

Lutron Driver for Tridium Niagara

User Guide

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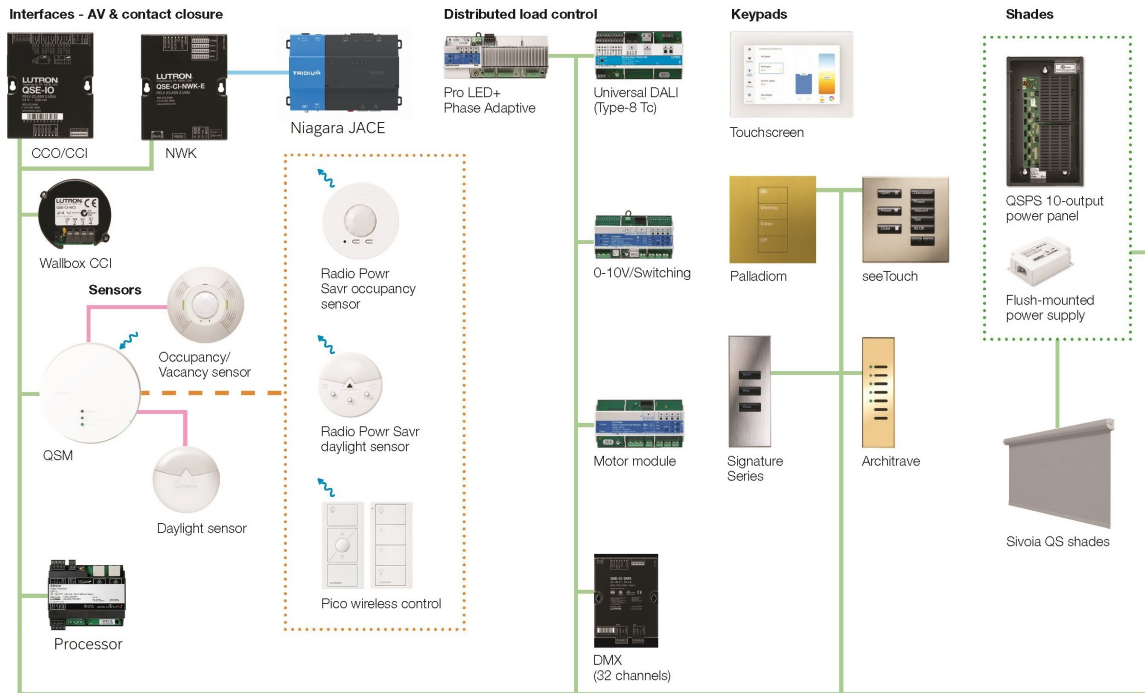


Figure 1: Lutron Athena Architecture

1 Introduction

Lutron Electronics¹ is a leading provider of lighting control systems and solutions for both residential and commercial customers. Founded in 1961 by the inventor of the original dimmer, the company has since expanded its offerings to include motorized shades, blinds and temperature controls. With a strong commitment to innovation and quality, Lutron has become a trusted name in the industry, renowned for its advanced technologies and intuitive user interfaces.

Lutron's lighting control systems allow users to effortlessly adjust the brightness, colour temperature, and ambience of their lights to create the desired atmosphere and enhance comfort. Whether it's a single room or an entire building, Lutron provides scalable solutions that can be customized to meet the specific needs of any space. Lutron's motorized shades and blinds offer convenient control over natural light, privacy, and energy efficiency. They can be seamlessly integrated with the lighting control systems, allowing users to easily manage both lighting and shading preferences.

Lutron's diverse product lineup includes multiple systems catering to a wide range of project sizes and requirements:

System	Type	Communication	Size
Caséta Wireless	Residential	Wireless	Small, 75 devices
RA2 Select	Residential	Wireless	Small, 100 devices
RadioRA2	Residential	Wireless	Medium, 200 devices
HomeWorks	Residential	Hybrid	Large, 10,000 devices
myRoom Plus	Hospitality	Hybrid	Small
Quantum	Commercial	Hybrid	Large, 16,384 switchlegs
Athena	Commercial	Hybrid	Large, 16,384 switchlegs

Each Lutron installation includes one or more processors / main repeaters / smart bridges, keypads and dimmers, as well as optional sensors, shades, thermostats, IO modules, gateways etc.

¹All trademarks or registered trademarks are the property of their respective owners

	QS Standalone	Quantum	RadioRA 2	HomeWorks QS	myRoom plus	Athena
GRAFIK Eye QS	✓	✓	✓	✓	✓	
Energi Savr Node DALI* Universal						✓
Energi Savr Node QS/DALI*	✓	✓		✓	✓	✓
Energi Savr Node QS/ EcoSystem	✓	✓				✓
Energi Savr Node QS/ EcoSystem (Int'l)	✓	✓		✓	✓	✓
Energi Savr Node QS/0-10 V/ Softswitch (Int'l)	✓	✓		✓	✓	✓
Energi Savr Node QS/ Phase-Adaptive (Int'l)	✓	✓		✓	✓	✓
Energi Savr Node QS/0-10 V/ Softswitch	✓	✓				✓
Energi Savr Node QS/ Motor Module (Int'l)	✓			✓	✓	✓
Remote Power Module		✓		✓		
Low-Capacity Switching DIN Power Module (1A/output)				✓	✓	
Low-Capacity Phase-Adaptive DIN Power Module (1A/output)				✓	✓	
Palladiom Keypad		✓		✓	✓	✓
Palladiom Thermostat					✓	
Architrave Keypad	✓	✓		✓	✓	✓
Signature Series Keypad	✓	✓		✓	✓	✓
seeTouch Keypad	✓	✓	✓	✓	✓	✓
seeTouch QS Keypad (Int'l)	✓	✓		✓	✓	✓
Tabletop seeTouch Keypad			✓	✓	✓	
Pico Wireless Control	✓	✓	✓	✓	✓	✓
Hybrid Keypad			✓	✓	✓	
Dynamic Keypad				✓	✓	
Wallbox Input Closure Interface	✓	✓		✓	✓	✓
Sivoia QS Shade	✓	✓	✓	✓	✓	✓
Sivoia QS Wireless Shade					✓	
Sivoia QS Venetian Blind	✓		✓	✓	✓	
Sivoia QS Wireless Venetian Blind				✓	✓	
Maestro Dimmer and Plug-In Module			✓	✓	✓	
Maestro Fan Speed Control			✓	✓	✓	
Visor Control Receiver			✓	✓	✓	
Radio Powr Savr Sensor			✓	✓	✓	
HVAC Controller			✓	✓	✓	
Wireless Temperature Sensor			✓	✓		
QS Input/Output Control Interface	✓	✓		✓	✓	✓
QS Sensor Module	✓	✓		✓	✓	✓
Ketra Devices						✓

Figure 2: Lutron Device Compatibility Matrix

2 Driver Concepts

The Lutron driver for Tridium Niagara communicates with Lutron system via TCP/IP via Lutron Integration Protocol. It is an event-driven protocol: as soon as anything happens in the system (button press, light switching, shade opening, area occupation) it sends a report message to a third-party system, i.e. Niagara.

Niagara driver maps every device to one or many Niagara points. Keypad with 4 buttons can be shown as four **Boolean Points** (to receive button events) or **Boolean Writable** points (to receive and send button events). When the physical button is pressed, the point value becomes true and when it is released, the value becomes false. Niagara points also have actions, which can be used to invoke Lutron actions, and topics, which Niagara fires when it receives a certain report message from Lutron system. These three sets of entities – point value, actions and topics – allow making a very powerful logic in Niagara. For example in addition to a simple monitoring of lights and shades, one can:

- Activate lighting scenes based on schedules, the astronomical clock and online weather service.
- Start HVAC equipment when lights are on.
- Connect multiple Lutron systems – especially budget ones like RA2 Select and Caséta. That allows building bigger systems more cost-effectively.
- Control third-party lights and shades using Lutron keypads. For example, DALI or KNX lights can be switched or dimmed with stylish Lutron keypads.
- Integrate lights with security systems.
- Many other complex control scenarios.

Note: the current revision of the Lutron driver does not support all Lutron commands and actions, e.g. HVAC. If your project requires them, request them via [e-mail](#).

3 Requirements

- Niagara framework host such as Supervisor, JACE or any other Niagara-compatible device
- Lutron driver module and license
- IP address of a compatible Lutron connection point
- Lutron login and password

Below is a list of supported Lutron systems and compatible IP connection points for each system. If your IP device is not in the list, [e-mail](#) our support to check it. The device might be protected with login and password configurable in Lutron software. In some cases it is **lutron : integration**.

Name	IP Device
Caséta Wireless	L-BDGPRO2-WH ²
RA2 Select	RRK-SEL-REP2-BL
RadiaRA2	RRK-MAIN-REP-WH
HomeWorks	HQP6-2
myRoom Plus	GCU-HOSP
QS Standalone	QSE-CI-NWK-E
Athena	QSE-CI-NWK-E
Quantum	QSE-CI-NWK-E

²Caséta Wireless only allows third-party integration if Smart Bridge PRO is used.

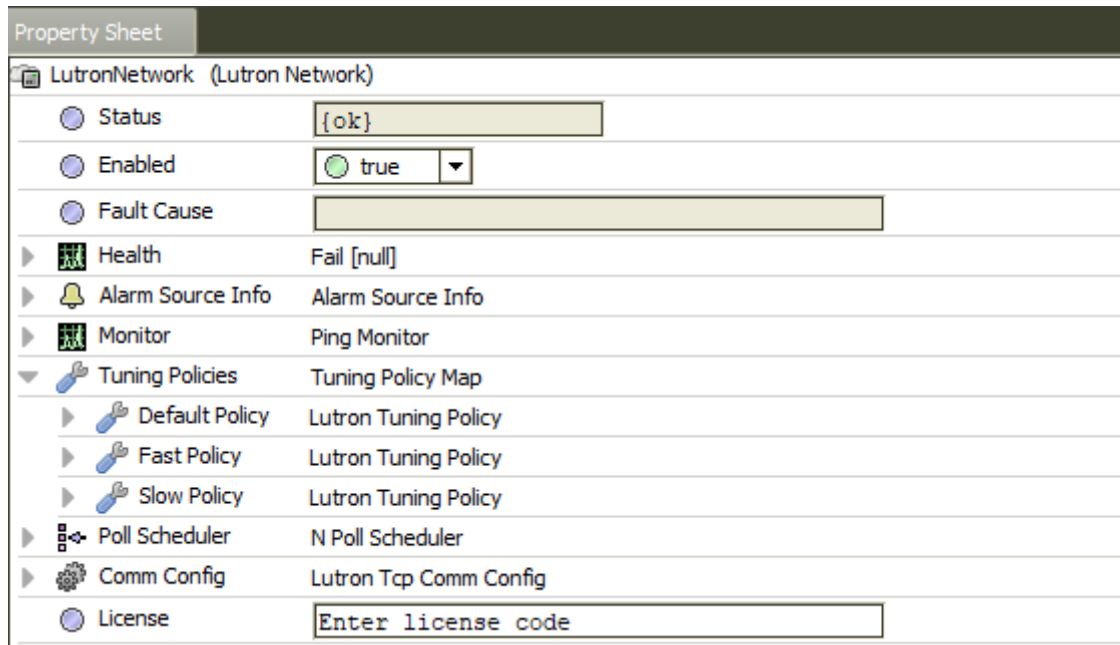


Figure 3: Lutron Network Properties

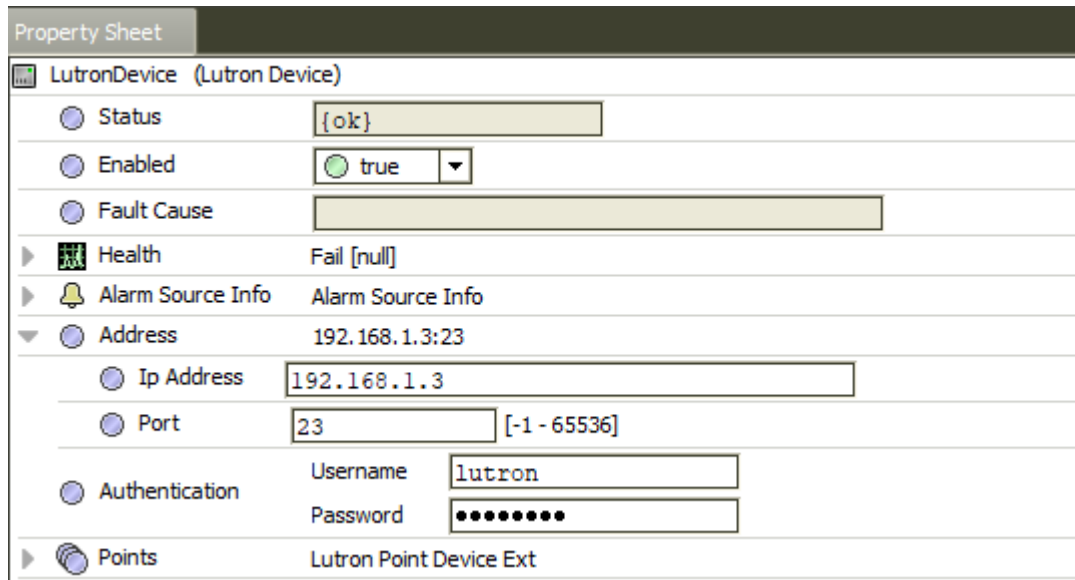
4 Quick Start

1. Copy `lutron-rt.jar` module to Niagara /modules folder of your PC and restart Niagara Supervisor / Workbench.
 - a. If the driver will be hosted on PC: restart Supervisor station.
 - b. If the driver will be hosted on JACE: import the module with all its dependencies into JACE and restart it.
2. Add **Lutron Network** to the station.
3. Enter license code in **License** property under **Lutron Network**.
4. Add **Lutron Device** to the station. Set IP address, username and password. The default port is 23.
5. Open device **Points** extension and add new points.
6. Set point address: Command, Integration Id, Component (only if **Command** is **Device**) and Profile.

5 Lutron Network

Lutron Network contains many standard Niagara properties, as well as a few driver-specific ones:

- **License** – the code which allows the driver to run on your host.
- **Tuning Policies** – policies defining polling rate and point writing logic. Initially, there are three policies with the following polling rates:
 - **Fast** – 15 seconds
 - **Default** – 30 seconds
 - **Slow** – 120 seconds
- **Poll Scheduler** – contains **fast**, **normal** and **slow** polling frequency periods.



Property Sheet	
LutronDevice (Lutron Device)	
Status	{ok}
Enabled	true
Fault Cause	
Health	Fail [null]
Alarm Source Info	Alarm Source Info
Address	192.168.1.3:23
Ip Address	192.168.1.3
Port	23 [-1 - 65536]
Authentication	Username: lutron Password: ●●●●●●
Points	Lutron Point Device Ext

Figure 4: Lutron Device Properties

In most cases only **License** value shall be changed.

6 Lutron Device

After Lutron network properties are set, **Lutron Device Manager** view is used to add devices. **Lutron Device** is an IP device used to connect to the system – see the list of supported IP devices in [Requirements](#). All other Lutron devices – keypads, dimmers, shades – are represented as points under this device. That is because of the event-driven communication model of Lutron system. That’s why in most cases there will be just one **Lutron Device** component under **Lutron Network**.

Lutron Device contains the following properties:

- Ip Address – IP address of Lutron device.
- Port – the default communication port is 23.
- Username and Password – used for authentication and is set in Lutron configuration software. In some systems fixed to **lutron : integration**.

7 Lutron Points

Each Lutron device has a unique Integration ID number assigned during system commissioning. Devices receive and send messages consisted of three main parts:

- Operation – either execute(#), query(?) or report(~)
- Command type – there are many different types, the most common are DEVICE (keypad) and OUTPUT (dimmer)
- Action – “Press”, “Release”, “Output Level”, “Start Raising” etc.

Lutron devices support certain messages depending on their type. For example, a simple keypad may accept execute message to imitate button press & release and it will send a report message every

Database			
Name	Type	Out	Address
● Button 1	Boolean Writable	true {ok} @ def	Device 2.2 Button
● Button 2	Boolean Writable	false {ok} @ def	Device 2.3 Button
● Button 3	Boolean Writable	false {ok} @ def	Device 2.4 Button
● Button 4	Boolean Writable	false {ok} @ def	Device 2.5 Button
● Button 5	Boolean Writable	false {ok} @ def	Device 2.6 Button
● Light	Boolean Writable	true {ok} @ def	Output 3 Level
● Dimmer	Numeric Writable	100.0 {ok} @ def	Output 3 Level
● Scene 1	Boolean Writable	false {stale} @ def	Device 1.1 Button
● Scene 2	Boolean Writable	false {stale} @ def	Device 1.2 Button
● Arriving Home	Boolean Writable	false {stale} @ def	Device 1.3 Button
● Leaving Home	Boolean Writable	false {stale} @ def	Device 1.4 Button

⚙ Edit ✕

Name	Type	Facets	Enabled	Address	Tuning Policy Name
● Button 3	Boolean Writable	trueText=true,falseText=false	true	Device 2.4 Button	defaultPolicy

● **Name**

● **Type** Cannot edit

● **Facets** trueText=true,falseText=false >>

● **Enabled** true

Command

● **Address**

Integration Id

Component

Profile

● **Tuning Policy Name**

Figure 5: Lutron Points

time the button is pressed or released, but it won't accept a query message, as it would add no value for a button. Unlike most building management systems, Lutron protocol does not rely on polling (querying) point values. Instead, it sends report commands on every change and Niagara updates its point values accordingly.

Lutron points are created using **New** button under **points** extension. Each point has the following properties, which specify point addressing:

- **Command** – Lutron command type. Can be **Device**, **Output**, **Shadegrp** etc.
- **Integration Id** – unique numeric address for Lutron device.
- **Component** – only present in **Device** commands and used to address individual buttons, zones, areas, and IO channels.
- **Profile** – determines the type of device and the list of available actions.

Tuning Policy property defines polling and writing strategy – see [Tuning Policy](#) section

There are two ways to determine point properties: an integration report or a traffic log.

The integration report is generated in Lutron software or Lutron app after the system is commissioned. The report might be in XML, JSON or CSV format and contains a list of devices with integration id, command type, component and profile.

NOTE: automatic importing of the integration report will be available in the next release. [Contact us](#) if you require it.

Another option is more suitable for small installations. After the connection with IP devices is established right-click on Station => Spy => logSetup, enable LutronNetwork.Tcp.Comm log and press any Lutron button. In Application Director console you shall see the Lutron message like the one shown below.

Message examples:

- `~DEVICE,1,2,3` – this message is sent when one of keypad buttons is pressed. In Niagara a Boolean Point shall be set as Command = Device, Integration Id = 1, Component = 2, Profile = Button
- `~OUTPUT,4,1,100.00` – this message is sent when dimmer output is changed to 100%. In Niagara a Numeric Point shall be set as Command = Output, Integration Id = 4, Profile = Dimmer

8 Actions and Topics

Lutron system is event-based, so Niagara should be able to receive and send individual events. Although most of Lutron events are mapped to Niagara boolean and numeric points, there are extra components called **actions** and **topics**, which provide extra flexibility when making graphics and logic.

Actions and topics are added to each Niagara points when its **Profile** is set and they are different for every profile.

For example **Button** have actions **Press** and **Release** – invoking them sends a button press or button release event to Lutron network and will make devices react according to system configuration, e.g. a certain light circuit will be switched on or off. Note: if the button is used for switching and not for dimming, then the light-switching device reacts either on press or on release, so it is not necessary to invoke both actions. Actions can be invoked via logic on Niagara wire sheet, linked to Niagara schedules for time-based control, or with the the help of **Action Button** on PX view.

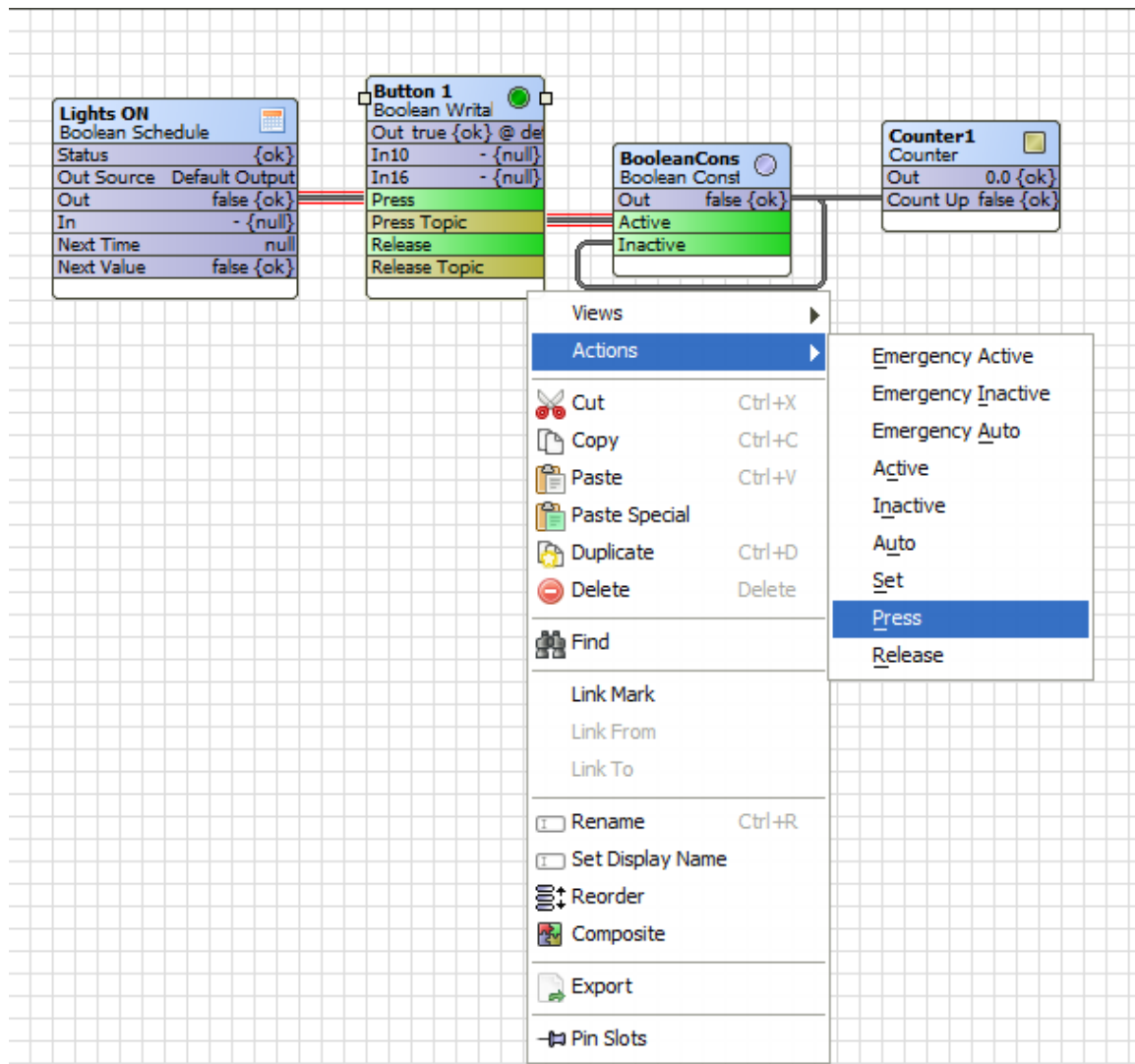


Figure 6: Lutron actions and topics

The same **Button** point has two topics **Press Topic** and **Release Topic**, which will fire when the button is pressed or released either using a physical button or from Niagara. Some external logic can be linked to topics on Niagara wire sheet to initiate certain logic, e.g. start the fan or send MQTT message to IoT Hub on the cloud.

9 Tuning Policy

Tuning policy defines when Niagara reads and writes the point. Writing normally happens when the writable point value is changed either by logic or by a user. In addition, Niagara can write:

- periodically every **Max Write Time** seconds,
- not more often than **Min Write Time** seconds,
- every time station starts,
- when the device goes online,
- when the point is enabled.

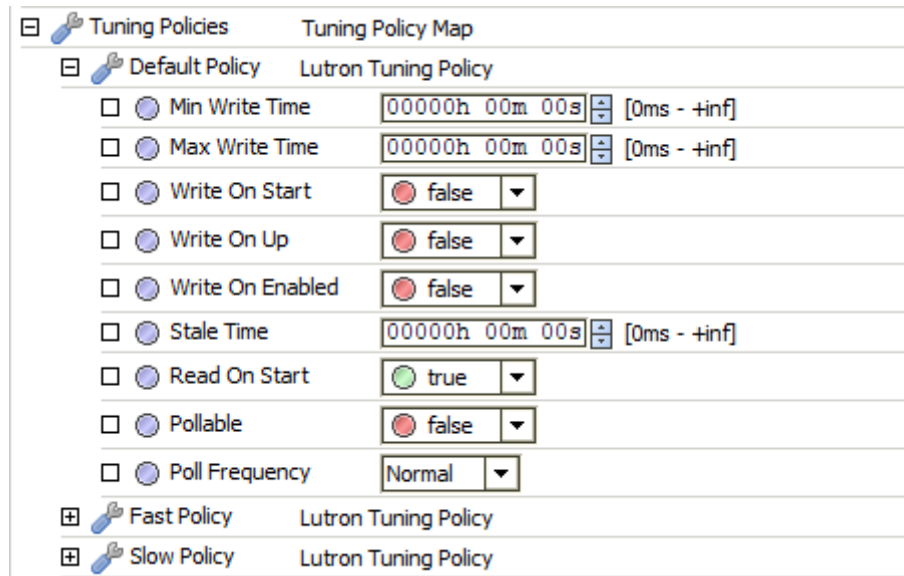


Figure 7: Tuning policy

In Lutron driver point values are updated on each event, e.g. when the button is pressed, its value will become true and when it is released it will be false. In addition to that, the driver can read values when the station starts (**Read On Start**) and even periodically (if **Pollable** is true) every **Poll Frequency** seconds. Not every point can be polled (e.g. button values cannot be polled).

Lutron does **not recommend** using periodical polling or periodical writing as it increases traffic load and in extreme cases can make the system non-responsive. In line with these recommendations, the default policy reads the value once on station start and then only updates it when the event occurs.

10 FAQ

10.1 Communication with Lutron system

I can't establish communication with Lutron system, what shall I check?

- Try to ping Lutron IP device from PC command prompt – there shall be a reply. If not, check communication settings.
- Check if the driver license is valid and is not expired. Restart the station if expired.
- In case the driver is deployed on Supervisor, check if the computer firewall allows traffic to TCP port 23.
- Connect to Lutron IP device TCP port 23 using **telnet** or **putty** software. You shall see **login>** message, enter login & password, then press a button of any Lutron keypad – you shall see a message similar to **~DEVICE,1,2,3**. If you cannot connect or don't see **login>** message, check if third-party integration functionality is enabled in Lutron system.
- Enable Niagara logs (right-click on Station => Spy => logSetup, change all Lutron.* logs to ALL), try to establish connection and send the contents of Application Director to [our support team].