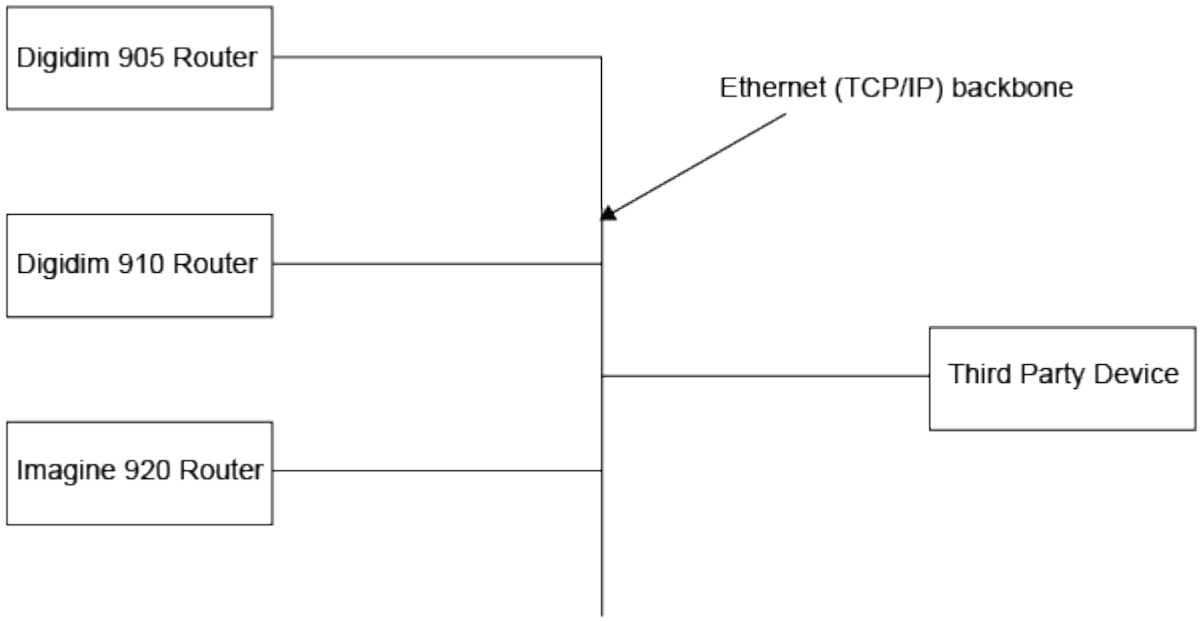
# HelvarNet Overview

Notes:

- The HelvarNet feature is aimed at software developers and advanced system integrators who are capable of programming their third party devices to communicate with a Helvar router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* (and therefore the whole Helvar lighting system *A network of Client PCs, Routers, Control Devices, Control Gear and lamps.* ), using the HelvarNet protocol, explained in this section of the Online Help.

HelvarNet is an Ethernet I/O protocol which allows third party devices (e.g. AV equipment) to query and control a 905/910/920 router system and perform some basic system configuration, over an Ethernet (*TCP Stands for Transmission Data Protocol. TCP is one of the core protocols of the Internet Protocol Suite. It was one of the two original components, with Internet Protocol (IP), of the suite, so that the entire suite is commonly referred to as TCP/IP. Whereas IP handles lower-level transmissions from computer to computer as a message makes its way across the Internet, TCP operates at a higher level, concerned only with the two end systems, for example, a Web browser and a Web server. In particular, TCP provides reliable, ordered delivery of a stream of bytes from a program on one computer to another program on another computer. (See also TCP/IP).*/IP) connection. It is a published standard which provides a set of rules for communicating with a Helvar lighting system.

The third party *device A physical item with which you can interact, either directly or via Designer.* may communicate with one or more routers in the system, provided it knows the *IP address Internet Protocol (IP) is a four-byte address that uniquely identifies the device to which it is assigned on the network. This address conforms to IPv4 standard. Each router broadcasts packets of information via IP. A router acts only upon instructions sent to its unique IP address.* of each router, in order to communicate with the lighting system.




## Protocols

The following TCP/IP protocols are supported by HelvarNet:

**TCP** connection created and accepted by router.

***UDP Stands for User Datagram Protocol. UDP is one of the core members of the Internet Protocol Suite, the set of network protocols used for the Internet. With UDP, computer applications can send messages, in this case referred to as datagrams, to other hosts on an Internet Protocol (IP) network, without requiring prior communications to set up special transmission channels or data paths.***
incoming and outgoing.

## What are the requirements?

- The interface provides you with a means of interacting with the lighting system, it is up to you to develop and program your third party device in order to achieve this communication.
- If you wish to send commands to the router system from the third party device, then the third party device must be able to instigate a TCP connection with a Helvar router or send UDP messages to a Helvar router (this is not required for the router system to control the third party device).
- To establish a TCP connection and therefore communicate with the router, the third party device is required to connect to listener port number **50000**.
- To send TCP messages from the router to the third party device, the router connects to a listener port provided in the third party device. It is recommended that this listener port is in the range of 49152 to 65535. *See Routing Entries and Schedules to learn more and Scene Triggered Ethernet I/O to find out how to do this.*
- When using the UDP protocol, the third party device is required to send a message to destination port number **50001** in the router.
- To send UDP messages from the router to the third party device, it is recommended that the destination port in the third party device is in the range of 49152 to 65535. *See Routing Entries and Schedules to learn more and Scene Triggered Ethernet I/O to find out how to do this.*

**Related Topics**

- Configuration Command Descriptions
- Configuration Command Table
- Command Format
- Control Command Descriptions
- Control Command Table
- Query Command and Reply Descriptions
- Query Reply Tables
- Query Command Table
- Messages
- Error / Diagnostic Messages
- Routing Entries

# Messages

## System Access and Message Routing

Messages from the third party *device A physical item with which you can interact, either directly or via Designer.* can be targeted at any *router In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* in the system.

If access has not been granted or has been blocked to a particular router, then communications can still be achieved to that router via any other router in the system, provided that you have the *IP address Internet Protocol (IP) is a four-byte address that uniquely identifies the device to which it is assigned on the network. This address conforms to IPv4 standard. Each router broadcasts packets of information via IP. A router acts only upon instructions sent to its unique IP address.* of another router and the third party device is allowed access to it.

If a query message needs to be sent to a router for which access has not been granted, then the query message can be sent to any of the alternative routers, following this the response to the query - the query reply message - will be returned by the router to which the query was originally sent.

## Message Format

Any message sent to, or received from, a router can be in either ASCII or raw binary form (see Command Format for more information).

Messages must not exceed the maximum length of 1500 bytes.

The format of the data contained within messages is defined by the protocol.

A query reply message from the router will be in the same format as the query command message sent i.e. if a query message is sent in ASCII form then the reply will also be in ASCII.

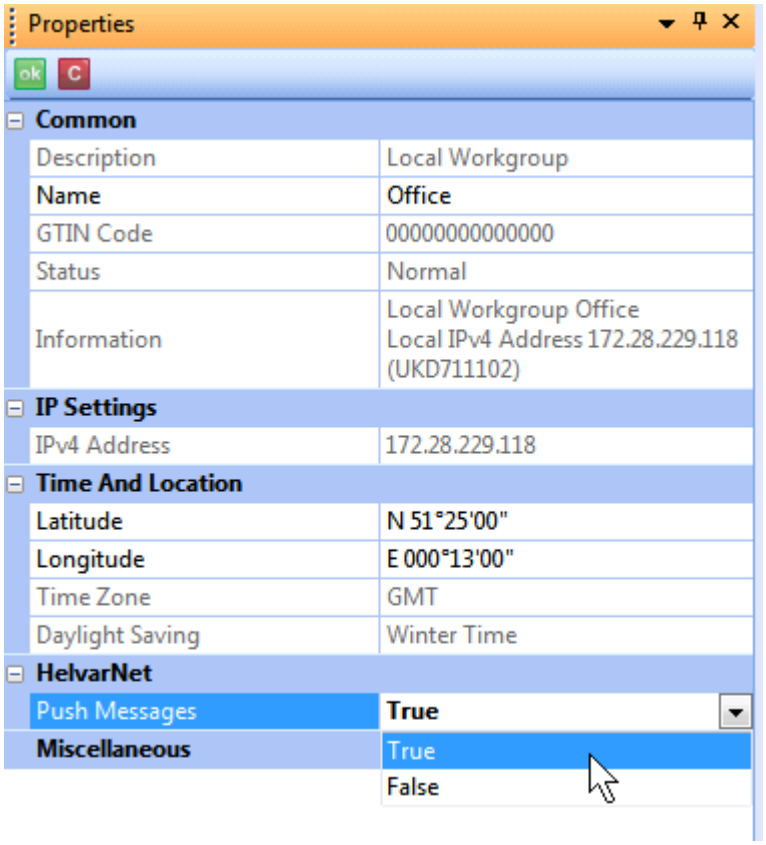
## Push Messages

Activate this option to enable routers to transmit internally generated messages to external HelvarNet clients.

To activate Push Messages:

1. In the Device Tree select the root node.
2. In the **HelvarNet** section of the Properties window (see screenshot below), set ‘Push Messages’ to True.

*Note: If new routers are introduced into the system then this procedure will need to be repeated*

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## Related Topics

- Configuration Command Descriptions
- Configuration Command Table
- Command Format
- Control Command Descriptions
- Control Command Table
- Query Command and Reply Descriptions
- Query Reply Tables
- Query Commands Table
- HelvarNet Overview
- Error / Diagnostic Messages
- Routing Entries

# Command Table

Commands can be sent in either ASCII (text) or raw format.

In ASCII format, the commands are split into parameters and in raw format the commands are split into binary Words which contain the parameters.

Each command contains:

- a command number.
- parameters that address devices or lighting operations.
- parameters that are required to accompany the commands.

Note:

- When sending raw commands, certain command Words have been reserved for future use. These should always be given the value of 0 when creating commands.
- When you send a command, if you have entered an invalid parameter or it has been sent to a device *A physical item with which you can interact, either directly or via Designer.*, router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* or cluster that does not exist, then you will receive an error message describing what is wrong with the command. *See Error / Diagnostic Messages*.

## ASCII Format

The ASCII format requires that certain rules concerning special characters, parameter identifiers, and delimiters be adhered to. These rules are as follows:

1. The ASCII string must begin with the command character '>' and end with the Terminator character '#'.
2. Replies to queries begin with the character '?' and the data concerning a query's response is separated from the query string using the character '='. Similarly, the whole query response string is terminated with the character '#' that signals the end of the reply, or '$' that signals the end of a partial response.
   For example, a response that contains more data than the maximum message size would be split into 2 responses. The first partial response would be terminated by '$', and the second partial response would be terminated by '#'.
3. Error / Diagnostic messages begin with the character '!' and, again, end in '#'.
4. Unless they are optional, all of the parameters required for the command must be included; otherwise the message is rejected and discarded.
5. The ASCII parameters are not required to be ordered.
6. The parameter identifiers are to be included as shown in the following table, i.e. all alphabetic identifiers should be in upper case.

| Description | Character | Optional | Hex | Character Type |
|---|---|---|---|---|
| Command | > | No | 0x3E | Message Type |
| Internal Command | < | No | 0x3C | Message Type |

| | | | | |
|---|---|---|---|---|
| Reply | ? | No | 0x3F | Message Type |
| Error / Diagnostic | ! | No | 0x21 | Message Type |
| | | | | |
| Terminator | # | No | 0x23 | Special |
| Partial reply terminator | $ | No | 0x24 | Special |
| Answer | = | No | 0x3D | Special |
| | | | | |
| Delimiter | , | No | 0x2C | Delimiter |
| Parameter ID Delimiter | : | No | 0x3A | Delimiter |
| Address Delimiter | . | No | 0x2E | Delimiter |
| | | | | |
| Sequence Number | Q | For internal commands only | 0x51 | Parameter ID |
| HelvarNet *An Ethernet I/O protocol which allows third party devices (e.g. AV equipment) to query and control a 910/920 router system and perform some basic system configuration, over an Ethernet (TCP/IP) connection.* Version | V | Version 1 only (assumes version 1) | 0x56 | Parameter ID |
| Command | C | No | 0x43 | Parameter ID |
| Acknowledgment | A | Yes (assumes a value of 0) | 0x41 | Parameter ID |
| Address | @ | No | 0x40 | Parameter ID |
| Group | G | Yes (assumes a value of 1) | 0x47 | Parameter ID |
| Scene *Collection of lighting levels for each channel* | S | Yes (assumes a | 0x53 | Parameter ID |

| | | | | |
|---|---|---|---|---|
| *assigned to the same group as the scene.* | | value of 1) | | |
| Block | B | Yes (assumes a value of 1) | 0x42 | Parameter ID |
| Fade Time | F | Yes (assumes 700ms) | 0x46 | Parameter ID |
| Level | L | No | 0x4C | Parameter ID |
| Proportion | P | No | 0x50 | Parameter ID |
| Display Screen | D | No | 0x44 | Parameter ID |
| Time | T | No | 0x54 | Parameter ID |
| Latitude *An imaginary line that extends horizontally around the Earth. Each line is referred to by the angle between it and the line at 0 degrees latitude (known as the Equator). Each line is therefore known as an angle of latitude.* | N | No | 0x4E | Parameter ID |
| Longitude *An imaginary line that extends from the North Pole to the South Pole of Earth. Each line is referred to by the angle between it and the line at 0 degrees longitude (known as the Greenwich Meridian). Each line is therefore known as an angle of longitude.* | E | No | 0x45 | Parameter ID |
| Time Zone Difference | Z | No | 0x5A | Parameter ID |

| | | | | |
|---|---|---|---|---|
| Daylight Saving Time (DST) | Y | No | 0x59 | Parameter ID |
| Constant Light Scene | K | Yes (assumes false) | 0x4B | Parameter ID |
| Force Store Scene | O | Yes (assumes false) | 0x4F | Parameter ID |

For example, in the command Recall Group 1234, Block 5, Scene 6, Fade Time 32 s, the string is sent as follows, including the delimiters and the start character '>' and stop character '#':

```
>V:1,C:11,G:1234,B:5,S:6,F:3200#
```

Note:

This ASCII representation for the above scene recall takes one byte per ASCII character, resulting in 26 bytes being transmitted.

## Raw Format

1. Command data is transmitted using the network byte order (big-endian).
2. All commands must be ten Words in length (each Word being a 32 bit / 4 Byte value). Words five & six are reserved for future expansion to the addressing capabilities, and Words nine and ten are reserved to accommodate any changes or future requirements in the parameters.

Note:

All ten Words must be sent, including all reserved Words.

For example, the command (Recall Group 1234, Block 5, Scene 6, Fade Time 32 s) is transmitted as follows (note that the trailing zeros are included and mandatory):

```
0x0001000B  0x000004D2  0x00000000  0x00050006  0x00000000  0x00000000
 0x00000000  0x00000C80  0x00000000  0x00000000
```

Note:

- In the first 32 bit Word, the message type (see below), version number (1) and command number must be included.

### Raw Message Types, Versions and Command Numbers

The raw message types are as follows:

0 = Command

1 = Reply

2 = Error / Diagnostic

The message type number is the included as the first byte of the 32 bit Word of the command. E.g. If you send a Query Clusters command, the first Word of the reply will be:

0x0**1**010065

(**1** denoting that the message is a reply)

| | | | |
|---|---|---|---|
| 31.....24 | 23.....16 | 15.....8 | 7.....0 |

| Message Type [31:24] | Ack [23] | Version [22:16] | Command Number [15:0] | |
|---|---|---|---|---|
| Byte 3 | Byte 2 | | Byte 1 | Byte 0 |

## Data Word Format (big-endian)

| WORD - 32 bits / 4 bytes | | | |
|---|---|---|---|
| Byte 3 (MSB) | Byte 2 | Byte 1 | Byte 0 |
| 31.....24 | 23.....16 | 15.....8 | 7.....0 |

**Related Topics**

- HelvarNet Overview
- Configuration Command Descriptions
- Configuration Command Table
- Control Command Descriptions
- Control Command Table
- Query Command and Reply Descriptions
- Query Reply Table
- Query Command Table
- Messages
- Error / Diagnostic Messages
- Routing Entries

# Control Commands

Notes:

- See Control Command Table for information on control command formats.
- Control commands can only be sent to control gear *For example, dimmers, relay units, ballasts etc. Receives messages from control devices, via the router, and performs the relevant action e.g. sets the lighting (lamps) it controls to the relevant level. Some control may be possible at the device itself. Also known as LIU or Load, see entries for both.* and DMX *Stands for Digital Multiplex. A type of subnet, used mainly for stage lighting and effects control.* 'Out' devices.
- When you send a command, if you have entered an invalid parameter or it has been sent to a device *A physical item with which you can interact, either directly or via Designer.*, router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* or cluster that does not exist, then you will receive an error message describing what is wrong with the command. *See Error / Diagnostic Messages*.

## Scene and Level Control Commands

*See Scenes topic for information about scenes.*

### 11 - Recall Scene (Group)

Send a *scene Collection of lighting levels for each channel assigned to the same group as the scene.* recall across a group.

Note:

- To call a constant light scene, use the Constant Light flag (with a parameter value of 1).

#### Command

Command (11), Group (1..16383), Block (1..8), Scene (1..16), Constant Light (1=ON, 0=OFF), Fade Time (0..6553.5s)

#### ASCII Example

To recall constant light scene 5 in scene block 2, across group 17, with a fade time of 90 seconds:

>V:1,C:11,G:17,K:1,B:2,S:5,F:9000#

#### Raw Example

To recall constant light scene 5 in scene block 2, across group 17, with a fade time of 90 seconds:

0x0001000B 0x00000011 0x00000000 0x10020005 0x00000000 0x00000000 0x00000000 0x00002328 0x00000000 0x00000000

### 12 - Recall Scene (Device)

Send a scene recall to a device .

Note:

- This command should not be sent to any device other than a load *For example, dimmers,*

*relay units, ballasts etc. Receives messages from control devices and performs the relevant action e.g. sets the lighting it controls to the relevant level. Some control may be possible at the device itself. Also known as Control Gear or LIU, see entries for both.*
(control gear), otherwise you will receive a diagnostic response if one was requested.

### Command

Command (12), Cluster (1..253), Router (1..254), *Subnet A subnet is a part of a Router, and there are two or more Subnets on each Router. It allows the flow of network traffic between hosts to be segregated, based on network configuration. By organising hosts into logical groups and joining them, subnetting, network security and performance can be improved.* (1..4), Device (1..255), Block (1..8), Scene (1..16), Fade Time (0..6553.5s)

### ASCII Example

To recall scene 4 in scene block 7, in a device at address 1.2.3.4, with a fade time of 1 second:

>V:1,C:12,B:7,S:4,F:100,@1.2.3.4#

### Raw Example

To recall scene 4 in scene block 7, in a device at address 1.2.3.4, with a fade time of 1 second:

0x0001000C 0x00010002 0x00030004 0x00070004 0x00000000 0x00000000 0x00000000 0x00000064 0x00000000 0x00000000

### 13 - Direct Level (Group)

Change the output level of all channels in a group.

### Command

Command (13), Group (1..16383), Level (0..100), Fade Time (0..6553.5s)

### ASCII Example

To change the output level to 60% across group 17, with a fade time of 90 seconds:

>V:1,C:13,G:17,L:60,F:9000#

### Raw Example

To change the output level to 60% across group 17, with a fade time of 90 seconds:

0x0001000D 0x00000011 0x00000000 0x00000000 0x00000000 0x00000000 0x0000003C 0x00002328 0x00000000 0x00000000

### 14 - Direct Level (Device)

Change the level of a load .

### Command

Command (14), Cluster (1..253) / Router (1..254), Subnet (1..4) / Device (1..255), Level (0..100), Fade Time (0..6553.5s)

### ASCII Example

To change the output level to 60% in a device at address 1.2.3.4, with a fade time of 90 seconds:

>V:1,C:14,L:60,F:9000,@1.2.3.4#

### Raw Example

To change the output level to 60% in a device at address 1.2.3.4, with a fade time of 90 seconds:

0x0001000E 0x00010002 0x00030004 0x00000000 0x00000000 0x00000000 0x0000003C 0x00002328 0x00000000 0x00000000

## Proportion Control Commands

When sending a 'Direct Proportion' value, this value relates to a proportion of the difference between the last recalled scene level or direct level and the output limits of the device.

When sending a positive value, this is a proportion of the difference of said level and 100% level. For example, if the last recalled scene level or direct level is 44% and you send a 'Direct Proportion at 50%' command, then the level rises from 44% to 72% (100 - 44 = 56 x 50% = 28 + 44 = 72).

When sending a negative proportion value, this is a proportion of the difference of the last recalled scene or direct level and 0%, which so happens to be a proportion of the level itself. For example, if the level is at 44% and you send a command to perform the 'Direct Proportion' function at -50%, then the level decreases to 22% (i.e. 50% of 44%).

Notes:

- The range for the 'Direct Proportion' and 'Modify Proportion' functions is -100% to 100%.
- Any succeeding 'Direct Proportion' commands will also use the last recalled scene or direct level as a base mark.

When sending a 'Modify Proportion' value, the same formula applies, only you are changing the currently applied 'Direct Proportion' value.

Take the example above resulting in a 'Direct Proportion' level of 72%. If you send a 'Modify Proportion at 5%' command, then the level rises from 72% to approx. 75% (100 - 44 = 56 x 55% = 30.8 + 44 = 74.8).

When sending a negative value, the formula subtracts that value from the 'Direct Proportion' level e.g. Still using the same example, if you send 'Modify Proportion at -5%' command, then the level decreases from 72% to approx. 69% (100 - 44 = 56 x 45% = 25.2 + 44 = 69.2).

### 15 - Direct Proportion (Group)

Send a 'Direct Proportion' message across a group (+/-100%).

#### Command

Command (15), Group (1..16383), Proportion (-100..100), Fade Time (0..6553.5s)

#### ASCII Example

To send a direct proportion of 72% across group 17 (with a fade time of 90 seconds):

>V:1,C:15,P:72,G:17,F:9000#

#### Raw Example

To send a direct proportion of 72% across group 17 (with a fade time of 90 seconds):

0x0001000F 0x00000011 0x00000000 0x00000000 0x00000000 0x00000000 0x00000048 0x00002328 0x00000000 0x00000000

### 16 - Direct Proportion (Device)

Send a 'Direct Proportion' message to a load (+/-100%).

#### Command

Command (16), Cluster (1..253) / Router (1..254), Subnet (1..4), Device (1..255), Proportion (-100..100), Fade Time (0..6553.5s)

#### ASCII Example

To send a direct proportion of 72% in a device at address 1.2.3.4 (with a fade time of 90 seconds):

>V:1,C:16,P:72,F:9000,@1.2.3.4#

#### Raw Example

To send a direct proportion of 72% in a device at address 1.2.3.4 (with a fade time of 90 seconds):

0x00010010 0x00010002 0x00030004 0x00000000 0x00000000 0x00000000 0x00000048 0x00002328 0x00000000 0x00000000

### 17 - Modify Proportion (Group)

Modify a 'Direct Proportion' level sent to a group (+/-100%).

#### Command

Command (17), Group (1..16383), Proportion Change (-100..100), Fade Time (0..6553.5s)

#### ASCII Example

To send a modify proportion of 5% across group 17, with a fade time of 90 seconds:

>V:1,C:17,P:5,G:17,F:9000#

#### Raw Example

To send a modify proportion of 5% across group 17, with a fade time of 90 seconds:

0x00010011 0x00000011 0x00000000 0x00000000 0x00000000 0x00000000 0x00000005 0x00002328 0x00000000 0x00000000

### 18 - Modify Proportion (Device)

Modify a 'Direct Proportion' level sent to a load (+/-100%).

#### Command

Command (18), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Proportion Change (-100..100), Fade Time (0..6553.5s)

#### ASCII Example

To send a modify proportion of 5% in a device at address 1.2.3.4, with a fade time of 90 seconds:

>V:1,C:18,P:5,F:9000,@1.2.3.4#

#### Raw Example

To send a modify proportion of 5% in a device at address 1.2.3.4, with a fade time of 90 seconds:

0x00010012 0x00010002 0x00030004 0x00000000 0x00000000 0x00000000 0x00000005 0x00002328 0x00000000 0x00000000

## Emergency Test Control Commands

Emergency Test commands should only be sent to *DALI Stands for Digital Addressable Lighting Interface. Standardised digital protocol for lighting control, allowing communication between control devices and LIUs (control gear).* emergency lighting ballasts, otherwise the emergency test will not be performed. *See DALI Emergency Lighting for more information on emergency lighting and how to test it.*

Note:

- Starting or stopping an Emergency Test will cause the corresponding 'Test Done' flag to be cleared.

### 19 - Emergency Function Test (Group)

Request an Emergency Function Test across a group.

Note:

- This command has no effect if sent to a group containing non-emergency devices.

#### Command

Command (19), Group (1..16383)

#### ASCII Example

To request an Emergency Function Test across group 56:

>V:1,C:19,G:56#

#### Raw Example

To request an Emergency Function Test across group 56:

0x00010013 0x00000038 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

### 20 - Emergency Function Test (Device)

Request an Emergency Function Test to an emergency lighting ballast.

Note:

- This command has no effect if sent to a non-emergency device.

#### Command

Command (20), Cluster (1..253) / Router (1..254), Subnet (1..4) / Device (1..255)

#### ASCII Example

To request an Emergency Function Test to an emergency lighting ballast at address 8.67.2.37:

>V:1,C:20,@8.67.2.37#

#### Raw Example

To request an Emergency Function Test to an emergency lighting ballast at address 8.67.2.37:

0x00010014 0x00080043 0x00020025 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

### 21 - Emergency Duration Test (Group)

Request an Emergency Duration Test across a group.

Note:

- This command has no effect if sent to a group containing non-emergency devices.

#### Command

Command (21), Group (1..16383)

#### ASCII Example

To request an Emergency Duration Test across group 56:

>V:1,C:21,G:56#

### Raw Example

To request an Emergency Duration Test across group 56:

0x00010015 0x00000038 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

### 22 - Emergency Duration Test (Device)

Request an Emergency Duration Test to an emergency lighting ballast.

Note:

- This command has no effect if sent to a non-emergency device.

### Command

Command (22), Cluster (1..253) / Router (1..254), Subnet (1..4) / Device (1..255)

### ASCII Example

To request an Emergency Duration Test to an emergency lighting ballast at address 8.67.2.37:

>V:1,C:22,@8.67.2.37#

### Raw Example

To request an Emergency Duration Test to an emergency lighting ballast at address 8.67.2.37:

0x00010016 0x00080043 0x00020025 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

### 23 - Stop Emergency Tests (Group)

Stop all Emergency Tests across a group.

Note:

- This command has no effect if sent to a group containing non-emergency devices.

### Command

Command (23), Group (1..16383)

### ASCII Example

To stop all Emergency Tests across group 56:

>V:1,C:23,G:56#

### Raw Example

To stop all Emergency Tests across group 56:

0x00010017 0x00000038 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

### 24 - Stop Emergency Tests (Device)

Stop any Emergency Test running in an emergency ballast.

Note:

- This command has no effect if sent to a non-emergency device.

### Command

Command (24), Cluster (1..253) / Router (1..254), Subnet (1..4) / Device (1..255)

### ASCII Example

To stop any Emergency Test to an emergency lighting ballast at address 8.67.2.37:

>V:1,C:24,@8.67.2.37#

### Raw Example

To stop any Emergency Test to an emergency lighting ballast at address 8.67.2.37:

0x00010018 0x00080043 0x00020025 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

## Related Topics

- Control Command Table
- Command Format
- HelvarNet Overview
- Configuration Command Descriptions
- Configuration Command Table
- Query Command and Reply Descriptions
- Query Reply Tables
- Query Command Table
- Routing Entries
- Error / Diagnostic Messages
- Messages
- DALI Emergency Lighting
- Scenes

Notes:

- See Word / Parameter Formats below the following tables for guidance on Words in raw format and parameters in ASCII format.
- With regards to Direct Level commands, if you enter a negative value, then the output level will be 0; if you enter a value greater than 100, then the level will be 100.
- When you send a command, if you have entered an invalid parameter or it has been sent to a device *A physical item with which you can interact, either directly or via Designer.*, router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* or cluster that does not exist, then you will receive an error message describing what is wrong with the command. *See Error / Diagnostic Messages*.

## ASCII Format

Note:

- In an ASCII string, the parameters are not required to be in the order shown below.

| **Name** | **Parameters** | | | | |
|---|---|---|---|---|---|
| Recall Scene *Collection of lighting levels for each channel assigned to the same group as the scene.* (Group) | Command Number 11 | Group 1..16383 | CL 1 or 0<br>Block 1..8<br>Scene 1..16 | Fade time 0..6553.5s | |
| Recall Scene ( Device ) | Command Number 12 | Cluster 1..253<br>Router 1..254 | Subnet 1..4<br>Device 1..255 | Block 1..8<br>Scene 1..16 | Fade time 0..655 |
| Direct Level (Group) | Command Number 13 | Group 1..16383 | Level<br>0 ... 100% | Fade time 0..6553.5s | |
| Direct Level (Device) | Command Number 14 | Cluster 1..253<br>Router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of* | Subnet *A subnet is a part of a Router, and there are two or more Subnets on each Router. It allows the flow of network traffic between hosts to be segregated, based on network configuration. By organising hosts into logical groups and joining them,* | Level 0..100% | Fade time 0..655 |

| | | | | | |
|---|---|---|---|---|---|
| | | *routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* 1..254 | *subnetting, network security and performance can be improved.* 1..4 Device 1..255 | | |
| Direct Proportion (Group) | Command Number 15 | Group 1..16383 | | Proportion -100..100% | Fade time 0..655 |
| Direct Proportion (Device) | Command Number 16 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | Proportion -100..100% | Fade time 0..655 |
| Modify Proportion (Group) | Command Number 17 | Group 1..16383 | | Proportion Change -100..100% | Fade time 0..655 |
| Modify Proportion (Device) | Command Number 18 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | Proportion Change -100..100% | Fade time 0..655 |
| Emergency Function Test (Group) | Command Number 19 | Group 1..16383 | | | |
| Emergency Function Test (Device) | Command Number 20 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | | |
| Emergency Duration Test (Group) | Command Number 21 | Group 1..16383 | | | |
| Emergency Duration Test (Device) | Command Number 22 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | | |
| Stop Emergency Tests (Group) | Command Number 23 | Group 1..16383 | | | |
| Stop Emergency Tests (Device) | Command Number 24 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | | |

## Raw Format

| Name | Word1 (32 bit) Command Number | Word 2 (32 bit) | Word 3 (32 bit) | Word 4 (32 bit) | Word 5 (32 bit) | Word 6 (32 bit) | Word 7 (32 bit) | Word 8 (32 bit) | Word 9 (32 bit) |
|---|---|---|---|---|---|---|---|---|---|
| Recall Scene *Collection of lighting levels for each channel assigned to the same group as the scene.* (Group) | 11 | Group 1..16383 | 0 | CL (MSBit) 1 or 0 Block 1..8 Scene 1..16 | 0 | 0 | 0 | Fade time 0..6553.5s | 0 |
| Recall Scene ( Device ) | 12 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | Block 1..8 Scene 1..16 | 0 | 0 | 0 | Fade time 0..6553.5s | 0 |
| Direct Level (Group) | 13 | Group 1..16383 | 0 | 0 | 0 | 0 | Level 0..100% | Fade time 0..6553.5s | 0 |
| Direct Level (Device) | 14 | Cluster 1..253 Router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more* | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | Level 0..100% | Fade time 0..6553.5s | 0 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | *Subnets.* 1..254 | | | | | | | |
| Direct Proportion (Group) | 15 | Group 1..16383 | 0 | 0 | 0 | 0 | Proportion - 100..100% | Fade time 0..6553.5s | 0 |
| Direct Proportion (Device) | 16 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | Proportion - 100..100% | Fade time 0..6553.5s | 0 |
| Modify Proportion (Group) | 17 | Group 1..16383 | 0 | 0 | 0 | 0 | Proportion Change - 100..100% | Fade time 0..6553.5s | 0 |
| Modify Proportion (Device) | 18 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | Proportion Change - 100..100% | Fade time 0..6553.5s | 0 |
| Emergency Function Test (Group) | 19 | Group 1..16383 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Emergency Function Test (Device) | 20 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 |
| Emergency Duration Test (Group) | 21 | Group 1..16383 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Emergency Duration Test (Device) | 22 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 |
| Stop Emergency Tests (Group) | 23 | Group 1..16383 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Stop Emergency Tests (Device) | 24 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 |

## Word / Parameter Formats

### Command Number

### Raw Format

| 31.....24 | 23.....16 | 15.....8 | 7.....0 |
|---|---|---|---|
| **Message Type** | **Ack[23],** | 0 0 0 0 0 0 0 0 | **Command** |

| [31:24] | HelvarNet Version [22:16] | | Number [7:0] |
|---|---|---|---|
| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
| | | | |

### ASCII Format

Command Number = 11..25 (in control commands' case)

### Group

### Raw Format

| 31.....24 | 23.....16 | 15.....8 | 7.....0 |
|---|---|---|---|
| 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 | 0 | **Group [14:0]** |
| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
| | | | |

### ASCII Format

Group = 1..16383

### Cluster / Router

### Raw Format

| 31.....24 | 23.....16 | 15.....8 | 7.....0 |
|---|---|---|---|
| 0 0 0 0 0 0 0 0 | **Cluster [23:16]** | 0 0 0 0 0 0 0 0 | **Router [7:0]** |
| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
| | | | |

### ASCII Format

Cluster = 1..253, Router = 1..254

### Subnet / Device

### Raw Format

| 31.....24 | 23.....16 | | 15.....8 | 7.....0 |
|---|---|---|---|---|
| 0 0 0 0 0 0 0 0 | 0 0 0 0 0 | **Subnet [18:16]** | 0 0 0 0 0 0 0 0 | **Device [7:0]** |
| Byte 3 | Byte 2 | | Byte 1 | Byte 0 |
| | | | | |

### ASCII Format

Subnet = 1..4, Device = 1..255

### CL / Block / Scene

If you wish to call a constant light scene, then send the CL flag (a value of 1).

Note:

- The scene called will only be a constant light scene if configured so in Designer.

### Raw Format

| 31.....24 | | 23.....16 | | 15.....8 | 7.....0 | |
|---|---|---|---|---|---|---|
| **CL** | 0 0 0 0 0 0 0 | 0 0 0 0 | **Block [19:16]** | 0 0 0 0 0 0 0 0 | 0 0 0 | **Scene [4:0]** |
| Byte 3 | | Byte 2 | | Byte 1 | Byte 0 | |
| | | | | | | |

### ASCII Format

Constant Light = 1 (True) or 0 (False), Block = 1..8, Scene = 1..16

Note:

- If any other block / scene values are requested then you will receive an 'Invalid block parameter' or 'Invalid scene parameter' error.

## Block / Scene

### Raw Format

| 31.....24 | 23.....16 | | 15.....8 | 7.....0 | |
|---|---|---|---|---|---|
| 0 0 0 0 0 0 0 0 | 0 0 0 0 | **Block [19:16]** | 0 0 0 0 0 0 0 0 | 0 0 0 | **Scene [4:0]** |
| Byte 3 | Byte 2 | | Byte 1 | Byte 0 | |
| | | | | | |

### ASCII Format

Block = 1..8, Scene = 1..16

Note:

- If any other block / scene values are requested then you will receive an 'Invalid block parameter' or 'Invalid scene parameter' error.

## Level

### Raw Format

| 31.....24 | 23.....16 | 15.....8 | 7.....0 | |
|---|---|---|---|---|
| 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 | 0 | **Level [6:0]** |
| Byte 3 | Byte 2 | Byte 1 | Byte 0 | |
| | | | | |

### ASCII Format

Level = 0..100

Note:

- If a value greater than 100 is requested then this is rounded down to 100.
- If a negative value is requested then this is rounded up to 0.

### Proportion

#### Raw Format:

| 31.....24 | 23.....16 | 15.....8 | 7.....0 |
|---|---|---|---|
| 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 | **Proportion [7:0]** |
| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
| | | | |

#### ASCII Format

Proportion = -100..100

### Proportion Change

#### Raw Format

| 31.....24 | 23.....16 | 15.....8 | 7.....0 |
|---|---|---|---|
| 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 | **Proportion Change [7:0]** |
| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
| | | | |

#### ASCII Format

Proportion Change = -100..100

### Fade Time

The fade time is represented as **hh:mm:ss:th**; where **hh** represents hours, **mm** represents minutes, **ss** represents seconds and **th** represents tenths (**t**) and hundredths (**h**) of seconds.

Note:

- The maximum fade time for DALI *Stands for Digital Addressable Lighting Interface. Standardised digital protocol for lighting control, allowing communication between control devices and LIUs (control gear).* / Digidim devices is 90 seconds; the maximum for Imagine / SDIM *Stands for Serial DIMming communication. It is a Helvar communication protocol.*-connected devices is 46 hours.

| Fade Time | ASCII | Hexadecimal |
|---|---|---|
| 0.01 second | 1 | 0x00000001 |
| 0.1 second | 10 | 0x0000000A |
| 1 second | 100 | 0x00000064 |

| | | |
|---|---|---|
| 60 seconds (1 minute) | 6000 | 0x00001770 |
| 60 minutes (1 hour) | 360000 | 0x00057E40 |

### Raw Format

| 31.....24 | 23.....16 | 15.....8 | 7.....0 |
|---|---|---|---|
| 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 | 0 0 0 | **Fade Time [12:0]** |
| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
| | | | |

## Related Topics

- Control Commands
- Command Format
- HelvarNet Overview
- Configuration Command Descriptions
- Configuration Command Table
- Query Command and Reply Descriptions
- Query Reply Tables
- Query Command Table
- Routing Entries
- Error / Diagnostic Messages
- Messages

# Query Commands

When you send a query command, the message returned contains the query command data which was sent, followed by the reply; this data makes up the query reply. If you send a query command in raw format, for example, the query reply will comprise all ten Words of the command plus the Word(s) that makes up the reply. It is necessary for the reply to contain the command data as the system will not guarantee the order of replies.

Notes:

- See Query Command Table and Query Reply Table for information on query command and reply formats.
- Query replies are sent in the same format as query commands. For example, if the query is sent to a router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* in ASCII form then the reply will also describe the reply data using the same ASCII format.
- When you send a command, if you have entered an invalid parameter or it has been sent to a device *A physical item with which you can interact, either directly or via Designer.*, router or cluster that does not exist, then you will receive an error message describing what is wrong with the command. *See Error / Diagnostic Messages*.

## General Query Commands

### 101 - Query Clusters

When you send a Query Clusters command, the reply provides you with all the Cluster IDs that exist in the system.

#### Command

Send: Command (101)

#### Reply

Returns a bit field indicating the presence of all clusters:

Command (101), Cluster Count, 8x32 bit Words detailing the existence of the clusters 1-253 (bits 0, 254, 255 are always zero)

#### ASCII Example

If you send the following Query Clusters command:

>V:1,C:101#

If there are clusters 1, 2 and 253, then the reply will be:

?V:1,C:101=1,2,253#

#### Raw Example

If you send the following Query Clusters command:

0x00010065 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If there are 1, 2 and 253 clusters, then the reply will be:

0x01010065 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00030006 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x20000000

### 102 - Query Routers

When you send a Query Routers command, the reply provides you with all the Cluster Member (Router) IDs that exist in the specified cluster.

#### Command

Send: Command (102), Cluster (1..253)

#### Reply

Returns a bit field indicating the presence of all routers within the specified cluster:

Command (102), Router Count / Cluster ID (1..253), 8x32 bit Words detailing the existence of the routers 1-254 (bits 0 and 255 are always zero)

#### ASCII Example

If you send the following Query Routers in cluster 253 command:

>V:1,C:102,@253#

If there are routers 252, 253 and 254 in cluster 253, then the reply will be:

?V:1,C:102,@253=252,253,254#

#### Raw Example

If you send the following Query Routers in cluster 253 command:

0x00010066 0x000000FD 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000

If there are routers 252, 253 and 254 in cluster 253, then the reply will be:

0x01010066 0x000000FD 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00030000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 0x00000000 0x70000000

### 103 - Query Last Scene In Block (LSIB)

When you send a Query Last *Scene* *Collection of lighting levels for each channel assigned to the same group as the scene.* In Block command, the reply provides you with the last scene that was recalled in the specified scene block.

**Note:** If no scene has been recalled, Query Last Scene In Block replies may also return current block status information.

See table below for the status description, ASCII reply information and HEX reply information.

| Status Description | ASCII Reply | HEX Reply |
|---|---|---|
| Off | 128 | 0x0080 |
| Min level | 129 | 0x0081 |
| Max level | 130 | 0x0082 |
| Last Scene Percentage (0%) | 137 | 0x0089 |

| | | |
|---|---|---|
| Last Scene Percentage (1%) | 138 | 0x008A |
| Last Scene Percentage (100%) | 237 | 0x00ED |

### Command

Send: Command (103), Group (1..16383), Block (1..8)

### Reply

Returns the number of the last recalled scene in the scene block:

Command (103), Group (1..16383), Block (1..8), Last Scene In Block (1..16)

### ASCII Example

If you send the following Query LSIB command (including the group and scene block parameters):

>V:1,C:103,G:5,B:2#

If the last scene called in the block is 4, then the reply will be:

?V:1,C:103,G:5,B:2=4#

### Raw Example

If you send the following Query LSIB command (including the group and scene block parameters):

0x00010067 0x00000005 0x00000000 0x00020000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the last scene called in the block is 4, then the reply will be:

0x01010067 0x00000005 0x00000000 0x00020000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00000004**

### 109 - Query Last Scene In Group (LSIG)

When you send a Query Last *Scene Collection of lighting levels for each channel assigned to the same group as the scene.* In Group command, the reply provides you with the last scene that was recalled in the specified group.

**Note:** If no scene has been recalled, Query Last Scene In Group replies may also return current group status information.

See table below for the status description, ASCII reply information and HEX reply information.

| Status Description | ASCII Reply | HEX Reply |
|---|---|---|
| Off | 128 | 0x0080 |
| Min level | 129 | 0x0081 |
| Max level | 130 | 0x0082 |
| Last Scene | 137 | 0x0089 |

| | | |
|---|---|---|
| Percentage (0%) | | |
| Last Scene Percentage (1%) | 138 | 0x008A |
| Last Scene Percentage (100%) | 237 | 0x00ED |

### Command

Send: Command (109), Group (1..16383)

### Reply

Returns the number of the last recalled scene in the group:
Command (109), Group (1..16383), Last Scene In Group (1..128)

### ASCII Example

If you send the following Query LSIG command:
>V:2,C:109,G:5#
If the last scene called in the group is 78, then the reply will be:
?V:2,C:109,G:5=78#

### 104 - Query Device Type

*DALI Stands for Digital Addressable Lighting Interface. Standardised digital protocol for lighting control, allowing communication between control devices and LIUs (control gear).* , Digidim, Imagine ( *SDIM Stands for Serial DIMming communication. It is a Helvar communication protocol.* ) and *DMX Stands for Digital Multiplex. A type of subnet, used mainly for stage lighting and effects control.* devices are all capable of returning a device type. Devices can return more than one piece of type information.

For an ASCII query the response will be four comma separated values, the last of which is the protocol; the penultimate is the device type; and the remaining two are extra device information.

For a raw query the response will be returned in a 32 bit Word. The least significant byte contains the protocol; the next least significant byte contains the main device type; the two most significant bytes contain extra device information.

The devices protocols are as follows:

| Protocol | Values |
|---|---|
| DALI | 0x01 |
| Digidim | 0x02 |
| Imagine / SDIM | 0x04 |
| DMX | 0x08 |

Note:

- Only certain combinations of device types are valid or make sense.

### Command

Send: Command (104), Cluster (1..253), Router (1..254), *Subnet A subnet is a part of a Router, and there are two or more Subnets on each Router. It allows the flow of network traffic between hosts to be segregated, based on network configuration. By organising hosts into logical groups and joining them, subnetting, network security and performance can be improved.* (1..4), Device (1..255)

### Reply

Returns the device type:

Command (104), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Device Type (see tables below)

### ASCII Example

If you send the following Query Device Type command (including the full address of the device):

>V:1,C:104,@2.2.1.1#

If the device is a 100 Rotary, then the reply will be:

?V:1,C:104,@2.2.1.1=00100802#

### Raw Example

If you send the following Query Device Type command (including the full address of the device):

0x00010068 0x00020002 0x00010001 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the device is a 100 Rotary, then the reply will be:

0x01010068 0x00020002 0x00010001 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00100802**

### DALI Device Type Information

| **Device Type** | **Byte3-Byte1 (MSBytes) [Any combination of the following]** | **Byte0 (LSByte)** |
|---|---|---|
| Fluorescent Lamps | 0x00 | 0x01 |
| Self-contained emergency lighting | 0x01 | 0x01 |
| Discharge lamps (excluding fluorescent lamps) | 0x02 | 0x01 |
| Low voltage halogen lamps | 0x03 | 0x01 |
| Incandescent lamps | 0x04 | 0x01 |
| Conversion into D.C. | 0x05 | 0x01 |

| | | |
|---|---|---|
| voltage (IEC 60929) | | |
| LED *A light-emitting diode (LED) is a semiconductor device that emits incoherent monochromatic light when electrically biased in the forward direction. This effect is a form of electroluminescence. The color depends on the semiconducting material used, and can be near-ultraviolet, visible or infrared.* modules | 0x06 | 0x01 |
| Switching function (i.e. Relay) | 0x07 | 0x01 |
| Colour control | 0x08 | 0x01 |
| Sequencer | 0x09 | 0x01 |
| Undefined | 0x0B-0xFE | 0x01 |

### Digidim Control Device Type Information

| Device Type | Byte3 (MSByte) | Byte2 | Byte1 | Byte0 (LSByte) |
|---|---|---|---|---|
| 100 – Rotary | 0x00 | 0x10 | 0x08 | 0x02 |
| 110 – Single Slider *A slider is a subdevice that is operated by the user. A slider is used to adjust lighting level(s).* | 0x00 | 0x11 | 0x07 | 0x02 |
| 111 – Double Slider | 0x00 | 0x11 | 0x14 | 0x02 |
| 121 – 2 Button *A button is a digital pushbutton subdevice that can be operated by the user, either directly or via the Infrared Remote Control Handset.* on/off + IR *Stands for Infrared. Infrared radiation is a form of light that is invisible to the human eye, and is often used as a medium to send information between two devices.* | 0x00 | 0x12 | 0x13 | 0x02 |
| 122 – 2 Button modifier *A control used to modify a level, such as a fade button on a control panel.* + IR | 0x00 | 0x12 | 0x20 | 0x02 |
| 124 – 5 Button + IR | 0x00 | 0x12 | 0x44 | 0x02 |
| 125 – 5 Button + modifier + IR | 0x00 | 0x12 | 0x51 | 0x02 |
| 126 – 8 Button + IR | 0x00 | 0x12 | 0x68 | 0x02 |

| | | | | |
|---|---|---|---|---|
| 170 – IR Receiver | 0x00 | 0x17 | 0x01 | 0x02 |
| 312 – Multisensor | 0x00 | 0x31 | 0x25 | 0x02 |
| 410 – Ballast Style 1-10V Converter | 0x00 | 0x41 | 0x08 | 0x02 |
| 416S – 16A Dimmer | 0x00 | 0x41 | 0x60 | 0x02 |
| 425S – 25A Dimmer | 0x00 | 0x42 | 0x52 | 0x02 |
| 444 – Mini Input Unit | 0x00 | 0x44 | 0x43 | 0x02 |
| 450 – 800W Dimmer | 0x00 | 0x45 | 0x04 | 0x02 |
| 452 – 1000W Universal Dimmer | 0x00 | 0x45 | 0x28 | 0x02 |
| 455 – 500 Watt Thyristor *A semiconductor device used to switch or control large amounts of power using a small triggering current or voltage. The most common type is an SCR. See the entry for SCR.* Dimmer | 0x00 | 0x45 | 0x59 | 0x02 |
| 458/DIM8 – 8 Channel *A channel pertaining to a Load (also known as Control Gear or LIU), see entry for Load. A ballast has one channel whereas a dimmer or relay unit can have numerous channels.* Dimmer | 0x00 | 0x45 | 0x80 | 0x02 |
| 458/CTR8 – 8-Channel Ballast Controller | 0x74 | 0x45 | 0x81 | 0x02 |
| 458/SW8 – 8-Channel Relay Module | 0x04 | 0x45 | 0x83 | 0x02 |
| 460 – DALI to SDIM Converter | 0x00 | 0x46 | 0x03 | 0x02 |
| 472 – Din Rail 1-10V / DSI *Stands for Digital Signal Interface. DSI is a protocol used for the controlling of lighting in buildings. The technology uses a single byte to communicate the lighting level. DSI was the start of digital communication technology and was the precursor to DALI.* Converter | 0x00 | 0x47 | 0x26 | 0x02 |
| 474 – 4 Channel Ballast Controller - Output Unit | 0x00 | 0x47 | 0x40 | 0x02 |
| 474 – 4 Channel Ballast Controller - Relay Unit | 0x00 | 0x47 | 0x41 | 0x02 |
| 490 – Blinds Unit | 0x00 | 0x49 | 0x00 | 0x02 |
| 494 – Relay Unit | 0x00 | 0x49 | 0x48 | 0x02 |
| 498 – Relay Unit | 0x00 | 0x49 | 0x86 | 0x02 |
| 804 – Digidim 4 | 0x00 | 0x80 | 0x45 | 0x02 |
| 924 – LCD TouchPanel | 0x00 | 0x92 | 0x40 | 0x02 |
| 935 – Scene Commander (6 buttons) | 0x00 | 0x93 | 0x56 | 0x02 |
| 939 – Scene Commander (10 buttons) | 0x00 | 0x93 | 0x94 | 0x02 |
| 942 – Analogue Input Unit | 0x00 | 0x94 | 0x24 | 0x02 |
| 458/OPT4 – 4-Channel Options Module | 0x00 | 0x45 | 0x86 | 0x02 |

### Imagine (SDIM) Device Type Information

| Device Type | Byte3 (MSByte) | Byte2 | Byte1 | Byte0 (LSByte) |
|---|---|---|---|---|
| No device present | 0x00 | 0x00 | 0x00 | 0x04 |
| 474 – 4 Channel Ballast Controller - Relay Unit | 0x00 | 0x00 | 0xF1 | 0x04 |
| 474 – 4 Channel Ballast Controller - Output Unit | 0x00 | 0x00 | 0xF2 | 0x04 |
| 458/SW8 – 8-Channel Relay Module | 0x00 | 0x00 | 0xF3 | 0x04 |
| 458/CTR8 – 8-Channel Ballast Controller | 0x00 | 0x00 | 0xF4 | 0x04 |
| 458/OPT4 – Options Module | 0x00 | 0x00 | 0xF5 | 0x04 |
| 498 – 8-Channel Relay Unit | 0x00 | 0x00 | 0xF6 | 0x04 |
| 458/DIM8 – 8-Channel Dimmer | 0x00 | 0x00 | 0xF7 | 0x04 |
| HES92060 Sine Wave Dimmer | 0x00 | 0x00 | 0xF8 | 0x04 |
| Ambience4 Dimmer | 0x00 | 0x00 | 0xF9 | 0x04 |
| HES92020 SCR *Stands for Silicon-Controlled Rectifier. The most common type of thyristor. See the entry for Thyristor.* Dimmer | 0x00 | 0x00 | 0xFA | 0x04 |
| HES98020 Output Unit | 0x00 | 0x00 | 0xFB | 0x04 |
| HES92220 Transistor Dimmer | 0x00 | 0x00 | 0xFC | 0x04 |
| HES98180-98291 Relay Unit | 0x00 | 0x00 | 0xFE | 0x04 |
| Dimmer (old style, type undefined) | 0x00 | 0x00 | 0xFF | 0x04 |

### DMX Device Type Information

| Device Type | Byte3 (MSB) | Byte2 | Byte1 | Byte0 (LSByte) |
|---|---|---|---|---|
| DMX No device present | 0x00 | 0x00 | 0x00 | 0x08 |
| DMX Channel In | 0x00 | 0x00 | 0x01 | 0x08 |
| DMX Channel Out | 0x00 | 0x00 | 0x02 | 0x08 |

### DIGIDIM Control Key Type Information

| Key Type | Byte3 (MSB) | Byte2 | Byte1 | Byte0 (LSByte) |
|---|---|---|---|---|
| SinglePress | 0x00 | 0x00 | 0x00 | 0x01 |
| TimedPress | 0x00 | 0x00 | 0x00 | 0x02 |
| ToggleSolo | 0x00 | 0x00 | 0x00 | 0x03 |
| ToggleBlock | 0x00 | 0x00 | 0x00 | 0x04 |
| TouchDimBlock | 0x00 | 0x00 | 0x00 | 0x05 |
| TouchDimSolo | 0x00 | 0x00 | 0x00 | 0x06 |
| Modifier | 0x00 | 0x00 | 0x00 | 0x07 |
| EdgeMode | 0x00 | 0x00 | 0x00 | 0x08 |
| Slider | 0x00 | 0x00 | 0x00 | 0x09 |
| AnalogueInput | 0x00 | 0x00 | 0x00 | 0x0A |
| Rotary | 0x00 | 0x00 | 0x00 | 0x0B |
| PIR | 0x00 | 0x00 | 0x00 | 0x0C |
| ContantLight | 0x00 | 0x00 | 0x00 | 0x0D |
| SliderInputUnit | 0x00 | 0x00 | 0x00 | 0x0E |

### 100 - Query Device Types and Addresses

When targeted at a subnet it will respond with all of the devices types with corresponding index, as in command 104. The device type and index pairs are in this format: Device Type @ index.

### ASCII Example

If you send the following Query Device Type command (including the full address of the device):

>V:2,C:100@2.2.1#

If the DALI subnet has 2 devices, one being a 100 Rotary at index 1, and the other being a 110 Slider at index 10, then the reply will be:

?V:2,C:100@2.2.1.1=00100802@1,00110702@10#

### 105 - Query Description Group

*DALI Stands for Digital Addressable Lighting Interface. Standardised digital protocol for lighting control, allowing communication between control devices and LIUs (control gear).* , Digidim, Imagine ( *SDIM Stands for Serial DIMming communication. It is a Helvar communication protocol.* ) and *DMX*

*Stands for Digital Multiplex. A type of subnet, used mainly for stage lighting and effects control.* devices are all capable of returning a description of the group.

The replies in the following examples are the default descriptions for those devices/objects. However, the reply will return group name according to the conventions you have applied to your *lighting system A network of Client PCs, Routers, Control Devices, Control Gear and lamps.* via Designer. For example, if the group has been named 'Building' then this will be returned in the Query Description Group reply.

Note:

- The query description group replies are case sensitive as per the Microsoft Windows ® ASCII extended character set.

### Command

Send: Command (105), Group (1...16383)

### Reply

Returns: Command (105), Group (1...16383), Group description

### ASCII Example

If you send the following Query Description Group command (including the group number):

>>V:1,C:105,G:5#

The reply will be the command sent and the reply containing the group description of the group requested i.e.

?V:1,C:105,G:5=Group 5#

### Raw Example

If you send the following Query Description Group command (including the group number):

0x00010069 0x00000005 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the description is Group 5, then the reply will be:

0x01010069 0x00000005 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x47726F75 0x70203500**

### 106 - Query Description Device

*DALI Stands for Digital Addressable Lighting Interface. Standardised digital protocol for lighting control, allowing communication between control devices and LIUs (control gear).* , Digidim, Imagine ( *SDIM Stands for Serial DIMming communication. It is a Helvar communication protocol.* ) and *DMX Stands for Digital Multiplex. A type of subnet, used mainly for stage lighting and effects control.* devices are all capable of returning a description of a specific device.

The replies in the following examples are the default descriptions for those devices/objects. However, the reply will return group name according to the conventions you have applied to your lighting system via Designer. For example, if the device has been named 'Ballast 10' then this will be returned in the Query Description Group reply.

Note:

- The query description device replies are case sensitive as per the Microsoft Windows ® ASCII extended character set.

### Command

Send: Command (106), Cluster (1..253), Router (1..254), *Subnet A subnet is a part of a Router, and there are two or more Subnets on each Router. It allows the flow of network traffic between hosts to be segregated, based on network configuration. By organising hosts into logical groups and joining them, subnetting, network security and performance can be improved.* (1..4), Device (1..255)

### Reply

Returns a description of the device:

Command (106), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Device description

### ASCII Example

If you send the following Query Description Device command (including the full address of the device):

>V:1,C:106,@2.2.1.1#

If the device is called 'Ballast', then the reply will be:

?V:1,C:106,@2.2.1.1=Ballast#

### Raw Example

If you send the following Query Description Device command (including the full address of the device):

0x0001006A 0x00020002 0x00010001 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the device is called 'Ballast', then the reply will be:

0x0101006A 0x00020002 0x00010001 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x42616C6C 0x61737400**

## Discovery Query Commands

The following set of commands are extensions to version 1 and are designed to allow for the discovery of a Helvar router system.

### 107 - Query Workgroup Name - UDP Broadcast

By broadcasting this command all Helvar routers that exist on a network, providing that they can see the message, will respond with the Workgroup name to which they belong. If there are multiple workgroups, then there will be responses from all routers in all workgroups.

### ASCII Example

If you broadcast (using UDP) the following Query Workgroup Name command:

>V:2,C:107#

All routers will respond with:

?V:2,C:107=WorkgroupName#

For example, a router with workgroup name 'Restaurant' will respond with: ?V:2,C:107=Restaurant#

### 108 - Query Workgroup Membership

A router will respond to this query with the address strings of the routers that are members of the workgroup.

An address string contains the IP address of the router, and takes the form of '@10.254.1.1'.

### ASCII Example

If you send the following Query Workgroup Membership command:

>V:2,C:108#

A typical response will be:

?V:2,C:108=@10.254.1.1,@10.254.1.2,@10.254.1.3#

### 165 - Query Groups

A router will respond to this query with the group identifiers of all groups that have been programmed to the router's workgroup.

The response is a comma delimited string of group identifiers.

#### ASCII Example

If you send the following Query Groups command:

>V:2,C:165#

A typical response will be:

?V:2,C:165=1,2,3,4,...,100#

### 164 - Query Group

A router will respond to this query with the address strings of all devices that are members of the group.

The device address string contains the cluster, router, subnet and device index, and takes the form of '@1.1.1.34'.

#### ASCII Example

If you send the following Query Groups command:

>V:2,C:164,G:100#

A typical response will be:

?V:2,C:164,G:100=@1.1.1.34,@1.1.1.35,@1.1.1.36#

### 166 - Query Scene Names

A router will respond to this query with the scene descriptions that are prefixed with the corresponding group, block and scene.

The scene description string contains the group, block, and scene numbers and scene description, and takes the form of '@G.B.S:Description'.

#### ASCII Example

If you send the following Query Groups command:

>V:2,C:166#

A typical response will be:

?V:2,C:166=@1.1.1:Morning@1.1.2:Afternoon@1.1.3:Night#

### 167 - Query Scene Info

When targeted at a load interface, the response will include all of the scene levels.

The response will contain all 136 scene levels, in a comma delimited format.

Ignores are represented by '*'. Last Level is represented by 'L'.

#### ASCII Example

If you send the following Query Groups command:

>V:2,C:167@1.1.1.4#

A typical response will be:

?V:2,C:167@1.1.1.4=100,75,50,25,0,0,0,0,0,0,0,0,L,L,L,0,*,*,*,*,*,*,*,*,*,*,*,*,*,*,*,(33-128),*,*,*,*,*,*,*,*#

Note: (33-128) in the above example represents scenes 33 to 128.

## Load Interface Maintenance Query Commands

When targeted at a load interface, the response will represent the maintenance property value.

The load interface must support the iDim Ballast range (see the iDim section of the Helvar website)

### 70 - Query Lamp Running Hours

### 71 - Query Ballast Running Hours

### 72 - Query Maximum Voltage

### 73 - Query Minimum Voltage

### 74 - Query Maximum Temperature

### 75 - Query Minimum Temperature

## Device State Query Commands

### 110 - Query Device State

E.g. disabled, lamp fault, missing, overtemperature, Function Test in progress, Function Test passed etc.

#### Command

Send: Command (110), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255)

#### Reply

Returns the device state:

Command (110), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Device State (see table below)

#### ASCII Example

If you send the following Query Device State command (including the full address of the device):

>V:1,C:110,@2.2.1.1#

If the device has been disabled, then the reply will be:

?V:1,C:110,@2.2.1.1=1#

#### Raw Example

If you send the following Query Device State command (including the full address of the device):

0x0001006E 0x00020002 0x00010001 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the device has been disabled, then the reply will be:

0x0101006E 0x00020002 0x00010001 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00000001**

The state of a device is described by the following set of flags:

| State | Description | Flag Value |
|---|---|---|
| NSDisabled | Device or | 0x00000001 |

| | | |
|---|---|---|
| | subdevice has been disabled, usually an IR subdevice or a DMX channel | |
| NSLampFailure | Unspecified lamp problem | 0x00000002 |
| NSMissing | The device previously existed but is not currently present | 0x00000004 |
| NSFaulty | Ran out of addresses (DALI subnet) / unknown Digidim control device / DALI load *For example, dimmers, relay units, ballasts etc. Receives messages from control devices and performs the relevant action e.g. sets the lighting it controls to the relevant level. Some control may be possible at the device itself. Also known as Control Gear or LIU, see entries for both.* that keeps responding with multi-replies | 0x00000008 |
| NSRefreshing | DALI subnet, DALI load or Digidim control device is being discovered | 0x00000010 |
| NSReserved | Internal use only | 0x00000020 |
| NSReserved | | 0x00000040 |
| NSReserved | Internal use only | 0x00000080 |
| NSEM_Resting | The load is intentionally off whilst the control gear *For example, dimmers, relay units, ballasts etc. Receives messages from control devices, via the router, and performs the relevant action e.g. sets the lighting* | 0x00000100 |

| | | |
|---|---|---|
| | *(lamps) it controls to the relevant level. Some control may be possible at the device itself. Also known as LIU or Load, see entries for both.* is being powered by the emergency supply | |
| NSEM_Reserved | | 0x00000200 |
| NSEM_InEmergency | No mains power is being supplied | 0x00000400 |
| NSEM_InProlong | Mains has been restored but device is still using the emergency supply | 0x00000800 |
| NSEM_FTInProgress | The Functional Test is in progress (brief test where the control gear is being powered by the emergency supply) | 0x00001000 |
| NSEM_DTInProgress | The Duration Test is in progress. This test involves operating the control gear using the battery until the battery is completely discharged. The duration that the control gear was operational for is recorded, and then the battery recharges itself from the mains supply | 0x00002000 |
| NSEM_Reserved | | 0x00004000 |
| NSEM_Reserved | | 0x00008000 |
| NSEM_DTPending | The Duration Test has been requested but has not yet commenced. The test can be delayed if the battery is not fully charged | 0x00010000 |
| NSEM_FTPending | The Functional Test has been requested but has not yet | 0x00020000 |

| | | |
|---|---|---|
| | commenced. The test can be delayed if there is not enough charge in the battery | |
| NSEM_BatteryFail | Battery has failed | 0x00040000 |
| NSReserved | Internal use only | 0x00080000 |
| NSReserved | Internal use only | 0x00100000 |
| NSEM_Inhibit | Prevents an emergency fitting from going into emergency mode | 0x00200000 |
| NSEM_FTRequested | Emergency Function Test has been requested | 0x00400000 |
| NSEM_DTRequested | Emergency Duration Test has been requested | 0x00800000 |
| NSEM_Unknown | Initial state of an emergency fitting | 0x01000000 |
| NSOverTemperature | Load is over temperature/heating | 0x02000000 |
| NSOverCurrent | Too much current is being drawn by the load | 0x04000000 |
| NSCommsError | Communications error | 0x08000000 |
| NSSevereError | Indicates that a load is either over temperature or drawing too much current, or both | 0x10000000 |
| NSBadReply | Indicates that a reply to a query was malformed | 0x20000000 |
| NSReserved | | 0x40000000 |
| NSDeviceMismatch | The actual load type does not match *An attempt to match corresponding items in an Upload Design and a Workgroup Design / Real Workgroup.* the expected type | 0x80000000 |

Note:

- All other flags are reserved for future use and should be ignored.

### 111 - Query Device Is Disabled

Query whether the device has been disabled.

#### Command

Send: Command (111), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255)

#### Reply

Returns the lamp state:

Command (111), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Device Disabled State (1=Disabled, 0=Enabled)

#### ASCII Example

If you send the following Query Device Is Disabled command (including the full address of the device):

>V:1,C:111,@1.1.2.58#

If the device has been disabled, then the reply will be:

?V:1,C:111,@1.1.2.58=1#

#### Raw Example

If you send the following Query Device Is Disabled command (including the full address of the device):

0x0001006F 0x00020002 0x00010001 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the device has been disabled, then the reply will be:

0x0101006F 0x00020002 0x00010001 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00000001**

### 112 - Query Lamp Failure

Query whether the lamp has failed.

Note:

- This command should not be sent to any device other than a ballast, otherwise you will receive a 'Property does not exist' error message. *See Error / Diagnostic Messages*.

#### Command

Send: Command (112), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255)

#### Reply

Returns the lamp state:

Command (112), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Lamp Failure State (1=Failed, 0=OK)

#### ASCII Example

If you send the following Query Lamp Failure command (including the full address of the device):

>V:1,C:112,@1.1.2.58#

If the lamp has failed, then the reply will be:

?V:1,C:112,@1.1.2.58=1#

### Raw Example

If you send the following Query Lamp Failure command (including the full address of the device):

0x00010070 0x00020002 0x00010001 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000

If the lamp has failed, then the reply will be:

0x01010070 0x00020002 0x00010001 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 **0x00000001**

## 113 - Query Device Is Missing

Query whether the device is missing.

### Command

Send: Command (113), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255)

### Reply

Returns a message indicating whether the device is missing or not:

Command (113), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Device Missing State (1=Missing, 0=Present)

### ASCII Example

If you send the following Query Device Is Missing command (including the full address of the device):

>V:1,C:113,@2.2.1.1#

If the device is missing, then the reply will be:

?V:1,C:113,@2.2.1.1=1#

### Raw Example

If you send the following Query Device Is Missing command (including the full address of the device):

0x00010072 0x00020002 0x00010001 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000

If the device is missing, then the reply will be:

0x01010072 0x00020002 0x00010001 0x00000000 0x00000000 0x00000000 0x00000000
0x00000000 0x00000000 0x00000000 **0x00000001**

## 114 - Query Device Is Faulty

Query whether the device is faulty.

### Command

Send: Command (114), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255)

### Reply

Returns a message indicating whether the device is faulty or not:

Command (114), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Device Faulty State (1=Faulty, 0=OK)

### ASCII Example

If you send the following Query Device Is Faulty command (including the full address of the device):

>V:1,C:114,@2.2.1.1#

If the device is faulty, then the reply will be:

?V:1,C:114,@2.2.1.1=1#

#### Raw Example

If you send the following Query Device Is Faulty command (including the full address of the device):

0x00010071 0x00020002 0x00010001 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the device is faulty, then the reply will be:

0x01010071 0x00020002 0x00010001 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00000001**

### 129 - Query Emergency Battery Failure

Query whether the emergency ballast's battery has failed.

Note:

- This command should not be sent to any device other than an emergency ballast, otherwise you will receive a 'Property does not exist' error message. *See Error / Diagnostic Messages*.

#### Command

Send: Command (129), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255)

#### Reply

Returns the emergency battery state:

Command (129), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Battery Failure State (1=Failed, 0=OK)

#### ASCII Example

If you send the following Query Emergency Battery Failure command (including the full address of the device):

>V:1,C:129,@1.1.2.58#

If the emergency ballast's battery has failed, then the reply will be:

?V:1,C:129,@1.1.2.58=1#

#### Raw Example

If you send the following Query Emergency Battery Failure command (including the full address of the device):

0x00010081 0x00010001 0x00020058 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the emergency ballast's battery has failed, then the reply will be:

0x01010081 0x00010001 0x00020058 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00000001**

## Measurement / Input / Level Query Commands

Note:

- Devices / subdevices of this type must be configured in Designer before you can query their measurement, input(s) or level. Specifically, they must be grouped

### 150 - Query Measurement

For analogue types, e.g. light measurement (Multisensor), analogue input (Analogue Input Unit).

Note:

- If sent to a digital device / subdevice which does not perform any measurement, for example a Button Panel, then you will receive a 'Property does not exist' error message. *See Error / Diagnostic Messages..*

### Command

Send: Command (150), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Subdevice (1..16)

### Reply

Returns the measurement from the device / subdevice:

Command (150), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Subdevice (1..16), Measurement (1..100)

### ASCII Example

If you send the following Query Measurement command (including the full address of the subdevice):

>V:1,C:150,@2.2.1.1.4#

If the measurement from the subdevice is 100, then the reply will be:

?V:1,C:150,@2.2.1.1.4=100#

### Raw Example

If you send the following Query Measurement command (including the full address of the subdevice):

0x00010096 0x00020002 0x00010001 0x00040000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the measurement from the subdevice is 100, then the reply will be:

0x01010096 0x00020002 0x00010001 0x00040000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00000064**

### 151 - Query Inputs

Returns the state or digital input(s) of: a device (e.g. for the PIR detector of a Multisensor - 0x01=occupied within past minute, 0x00=unoccupied); or the LEDs of a button panel; or the switch inputs of an input unit. If sent to the device level, summarises the digital input state. If sent to the subdevice level, gives the state of that subdevice's input.

Note:

- Before running Query Inputs please ensure that the input source has been set via Designer for input devices such as the 444 Mini Input Unit or 942 Analogue Input Unit . *See Analogue Mode Configuration and Edge Mode Configuration.*

### Command

Send: Command (151), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Subdevice (1..16)

### Reply

Returns the input state of the device / subdevice:

Command (151), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Subdevice (1..16), Input State *(see below)*

The majority of subdevices have on and off states and are therefore represented by 0 (OFF) or 1 (ON). For example, buttons with LEDs will either be pressed (LED on) or not pressed (LED off). *See below for the exceptions.*

Mini Input Unit: As there are 8 inputs on this device there will be 8 states e.g. 01001100 would be represented in ASCII as 50.

Slider: 0..100 (level in %)

Analogue Input Unit: 0..100 (level in %)

### ASCII Example

If you send the following Query Inputs command to a subdevice (including the full address of the subdevice):

>V:1,C:151,@2.2.1.1.4#

If the state of the subdevice is ON, then the reply will be:

?V:1,C:151,@2.2.1.1.4=1#

### Raw Example

If you send the following Query Inputs command to a subdevice (including the full address of the subdevice):

0x00010097 0x00020002 0x00010001 0x00004000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the state of the subdevice is ON, then the reply will be:

0x01010097 0x00020002 0x00010001 0x00004000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00000001**

## 152 - Query Load Level

Note:

- This command should not be sent to any device other than a load (control gear), otherwise you will receive a 'Property does not exist' error message. *See Error / Diagnostic Messages*.

### Command

Send: Command (152), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255)

### Reply

Command (152), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Load Level (1..100)

### ASCII Example

If you send the following Query Load Level command (including the full address of the device):

>V:1,C:152,@1.1.2.15#

If the load level is 25%, then the reply will be:

?V:1,C:152,@1.1.2.15=25#

### Raw Example

If you send the following Query Load Level command (including the full address of the device):

0x00010098 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the load level is 25%, then the reply will be:

0x01010098 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00000019**

Note:

- Query load level commands may also report a level even though the device may be set to 'Off'. This is because the load level is set below the switch on level.
- Levels above 50% may be subject to a 1% swing when returning levels due to the DALI standard logarithmic dimming curve *DALI standard logarithmic curve for defining dim levels of DALI units*. E.g. setting the level of a DALI ballast to 93% in Designer will cause the router to actually return a level of 92% when queried using Ethernet I/O. This is because 93% is not accounted for in the DALI logarithmic dimming curve. The router always assigns the closest dimming curve level to the level set in Designer. *For further information see DALI Logarithmic Dimming Levels*

### ASCII Example

If you send the following Query Load Level command (including the full address of the device):

>V:1,C:152,@1.1.2.15#

If the load level is set at 1% and the switch on level is 2%, then the reply will be:

?V:1,C:152,@1.1.2.15=2147483649#

### Raw Example

If you send the following Query Load Level command (including the full address of the device):

0x00010098 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the load level is 1% and the switch on level is 2%, then the reply will be:

0x01010098 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x80000001**

The ASCII and Raw reply responses, 2147483649 and 0x80000001 are synonymous. If these replies are returned following a query load level request then the device at the specified address is 'Off' even though it appears 'On'.

For further reference the Raw Word table denotes the response to query load level command when device is set to 'off':

| 31.....24 | 23.....16 | 15.....8 | 7.....0 |
|---|---|---|---|
| **Switch [31:30]** 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 | 0 **Level [6:0]** |
| Byte 3 | Byte 2 | Byte 1 | Byte 0 |

## Power Consumption Query Commands

### 160 - Query Power Consumption

Query the power consumption of a device.

Note:

- If the power consumption of the device is unknown, then you will receive a value of 0 in the reply.

### Command

Send: Command (160), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255)

### Reply

Command (160), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Power (in W)

### ASCII Example

If you send the following Query Power Consumption command (including the full address of the device):

>V:1,C:160,@1.1.2.15#

If the power consumption of the device is 23 W, then the reply will be:

?V:1,C:160,@1.1.2.15=23#

### Raw Example

If you send the following Query Power Consumption command (including the full address of the device):

0x000100A0 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the power consumption of the device is 15 W, then the reply will be:

0x010100A0 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x0000000F**

## 161 - Query Group Power Consumption

Query the power consumption of all devices in a group.

Note:

- If the total power consumption of the devices in the group are unknown, then you will receive a value of 0 in the reply.

### Command

Send: Command (161), Group (1..16383)

### Reply

Command (161), Group (1..16383), Power Consumption (in Watts)

### ASCII Example

If you send the following Query Group Power Consumption command (including the group number):

>V:1,C:161,G:16#

If the group's power consumption is 105 W, then the reply will be:

?V:1,C:161,G:16=105#

### Raw Example

If you send the following Query Group Power Consumption command (including the group number):

0x000100A1 0x00000010 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the group's power consumption is 105 W, then the reply will be:

0x010100A1 0x00000010 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00000069**

# Emergency Test Query Commands

## 170 - Query Emergency Function Test Time

Note:

- Emergency Test queries should only be sent to emergency ballasts, otherwise you will receive a 'Property does not exist' error message. *See* *Error / Diagnostic Messages*.

### Command

Send: Command (170), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255)

### Reply

Command (170), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Emergency Function Test Time (hh:mm:ss dd-mmm-yyyy)

### ASCII Example

If you send the following Query Emergency Function Test Time command (including the full address of the device):

>V:1,C:170,@1.1.2.15#

If the Emergency Function Test Time is 08:00 on 1st July 2009, then the reply will be:

?V:1,C:170,@1.1.2.15=08:00:00 01-Jul-2009#

### Raw Example

The raw time value is calculated in seconds from 00:00:00, 1 January 1970.

| Time Value | Hexadecimal |
|---|---|
| 1 second | 0x00000001 |
| 60 seconds (1 minute) | 0x0000003C |
| 60 minutes (1 hour) | 0x00000E10 |
| 24 hours (1 day) | 0x00015180 |
| 1 year (365 days) | 0x01E13380 |

If you send the following Query Emergency Function Test Time command (including the full address of the device):

0x000100AA 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the Emergency Function Test Time is 08:00 on 1st July 2009, then the reply will be:

0x010100AA 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x4A3DE880**

## 171 - Query Emergency Function Test State

Note:

- Emergency Test queries should only be sent to emergency ballasts, otherwise you will receive a 'Property does not exist' error message. *See* *Error / Diagnostic Messages*.

### Command

Send: Command (171), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255)

### Reply

Command (171), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Emergency Function Test State (combinations of the following emergency state values).

**Emergency State Values**

| States | Values |
|---|---|
| Pass | 0 |
| Lamp Failure | 1 |
| Battery Failure | 2 |
| Faulty | 4 |
| Failure | 8 |
| Test Pending | 16 |
| Unknown | 32 |

### ASCII Example

If you send the following Query Emergency Function Test Pending command (including the full address of the device):

>V:1,C:171,@1.1.2.15#

If the Emergency Function Test is pending, then the reply will be:

?V:1,C:171,@1.1.2.15=16#

### Raw Example

If you send the following Query Emergency Function Test Pending command (including the full address of the device):

0x000100AB 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the Emergency Function Test is pending, then the reply will be:

0x010100AB 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00000010**

## 172 - Query Emergency Duration Test Time

Note:

- Emergency Test queries should only be sent to emergency ballasts, otherwise you will receive a 'Property does not exist' error message. *See* *Error / Diagnostic Messages*.

### Command

Send: Command (172), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255)

### Reply

Command (172), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Emergency Duration Test Time (hh:mm:ss dd-mmm-yyyy)

### ASCII Example

If you send the following Query Emergency Duration Test Time command (including the full address of the device):

>V:1,C:172,@1.1.2.15#

If the Emergency Duration Test Time is 06:00 on 1st January 2010, then the reply will be:

?V:1,C:172,@1.1.2.15=06:00:00#

### Raw Example

The raw time value is calculated in seconds from 00:00:00, 1 January 1970.

| Time Value | Hexadecimal |
|---|---|
| 1 second | 0x00000001 |
| 60 seconds (1 minute) | 0x0000003C |
| 60 minutes (1 hour) | 0x00000E10 |
| 24 hours (1 day) | 0x00015180 |
| 1 year (365 days) | 0x01E13380 |

If you send the following Query Emergency Duration Test Time command (including the full address of the device):

0x000100AC 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the Emergency Duration Test Time is 06:00 on 1st January 2010, then the reply will be:

0x010100AC 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x4B306060

## 173 - Query Emergency Duration Test State

Note:

- Emergency Test queries should only be sent to emergency ballasts, otherwise you will receive a 'Property does not exist' error message. *See* *Error / Diagnostic Messages*.

### Command

Send: Command (173), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255)

### Reply

Command (173), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Emergency Duration Test Pending (combinations of the emergency state values described in command 171)

### ASCII Example

If you send the following Query Emergency Duration Test Pending command (including the full address of the device):

>V:1,C:173,@1.1.2.15#

If the Emergency Duration Test is pending, then the reply will be:

?V:1,C:173,@1.1.2.15=16#

### Raw Example

If you send the following Query Emergency Duration Test Pending command (including the full address of the device):

0x000100AD 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the Emergency Duration Test is pending, then the reply will be:

0x010100AD 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00000010**

### 174 - Query Emergency Battery Charge

Query the remaining charge of the emergency ballast battery.

Note:

- Emergency queries should only be sent to emergency ballasts, otherwise you will receive a 'Property does not exist' error message. *See* *Error / Diagnostic Messages*.

#### Command

Send: Command (174), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255)

#### Reply

Command (174), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Emergency Battery Charge (0..100%)

#### ASCII Example

If you send the following Query Emergency Battery Charge command (including the full address of the emergency ballast):

>V:1,C:174,@1.1.2.15#

If the emergency ballast battery has 40% charge remaining, then the reply will be:

?V:1,C:174,@1.1.2.15=40#

#### Raw Example

If you send the following Query Emergency Battery Charge command (including the full address of the emergency ballast):

0x000100AE 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the emergency ballast battery has 40% charge remaining, then the reply will be:

0x010100AE 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00000028**

### 175 - Query Emergency Battery Time

Query the current total running time of the emergency ballast battery.

Note:

- Emergency queries should only be sent to emergency ballasts, otherwise you will receive a 'Property does not exist' error message. *See* *Error / Diagnostic Messages*.

#### Command

Send: Command (175), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255)

#### Reply

Command (175), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Emergency Battery Time (1 ... 255 hours)

#### ASCII Example

If you send the following Query Emergency Battery Time command (including the full address of the emergency ballast):

>V:1,C:175,@1.1.2.15#

If the emergency ballast battery running time has been 12 hours, then the reply will be:

?V:1,C:175,@1.1.2.15=12#

### Raw Example

If you send the following Query Emergency Battery Time command (including the full address of the emergency ballast):

0x000100AF 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the emergency ballast battery running time has been 12 hours, then the reply will be:

0x010100AF 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x0000000C**

### 176 - Query Emergency Total Lamp Time

Query the current total lamp running time from any power source.

Note:

- Emergency queries should only be sent to emergency ballasts, otherwise you will receive a 'Property does not exist' error message. *See* *Error / Diagnostic Messages*.

### Command

Send: Command (176), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255)

### Reply

Command (176), Cluster (1..253), Router (1..254), Subnet (1..4), Device (1..255), Emergency Total Lamp Time (1 ... 1020 hours)

### ASCII Example

If you send the following Query Emergency Total Lamp Time command (including the full address of the emergency ballast):

>V:1,C:176,@1.1.2.15#

If the emergency ballast total lamp running time has been 100 hours, then the reply will be:

?V:1,C:176,@1.1.2.15=100#

### Raw Example

If you send the following Query Emergency Total Lamp Time command (including the full address of the emergency ballast):

0x000100B0 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the emergency ballast total lamp running time has been 100 hours, then the reply will be:

0x010100B0 0x00010001 0x0002000F 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00000064**

## System Query Commands

### 185 - Query Time

### Command

Send: Command (185)

### Reply

Returns the local system time:

Command (185), Local System Time (hh:mm:ss dd-mmm-yyyy)

### ASCII Example

If you send the following Query Time command:

>V:1,C:185#

If the time is 14:36:39 on 1st July 2009, then the reply will be:

?V:1,C:185=1245591399#

### Raw Example

The raw time value is calculated in seconds from 00:00:00, 1 January 1970.

| Time Value | Hexadecimal |
|---|---|
| 1 second | 0x00000001 |
| 60 seconds (1 minute) | 0x0000003C |
| 60 minutes (1 hour) | 0x00000E10 |
| 24 hours (1 day) | 0x00015180 |
| 1 year (365 days) | 0x01E13380 |

If you send the following Query Time command:

0x000100B9 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the time is 14:36:39 on 1st July 2009, then the reply will be:

0x010100B9 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x4A3E3767**

## 186 - Query Longitude

### Command

Send: Command (186)

### Reply

Returns the *longitude An imaginary line that extends from the North Pole to the South Pole of Earth. Each line is referred to by the angle between it and the line at 0 degrees longitude (known as the Greenwich Meridian). Each line is therefore known as an angle of longitude.*:

Command (186), Longitude (H ddd°mm'ss" - where H = Hemisphere, d = degrees, m = minutes and s = seconds)

### ASCII Example

If you send the following Query Longitude command:

>V:1,C:186#

If the longitude of your location is W 064° 38'21", then the reply will be:

?V:1,C:186=232701#

### Raw Example

Longitude is calculated from the raw value received as follows:

Note:

- E = negative of W (for Hexadecimal, use two's compliment to represent negative values)

| Hexadecimal | Decimal | Longitude |
|---|---|---|
| 0x0002D30C | 185100 | W 051°25’00” |
| 0xFFFD2CF4 | -185100 | E 051°25’00” |

The calculation is as follows:

ddd° = 185100 / 3600 = 51.41666666666666666666666666667 - 0.41666666666666666666666666667 (remainder) = **51**

mm’ = 0.41666666666666666666666666667 (remainder) x 60 = 25.00000000000000000000000000002 - 0.00000000000000000000000000002 (remainder) = **25**

ss” = 0.00000000000000000000000000002 (remainder) x 60 = 0.00000000000000000000000000012 = **0**

If you send the following Query Longitude command:

0x000100BA 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the longitude of your location is W 064° 38’21”, then the reply will be:

0x010100BA 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00038CFD**

This is how you calculate the longitude values from this hexadecimal value:

0x00038CFD = 232701

ddd° = 232701 / 3600 = 64.63916666666666666666666666667 - 0.63916666666666666666666666667 (remainder) = **64**

mm’ = 0.63916666666666666666666666667 (remainder) x 60 = 38.35 - 0.35 (remainder) = **38**

ss” = 0.35 (remainder) x 60 = **21**

### 187 - Query Latitude

#### Command

Send: Command (187)

#### Reply

Returns the *latitude* *An imaginary line that extends horizontally around the Earth. Each line is referred to by the angle between it and the line at 0 degrees latitude (known as the Equator). Each line is therefore known as an angle of latitude.*:

Command (187), Latitude (H dd°mm’ss” - where H = Hemisphere, d = degrees, m = minutes and s = seconds)

#### ASCII Example

If you send the following Query Latitude command:

>V:1,C:187#

If the latitude of your location is N 64° 38’21”, then the reply will be:

?V:1,C:187=232701#

#### Raw Example

The raw latitude value is calculated as per the longitude value (see above),

Note:

- S = negative of N (for Hexadecimal, use two’s compliment to represent negative values)

If you send the following Query Latitude command:

0x000100BB 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the latitude of your location is N 64° 38’21”, then the reply will be:

0x010100BB 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00038CFD**

### 188 - Query Time Zone

#### Command

Send: Command (188)

#### Reply

Returns the timezone offset (*GMT Stands for Greenwich Mean Time. The time (based on the Earth's movement) at the Greenwich Meridian in England. The Greenwich Meridian is the starting point for all Time Zones in the world. Now superceded by UTC. See also UTC.*):

Command (188), Time Difference (-12..12 hours)

#### ASCII Example

If you send the following Query Time Zone command:

>V:1,C:188#

If you are located at 1 hour offset from Greenwich Mean time (GMT), then the reply will be:

?V:1,C:188=3600#

#### Raw Example

Note:

- The raw time zone value received is in seconds. For hexadecimal, use two's complement for negative values.

If you send the following Query Time Zone command:

0x000100BC 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If you are located at 1 hour offset from Greenwich Mean time (GMT), then the reply will be:

0x010100BC 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00000E10**

### 189 - Query Daylight Saving Time

#### Command

Send: Command (189)

#### Reply

Returns the DST:

Command (189), DST (1=ON, 0=OFF)

#### ASCII Example

If you send the following Query DST command:

>V:1,C:189#

If Daylight Saving Time is enabled, then the reply will be:

?V:1,C:189=1#

### Raw Example

If you send the following Query DST command:

0x000100BD 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If Daylight Saving Time is enabled, then the reply will be:

0x010100BD 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00000001**

## 190 - Query Software Version

Query the router firmware version.

### Command

Send: Command (190)

### Reply

Returns the software version:

Command (190), Software Version (e.g. 4.2.2)

### ASCII Example

If you send the following Query Software Version command:

>V:1,C:190#

If the router firmware version is 4.2.2, then the reply will be:

?V:1,C:190=67240448#

### Raw Example

If you send the following Query Software Version command:

0x000100BE 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the router firmware version is 4.2.2, then the reply will be:

0x010100BE 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x04020200**

## 191 - Query HelvarNet Version

Query the *HelvarNet An Ethernet I/O protocol which allows third party devices (e.g. AV equipment) to query and control a 910/920 router system and perform some basic system configuration, over an Ethernet (TCP/IP) connection.* software version.

### Command

Send: Command (191)

### Reply

Returns the software version:

Command (191), HelvarNet Version (e.g. 1)

### ASCII Example

If you send the following HelvarNet Software Version command:

>V:1,C:191#

If the HelvarNet version is 1, then the reply will be:

?V:1,C:191=1#

### Raw Example

If you send the following Query Software Version command:

0x000100BF 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the Designer software version is 4.2.2, then the reply will be:

0x010100BF 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x00000001**

## Related Topics

- Query Command Table
- Query Reply Tables
- Control Command Table
- Control Command Descriptions
- Configuration Command Descriptions
- Configuration Command Table
- HelvarNet Overview
- Routing Entries
- Error / Diagnostic Messages
- Messages
- Command Format
- DALI Logarithmic Dimming Levels

# Query Command Table

Note:

- See Word / Parameter Formats below table for guidance on Words in raw format and parameters in ASCII format.
- When you send a command, if you have entered an invalid parameter or it has been sent to a device *A physical item with which you can interact, either directly or via Designer.*, router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* or cluster that does not exist, then you will receive an error message describing what is wrong with the command. *See Error / Diagnostic Messages*.

## ASCII Format

Note:

- In an ASCII string, the parameters are not required to be in the order shown below.

| Name | Parameters | | | |
|---|---|---|---|---|
| Query Lamp Running Hours | Command Number 70 | | | |
| Query Ballast Running Hours | Command Number 71 | | | |
| Query Maximum Voltage | Command Number 72 | | | |
| Query Minimum Voltage | Command Number 73 | | | |
| Query Maximum Temperature | Command Number 74 | | | |
| Query Minimum Temperature | Command Number 75 | | | |
| Query Clusters | Command Number 101 | | | |
| Query Routers | Command Number 102 | Cluster 1..253 | | |
| Query LSIB | Command Number | Group 1..16383 | Block 1..8 | |

| | | | | |
|---|---|---|---|---|
| | 103 | | | |
| Query Device Type | Command Number 104 | Cluster 1..253 Router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* 1..254 | Subnet *A subnet is a part of a Router, and there are two or more Subnets on each Router. It allows the flow of network traffic between hosts to be segregated, based on network configuration. By organising hosts into logical groups and joining them, subnetting, network security and performance can be improved.* 1..4 Device 1..255 | |
| Query Description Group | Command Number 105 | Group 1..16383 | | |
| Query Description Device | Command Number 106 | Cluster 1..253 Router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* 1..254 | Subnet 1..4 Device 1..255 | |
| Query Device State | Command Number 110 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | |
| Query Device Is Disabled | Command Number 111 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | |
| Query Lamp Failure | Command Number 112 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | |
| Query Device Is Faulty | Command Number 113 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | |
| Query Device Is | Command | Cluster 1..253 | Subnet 1..4 | |

| | | | | |
|---|---|---|---|---|
| Missing | Number 114 | Router 1..254 | Device 1..255 | |
| Query Emergency Battery Failure | Command Number 129 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | |
| Query Measurement | Command Number 150 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | Subdevice 1..16 / 0 (0x0 = no subdevice specified) |
| Query Inputs | Command Number 151 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | Subdevice 1..16 / 0 (0x0 = no subdevice specified) |
| Query Load *For example, dimmers, relay units, ballasts etc. Receives messages from control devices and performs the relevant action e.g. sets the lighting it controls to the relevant level. Some control may be possible at the device itself. Also known as Control Gear or LIU, see entries for both.* Level | Command Number 152 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | |
| Query Power Consumption | Command Number 160 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | |
| Query Group Power Consumption | Command Number 161 | Group 1..16383 | | |
| Query Emergency Function Test Time | Command Number 170 | | | |
| Query Emergency Function Test State | Command Number 171 | | | |
| Query Emergency Duration Test Time | Command Number 172 | | | |
| Query Emergency Duration Test State | Command Number 173 | | | |
| Query Emergency | Command | | | |

| | | | | |
|---|---|---|---|---|
| Battery Charge | Number 174 | | | |
| Query Emergency Battery Time | Command Number 175 | | | |
| Query Emergency Total Lamp Time | Command Number 176 | | | |
| Query Time | Command Number 185 | | | |
| Query Longitude *An imaginary line that extends from the North Pole to the South Pole of Earth. Each line is referred to by the angle between it and the line at 0 degrees longitude (known as the Greenwich Meridian). Each line is therefore known as an angle of longitude.* | Command Number 186 | | | |
| Query Latitude *An imaginary line that extends horizontally around the Earth. Each line is referred to by the angle between it and the line at 0 degrees latitude (known as the Equator). Each line is therefore known as an angle of latitude.* | Command Number 187 | | | |
| Query Time Zone | Command Number 188 | | | |
| Query Daylight Saving Time | Command Number 189 | | | |
| Query Software Version | Command Number 190 | | | |
| Query HelvarNet *An Ethernet I/O protocol which allows third party devices (e.g. AV equipment) to query and control a 910/920 router system and perform some basic* | Command Number 191 | | | |

| | | | | | |
|---|---|---|---|---|---|
| *system configuration, over an Ethernet (TCP/IP) connection.* Version | | | | | |

## Raw Format

| Name | Command Number Word1 ((32 bit) | Word 2 (32 bit) | Word 3 (32 bit) | Word 4 (32 bit) | Word 5 (32 bit) | Word 6 (32 bit) | Word 7 (32 bit) | Word 8 (32 bit) | Word 9 (32 bit) | W 10 (32 bit |
|---|---|---|---|---|---|---|---|---|---|---|
| Query Lamp Running Hours | 70 | | | | | | | | | |
| Query Ballast Running Hours | 71 | | | | | | | | | |
| Query Maximum Voltage | 72 | | | | | | | | | |
| Query Minimum Voltage | 73 | | | | | | | | | |
| Query Maximum Temperature | 74 | | | | | | | | | |
| Query Minimum Temperature | 75 | | | | | | | | | |
| Query Clusters | 101 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Routers | 102 | Cluster 1..253 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query LSIB | 103 | Group 1..16383 | 0 | Block 1..8 / 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Device Type | 104 | Cluster 1..253 Router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware* | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | *perform the tasks of routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* 1..254 | | | | | | | | |
| Query Description Group | 105 | Group 1..16383 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Description Device | 106 | Cluster 1..253 Router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Query Device State | 110 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Device Is Disabled | 111 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Lamp Failure | 112 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Device Is Faulty | 113 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Device Is Missing | 114 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Emergency Battery Failure | 129 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Measurement | 150 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | Subdevice 1..16 / 0 (0x0 = no subdevice specified) | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Inputs | 151 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | Subdevice 1..16 / 0 (0x0 = no subdevice specified) | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Load Level | 152 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Power Consumption | 160 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Group Power Consumption | 161 | Group 1..16383 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Emergency Function Test | 170 | Cluster 1..253 Router | Subnet 1..4 Device | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Time | | 1..254 | 1..255 | | | | | | | |
| Query Emergency Function Test State | 171 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Emergency Duration Test Time | 172 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Emergency Duration Test State | 173 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Emergency Battery Charge | 174 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Emergency Battery Time | 175 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Emergency Total Lamp Time | 176 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Time | 185 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Longitude | 186 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Latitude | 187 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Time Zone | 188 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Daylight Saving Time | 189 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query Software Version | 190 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Query HelvarNet Version | 191 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## Word / Parameter Formats

Note:

- See Control Command Word Formats for Word formats not given here.

### Cluster

### Raw Format

| 31.....24 | 23.....16 | 15.....8 | 7.....0 |
|---|---|---|---|
| 0 0 0 0 0 0 0 0 | **Cluster [23:16]** | 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 |
| Byte 3 | Byte 2 | Byte 1 | Byte 0 |

### ASCII Format

Cluster = 1..253

### Block

### Raw Format

| 31.....24 | 23.....16 | | 15.....8 | 7.....0 |
|---|---|---|---|---|
| 0 0 0 0 0 0 0 0 | 0 0 0 0 | **Block [19:16]** | 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 |
| Byte 3 | Byte 2 | | Byte 1 | Byte 0 |

### ASCII Format

Block = 1..8

### Subdevice

### Raw Format

| 31.....24 | 23.....16 | | 15.....8 | 7.....0 |
|---|---|---|---|---|
| 0 0 0 0 0 0 0 0 | 0 0 0 0 | **Subevice [19:16]** | 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 |
| Byte 3 | Byte 2 | | Byte 1 | Byte 0 |

### ASCII Format

Subdevice = 1..16

## Related Topics

- Query Command and Reply Descriptions
- Query Reply Tables
- Control Command Table
- Control Command Descriptions

# Query Replies Table

Notes:

- See Word / Parameter Formats below the following tables for guidance on Words in raw format and parameters in ASCII format.
- A query reply is prefixed with the query command which was sent.
- When you send a query command, if you have entered an invalid parameter or it has been sent to a device *A physical item with which you can interact, either directly or via Designer.*, router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* or cluster that does not exist, then, instead of a reply, you will receive an error message describing what is wrong with the command. *See Error / Diagnostic Messages*.

## ASCII Format

| Name | Reply Description |
|---|---|
| 101 - Query Clusters | List of cluster IDs (separated by comma delimiter) |
| 102 - Query Routers | List of router IDs (separated by comma delimiter) |
| 103 - Query LSIB | LSIB, 1..16 |
| 104 - Query Device Type | Device Type |
| 105- Query Description Group | Group Description, an ASCII extended character set response describing the group queried |
| 106- Query Description Device | Device Description, an ASCII extended character set response describing the device queried |
| 110 - Query Device State | Device State, a decimal value, that when broken down into its binary form, represents the states where each state is represented by 1 or 0 |
| 111 - Query Device Is Disabled | Device Disabled State, 1 = 'Disabled' or 0 = 'Enabled' |
| 112 - Query Lamp Failure | Lamp Failure State, 1 = 'Failed' or 0 = 'OK' |
| 113 - Query Device Is Faulty | Device Faulty State, 1 = 'Faulty' or 0 = 'OK' |
| 114 - Query Device Is Missing | Device Missing State, 1 = 'Missing' or 0 = 'Present' |
| 129 - Query Emergency Battery Failure | Battery Failure State, 1 = 'Failed' or 0 = 'OK' |
| 150 - Query Measurement | Measurement, 1..100 (%) or 0..200 light sensor *Detects changes in ambient light. Contained within the Multisensor (312).* level |

| | |
|---|---|
| 151 - Query Inputs | Input State, a decimal value, that when broken down into its binary form, represents the input states where each state is represented by 1 or 0 |
| 152 - Query Load *For example, dimmers, relay units, ballasts etc. Receives messages from control devices and performs the relevant action e.g. sets the lighting it controls to the relevant level. Some control may be possible at the device itself. Also known as Control Gear or LIU, see entries for both.* Level | Load Level, 1..100 (%) |
| 160 - Query Power Consumption | Power, Watts (W) |
| 161 - Query Group Power Consumption | Power, Watts (W) |
| 170 - Query Emergency Function Test Time | Time test was completed (Local System Time, a decimal value that represents the number of seconds since 1st January 1970) |
| 171 - Query Emergency Function Test State | Test Status, a decimal value that accounts for combinations of the state values described in the Emergency State Values table |
| 172 - Query Emergency Duration Test Time | Time test was completed (Local System Time, a decimal value that represents the number of seconds since 1st January 1970) |
| 173 - Query Emergency Duration Test State | Test Status, a decimal value that accounts for combinations of the state values described in the Emergency State Values table |
| 174 - Query Emergency Battery Charge | Battery Charge, 0-100 (%) |
| 175 - Query Emergency Battery Time | Battery Time. A decimal value for the time the lamp has been running from the batteries. 0 ... 255 hours |
| 176 - Query Emergency Total Lamp Time | Total Lamp Time. A decimal value for the amount of time the lamp has been running on all power supplies. |
| 185 - Query Time | Local System Time, a decimal value that represents the number of seconds since 1st January 1970 |
| 186 - Query Longitude *An imaginary line that extends from the North Pole to the South Pole of Earth. Each line is referred to by the angle between it and the line at 0 degrees longitude (known as the Greenwich Meridian). Each line is therefore known as an angle of* | Longitude, a signed decimal value that represents the hemisphere, hours, minutes and seconds of the longitudinal line from GMT *Stands for Greenwich Mean Time. The time (based on the Earth's movement) at the Greenwich Meridian in England. The Greenwich Meridian is the starting point for all Time Zones in the world. Now superceded by UTC. See also UTC.* |

| | |
|---|---|
| *longitude.* | |
| 187 - Query Latitude *An imaginary line that extends horizontally around the Earth. Each line is referred to by the angle between it and the line at 0 degrees latitude (known as the Equator). Each line is therefore known as an angle of latitude.* | Latitude, a signed decimal value that represents the hemisphere, hours, minutes and seconds of the latitudinal line from GMT |
| 188 - Query Time Zone | Time Difference, a decimal value that represents the number of seconds for the longitudinal location of the time line from GMT |
| 189 - Query Daylight Saving Time | DST, 1 = 'On' or 0 = 'Off' |
| 190 - Query Software Version | Designer Version (Major Version, Step Stone Version, Point Release Version), a decimal value, that when broken down into its hexadecimal form shows the version parts in their respective octets |
| 191 - Query HelvarNet *An Ethernet I/O protocol which allows third party devices (e.g. AV equipment) to query and control a 910/920 router system and perform some basic system configuration, over an Ethernet (TCP/IP) connection.* Version | HelvarNet Version |

## Raw Format

| Name | Word 11 (32b) | Word 12 (32b) | W13 (32b) | W14 (32b) | W15 (32b) | W16 (32b) | W17 (32b) | W18 (32b) | W19 (32b) |
|---|---|---|---|---|---|---|---|---|---|
| 101 - Query Clusters | Cluster Count (total no. of clusters), 0 | Cluster IDs 32 bytes in total, arranged as 8x32 bit words; a bit field detailing the existence of the clusters 1-253 (bits 0, 254 and 255 are always | C2 | C3 | C4 | C5 | C6 | C7 | C8 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | zero) | | | | | | | |
| 102 - Query Routers | Router Count (total no. of routers), 0 | Router IDs 32 bytes in total, arranged as 8x32 bit words; a bit field detailing the existence of the routers 1-254 (bits 0, 255 are always zero) | R2 | R3 | R4 | R5 | R6 | R7 | R8 |
| 103 - Query LSIB | LSIB, 1..16 | | | | | | | | |
| 104 - Query Device Type | Device Type | | | | | | | | |
| 105 - Query Description Group | Group Description | Group Description (visible in additional word 8x32 bit word if the group description is longer than 4 ASCII extended display characters) | | | | | | | |
| 105 - Query Description Device | Device Description | Device Description (visible in additional word 8x32 bit words if the group description is longer than 4 ASCII extended display characters) | | | | | | | |
| | | | | | | | | | |
| 110 - Query Device State | Device State | | | | | | | | |
| 111 - Query | Device | | | | | | | | |

| | |
|---|---|
| Device Is Disabled | Disabled State, 1=Disabled / 0=OK |
| 112 - Query Lamp Failure | Lamp Failure State, 1=Failed / 0=OK |
| 113 - Query Device Is Faulty | Device Faulty State, 1=Faulty / 0=OK |
| 114 - Query Device Is Missing | Device Missing State, 1=Missing / 0=OK |
| 129 - Query Emergency Battery Failure | Battery Failure State, 1=Failed / 0=OK |
| 150 - Query Measurement | Measurement, 1..100(%) |
| 151 - Query Inputs | Input State |
| 152 - Query Load Level | Load Level, 1..100(%) |
| 160 - Query Power Consumption | Power, Watts(W) |
| 161 - Query Group Power Consumption | Power, Watts(W) |
| 170 - Query Emergency Function Test Time | Local System Time, no. of seconds since 00:00:00, 1st Jan 1970 |
| 171 - Query Emergency Function Test State | Test Status |
| 172 - Query Emergency Duration Test Time | Local System Time, no. of seconds since 00:00:00, 1st Jan 1970 |
| 173 - Query Emergency Function Test | Test Status, Pending=1 / Ready=0 |

| | |
|---|---|
| State | |
| 174 - Query Emergency Battery Charge | Battery Charge, 0-100(%) |
| 175 - Query Emergency Battery Lamp Time | Battery Time. The time the lamp has been running from the batteries. 0 ...255 hours |
| 176 - Query Emergency Battery Total Lamp Time | Battery Total Lamp Time. The amount of time the lamp has been running on all power supplies. 0 ...255 hours |
| 185 - Query Time | Local System Time, no. of seconds since 00:00:00, 1st Jan 1970 |
| 186 - Query Longitude | Longitude<br>A signed 32 bit value, W=Positive, E=Negative |
| 187 - Query Latitude | Latitude<br>A signed 32 bit value, N=Positive, S=Negative |
| 188 - Query Time Zone | Time Zone<br>A signed 32 bit integer representing the seconds from GMT; each time zone is represented by an hour (3600 seconds). Western zones are negative and Eastern zones |

| | |
|---|---|
| | are positive |
| 189 - Query Daylight Saving Time | DST (LSBit), 1=On / 0=Off |
| 190 - Query Software Version | Version number:<br>Byte 3 (MSB)=Major Version<br>Byte 2=Step Stone Version<br>Byte 1=Point Release Version |
| 191 - Query HelvarNet Version | Version number |

## Word / Parameter Formats

Note:

- See Control Command Word Formats and Configuration Command Word Formats for Word formats not given here.

### Cluster Count

#### Raw Format

| 31.....24 | 23.....16 | 15.....8 | | | | | |
|---|---|---|---|---|---|---|---|
| **Cluster Count [31:16]** | | 0 | 0 | 0 | 0 | 0 | 0 |
| Byte 3 | Byte 2 | Byte 1 | | | | | |

### Router Count

#### Raw Format

| 31.....24 | 23.....16 | 15.....8 | | | | | |
|---|---|---|---|---|---|---|---|
| **Router Count [31:16]** | | 0 | 0 | 0 | 0 | 0 | 0 |
| Byte 3 | Byte 2 | Byte 1 | | | | | |

### Cluster IDs

#### Raw Format

| 31.....24 | 23.....16 | 15.....8 | 7 |
|---|---|---|---|
| **Cluster IDs [31:0]** | | | |
| Byte 3 | Byte 2 | Byte 1 | |

#### ASCII Format

Cluster IDs = 1..253

**Cluster Member (Router) IDs**

**Raw Format**

| 31.....24 | 23.....16 | 15.....8 | 7 |
|---|---|---|---|
| **Router IDs [31:0]** | | | |
| Byte 3 | Byte 2 | Byte 1 | |

**ASCII Format**

Cluster Member IDs = 1..254

**Last Scene In Block (LSIB)**

**Raw Format**

| 31.....24 | | | | | | | | 23.....16 | | | | | | | | 15.....8 | | | | | | | | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Byte 3 | | | | | | | | Byte 2 | | | | | | | | Byte 1 | | | | | | | | |

**ASCII Format**

LSIB = 1..16

**Device Type**

**Raw Format**

| 31.....24 | 23.....16 | 15.....8 | 7 |
|---|---|---|---|
| **Device Type [31:0]** | | | |
| Byte 3 | Byte 2 | Byte 1 | |

**ASCII Format**

Refer to Query Device Type section

**Device State**

**Raw Format**

| 31.....24 | 23.....16 | 15.....8 | |
|---|---|---|---|
| **Device State [31:0]** | | | |
| Byte 3 | Byte 2 | Byte 1 | |

**ASCII Format**

Refer to Query Device State section

**Device Disabled State**

**Raw Format**

| 31.....24 | | | | | | | | 23.....16 | | | | | | | | 15.....8 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Byte 3 | | | | | | | | Byte 2 | | | | | | | | Byte 1 | | | | | | | |

### ASCII Format

Device Disabled State = 1 (Disabled) or 0 (OK)

### Lamp Failure State

### Raw Format

| 31.....24 | | | | | | | | 23.....16 | | | | | | | | 15.....8 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Byte 3 | | | | | | | | Byte 2 | | | | | | | | Byte 1 | | | | | | | |

### ASCII Format

Lamp Failure State = 1 (Failed) / 0 (OK)

### Device Faulty State

### Raw Format

| 31.....24 | | | | | | | | 23.....16 | | | | | | | | 15.....8 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Byte 3 | | | | | | | | Byte 2 | | | | | | | | Byte 1 | | | | | | | |

### ASCII Format

Device Faulty State = 1 (Faulty) / 0 (OK)

### Device Missing State

### Raw Format

| 31.....24 | | | | | | | | 23.....16 | | | | | | | | 15.....8 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Byte 3 | | | | | | | | Byte 2 | | | | | | | | Byte 1 | | | | | | | |

### ASCII Format

Device Missing State = 1 (Missing) / 0 (OK)

### Battery Failure State

### Raw Format

| 31.....24 | | | | | | | | 23.....16 | | | | | | | | 15.....8 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Byte 3 | | | | | | | | Byte 2 | | | | | | | | Byte 1 | | | | | | | |

### ASCII Format

Battery Failure State = 1 (Failed) / 0 (OK)

### Measurement

### Raw Format

| 31.....24 | | | | | | | | 23.....16 | | | | | | | | 15.....8 | | | | | | | | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Byte 3 | | | | | | | | Byte 2 | | | | | | | | Byte 1 | | | | | | | | |

### ASCII Format

Measurement = 1..100 or the reading from the Light Sensor subdevice of the Multisensor

### Input State

### Raw Format

| 31.....24 | | | | | | | | 23.....16 | | | | | | | | 15..... | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Byte 3 | | | | | | | | Byte 2 | | | | | | | | Byte 1 | | | | | |

### ASCII Format

Refer to Query Inputs section

### Load Level

### Raw Format

| 31.....24 | | | | | | | | 23.....16 | | | | | | | | 15.....8 | | | | | | | | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Byte 3 | | | | | | | | Byte 2 | | | | | | | | Byte 1 | | | | | | | | |

### ASCII Format

Load Level = 0..100

### Power Consumption

### Raw Format

| 31.....24 | | | | | | | | 23.....16 | | | | | | | | 15.....8 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Power [31:0]** | | | | | | | | | | | | | | | | | | | | | | | | |
| Byte 3 | | | | | | | | Byte 2 | | | | | | | | Byte 1 | | | | | | | | |

### ASCII Format

Power = W

### Local System Time

### Raw Format

| 31.....24 | 23.....16 | 15.....8 |
|---|---|---|
| **Local System Time [31:0]** | | |
| Byte 3 | Byte 2 | Byte 1 |

### ASCII Format

The local system time value is calculated in seconds from 00:00:00, 1 January 1970.

| ASCII | Hexadecimal | System Time Value |
|---|---|---|
| 1 | 0x00000001 | 1 second |
| 60 | 0x0000003C | 60 seconds (1 minute) |
| 3600 | 0x00000E10 | 60 minutes (1 hour) |
| 86400 | 0x00015180 | 24 hours (1 day) |
| 31536000 | 0x01E13380 | 1 year (365 days) |

## Test Status

### Raw Format

| 31.....24 | | | | | | | | 23.....16 | | | | | | | | 15.....8 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Byte 3 | | | | | | | | Byte 2 | | | | | | | | Byte 1 | | | | | | | |

### ASCII Format

Test Status = 1 (Pending) / 0 (Ready)

## Test Result

### Raw Format

| 31.....24 | | | | | | | | 23.....16 | | | | | | | | 15.....8 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Byte 3 | | | | | | | | Byte 2 | | | | | | | | Byte 1 | | | | | | | |

### ASCII Format

Test Result = 1 (Passed) / 0 (Failed)

## Battery Charge

### Raw Format

| 31.....24 | 23.....16 | 15.....8 |
|---|---|---|

| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Byte 3 | | | | | | | | Byte 2 | | | | | | | | Byte 1 | | | | | | | |

### ASCII Format

Battery Charge = 0-100

### Longitude

### Raw Format

Longitude is calculated from the raw value received as follows:

W 051°25’00” = (51 x 3600 secs) + (25 x 60 seconds) + (0 x 1 second) = 185100

Note:

- E = negative of W (for Hex, use two’s complement to represent negative values).

| Hexadecimal | Decimal | Longitude |
|---|---|---|
| 0x0002D30C | 185100 | W 051°25’00” |
| 0xfffD2CF4 | -185100 | E 051°25’00” |

The calculation is as follows:

ddd° = 185100 / 3600 = 51.41666666666666666666666666667 - 0.41666666666666666666666666667 (remainder) = **51**

mm’ = 0.41666666666666666666666666667 (remainder) x 60 = 25.00000000000000000000000000002 - 0.00000000000000000000000000002 = **25**

ss” = 0.00000000000000000000000000002 x 60 = 0.00000000000000000000000000012 = **0**

### ASCII Format

Longitude = a signed decimal value that represents the hemisphere, hours, minutes and seconds of the longitudinal line from GMT, e.g. "185100".

### Latitude

Latitude is as per longitude (see above).

Note:

- S = negative of N (for Hex, use two’s complement to represent negative values).

### Designer Version

### Raw Format

| 31.....24 | 23.....16 | 15.....8 |
|---|---|---|
| **Designer Version [31:0]** | | |
| Byte 3 | Byte 2 | Byte 1 |

### ASCII Format

Designer Version = a decimal value, that when broken down into its hexadecimal form shows the version parts in their respective octets, e.g. v 4.2.2 = 67371520

### HelvarNet Version

### Raw Format

| 31.....24 | | | | | | | | 23.....16 | | | | | | | | 15.....8 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Byte 3 | | | | | | | | Byte 2 | | | | | | | | Byte 1 | | | | | | | |

### ASCII Format

HelvarNet Version = X  (e.g. 1)

## Related Topics

- Query Command and Reply Descriptions
- Query Command Table
- Control Command Table
- Control Command Descriptions
- HelvarNet Overview
- Configuration Command Descriptions
- Configuration Command Table
- Routing Entries
- Error / Diagnostic Messages
- Messages
- Command Format

# Configuration commands

Notes:

- See Configuration Command Table for information on configuration command formats.
- Unless stated otherwise, configuration commands are not intended for daily use. This is to avoid continual re-writing of flash memory.
- With regard to Store Scene *Collection of lighting levels for each channel assigned to the same group as the scene.* commands, if you enter a negative value, then the output level will be 0; if you enter a value greater than 100, then the level will be 100.
- When you send a command, if you have entered an invalid parameter or it has been sent to a device *A physical item with which you can interact, either directly or via Designer.*, router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* or cluster that does not exist, then you will receive an error message describing what is wrong with the command. *See Error / Diagnostic Messages*.

## Scene Configuration Commands

Note:

- Scene configuration commands should only be sent to control gear *For example, dimmers, relay units, ballasts etc. Receives messages from control devices, via the router, and performs the relevant action e.g. sets the lighting (lamps) it controls to the relevant level. Some control may be possible at the device itself. Also known as LIU or Load, see entries for both.* (load *For example, dimmers, relay units, ballasts etc. Receives messages from control devices and performs the relevant action e.g. sets the lighting it controls to the relevant level. Some control may be possible at the device itself. Also known as Control Gear or LIU, see entries for both.*) channels, otherwise the commands will be ignored.
- With regard to group scene store commands, when channels in a group are not used in a scene, the Force flag can be used to override this, thus forcing the scene to use those channels. *See Scene Table for more information on channel A channel pertaining to a Load (also known as Control Gear or LIU), see entry for Load. A ballast has one channel whereas a dimmer or relay unit can have numerous channels. 'ignores' in scenes.*
- With regard to channel scene store commands, when a channel is not used in a scene, the Force flag can be used to override this, thus forcing the scene to be stored. *See Scene Table for more information on channel 'ignores' in scenes.*

### 201 - Store Scene (Group)

Set the scene level for channels in the specified group. *If the 'Force' flag is clear, channels with 'ignore' already stored in the Scene Table are not affected.*

#### Command

Command (201), Group (1..16383), Force Store (1=ON, 0=OFF) / Block (1..8) / Scene (1..16), Level (0..100)

#### ASCII Example

To store an output level of 75% as scene 5 in scene block 2, across group 17:

>V:1,C:201,G:17,O:1,B:2,S:5,L:75#

### Raw Example

To store an output level of 75% as scene 5 in scene block 2, across group 17:

0x000100C9 0x00000011 0x00000000 0x10020005 0x00000000 0x00000000 0x0000004B 0x00000000 0x00000000 0x00000000

### 202 - Store Scene (Channel)

Set the scene level for the channel.

**Special values for the L Parameter**

253: Last Level
254: Ignore

*If the Force flag is clear and 'ignore' is already stored in the Scene Table for the channel, then the scene is not stored.*

### Command

Command (202), Cluster (1..253) / Router (1..254), *Subnet A subnet is a part of a Router, and there are two or more Subnets on each Router. It allows the flow of network traffic between hosts to be segregated, based on network configuration. By organising hosts into logical groups and joining them, subnetting, network security and performance can be improved.* (1..4) / Device (1..255), Force Store (1=ON, 0=OFF) / Block (1..8) / Scene (1..16), Level (0..100)

### ASCII Example

To store an output level of 75% as scene 5 in scene block 2, at channel 2.2.1.1:

>V:1,C:202,@2.2.1.1,O:1,B:2,S:5,L:75#

### Raw Example

To store an output level of 75% as scene 5 in scene block 2, at channel 2.2.1.1:

0x000100CA 0x00020002 0x00010001 0x10020005 0x00000000 0x00000000 0x0000004B 0x00000000 0x00000000 0x00000000

### 203 - Store As Scene (Group)

Stores the current levels of channels in the group into the specified block / scene. *If the 'Force' flag is clear, channels with 'ignore' already stored in the Scene Table are not affected.*

### Command

Command (203), Group (1..16383), Force Store (1=ON, 0=OFF) / Block (1..8) / Scene (1..16)

### ASCII Example

To store the current levels of all channels in group 17 as scene 5 in scene block 2:

>V:1,C:203,G:17,O:1,B:2,S:5#

### Raw Example

To store the current levels of all channels in group 17 as scene 5 in scene block 2:

0x000100CB 0x00000011 0x00000000 0x10020005 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

### 204 - Store As Scene (Channel)

Stores the current level of the channel into the specified block / scene. *If the Force flag is clear and 'ignore' is already stored in the Scene Table for the channel, then the scene is not stored.*

### Command

Command (204), Cluster (1..253) / Router (1..254), *Subnet A subnet is a part of a Router, and there are two or more Subnets on each Router. It allows the flow of network traffic between hosts to be*

*segregated, based on network configuration. By organising hosts into logical groups and joining them, subnetting, network security and performance can be improved.* (1..4) / Device (1..255), Force Store (1=ON, 0=OFF) / Block (1..8) / Scene (1..16), Level (0..100)

#### ASCII Example

To store the current level of channel 2.2.1.1 as scene 5 in scene block 2:

>V:1,C:204,@2.2.1.1,O:1,B:2,S:5#

#### Raw Example

To store the current level of channel 2.2.1.1 as scene 5 in scene block 2:

0x000100CC 0x00020002 0x00010001 0x10020005 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

### 205 - Reset Emergency Battery and Total Lamp Time (Group)

Reset the Emergency Battery and Total Lamp Time across a group.

Note:

- This command has no effect if sent to a group containing non-emergency devices.

#### Command

Command (205), Group (1..16383)

#### ASCII Example

To reset the Emergency Battery Time and Total Lamp time across group 56:

>V:1,C:205,G:56#

#### Raw Example

To reset the Emergency Battery Time and Total Lamp time at group 56:

0x000100CD 0x00000038 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

### 206 - Reset Emergency Battery and Total Lamp Time (Device)

Reset the Emergency Battery and Total Lamp Time at a device.

Note:

- This command has no effect if sent to a non-emergency device.

#### Command

Command (206), Cluster (1..253) / Router (1..254), Subnet (1..4) / Device (1..255)

#### ASCII Example

To reset the Emergency Battery Time and Total Lamp time of an emergency lighting ballast at address 8.67.2.37:

>V:1,C:206,@8.67.2.37#

#### Raw Example

To reset the Emergency Battery Time and Total Lamp time of an emergency lighting ballast at address 8.67.2.37:

0x000100CE 0x00080043 0x00020025 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

## Time and Location Configuration Commands

Notes:

- Only Daylight Saving Time (DST), longitude *An imaginary line that extends from the North Pole to the South Pole of Earth. Each line is referred to by the angle between it and the line at 0 degrees longitude (known as the Greenwich Meridian). Each line is therefore known as an angle of longitude.* / latitude *An imaginary line that extends horizontally around the Earth. Each line is referred to by the angle between it and the line at 0 degrees latitude (known as the Equator). Each line is therefore known as an angle of latitude.* and time zone changes cause a write to flash memory. Local time changes may be written as frequently as desired.
- The time zone difference value is in seconds. For raw, use two's complement for negative values.
- For system time calculation, see Local System Time Word Format; for longitude and latitude calculation, see Longitude and Latitude Word Format.

### 240 - Set Time and Location

Allows the system time, longitude, latitude, time zone and Daylight Saving Time (DST) to be set.

#### Command

Command (240), Local Time (seconds since 00:00:00, 1st Jan 1970), Longitude (H ddd°mm'ss"), Latitude (H ddd°mm'ss"), Time Zone Difference (-12..12 hours, calculated in seconds), Daylight Saving Time (1=ON, 0=OFF)

#### ASCII Example

To set a time of 14:36:39 on 1st July 2009, at a location of longitude W 064°38'21" and latitude N 51°25'00", in time zone +01:00, with DST applied:

>V:1,C:240,T:1245591399,E:-232701,N:185100,Z:3600,Y:1#

#### Raw Example

To set a time of 14:36:39 on 1st July 2009, at a location of longitude W 064°38'21" and latitude N 51°25'00", in time zone +01:00, with DST applied:

0x000100F0 0x4A3E3767 0xfffC7303 0x0002D30C 0x00000E10 0x00000001 0x00000000 0x00000000 0x00000000 0x00000000

### 241 - Set Time

Allows the system time to be set.

#### Command

Command (241), Local System Time (seconds since 00:00:00, 1st Jan 1970)

#### ASCII Example

To set a time of 14:36:39 on 21st June 2009:

>V:1,C:241,T:1245591399#

#### Raw Example

To set a time of 14:36:39 on 21st June 2009:

0x000100F1 0x4A3E3767 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

### 242 - Set Longitude

Allows the longitude to be set.

### Command

Command (242), Longitude (H ddd°mm'ss")

### ASCII Example

To set a longitude W 064°38'21":

>V:1,C:242,E:-232701#

### Raw Example

To set a longitude W 064°38'21":

0x000100F2 0x00000000 0xfffC7303 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

## 243 - Set Latitude

Allows the latitude to be set.

### Command

Command (243), Latitude (H dd°mm'ss")

### ASCII Example

To set a latitude N 51°25'00":

>V:1,C:243,N:185100#

### Raw Example

To set a latitude N 51°25'00":

0x000100F3 0x00000000 0x00000000 0x0002D30C 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

## 244 - Set Time Zone

Allows the time zone to be set. This is the local time subtracted from GMT time.

### Command

Command (244), Time Zone Difference (-12..12 hours calculated in seconds)

### ASCII Example

To set a time zone for New York:

>V:1,C:244,Z:18000#

### Raw Example

To set a time zone for New York:

0x000100F4 0x00000000 0x00000000 0x00000000 0x00000E10 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

## 245 - Set Daylight Saving Time

Allows DST to be set.

### Command

Command (245), DST (1=ON, 0=OFF)

### ASCII Example

To apply DST:

>V:1,C:245,Y:1#

### Raw Example

To apply DST:

0x000100F5 0x00000000 0x00000000 0x00000000 0x00000000 0x00000001 0x00000000 0x00000000 0x00000000 0x00000000

## Related Topics

- Configuration Command Table
- Query Command and Reply Descriptions
- Query Commands Table
- Query Reply Tables
- Control Command Table
- Control Command Descriptions
- HelvarNet Overview
- Routing Entries
- Error / Diagnostic Messages
- Messages
- Command Format

# Configuration Commands Table

Notes:

- See Word / Parameter Formats below the following tables for guidance on Words in raw format and parameters in ASCII format.
- When you send a command, if you have entered an invalid parameter or it has been sent to a device *A physical item with which you can interact, either directly or via Designer.*, router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* or cluster that does not exist, then you will receive an error message describing what is wrong with the command. *See Error / Diagnostic Messages*.

## ASCII Format

Note:

- In an ASCII string, the parameters are not required to be in the order shown below.

| Name | Parameters | | | | | |
|---|---|---|---|---|---|---|
| Store Scene *Collection of lighting levels for each channel assigned to the same group as the scene.* (Group) | Command Number 201 | Group 1..16383 | Force Store Block 1..8 Scene 1..16 | Level 0..100% | | |
| Store Scene (Device) | Command Number 202 | Cluster 1..253 Router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing* | Subnet *A subnet is a part of a Router, and there are two or more Subnets on each Router. It allows the flow of network traffic between hosts to be segregated, based on network configuration.* | Force Store Block 1..8 Scene 1..16 | Level 0..100% **Special values:** 253=Last Level; 254=Ignore | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | *and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* 1..254 | *By organising hosts into logical groups and joining them, subnetting, network security and performance can be improved.* 1..4 Device 1..255 | | | |
| Store As Scene (Group) | Command Number 203 | Group 1..16383 | Force Store Block 1..8 Scene 1..16 | | | |
| Store As Scene (Device) | Command Number 204 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | Force Store Block 1..8 Scene 1..16 | | |
| Reset Emergency Battery and Total Lamp Time (Group) | Command Number 205 | Group 1..16383 | | | | |
| Reset Emergency Battery and Total Lamp Time (Device) | Command Number 206 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | | | |
| Set Time and Location | Command Number 240 | Local System Time no. of seconds since 1st January 1970 | Longitude Hemisphere, hours, minutes and seconds in decimal form | Latitude Hemisphere, hours, minutes and seconds in decimal form | Time Zone -12..12 (GMT *Stands for Greenwich Mean Time. The time (based on the Earth's movement) at the Greenwich Meridian in England. The Greenwich Meridian is the starting point for all Time* | DST 1=ON / 0=OFF |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | *Zones in the world. Now superceded by UTC. See also UTC.*) | |
| Set Time | Command Number 241 | Local System Time<br>no. of seconds since 1st January 1970 | | | | |
| Set Longitude *An imaginary line that extends from the North Pole to the South Pole of Earth. Each line is referred to by the angle between it and the line at 0 degrees longitude (known as the Greenwich Meridian). Each line is therefore known as an angle of longitude.* | Command Number 242 | | Longitude | | | |
| Set Latitude *An imaginary line that extends horizontally around the Earth. Each line is referred to by the angle between it* | Command Number 243 | | | Latitude | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| *and the line at 0 degrees latitude (known as the Equator). Each line is therefore known as an angle of latitude.* | | | | | | |
| Set Time Zone | Command Number 244 | | | | Time Zone -12..12 (GMT) | |
| Set DST | Command Number 245 | | | | | DST 1=ON / 0=OFF |

## Raw Format

| **Name** | **Command Number Word1 (32 bit)** | **Word 2 (32 bit)** | **Word 3 (32 bit)** | **Word 4 (32 bit)** | **Word 5 (32 bit)** | **Word 6 (32 bit)** | **Word 7 (32 bit)** | **Word 8 (32 bit)** | **W 9 (3 bi** |
|---|---|---|---|---|---|---|---|---|---|
| Store Scene *Collection of lighting levels for each channel assigned to the same group as the scene.* (Group) | 201 | Group 1..16383 | 0 | Force Store (MSBit) Block 1..8 Scene 1..16 | 0 | 0 | Level 0..100% | 0 | 0 |
| Store Scene ( Device ) | 202 | Cluster 1..253 Router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing* | Subnet 1..4 Device 1..255 | Force Store (MSBit) Block 1..8 Scene 1..16 | 0 | 0 | Level 0..100% | 0 | 0 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | *and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* 1..254 | | | | | | | |
| Store As Scene (Group) | 203 | Group 1..16383 | 0 | Force Store (MSBit) Block 1..8 Scene 1..16 | 0 | 0 | 0 | 0 | 0 |
| Store As Scene (Device) | 204 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | Force Store (MSBit) Block 1..8 Scene 1..16 | 0 | 0 | 0 | 0 | 0 |
| Reset Emergency Battery and Total Lamp Time (Group) | 205 | Group 1..16383 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reset Emergency Battery and Total Lamp Time (Device) | 206 | Cluster 1..253 Router 1..254 | Subnet 1..4 Device 1..255 | 0 | 0 | 0 | 0 | 0 | 0 |
| Set Time and Location | 240 | Local System Time no. of seconds since 1st January 1970 | Longitude hemisphere, hours, minutes, and seconds in decimal form | Latitude Hemisphere, hours, minutes and seconds in decimal form | Time Zone - 12..12 (GMT) | DST (LSBit) 1=ON / 0=OFF | 0 | 0 | 0 |
| Set Time | 241 | Local System | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Set Longitude | 242 | 0 | Longitude | 0 | 0 | 0 | 0 | 0 | 0 |
| Set Latitude | 243 | 0 | 0 | Latitude | 0 | 0 | 0 | 0 | 0 |
| Set Time | 244 | 0 | 0 | 0 | Time Zone | 0 | 0 | 0 | 0 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Zone | | | | | -12..12 (GMT) | | | | |
| Set DST | 245 | 0 | 0 | 0 | 0 | DST (LSBit) 1=ON / 0=OFF | 0 | 0 | 0 |

## Word / Parameter Formats

Note:

- See Control Command Word Formats for Word formats not given here.

### Force Store / Block / Scene

If a *channel A channel pertaining to a Load (also known as Control Gear or LIU), see entry for Load. A ballast has one channel whereas a dimmer or relay unit can have numerous channels.* has been configured to be ignored by a scene, the Force Store flag can be used (by using the value of 1) to override this, and thus the channel's output will go to the desired level when the scene is recalled.

### Raw Format

| 31.....24 | | 23.....16 | | 15.....8 | 7.....0 | |
|---|---|---|---|---|---|---|
| **Force [31]** | 0 0 0 0 0 0 0 | 0 0 0 0 | **Block [19:16]** | 0 0 0 0 0 0 0 0 | 0 0 0 | **Scene [4:0]** |
| Byte 3 | | Byte 2 | | Byte 1 | Byte 0 | |
| | | | | | | |

### ASCII Format

Force Store = 1 (True) or 0 (False), Block = 1..8, Scene = 1..16

### Local System Time

### Raw Format

| 31.....24 | 23.....16 | 15.....8 | 7.....0 |
|---|---|---|---|
| **Local System Time [31:0]** | | | |
| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
| | | | |

### ASCII Format

The ASCII and raw time value is calculated in seconds from 00:00:00, 1 January 1970.

| System Time Value | ASCII | Raw |
|---|---|---|
| 1 second | 1 | 0x00000001 |
| 60 seconds (1 minute) | 60 | 0x0000003C |

| | | |
|---|---|---|
| 60 minutes (1 hour) | 3600 | 0x00000E10 |
| 24 hours (1 day) | 86400 | 0x00015180 |
| 1 year (365 days) | 31536000 | 0x01E13380 |

### Longitude and Latitude

Note:

- For general information about longitude and latitude, see Longitude and Latitude.

The longitude and latitude values are calculated as follows:

### Raw Format

**Longitude**

| 31.....24 | 23.....16 | 15.....8 | 7.....0 |
|---|---|---|---|
| **Longitude [31:0]** | | | |
| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
| | | | |

**Latitude**

| 31.....24 | 23.....16 | 15.....8 | 7.....0 |
|---|---|---|---|
| **Latitude [31:0]** | | | |
| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
| | | | |

### ASCII Format

51°25’00” = (51 x 3600 seconds) + (25 x 60 seconds) + (0 x 1 second) = 185100

**S** = negative of N and **W** = negative of E (for Raw format, use two’s complement to represent negative values)

| Latitude | ASCII | Raw |
|---|---|---|
| N: 51°25’00” | N: 185100 | 0x0002D30C |
| S: 51°25’00” | N: -185100 | 0xfffD2CF4 |

| Longitude | ASCII | Raw |
|---|---|---|
| W: | E: - | 0xfffB8734 |

| | | |
|---|---|---|
| 81°24'28" | 293068 | |
| E: 170°28'48" | E: 613728 | 0x00095D60 |

### Time Zone

#### Raw Format

| 31.....24 | 23.....16 | 15.....8 | 7.....0 |
|---|---|---|---|
| **TimeZone [31:0]** | | | |
| Byte 3 | Byte 2 | Byte 1 | Byte 0 |

#### ASCII Format

Time Zone Difference = -12..12 hours calculated in seconds.

### Daylight Saving Time (DST)

#### Raw Format

| 31.....24 | 23.....16 | 15.....8 | 7.....0 |
|---|---|---|---|
| 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 **1** |
| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
| | | | |

#### ASCII Format

Daylight Saving Time = 1 (ON) / 0 (OFF)

## Related Topics

- Configuration Command Descriptions
- Command Format
- Control Command Descriptions
- Control Command Table
- Query Command and Reply Descriptions
- Query Reply Tables
- Query Command Table
- HelvarNet Overview
- Messages
- Routing Entries
- Error / Diagnostic Messages
- Longitude and Latitude

# Error / Diagnostics

The routers are capable of providing useful diagnostic information for all possible Ethernet I/O messages received from a 3rd party *device A physical item with which you can interact, either directly or via Designer.*. The diagnostic response can provide information concerning whether a message was successful, was invalid or was not appropriate for a specified address. Obviously successful queries will simply be replied with the answer, however if the query is invalid or does not contain the correct parameters then an error diagnostic will be returned, instead of the expected answer, with the original query. For lighting or configuration commands diagnostic information is available on demand and is achieved by specifying that you want this information returned using the Ethernet I/O 'Acknowledgment' feature. In the ASCII format this will mean attaching the parameter ID 'A' with a parameter value of 1 or in the RAW format by switching the 'Acknowledgment' flag on in the command word.

The following table shows you the raw value and ASCII description for each error message:

| Raw Value | ASCII Description |
|---|---|
| 0 | Success |
| 1 | Error - Invalid group index parameter |
| 2 | Error - Invalid cluster parameter |
| 3 | Error - Invalid router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* parameter |
| 4 | Error - Invalid subnet *A subnet is a part of a Router, and there are two or more Subnets on each Router. It allows the flow of network traffic between hosts to be segregated, based on network configuration. By organising hosts into logical groups and joining them, subnetting, network security and performance can be improved.* parameter |
| 5 | Error - Invalid device parameter |
| 6 | Error - Invalid sub device parameter |
| 7 | Error - Invalid block parameter |
| 8 | Error - Invalid scene *Collection of lighting levels for each channel assigned to the same group as the scene.* parameter |
| 9 | Error - Cluster does not exist |
| 10 | Error - Router does not exist |
| 11 | Error - Device does not exist |
| 12 | Error - Property does not exist |

| | |
|---|---|
| 13 | Error - Invalid RAW message size |
| 14 | Error - Invalid messages type |
| 15 | Error - Invalid message command |
| 16 | Error - Missing ASCII terminator |
| 17 | Error - Missing ASCII parameter |
| 18 | Error - Incompatible version |

The error message contains the command data which was sent, followed by the data concerning the erroneous command. *See below for an example error message in ASCII and raw formats.*

## Example

### ASCII Format

If you send the following Query Device type command:

>V:1,C:104,@:2.2.1.1#

If the device does not exist, then the reply will be:

!V:1,C:104,@:2.2.1.1=11#

### Raw Format

If you send the following Query Device type command:

0x00010068 0x00020002 0x00010001 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000

If the device does not exist, then the reply will be:

0x02010068 0x00020002 0x00010001 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 **0x0000000B**

**Related Topics**

- Configuration Command Descriptions
- Configuration Command Table
- Command Format
- Control Command Descriptions
- Control Command Table
- Query Command and Reply Descriptions
- Query Reply Tables
- Query Command Table
- HelvarNet Overview
- Messages
- Scene Triggered Ethernet I/O
- Routing Entries

# HelvarNet Routing Entries

Routing entries of the following type allow generic data transmission over Ethernet:

- ETHERNET TRANSMIT triggered by a group / block / scene *Collection of lighting levels for each channel assigned to the same group as the scene.* recall: This causes transmission of a generic string, from a single router *In the sense of a Lighting System, a Router is an intelligent device whose software and hardware perform the tasks of routing and forwarding messages (data) from Control Devices to the Control Gear. A Router contains two or more Subnets.* .

When the entry is triggered, a connection to the third party *device A physical item with which you can interact, either directly or via Designer.* is instigated from the router. The *IP address Internet Protocol (IP) is a four-byte address that uniquely identifies the device to which it is assigned on the network. This address conforms to IPv4 standard. Each router broadcasts packets of information via IP. A router acts only upon instructions sent to its unique IP address.* and port to which the connection to the third party device is made is determined from the routing entry's configuration:

- To send TCP *Stands for Transmission Data Protocol. TCP is one of the core protocols of the Internet Protocol Suite. It was one of the two original components, with Internet Protocol (IP), of the suite, so that the entire suite is commonly referred to as TCP/IP. Whereas IP handles lower-level transmissions from computer to computer as a message makes its way across the Internet, TCP operates at a higher level, concerned only with the two end systems, for example, a Web browser and a Web server. In particular, TCP provides reliable, ordered delivery of a stream of bytes from a program on one computer to another program on another computer. (See also TCP/IP).* messages from the router to the third party device, the router connects to a listener port provided in the third party device. It is recommended that this listener port is in the range of 49152 to 65535.
- To send UDP *Stands for User Datagram Protocol. UDP is one of the core members of the Internet Protocol Suite, the set of network protocols used for the Internet. With UDP, computer applications can send messages, in this case referred to as datagrams, to other hosts on an Internet Protocol (IP) network, without requiring prior communications to set up special transmission channels or data paths.* messages from the router to the third party device, it is recommended that the destination port in the third party device is in the range of 49152 to 65535.
- Additionally, the IP address of the router that is responsible for the transmission of the generic string also needs to be configured.

*See Scene Triggered Ethernet I/O to learn how to configure this type of routing entry.*

## Related Topics

- Configuration Command Descriptions
- Configuration Command Table
- Command Format
- Control Command Descriptions
- Control Command Table
- Query Command and Reply Descriptions
- Query Reply Tables
- Query Command Table
- HelvarNet Overview
- Messages
- Error / Diagnostic Messages

- Scene Triggered Ethernet I/O

## Times, Dates and Global Positions

# Date and Times

Designer uses the *PC Stands for Personal Computer.* clock to obtain the date and time, and Time Zone. Therefore, Designer's efficacy with regard to time-dependent events depends on the accuracy of the PC clock. *Ensure that your PC clock is set correctly.*

## Date Notation

Designer uses **dd-Mmm-yyyy** notation, representing the day using two digits (**dd**), the month as three letters (**Mmm**), the year as four digits (**yyyy**), and using a hyphen (**-**) as a separator. For example, **09-Nov-2008** is the ninth day of November in 2008, and **12-Jul-2009** is the twelfth day of July in 2009.

## Time Notation

Designer uses 24-hour, **hh:mm:ss.th** notation for time, representing hours (**hh**), minutes (**mm**), seconds (**ss**), and using a colon (**:**) as a separator. This notation also includes tenths and hundredths of seconds (**th**), where appropriate.

In 24-hour notation, the 24 hours of a day are numbered from 0 to 23. This means that the midnight hour is 0 (zero), midday is 12, and 9 o'clock at night is 21. For example, **00:00:00** is midnight, **23:59:59** is one second before midnight, **08:00:00** is eight o'clock in the morning, **00:00:00.20** is two tenths of a second (200 milliseconds) after midnight.

## Sunrise and Sunset Considerations

Sunrise, sunset, dawn and dusk times depend on your location, the date and daylight savings.

Designer can determine the sunrise and sunset times for the current date, using the latitude and longitude values provided to it. However, we recommend that you do not use time settings relative to sunrise and sunset if travelling between Time Zones, or located in-between Time Zones e.g. on the border of two countries.

Dawn, the time at which the sky starts to brighten, is typically 30 minutes before sunrise.

Dusk, the time at which the sky finishes darkening, is typically 30 minutes after sunset.

The offset property of a schedule that is using sunrise or sunset times can be used to approximate dawn and dusk times.

**Related Topics**

- Time Zones
- Longitude and Latitude
- Conditions

# Time Zones

Helvar

## Daylight Saving Time

Daylight Saving Time (also known as Summer Time) is local standard time adjusted to achieve longer evening daylight, especially in summer, by setting clocks one hour ahead of local standard time. In Daylight Saving Time, the sun rises one hour later in the morning, and sets one hour later in the evening. This has the principal benefit of saving energy, as less artificial light is needed during the evening. Later in the year, Daylight Saving Time is ended, and clocks are set back, returning them to standard local time. The date on which Daylight Saving Time begins or ends is called the **Transition**.

For a *lighting system* *A network of Client PCs, Routers, Control Devices, Control Gear and lamps.* installed on a ship, Daylight Saving Time is complicated for several reasons:

- Some countries do not use Daylight Saving Time, or use it in differing ways.
- Some countries may change Transition, if circumstances make it advantageous.
- Daylight Saving Time is a seasonal event. This means that while countries in the northern hemisphere are having summer, countries in the southern hemisphere are having winter. Hence, different countries may use Daylight Saving Time at different times of the year.
- Daylight Saving Time is a regional event, with neighbouring countries setting different local Daylight Saving Times. Furthermore, some countries near the equator do not use it at all as the hours of daylight vary insufficiently to require it.

Tip:

- If you are travelling between different Time Zones and using Scheduler to time-schedule events, to ensure that the PC *Stands for Personal Computer.* on which you use Designer is always set the to correct Time Zone and Daylight Saving Time, connect it to a GPS receiver *A GPS (see GPS entry) receiver receives signals from the Global Navigation Satellite System, in order to determine its location, time, speed and direction.* .

**Related Topics**

- Dates and Times
- Longitude and Latitude
- Options

# Longitude and Latitude

Helvar

Note:

- Setting your location, using longitude *An imaginary line that extends from the North Pole to the South Pole of Earth. Each line is referred to by the angle between it and the line at 0 degrees longitude (known as the Greenwich Meridian). Each line is therefore known as an angle of longitude.* and latitude *An imaginary line that extends horizontally around the Earth. Each line is referred to by the angle between it and the line at 0 degrees latitude (known as the Equator). Each line is therefore known as an angle of latitude.* coordinates, is important for Designer to accurately set the dawn and dusk times. *See Sunrise and Sunset Considerations*.

## Lines of Longitude

A line of longitude is an imaginary line that extends from the North Pole to the South Pole of Earth. Each line is referred to by the angle between it and the line at 0 degrees longitude (known as the Greenwich Meridian). Each line is therefore known as an angle of longitude.

## Lines of Latitude

A line of latitude is an imaginary line that extends horizontally around the Earth. Each line is referred to by the angle between it and the line at 0 degrees latitude (known as the Equator). Each line is therefore known as an angle of latitude.

Any position on Earth can be identified as the point where a line of longitude and a line of latitude intersect. This point is normally written in terms of these two angles, with an indication of whether the angle of longitude is East or West of the Greenwich Meridian, and whether the angle of latitude is North or South of the Equator.

| | |
|---|---|
| Latitude | N 51°25'00" |
| Longitude | E 000°13'00" |

Longitude and Latitude can be configured in the properties of the Workgroup (see Workgroup Configuration). This example shows a latitude of 51 degrees, 25 minutes and 0 seconds North of the Equator, and a longitude of 0 degrees, 13 minutes and 0 seconds East of the Greenwich Meridian.

Angles are described in terms of three units: degrees, minutes and seconds. One degree is made up of 60 minutes. One minute is made up of 60 seconds. In an angle, the degrees are denoted by the symbol **°**; the minutes are denoted by **'**; and the seconds denoted by **"**.

**Related Topics**

- Time Zones

- Dates and Times