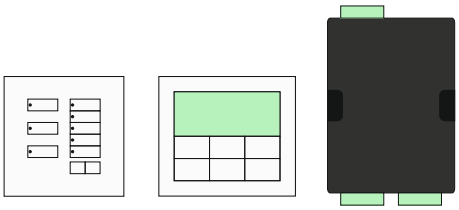
North

The LutronQS Driver



The LutronQS driver interfaces to a Lutron HomeWorks QS, Quantum, or QS Standalone lighting control system. Available for Commander and ObSys.

This document relates to LutronQS driver version 1.1

Please read the *Commander Manual* or *ObSys Manual* alongside this document, available from *www.northbt.com*

Contents

Compatibility with the Lutron System

The LutronQS driver allows North to interface with a Lutron HomeWorks QS, Quantum, or QS Standalone lighting control system.

The driver connects via an Ethernet network, to a single Lutron Integration Access Point (Fig. 1). Compatible access points include the HomeWorks QS Processor (HQP6-2) and QS Network Interface (QSE-CI-NWK-E).

Two alternative Lutron compatible drivers are also available: the LutronHW driver interfaces to the HomeWorks series processor, and the BACnetIP driver interfaces to the Lutron Quantum BACnet Integration module.

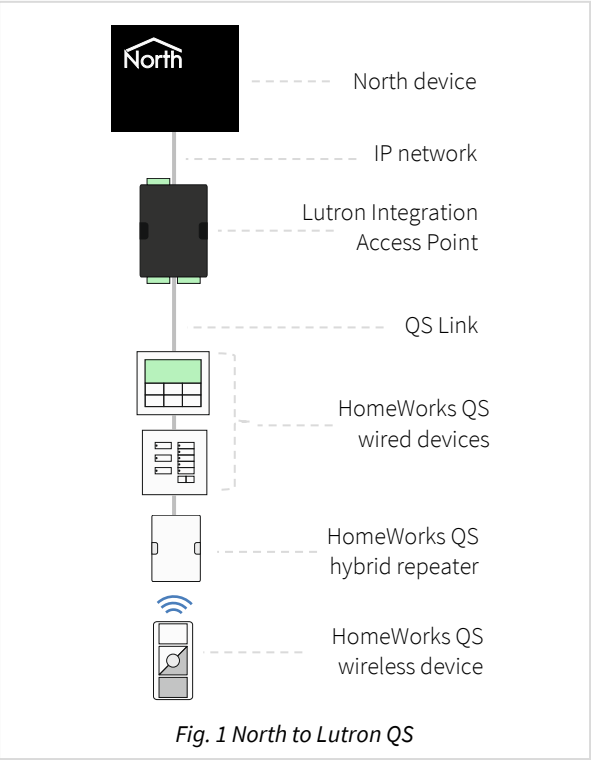


Fig. 1 North to Lutron QS

Equipment

Lutron product ranges compatible with the driver include:

- HomeWorks QS home control system
- Quantum commercial lighting and shade control system
- QS Standalone lighting control system

Values

Depending on the type of Lutron equipment connected to the Integration Access Point, the driver can typically access the following values:

- Device input LED state
- Device input button actions
- Device input light level
- Device input battery status
- Output device zone level
- HVAC controller temperature
- HVAC controller heat/cool setpoint
- HVAC controller mode
- Area occupancy state
- Area scene
- Time-clock event

Prerequisites

IP Networking

Set the IP address of the Lutron Integration Access Point to the same range assigned to the North device. With a QS Network Interface, the default IP address is 192.168.250.1. With a HomeWorks QS Processor, change the IP address from DHCP assigned to a static value.

Integration IDs

Before a device, output, time clock, etc. can be accessed, it must be assigned a **numeric** Integration ID within the Lutron system. The driver will only scan up to ID 500 but can handle IDs greater than this. Lutron software can automatically assign Integration IDs for each component during system setup.

Remote Ports

If you are connecting to an Integration Access Point via a firewall, then the driver will require access to TCP port 23 on Lutron.

Communications Limits

The Lutron system may begin to slow down if requests are sent too frequently to the Integration Access Point. If this problem is experienced, then increase the time between read and write requests from the North system. When using an ObVerse Processor, check the frequency between object read and write requests as these can make many requests in a short period. Also consider enabling Monitoring Mode.

Detailed Operation

There are two ways the driver can request values from the Lutron system: by polling values or by using monitoring events.

Use the Monitoring Mode object (CM) in the driver setup to set which method the driver uses.

Monitoring Mode

If the Monitoring Mode is set to 'None', the driver works supports real-time polling of values. The driver requests a value from the Lutron system when an object is read. No values are remembered by the driver. This is the default operation.

If the Monitoring Mode for an item-type is enabled, such as for HVAC controllers or Outputs, the driver instructs the Lutron system to monitor the items of that type and notify it of any changes. As changes arrive from Lutron, the values are remembered by the driver.

When an object is read, if the value has already been received from the Lutron system, this value is returned without making a request to Lutron. If the value has not been received, the driver requests the value as with polling mode, then additionally stores the response for future use.

To prevent stored values from becoming out-of-date, the driver clears its memory of these values after approximately 6 hours. This causes values in memory to be re-requested if needed unless they have been re-sent by the Lutron system.

The benefits of monitoring include:

- Objects can be read more quickly from memory, so the driver doesn't need to poll as often
- Lutron receives fewer requests, so has more time to do other things

However, once monitoring is enabled for an item-type, the driver receives every change for every item of the item-type, even if you are only interested in a few IDs. This could be significant and produce a greater volume of traffic than polling alone.

Enable monitoring only for the item-types required, HVAC controllers or outputs, when you require faster access to these items.

Scanning for HVAC items

The driver supports scanning to determine the available Integration IDs available. Unfortunately, the Lutron system does not respond to scans for HVAC Integration IDs, so these need to be added manually.

To add a HVAC item at a known Integration ID to a completed scan, follow these steps:

- Navigate to the LutronQS System object, which shows the scanned list of Lutron items.
- From the menu, choose **Object, Edit Contents...** The Object Editor shows the Lutron QS System object contents - a list of Integration types available
- In the Object Editor window's menu, choose **Item, Add...** to show the Add Object popup
- In the Add Object popup, set the **Reference** value to 'H<IID>' (where <IID> is the numeric Integration ID of the HVAC item in the Lutron; set the **Type** to '!LutronQS v11\HVAC'; set the **Label** to any useful text.
- In the Add Object popup, press **OK** to close the Add Object popup and add the HAVC object to the list.
- On the Object Editor window, press the top-right **X** to close the Object Editor; a Save Changes confirmation is needed to finally save the new contents file, and close the Object Editor.
- Finally, on the main Engineering window press the **Refresh** button to view the new list of Lutron items, including the added HVAC object. Manual changes will be lost if you rescan the LutronQS System object!

If Monitoring Mode is enabled for HVAC items, then object scanning will return any known HVAC items from memory. Therefore, to save object editing, force the Lutron system to send HVAC item changes before scanning the LutronQS System for objects.

Using the Driver

On ObSys and Commander, the driver is pre-installed. On all these North devices, you can use the driver to create an interface to Lutron. Once started, you will need to configure the driver before it can communicate with the Lutron system.

Starting the Interface

To start an interface using the LutronQS driver, follow these steps:

- → **Start Engineering** your North device using ObSys
- → Navigate to **Configuration, Interfaces,** and set an unused **Interface** to 'LutronQS' to start the interface
- → Navigate to the top-level of your North device and re-scan it

The driver setup object (Mc), labelled **LutronQS Setup**, should now be available. If this object is not available, check an interface licence is available and the driver is installed.

Setting up the Driver

To set up the driver, follow these steps:

- → Navigate to the **LutronQS Setup** object (Mc). For example, if you started interface 1 with the driver earlier, then the object reference will be 'M1'
- → Set the **Lutron IP Address** object (SIA) to the IP address of the Lutron Integration Access Point
- → Set the **Telnet User** (TU) and **Telnet Password** (TP) objects to match those configured in the Lutron Integration Access Point. The Homeworks QS requires both, the QS Standalone requires only the Telnet User.

Checking Communications

You can check that the interface is communicating by reading the **Device Communicating** object (DS). A value of 'yes' indicates the driver is communicating with the LutronQS system.

Object Specifications

Once an interface is started, one or more extra objects become available within the top-level object of the device. As with all North objects, each of these extra objects may contain sub-objects, (and each of these may contain sub-objects, and so on) – the whole object structure is a multi-layer hierarchy. It is possible to navigate around the objects using the ObSys Engineering Software.

Each object is specified below, along with its sub-objects.

Example Object Reference

An example of a reference to an object in the same device: the LutronQS system object (S1) contains a keypad Device 20 (D20), which contains an LED at Component 9 (C9), with an LED state object (LS). Therefore, the object reference will be 'S1.D20.C9.LS'.

An example of a reference to an object in a different device: the IP network object (IP) contains Default Commander object (CDIP), which contains the object above (S1.D20.C9.LS) – therefore the complete object reference is 'IP.CDIP.S1.D20.C9.LS'.

Device Top-Level Objects

When an interface is started using the LutronQS driver, the objects below become available within the top-level object of the device. For example, if Interface 1 is started, then the object with references 'M1' and 'S1' become available.

Description	Reference	Type
LutronQS Setup Set up the LutronQS driver, started on interface *c* (*c* is the interface number)	M*c*	Fixed Container: On the Commander platform this will be *[CDM v20\LutronQS v11]* On the ObSys platform this will be *[OSM v20\LutronQS v11]*
LutronQS System Access LutronQS system connected to interface *c* (*c* is the interface number)	S*c*	Variable Container: *[LutronQS v11]*

LutronQS Driver Setup

Object Type: *[OSM v20\LutronQS v11]*
Object Type: *[CDM v20\LutronQS v11]*

The Lutron driver contains the following objects:

Description	Reference	Type
System Label Label displayed when scanning the system object	DL	Obj\Text; Max. 20 chars; Adjustable
Lutron IP Address IP address of the Integration Access Point	SIA	Obj\IP; Adjustable
Telnet User	TU	Obj\Text; Max. 30 chars; Adjustable
Telnet Password Not required by QS Standalone	TP	Obj\Text; Max. 30 chars; Adjustable
Monitoring Mode See *Detailed Operation*. Set to 'None' for polled operation, or enable monitoring for an item-type	CM	Obj\ENum; Adjustable Values: 0=None, 1=HVAC, 2=Outputs, 3=HVAC & Outputs
Interface The type of Lutron access point detected	DT	Obj\ENum Values: 0=Unknown, 1=HWQS, 2=QS-SA
Device Communicating Indicates the driver has connected to the Lutron Integration Access Point	DS	Obj\NoYes

LutronQS System

Object Type: *[LutronQS v11]*

The Lutron QS System includes objects to access device, output, HVAC, area, and timeclock components within the Lutron system. These objects can represent physical items attached to the system, or virtual modules configured in software.

Before a device, output, time clock, etc. can be accessed, it must be assigned a numeric Integration ID. Lutron software automatically generates Integration IDs for each item.

Scan this variable container object to find the list of items available. Currently, only Integration IDs less than 500 are scanned. Include additional IDs by editing the object with Object Editor and add information from the *Integration Report*. Generate the report for your installation using the Lutron software.

Description	Reference	Type
Device *x* Device inputs, such as button presses, releases and contact closure inputs. The integration ID, *x,* is in the range 1…65535	D*x*	Fixed Container: *[LutronQS v11\Device]*
Output *x* Device outputs, such as dimmers, CCOs, etc. The integration ID, *x,* is in the range 1…65535	O*x*	Fixed Container: *[LutronQS v11\Output]*
HVAC *x* HVAC controller. The integration ID, *x,* is in the range 1…65535	H*x*	Fixed Container: *[LutronQS v11\HVAC]*
Area *x* Activate area scene or monitor occupancy. The integration ID, *x,* is in the range 1…65535	A*x*	Fixed Container: *[LutronQS v11\Area]*
TimeClock *x* System time clock event. The integration ID, *x,* is in the range 1…65535	T*x*	Fixed Container: *[LutronQS v11\TimeClock]*

Device

Object Type: *[LutronQS v11\Device]*

The Device object allows control and monitoring of device inputs such as button presses, releases, and contact closure inputs.

Each Lutron device type has a published list of component numbers and their use. For example, a GRAFIK Eye QS device uses component number 70 for a Scene 1 Button.

Generate an *Integration Report* for your installation using Lutron software. This contains a list of component numbers and their usage for each device installed.

Description	Reference	Type
Component *x* The component number, *x*, is in the range 1…2100 and dependent on the type of device.	C*x*	Fixed container: *[LutronQS v11\Device\Comp]*

Device Component

Object Type: *[LutronQS v11\Device\Comp]*

A Device Component supports various actions depending on the type of input. Not all sub-objects are supported by all components.

For example, a GRAFIK Eye QS device has a Scene 1 Button. This only supports press and release actions.

The driver supports the following device component actions using these objects:

Description	Reference	Type
LED State State of LED. May be unavailable. (Action 9)	LS	Obj\OffOn; May be non-adjustable, adjustable, or adjustable-only
Button Press Set value to 'yes' to simulate a press/close/occupied action on the component. May be unavailable. (Action 3)	BP	Obj\NoYes; Adjustable-only
Button Release Set value to 'yes' to simulate a release/open/unoccupied action on the component. May be unavailable. (Action 4)	BR	Obj\NoYes; Adjustable-only
Button Press Release Set value to 'yes' to simulate pressing and releasing the button. May be unavailable. (Action 3 and 4)	BPR	Obj\NoYes; Adjustable-only
Button Hold Set value to 'yes' to simulate a hold action on the component. May be unavailable. (Action 5)	BH	Obj\NoYes; Adjustable-only
Button Multi-tap Set value to 'yes' to simulate a multi-tap action on the component. May be unavailable. (Action 6)	BM	Obj\NoYes; Adjustable-only
Light Level % Light level, as a percentage. May be unavailable. (Action 14)	LL	Obj\Float; May be non-adjustable, adjustable, or adjustable-only Range: 0…100.00
Action *x* Where *x* is in the action number in the range 1...65535 The value will be written as parameters to the Action number	A*x*	Obj\Text; May be adjustable, non-adjustable, or adjustable only; Max. chars=127

Output

Object Type: *[LutronQS v11\Output]*

The Output object allows control and monitoring of device outputs, such as dimmers, CCOs, or other devices in a system that have a controllable output.

Description	Reference	Type
Zone Level (%) (Action 1)	L	Obj\Float: 0…100.00; Adjustable
Action *x* Where *x* is in the action number in the range 1...65535 The value will be written as parameters to the Action number	A*x*	Obj\Text; May be adjustable, non-adjustable, or adjustable only; Max. chars=127

HVAC

Object Type: *[LutronQS v11\Hvac]*

The HVAC object allows control and monitoring of HVAC controllers and temperature sensors. Adjusting the Temperature (object TC), and the availability of some modes depends on how the HVAC controller is configured within the Lutron HomeWorks QS database. For full control, add a '3rd party HVAC' control and set the manufacturer to 'Generic (Via Integration)'.

Description	Reference	Type
Temperature (°C) (Action 15)	TC	Obj\Float; Adjustable; Dps:1 Range: 4…38
Temperature (°F) (Action 1)	TF	Obj\Float; Adjustable; Dps:1 Range: 40…100
Cool Setpoint (°C) (Action 16)	CSPC	Obj\Float; Adjustable; Dps:1 Range: 10…45°C
Cool Setpoint (°F) (Action 2)	CSPF	Obj\Float; Adjustable; Dps:1 Range: 40…103°F
Heat Setpoint (°C) (Action 16)	HSPC	Obj\Float; Adjustable; Dps:1 Range: 10…45°C
Heat Setpoint (°F) (Action 2)	HSPF	Obj\Float; Adjustable; Dps:1 Range: 40…103°F
System Mode (Action 11)	SM	Obj\ENum: 0…2 Values: 0=Normal, 1=Away, 2=Green
Operating Mode (Action 3)	OM	Obj\ENum: 0…7; Adjustable Values: 0=Off, 1=Heat, 2=Cool, 3=Auto, 4=EmHeat, 6=Fan, 7=Dry
Sensor Status Temperature sensor connection status (Action 8) – See Note 1 below	SS	Obj\ENum: 0…3 Values: 0=Ok, 1=Missing, 2=Wired only, 3=No sensor
Schedule Status (Action 7)	SCS	Obj\ENum; Adjustable Values: 0=n/a, 1=Schedule, 2=Permanent Hold, 3=Temporary Hold (read only)
Eco Offset (Action 6)	EO	Obj\Num Range: 1…11°
Eco Mode Enables setback mode (Action 5)	EM	Obj\OffOn; Adjustable
Fan Mode (Action 4)	FM	Obj\ENum: 0…7; Adjustable Values: 0=Auto, 1=On, 2=Cycle, 4=High, 5=Medium, 6=Low, 7=Top
Single Setpoint (°C) (Action 19)	SPC	Obj\Float; Adjustable; Dps:1 Range: 0…100°C
Setpoint Negative Drift (°C) (Action 19)	SPNC	Obj\Float; Adjustable; Dps:1 Range: 0…8°C
Setpoint Positive Drift (°C) (Action 19)	SPPC	Obj\Float; Adjustable; Dps:1 Range: 0…8°C
Single Setpoint (°F) (Action 18)	SPF	Obj\Float; Adjustable; Dps:1 Range: 32…212°C
Setpoint Negative Drift (°F) (Action 18)	SPNF	Obj\Float; Adjustable; Dps:1 Range: 0…15°C
Setpoint Positive Drift (°F) (Action 18)	SPPF	Obj\Float; Adjustable; Dps:1 Range: 0…15°C
Action *x* Where *x* is in the action number in the range 1...65535 The value will be written as parameters to the Action number	A*x*	Obj\Text; May be adjustable, none-adjustable, or adjustable only; Max. chars=127

Note 1: The Sensor Status value is not remembered in Monitoring Mode, therefore a read response indicates the HVAC object is still communicating.

Area

Object Type: *[LutronQS v11\Area]*

The Area object allows control and monitoring of an area – such as activating area scenes, or monitoring occupancy.

Description	Reference	Type
Area Occupied (Action 8)	OS	Obj\NoYes
Scene Set the area to a pre-configured scene. Scene 0 is the Off scene. (Action 6)	S	Obj\Num; Adjustable Range: 0…32
Daylighting Mode (Action 7)	DM	Obj\OffOn; Adjustable
Action *x* Where *x* is in the action number in the range 1...65535 The value will be written as parameters to the Action number	A*x*	Obj\Text; May be adjustable, none-adjustable, or adjustable only; Max. chars=127

TimeClock

Object Type: *[LutronQS v11\TimeClock]*

The TimeClock object allows control of a system time clock.

Description	Reference	Type
Execute Event Set the event number to trigger (Action 5)	X	Obj\Num; Adjustable-only Value: 1…1000
Action *x* Where *x* is in the action number in the range 1...65535 The value will be written as parameters to the Action number	A*x*	Obj\Text; May be adjustable, none-adjustable, or adjustable only; Max. chars=127

Driver Versions

Version	Build Date	Details
1.0	03/03/2014	Driver released
1.0	17/05/2017	Updated log-in for QSE-CI-NWK-E Fix write to Dx.Cx.LL
1.0	06/07/2017	Modification for shades and blinds – added button pre-release object (BPR) Modifications for schedule on display – added object SCS
1.0	15/03/2018	Added separate heating setpoints HSPC and HSPF. Added A# object to allow unsupported actions to be performed. IntegrationIDs now scanned to 512. Extra objects for HVAC integration. Documentation tidy up.
1.0	09/11/2018	Added HVAC Single Setpoint support. Modified °C and °F parameters to return floating-point numbers
1.1	20/02/2020	Added support for HVAC and Output Monitoring. Reduced the scanning limit on IntegrationIds to 500, in line with monitoring value memory

Next Steps…

If you require help, contact support on 01273 694422 or visit *www.northbt.com/support*

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Document issued 17/08/2020.