YAMAHA

PM5D

DIGITAL MIXING CONSOLE

Version 2

DSP5D
DIGITAL MIXING SYSTEM

DCU5D
DIGITAL CABLING UNIT

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A New High Point in Digital Live Sound

PM5D
DIGITAL MIXING CONSOLE
Version 2

Since its introduction in 2004 the Yamaha PM5D Digital Mixing Console has become a common sight at concerts and live venues throughout the world. In fact, more than 2,000 units have been shipped since that time. The reason? Simply that it's one of the most versatile, practical, reliable, and great-sounding digital mixers in it's class. But technology must evolve to meet the changing needs of the field it serves, and the PM5D is no exception. Over the years that the PM5D has been in service the discerning pros who use it came up with quite a few valuable suggestions as to how it might be improved and expanded. The PM5D V2 is the result, loaded with new features ranging from subtle refinements to seriously notable innovations. And owners of the original PM5D aren't excluded from the good news: a free firmware update that is downloadable from Yamaha's Pro Audio website will bring you right up to speed.

But there's been another important development that makes the PM5D V2 a major system player: the DSP5D Digital Mixing System. Although the PM5D was always expandable via Yamaha's MY-series expansion cards and integration with digital systems such as DME64N and AD8HR, the DSP5D takes system scalability to a totally new level. In essence the DSP5D is a complete PM5D without the control surface, doubling your processing power and I/O capacity while allowing direct, seamless control from the PM5D V2 control surface. In fact you can add up to two DSP5D units for a total of 144 mono and 24 stereo input channels, and even use the DSP5D units on-stage, connected to the console via a single Ethernet cable.

The PM5D is a great live sound console, as attested to by its popularity. But now with new features grounded in actual day-to-day use, and scalability that makes it an excellent choice for much larger applications, the PM5D V2 is poised to become an industry standard.

Enhanced Features and Scalability

The PM5D V2* includes numerous refinements and innovations that significantly improve both its operability and functionality. Almost all of these have been implemented on the basis of feedback from experienced professionals in the field, and provide improved functionality and performance that makes a difference in real-world applications. PM5D V2 also offers full compatibility with Yamaha's new DSP5D Digital Mixing System units can not only double or triple the I/O capacity of the PM5D V2 console with seamless control integration, but also function as high-performance remote mixing engines and stage boxes connected to the console via a single Cat-5 Ethernet cable.

* Owners of the original PM5D or PM5D-RH can download the version-2 firmware update from the Yamaha Pro Audio website at: **http://www.yamahaproaudio.com/**

Choose the Front End that Suits Your Needs

Customers have a choice of two front-end configurations. The PM5D V2 includes 48 XLR/balanced TRS analog mono inputs with manual mic preamps, plus additional 4 stereo line level inputs. The PM5D-RH V2 includes 48 XLR analog mono inputs with recallable mic preamps with 4 stereo inputs that will accept mic level signals. The choice will depend on your needs and budget, and whether you need to store and recall the analog gain settings in the same way as other parameters. Whichever model you choose, you are assured of the best sound quality available. Both superb mic preamps convey the most delicate nuances of the input signal right down to the smallest details. In this brochure "PM5D V2" refers to features common to both configurations, unless otherwise noted.

Easily Manageable Size and Weight for Touring or Installations

On the surface the PM5D V2 may look like a streamlined 24-channel console, but it is actually much, much more: a total of 130 input connections, simultaneous mixing of up to 64 inputs to stereo or LCR stereo, and 24 mix buses with extraordinary versatility, all with 500-scenes of total recall. Plus you have the equivalent of several racks full of first-rate processing gear onboard (56 Gates, 92 Comps, 97 Delays, 12 GEQs, 8 units of SPX2000 class multi effects, and more). Add advanced digital patching capability, sophisticated monitoring, surround panning from 3-1 to 6.1, and a wealth of features that contribute to unprecedented operational ease and efficiency. The fact that all of this is housed in a 950mm x 1551mm foot print console that weighs less than 98kg, powered by a 3U external power supply that weighs only 10kg, is simply staggering. If you've been touring with traditional equipment you'll appreciate the dramatically reduced setup time and effort required by this groundbreaking console. If you're equipping an installation you'll love the reduced installation and maintenance costs, as well as all the space you'll save.

32-bit Internal Processing

The PM5D V2 will handle 24-bit/96kHz audio without compromise. You won't sacrifice channels or any other processing capabilities whether the PM5D is run at 44.1, 48, 88.2 or 96-kHz. Internal processing is all 32-bit (using 58-bit accumulators) to ensure that absolutely no loss of audio quality occurs at any point in the signal path.

High-capacity, Versatile Mix Performance

The PM5D V2 can accommodate a total of 130 input connections (48 channel inputs, four stereo inputs, five 2 TR IN's plus four mini-YGDAI slots), and can handle up to 64 inputs simultaneously. The 64 input mixing channels are configured by default as 48 mono input channels, 4 stereo inputs, and 4 stereo effect returns. By utilizing the internal patch bay and expansion slots you can instantly scene-switch between totally separate stage setups. In terms of bus-routing capability you have 24 mix buses that can function as submasters or auxiliary sends, in addition to the stereo A and B (or LCR) and CUE buses. There's also an 8- output mix matrix that is invaluable for setting up submixes for a variety of applications. Any of the input channels, mix buses, and matrix buses can be assigned to the console's 8 DCA faders for extraordinarily flexible group control.

DSP5D Digital Mixing System Compatibility for Doubled or Tripled Capacity

If you need more I/O capacity and processing power than the PM5D V2 provides alone, you can add Yamaha DSP5D Digital Mixing System units that provide essentially all the functionality of a PM5D-RH V2 in a rack-mountable unit that can be seamlessly controlled from a PM5D (RH) V2 console. Up to two DSP5D units can be used with a single PM5D V2 console. A PM5D V2 plus one DSP5D gives you a total of 96 mono and 16 stereo input channels, while adding two DSP5D units to a PM5D V2 provides 144 mono and 24 stereo input channels to comfortably handle large-scale applications. And of course your processing power is doubled or tripled, respectively.

In terms of I/O capacity and processing capability a single DSP5D offers:

- **48 mono and 4 stereo inputs.**
- **24 Mix buses (cascaded to the PM5D V2 mix buses).**
- **8 Matrix buses.**
- **24 Omni Outputs.**
- **Full channel functionality: gain, EQ and filters, dynamics, sends.**
- **8 effect processors and 12 graphic equalizers.**
- **2 mini-YGDAI expansion card slots.**
- **Full compatibility with DSP5D Editor computer software.**
- **The ability to function as a remote DSP processor and I/O expansion unit via the DCU5D Digital Cabling Unit. The ability to function as a remote DSP processor and I/O expansion unit via the DCU5D Digital Cabling Unit.**

Like the PM5D itself, all analog inputs and outputs are directly accessible via standard XLR type connectors. After a few simple connections the DSP5D becomes an integral part of the PM5D console, and can be controlled from the PM5D control surface in the same way as the internal functions. So although you have significantly upgraded the system, you can simply plug in your sources and output devices and use it right away without having to work through another learning curve. You can directly connect the DSP5D to a PM5D via standard cascade cables if they are to be used in relatively close proximity. But if you want to use the DSP5D as a remote I/O with powerful DSP function the DCU5D Digital Cabling Unit lets you locate the DSP5D as far as 120 meters* from the PM5D console, connected only by one Cat-5 Ethernet cable. This dramatically reduces cabling requirements while maintaining solid audio and control reliability over extended distances.

* Refer to http://www.ethersound.com/technology/compatibility.php

DSP5D and DCU5D utilize EtherSound technologies. But because bandwidth is fixed exclusively for DSP5D and DCU5D, they cannot be controlled by ES monitor.

PM5D-RH V2

PM5D V2

DSP5D

DCU5D

All the Effects and Processing You'll Need Onboard

The PM5D V2 offers every processing facility you'll ever need onboard. Every input channel has 4 band EQ plus a high pass filter, a separate gate and compressor, and delay of up to 1000 milliseconds. The stereo and mix outs have 8-band EQ, compressor, and delay. The matrix outs have 4 band EQ, compressor and delay. The cue and monitor outs also include delay. But the PM5D V2 doesn't stop there! It features twelve 31-band GEQs and eight independent SPX2000- class multi-effect processors that can be patched into any of the console's input, stereo, mix, or matrix channels, offering a comprehensive range of reverb, delay, modulation, and combination effects. The PM5D V2 also comes with Yamaha's incomparable ADD-ON EFFECTS built in! You have immediate access to acclaimed REV-X Reverb programs as well as the Compressor276, Compressor260 and EQ601 programs from the AE-011 Channel Strip package and the Open Deck programs from the AE-021 Master Strip package.

Advanced, Intuitive User Interface

The PM5D V2 features interface technology developed and refined through an impressive lineup of digital consoles, including the PM1D. Here are a few highlights:

Selected Channel: Press the SEL key on any input or master channel and that channel strip is assigned to the console's SELECTED CHANNEL controls for real-time adjustment of a dazzling array of parameters. When you edit a parameter via a SELECTED CHANNEL control block, the corresponding display is automatically called to the console's large LCD display for even further editing precision and versatility.

Mix Send Select: With the PM5D V2 "vertical" and "horizontal" signal control corresponding to channel and buss flow on a conventional analog console is intuitive and efficient. For example; Press the MIX SELECT key corresponding to the desired mix bus, and the send levels to the selected bus can be adjusted directly via the channel strip encoders. If the MIX MASTER MIX SEND key is engaged, the send level from the current SELECTED CHANNEL input to all 24 mix busses can be adjusted via the MIX master encoders.

Encoder Mode: The input channel encoders can be assigned to mix send level, panning, input gain, or alternate layer input level, enabling the operator to adjust all input channel levels without changing layers.

Flip: When this key is engaged the functions of the input strip faders and encoders are reversed ... this is great when you want to use the faders for fine control of a parameter normally assigned to the encoders, which is ideal when using PM5D V2 for monitor applications. The interface advantages are extensive, and extend to details that can make a significant difference to work efficiency and comfort. Also there are connectors for mouse and keyboard: great assistance when you have to type in numerous characters while setting up patches and scenes.

Scene Recall

On the PM5D V2, all parameters are recallable in up to 500 scenes, so you can instantly key to the perfect mix. This type of repeatability is particularly important in high-turnover applications where you might need to accommodate a number of totally different acts every day. It can also make life much easier in one-act touring applications, leaving you more time to optimize the mix for individual venues. There is also a flexible recall safe function that enables on-the-spot cancellation and alteration of the pre-programmed settings.

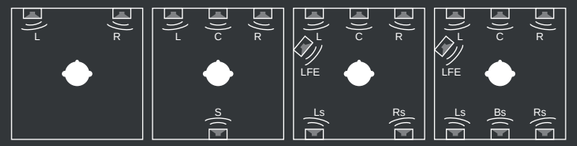
HA Library

Another important feature on the PM5D V2 is an HA library that, on the PM5D-RH V2, allows the gain and other parameters of the internal microphone preamplifier to be recalled in one operation. The HA library is also an advantage on both the PM5D V2 and PM5D-RH V2 when remotely-controllable preamplifiers such as the Yamaha AD8HR are connected via the console's expansion slots.

Surround Ready

The PM5D V2 is equipped with 3-1, 5.1 and 6.1 surround modes. You can easily set up surround channels on the mix buses, and panning can be controlled via the track pad or by using dedicated control devices connected via the MIDI or GPI port.

SURROUND SETUP



STEREO 3-1 5.1 6.1

Expansion Slots for Added Connectivity

Four rear-panel mini-YGDAI expansion slots allow you to use a range of MY series expansion cards to enhance the PM5D V2 in a number of ways. You can, for example, use the added I/O capability to connect to and remotely control high-performance Yamaha AD8HR 8-channel A/D with microphone preamplifiers. You could also significantly expand your audio processing capabilities by cascading to a DME64N Digital Mixing Engine. You can have 64 matrix outs, and control additional GEQ, Master fader, Cross Over, Delay and Matrix Mixer components created on DME64N from PM5D. Or you could cascade-connect to another PM5D V2 bi-directionally (up to 4 units uni-directionally) to create a huge system, or other Yamaha digital mixers such as the DM2000 or DM1000 for submix applications.

Virtual Soundcheck

Here's a perfect example of a version-2 feature that has been implement in response to feedback from the field. With a multi-track recording system such as Steinberg's Nuendo DAW, the PM5D V2 can not only be used to make top-quality live recordings, but a live recording made during a rehearsal or performance can be temporarily patched to the console's inputs and used for setup and adjustment when the musicians or performers aren't available. The results of this "Virtual Soundcheck" can then be directly saved to a scene without the need for complex re-patching or fear of accidental changes to setting. And unlike similar features found in other consoles, the PM5D V2 lets you assign individual channels to the Virtual Soundcheck function as required, so you can keep sound effect or BGM channels alive while doing a sound check.

Expanded Dynamics Capability

Next to level control and equalization, dynamics processing is one of the most critical requirements for achieving optimum mix quality. That's why the original PM5D console included sophisticated compressors, expanders, and companders on every channel. The PM5D V2 goes a step further by adding flexible de-essers that can significantly enhance the quality of vocal and speech channels by precisely isolating and compressing vocal sibilance.

Extra EQ

The PM5D's eight SPX2000-class internal effect processors offer a vast amount of DSP power. But since not every application requires full use of eight powerful effect processors, some of that power may go unused. In version 2 that potential can be put to good use in providing additional graphic and parametric EQ units. The PM5D V2 offers a plentiful supply of independent equalizers for input and output processing, but every engineer runs up against situations in which no amount of EQ seems to be enough. That's where the expanded EQ capability provided by this new feature will really shine.

Solid Security

Although the original PM5D offered plenty of security-oriented features, version 2 provides even greater security that will keep the system operating properly in the widest possible range of applications. A new Load Lock function, for example, makes it impossible to inadvertently load data that might change critical settings from external memory or the PM5D Editor. There's also an Output Isolation feature that allows full input channel control while preventing scene recall operations from changing output compression, delay, EQ, fader, patching, and other output parameters that needs to remain constant even through band or program material changes. You can specify any or all of the output parameters you want protected. And you can now assign "read-only" status to specific scenes to prevent them from being overwritten by store, load, or edit operations.

Channel Move Function

This seemingly simple function can be a huge advantage when revising a channel layout plan. Mono and stereo input channel setups can be "moved" to any other channel in one simple operation so you don't have to spend time re-entering all of the related channel settings, including patch and HA settings.

Elegant, Efficient, and Eminently Practical

Everything you need for hands-on mix control is right where you need it. The PM5D V2 physical control surface offers direct access to all of the major functions you're likely to need for just about any real-world application. And if you're using one or two DSP5D Digital Mixing System units for I/O and DSP expansion, you get seamless, comprehensive control directly from the PM5D V2 panel.

Mic Preamp Controls

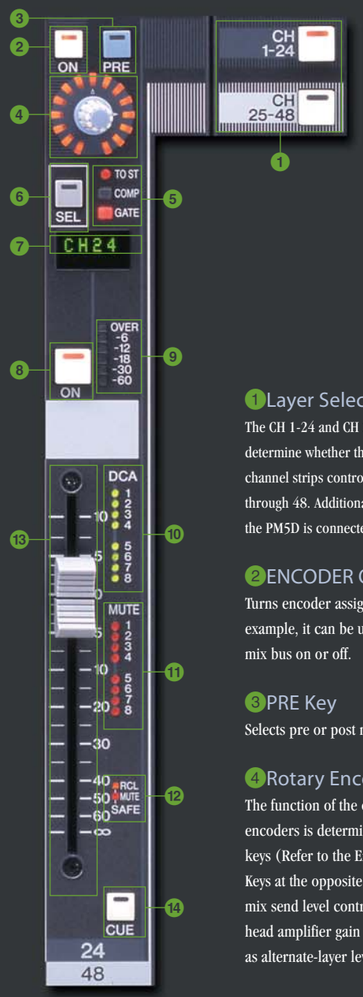
While the PM5D V2 manual microphone preamplifiers have physical phantom power, pad, gain, and insert switching controls, the PM5D-RH's recallable mic preamplifiers allow access to the same parameters via the console's encoders and software. Both models offer peak and signal indication LEDs for easy visual input level monitoring. If you're connected to a DSP5D Digitial Mixing System you have complete control of its mic preamps directly from the PM5D V2 console as well.

Input Patching

Although physical input jacks 1 through 48 on the rear panel of the PM5D are connected to the corresponding internal channels by default, digital patching provides total assignment freedom. You won't have to run around to physically re-patch cables whenever you need to reconfigure the system. The same goes for the inputs on a connected DSP5D Digital Mixing System. On-screen patch displays allow the system's inputs and outputs to be patched to appropriate I/O points and you can also assign and display channel names for easy identification. Patch setups you might want to use again can be stored in the patch library for instant recall at any time.

INPUT PATCH

Channel Strip Controls



1 Layer Select Keys

The CH 1-24 and CH 25-48 layer select keys determine whether the console's 24 physical mono channel strips control channels 1 through 24 or 25 through 48. Additional layers can be accessed when the PM5D is connected to one or two DSP5D units.

2 ENCODER ON Key

Turns encoder assigned functions on or off. For example, it can be used to switch the send to the mix bus on or off.

3 PRE Key

Selects pre or post mix send.

4 Rotary Encoder

The function of the channel strip rotary encoders is determined by the ENCODER MODE keys (Refer to the Encoder Mode & Fader Flip Keys at the opposite page). They can function as mix send level controls, channel pan controls, head amplifier gain or attenuation controls, or as alternate-layer level controls.

5 TO STEREO, GATE, and COMP Indicators

The TO STEREO indicator lights when the channel signal is feeding the stereo mix bus. The GATE indicator lights when the channel gate is closed, lights dimly during gate attack or decay, and goes out when the gate is open. The COMP indicator lights when the channel compressor is applying gain reduction, lights dimly during compressor attack or decay, and goes out when no gain reduction is being applied.

6 SEL Key

Assigns the corresponding channel to the console's SELECTED CHANNEL control section and to the built-in LCD display. The SEL keys can also be used to assign channels as stereo pairs.

7 Channel Name Display

This 4-character display shows the assigned name for the corresponding channel. The name dims when the channel is muted.

8 CH ON Key

Turns the corresponding input channel on or off.

9 Meter

A 6-point LED meter displays the channel input level.

10 DCA Indicators

The console's input channels can be assigned to any of 8 DCA. The DCA LEDs indicate the DCA faders to which the channel is assigned.

11 MUTE Indicators

Input channels can be assigned to eight mute groups for versatile mute control. The MUTE LEDs indicate the mute groups to which the corresponding channel is assigned.

12 RCL and MUTE SAFE Indicators

The RCL SAFE LED lights when the channel is set to the recall safe mode so that it will not be affected by scene recall operations. The MUTE SAFE mode prevents the channel from being affected by mute group operations.

13 Channel Fader

These very smooth and quiet 100mm motorized faders control and display the channel input level, or the send level to the selected mix bus when the FADER FLIP mode is on.

14 CUE Key

Sends the channel signal to the cue bus for monitoring according to the currently selected cue mode: LAST CUE, MIX CUE, or SOLO and various function settings.

Stereo Input Channels

The stereo input channels are essentially the same as the mono input channels, except that they have stereo level meters, and ST IN 1-4 and FX RTN 1-4 keys that assign the strips for stereo input channel or stereo effect return operation.

ENCODER MODE & FADER FLIP Keys

The ENCODER MODE keys determine the function of the rotary encoders at the top of the console's channel strips: send level to each of 24 mix buses, channel pan, input gain of the recallable head amps in the PM5D-RH V2 (or connected remote recallable head amplifiers) or attenuation after A/D conversion, and input fader level of alternate (unselected) layer. The FADER FLIP key swaps the functions assigned to encoders and faders. For example, if you engage the FADER FLIP key when MIX SEND is selected, the channel-strip faders adjust the mix send level while the encoders adjust the channel input level.

SELECTED CHANNEL Controls

1 EQUALIZER & HPF

A flexible 4-band equalizer section with high and low bands switchable for shelving or peaking response, variable frequency and Q on all bands, and an independent variable-frequency HPF. Since 8-band EQ is provided for output channels, UPPER and LOWER keys are provided to assign control to the upper or lower four bands.

2 STEREO

The STEREO section allows the currently selected channel signal (input, stereo input, effect return, mix) to be routed to the stereo bus with pan control.

3 COMPRESSOR

This is a full-featured compressor/expander/compander/de-esser module with independent threshold, range, attack, release, knee and ratio parameters. Like the noise gate section, the compressor section includes a six-segment gain reduction meter for convenient visual monitoring.

4 DELAY

Turns the channel delay on or off, and sets the delay time from 0 to 1,000 milliseconds for the selected input channel.

5 GAIN/ATTENUATION/Ø

When the GAIN/ATT key is on the encoder adjusts the gain of a recallable microphone preamplifier patched to the input of the selected channel. When the GAIN/ATT key indicator is off the encoder adjusts attenuation for the selected channel. The Ø key inverts the phase of the selected channel.

6 NOISE GATE

Extremely versatile noise gate provides effective noise suppression, ducking, and other gate functions. Extensive control is provided with independent threshold, range, attack, hold, and decay parameters, as well as key-ins and key-in filters.

7 GROUP

This section controls channel to DCA and MUTE group assignments. The DCA keys assign the currently selected input channel to one or more of the DCA faders, while the MUTE keys assign the currently selected input channel to one or more of the eight available mute groups. The GROUP section also includes RECALL SAFE and MUTE SAFE assign keys that engage or disengage recall safe and/or mute safe status for the currently selected input channel.

8 CHANNEL SELECT

This section can be used to select the channel to which the SELECTED CHANNEL controls will apply. COPY and PASTE function are also included, making it easy to copy all parameters from one channel to any other channel.

Flexible Mixing For Any Application

In addition to dual stereo mix buses that can be used together for LCR send, the PM5D V2 offers 24 independent mix buses that you can use for submix, auxiliary, effect, or just about any other type of send your application requires ... all with master mix control as well as individual mix send level control from all available inputs. All mix buses have 8-band EQ, compression, and delay that you can control via the SELECTED CHANNEL controls to optimize your submix signals. And if that isn't enough, there's also an 8-output matrix mix for the mix and stereo buses (also equipped with EQ, compression and delay!) on the PM5D V2, plus an additional 8 matrix buses on each DSP5D unit you use. Once you've created all the submixes you need, you can group them, as well as the input channels, by assigning them to the very versatile DCA faders.

MIX Send/Master Controls

Independent MIX control blocks are provided for the mix buses. When the MIX SEND key is engaged, the MIX encoders adjust the send level from the selected channel to the corresponding mix buses. When the MIX MASTER key is engaged the encoders function as master level controls for the corresponding mix buses. You can still use the channel-strip encoders to adjust mix send level by using the MIX SEND SELECT keys to specify the destination mix bus. The MIX blocks also include ON keys to turn the corresponding send on or off, TO STEREO and TO MTRX LEDs to indicate assignment to the stereo and matrix busses, PAIR LEDs that indicate paired mix sends, and CUE and SEL keys that assign the corresponding MIX signal to the SELECTED CHANNEL controls when the MIX MASTER mode is engaged. When an odd-even numbered pair of mix bus sends is assigned as a stereo pair, the odd-numbered encoder functions as a pan/balance control while the even-numbered encoder sets the send level for the pair. The MIX controls can be assigned to DCA groups 7 and 8, so a pair of DCA assignment indicators is also provided.

MATRIX Controls

The MATRIX controls comprise an 8-channel submix matrix from the mix and stereo buses. Each matrix module features a level encoder, ON key, CUE key, and SEL key which assigns that channel to the SELECTED CHANNEL controls. Like the MIX bus controls, the MATRIX controls can be assigned to DCA groups 7 and 8, so a pair of DCA assignment indicators is provided. PAIR LEDs indicate paired matrix controls. When an odd-even numbered pair of matrix controls is assigned as a stereo pair, the odd-numbered encoder functions as a pan/balance control while the even-numbered encoder sets the send level for the pair.

MATRIX/ST ROUTING

MIX to MATRIX VIEW

DCA Faders

Any input or output channels can be assigned to any of the console's eight DCA faders for convenient grouping. Each DCA strip also includes a four-character name display as well as MUTE and CUE keys for convenient muting and cue monitoring of the corresponding DCA signal. The faders can also be used to control individual bands of the internal graphic equalizers. In fact, you can assign a variety of functions to the DCA faders that can be instantly recalled via the FADER MODE keys. You could, for example, assign input channel level control to the DCA faders so you have simultaneous control of 32 channels instead of the normal 24. Or you could assign mix master levels, matrix levels ... whatever you need to work in the most productive, efficient manner for the job at hand.

DCA GROUP ASSIGN (In)

STEREO Faders

The master stereo faders control the output from the console's STEREO A and STEREO B buses. In addition to the faders the STEREO strips include channel ON keys, TO MTRX and COMP LEDs, CUE keys, and SEL keys which assign the corresponding STEREO bus signal to the SELECTED CHANNEL controls. The STEREO OUTPUT block also features RECALL SAFE and MUTE SAFE LEDs similar to those on the input and output channels, and DCA 7 and 8 LEDs that indicate assignment to the corresponding DCA faders. The STEREO B strip additionally features a MONO key that sums the STEREO B channels to a mono signal that can serve as the center channel for LCR configurations.

DCA GROUP ASSIGN (Out)

Output Patching

As with input patching, all outputs can be conveniently patched to just about anywhere you need them via the LCD display screen patch matrix without having to physically re-patch cables. The mix outputs, stereo outputs, matrix outputs, mono and stereo channel insert and direct outs, oscillator output, talkback output, and monitor outputs can be patched to the console's mix outputs, cascade outputs, option slot outputs, and any of the three 2TR digital outputs. Send to internal effects can be patched anywhere from the MIX outputs and INSERT OUT points. Inputs and outputs on connected DSP5D units can be patched directly from the PM5D V2 in the same way and just as easily as the console's own inputs and outputs.

Comprehensive Monitoring Facilities

Staying in touch with your sound is vital to create the perfect mix. The PM5D's in-depth cue, monitor and metering facilities let you hear what's happening at any point in the mix with maximum ease and efficiency.

CUE & SOLO

The PM5D V2 provides three cue and solo modes: Mix Cue, Last Cue, and Solo. The PM5D V2 cue system additionally provides four types of cue monitoring: INPUT CUE, DCA CUE, OUTPUT CUE, and EFFECT or GATE KEY IN CUE with various function settings. There is also a CUE INTERRUPT function that lets you select whether the MONITOR OUT signal will be affected by cue/solo operation or not. This last function can be extremely useful in broadcast applications.

MONITOR

The PM5D V2 MONITOR section offers a range of monitor source selection keys: 2 Track In Analog 1 and 2, 2 Track In Digital 1 through 3 (all with sample rate converters), STEREO A and B for the console's stereo busses (these buttons can be pressed simultaneously to allow LCR monitoring), and a DEFINE key that can be assigned to select any source. Also USER DEFINED KEYS can be assigned for this purpose, so you can monitor-select as many sources as you like at the touch of a button. Individual level controls are provided for the MONITOR OUT and PHONES outputs.

MONITOR

TALKBACK

In addition to the talkback microphone signal, the PM5D V2 TALKBACK setup display allows the signals from any one of the AD inputs to be mixed with the microphone signal, and the TALKBACK destination can be assigned freely to any of the output ports. The TALKBACK ON button can be set for latched or unlatched operation.

TALKBACK

Level Meters

A complete set of level meters is provided on the console panel. Layer select keys let you monitor any input channel layer plus the stereo inputs or effect returns. The MIX/MATRIX key allows visual monitoring of the mix buses and matrix outputs. Individual stereo meters are also provided for the STEREO A, STEREO B, and CUE buses. A PEAK HOLD key engages or disengages the meter peak hold function. In addition, a comprehensive range of meter facilities are provided via the LCD display showing all inputs, outputs, input gain reduction and output gain reduction. Flat meters won't obstruct the engineer's view of the stage.

Left of LCD

Right of LCD

Extensive Analog and Digital Connectivity

The PM5D V2, PM5D-RH V2, and the DSP5D all provide comprehensive analog and digital connectivity that makes it easy to set up just about any type of system without requiring external interfacing. Flawlessly bridging the gap between the analog and digital worlds are high-performance analog-to-digital and digital-to-analog converters that provide totally transparent conversion.

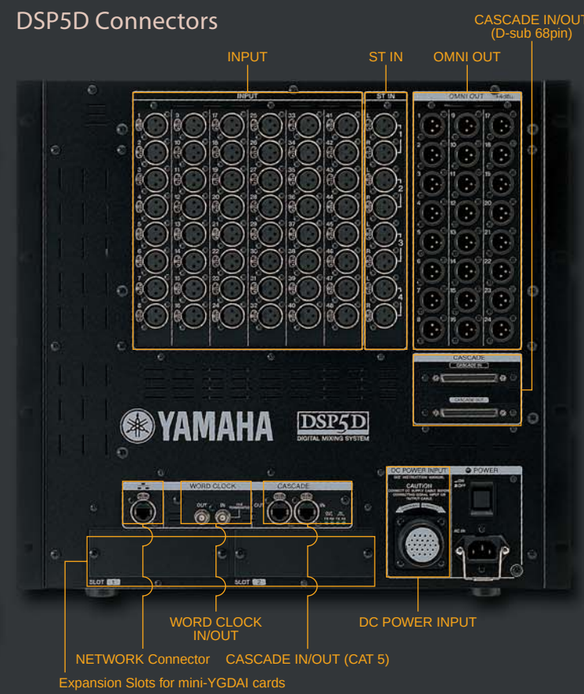
PM5D V2 Connectors

· ST IN Connectors
The PM5D-RH V2 and DSP5D ST IN connectors accept both line and microphone input, while the PM5D V2 ST IN connectors accept line-level input only.

* MIX OUT Connectors of PM5D V2 can be used as OMNI OUT connectors.

PM5D-RH V2 Connectors

DSP5D Connectors

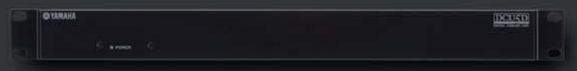


DCU5D Digital Cabling Unit

You can directly connect the DSP5D to a PM5D V2 via standard cascade cables if they are to be used in relatively close proximity. But if you want to use the DSP5D as a powerful on-stage DSP and I/O expansion unit the DCU5D Digital Cabling Unit lets you locate the DSP5D as far as 120 meters* from the PM5D V2 console, connected only by one Cat-5 Ethernet cable. The DCU5D converts the PM5D V2 cascade signals (68-pin D-sub connector) to and from Cat-5 audio, dramatically reducing cabling requirements while maintaining solid audio and control reliability over extended distances. For maximum power reliability the DCU5D also features a 4-pin XLR connector that will accept standard external power supplies for failsafe redundant operation.

* Refer to http://www.ethersound.com/technology/compatibility.php

DSP5D and DCU5D utilize EtherSound technologies. But because bandwidth is fixed exclusively for DSP5D and DCU5D, they cannot be controlled by ES monitor.



Front

Rear

PW800W Power Supply

The PM5D V2 is reliably powered by an external power supply unit. The PW800W is extremely compact and lightweight (3U, 10kg). Thanks to its high efficiency, the low speed cooling fans are extremely quiet. PW800W accepts 100 - 240 volts so it can be universally used. The PW800W can also be used as a secondary "redundant" power supply for the DSP5D.

PSL120 Power Supply Link Cable

Two PW800W units can be serially connected using the optional PSL120 cable for failsafe operation.

Enhanced Efficiency & Operability

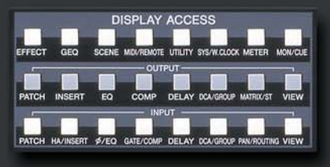
These are the features that make a difference in workflow and efficiency. On the PM5D V2 they attest to the fact that Yamaha has really listened to feedback from the field, and implemented refinements that make sense in real-world applications.

Large LCD Display

Although PM5D V2 can be operated without relying on the LCD display, the 10.2-inch 600 x 800 dot color LCD display provides easy-to-read graphics and multiple parameter views. It is particularly useful when you want to dig in and do in-depth programming and editing to take full advantage of this remarkable console's capabilities, as well as when changing patch, utility, and other settings.

DISPLAY ACCESS Keys

The DISPLAY ACCESS keys determine which type of data will be shown on the LCD panel. A total of 24 categories are provided in logical groups, letting you access a particular type of data directly. If you want to set up an input patch, for example, simply press the PATCH key in INPUT group to call up the appropriate display.



USER DEFINED KEYS

These 25 keys can be assigned to control just about any functions you choose, for example, to individually mute outputs, bookmark LCD display menu, for external machine control or effect tap tempo. USER DEFINED KEY number 25 is located separately from the other 24 keys, next to the FADER MODE buttons, and is conveniently assigned to scene increment operation ... but you can reassign it to perform any function you require.

USER DIFINED KEY

DIRECT RECALL/ MUTE MASTER

These eight keys can be used either to directly recall assigned scene numbers, or to mute the corresponding mute groups. The DIRECT RECALL and MUTE MASTER LEDs indicate which function the keys are currently assigned to.

SCENE MEMORY

Scene recall has become one of the most in-demand features of digital consoles because of the enormous boost in productivity it can provide. The PM5D V2 offers storage and recall capacity for up to 500 scenes. Scenes can be recalled via the SCENE MEMORY section keys, the DIRECT RECALL keys, the USER DEFINED KEYS, the scene management display, or external control such as MIDI or GPI. Scenes can be protected so that they can't be inadvertently overwritten. Recall safe function can be applied to parameters you don't want to be affected by scene recall operations, or alternatively you can make Selective Recall to recall the wanted parameters only. There's a PREVIEW mode that lets you visually confirm the contents of recalled scenes before actually applying the changes to the console, and an UNDO key lets you quickly undo an unwanted scene recall.

SCENE

RECALL SAFE

TRACKING RECALL

Event List

The Event List allows existing scenes to be freely assigned as events in a list. This not only allows scenes to be lined up for recall in any required order, but it also allows the scenes to be recalled at specified times in a time code signal generated by external equipment or by the PM5D V2 itself.

Data Entry Controls

This section includes cursor keys, INC/DEC keys, data wheel, and a trackpad for versatile, easy data entry when editing via the LCD display. If you prefer to work with a keyboard and mouse, appropriate connectors are conveniently provided under the front armrest pad.

Lamp Dimmer and LED, LCD Brightness Control

The lamp dimmer controls the brightness of the LA1L gooseneck lamps. Parameter visibility can be an issue, depending on your work environment. The PM5D V2 lets you control the brightness of the LCD screen and also all of the LEDs on the control surface in 8 steps. At outdoor events, you might want to turn the brightness of the PM5D V2 indicators up high. Lower brightness is more appropriate in dark venues, where a bright display may distract nearby audience members. PM5D V2 even has a "Panel Assistance Mode" in which "off" LEDs are dimly lit to assist the operator to see the surrounding keys and signs in a very dark operational environment (where the use of gooseneck lamps are prohibited).

PCMCIA Card Slot

Set up your mixes, dump your data to a Compact Flash memory card using PCMCIA adapters and you can easily transfer it to another PM5D V2 console, or keep it safe for reloading into the same console at a different time or venue. Engineers can travel worldwide with just one memory card in their pocket! The PCMCIA card slot will also be used for future firmware updates.

Libraries

Setting up the entire PM5D V2 system from scratch can be a formidable task, so Yamaha has provided an extensive selection of presets in a range of libraries that can simply be selected and used as they are or modified to suit specific requirements. Of course, your own setups can be added to the libraries for instant recall whenever they are needed. Here's a list of the available libraries:

Name	Number	Total
Scene Memory	Preset 1 + User 500	501
Input Patch Library	Preset 1 + User 99	100
Output Patch Library	Preset 1 + User 99	100
Input Channel Library	Preset 1 + User 199	200
Output Channel Library	Preset 1 + User 199	200
Input EQ Library	Preset 40 + User 159	199
Output EQ Library	Preset 3 + User 196	199
GATE Library	Preset 4 + User 195	199
COMP Library	Preset 36 + User 163	199
Effect Library	Preset 55 + User 144	199
GEQ Library	Preset 1 + User 199	200
HA Library	Preset 1 + User 199	200

Graphic Equalizers

The PM5D V2 provides twelve dedicated 31-band graphic equalizers for output processing, and more are available via the internal effects when necessary. The graphic equalizers are ideal for use whether you need a subtle overall response adjustment or a more dramatic boost or cut in a limited frequency range. Each equalizer also features a spectrum analyzer display. For easy setup the console's DCA faders can be assigned to directly adjust the GEQ bands in 8-band groups via the FADER MODE keys.

GEQ PARAMETER

GEQ ASSIGN

Internal Effect Processors

The PM5D V2 is equipped with eight SPX-class and VCM (Virtual Circuit Modeling) effect processors that can be patched into any of the console's input, stereo, mix, or matrix channels, offering a comprehensive range of reverb, delay, modulation, and combination effects.

Effect List

Acclaimed VCM & REV-X Effects Built In

Previously available as options for Yamaha digital mixing consoles, a number of our top-performance Add-on Effects programs are now provided in the PM5D V2. You can edit, store and recall the Add-on Effects on the console in the same way as the standard internal effects. In addition, a special GUI is available in the PM5D editor to manage these effects.
The extraordinary quality of many of the Add-on Effects is due to the innovative VCM technology they employ. VCM (Virtual Circuitry Modeling) technology actually models the characteristics of analog circuitry - right down to the last resistor and capacitor. VCM technology goes well beyond simply analyzing and modeling electronic components and emulating the sound of old equipment, and is capable of capturing subtleties that simple digital simulations cannot even approach.

CHANNEL STRIP Compressor Programs (Effect No.49~53)

This group of effects includes 5 models that employ VCM (Virtual Circuitry Modeling) technology to recreate the sound and characteristics of several classic compression and EQ units from the 70's. Compressor 276 (mono) and Compressor 276S (stereo) recreate the fast response, frequency characteristics, and tube-amp saturation of the most in-demand analog compressors for studio use. Compressor 260 (mono) and Compressor 260S (stereo) feature faithful modeling of the solid-state VCA and RMS detection circuitry of the late 70's for live sound reinforcement applications. And Equalizer 601 delivers the unique characteristics of 70's analog EQ circuitry, featuring graphical editing capability on both the console and PC displays.

Compressor 276 (mono)
Compressor 276S

EQ601

Compressor 260 (mono) /
Compressor 260S

MASTER STRIP Open Deck Programs (Effect No.54)

Virtual Circuitry Modeling technology is employed to recreate both the analog circuitry and tape characteristics that shaped the sound of open-reel tape machines from the "golden age" of recording. Models of four machine types are included: Swiss '70, Swiss '78, Swiss '85, and American '70. You can even combine different record and playback decks for a wider range of variation. You also have a choice of "old" and "new" tape types, tape speed, bias, and EQ settings that can vary the "focus" of the sound, distortion, and saturation characteristics.

American '70 with New

Swiss '85 with New

Swiss '70 with New

REV-X Reverb Programs (Effect No.46~48)

The REV-X programs feature the richest reverberation and smoothest decay available, based on the REV-X algorithms first introduced in Yamaha's SPX2000 Professional Multi Effect Processor. The Hall and Room programs have a very open sound, while Plate delivers a brighter tonality that is ideal for vocals.

REV-X HALL

REV-X ROOM

REV-X PLATE

* Note: The names of programs or menus incorporated in the Add-on Effects are for descriptive purposes only. Reference to product names, trademarks, artists and songs is made for the sole purpose of identifying products and sounds studied for modeling and describing the sound nuances Yamaha attempted to create through use of its proprietary technology. Such reference does not constitute representations that they physically possess equal qualities, and does not imply any cooperation or endorsement by such manufacturers or artists. The products, trademarks are the property of their respective owners.

HA REMOTE Control Output

This connector provides control signals for remote control of an external microphone preamplifier such as the Yamaha AD8HR 8-channel A/D microphone preamplifier. The AD8HR's mic preamp gain can be remotely controlled in steps of 1dB directly from the PM5D V2. There's also a high pass filter and phantom power supply integrated into each channel that can be turned on and off by remote control. The filter's cut-off frequency is also remotely adjustable. This Head Amp Remote Control function makes it possible for the AD8HR to be used as a stage box. In addition to the many advantages that this offers, digital connection of the AD8HR and PM5D V2 using an AES/EBU cable reduces analog wiring requirements to the bare minimum.

HA

HA LIBRARY

Operation Lock

The Operation Lock function prevents accidental or inadvertent operation by requiring a password for access.

SECURITY

Internal Oscillator

The internal oscillator provides 100Hz, 1kHz, and 10kHz sine-wave signals as well as pink and burst noise. Sine waves of different frequencies can be sent to the left and right channels for effective setup checks.

GPI Interface

A 4-input 12-output General Purpose Interface is provided on PM5D V2 to provide control interoperability with a wide range of sound and studio equipment - fader start and talk back on/off are just two examples. The USER ASSIGNABLE KEYS can be assigned to trigger appropriate output signals, and continuous input capability allows the PM5D V2 to be controlled by external equipment.

GPI

MS Decoding

Built-in MS decoding eliminates the need for external matrix transformers for MS microphones when working with MS-encoded source material.

M/S DECODE

Mix Minus

Mix Minus makes it possible to instantly remove a specified channel from the mix - a common example from the broadcast field would be removing an announcer from a mix. Vertical Pairing In addition to standard odd-even channel pairing, the PM5D V2 allows "vertical pairing" in which adjacent channels on different layers can be operated in tandem - channels 1 and 25, for example.

Word Clock

The PM5D V2 can be used as either word clock master or slave to allow effective integration with any type of digital audio system up to 96-kHz.

WORD CLOCK

MIDI Remote

The PM5D V2 features MIDI IN, OUT and THRU connectors that can be connected to external MIDI equipment to allow transmission and reception of MIDI control signals.

Complete Software Control

As with other Yamaha digital consoles, editor application software is provided to PM5D V2 users. The PM5D Editor is designed for the offline programming and on-line control, with comprehensive analog-style visual representation of the PM5D V2 controls. A separate DSP5D Editor application is provided for control of the DSP5D. The PM5D Editor will run on Windows XP and Mac OSX (10.2 or later) compatible computers connected to the PM5D V2 via USB. The DSP5D Editor runs on a Windows computer connected to the DSP5D via an Ethernet network cable. The PM5D Editor works within the Yamaha Studio Manager Host environment for smooth integration with other Yamaha digital systems. It would not be possible to introduce all of the PM5D V2 software parameters and displays in the space available here, but here are a few examples.

Layer Window

Almost a complete virtual mixer, this window shows all PM5D V2 input channel parameters "in-line" as they might appear on an analog console. This is a comprehensive overview designed for fast, efficient editing of the most essential mix elements.

Selected Channel Window

This very useful overview window shows all parameters available via the console's SELECTED CHANNEL section in easy-to-grasp graphic form, as well the controls in the selected channel strip itself, and the MIX SEND controls.

The PM5D Editor will also include the following windows for total console management :

- Effect Window
- DCA/Mute Group Window
- Effect Window
- GEQ Window
- Surround Editor Window
- Meter Window
- Patch Editor
- Library Window
- Scene Window
- Setup Window

Master Windows (Mix, Matrix, DCA, Stereo)

These windows provide an informative overview of fader levels as well as other parameters including EQ, compressor gain reduction, delay, and more.

Options

The PM5D V2's real I/O versatility comes in the form of four mini-YGDAI expansion slots. The expansion slots are 24 bit/96 kHz compatible, so you can select mini YGDAI plug-in cards to create the input/output configuration that's perfect for your needs.

mini-YGDAI Cards

Digital I/O Cards

MY16-AE
16 channel AES/EBU format I/O

MY16-AT
16 channel ADAT format I/O

MY16-TD
16 channel TDIF format I/O

MY16-CII
16 channel CobraNet™ I/O

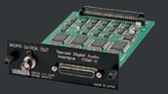
MY16-C
16 channel CobraNet™ I/O

MY8-AE96
8 channel AES/EBU format I/O

MY8-AE96S
8 channel AES/EBU format I/O
(w/Sample rate converter)

MY8-AE
8 channel AES/EBU format I/O

MY8-AEB
8 channel AES/EBU format I/O



MY8-TD
8 channel TDIF format I/O

AD/DA Card

MY8-AT
8 channel ADAT format I/O

MY8-ADDA96
8 channel Analog I/O

AD Cards

MY8-AD96
8 channel Anolog Input Card

MY8-AD24
8 channel Analog Input Card

MY4-AD
4 channel Analog Input Card

DA Cards

MY8-DA96
8 channel Anolog Output Card

MY4-DA
4 channel Anolog Output Card (20bit)

Third Party Cards

AVIOM 16/o-Y1
16 channel AVIOM A-Net Output Card

AuviTran AVY16-ES
16 channel EtherSound I/O

Audio-Service MY16MADI64
MADI I/O

PW800W

Power Supply

PSL120

Power Supply Link Cable

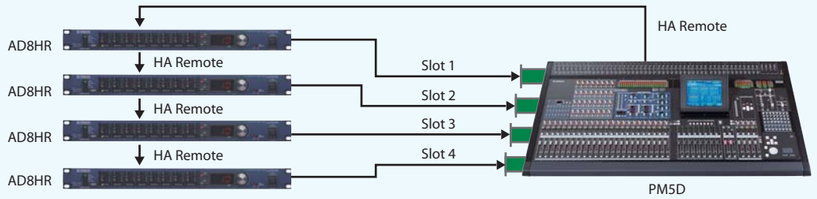
Application Examples

1. Remote Microphone Preamplifier Control

Using MY-series expansion cards and the PM5D's HA REMOTE output, it is possible to receive input from and remotely control up to eight high-performance Yamaha AD8HR 8-channel A/D converter with remote preamp.

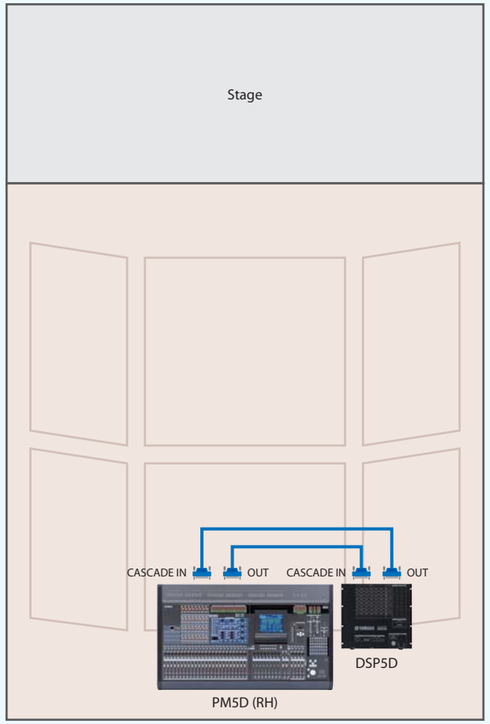
The AD8HR's mic preamp gain can be remotely controlled in steps of 1dB directly from the PM5D. There's also a high pass filter and phantom power supply integrated into each channel that can be turned on and off by remote control. The filter's cut-off frequency is also remotely adjustable.

This Head Amp Remote Control function makes it possible for the AD8HR to be used as a stage box. In addition to the many advantages that this offers, digital connection of the AD8HR and PM5D using an AES/EBU cable reduces analog wiring requirements to the bare minimum.



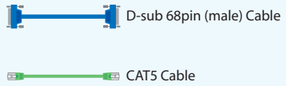
2. F.O.H for Concerts

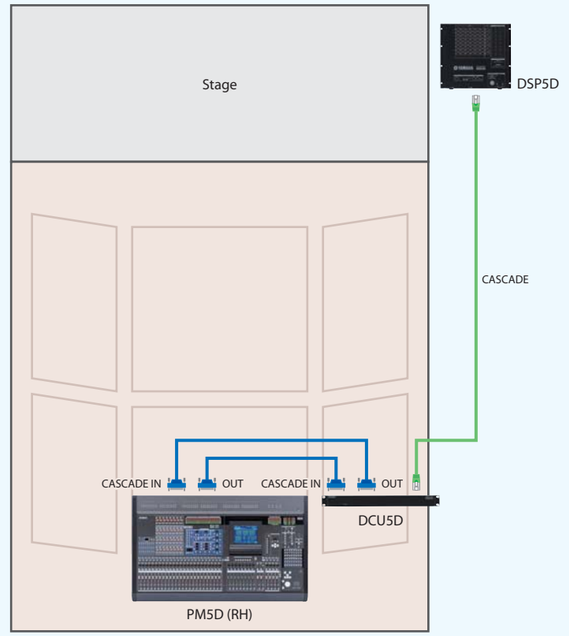
If the DSP5D will be located near the PM5D V2 at the front-of-house position, you can connect it to the console via a pair of D-sub 68-pin cascade cables. In the setup shown here, with a single DSP5D cascaded to a PM5D V2, you have 96 microphone inputs and 48 omni outputs (24 Mix buses, 16 Matrix buses). Other peripheral gear such as a playback device for BGM and/or effects can be mounted in the same rack as the DSP5D.



3. Concerts Using the DSP5D as a Remote I/O

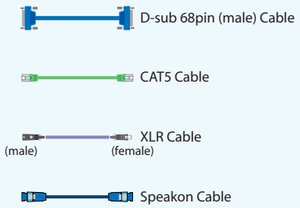
If the console needs to be located a significant distance from the stage you can add a DCU5D Digital Cabling Unit so that the DSP5D can be located on stage and connected via a "digital snake" consisting of a single CAT5 Ethernet cable. The DCU5D is connected to the console via a pair of D-sub 68-pin cascade cables. In addition to the 48 inputs and 24 outputs provided by the PM5D V2 itself, you now have another 48 microphone/line inputs and 24 omni outputs on stage. (Totally 24 Mix Buses, 16 Matrix buses, 48 OMNI outs). Of course, all DSP5D functions can be controlled directly from the PM5D V2 console. You could also add one or two MY-card output interfaces such as the MY8-DA96 to the DSP5D, and use them to drive an on-stage power amp rack for monitors and FOH speakers.

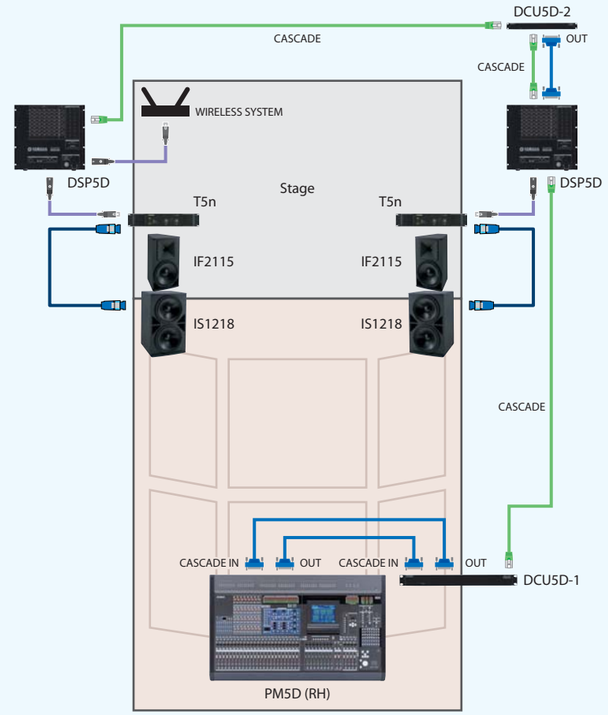




4. Dual DSP5D for Theater and Performance

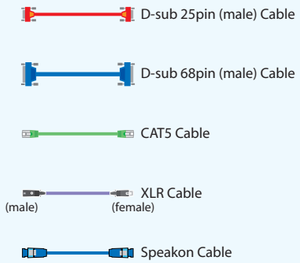
If you need more on-stage I/O capability for complex staging, for example, add a second DCU5D and DSP5D as shown in the system below. The second DCU5D is connected to the first DSP5D via a pair of D-sub 68-pin cascade cables, and an Ethernet cable connects to the second DSP5D. In this example each DSP5D drives a power amplifier and FOH speaker - a fast and easy setup for theaters that don't have a built-in sound system that will handle the job. Monitors could also be easily accommodated if required. Wireless receivers can be connected directly to the DSP5D units for reliable performer mic pickup. This setup gives you 96 microphone/line inputs and 48 omni outputs (24 Mix buses and 16 Matrix buses) on stage.

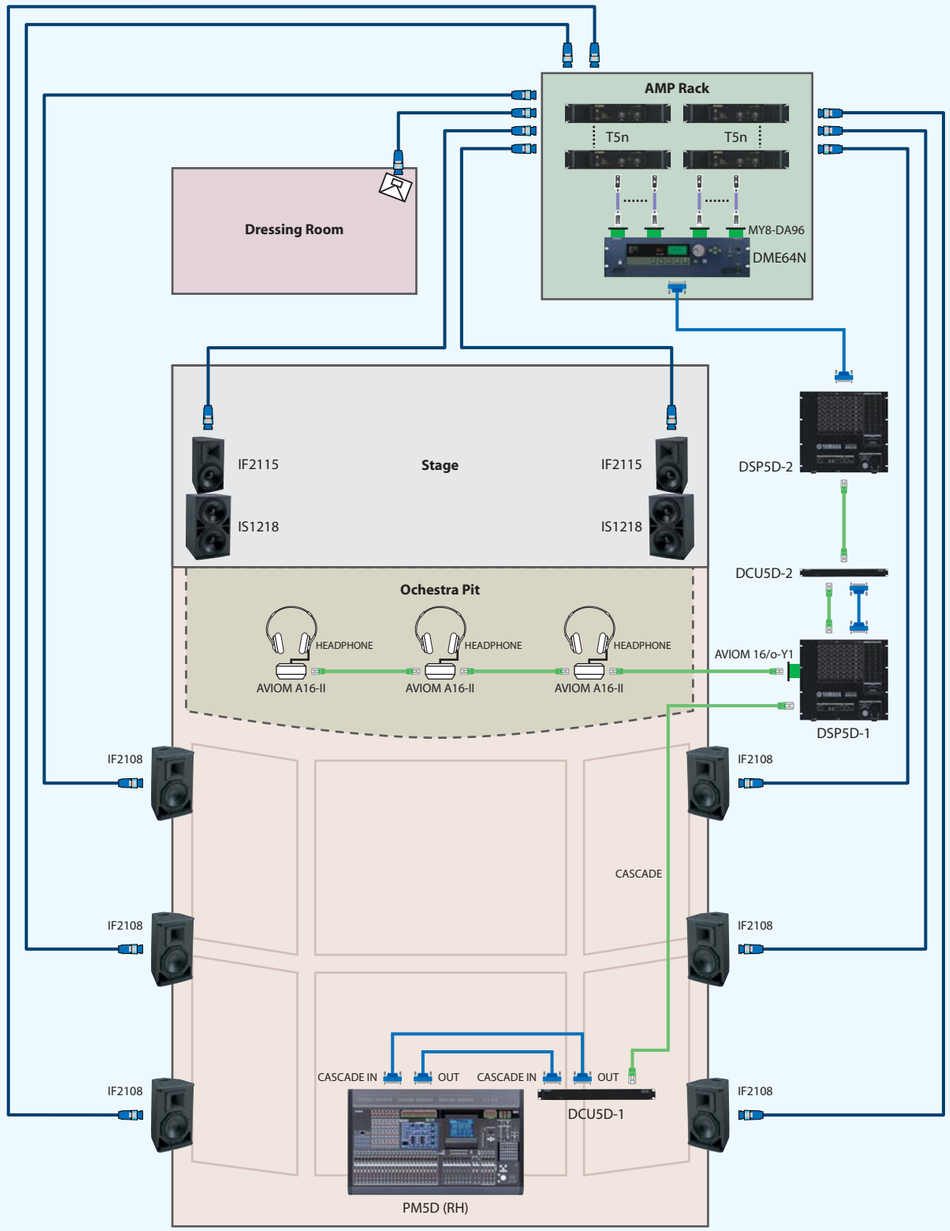




5. Opera House with Orchestra Pit and Stage DSP5D Units

In this system, which is designed primarily for an opera-house type situation, one DSP5D unit is located in the orchestra pit while the second DSP5D unit is located on stage. A DCU5D is connected to the console at the rear of the house via D-sub 68-pin cables. That DCU5D then connects to the first DSP5D unit via a single CAT5 cable. A second DSP5D unit is connected to the first DSP5D via a second DCU5D using D-sub 68pin cable and CAT5 cables, as shown in the diagram. This makes 48 microphone/line inputs available in the orchestra pit, and another 48 microphone/line inputs available on stage. The DSP5D head amps can be controlled directly from the PM5D V2 console. A pair of DME64N units connected to the stage DSP5D outputs perform processing and distribution for the FOH speakers, box-seat speakers, and a back-stage speaker system. The orchestra pit DSP5D directly feeds powered monitors for the musicians in the pit.





PM5D V2, PM5D-RH V2 GENERAL SPECIFICATIONS

All faders are nominal when measured. Output impedance of signal generator:150Ω

Internal Signal Processing	32-bit (Accumulator 58-bit)	
Sampling Frequency	Internal External	44.1kHz, 48kHz, 88.2kHz, 96kHz Normal rate: 44.1kHz — 48kHz Double rate: 88.2kHz — 96kHz
Signal Delay	PM5D PM5D-RH	Less Than 2.3ms INPUT to STEREO A, B (@ Fs = 48kHz) Less Than 1.15ms INPUT to STEREO A, B (@ Fs = 96kHz) Less Than 2.5ms INPUT to STEREO A, B (@ Fs = 48kHz) Less Than 1.25ms INPUT to STEREO A, B (@ Fs = 96kHz)
Fader	Moterized, Stroke: 100mm All Faders	
Fader Resolution	+10 — -138, -∞dB All Faders	
Total Harmonic Distortion Input Gain = Min.	Less Than 0.05% 20Hz — 20kHz @+4dBu into 600Ω INPUT 1 — 48ch to STEREO A,B OUT (@Sampling frequency = 44.1kHz or 48kHz) Less Than 0.05 % 20Hz — 40kHz @+4dBu into 600Ω INPUT 1 — 48ch to STEREO A,B OUT (@Sampling frequency = 88.2kHz or 96kHz)	
Frequency Response	PM5D	0.5, -1.5dB 20Hz — 20kHz @1kHz into 600Ω INPUT 1 — 48ch to STEREO A,B OUT (@Sampling frequency = 44.1kHz or 48kHz) 0.5, -2dB 20Hz — 40kHz @1kHz into 600Ω INPUT 1 — 48ch to STEREO A,B OUT (@Sampling frequency = 88.2kHz or 96kHz)
	PM5D-RH	1.0, -3.0dB 20Hz — 20kHz @1kHz into 600Ω INPUT 1 — 48ch to STEREO A,B OUT (@Sampling frequency = 44.1kHz or 48kHz) 1.0, -3.0dB 20Hz — 40kHz @1kHz into 600Ω INPUT 1 — 48ch to STEREO A,B OUT (@Sampling frequency = 88.2kHz or 96kHz)
Dynamic Range (Max. level to noise level)	110 typ. DA Converter (STEREO A, B OUT) (@Sampling frequency = 44.1kHz or 48kHz) 108 typ. AD + DA (to STEREO A, B OUT), GAIN: Min., PAD: ON (@Sampling frequency = 44.1kHz or 48kHz) 110 typ. DA Converter (STEREO A, B OUT) (@Sampling frequency = 96kHz) 106 typ. AD + DA (to STEREO A, B OUT), GAIN: Min., PAD: ON (@Sampling frequency= 88.2kHz or 96kHz)	
Hum & Noise Rs = 150Ω Input Gain = Max. Input Pad = 0dB Input sensitivity = -60dB	-128dBu Equivalent Input Noise (20Hz — 20kHz) STEREO A, B OUT -86dBu Residual Output Noise, ST Master Off.	
Maximum Voltage Gain @1kHz	84dB INPUT 1 — 48 to STEREO A, B OUT, Rs = 150Ω, Input Gain: Max., PAD: Off 84dB INPUT 1 — 48 to MIX OUT/MATRIX OUT/CUE OUT/MONITOR OUT (via STEREO Bus)	
Crosstalk @1kHz	-80dB Adjacent Input 1 — 48 -80dB Input to Output	
Power Requirements	PM5D PM5D-RH	480W DC 24V 20A (Use PW800W Only) 528W DC 24V 22A (Use PW800W Only)
Dimensions W x D x H (mm)	1551 x 950 x 283	
Net Weight	PM5D: 98kg, PM5D-RH: 97kg	
Operation free-air Temperature Range	10 — 35°C	
Storage Temperature Range	-20 — 60°C	
Accessories	Goothneck Lamp x 3, Power Supply cable (3.6m), Cover	

* Input Gain = Min.
* Hum & Noise is measured with a 6dB/octave filter @12.7kHz; equivalent to a 20kHz filter with infinite dB/octave attenuation.
* Total Harmonic Distortion is measured with a 18dB/octave filter @80kHz
* Dynamic range is measured with a 6dB/octave filter @12.7kHz; equivalent to a 20kHz filter with infinite dB/octave attenuation.

LIBRARIES

Name	Number	Total
Scene Memory	Preset 1 + User 500	501
Input Patch Library	Preset 1 + User 99	100
Output Patch Library	Preset 1 + User 99	100
Input Channel Library	Preset 1 + User 199	200
Output Channel Library	Preset 1 + User 199	200
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Output EQ Library	Preset 3 + User 196	199
GATE Library	Preset 4 + User 195	199
COMP Library	Preset 36 + User 163	199
Effect Library	Preset 55 + User 144	199
GEQ Library	Preset 1 + User 199	200
HA Library	Preset 1 + User 199	200

DSP5D GENERAL SPECIFICATIONS

Internar Signal Processing	32-bit (Accumulator 58-bit)	
Sampling Frequency	Internal External	44.1kHz, 48kHz, 88.2kHz, 96kHz Normal rate: 44.1kHz — 48kHz Double rate: 88.2kHz — 96kHz
Signal Delay	Less Than 2.5ms INPUT to OMNI OUT (@ Fs = 48kHz) Less Than 1.25ms INPUT to OMNI OUT (@ Fs = 96kHz)	
Total Harmonic Distortion Input Gain = Min.	Less Than 0.05% 20Hz - 20kHz @+4dBu into 600Ω INPUT 1 — 48ch to OMNI OUT 1-24ch (@ Sampling frequency = 44.1kHz or 48kHz) Less Than 0.05% 20Hz - 20kHz @+4dBu into 600Ω INPUT 1 — 48ch to OMNI OUT (@Sampling frequency = 96kHz)	
Frequency Response	1.0, -3.0dB 20Hz — 20kHz @1kHz into 600Ω INPUT 1 — 48ch to OMNI OUT (@ Sampling frequency = 44.1kHz or 48kHz) 1.0, -3.0dB 20Hz — 40kHz @1kHz into 600Ω INPUT 1 — 48ch to OMNI OUT (@ Sampling frequency = 96kHz)	
Dynamic Range	110 typ. DA Converter (OMNI OUT) (@ Sampling frequency = 44.1kHz or 48kHz) 108 typ. AD + DA (to OMNI OUT) GAIN; Min., PAD: ON (@ Sampling frequency = 44.1kHz or 48kHz) 110 typ. DA Converter (OMNI OUT) (@ Sampling frequency = 96kHz) 106 typ. AD + DA (to OMNI OUT) GAIN; Min., PAD: ON (@ Sampling frequency = 96kHz)	
Hum & Noise Rs=150Ω, Input Gain = Max.	-128dBu Equivalent Input Noise (20Hz - 20kHz) -86dBu Residual Output Noise, OMNI OUT	
Crosstalk @1kHz	-80dB adjacent INPUT channels(1 — 48ch) -80dB INPUT to OMNI OUT	
Power Requirements	300W, AC 100 — 240V 50/60Hz	
Dimensions W x D x H (mm)	480 x 460 x 440 (11U) + 13 (leg)	
Net Weight	38kg	
Operation free-air Temperature Range	10 — 35°C	
Storage Temperature Range	-20 — 60°C	
Accessories	D-sub 68pin cable 10m x 2	

PW800W GENERAL SPECIFICATIONS

Power Requirements		1000W (Max.), 100 — 240V, 50/60Hz
Dimensions	W x D x H (mm)	480 x 355 x 132 (3U)
DC Output	Voltage	24V
	Current	23A (Max.)
Net Weight		10kg
Operation Temperature Range		10 — 35°C
Storage Temperature Range		-20 — 60°C

PW800W OUTPUT SPECIFICATIONS

Output Terminal	Format	Level	Connector
DC OUTPUT	—	DC 24V	JL05-2A22-14PC 24pin (Male)

DCU5D GENERAL SPECIFICATIONS

Sampling Frequency	Nomal rate; 44.1kHz - 48kHz Double rate; 88.2kHz - 96kHz
Power Requirements	12W, 100-240V 50/60Hz DC IN; XLR-4-32 type (4pin=+12V, 1pin=GND), 11.4V-15V, 1.5A
Dimensions W x D x H (mm)	480 x 150 x 44
Net Weight	2.3kg
Operation free-air Temperature Range	10 — 35°C
Storage Temperature Range	-20 — 60°C

PM5D V2 ANALOG INPUT CHARACTERISTICS

Input Terminals	PAD	GAIN	Actual Load Impedance	For Use With Nominal	GAIN SW *4	Input Level			Connector
						Sensitivity *1	Nominal	Max. Before Clip	
INPUT 1 – 48	0	-60dB	3kΩ	50-600Ω Mics & 600Ω Lines	—	-80dBu (0.0775mV)	-60dBu (0.775mV)	-40dBu (7.75mV)	XLR-3-31 Type (Balanced) *2
		-16dB				-36dBu (12.3mV)	-16dBu (123mV)	+4dBu (1.23V)	
	26					-10dBu (245mV)	+10dBu (2.45V)	+30dBu (24.51V)	
STEREO INPUT 1 – 4 [L, R]		-34dB	4kΩ	600Ω Lines	—	-54dBu (1.55mV)	-34dBu (15.5mV)	-14dBu (155mV)	XLR-3-31 Type (Balanced) *2
		10dB				-10dBu (245mV)	+10dBu (2.54V)	+30dBu (24.51V)	
INSERT IN 1 – 48			10kΩ	600Ω Lines	—	-16dBu (123mV)	+4dBu (1.23V)	+24dBu (12.28V)	Phone Jack (TRS) (Balanced) *3
2TR IN ANALOG 1, 2 [L, R]			10kΩ	600Ω Lines	+24dB (default)	-6dBu (388mV)	+4dBu (1.23V)	+24dBu (12.28V)	XLR-3-31 Type (Balanced) *2
					+18dB	-12dBu (195mV)	-2dBu (0.616V)	+18dBu (6.16V)	
TALKBACK			3kΩ	50-600Ω Mics & 600Ω Lines	—	-60dBu (0.775mV)	-50dBu (2.45mV)	-30dBu (24.5mV)	XLR-3-31 Type (Balanced) *2

PM5D-RH V2 ANALOG INPUT CHARACTERISTICS

Input Terminals	GAIN	Actual Load Impedance	For Use With Nominal	GAIN SW *4	Input Level			Connector
					Sensitivity *1	Nominal	Max. Before Clip	
INPUT 1 – 48	-62dB	3kΩ	50-600Ω Mics & 600Ω Lines	—	-82dBu (61.6μV)	-62dBu (0.616mV)	-42dBu (6.16mV)	XLR-3-31 Type (Balanced) *2
	+10dB				-10dBu (245mV)	+10dBu (2.45V)	+30dBu (24.5V)	
STEREO INPUT 1 – [L, R]	-62dB	3kΩ	50-600Ω Mics & 600Ω Lines	—	-82dBu (61.6μV)	-62dBu (0.616mV)	-42dBu (6.16mV)	XLR-3-31 Type (Balanced) *2
	+10dB				-10dBu (245mV)	+10dBu (2.45V)	+30dBu (24.5V)	
2TR IN ANALOG 1, 2 [L, R]		10kΩ	600Ω Lines	+24dB (default)	-6dBu (388mV)	+4dBu (1.23V)	+24dBu (12.28V)	XLR-3-31 Type (Balanced) *2
				+18dB	-12dBu (195mV)	-2dBu (0.616V)	+18dBu (6.16V)	
TALKBACK		3kΩ	50-600Ω Mics & 600Ω Lines	—	-60dBu (0.775mV)	-50dBu (2.45mV)	-30dBu (24.5mV)	XLR-3-31 Type (Balanced) *2

*1. Sensitivity is the lowest level that will produce an output of +4dBu (1.23V) or the nominal output level when the unit is set to maximum gain. (All faders and level controls are maximum position.)
*2. XLR-3-31 type connectors are balanced. (1 = GND, 2 = HOT, 3 = COLD)
*3. Phone jacks are balanced. (Tip = HOT, Ring = COLD, Sleeve = GND)
*4. There are switches inside the body to preset the maximum input level.
• In these specifications, 0dBu = 0.775 V rms.
• All input AD converters are 24bit linear, 128times (@48kHz) oversampling.
• +48V DC (phantom power) is supplied to INPUT (1 – 48) XLR type connectors via each individual switch.

PM5D V2/PM5D-RH V2 ANALOG OUTPUT CHARACTERISTICS

Output Terminals	Actual Source Impedance	For Use With Nominal	GAIN SW *4	Output Level		Connector
				Nominal	Max. Before Clip	
STEREO A, B [L, R]	150Ω	600Ω Lines	+24dB (default)	+4dBu (1.23 V)	+24dBu (12.28 V)	XLR-3-32 Type (Balanced) *1
			+18dB	-2dBu (616mV)	+18dBu (6.16V)	
MONITOR OUT [L, R, C]	150Ω	600Ω Lines	+24dB (default)	+4dBu (1.23 V)	+24dBu (12.28 V)	XLR-3-32 Type (Balanced) *1
			+18dB	-2dBu (616mV)	+18dBu (6.16V)	
CUE OUT [L, R]	150Ω	600Ω Lines	+24dB (default)	+4dBu (1.23 V)	+24dBu (12.28 V)	XLR-3-32 Type (Balanced) *1
			+18dB	-2dBu (616mV)	+18dBu (6.16V)	
MATRIX OUT 1 – 8	150Ω	600Ω Lines	+24dB (default)	+4dBu (1.23 V)	+24dBu (12.28 V)	XLR-3-32 Type (Balanced) *1
			+18dB	-2dBu (616mV)	+18dBu (6.16V)	
MIX OUT 1 – 24	150Ω	600Ω Lines	+24dB (default)	+4dBu (1.23 V)	+24dBu (12.28 V)	XLR-3-32 Type (Balanced) *1
			+18dB	-2dBu (616mV)	+18dBu (6.16V)	
INSERT OUT 1 – 48	150Ω	10kΩ Lines	—	+4dBu (1.23 V)	+24dBu (12.28 V)	Phone Jack (TRS) (Balanced) *2 *5
PHONES (x2)	15Ω	8Ω Phones	—	75mW *6	150mW	Stereo Phone Jack (TRS)
		40Ω Phones	—	65mW *6	150mW	(Unbalanced) *3

*1. XLR-3-32 type connectors are balanced. (1 = GND, 2 = HOT, 3 = COLD)
*2. Phone jack are balanced. (Tip = HOT, Ring = COLD, Sleeve = GND)
*3. PHONES stereo phone jack is unbalanced. (Tip = LEFT, Ring = RIGHT, Sleeve = GND)
*4. There are switches inside the body to preset the maximum output level.
*5. INSERT OUTs are only provided for PM5D.
*6. The position of the level control is 10dB lowered from Max.
• In these specifications, 0dBu = 0.775 Vrms.
• All output DA converters are 24bit, 128times (@48kHz) oversampling.

PM5D V2/PM5D-RH V2 DIGITAL INPUT CHARACTERISTICS

Terminal			Format	Data Length	Level	Connector
2TR IN DIGITAL *2	1	AES/EBU	AES/EBU	24bit	RS422	XLR-3-31 Type (Balanced) *1
	2	AES/EBU	AES/EBU	24bit	RS422	XLR-3-31 Type (Balanced) *1
	3	COAXIAL	IEC-60958	24bit	0.5Vpp/75Ω	RCA Pin Jack
CASCADE IN			—	—	RS422	D-Sub Half Pitch Connector 68P (Female)

*1. XLR-3-31 type connectors are balanced. (1 = GND, 2 = HOT, 3 = COLD)
*2. With Sampling Rate Converter.

PM5D V2/PM5D-RH V2 DIGITAL OUTPUT CHARACTERISTICS

Terminal			Format	Data Length	Level	Connector
2TR OUT DIGITAL *3	1	AES/EBU	AES/EBU Professional Use	24bit *1	RS422	XLR-3-32 Type (Balanced) *2
	2	AES/EBU	AES/EBU Professional Use	24bit *1	RS422	XLR-3-32 Type (Balanced) *2
	3	COAXIAL	IEC-60958 Consumer Use	24bit *1	0.5Vpp/75Ω	RCA Pin Jack
CASCADE OUT			—	—	RS422	D-Sub Half Pitch Connector 68P (Female)

*1. Dither :word length 16/20/24 bit
*2. XLR-3-32 type connectors are balanced. (1 = GND, 2 = HOT, 3 = COLD)
*3. With Sampling Rate Converter.

PM5D V2/PM5D-RH V2 CONTROL INPUT/OUTPUT CHARACTERISTICS

Terminal		Format	Level	Connector
TO HOST	USB	USB1.1	—	B type USB Connector
MIDI	IN	MIDI	—	DIN-5pin
	OUT	MIDI	—	DIN-5pin
	THRU	MIDI	—	DIN-5pin
TIME CODE IN	SMPTE	SMPTE	0.3Vpp (min.)/10Vpp (max.), 10kΩ	XLR-3-31 type
WORD CLOCK	IN	—	TTL/75Ω (ON/OFF)	BNC
	OUT	—	TTL/75Ω	BNC
GPI		—	—	D-sub 25pin (female)
HA REMOTE		—	RS422	D-sub 9pin (male)
REMOTE		—	RS422	D-sub 9pin (female)
KEYBOARD		PS/2	—	DIN 6pin
MOUSE		PS/2	—	DIN 6pin
LAMP 1,2,3		—	2.5V-11.5V	XLR-4-31 type
MEMORY CARD		—	—	PCMCIA (CF)

PM5D V2/PM5D-RH V2 SLOT (1-4) CHARACTERISTICS

Each I/O SLOT accepts a Digital Interface card.

Card Name	Function	Input	Output	The Number Of Usable Cards
MY4-AD	ANALOG IN	4 IN	—	4
MY8-AD24	ANALOG IN	8 IN	—	4
MY8-AD96	ANALOG IN	8 IN	—	4
MY4-DA	ANALOG OUT	—	4 OUT	4
MY8-DA96	ANALOG OUT	—	8 OUT	4
MY8-AE96	AES/EBU	8 IN	8 OUT	4
MY8-AE96S	AES/EBU	8 IN	8 OUT	4

Card Name	Function	Input	Output	The Number Of Usable Cards
MY8-AT	ADAT	8 IN	8 OUT	4
MY8-TD	TASCAM	8 IN	8 OUT	4
MY8-AE	AES/EBU	8 IN	8 OUT	4
MY16-AT	ADAT	16 IN	16 OUT	4
MY16-TD	TASCAM	16 IN	16 OUT	4
MY16-AE	AES/EBU	16 IN	16 OUT	4
MY16-CII*	CobraNet	16 IN	16 OUT	4

*Only SLOT1 has a Serial Interface.

DSP5D ANALOG INPUT CHARACTERISTICS

Input Terminals	GAIN	Actual Load Impedance	For Use With Nominal	Output Level			Connector
				Sensitivity*1	Nominal	Max. Before Clip	
INPUT 1 – 48	-62dB +10dB	3kΩ	50-600Ω Mics. & 600Ω Lines	-82dBu	-62dBu	-42dBu	XLR-3-31 Type (Balanced) *2
				-10dBu	+10dBu	+30dBu	
ST IN 1 – 4 [L, R]	-62dB +10dB	3kΩ	50-600Ω Mics. & 600Ω Lines	-82dBu	-62dBu	-42dBu	XLR-3-31 Type (Balanced) *2
				-10dBu	+10dBu	+30dBu	

*1. Sensitivity is the lowest level that will produce an output of +4dBu (1.23V) or the nominal output level when the unit is set to maximum gain. (all faders and level controls are maximum position.)
*2. XLR-3-31 type connectors are balanced. (1=GND, 2=HOT, 3=COLD)
• All input AD converters are 24bit linear, 128times (@48kHz) oversampling.
• +48V DC (phantom power) is supplied to INPUT (1 – 48) XLR type connectors via one master software controled switch and each individual software controled switches.
• There are switches inside the body to preset the maximum input level.

DSP5D ANALOG OUTPUT CHARACTERISTICS

Output Terminals	Actual Source Impedance	For Use With Nominal	GAIN SW*2	Output Level		Connector
				Nominal	Max. Before Clip	
OMNI OUT – 24	150Ω	600Ω Lines	+24dB (default)	+4dBu	+24dBu	XLR-3-32 Type (Balanced) *1
			+18dB	-2dBu	+18dBu	

*1. XLR-3-32 type connectors are balanced. (1=GND, 2=HOT, 3=COLD)
*2. There are switches inside the body to preset the maximum output level.
• All output DA converters are 24bit, 128times (@48kHz) oversampling.

DSP5D DIGITAL INPUT CHARACTERISTICS

Terminal	Format	Data Length	Level	Connector
CASCADE IN	—	—	RS422	D Sub Half Pitch Connector 68P (Female)
CASCADE IN	—	—	100 Base-TX (RJ-45)	Ether Con

• CASCADE cable max. 200m@48KHz, 50m@96KHz.

DSP5D DIGITAL OUTPUT CHARACTERISTICS

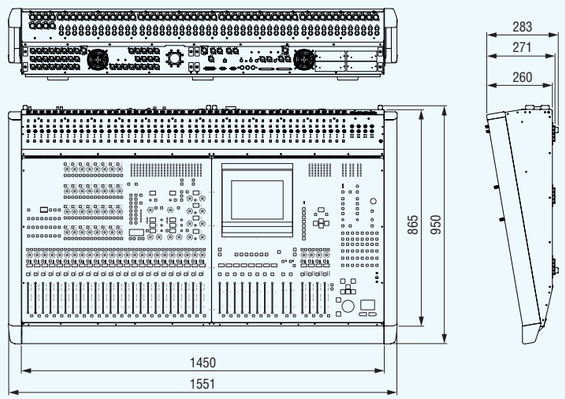
Terminal	Format	Data Length	Level	Connector
CASCADE OUT	—	—	RS422	D Sub Half Pitch Connector 68P (Female)
CASCADE OUT	—	—	100 Base-TX (RJ-45)	Ether Con

• CASCADE cable max. 200m@48KHz, 50m@96KHz.

Dimensions

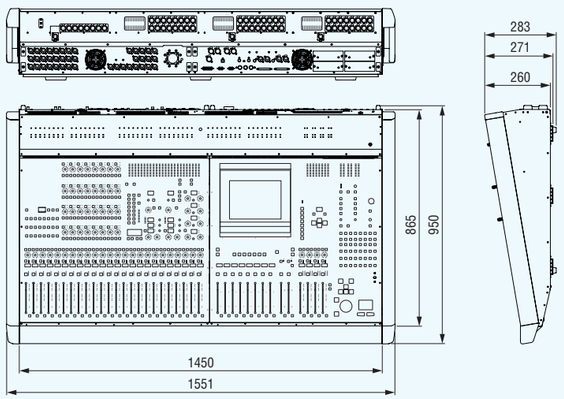
PM5D V2

Unit: mm



PM5D-RH V2

Unit: mm



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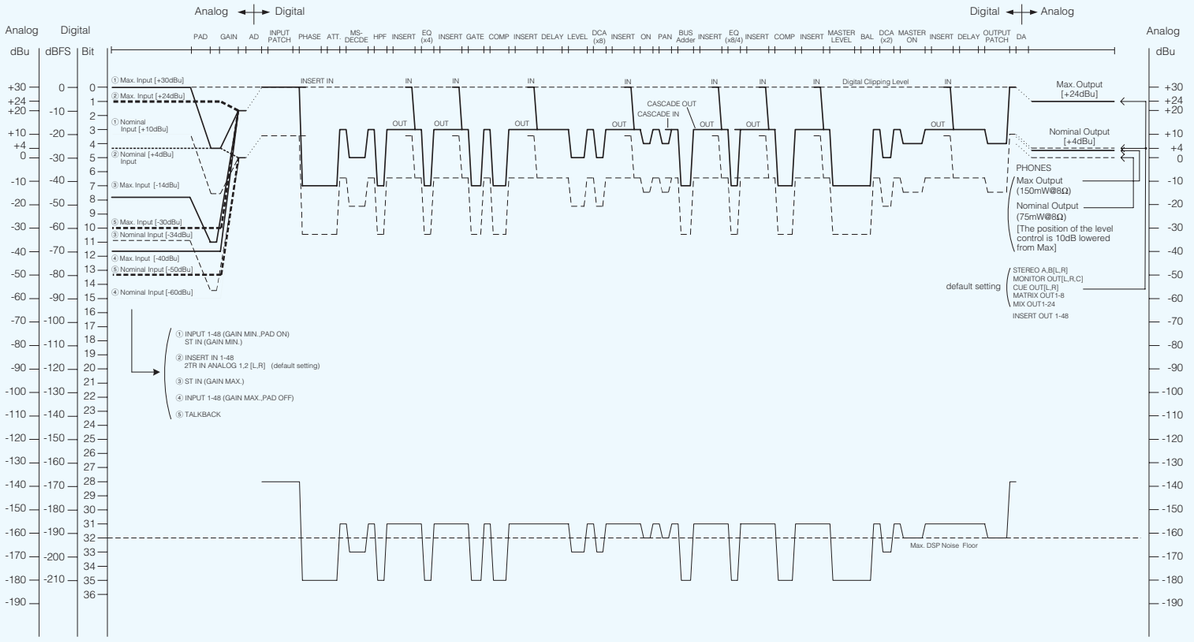
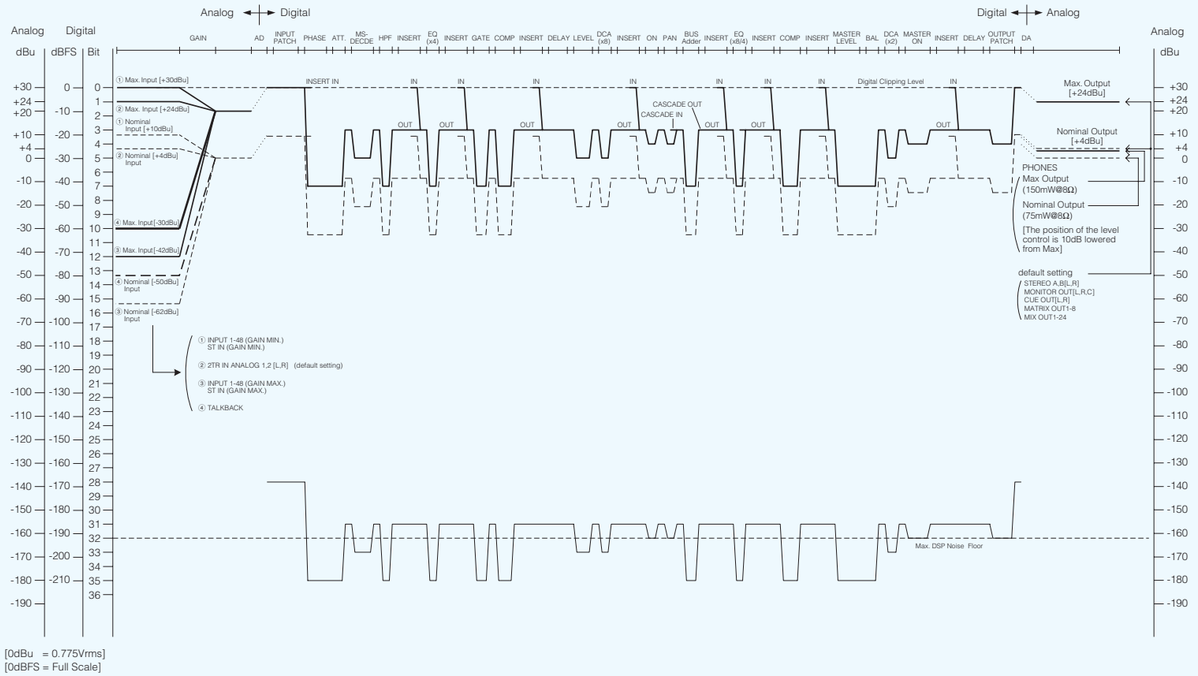
System Level Diagram



[0dBu = 0.775Vrms]
[0dBFS = Full Scale]

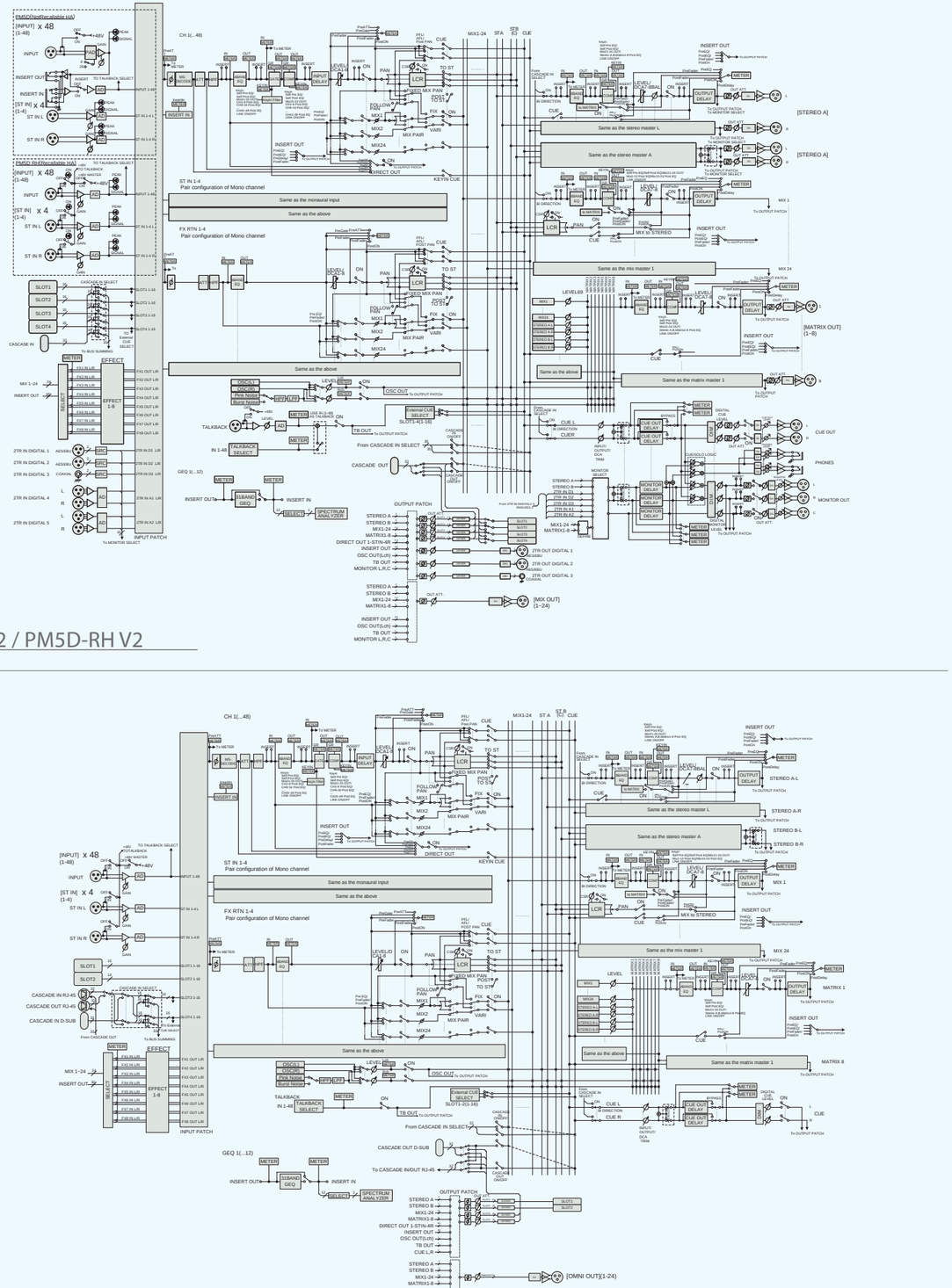
PM5D V2



[0dBu = 0.775Vrms]
[0dBFS = Full Scale]

PM5D-RH V2 / DSP5D

Block Diagram



PM5D V2 / PM5D-RH V2

DSP5D