the IP address of the FTP server the unit will try to connect to along with the username it will try to log in with.
6	MAC: 18:67:3F:00:04:07 4308833731384D336280FF37 Subnet 255.255.0.0	• **MAC**: displays the MAC address assigned to the unit by Hanover. For example: 18:67:3F:00:04:07. • **Series of numbers:** displays the unique ID assigned to the processor chip by the manufacturer. This is used to “tag” the Status files the unit sends back to the FTP server so it is capable of identifying the individual DG3s within the fleet if you change its network ID. • **Subnet**: is the assigned Subnet mask used for establishing the DG3’s connection to the FTP server.

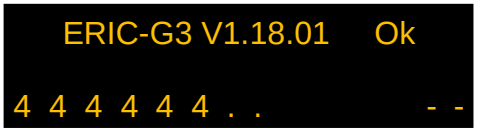
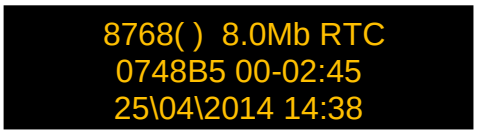
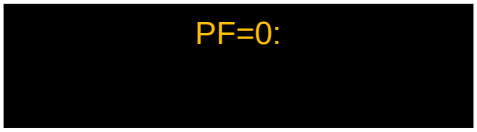
4.2 EG3 controller

The two ways to access this option are:

- either by holding down the Ent button for about 3 seconds. The HTC menu will be displayed first if connected. Then, press the up arrow key to access the status option.
- or by entering the lock code. 'Show status?' can be found from within the list and then selected using the Ent key. Use the up and down arrow keys to navigate between each one.

Note: If accessing the status options by holding down the Ent button, the status options screen will be displayed temporarily (only for a few seconds) and the EG3 will revert to its previous state. Whereas via the lock code, the status options screen will remain displayed until the user presses on the left arrow key or Ent key to quit this option.

The following table shows all functions available in the status options:

No.	Figure	Description
1		• **ERIC-G3**: software name • **V1.18.01**: software version number • **Ok**: indicates database loaded successfully (otherwise, error code shown) • **4 4 4 4 4 4 . .**: status of individual signs[5] • **- -**: 2 external voltage signal inputs (# = active; **-** = inactive)
2		• **8768( )**: database file size in bytes (value in brackets no longer used) • **8.0Mb**: flash memory capacity (needs to accommodate both download file and operational database file) • **RTC** : Real Time Clock (optional) • **0784B5**: database file checksum value • **00-02:45**: timer / clock showing length of time in use since last reboot (DD-HH:MM = days-hours:minutes) • **25\04\2014**: date (is displayed only if RTC is fitted and enabled) • **14:38**: time (is displayed only if RTC is fitted and enabled)
3		• **PF**: controller profile[6] • **PF=X**: where X indicates the value of the profile

[5] This code monitors the status fed back from up to 8 passenger information signs that can be connected to the RS485 port. Each digit corresponds to one sign. The possible values and their meanings are:

.	No sign connected
0	Sign connected and working correctly
1	Message content error
2	Checksum error
3	Halogen bulb failure (applies to flip dot signs only but not to LED type signs)
4	No response from sign
5	Bad status reply
6	Communications error

Note: If the digit flashes between values 0 and 4, it means that two signs may have the same sign address.

[6] This is a feature that makes it easy to manage a fleet of vehicles fitted with many different signs but all using the same destination list. Full details are given in the HELEN sign-editing software - operating manual (ref. 540125).

No.	Figure	Description
4	1: L, 160 x 19 #0 2: L, 96 x 8 #1 3: L, 32 x 17 #2 4: L, 144 x 19 #3 5: L, 144 x 19 #4 (HANCIS) #5	• **1:, 2:, 3:, 4:, 5:, etc.:**: sign numbers (+1) as set by HELEN software[7] • **L**: indicates route number set to left of sign (R=right) • **(HANCIS):** sign options • **160 x 19**, **96 x 8, 32 x 17**: sign sizes (LED columns x LED rows) • **#X**: X is the sign address as determined by its switch setting[8]
5	Network: ID9876 IP DHCP-0.0.0.0 FTP 62.7.92.72 EG3	• **Network**: refers to the customer reference assigned to the unit that is used when it connects to the FTP server. If for example, the ID is 9876, it will navigate to the 9876 folder on the FTP server and carry out relevant FTP tasks (upload a status file, download any pending updates etc.) • **IP:** static or DHCP followed by the IP address assigned to the unit. Static = fixed and DHCP = dynamically assigned IP address. If no DHCP server is present, it will show 0.0.0.0. "DHCP-" will be displayed if the unit has not detected a DHCP server and "DHCP+" will be displayed if it has received its IP from a DHCP server. • **FTP**: displays the IP address of the FTP server the unit will try to connect to along with the username it will try to log in with.
6	MAC:18:67:3F:00:04:07 31323531353047140031004 3 Subnet 255.255.0.0	• **MAC**: displays the MAC address assigned to the unit by Hanover. For example: 18:67:3F:00:04:07. • **Series of numbers:** displays the unique ID assigned to the processor chip by the manufacturer. This is used to "tag" the Status files the unit sends back to the FTP server so it is capable of identifying the individual EG3s within the fleet if you change its network ID. • **Subnet**: is the assigned Subnet mask used for establishing the EG3's connection to the FTP server.

4.3 ERIC++ controller

The two ways to access this option are:

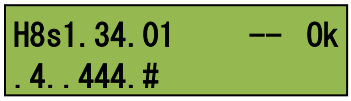
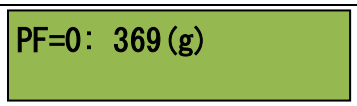
- either holding down the Ent key for about 3 seconds. The HTC menu will be displayed first if connected. Then, press the up arrow key to access the status option.
- or by entering the lock code. 'Show status?' can be found from within the list and then selected using the Ent key. Use the up and down arrow keys to navigate between each one.

[7] HELEN allocates numbers to each destination (and internal) sign configured by the software. By convention, these start at 0. However, within the controller, 0 is reserved for the driver's sign on the front of the controller itself so all these numbers are incremented by 1.

[8] There may be other signs with different switch settings included in the controller's configuration; in this example, these signs are not currently connected to the controller and are thus 'inactive'.

Note: If accessing the status options by holding down the Ent button, the status options screen will be displayed temporarily (only for a few seconds) and the ERIC++ will go back to its previous screen. Whereas via the lock code, the status options screen will remain displayed until the user presses on the Ent key to quit this option.

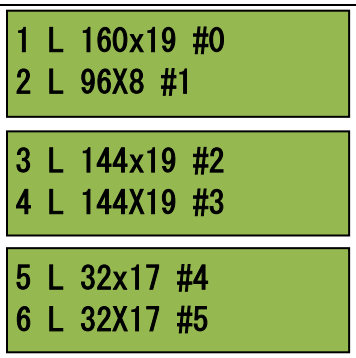
The following table shows all functions available in the status options:

No.	Figure	Description
1		• **H8s:** software name • **1.34.01**: software version number • **– –**: states of inputs I0 and I1 used with special feature such as battery guard, bus reversing • **Ok**: indicates database loaded successfully (otherwise, error code shown) • **.4 .. 4 4 4 .** : status of individual signs[9] • **#:** indicates bus stopping emergency feature activated
2		• **1087(g)**: database file size in bytes (file type)[10] • **2.0Mb**: flash memory capacity (needs to accommodate both download file and operational database file) • **00A5AE**: database file checksum value • **00-00:14**: timer / clock showing length of time in use since last reboot (DD-HH:MM = days-hours:minutes)
3		• **PF**: controller profile[11] • **PF=X**: where X indicates the value of the profile • **369(g)**: profile size in bytes (Gzip file)

[9] This code monitors the status fed back from up to 8 passenger information signs that can be connected to the RS485 port. Each digit corresponds to one sign. The possible values and their meanings are:

.	No sign connected
0	Sign connected and working correctly
1	Message content error
2	Checksum error
3	Halogen bulb failure (applies to flip dot signs but not to LED type signs)
4	No response from sign
5	Bad status reply
6	Communications error

[10] Type of file loaded: (g)=compressed, (p)=plain, (e)=firmware, ()=old style database.
[11] This is a feature that makes it easy to manage a fleet of vehicles fitted with many different signs but all using the same destination list. Full details are given in the HELEN sign-editing software - operating manual (ref. 540125).

No.	Figure	Description
4		• **1:, 2:, 3:, 4:, 5:, 6:**: sign numbers (+1) as set by HELEN software[12] • **L**: indicates route number set to left of sign (R=right) • **160 x 19**, **96 x 8, 144 x 19, 32 x 17**: sign sizes (LED columns x LED rows) • **#X**: X is the sign address as determined by its physical switch setting[13]

4.4 DERIC+ controller

The two ways to access this option are:

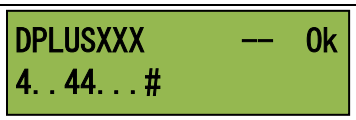
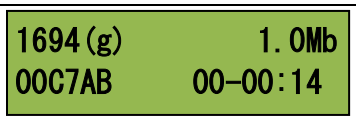
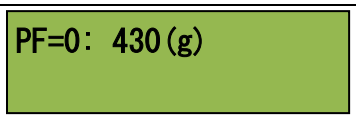
- either by holding down the F/E key for about 3 seconds
- or by entering the lock code. 'Show status?' can be found from within the list and then selected using the F/E key.

Use the up and left arrow keys to navigate between each one.

Note: If accessing the status options by holding down the F/E button, the status options screen will be displayed temporarily (only for a few seconds) and the DERIC+ will go back to its previous screen. Whereas via the lock code, the status options screen will remain displayed until the user presses on the F/E key to quit this option.

[12] HELEN allocates numbers to each destination (and internal) sign configured by the software. By convention, these start at 0. However, within the controller, 0 is reserved for the driver's sign on the front of the controller itself so all these numbers are incremented by 1.
[13] There may be other signs with different switch settings included in the controller's configuration; in this example, these signs are not currently connected to the controller and are thus 'inactive'.

The following table shows all functions available in the status options:

No.	Figure	Description
1		• **DPLUS**: software name • **XXX = 342** for standard software version number or **501** for Hancis/HTC connected software version number • **– –**: states of inputs I0 used with special feature such as battery guard • **Ok**: indicates database loaded successfully (otherwise, error code shown) • **4 .. 4 4 ...** : status of individual signs[14] • **#:** indicates bus stopping emergency feature activated
2		• **1694 (g)**: database file size in bytes (file type)[15] • **1.0Mb**: flash memory capacity (needs to accommodate both download file and operational database file) • **00C7AB**: database file checksum value • **00-00:14**: timer / clock showing length of time in use since last reboot (DD-HH:MM = days-hours:minutes)
3		• **PF**: controller profile[16] • **PF=X**: where X indicates the value of the profile • **430(g)**: profile size in bytes (Gzip file)

[14] This code monitors the status fed back from up to 8 passenger information signs that can be connected to the RS485 port. Each digit corresponds to one sign. The possible values and their meanings are:

.	No sign connected
0	Sign connected and working correctly
1	Message content error
2	Checksum error
3	Halogen bulb failure (applies to flip dot signs but not to LED type signs)
4	No response from sign
5	Bad status reply
6	Communications error

[15] Type of file loaded: (g)=compressed, (p)=plain, (d)=firmware, ()=old style database.
[16] This is a feature that makes it easy to manage a fleet of vehicles fitted with many different signs but all using the same destination list. Full details are given in the HELEN sign-editing software - operating manual (ref. 540125).

5. Top left LED lit

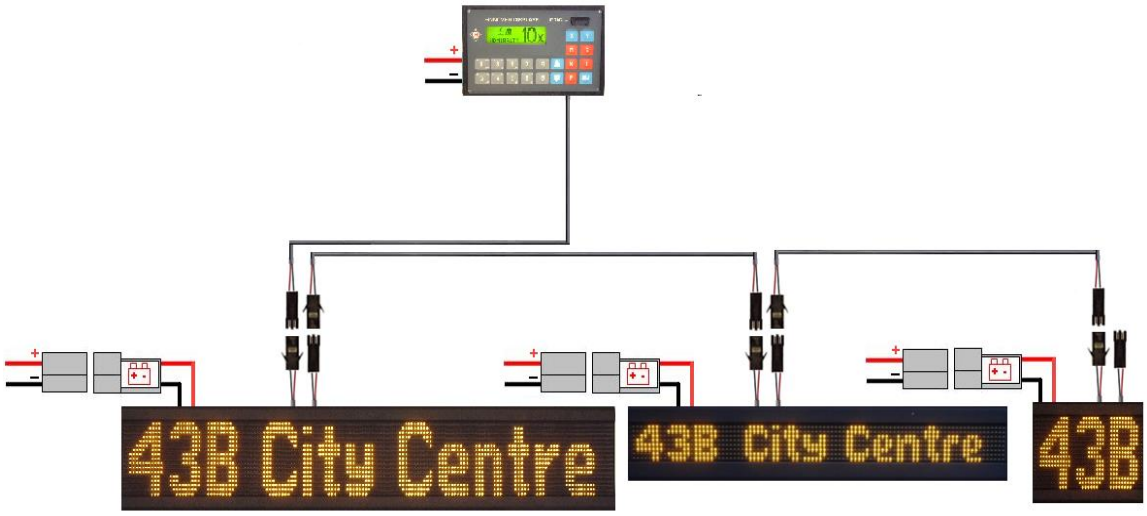
When the sign is first powered on, the top left LED comes on until it receives the first communications message from the controller. If then it does not go out, it may signify a problem with the controller or the communications network wiring.

On a DD-series (OLEMS) sign, there is an additional feature that checks the quality of the communications message:

- If the LED does not go out but flashes slowly (about once per second) it indicates that the sign has received communications messages, but none were addressed to it. This might indicate a problem with the destination list or a problem with the address setting.
- If the LED flashes quickly, it indicates that the sign has received a communications message but it is scrambled. This can indicate a network wiring fault such as RS485A and RS485B wires crossed or it might be because the correct baud rate has not been set.

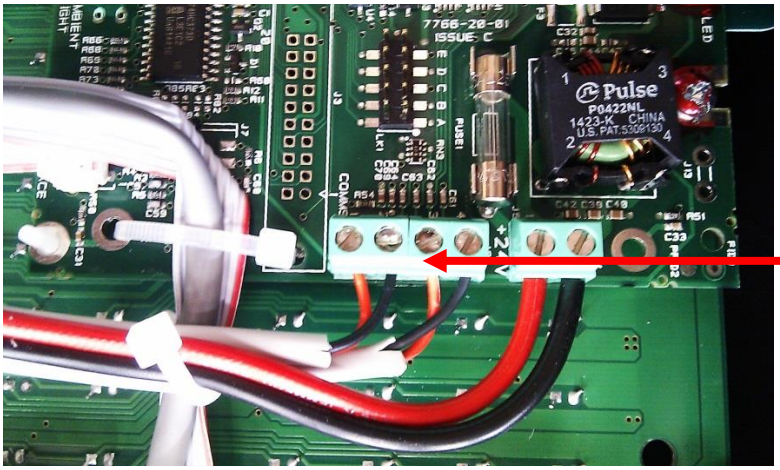
5.1 Checks

1. Incorrect list – check sign address and dimensions displayed in test message (refer to 2. Sign Test – Controller) against list loaded to the controller either in HELEN software or show status (refer to No. 4 in table of 4. Status Options).
2. If sign does not display test message, check communications cable wiring to affected sign.

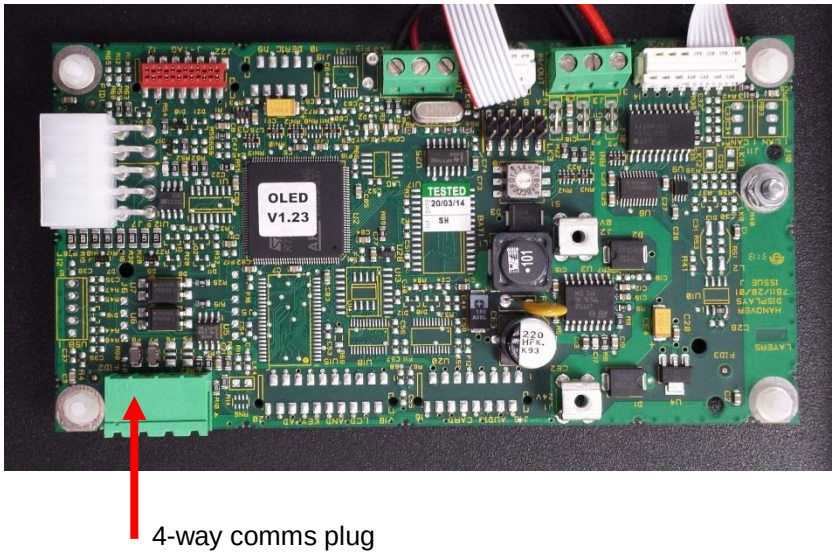


3. Check 4-way comms plug to processor within sign is connected and wire connections are OK.

- For the 7766 board:



- For the 7611 board:



6. Removing signs from communications

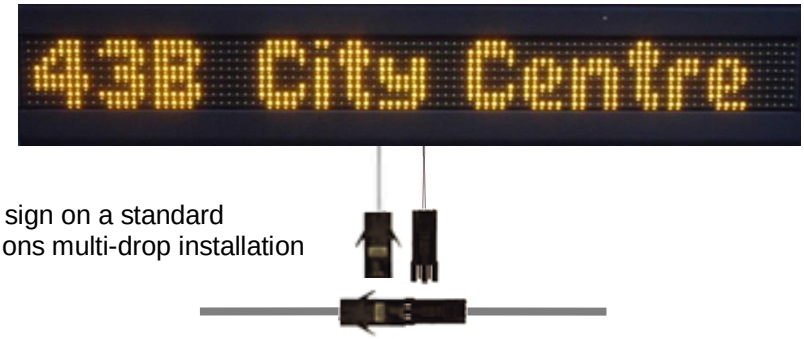
6.1 Communications system

The controller and signs on the vehicle are generally connected in series - typically, controller, front, side, rear. There are other possible variations, but the same rules apply for all installations. When power is applied, if a sign is working, the LED in the top left corner will light. The LED turns off once the sign receives a communications message.

6.2 How to check communication signals and cable

The communication cable consists of two conductors with a differential voltage between them; they are generally marked as red (A) and black (B). The data is sent from the controller to each sign which then makes use of it according to the address setting on the processor board. It is essential that the conductors are connected correctly, otherwise the message content will not be understood by the sign.

Because all the signs share the same communications network, it is possible for a sign to fail and corrupt the data so that other signs may also appear not to be working. To test for this kind of fault, bypass one of the signs as shown below. If all the others then start to work, the one that was bypassed is faulty. Repeat this process for each sign in the system until the problem has been located.



Bypassing a sign on a standard communications multi-drop installation

7. Processor LEDs

7.1 Sign processor LED indicators

Heartbeat (numbered LED1 or LED2)

1. 0.5 sec on and 0.5 sec off - normal operation
2. 4 secs on and 4 secs off - bootloader is present but no firmware is loaded.
3. Solid light and very quick blink every 4 seconds - firmware and bootloader are present but the processor is unable to sign-size the boards.
4. Off - bootloader is not present.

Communications (numbered LED2 or LED1)

1. Brief flash when the sign receives a valid communications message.
2. Solid light followed by a very quick blink every four seconds when firmware and bootloader are present but the processor is unable to sign-size the boards.
3. Long flash if the sign receives a message with bad contents.
4. Permanently on if the sign has not received a valid message from the controller within the previous 60 seconds.
5. Off when bootloader is not present.

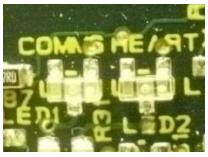
7.2 Processor LED diagnostics

During power-up and after a power cycle, the red LEDs on the processor board behave as follows:

1. Both will come on: at this point the processor is ‘sizing’, i.e. calculating the position and size of each sign board.
2. After the processor has checked the firmware database, if a valid combination of height x width is found (this takes about two seconds) then both LEDs will go out briefly and the heart will blink half-a-second off / half-a-second on.
3. If any other sequence than described is observed, then the sign has failed to size.

Power up, sign-sizing:
communications and heartbeat = ON

Sign-sizing complete:
communications and heartbeat = OFF



Sign receiving valid data:
communications = flashes briefly when communications received;
heartbeat = ON 0.5sec + OFF 0.5sec

8. Hanover Technical Support

8.1 List of information required

Please gather the following list of information before contacting Hanover Technical Support:

No	Information	Where it is found
1	Does the unit have any display?	
2	Are any of the signs in the system displaying the top left LED only?	Refer to 5. Top left LED lit
3	Product details: • Product no.: identifies the sign type. • Our O/N: number used to identify the order for the unit. Usually written IWOxxxxx.	Silver label on rear of casing: 

8.2 United Kingdom

Please do not hesitate to contact Hanover Technical Support located in Lewes, UK for any problem encountered or for any advice needed:

Contact	
Phone	+44 (0)1273 477528 Ext.615 or Option 2
Email	support@hanoverdisplays.com

8.3 United States of America

Please do not hesitate to contact Hanover Technical Support located in USA for any problem encountered or for any advice needed:

Contact	
Phone	+1 (773) 334 9934
Email	STL@hanoverdisplays.com