Calrec Ember+ GPIO Setup Guide

Henry Bourne
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This guide should provide all the necessary steps to configure VSM to create a GPIO routing matrix. The guide results in a VSM matrix that allows any Calrec Ember+ GPO to be connected to one or more Calrec Ember+ GPI(s), so that when the GPO is triggered, the connected GPI or GPIs are also triggered.

This matrix can be extended to include GPI and GPO from other items of equipment, although the configuration of VSM and the other items of equipment is not covered here.

This GPIO matrix is based on a sample VSM configuration provided by AMP in September 2015.

Enable the Ember+ server in the Calrec desk

- In the PC app, go to “Fixed Options” (will be “System Settings” when software is released)
- Click to “Control Protocols” in the menu at the left
- Click the “Ember/Ember+” tab
- Click “Enable” next to the Virtual GPIO setting

Add a new gadget for the primary control processor

- Open “Manage Communication Ports” dialog (Computer icon next to the Spanner icon)
- Click New
- In the dialog that appears, disclose “Gadgets”, “VSM”, then select “Gadget Connector”
- Click Next
- If the port does not already exist, add it:
    - Click “New Port”
    - Description: DeskName Primary Control (or anything else you want)
    - Type of Port: TCP – Outbound
    - Remote IP Address: The IP address of the appropriate LAN port on the desk’s primary control module
    - Port: 62001
    - Click OK
- Select the port in the list
- Click Finish

Add a new gadget for the secondary control processor

- Open “Manage Communication Ports” dialog (Computer icon next to the Spanner icon)
- Click New
- In the dialog that appears, disclose “Gadgets”, “VSM”, then select “Gadget Connector”
- Click Next
- If the port does not already exist, add it:
    - Click “New Port”
    - Description: DeskName Secondary Control (or anything else you want)
    - Type of Port: TCP – Outbound
    - Remote IP Address: The IP address of the appropriate LAN port on the desk’s secondary control module
    - Port: 62001
    - Click OK
- Select the port in the list
- Click Finish

Configure the primary and secondary control module ports to appear to VSM as a singular item of equipment, for redundancy support

- Open the “Manage Communication Ports” window (Computer Icon)
- Double click on the primary control module gadget
- Select the “Attributes” tab
- Enter a label in the “Reflect Identifier”
- Click OK
- Do the same for the secondary control module gadget

Add Calrec GPI and Calrec GPO matrices

- Open the “Matrix Properties” dialog (Spanner icon)
- Cick the “Layers” node in the tree at the left
- Add the GPI matrix
    - Click “New Layer”
    - Name: Calrec GPI
    - Switch Behaviour: 1:n
    - Inputs: 1
    - Outputs: As many GPIs as you want to configure (max is 256)
    - Ensure “Physical Layer” is selected
    - Leave all other options at default values
    - Click OK
- Add the GPO matrix
    - Click “New Layer”
    - Name: Calrec GPO
    - Switch Behaviour: 1:n

    - Inputs: 1
    - Outputs: As many GPOs as you want to configure (max is 256)
    - Ensure “Physical Layer” is selected
    - Leave all other options at default values
    - Click OK
- Click OK in the “Matrix Properties” dialog.

Link the Calrec Ember+ GPIO matrices to the VSM “Calrec GPI” and “Calrec GPO” matrices

- Open the “Manage Communication Ports” dialog (Computer icon)
- Double click on the primary control module gadget
- The “Port Settings” dialog will open
- Click on the “Layer Assignment” tab
- Double click on the GPIO Inputs row in the list
- *(if nothing appears here, it may be a VSM bug that requires you to manally expand the nodes of our gadget tree – you get to this by clicking on the header icon with the four blue cubes, and epxnading the Calrec tree.)*
- In the dialog that appears, select the “Calrec GPI” matrix in the “Controlling VM Layer” popup
- Click OK
- Double click on the GPIO Outputs row in the list
- In the dialog that appears, select the “Calrec GPO” matrix in the “Controlling VM Layer” popup
- Click OK
- Click OK in the “Port Settings” dialog
- Repeat this process for the secondary control module gadget
  (This step needs verifying – we are still finishing support for redundant connections)

Create GPI Signal Paths

- Open the “Signal Paths” dialog (icon is a white rectangle, with an arrow a the top left)
- Select the Calrec GPI physical layer tab
- Add the Calrec GPI destination signal paths
    - Right click in the window, then click “New Signal Path”
    - In Description, enter “Calrec GPI 1”
    - Select the amount of GPIs, to match the number of destinations in the GPI matrix you created earlier
    - Click Next
    - On the “Calrec GPI” row in the list, click in the “Input” arrow
    - In the popup that appears, click on number 1
    - Click Next seven times.
- Add the Calrec GPI active source signal path
    - Right click in the window, then click “New Signal Path”

    - In Description, enter “Calrec GPI Active”
    - Set amount to 1
    - Click Next
    - On the “Calrec GPI” row in the list, click in the “Output” arrow
    - In the popup that appears, click the number 1
    - Click Next seven times.
- Add the Calrec GPI disconnected source signal path
    - Right click in the window, then click “New Signal Path”
    - In Description, enter “Calrec GPI Disconnected”
    - Set amount to 1
    - Click Next
    - On the “Calrec GPI” row in the list, click in the “Output” arrow
    - In the popup that appears, click “D/C”
    - Click Next seven times.
- The Calrec GPI Active source, and all Calrce GPI destiantions should have appeared in the Calrec GPI physical layer matrix. The Calrec GPI Disconnected source will not appear yet. Lawo tell us this is a bug, but we have a workaround:

Create a virtual layer for Calrec GPI, so that we can add the disconnect source

- Open the “Matrix Properties” dialog (spanner icon)
- Click the “New Layer” button
- In the “Layer Properties” dialog that appears, enter the following information:
    - Name “Calrec GPIv” (or anything else you want to identify this virtual layer)
    - Switch Behaviour: 1:n
    - Give it 2 inputs, and as many outputs as you gave to the physical GPI matrix
    - Select “Virtual Layer”
    - Click OK
- Double click the Calrec GPI layer in the list
- In the “Layer Properties” dialog that appears, deselect “Show as tab in Mater Matrix view”
- Click OK
- Open the “Master Matrix” view (the matrix icon) and the “Signal Paths” view (white rectangle with arrow at top left icon)
- In the matrix view, select the Calrec GPIv layer, and click the “Layout” tab at the top left
- In the signal paths view, select the Calrec GPI layer and select all Calrec GPI targets
- Click and drag the Calrec GPI target signal paths onto the appropriate destinations at the top of the Calrec GPIv matrix
- Click and drag the Calrec GPI Active, and Calrec GPI Disconnected sources onto the two sources in the matrix

Repeat the previous two processes for Calrec GPOs

- You should now have another virtual layer called Calrec GPOv, with two sources (Calrec GPO Active, and Calrec GPO Disconnected), and a range of numbered GPO destinations.

Connect some desk functions to trigger Ember+ GPO

- In the PC App, go to Hydra Options, GPO
- Click the “Filter Outputs” button and select “Ember+ GPIO”
- Select a GPO Function from the source list and connect it to an Ember+ GPO
- In VSM, in the master matrix, select the Calrec GPOv layer, and make sure the “Current” tab at the top is selected.
- Trigger the function on the desk, and you should see the cross-points in the matrix respond accordingly.

to create a matrix of GPIO, so that when a GPO from one item of equipment if triggered, it can trigger one or more GPIs on other items of equipment

- Configure a Zone Sync Layer
    - Open the “Matrix Properties” dialog (spanner icon)
    - Create a new layer
    - Call it GPIO (or anything else you want)
    - Switch behavior: 1:n
    - Inputs should be set to equal the number of GPOs you defined in the Calrec GPO layer
    - Outputs should be set to equal the number of GPIs you defined in the Calrec GPI layer
    - Select “Zone Sync Layer”
    - Click OK
    - Click OK in the “Matrix Properties” dialog
- Create signal paths for this new layer
    - Open the “Signal Paths” view (white rectangle icon)
    - Select the “GPIO” layer tab at the bottom
    - Create the GPO sources
        - Right click and then click “New Signal Path”
        - Description: Calrec GPOv 1
        - Amount: Equal to the amount of GPOs you created earlier
        - Click Next
        - In the GPIO row, click in the output arrow
        - In the popup that appears, click number 1
        - Click Next seven times
    - Create the GPI Destinations
        - Right click and then click “New Signal Path”
        - Description: Calrec GPIv 1

        - Amount: Equal to the amount of GPIs you created earlier
        - Click Next
        - In the GPIO row, click in the input arrow
        - In the popup that appears, click number 1
        - Click Next seven times
    - The GPO sources and GPO destinations should now appear in the GPIO layer
    - Unlock the layer, and you should be able to make cross-points.
    - These cross-points will not trigger anything at the moment, but they will be used to determine which GPIs are triggered by VSM, when a certain GPO is active

Configure VSM's GPO system (different to Calrec's GPIO) to pass tallies from an active Calrec GPO, to the Calrec GPI to which it is connected in the GPIO layer. This will then trigger the relevant GPI.

- Open the GP-I/O List (red-arrow, blue-circle, green-arrow icon)
- Click the GPOs tab
- Add VSM GPO Tallies to indicate an active Calrec GPO
    - Right click, and choose "New GP-I/O"
    - Number: The first available number (or whatever number you want)
    - Name: "Calrec GPO {1-8}" (or change 8 to the number of Calrec GPOs you defined earlier)
    - Click OK
- Connect the Calrec GPO active cross-points to the VSM "Calrec GPO" GPOs, so the VSM GPOs activate when Calrec GPOs are active
    - In the matrix view, select the "Calrec GPOv" layer
    - Click the "GPI" tab at the top
    - Drag the crosspoint "Calrec GPO Active > Calrec GPO 1" onto the "Calrec GPO 1" item in the VSM GP-I/O list.
    - A green circle should appear in the cross-point to indicate it is connected somewhere
    - Do the same for the remaining GPOs until all active cross-points are connected to VSM GPOs.
    - Now trigger a GPO in the calrec desk, and see that a green icon appears next to each VSM GPO in the GP-I/O list
- Connect the VSM GPOs to the Calrec GPO sources in the GPIO layer, so that when Calrec GPOs are active, and the VSM is active, a tally is sent to the Calrec GPO sources in the GPIO layer
    - In the matrix view, select the "GPIO" layer
    - Make sure the GPI tab at the top is selected
    - From the VSM GP-I/O list, drag "Calrec GPO 1" to the "Calrec GPOv 1" source in the GPIO layer
    - Repeat for all other VSM GPOs
    - Now trigger a GPO in the Calrec desk, and make sure that a red circle appears next to the appropriate source in the "GPIO" layer

- When you make a cross-point in the GPIO layer, an active GPO (with a red circle) should cause a red line to appear on the connected GPI destination. This is passing the tally from the source to the destination.
- Back in the GP-/O list, add VSM GPOs to receive tallies from an active GPO, and trigger a Calrec GPI
    - Right click, and choose “New GP-I/O”
    - Number: The first available number (or whatever number you want)
    - Name: “Calrec GPI {1-8}” (or change 8 to the number of Calrec GPOs you defined earlier)
    - Click OK
- Connect the tally active message from the GPI destination in the GPIO layer, to the VSM “Calrec GPI” GPOs
    - In the GPIO layer, drag from each GPI destination to the corresponding “Calrec GPI” in the GP-I/O list
    - If you double click on a “Calrec GPI” in the GP-I/O list, you should see a tally has been added, which when active, triggers the VSM GPO to be active.
    - To test this, in the GPIO layer, make the cross-point from Calrec GPOv1 to Calrec GPIv 1.
    - When Calrec GPO 1 is active, you should see a green icon appear in the VSM GP-I/O list next to Calrec GPI 1.
    - This will not have triggered the Calrec Ember+ GPI just yet.
- Connect the VSM “Calrec GPI” GPOs so that they trigger Calrec’s Ember+ GPIs.
    - In the matrix view, change to the “Calrec GPIv” layer
    - Change to the GPI tab at the top
    - Double click on “Calrec GPI 1” in the VSM GP-I/O list
    - From the matrix, drag the “Calrec GPI Active > Calrec GPI 1” crosspoint into the “Properties of Calrec GPI 1” dialog
    - In the “Properties of Calrec GPI 1” dialog, change the “Condition” parameter of the new item in the list to “True”
    - From the matrix, drag the “Calrec GPI Disconnected > Calrec GPI 1” crosspoint into the “Properties of Calrec GPI 1” dialog
    - In the “Properties of Calrec GPI 1” dialog, leave the condition for this entry as false.
    - Repeat this process for each destination in the matrix, and the correspondingly numbered VSM “Calrec GPI” GPO

Test the Matrix

Finally, you should be able to use the GPIO matrix, to connect any Calrec GPO to any Calrec GPI, by making cross-points. When a Calrec GPO is active, it should trigger the Calrec GPI to which it is connected.

Any GPIs and GPOs related to other items of equipment can be added to this GPIO matrix, and controlled via VSM GPO tallies in the same way, although the method of configuring the GPIO from those items of equipment may be different. This is for Lawo

to support.