Overview

The control surface with two large touch panel displays and 38 faders enables you to perform general operations on the RIVAGE PM system.

Rear Panel

Features

- Fader configuration: 38 (12+12+12+2) faders.
- Touch Screen: 15" x 2
- Local I/O: 8 in, 8 out.
- Yamaha's industry-standard Selected Channel concept, providing direct access to parameters of any channel selected via its SEL key.
- Up to 8 RPio units can be connected to each TWINLANe ring. (Maximum 16 units in one RIVAGE PM system)
- Up to 48 Rio units can be mounted in one RIVAGE PM system.
- Up to 2 DSP engine units can be connected within one RIVAGE PM system.
- Up to 2 control surfaces can be connected within one RIVAGE PM system.
- Seamlessly integrated remote control and offline editing via computer software.
- Wireless remote control of a RIVAGE PM system is possible via an iPad app
- Individual wireless MIX/MATRIX mixing can be simultaneously performed by up to 10 different iPad, iPhone, iPod touch, or Android devices (V4.0 or later)
- Data exchangeable using Console File Converter.
- Direct 2-track recording to standard USB flash drives, or serious multitrack recording to a DAW via Dante.
- Multitrack recordings can be used for "virtual sound check" when the performers aren't available.
- Expansion Slots: MY Slots: 2
- GPI Interface: 8-in/8-out
- Other features: comprehensive Fader Bank section with recallable custom banks, editable channel names and colors, user defined keys and user defined knobs, 1000 scene memories, input and output delays, ample EQ and dynamics processing, 24 DCA groups, 12 mute groups, multiple user defined key and knob, and more.
- Dimensions (W x H x D): 1549 x 417 x 848 mm
- Net Weight: 85 kg

Specifications 1/3

Functional Specifications

Local Connectors	Analog	In	8 (SILK)
		Out	8
	Digital	AES IN	4 (AES/EBU)
		AES OUT	4 (AES/EBU)
	Expansion Slot	MY	2
	GPI	IN	8
		ONT	8
	Word Clock		Only Out
	MIDI		In / Out
	USB	File	4
		Rec/Play	1
	Redundant PSU		Built-in dual power supply
	Meter Bridge		On screen
	Lamp		4
	Talkback In		Yes
	Video Out		Yes
	Phones		2 x 2
	AC Inlet		2 (V-Lock Type)
Scene Memory	Tactile Control Keys		Yes
User Interface	Display		15 inch Touch Panel x2
	Centralogic Section		Yes
	Faders		12+12+12+2
	Selected Channel Encoders		All Parameters
	Channel Encoder		Yes
	Channel Name / Color Display		Yes
	Custom Fader Banks		Yes (6 x 5 on each bay) (V4.0 or later)
	User Defined Keys		12 (x 4 banks)
	User Defined Knobs		4 (x 4 banks)
	Touch and Turn Knob		Yes (2)
	Monitor Level Knob		Yes (2: A and B)
	Wooden Arm Rest		Yes
Software	Editor		RIVAGE PM Editor
	StageMix		RIVAGE PM StageMix
	Console File Converter		Yes

Specifications 2/3

General Specifications

User Interface		100 mm touch-sensitive motorized fader (resolution=1024 steps) × 38 15" multi-touch screen (high brightness, wide view angle) x 2
Power Requirements		100-240 V, 50/60 Hz
Power Consumption		380 W
Dimensions	W x H x D	1549mm x 417mm x 848mm (61.0" x 16.4" x 33.4") (including the rubber feet)
Weight		85kg (187lbs)
NC Value *1		FAN speed LOW: NC=15 / HIGH: NC=25
Temperature Range	Operating Temperature Range	Min: 0°C, Max: 40°C
	Storage Temperature Range	Min: –20°C, Max: 60°C
Accessories		System set up guide, AC power cord x 2, Dust cover Gooseneck Lamp LA1L x 4
Optional Items		Mini-YGDAI card

*1 Measured 30 cm horizontally away and vertically up from the unit (front pad).

Audio Specifications

At the time of measurement, all levels are set to nominal. Output impedance of the signal generator is 150Ω.

Frequency Response

Fs=44.1kHz, 48kHz, 88.2kHz, 96kHz @20Hz-20kHz, reference to the nominal output level @ 1kHz

Inputs	Outputs	RL	Conditions	Min.	Typ.	Max.	Unit
OMNI IN 1-8	OMNI OUT 1-8	600Ω	GAIN: +66 dB	-0.8	0.0	0.5	dB

Total Harmonic Distortion *1

Fs=44.1kHz, 48kHz, 88.2kHz, 96kHz

Inputs	Outputs	RL	Conditions	Min.	Typ.	Max.	Unit
OMNI IN 1-8	OMNI OUT 1-8	600Ω	+4 dBu@20 Hz-20 kHz, GAIN:+66 dB			0.12	%
OMNI IN 1-8	OMNI OUT 1-8	600Ω	+4 dBu@20 Hz-20 kHz, GAIN:-6 dB			0.05	%
Internal OSC	OMNI OUT 1-8	600Ω	Full scale output@1 kHz			0.02	%
Internal OSC	PHONES	8Ω	Full scale output@1 kHz, phones level control: max			0.2	%

*1 An 80kHz, 18dB/octave low pass filter is used to measure total harmonic distortion.

Hum & Noise *1

Fs=44.1kHz, 48kHz, 88.2kHz, 96kHz

Inputs	Outputs	RL	Conditions	Min.	Typ.	Max.	Unit
OMNI IN 1-8	OMNI OUT 1-8	600Ω	RS= 150Ω, GAIN: +66 dB Master fader at nominal level and one Ch fader at nominal level.		-128 EIN*2		dBu
					-62		dBu
OMNI IN 1-8	OMNI OUT 1-8	600Ω	RS= 150Ω, GAIN: -6 dB Master fader at nominal level and one Ch fader at nominal level.		-90	-85	dBu
All Inputs	OMNI OUT 1-8	600Ω	RS= 150Ω, GAIN: -6 dB Master fader at nominal level and all OMNI IN 1-8 faders at nominal level.			-76	dBu
-	OMNI OUT 1-8	600Ω	Residual output noise, ST master off.		-92		dBu
-	PHONES	8Ω	Residual output noise, phones level control min.			-88	dBu

*1 An IHF-A filter is used to measure hum & noise level.
*2 EIN stands for Equivalent Input Noise.

Dynamic Range *1

Fs=44.1kHz, 48kHz, 88.2kHz, 96kHz

Inputs	Outputs	RL	Conditions	Min.	Typ.	Max.	Unit
OMNI IN 1-8	OMNI OUT 1-8	600Ω	AD +DA, GAIN: -6 dB		114		dB
-	OMNI OUT 1-8	600Ω	DA Converter		116		dB

*1 An IHF-A filter is used to measure dynamic range.

Crosstalk *1

@1 kHz Fs=44.1kHz, 48kHz, 88.2kHz, 96kHz

From/To	To/From	Conditions	Min.	Typ.	Max.	Unit
OMNI IN n	OMNI IN (n-1) or (n + 1)	OMNI IN 1-8 adjacent inputs, GAIN:-6 dB			-100	dB
OMNI OUT n	OMNI OUT (n-1) or (n + 1)	OMNI OUT 1-8, input to output			-100	dB

*1 A 22kHz, 30 dB/octave low pass filter is used to measure crosstalk.

Specifications

Analog Input Characteristics *1 *2 *3

Input Jack	GAIN	Input Impedance	Source Impedance	Input Level			Connector
				Sensitivity*4	Nominal	Max. before Clip	
OMNI IN 1-8	+66 dB	10kΩ	50-600Ω Mics & 600Ω Lines	–82dBu (61.6μV)	–62dBu (0.616mV)	–42dBu (6.16mV)	XLR-3-31 type (Balanced)*5
	–6 dB			–10dBu (245mV)	+10dBu (2.45V)	+30dBu (24.5V)	
TALKBACK	+54 dB	10kΩ	50-600Ω Mics & 600Ω Lines	–70dBu (245μV)	–50dBu (2.45mV)	–30dBu (24.5mV)	XLR-3-31 type (Balanced)*5
	-6 dB			–10dBu (245mV)	+10dBu (2.45V)	+30dBu (24.5V)	

*1 0dBu= 0.775 Vrms for all specifications
*2 All AD converters are 24bit linear.
*3 OMNI IN jacks 1-8 and the TALKBACK XLR jack feature +48V DC phantom power which is switchabel for each jack individually from the unit's software.
*4 Sensitivity is defined as the input level required to produce an output of +4dBu (1.23V) or the nominal output level when all faders and level controls are set to maximum.
*5 Connectors are balanced. (1= GND, 2= HOT, 3= COLD)

Analog Output Characteristics *1 *2 *3

Output Jacks	Output Impedance	Load Impedance	Max Output Level Select Switch *4 *5	Output Level		Connector
				Nominal	Max. before Clip	
OMNI OUT 1-8	75Ω	600Ω Lines	+24dB (default)	+4dBu (1.23V)	+24dBu (12.3V)	XLR-3-32 type (Balanced)*7
			+18dB	–2dBu (0.616V)	+18dBu (6.16V)	
			+15dB	–5dBu (0.436V)	+15dBu (4.36V)	
PHONES A, B (1/2 *3)	15Ω	8Ω Phones	-	75mW*6	150mW	Stereo Phone Jack (TRS) (Unbalanced)*8
		40Ω Phones	-	65mW*6	150mW	

*1 0dBu= 0.775 Vrms for all specifications
*2 All DA converters are 24bit linear.
*3 PHONES A,B 1/2 (CS-R10), PHONES A/B (CS-R10S)
*4 The unit features an internal switch to change the maximum output level.
*5 The 24dBu switch position can be changed for fee so that the output level will be + 20dBu.
*6 These measurements were obtained when the PHONES A/B LEVEL knobs are set 10 dB lower than the maximum.
*7 Connectors are balanced. (1= GND, 2= HOT, 3= COLD)
*8 Connectors are unbalanced. (Tip=LEFT, Ring= RIGHT, Sleeve= GND)

Digital Input & Output Characteristics

Jack	Format	Data Length	Level	Connector
AES/EBU IN 1/2, 3/4, 5/6, 7/8 *1	AES/EBU	24bit	RS422	XLR-3-31 type (Balanced)*2
AES/EBU OUT 1/2, 3/4, 5/6, 7/8 *1	AES/EBU	24bit	RS422	XLR-3-32 type (Balanced)*2

*1 Features sampling rate converters.
Input SRC
Supported input frequency (conversion source): 44.1 kHz-4%-200ppm - 96 kHz+4.1667%+200 ppm
Output SRC
Supported output frequency (conversion destination): 44.1 kHz-4%-200ppm - 96 kHz+4.1667%+200 ppm
*2 Connectors are balanced. (1= GND, 2= HOT, 3= COLD)

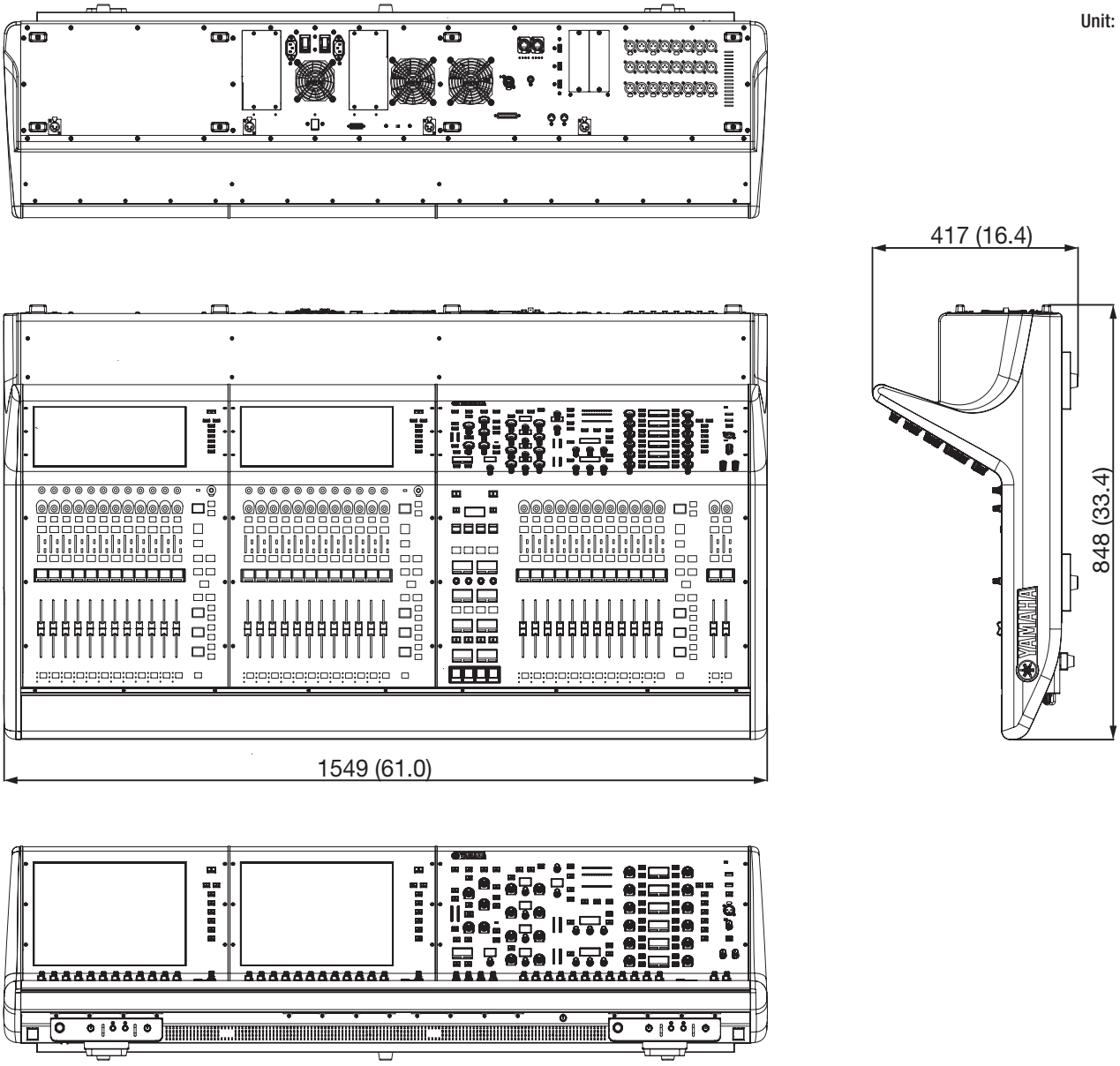
Control I/O Characteristics

Terminal		Format	Level	Connector
WORD CLOCK	OUT	-	TTL/75Ω	BNC
MIDI	IN	MIDI	-	DIN 5P
	OUT	MIDI	-	DIN 5P
USB 1-4		USB 2.0 Host	USB	USB A (Female)
RECORDING *1		USB 2.0 Host	USB	USB A (Female)
VIDEO OUT		-	DVI-D	DVI
NETWORK [PC]		IEEE802.3	10BASE-T/100BASE-TX	etherCON CAT5 *2 *3
To ENGINE IN/OUT		-	1000BASE-T	etherCON CAT5e *3 *4
GPI *5		-	-	D-sub 25pin (Female)
LAMP 1-4		-	0V-12V	XLR-4-31 type *6

*1 Supported file formats are WAV and MP3.
*2 CAT5 or higher cables are used for connections.
*3 STP cables are recommended for connections.
*4 CAT5e or higher cables are used for connections.
*5 Input pin
CH1-7 TTL level (input voltage 0-5V)
CH8 Photo coupler (input voltage 0-24V, low level: 1V or lower, high level: 5V or higher)
Output pin
CH1-7 Open drain output (max supply voltage 12V, max. sink current/pin 75mA)
CH8 Relay contact (max. 1A/30VDC)
Power supply pin
Output voltage 5 V±5%, max. output current 600mA
*6 4-pin=+12V, 3-pin=GND; Up to 5 W is supported for lamp rating.

Dimensions

Unit: mm (inch)



RIVAGE PM Components

- Control Surface CS-R10 / CS-R10-S / CSD-R7 / CS-R5 / CS-R3
- Signal Processor DSP-RX / DSP-RX-EX / DSP-R10
- I/O Rack RPio622 / RPio222 / Rio3224-D2 / Rio1608-D2 / RSio64-D / RMio64-D / Ri8-D / Ro8-D
- Audio Interface Card RY16-ML-SILK / RY16-DA / RY16-AE / HY256-TL / HY256-TL-SMF / HY144-D / HY144-D-SRC / HY128-MD

Software

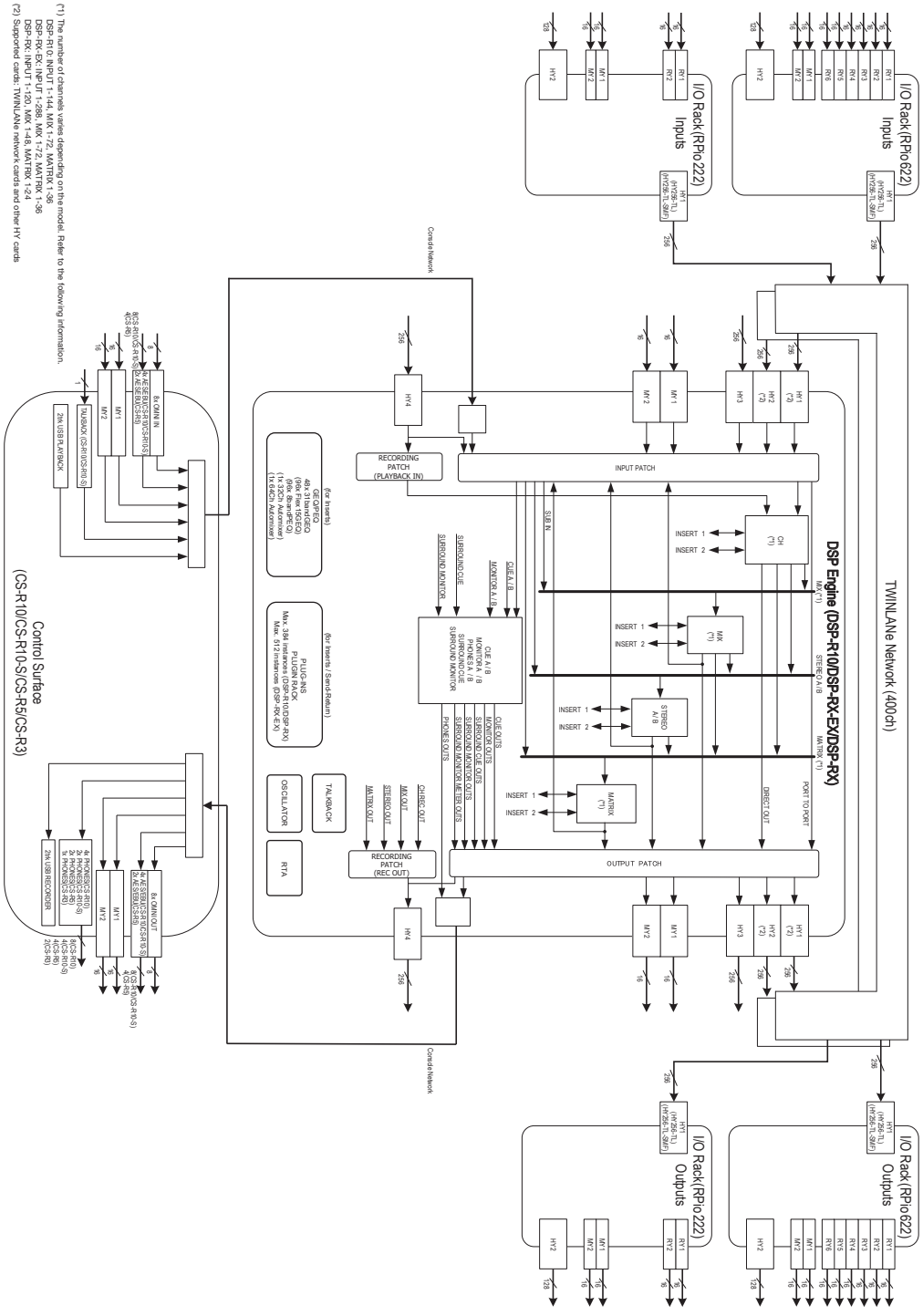
- RIVAGE PM Editor
- RIVAGE PM StageMix
- Yamaha Console File Converter
- Steinberg Nuendo Live

Architectural and Engineering Specifications

The Yamaha CS-R10 shall be a control surface for use with the Yamaha RIVAGE PM10 Digital Mixing System. CS-R10 shall adopt TWINLANe network connectivity and it shall build a console network with low latency. Selected Channel shall provide direct access to parameters of any channel selected via its SEL key. It shall include 12 faders in the left section, 12 faders in the center section, and 12 fader in the right section plus 2 master faders. All the faders are touch-sensitive 100mm motorized faders. The CS-R10 shall provide functions for fast, efficient mixing via an intuitive interface. It shall include a 2 x 15" touch-screen Multi Function Display. Physical controllers other than faders shall include the Selected Channel controllers, 12 x 4 banks User Defined Keys, 4 x 4 banks User Defined Knobs, and 2 Touch and Turn knob provides directly and intuitively controllability. Local I/O shall include 8 analog microphone/line inputs and 8 outputs, 4 AES/EBU inputs and output (with SRC), 2 Mini YGDAI slots, GPI ports (8 in/8 out), word clock I/O, MIDI I/O, network port, 5 USB (1 for 2-track recording), and Video Out (DVI-D). It shall be Dual redundant power supply and power consumption shall be 380 W. Dimensions shall be 1549 (W) x 417 (H) x 848 (D) mm. Weight shall be 85 kg.

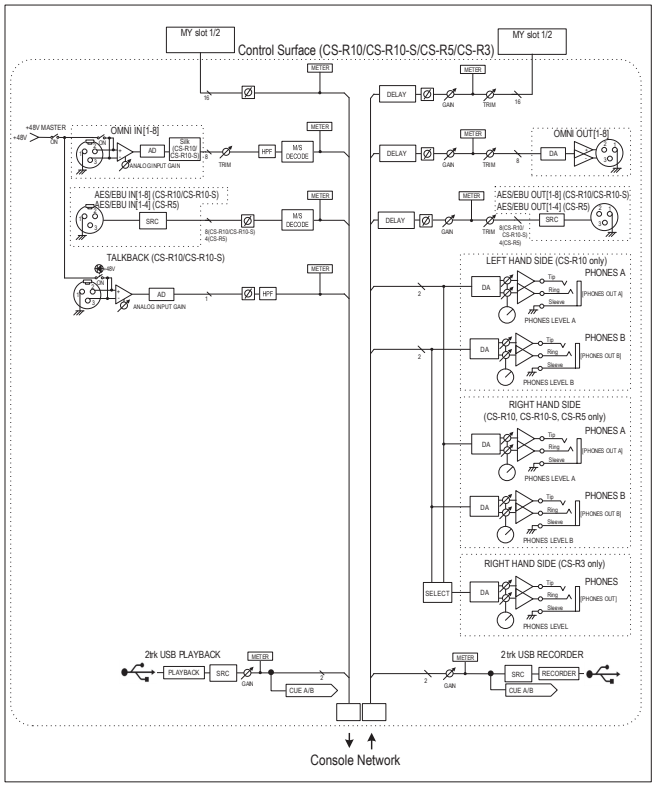
Block Diagrams

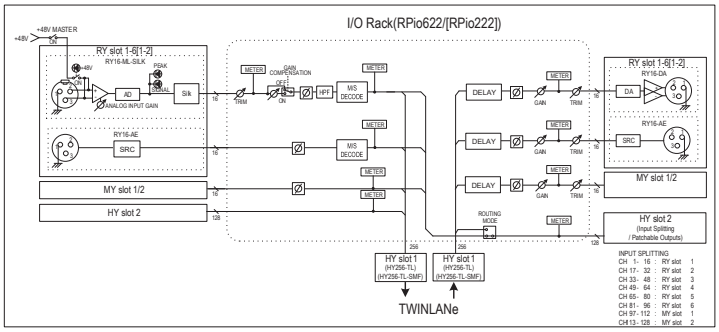
System Overview

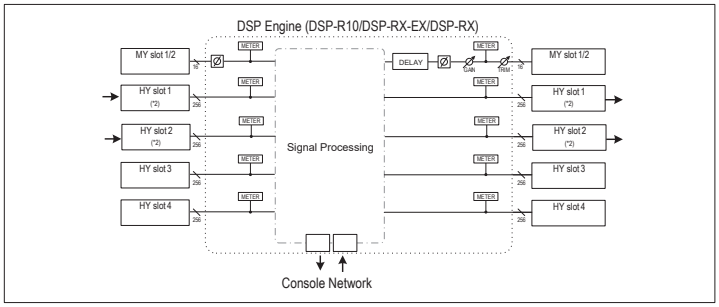


Block Diagrams

Control Surface, I/O Rack, DSP Engine



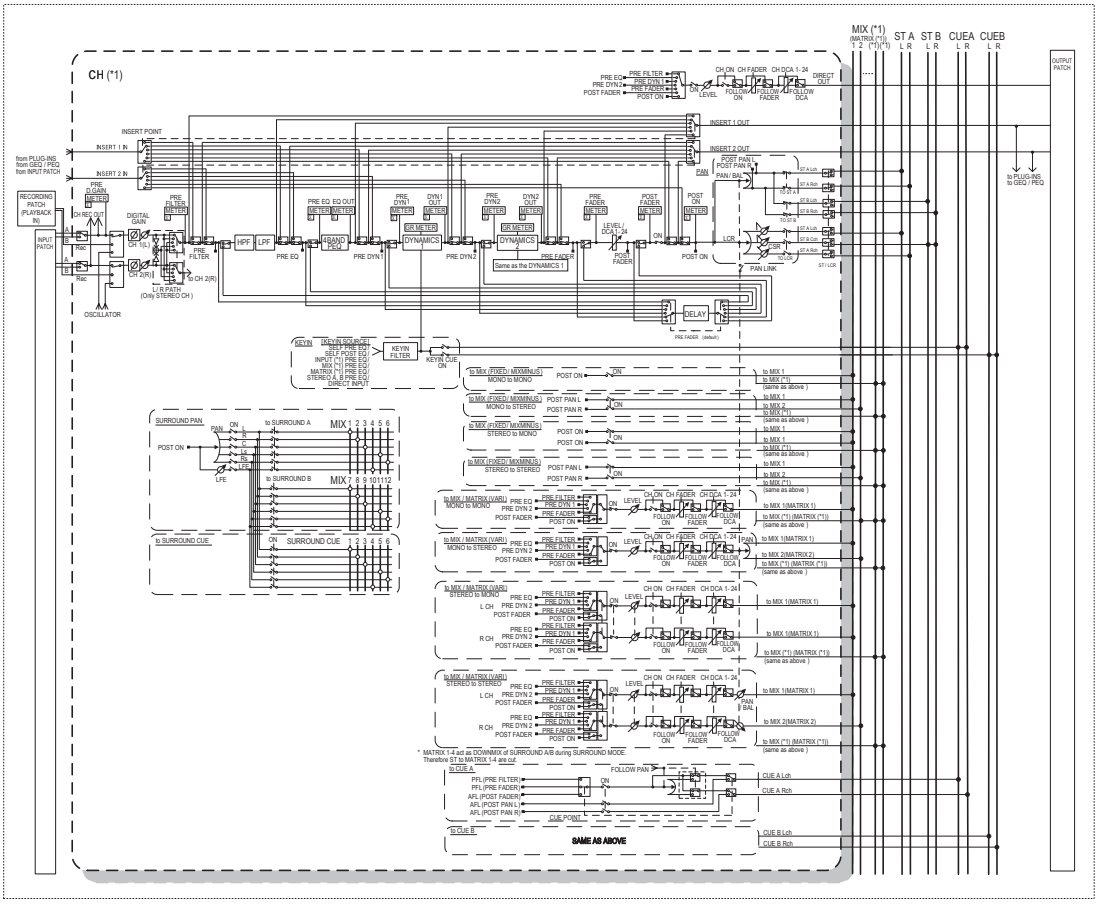




(*2) Supported cards: TWINLANe network cards and other HY cards

Block Diagrams

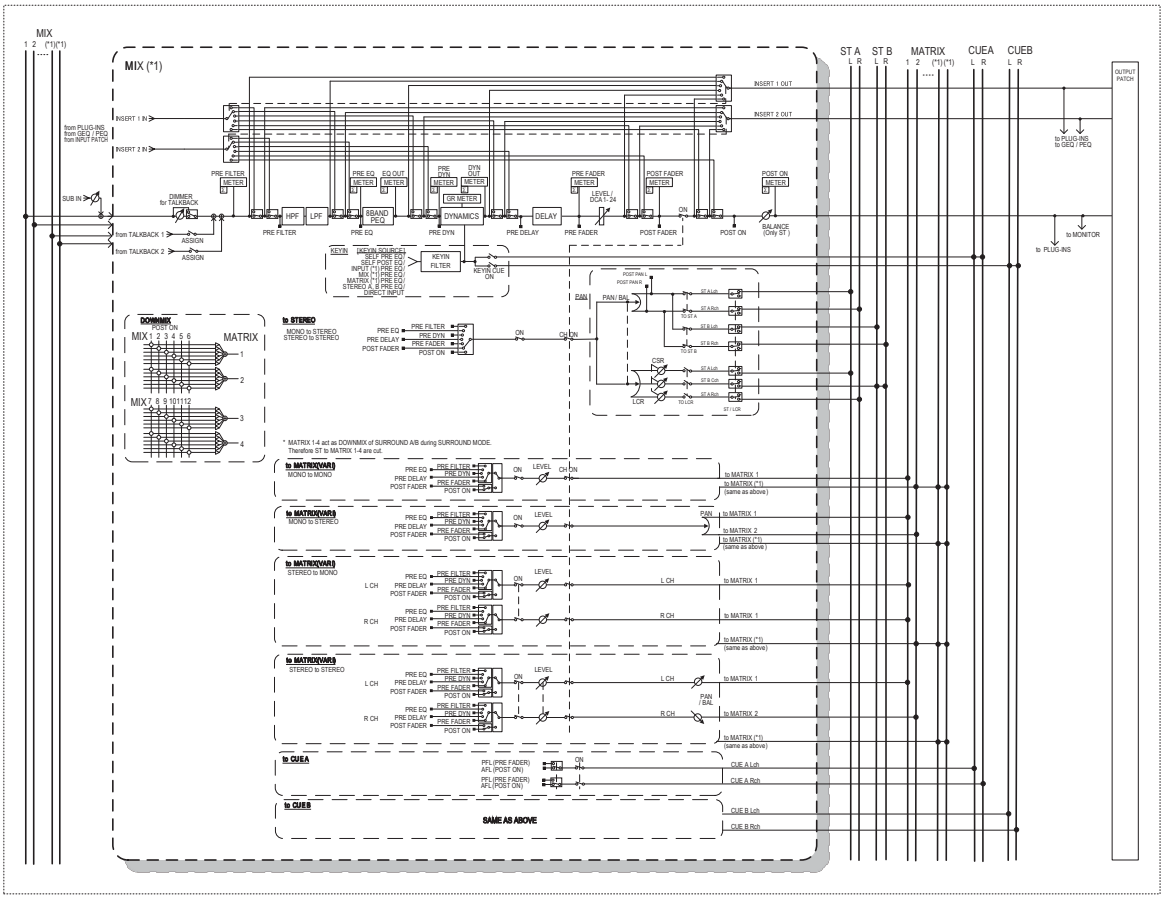
CH (*1)



(*1) The number of channels varies depending on the model. Refer to the following information.
CSD-R7: INPUT 1-144, MIX 1-60, MATRIX 1-36
DSP-R10: INPUT 1-144, MIX 1-72, MATRIX 1-36
DSP-RX-EX: INPUT 1-288, MIX 1-72, MATRIX 1-36
DSP-RX: INPUT 1-120, MIX 1-48, MATRIX 1-24

Block Diagrams

MIX (*1)



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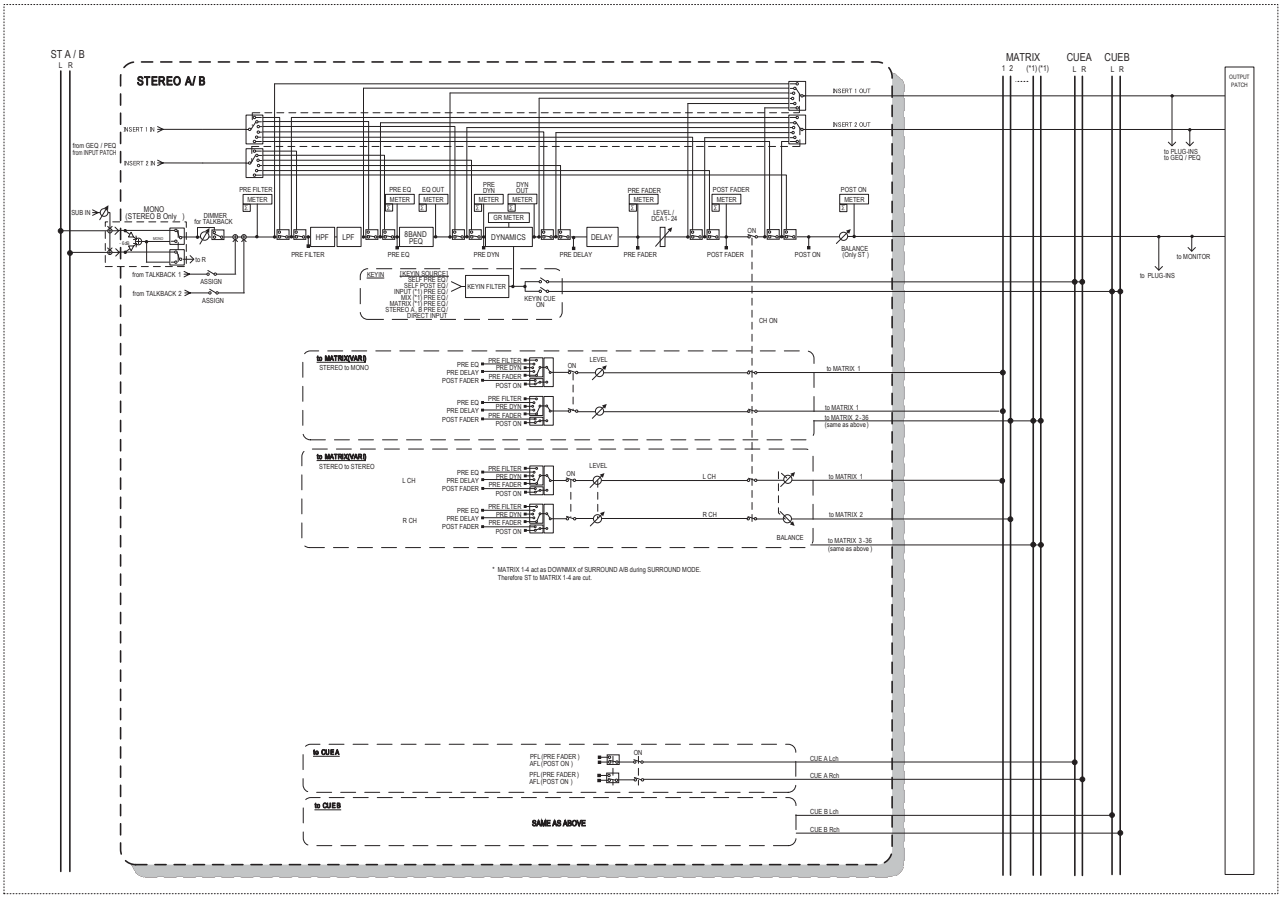
DSP-RX: INPUT 1-120, MIX 1-48, MATRIX 1-24

Block Diagrams

STEREO A/B



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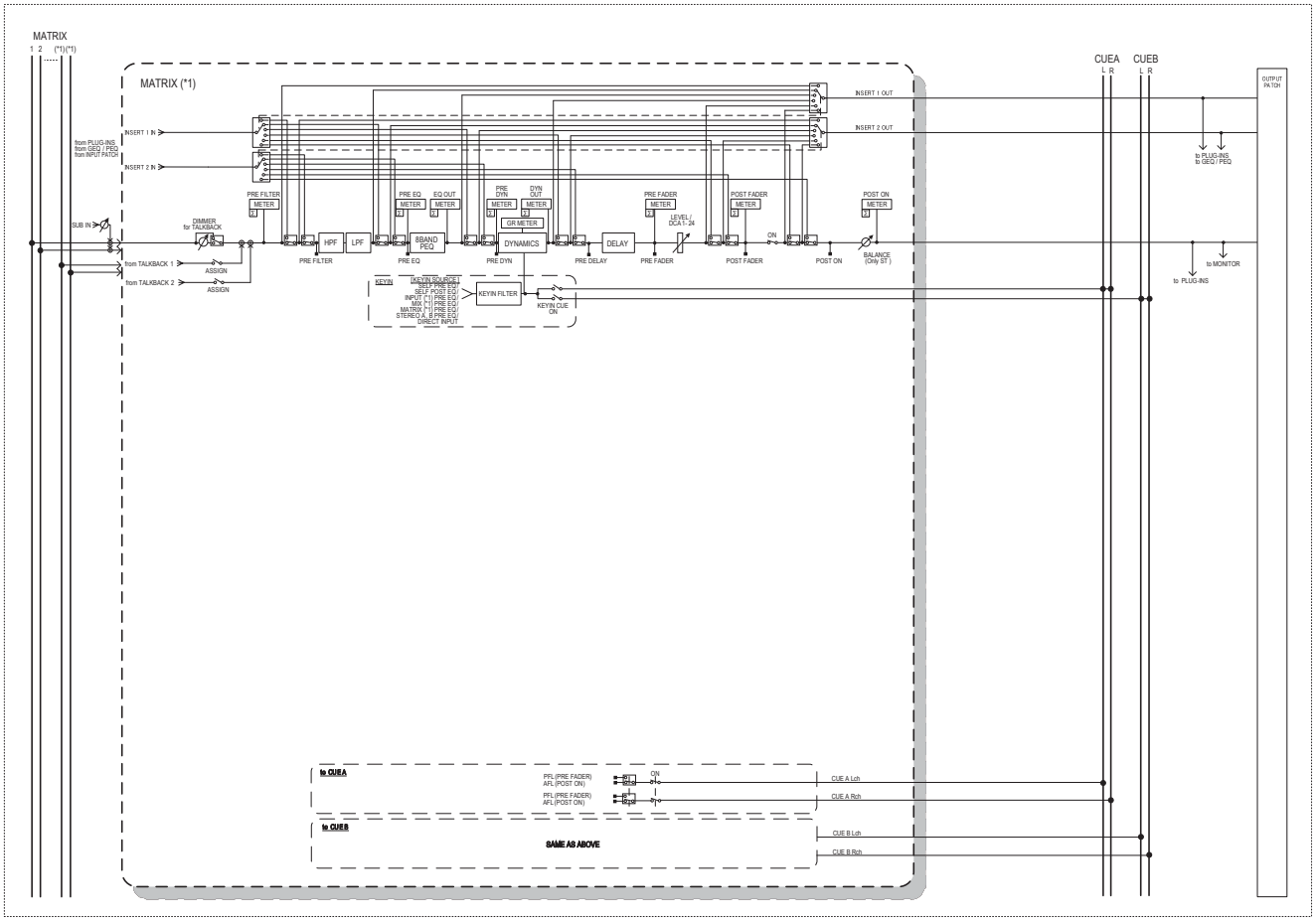
DSP-RX: INPUT 1-120, MIX 1-48, MATRIX 1-24

Block Diagrams

MATRIX (*1)



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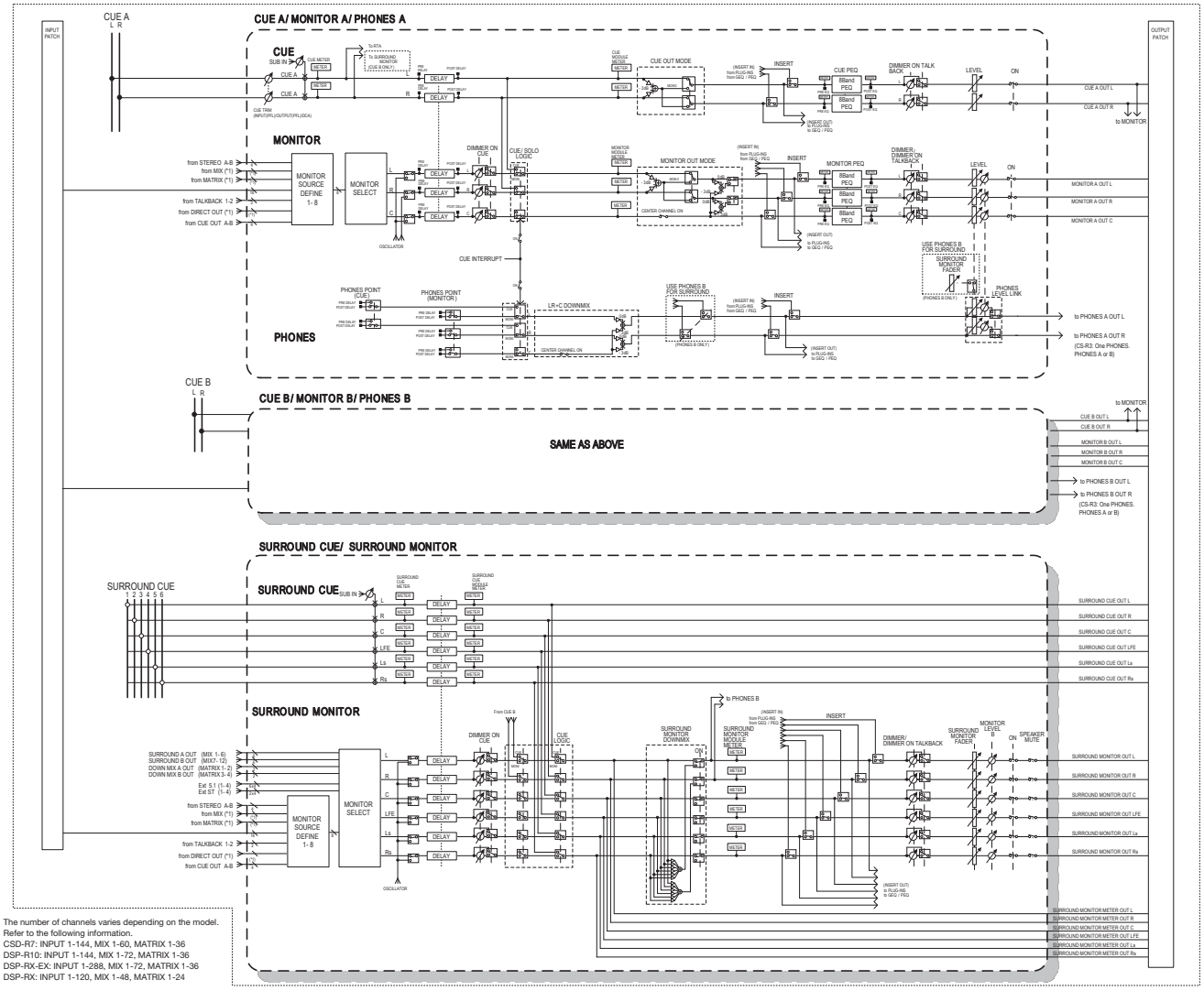
Block Diagrams

CUE/MONITOR/MISC.



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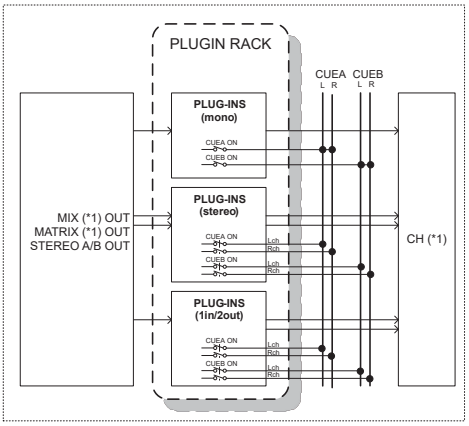
Block Diagrams



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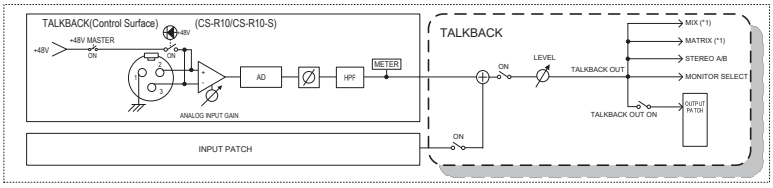
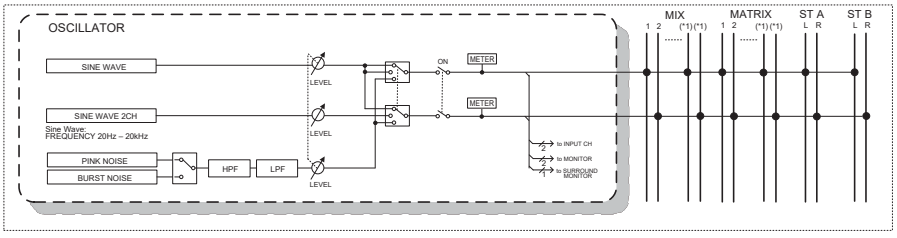
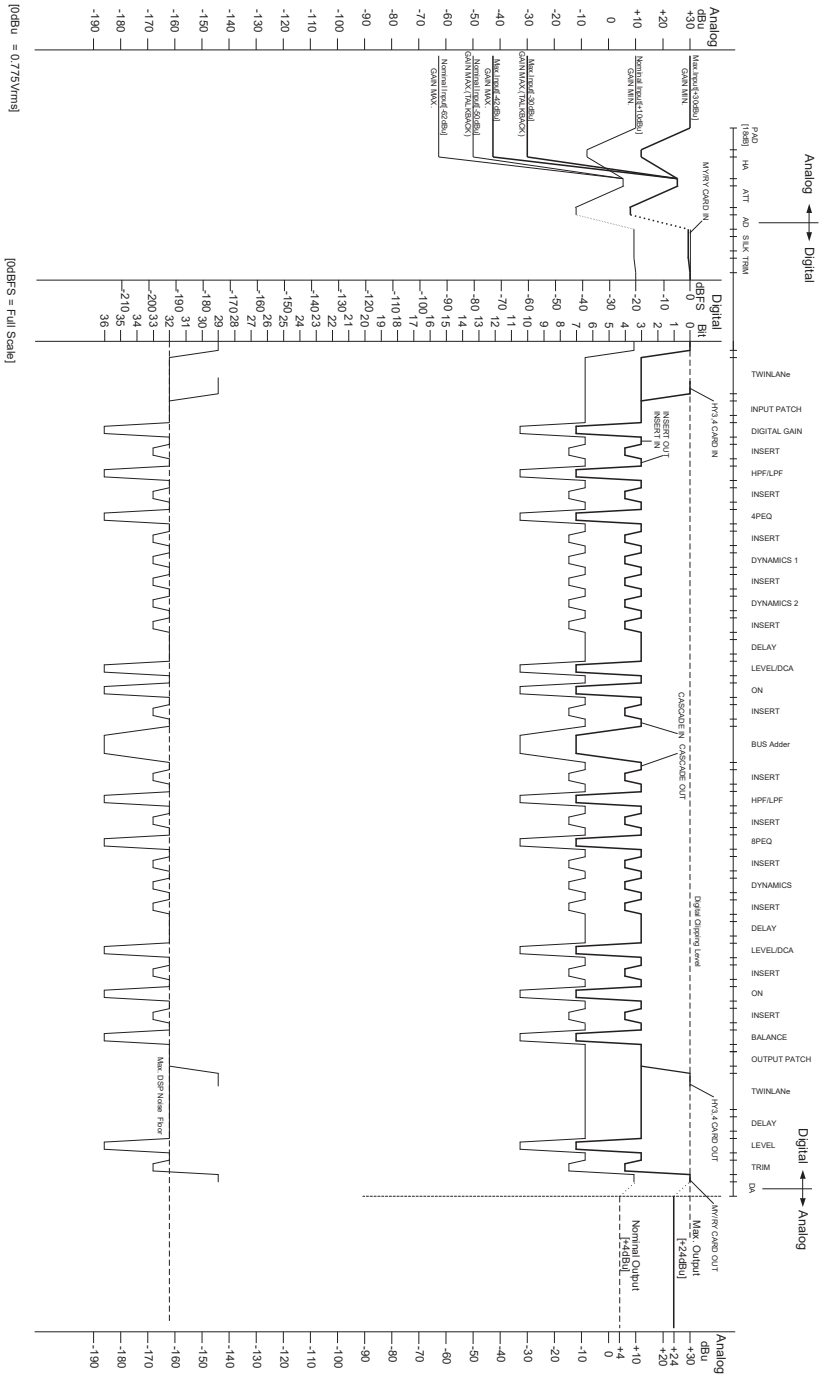




Level Diagram



Created in October, 2020

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