

Gateway Rules (Updated 5-September-23)

What follows is a description of the new feature in the PulseWorx Gateway firmware. Before you can utilize these new features you will need:

- Gateway firmware 2.7
- UPStart version 8.3.33
- PulseWorxApp 1.0.46


To install the 2.7 firmware into the Gateway, follow this PCS application note #302

https://cdn.shopify.com/s/files/1/0152/7169/0340/files/PWX_302_Gateway_Firmware.pdf

A recommendation: While you can use UPStart to update the Gateway firmware, it is recommended that you use the procedure in technical note #302 in the section entitled “Update PulseWorx firmware using Windows FTP” (pages 6-7). The application note has you move the image.bin and version.txt files into the UPStart installation but this isn’t necessary. You can extract the files from the firmware zip file into any folder you want and then change to that folder before you start Windows FTP.

Since this is beta firmware you may have to update the firmware several times during the beta test and the FTP method is easier because it is faster, and you don’t have to move files into the Windows protected folder area.

How ever you do the install of the new firmware, please make sure that when you start UPStart that you use the “Configure” button on the “Network” ribbon category and then the “Connect” button in the “UPB Interface Setup” dialog. This is done so you can see the firmware version in the Gateway. Upon a successful connection, UPStart displays that version number in blue text at the bottom of the window.



Selected powerline interface is operational
(PCS) Powerline Control Systems UPB interface. Firmware version 5.57.
Gateway version 2.7 (1 other clients connected)

Because the firmware file must be named “image.bin” you can, by an easy mistake to make, inadvertently use an older firmware file. Always bets to do this simple check before reporting that rules are not working as expected.

What is a rule?

Using UPStart or PulseWorxApp you can now create one or more “rules” that the Gateway interprets as it is operating. Each rule consists of three parts:

1. Trigger: What causes the rule to be looked at by the Gateway?
2. Condition: What must evaluate to TRUE for the rule action to take effect?
3. Action: What does the rule do?

These are the supported triggers:

- Device going from off to on. Multi-channel devices are supported.

- Device going from on to off. Multi-channel devices are supported.
- Scene activating.
- Scene deactivating.
- The time of day being equal to HH:MM.
- Is light (time just after sunrise)
- Is dark (time just past sunset)

Note that the “time of day” trigger can already be done by a schedule, but schedules don’t have the condition part. This lets you create, in effect, a “conditional” schedule entry.

Important note on the first four triggers listed above: The Gateway must detect a change in state for the trigger to occur. For example, suppose this happens:

1. Scene “X” activates.
2. The rule is triggered.
3. Scene “X” deactivates.
4. Scene “X” activates.
5. The rule is triggered.
6. Scene “X” activates.
7. The rule is NOT triggered because there is no change in the scene state as recorded by the Gateway.

The same logic is used for the “device going on” and “device going off” triggers.

A rule can have zero, one, two, or three conditions. These are evaluated when the trigger occurs. Part of the rule says if ALL conditions must be true, or ANY condition must be true. In the programmer world, this means that the conditions are either ANDed together or ORed together.

These are the supported conditions:

- Is the time between hh:mm and hh:mm? (note that crossing midnight isn’t allowed)
- Is today one of these days of the week?
- Is today this day of the month?
- Is scene “x” currently activated?
- Is scene “x” currently deactivated?
- Is scene “x” currently undefined?
- Is scene “x” currently activated or undefined?
- Is scene “x” currently deactivated or undefined?
- Is device “y” currently on? Multi-channel devices are supported.
- Is device “y” currently off?
- Is device “y” state currently undefined?
- Is device “y” state currently on or undefined?

- Is device “y” state currently off or undefined?
- Is it light?
- Is it dark?

Note that a rule can have no conditions if desired.

The action section of a rule is what happens once the trigger is received and the conditions are met. A rule can have one, two, or three actions. These are the supported actions:

- Activate scene “s”.
- Deactivate scene “s”.
- Change active schedule to one of the 4 Gateway schedules.
- Send a status poll for devices with id “x” to “y”. Replies update the Gateway’s internal state table.
- Activate scene “s” delayed by ‘x’ minutes.
- Deactivate scene “s” delayed by ‘x’ minutes

The delay time cannot be relied upon to be exact. It will be within 30 seconds of the time specified – either plus or minus - due to the Gateway only checking every minute to see if it is time to execute the delayed action.

Here are some example rules:

- *If scene 6 activates on sat/sun between 9am and 6pm then activate scene 10 and deactivate scene 2*
- *If scene 10 activates between 6pm and 11:59pm then activate scene 11*
- If scene 90 activates then change to schedule B
- If scene 6 activates then deactivate scene 6 after 10 minutes

How times work with Rules

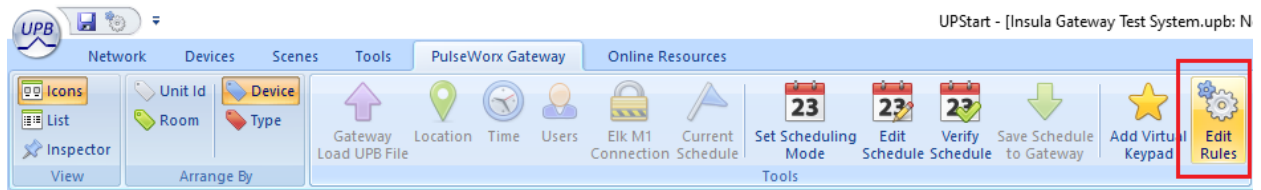
One of the trigger types is a time given by HH:MM. The rule is triggered immediately after the Gateway's internal clock rolls over to the targeted minute. For example, if you specified a trigger of 09:00, the rule would be triggered within a second of the Gateway's clock reaching 09:00.

One of the condition types is “Time between hh:mm and hh:mm”. The way to fully understand how the Gateway operates in evaluating that condition is to pretend that the Gateway clock has no seconds.

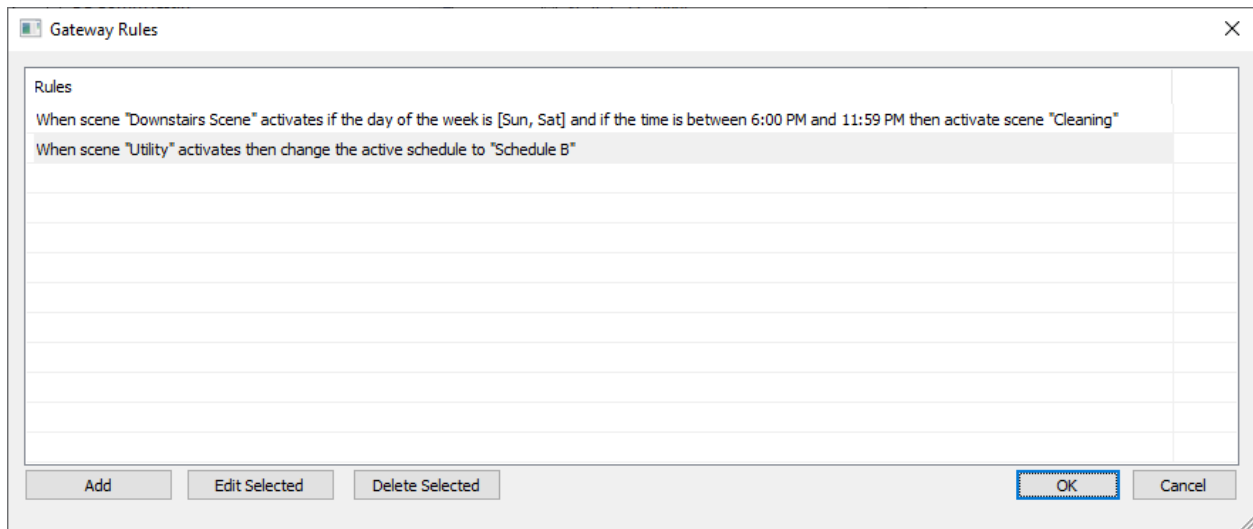
For example, suppose you created a condition of 06:00 to 10:59. This condition will be satisfied after 06:00 and just before 11:00. While you specified the end time as 10:59, the condition is still satisfied for the minute between 10:59 and 11:00. That is, until the hour and minute becomes 11:00.

Working with rules using UPStart

UPStart has been updated to contain a rules editor from the “PulseWorx Gateway” ribbon category, “Tools” panel.



In the same way that the schedule editor operates, the tool displays a list, in readable language, all the rules read from the Gateway.



From this display you can add a new rule, edit an existing rule, or delete a rule. The rule editor shows the elements of the rule. During the edit as the various trigger, condition, and action types are selected, the various control for modifying that piece of the rule become available.

Rule Editor

Trigger

When scene activates ▼ Downstairs Scene ▼

Condition

There are two conditions ▼

If the day of the week is ▼ ☐ Mon ☐ Tue ☐ Wed ☐ Ths ☐ Fri ☒ Sat ☒ Sun

And ▼

If the time is between ▼ 6:00 PM 11:59 PM

Action

There is one action ▼

Activate scene ▼ Cleaning ▼

OK Cancel

Like schedules, rules are saved in the UPStart UPB file and are stored into the Gateway as part of the Export action not when the edit is completed.

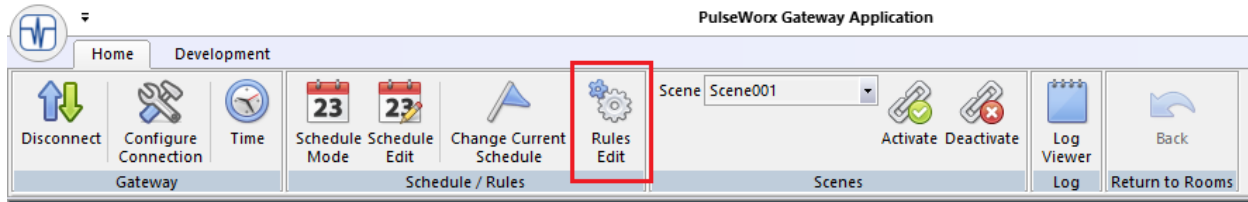
Because there are rules in the Gateway memory and in the UPStart UPB file these could get out of sync. When the Gateway rules table is read by UPStart from the Gateway, it is compared to what is in the loaded UPB file and if differences are noted a popup that lets you resolve the differences but either accepting the rules from the UPB file or from the Gateway.

Very important note:

While UPStart is connected to the Gateway no rules will be carried out. If you want to test the rules you create you should use PulseWorx Application as it can be connected to the Gateway and features a logging capability as well as scene control if you want to generate triggers.

Working with rules using PulseWorxApp

In addition to UPStart, you can also use the Windows PulseWorx App application to view and modify the rules.



Unlike schedules, they cannot be viewed or modified using the mobile Android or iOS applications. There are no plans to update the mobile applications with rule editing capabilities.

Reporting problems

Since this is a beta release of the Gateway firmware, UPStart and PWA, it is important to report any problems as accurately and completely as possible. Please don't say "It doesn't work" and leave it at that.

If you think this is an UPStart or PWA problem with creating or modifying rules please document a step-by-step recreation of the problem so that PCS can confirm the problem and implement a fix. Remember that we can't see what you see so you must be as clear as possible. If you think that your UPB installation somehow contributes to the issue, send along your UPStart UPB file with the problem report.

If you think the problem lies in the Gateway firmware, please send along your UPStart UPB file so that we can look at all the rules you have. Of course, identify the rule that didn't work and try and describe what exactly didn't work. Was it a condition that was not evaluated correctly? A trigger not being taken? The action not being sent correctly? As much information as possible would help a lot.

Finally, if you have an idea for how the rules system could be improved, please let us know. It's not too late to make changes and we appreciate feedback.

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