



KONTROL

REMOTE SOFTWARE

USER GUIDE V1.0

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1. Prerequisites

The Trinity loudspeaker system requires an Ethernet computer network connection between every Trinity module and the device running the Kontrol software. Every module requires a unique Internet Protocol (IP) address to allow remote control and monitoring capabilities.

2. Network

Providing IP addresses to devices on a network is generally achieved by connecting a router with Dynamic Host Configuration Protocol (DHCP) capabilities.

Note: Although they look similar, network switches do NOT provide IP addresses to connected devices

2.1 Routers

While any router will successfully grant module IP addresses, PK recommends only using the Cisco RV325 router (figure 1).

When connecting network cables to the router, only use the LAN ports and NOT the WAN port as shown in Figure 1.



Figure 1 - Cisco RV352 router

2.2 Router operation checklist

1. Connect Ethernet cables for speaker modules and front of house computers to the LAN ports of the router
2. Power on the router
 - a. Wait at least 30 seconds for the router to initialize
3. Power on speaker modules
 - a. Wait at least 30 seconds for modules to retrieve an IP address from the router
4. Power on Kontrol computer

(Router operation checklist continued)

5. Start Kontrol application
 - a. Powered on modules should appear on the Kontrol workspace (see Troubleshooting section if not all modules appear)
6. Before starting Kontrol, it is recommended that devices be connected to the network and powered on in the following order:
 - a. Router
 - b. PK loudspeaker modules
 - c. Kontrol computer

Once all devices are connected and powered on, you are ready to run Kontrol.

2. Kontrol operation

2.1 First time run – Network selection

When Kontrol is initially run, you will be asked to select which network Kontrol should use to communicate with PK speaker modules (Figure 2 - First run).

Once a network is selected and “Continue” is clicked, the network choice is saved and automatically chosen the next time Kontrol is opened.



Figure 2 - First run

Network selection can be changed at any time by clicking the configuration icon on the bottom right corner of the application window.

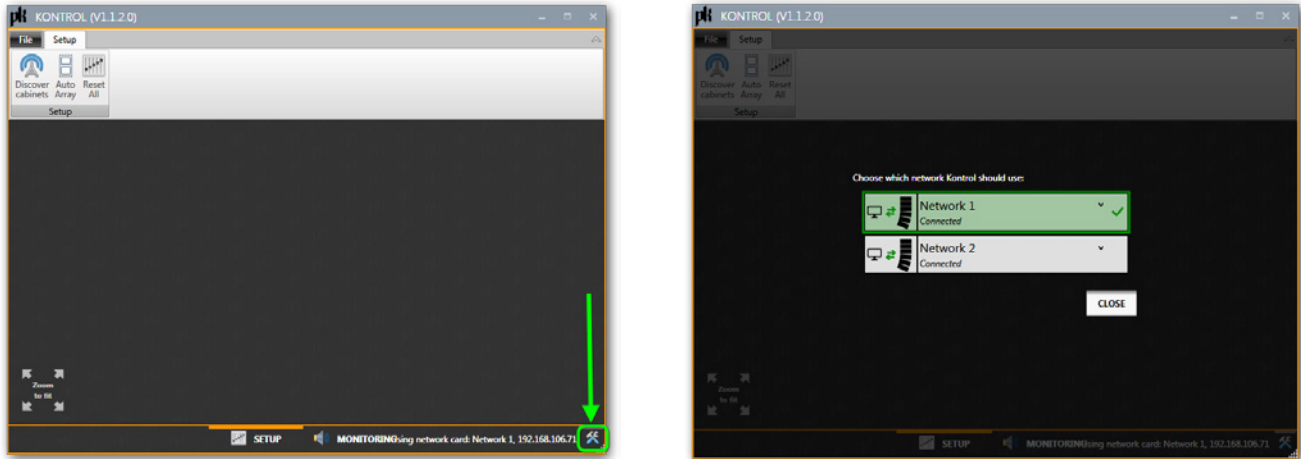


Figure 3 - Network selection

3. Show Setup

3.1 Discovering speaker modules

Kontrol will automatically attempt to discover networked speaker modules on startup, but discovery can always be initiated manually using the “Discover Cabinets” button found in the “Setup” tab (Figure 4 - Discover cabinets).

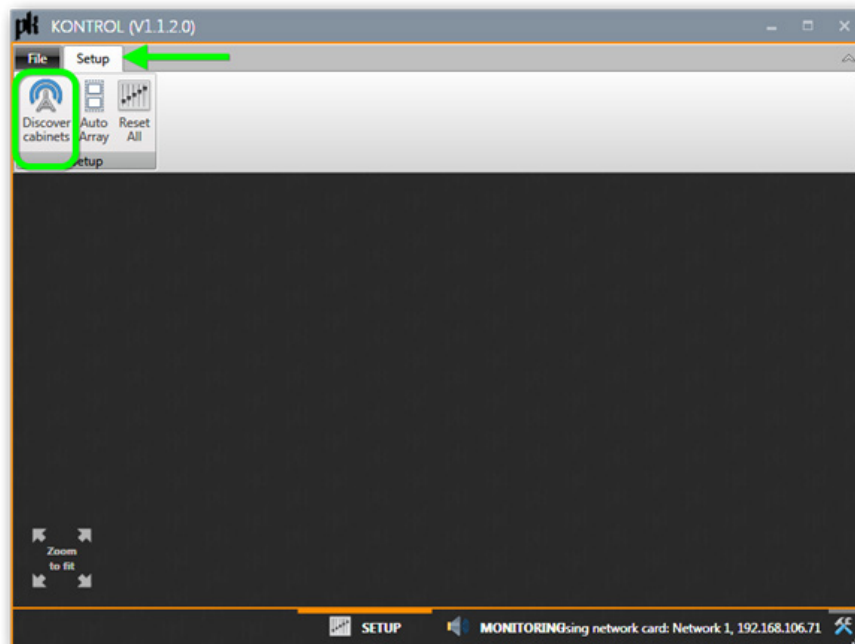


Figure 4 - Discover cabinets

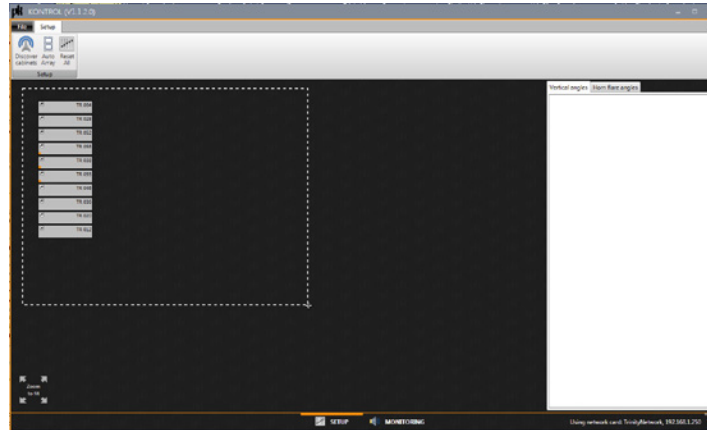


Figure 5 - Kontrol Workspace

When loudspeaker modules are discovered, a virtual representation will appear in the Kontrol workspace.



Figure 6 - Speaker module visual

3.2 Resetting all modules

Kontrol offers a shortcut to reset all modules on the screen to their defaults. This resets all the DSP and custom settings that may have been applied to the modules. Typically, one would use this functionality right after discovering all the modules.

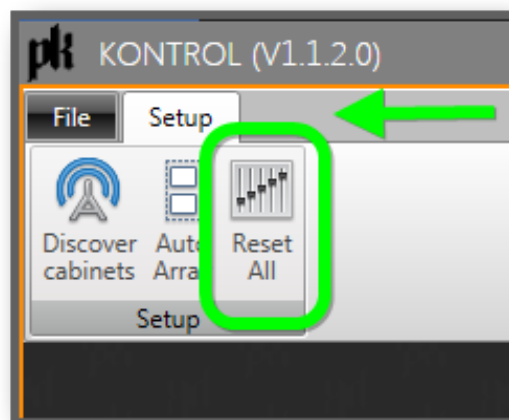


Figure 7 - Reset all feature



WARNING: "Reset All" does not impact:

- The vertical and horizontal angles
- The individual channel mutes
- The service notes

3.3 Line Arrays

To ensure safety when moving modules while connected in a line array, Kontrol performs safety calculations for physical line array configurations. To adjust vertical module angles, the modules must be associated to a line array in Kontrol that matches the physical line array configuration, exactly.

3.4 Auto-array feature

To facilitate the creation of virtual line arrays that match the physical world, each loudspeaker module is equipped with inter-module infrared sensors. These sensors are controlled by the Kontrol application to automatically determine the physical line array configurations and group the modules accordingly in the software.

After all modules are successfully discovered and displayed in the Kontrol workspace, the Auto Array feature will determine the line array configurations and place the line array objects in the workspace (Figure 8)

Note: a forward-facing, aluminum flybar is assumed for auto-array creation

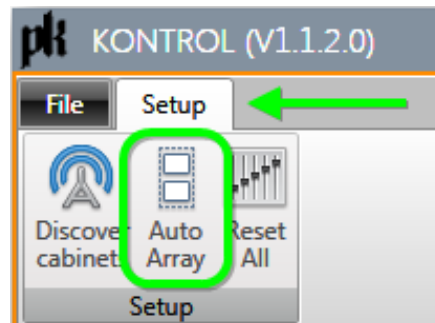


Figure 8 - Auto-array feature

3.5 Deleting line arrays

There may be circumstances where automatic line array creation does not accurately detect the physical line array configurations. Examples where this may occur are:

- Very dirty infrared sensors
- Damaged infrared sensors

In the event of a mis-configured auto-array operation, line arrays can be deleted and re-created manually.

To delete a line array, select the line array by clicking on the line array name (above the group of modules) and click the “Delete Line Array” button in the “Line Array” tab on the ribbon menu at the top of the application (Figure 9).

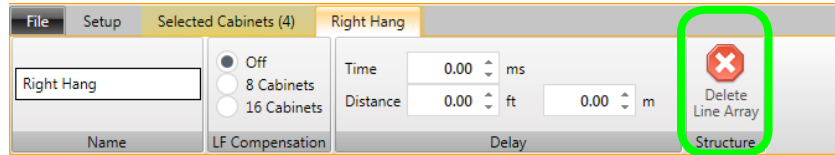


Figure 9 - Delete line array

Once you have deleted the mis-configured line array objects, you can manually create line arrays from groups of modules to accurately reflect the physical configuration.

3.6 Manual line array creation

Line arrays are created by selecting the modules in the workspace that represent the physical modules in the array.

Select the modules to be assigned to the line array by dragging a selection rectangle around the desired virtual modules. You can also hold the CTRL key while clicking individual modules to select multiple modules (Figures 10A & 10B).

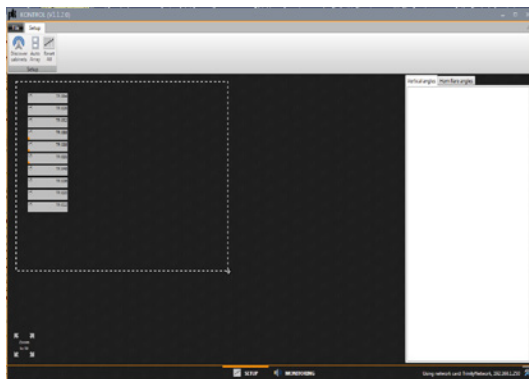


Figure 10A - Manual array creation

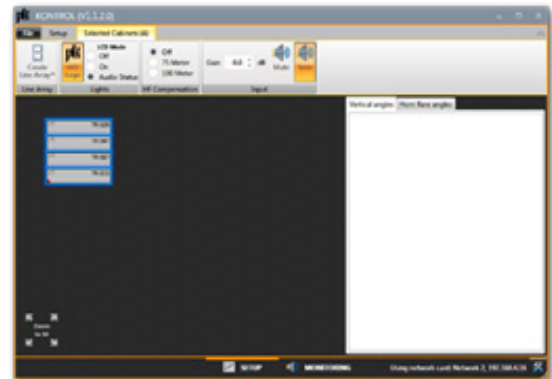


Figure 10B - Manual array creation

Selected modules will appear with a blue border. Once the modules are selected, you can create a line array by clicking “Create Line Array” in the ribbon menu.

From the menu, choose the type of flybar that will hang this line array.



WARNING: Flybar choice MUST accurately match the physical flybar configuration as safety calculations depend on the choice. User is responsible for weight above flybar.

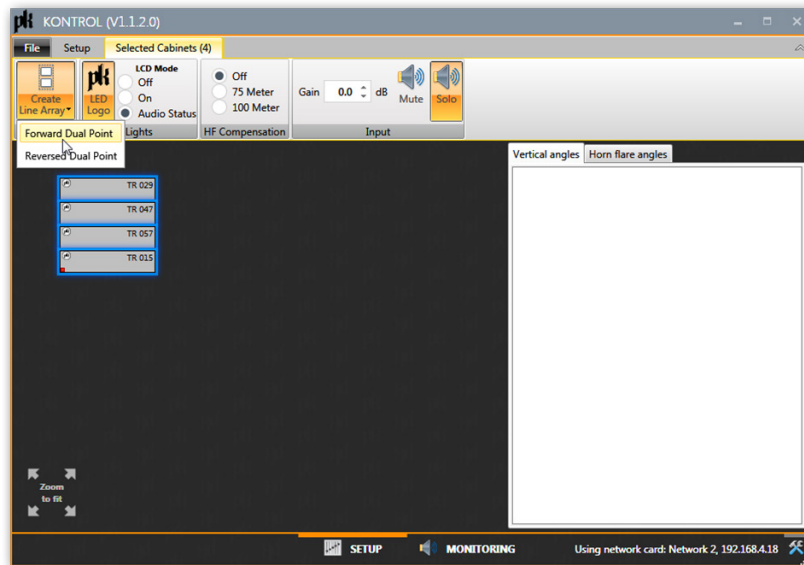


Figure 11 - Create line array

Once line array objects are created, the vertical and horizontal dispersion angles can be safely adjusted (Figure 11).

4. Lighting Controls

4.1 Logo Backlight control

The PK logo backlight on the front of the cabinet is controllable by selecting desired cabinets and toggling the “PK LED Logo” button on the ribbon menu or by clicking the LED logo representation on individual cabinet shapes.

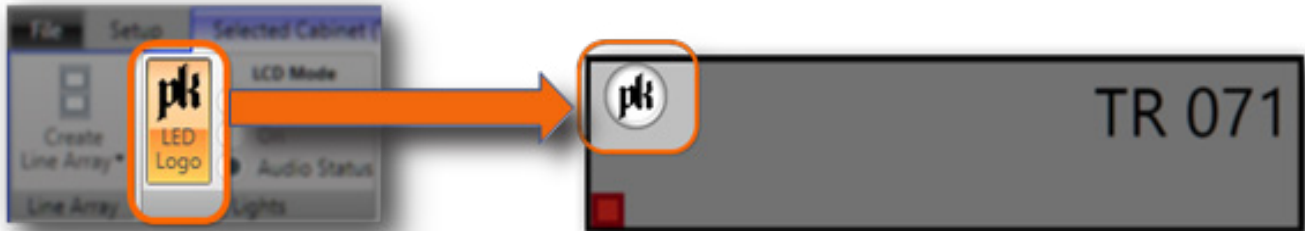


Figure 12

4.2 LCD Backlight control

The backlight on the back of every cabinet is controllable by selecting desired cabinets and setting the “LCD Mode”.

The available options are:

- Off – no backlight
- On – default color (cyan)
- Audio Status (LCD color changes with DSP status)
 - Purple - default
 - Green - audio signal present
 - Yellow - temperature warning
 - Red - clipping / limiting

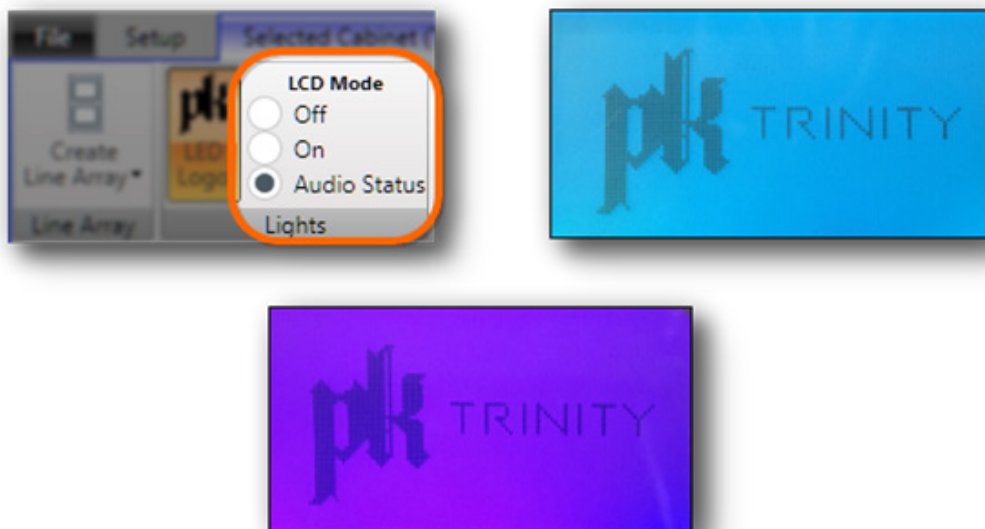


Figure 13

4.3 Inclinometer

For PK products with inclinometer support (Trinity), Kontrol reads the selected cabinet's inclination in real-time. After selecting a cabinet, the inclination is shown in the ribbon menu



Figure 14

5. Line Array Remote Control

5.1 Safety

Operator Presence Control

The Operator Presence Control feature of Kontrol is intended to keep the operator vigilant and cognizant of the location of any persons working or obstacles near the cabinets under control. Always ensure that the surrounding area is clear before initiating a movement.

Safety is paramount when remotely moving line array cabinets, weighing thousands of pounds, potentially suspended above workers.

To mitigate risk of injury or damage, fail-safe mechanisms are built into every cabinet's operating system that disable all motor functions in the event of network communication issues or sudden operator absence. The Operator Presence Control feature ensures that the default operating state is safe.

5.2 Statics Calculations

As the user inputs splay angles, Kontrol continually performs calculations to determine the location of the array’s center of gravity and the forces experienced by the connection between the flybar and topmost module. If a configuration would cause the array’s center of gravity to fall outside of the bounds set by the flybar’s pick points, the array will be considered unsafe and movement will be disabled. Similarly, if the forces on the connection between the flybar and the topmost module exceed the acceptable limit for the particular flybar and module involved then movement will be disabled as well.

5.3. Module Splay Angle Adjustments

5.3.1 Group Adjustments

To apply the same angle to all modules in the selected line array, enter the angle in the “QUICK SETTINGS” section and click “Apply to All” (Figure 15)

If the requested angles fall outside safe configurations, you will not be allowed to apply the configuration to the physical array.



Figure 15 - Vertical quick settings

5.3.2 Individual Module Adjustments

You can also adjust individual module angles in this pane. Each row represents a module in the array, and is labeled and numbered for ease of identification. The tab key can be used to navigate between editable fields quickly. (Figure 16)

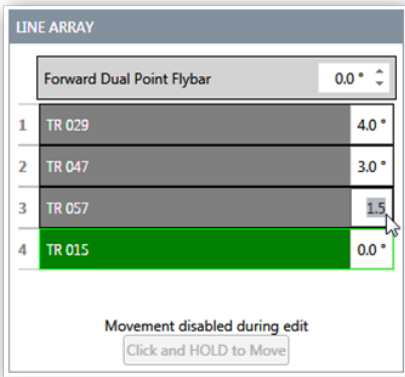


Figure 16 - Module angle adjustment

The rows will take on different colors to communicate whether they accurately reflect the current physical angles of the modules. (Table 1)

Color	Meaning
Green	The current, real world state of the respective module.
Grey	The displayed value has been edited, but not applied to the real world yet
Blue	Movement is underway
Red	An error has occurred. A message will appear describing what the issue was, and usually display the angle the module arrived at.
Orange	The current movement is cancelled. Kontrol will wait for Trinity to respond with an update of its current state.

Table 1 - Vertical angle status colors

Hovering the mouse cursor over a label or value will often result in more information popping up regarding the label or value. (Figure 17)

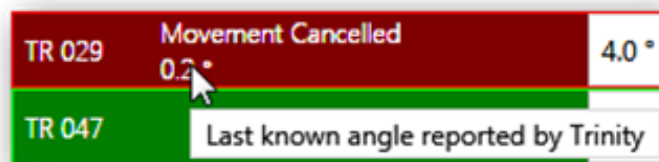


Figure 17 - Vertical movement tool-tip

When Kontrol calculations deem the requested line array configuration is safe, the configuration is applied to the physical world setup by pressing and holding the mouse button on the Apply button. The “M” key on the keyboard can also be pressed and held to accomplish the same, if the movement button is available and enabled.

To apply the requested angles to the physical modules, click and hold the button shown in Figure 18.

The button is enabled when none of the editable fields have keyboard focus and the requested configuration is deemed safe.



Figure 18 - Movement disallowed / allowed

5.6 Horn Flare Adjustments

The module's horn flares can be adjusted using the "Horn flare angles" tab in the line array edit pane. Similarly, to the vertical adjustment operations, the horn flares can be controlled as a group or individually.



WARNING: It is up to the user to ensure that the area in which the horn flares move is clear of equipment and other people. Damage or injury may occur if moving horn flares while obstructed!

The horn flare angle edit text boxes represent left and right horn flares (and total composite angle) while facing the front of the module. (Figure 19)

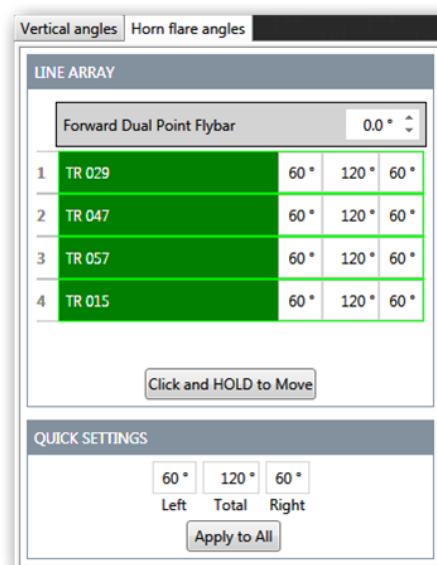


Figure 19 - Line array horn flare panel

Each visual element has three numeric entry boxes: one for the left horn flare, one for the right horn flare, and another to control both horn flares symmetrically. (Figure 19)

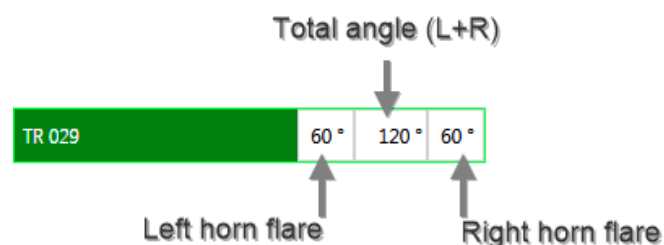


Figure 20 - Horn flare angle editing

The values represent the angle between the module's center line (CL, below)(Figure 20) and the module's -6dB line, which can be approximated as being 5° past the face of the horn flare.

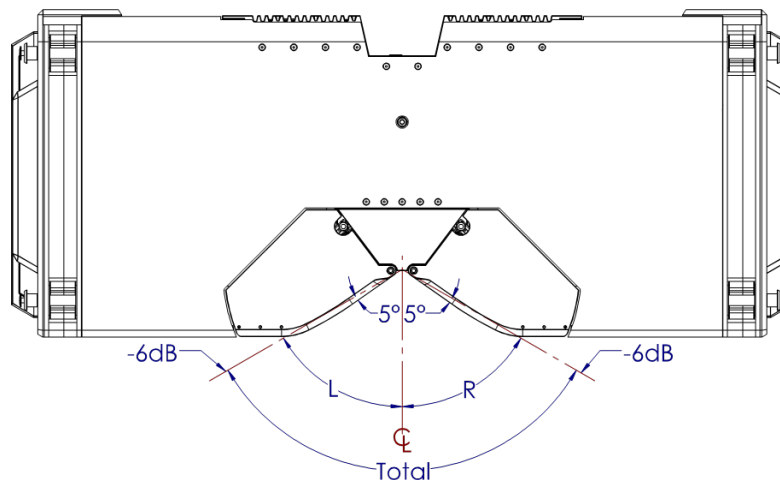


Figure 21 - Horn flare angle presentation

When using the “Total” angle control, the horn flares will be configured symmetrically from the module’s center line. Asymmetrical configurations can be achieved by editing each horn flare entry individually. In this case, the “Total” angle control will simply display the total angle between the two horn flares.

6. Tuning features

6.1 High Frequency Compensation Filters

High Frequency Compensation (HFC) (Figure 22) filters apply a subtle high-shelf boost to the modules on which it is enabled. This is meant to be used on the topmost modules of a flown array to compensate for the high frequency attenuation that occurs over long throws.

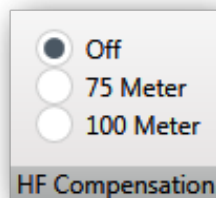


Figure 22

This feature is enabled whenever one or more trinity modules are selected. The “HF Compensation” settings group is found under the “Selected Cabinets” tab.

There are three options:

- Off – no filter is applied
- 75 Meter – a high shelf with gain appropriate for a 75 meter throw is applied
- 100 Meter – a high shelf with gain appropriate for a 100 meter throw is applied

If the selected modules do not all have the same filter applied, then each filter that is applied to some of the modules will be selected with a grey color. Choosing a single filter will then cause that filter to be applied to all selected modules.

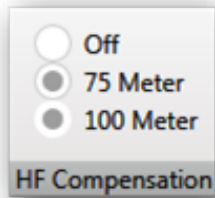


Figure 23

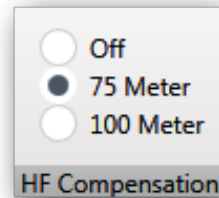


Figure 24

A small purple indicator will appear on any module that currently has an HFC filter applied to it. This allows a user to determine which modules have filters applied at a glance.



Figure 25

6.2 Low Frequency Compensation Filters

Low Frequency Compensation (LFC) Filters are available to help tame the low-frequency coupling that occurs when multiple modules are arrayed together. Because this is only encountered when modules are arrayed, this feature is only available under the “Line Array” tab once a line array is selected.

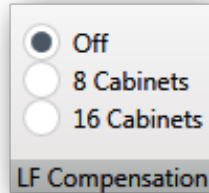


Figure 26

There are three options: (Figure 26)

- Off – no filter is applied
- 8 modules – a low shelf with attenuation appropriate for 8 modules is applied
- 16 modules – a low shelf with attenuation appropriate for 16 modules is applied

If the modules within a line array do not all have the same compensation filter applied, this group will display each of the applied filters with a grey indicator (Figure 27). Selecting a filter will then apply that filter to all members of the array. (Figure 28)

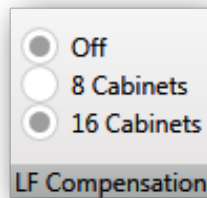


Figure 27

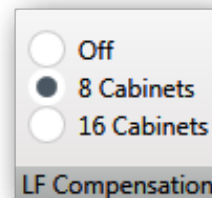


Figure 28

A small purple indicator will appear on any module that currently has an LFC filter applied to it. This allows a user to determine which modules have filters applied at a glance.

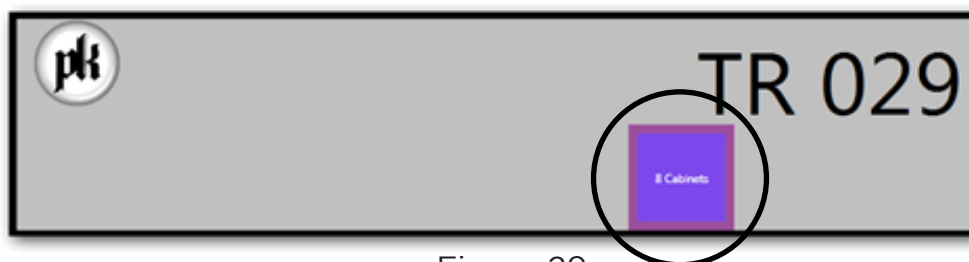


Figure 29

6.3 Gain

When a module is selected, its gain can be adjusted by using the gain control found in the “Input” group under the “Selected Cabinet” tab. The gain can be adjusted to a maximum of +5dB and a minimum of -10dB, by increments of 0.1dB (Figure 30).



Figure 30

This value can be adjusted by using the up/down button on the control itself, or by entering values directly using the keyboard. Be mindful that if the keyboard is being used, the gain value will not be applied until the ENTER or TAB key is pressed. Otherwise, the value will be discarded. When using the up/down buttons, gain values are applied immediately.

If multiple modules are selected and they all have different gains applied to them, the value of this gain control will appear blank. Setting a new value in this case will apply the new gain to all of the selected modules equally (Figure 31).



Figure 31

A small purple green will appear on any module whose gain is anything other than unity (0dB). This allows a user to determine which modules have had their gains adjusted (Figure 32).

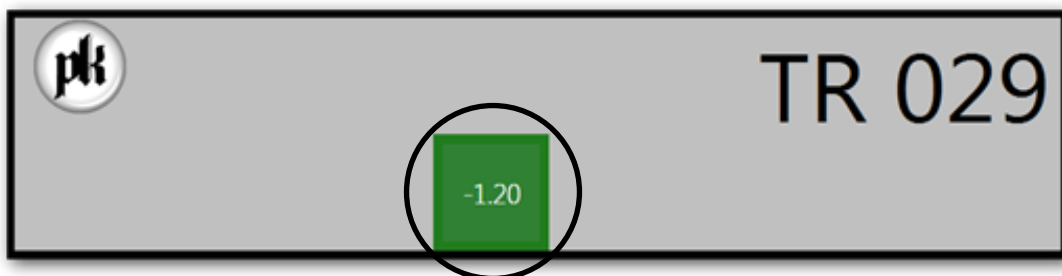


Figure 32

6.4 Delay

Delay can be applied to a line array using the “Delay” group under the “Line Array” tab. This group allows adjustment of delays in units of time or distance. Adjusting these values applies a delay to each module in the line array uniformly (Figure 33).

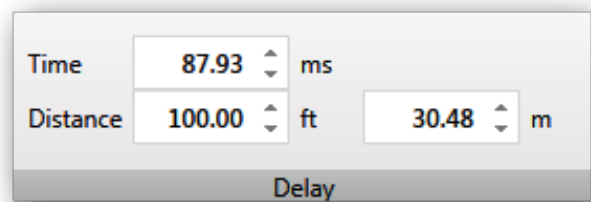


Figure 33

A small purple green will appear on any module with a delay applied to it (Figure 34). This allows a user to determine which modules have had their delays adjusted. This indicator will be present even if a module isn’t part of an array – hinting that the last user of these modules neglected to use the “Reset All” feature before tear down.

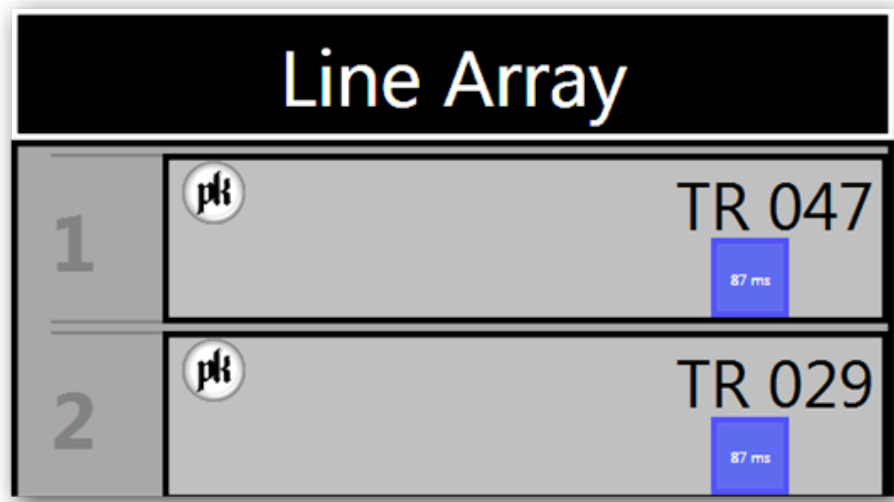


Figure 34

7. Monitoring

7.1 Switching modes

Kontrol's operation mode (Setup vs. Monitoring) is controlled with the two tab-like buttons at the bottom-center of the application window. A color indicator is displayed around the application frame depending on which mode is currently selected – orange for setup, blue for monitoring (Figure 35).

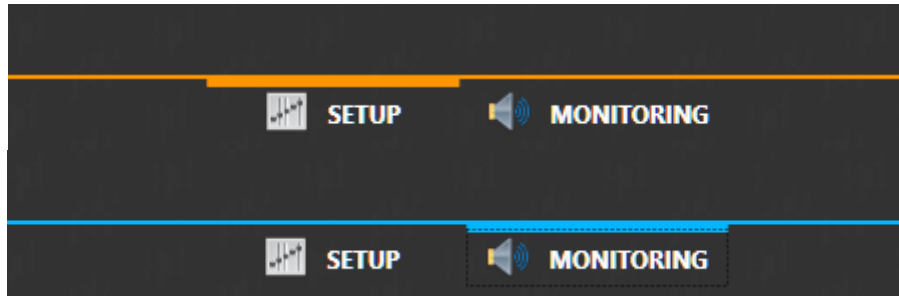


Figure 35 - Setup / monitoring switch

7.2 Temperature

Trinity reports the current temperature of its audio amplifier in real time. This information is available in the “Status” group of the “Selected Cabinet” tab, but only when a single module is selected (Figure 36).

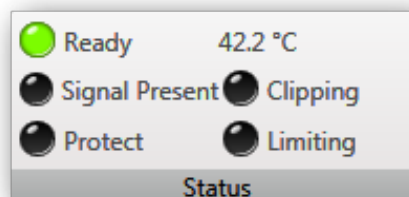


Figure 36

When Kontrol is in MONITORING mode, any temperature related warnings will appear directly on the module visuals. If the amplifier module is at or above 65°C an orange warning indicator will appear (Figure 37).

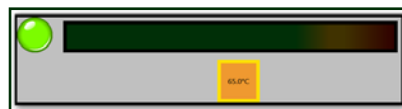


Figure 37

If the amplifier module is at or above 70°C a red indicator will appear. The module is considered to be in thermal protection mode and will reduce output until the module cools down to a safer level (Figure 38).

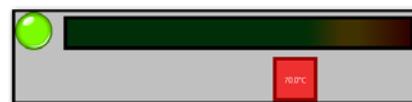


Figure 38

7.3 Levels

When a single module is selected, the input and output levels of the module can be viewed under the “Selected Cabinet” tab. Each of the four output channels is represented in the “Output” group (Figure 39).

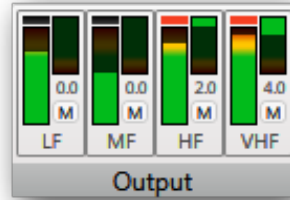


Figure 39

Each channel has a frequency band label, an output level indicator, a limit indicator, a gain reduction indicator, and a channel mute toggle button. The four channels are labeled:

- LF – Low Frequency
- MF – Mid Frequency
- HF – High Frequency
- VHF – Very High Frequency

The input level and input type (analog or digital) of a module will be displayed in the “Input” group of the “Selected Cabinet” tab when a single module is selected (Figure 40).



Figure 40

Under the VU meter a small image appears to indicate the input type. A small, green sine wave indicates analog input, a blue square wave indicates digital input, and a red circle with a line through it indicates that no input is present.

When Kontrol is in MONITORING mode, the input VU meter will also appear on the module itself.

7.4 Gain reduction

In each channel output view there is a small, secondary display to indicate the current gain reduction applied to that particular channel. A numeric display underneath this meter shows the exact amount of gain reduction applied in units of dB (Figure 41).

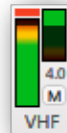


Figure 41

The red indicator above the main channel output display will indicate when limiting is active on that channel. If any of the output channels are currently limiting, the overall limiting indicator in the “Status” group will be active.

8. Servicing Features

8.1 Service notes

Often, in the field, cabinet issues are indicated by attaching small pieces of gaff or masking tape directly to the cabinet. This is problematic as the tape can fall off between events and often don't provide enough information what specific issues need addressing.

Kontrol-supported cabinets solve this problem by allowing users to indicate and communicate detailed cabinet issues by storing the service information in each cabinet's internal memory.

Kontrol's "Service" tab provides access to these digital servicing features

8.2 Service Required feature

The "Service required" toggle button, when enabled, alerts users or technicians that a cabinet requires attention as soon as possible (Figure 43).

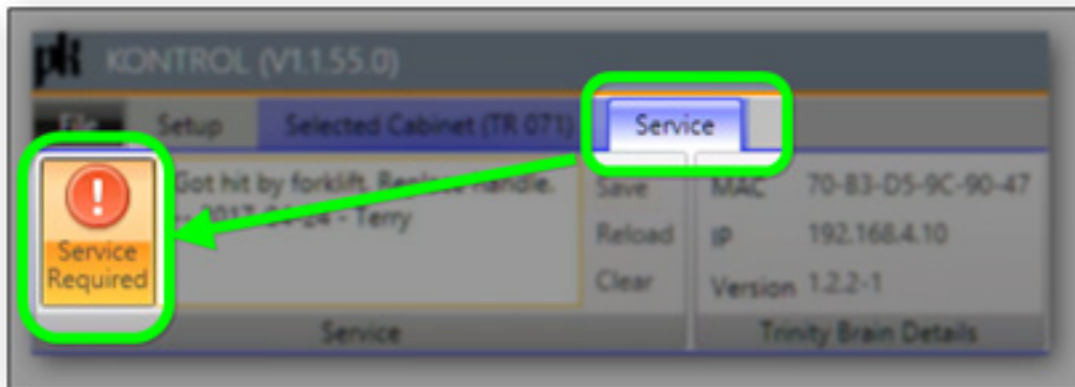


Figure 43 - Service Required Toggle Button

This setting is immediately applied to the physical cabinet, when toggled on, and results in the physical cabinet's LCD display screen color turning for 10 seconds upon powering on the cabinet.

A technician can then view the service notes directly from the cabinet's LCD display by navigating to the "Utilities -> Service Menu" menu.



Figure 43 - Service Required Toggle Button

When “Service Required” is enabled, an indicator on the cabinet shape is visible (Figure 44)



Figure 44 - Service Required Indicator

8.3 Service Notes feature

Kontrol-supported cabinets can store notes, up to 255 characters, that communicate cabinet service requirements to audio techs or technicians (Figure 45).

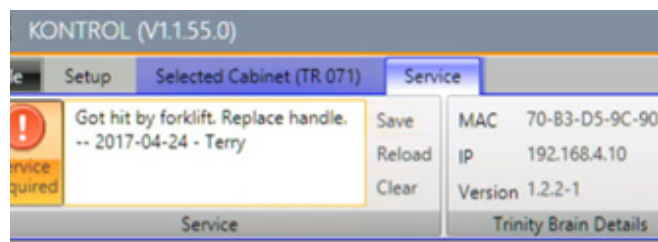


Figure 45

The buttons to the right of the service notes text area operate as follows:

- Save - uploads the service note text to the physical cabinet memory
- Reload - downloads the service note text from the physical cabinet memory
- Clear - clears the service note text from the physical cabinet memory

When a service note is present in a cabinet’s memory, an indicator on the cabinet shape is visible (Figure 46)



Figure 46 - Service Notes Indicator

9. PK Sound Support Process

9.1 Requesting support

All support requests are managed through the PK Sound Support Desk, which automates support staff and requester communications.

There are two ways to submit and track support tickets:

1. Email support (support@pksound.ca)
2. PK Sound Support Desk website (http://support.pksound.ca)

9.2 Email support

The simplest way to submit a support ticket is to send an email to support@pksound.ca with the email subject as the title of the request and the body of the email as the detailed description of the issue.

9.3 Account creation

If you do not already have an account for the PK Sound Support Desk (http://support.pksound.ca), an account will be created using the email account from which you sent the support request. A link is provided in every support response to set or reset your account password.

You must set a password for your PK Sound Support Desk account by clicking the “Create or reset your password here” link in the confirmation email (Figure 47).

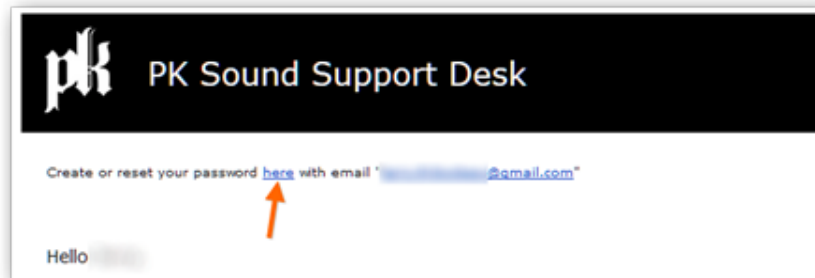


Figure 47- Password reset email link

10. PK Sound Support Desk website

Support requests for all PK Sound products can be submitted through the PK Sound support Desk website at <http://support.pksound.ca>.

10.1 Account creation

By creating an account with the PK Sound Support Desk system, you can submit and track the progress of all support requests from a web browser or mobile device (Figure 48).

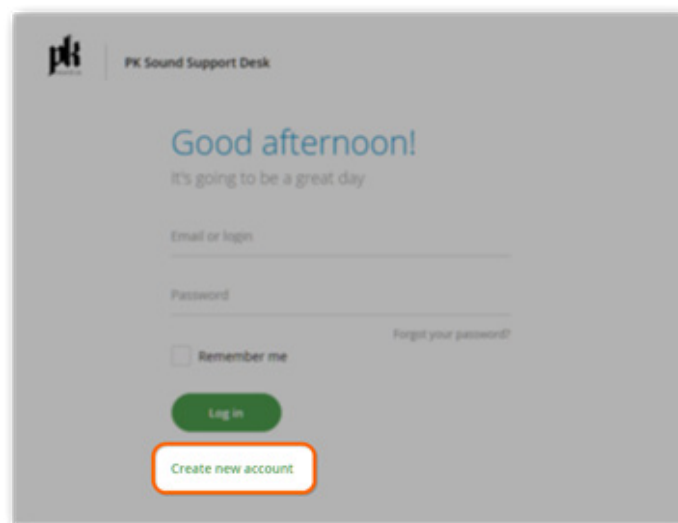


Figure 48 - Support Desk
Create New Account

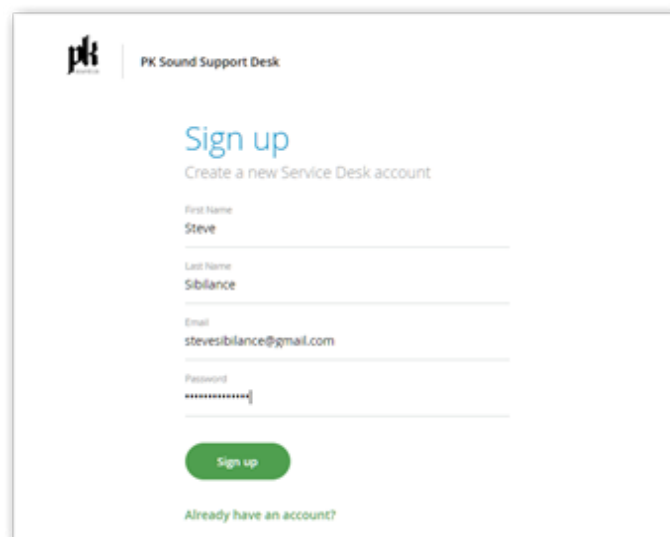


Figure 49 - New account details

10.2 Add request

Once you have an account, you can add a new request as a question, idea, or issue for any PK Sound product.

You can choose the product for which you require support before clicking “Add Request”, or you can choose the product from the “Add Request” screen that follows (Figure 50).

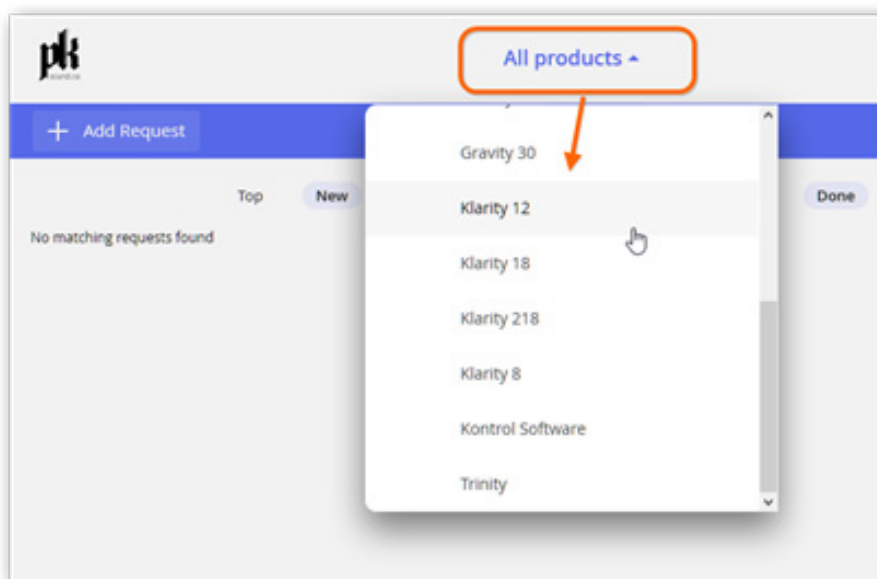


Figure 50 - Product support selection

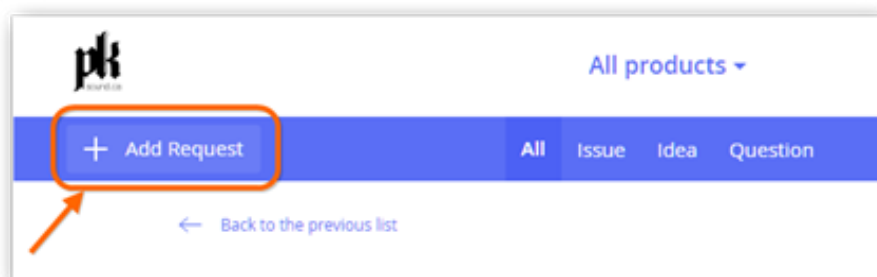


Figure 51 - Add request

Enter a brief description of the question, idea, or issue in the subject field and a more detailed explanation of your request in the large text area on the request entry screen. (Figure 52) Include details such as ;

- A detailed description of the issue
- Steps to reproduce the issue
- Screenshots or documentation (attachments)
- Product serial numbers

The screenshot displays the 'Question' tab of the KONTROL interface. The subject field is labeled 'Possible blown driver?'. The main text area contains the query: 'It sounds like I may have a blown driver. Do I still have warranty?'. Below the text area is a file upload section with the text 'Drag and drop files here or click to select files'. At the bottom, there is a 'Priority' dropdown set to 'Normal', a 'Product' dropdown menu, and a 'Private (only admins can see it)' checkbox. The 'Product' dropdown is open, showing a list of products: CK215, CK800, General Support, Gravity 218, Gravity 30, Klarity 12, Klarity 18, Klarity 218, Klarity 8, Kontrol Software, and Trinity. The 'Post Question' button is visible.

Figure 52 - Request details

10.3 Track requests

You can track the progress of your requests at any time from the PK Sound Support Desk (<http://support.pksound.ca>) (Figure 51).

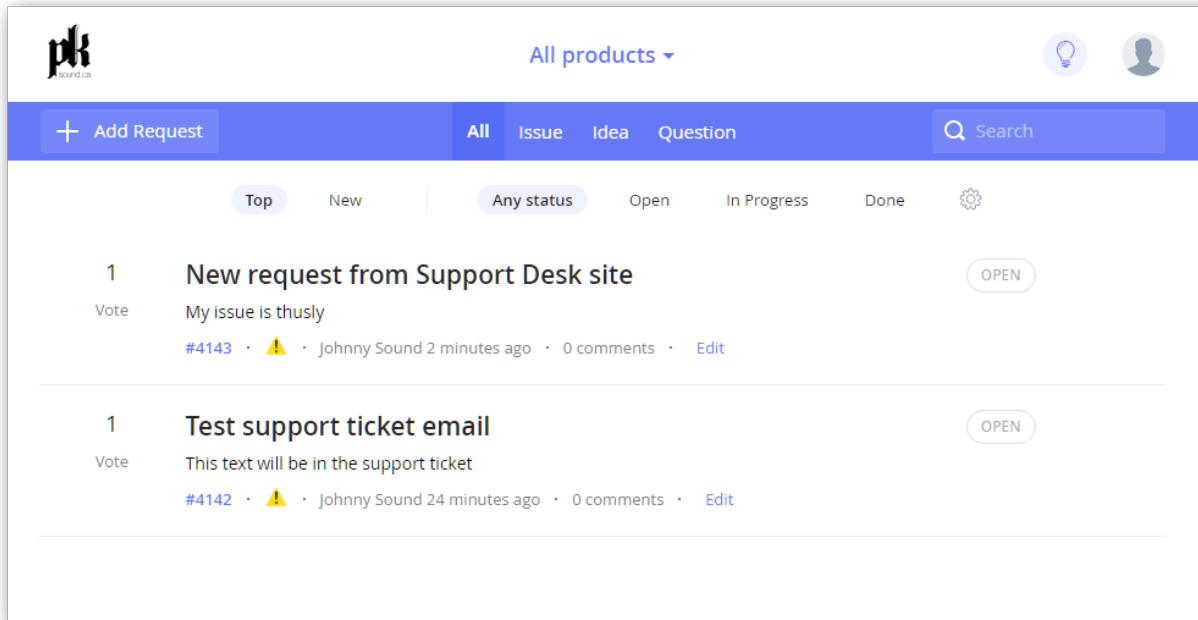


Figure 51 - Request tracking

You will also receive email notifications when PK Sound support staff change the status of your request (Figure 52).

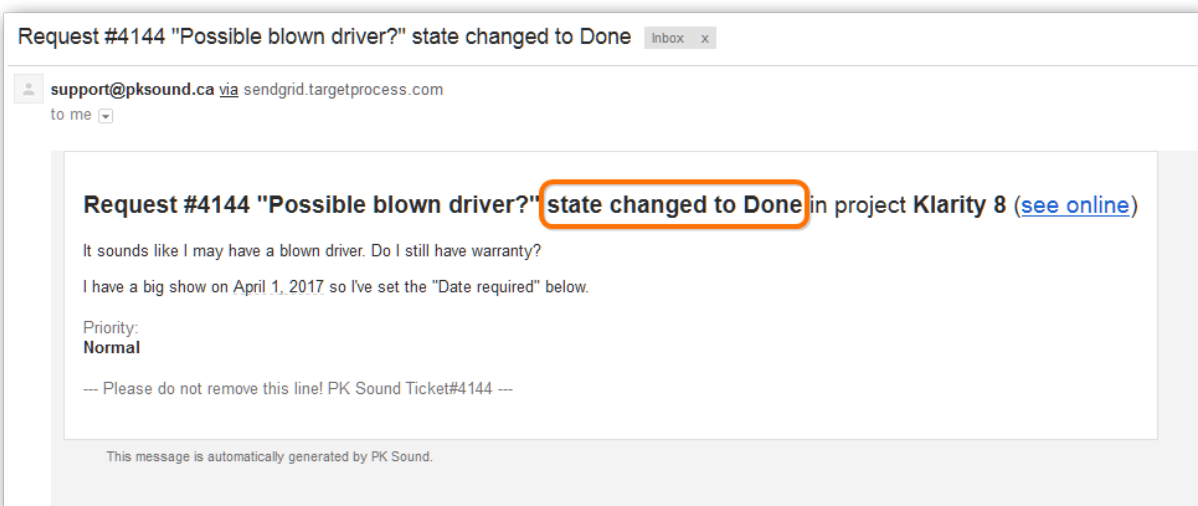
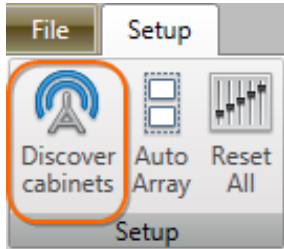

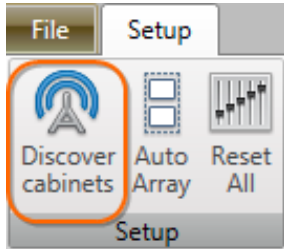


Figure 52 - Request status email notifications

11. Troubleshooting

Problem	Resolution
Modules missing in Kontrol	<ol style="list-style-type: none"> 1. Power on as few modules as possible 2. Click “Discover cabinets” in Kontrol  <ol style="list-style-type: none"> 3. Power on next set of modules, repeat steps 1 and 2 until all modules are displayed in Kontrol. <p>If modules still do not appear: Refer to “Module IP address not valid” Repeat steps 1 - 3</p>
Module IP address not valid (IP: 0.0.0.0)	<ol style="list-style-type: none"> 1. Power cycle module(s) 2. Wait 15 seconds for module to obtain IP address 3. Verify IP address from the LCD menu system on the back of the module <ol style="list-style-type: none"> a. Navigate to the following menu: <ul style="list-style-type: none"> • Utilities -> Display IP Info • A valid IP address of “192.168.xx.xx” should be displayed 

11. Troubleshooting

Problem	Resolution
Modules missing in Kontrol	<ol style="list-style-type: none"> 1. Power on as few modules as possible 2. Click “Discover cabinets” in Kontrol  <ol style="list-style-type: none"> 3. Power on next set of modules, repeat steps 1 and 2 until all modules are displayed in Kontrol. <p>If modules still do not appear: Refer to “Module IP address not valid” Repeat steps 1 - 3</p>
Discovery troubles early in shows ‘setup’ phase	<ol style="list-style-type: none"> 1. Open Network and Sharing Center and look at the active networks 2. Make sure Windows has finished its “Identifying” phase on the network you are trying to use.