DALI help and troubleshooting

Contents

Introduction to DALI (*things you should know*)

What is DALI?

DALI: **D**igital **A**ddressable **L**ighting **I**nterface

DALI: communications protocol for lighting systems.
DALI-enabled devices send messages to each other along DALI cable. The DALI protocol is used for communicating between controls (e.g. switches, sliders, rotary controls, time clocks) and loads (e.g. LED drivers, dimmers, fluorescent ballasts).

DALI international standard: IEC 62386
Note: IEC 60929 annex E is the first version of the standard and will be withdrawn in June 2014.

What does the DALI message look like?

DALI is a digital protocol. Signal levels are defined as;

- **0 V (**±4.5 V) for "0" and **16 V (**±6.5 V) for "1".

- Ideally the measured voltage should be between 16 and 22.5 V DC.

- Maximum DALI current per system or subnet is 250 mA and load interface maximum current is 2 mA per unit.
  The network cable must be mains-rated, with 600 V isolation with a maximum drop of 2 volts along the cable (max 300 metres).

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Basic Rules for DALI and Helvar products & systems

There are a few basic rules to take into account when planning and wiring a DALI system.

Max. addresses per system (subnet)
63
It's officially 64, but you need to leave one free, to make system updates easier.

Polarity
DALI connections are not polarity sensitive.

Max. DALI current per system (subnet)
250 mA DALI supply.
The total current that is supplied by all sources of the control system must not be more than 250mA.

DALI wiring safety rating
DALI wiring and connections should be treated like Mains voltage wiring.
Though the signal is 16 volt the hardware is not SELV rated (Safety Extra Low Voltage).

Which wire for DALI cable?
You must use 2-conductor, mains rated wire.

Maximum cable length

DALI Cable length	Recommended minimum conductor size for DALI wiring
Less than 100 metres	0.5 mm^2
100 to 150 metres	0.75 mm^2
More than 150 metres	1.5 mm^2
More than 300 metres	**Not recommended**, avoid runs over 300 metres

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Troubleshooting: DALI check list

If you are having problems with (the first things to check if you are having problems)

- ✓ **Check number of addresses**: 63 or fewer

- ✓ **Check total current consumption** of all the devices connected is not more than 250 mA.

- ✓ **Check cable length**: total cable length should not be more than 300m.

- ✓ **Check DALI signal voltage**
  Use a suitable multimeter check the DALI signal voltage.
  Ideally the measured voltage should be between 16 V DC and 22.5 V DC with no more than a 2 V DC drop along the cable length.
  If you read less than 14 V DC, it is likely that you have, or will have, a problem with your DALI system.

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<u>**Quick fault diagnosis**</u>

If you have checked the DALI system (see: **TROUBLESHOOTING: DALI CHECK LIST**) and you still have a problem, it's time to use a DALI broadcast signal to help you isolate the problem.

TEST DALI SYSTEM BY SENDING A DALI BROADCAST COMMAND

A DALI broadcast command sends a signal all connected DALI load interfaces regardless of their address.

1.   PREPARE FOR DALI BROADCAST

   1a.   **Disconnect your DALI system** from any central controller (e.g. Helvar 905, 910 or 920 Router). This means you are checking the DALI system only.

   1b.   Ensure that you have **one DALI power supply connected** to the DALI system (e.g. Helvar 401 or 402).

   1c.   **Connect one Helvar control panel** to your DALI system (e.g. Rotary Module (*part number 100*), Single Slider Module (*part number 110*).

2.   SEND DALI BROADCAST COMMAND

When you have a simple system set up as above(steps 1-3), you can send a DALI broadcast command to every load interface unit in your system.
Sending DALI broadcast command sends one command (e.g. go to 'full' and go to 'off') to every load connected to your DALI system. Each load should respond to this command in the same way. These instructions assume you have chosen to use a single slider module (part number 110) to send your DALI broadcast command.

   2a.   **Send your DALI broadcast command.**
          Push your slider to the full position and every load should go to full.
          Push your slider to the off position and every load should go to off.

If your system or connected loads do not respond to the DALI broadcast command, see the next page.

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What to do if there is no response to DALI broadcast from system (connected loads)

If your system / connected loads do not respond correctly to your DALI broadcast command you can start to diagnose the problem from the observations you make.
Below you will find some tips to get you started. (*these are not 100% guaranteed solutions, they are meant as helpful hints*)

1. None of my loads responds

✓ Check the DALI signal by measuring between 16V DC and 22.5V DC on the DALI cable
✓ If lights are off check mains power is connected to the loads

2. Only some of my loads respond

✓ Check mains power is connected to the loads that are off
✓ Check the DALI signal with your multimeter at the terminals of the loads that are not working
✓ Check the lamp(s)

3. Only one load does not respond, everything else is OK

✓ Check mains power is connected to the load that is off
✓ Check the DALI signal with your multimeter at the terminal of the load that does not respond
✓ Check the lamp(s)

These tips are for basic fault finding covering the most common site issues. If you are in doubt and need further assistance, please contact your local Helvar representative.

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