

Voice UPB Bridge Technical note

It may seem obvious but when controlling UPB devices using a voice assistant, it is a challenge knowing the best commands to use. The Bridge can always send a command to control the device directly but that may not always yield the best results.

For example, assume that you have a wall switch that has a scene (link) configured so that when the top of the paddle is tapped the load comes on and that link is transmitted.

There are two types of UPB commands that the bridge can send. A *direct* command is a command that is received and processed only by the device it is directed to. A *scene* (or link) command is received by all devices in the network and any device that has that link in its receive components table (RCT) responds as configured.

When controlled by a voice assistant the desired action to achieve is the same result as if you walked up and tapped the paddle on our example switch. In this manner, the load controlled by the switch goes on or off and any devices linked to it are controlled as well. To achieve this, both a direct command must be sent to the device - so its load is controlled - and a scene command transmitted also – the same scene that would be transmitted by the switch if the paddle was tapped - so that linked devices respond.

The Bridge configuration software attempts to determine what commands(s) should be sent by looking at the transmit and receive configuration of each device and deciding if a scene command should be sent to control the device, or a direct command that only effects the device, or both.

A note on SAI switches with changeable faceplates.

The SAI switches with changeable faceplates have additional rockers and/or buttons. These generally don't control the device load and are used to activate and deactivate scenes. While you can control such a device with a voice assistant using its name, and you can also control the scenes that are transmitted by those additional rockers and buttons from the assistant as well, so no control is unavailable.

Here are some notes on how the Bridge software figures out what commands to send.

PCS or HAI Switch

- Always send a direct command since rocker always controls the load.
- If rocker top has a transmit link, also activate that link when controlling ON.
- If rocker bottom has a transmit link, also deactivate that link when controlling OFF.

SAI US1/US2 (product id 22): Has selectable face plate

- Assumes at least one rocker.

- Always send direct command to control the load unless the option that says “Load controlled by rocker” is disabled.
- If rocker 1 top has transmit link, also activate that link when controlling ON.
- If rocker 1 bottom has transmit link, also deactivate that link when controlling OFF.

SAI US1-40 US1-40T (product id 28 / 34): Always single rocker only

- Assumes at least one rocker
- Always send direct command to control the load unless option that says “Load controlled by rocker” is disabled.
- If rocker 1 top has a transmit link, also activate that link when controlling ON.
- If rocker 1 bottom has a transmit link, also deactivate that link when controlling OFF.

SAI US2-40 (Product id29): Has selectable face plate

For the US2-40 rocker to control its own load, a link must be placed in both the transmit component and the receive components table or the load will not be controlled by the paddle. UPStart by default uses link 241 for this.

For this device type, the transmit components (rockers and buttons) can be configured so that they don't transmit. That is, the 241 link is defined in the rocker setup and that same link is in the receive components table but when the rocker is tapped then link 241 doesn't get transmitted on to the power line. It is processed internally by the switch so the load is controlled as defined in the receive components table.

When controlled by a voice assistant for this type of device, it is vital that this device not be controlled by the link used by the rocker if the rocker isn't set to transmit. This is because many switches may use that same link (241 for example) and the assistant wants to control only the named device. But if the rocker is configured to transmit, then possibly the link transmitted by it can be used by the assistant for control.

For this device type the Bridge setup assumes at least one rocker on the faceplate.

- Send direct command to control the load unless rocker 1 is transmit enabled then more examination is needed.
- If rocker 1 transmit enabled:
 - If rocker 1 top has a transmit link, activate that link when controlling ON and the additional direct command need not be sent.
 - If rocker 1 bottom has a transmit link, deactivate that link when controlling OFF and the additional direct command need not be sent.

SAI PID 62 US22-40T (has selectable face plate)

This is the two-channel version of the US2-40 and the same rules apply as given above.

- Send direct command to control the load unless rocker <channel> is transmit enabled then more examination is needed.
- If rocker <channel> transmit enabled:
 - If rocker <channel> top has a transmit link, activate that link when controlling ON and the additional direct command need not be sent.
 - If rocker <channel> bottom has a transmit link, deactivate that link when controlling OFF and no additional direct command need be sent.

Different PulseWorx Keypads models that also control a load (KPLD and KPLR)

The PulseWorx keypad load dimmer and keypad load relay present another challenge. When the device is controlled by an assistant it would be desirable that the button LEDs change to show the state of the load. For example, on the 6-button keypad there are large ON and OFF buttons that we would like to show the actual state of the load. Similar load control buttons can be created for the 7 and 8 button keypads.

The Bridge configuration software must make some assumptions about how the keypads are configured to control the load and if the assumptions are not valid, then the keypad load is controlled by a direct command. The setup software also only considers the Single-Click (SC) actions of buttons.

The concern is that the link configured for a ON button can't always be used. If the button is not configured to transmit, then whatever link it uses could be used by many other keypads as it is never expected to be on the power line. In this case the link can't be used to control the device.

Unfortunately, by not using that link to control the keypad load when controlling the keypad by a voice assistant, the keypad indicators will most likely not operate as expected. There are two ways around this and this might mean changing the configuration of the keypad device in UPStart.

Possibility 1: Don't control the keypad load by the device name from a voice assistant but rather by a scene you create for the load control. Create a new scene and add it to the device's receive components and indicators. The voice assistant will use it and the device will go on and the indicators will show as expected.

Possibility 2: Enable the transmit for the ON and OFF buttons and ensure that the scene isn't used by other devices in the installation. You might need to create a new scene just for this device's load.

KPD6 / KPR6

Consider ON button.

- If ON is not set to transmit -> Control load by direct command
- If ON is set to transmit and ON SC link is in the RCT -> Control by that link. No direct command.
- If ON is set to transmit and ON SC link is not in the RCT -> Control by direct command

Consider OFF button.

- If OFF is not set to transmit -> Control by direct command
- If OFF is set to transmit and OFF SC link is in the RCT -> Control by that link. No direct command.
- If OFF is set to transmit and OFF SC link is not in the RCT -> Control by direct command

KPD7 / KPR7

Consider B1 as possibly an ON button.

- If B1 is not set to transmit -> Control by direct command.
- If B1 is set to transmit and B1 SC link is in the RCT -> Control by that link. No direct command.
- If B1 is set to transmit and B1 SC link is not in the RCT -> Control by direct command

Consider B5 as possibly an OFF button.

- If B5 is not set to transmit -> Control by direct command.
- If B5 is set to transmit and B5 SC link is in the RCT -> Control by that link. No direct command.
- If B5 is set to transmit and B5 SC link is not in the RCT -> Control by direct command

KPD8 / KPR8

Handle two cases of keypad configuration for a button controlling the load

- One button turns the load on and another turns it off
- One button toggles the load on and off

What to do is determined by this algorithm:

“Link for on” and “Link for off” are unknown.

For each button that is set to transmit and whose link is in the RCT:

- If button toggles, then that link is used for both “link for on” and “Link for off”.
- If button doesn’t toggle, and the RCT entry for that link has level > 0, use that link as “link for on”.
- If button doesn’t toggle, and the RCT entry for that link has level = 0, use that link as “link for off”.

Keep going until all 8 buttons examined or have determined both a “link for on” and a “link for off”.

If have a “link for on” then don’t use direct command when controlling the device load on.
Instead activate that link.

If have a “link for off” then don’t use a direct command when controlling the device load off.
Instead deactivate that link.

##end##