

Overview

The CSD-R7 Digital Mixing Console is the core component of any RIVAGE PM7 system, with 96 kHz processing, 144 monaural inputs, and a versatile complement of mixing busses (60 MIX, 36 MATRIX, and 2 STEREO). The console has three 12-faders bays for flexible setup and configuration, and dual power supply units are built in for enhanced reliability.



Rear Panel

Features

- Fader configuration: 38 (12+12+12+2) faders.
- Touch Screen: 15" x 2
- Local I/O: 8 in, 8 out.
- Superior capability of processing digital audio signals of up to 144 input, 60 MIX, 36 MATRIX, and two STEREO channels.
- Three HY card slots that are capable of transmitting/receiving up to 256 ins/outs of digital audio signals/control signals.
- A TWINLANe network card will work exclusively in HY card slot 1. The virtual sound check (VSC) function will work exclusively in HY card slot 3.
- 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 TWINLANe ring.
- Up to 48 Rio units can be mounted in 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: HY Slots: 3, 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: 94 kg

Specifications

1/3

Functional Specifications

| | | | | |
|--------------------------|---------------------------------|--|---|--------------------------------|
| Mixing Capacity | Input Mixing Channels | | 144 mono | |
| | Mix Buses | | 60 | |
| | Matrices | | 36 (Input to Matrix supported) | |
| | Stereo Buses | | 2 | |
| | Mono Buses | | 1 | |
| | Cue Bus | | 2 | |
| Local Connectors | Analog | In | 8 (SILK) | |
| | | Out | 8 | |
| | Digital | AES IN | 4 | |
| | | AES OUT | 4 | |
| | Expansion Slot | HY | 3 | |
| | | MY | 2 | |
| | GPI | IN | 8 | |
| | | ONT | 8 | |
| | Word Clock | | In / Out | |
| | MIDI | | In / Out | |
| | USB | File | 4 | |
| | | Rec/Play | 1 | |
| | Redundant PSU | | Built-in dual power supply | |
| | Meter Bridge | | On screen | |
| | Ethernet | | Yes | |
| | Lamp | | 3 | |
| | Talkback In | | Yes | |
| | Video Out | | Yes | |
| | TC In | | Yes | |
| | Fault Output | | No | |
| | Phones | | 1 | |
| | AC Inlet | | 2 (V-Lock Type) | |
| Scene Memory | Number of Scenes | | 1000 | |
| | Recall Safe | | Yes | |
| | Focus Recall | | Yes | |
| | Fade Time | | Yes (0s ~ 60s) | |
| | Preview | | Yes | |
| | Selective Load / Save | | Yes | |
| | Global Paste | | Yes | |
| | Event List | | Yes | |
| | Overlay | | Yes | |
| | Isolate | | Yes | |
| | Tactile Control Keys | | Yes | |
| | Input Channel Functions | Gain Compensation | | Yes |
| | | Silk | | Yes (with RPi) |
| Digital Gain | | Yes (-96dB ~ +24dB) | | |
| ATT | | No | | |
| HPF | | 20Hz~2000Hz, -6/-12/-18/-24dB/oct Selectable | | |
| PEQ | | 4 Band Full PEQ (4 algorithms, RTA overlay support) | | |
| Dynamics 1 | | Legacy Comp / Comp260 / Gate / De-Esser / Expander / Ducking | | |
| Dynamics 2 | | Legacy Comp / Comp260 / Gate / De-Esser / Expander / Ducking | | |
| Input Delay | | Yes (0ms ~ 1000ms) | | |
| Pan | | Center Nominal | | |
| DCA Group | | 24 (Output DCA support) | | |
| DCA Rollout | | Yes | | |
| MUTE Group | | 12 | | |
| Input Channel Functions | | Number of Inserts | | 4 slots on each 2 insert point |
| | Direct Out | | Yes | |
| Output Channel Functions | PEQ | | 8 Band Full PEQ | |
| | GEQ | | Plug-in | |
| | Dynamics 1 | | Legacy Comp / Comp260 / Gate / De-Esser / Expander / Ducking | |
| | Output Channel Delay | | Yes (0ms ~ 1000ms) | |
| | MUTE Group | | 12 | |
| | Number of Inserts | | 4 slots on each 2 insert point | |
| Plug-in | Number of Slots | | 384 | |
| | Number of Effect Programs | | 50 or more | |
| GEQ Rack | Number of GEQ Racks | | 48 | |
| | Mountable Device | | 31BandGEQ / Flex15GEQ / 8Band PEQ (RTA overlay support) / Automixer | |
| TWINLANe | Number of I/O Channels per card | | 256 in / 256 out (with HY256-TL) | |
| Dante | Number of I/O Channels per card | | 144 in / 144 out (with HY144-D) | |
| Recording | USB Memory Recording | | Yes | |
| | DVS Recording | | Yes (with HY144-D or HY144-D-SRC) | |
| Broadcast Functions | 5.1 Surround Panning | | Yes | |
| | Surround Monitor | | Yes | |
| | Mix Minus | | Yes | |
| | L-Mono / R-Mono / LR-Mono | | No | |
| Monitor | Solo Mode | | Yes | |
| | Oscillator | | Sine Wave 1ch / Sine Wave 2ch / Pink Noise / Burst Noise | |
| Other Functions | Port to Port | | Yes | |
| | Dual Console | | Yes | |
| | DSP Mirroring | | No | |
| | Timecode Reader/Display | | Yes | |
| | Timecode Chase (Event List) | | Yes | |
| | GPI/MIDI | | Yes | |
| | RTA | | Yes | |
| | Output Port Delay | | Yes (0ms ~ 1000ms) | |
| | Mix/Matrix to Input | | Yes | |
| | Sub In | | Yes | |
| User Interface | Theatre Mode | | Yes | |
| | Display | | 15 inch Touch Panel x2 | |
| | Centralogic Section | | Yes | |
| | Faders | | 12+12+12+12 | |
| | Selected Channel Encoders | | All Parameters | |
| | Channel Encoder | | Yes | |
| | Channel Name / Color Display | | Yes | |
| | Custom Fader Banks | | Yes (6 x 5 on each bay) | |
| | User Defined Keys | | 12 (x 4 banks) | |
| | User Defined Knobs | | 4 (x 4 banks) | |
| Software | Touch and Turn Knob | | Yes (2) | |
| | Monitor Level Knob | | Yes (2: A and B) | |
| | Wooden Arm Rest | | Yes | |
| | Editor | | RIVAGE PM Editor | |
| | StageMix | | RIVAGE PM StageMix | |
| | MonitorMix | | Yes (V4.0 or later) | |
| | Console File Converter | | Yes | |

Specifications

2/3

General Specifications

| | | |
|--------------------|-----------------------------|--|
| Mixing Capacity | | 144 Inputs, 60 MIX + 36 MATRIX + 2 STEREO |
| 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 | | 415 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 | | 94kg (207lbs) |
| 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).

Sampling Frequency

| | | Conditions | Min. | Max. | Unit |
|----------------|------------------|--|-------|--------------------------|------|
| External Clock | Frequency Range | Fs=44.1kHz, 48kHz, 88.2kHz, 96kHz | -1000 | +1000 | ppm |
| | Jitter of PLL *1 | WORD CLOCK IN Fs= 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz | — | 10 | ns |
| Internal Clock | Frequency | Word clock: int 44.1 kHz Word clock: int 48 kHz Word clock: int 88.2 kHz Word clock: int 96 kHz | — | — | kHz |
| | Accuracy | Fs=44.1kHz, 48kHz, 88.2kHz, 96kHz | -50 | +50 | ppm |
| | Jitter *2 | Word clock: int 44.1 kHz Word clock: int 48 kHz Word clock: int 88.2 kHz Word clock: int 96 kHz | — | 4.5 4.1 2.3 2.1 | ns |

*1 Input clock jitter must be 1 ns or less.

*2 Measured at the WORD CLOCK OUT connector.

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 | | -128 EIN*2 | | dBu |
| | | | Master fader at nominal level and one Ch fader at nominal level. | | -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

3/3

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 | +66dB | 10kΩ | 50-600Ω Mics & 600Ω Lines | -82dBu (61.6μV) | -62dBu (0.616mV) | -42dBu (6.16mV) | XLR-3-31 type (Balanced)*5 |
| | -6dB | | | -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 switchable 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 *3 *4 | 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)*6 |
| | | | +18dB | -2dBu (0.616V) | +18dBu (6.16V) | |
| | | | +15dB | -5dBu (0.436V) | +15dBu (4.36V) | |
| PHONES A,B | 15Ω | 8Ω Phones | — | 75mW*5 | 150mW | Stereo Phone Jack (TRS) (Unbalanced)*7 |
| | | 40Ω Phones | — | 65mW*5 | 150mW | |

*1 0dBu= 0.775 Vrms for all specifications

*2 All DA converters are 24bit linear.

*3 The unit features an internal switch to change the maximum output level.

*4 The 24dBu switch position can be changed for fee so that the output level will be + 20dBu.

*5 These measurements were obtained when the PHONES A/B LEVEL knobs are set 10 dB lower than the maximum.

*6 Connectors are balanced. (1= GND, 2= HOT, 3= COLD)

*7 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 source): 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 | IN | - | TTL/75Ω terminated | BNC |
| | OUT | - | TTL/75Ω | BNC |
| MIDI | IN | MIDI | - | DIN 5P |
| | OUT | MIDI | - | DIN 5P |
| TC IN | SMPTE | SMPTE | 0.3Vpp(min)/10.0Vpp(max), 10kΩ | XLR-3-31 type *7 |
| 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 |
| CONSOLE NETWORK IN/OUT | | - | 1000BASE-T | etherCON CAT5e *3 *4 |
| GPI *5 | | - | - | D-sub 25pin (Female) |
| NETWORK | | IEEE802.3 | 10BASE-T/100BASE-TX | etherCON CAT5 *2 *3 |
| 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

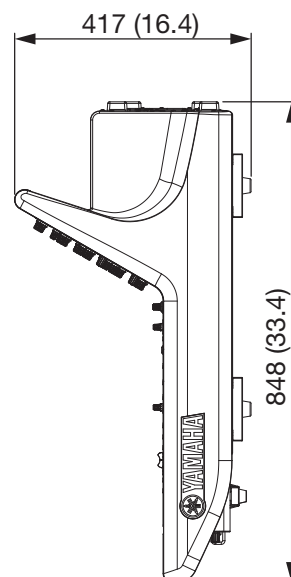
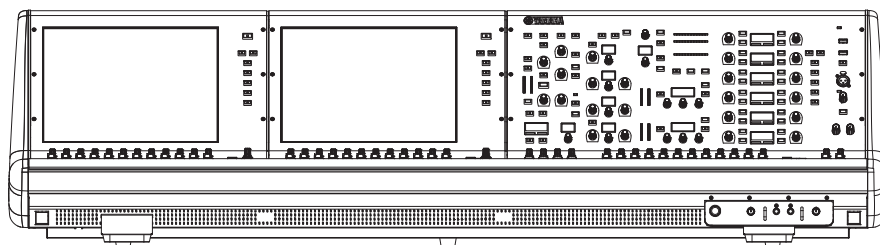
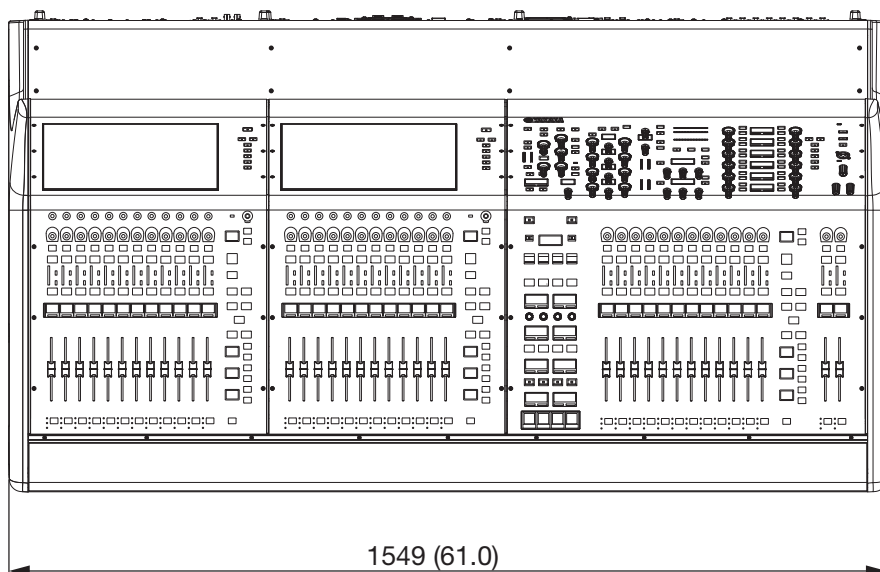
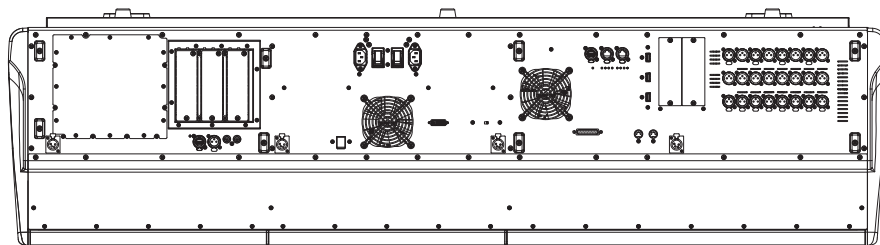
Output voltage 5 V±5%, max. output current 600mA

*6 4-pin=+12V, 3-pin=GND; Up to 5 W is supported for lamp rating.

*7 1= GND, 2= HOT, 3= COLD

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

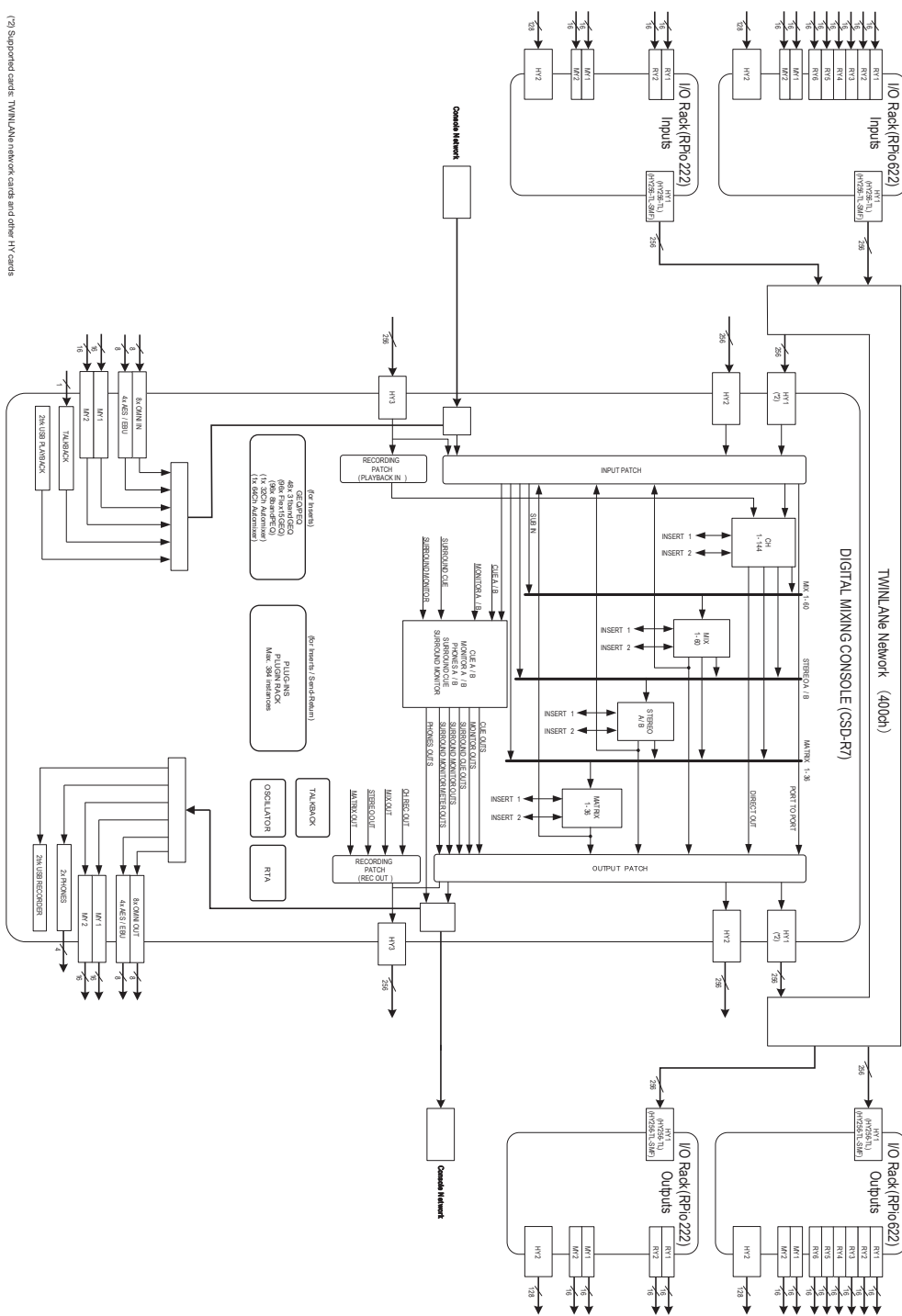
Software

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

Architectural and Engineering Specifications

The Yamaha CSD-R7 shall be a control surface for use with the Yamaha RIVAGE PM Digital Mixing System. It shall provide 96kHz processing 144 inputs, and a versatile complement of mixing busses (60 MIX, 36 MATRIX, and 2 STEREO). CSD-R7 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 CSD-R7 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), 3 HY slots, 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 415 W. Dimensions shall be 1549 (W) x 417 (H) x 848 (D) mm. Weight shall be 94 kg.

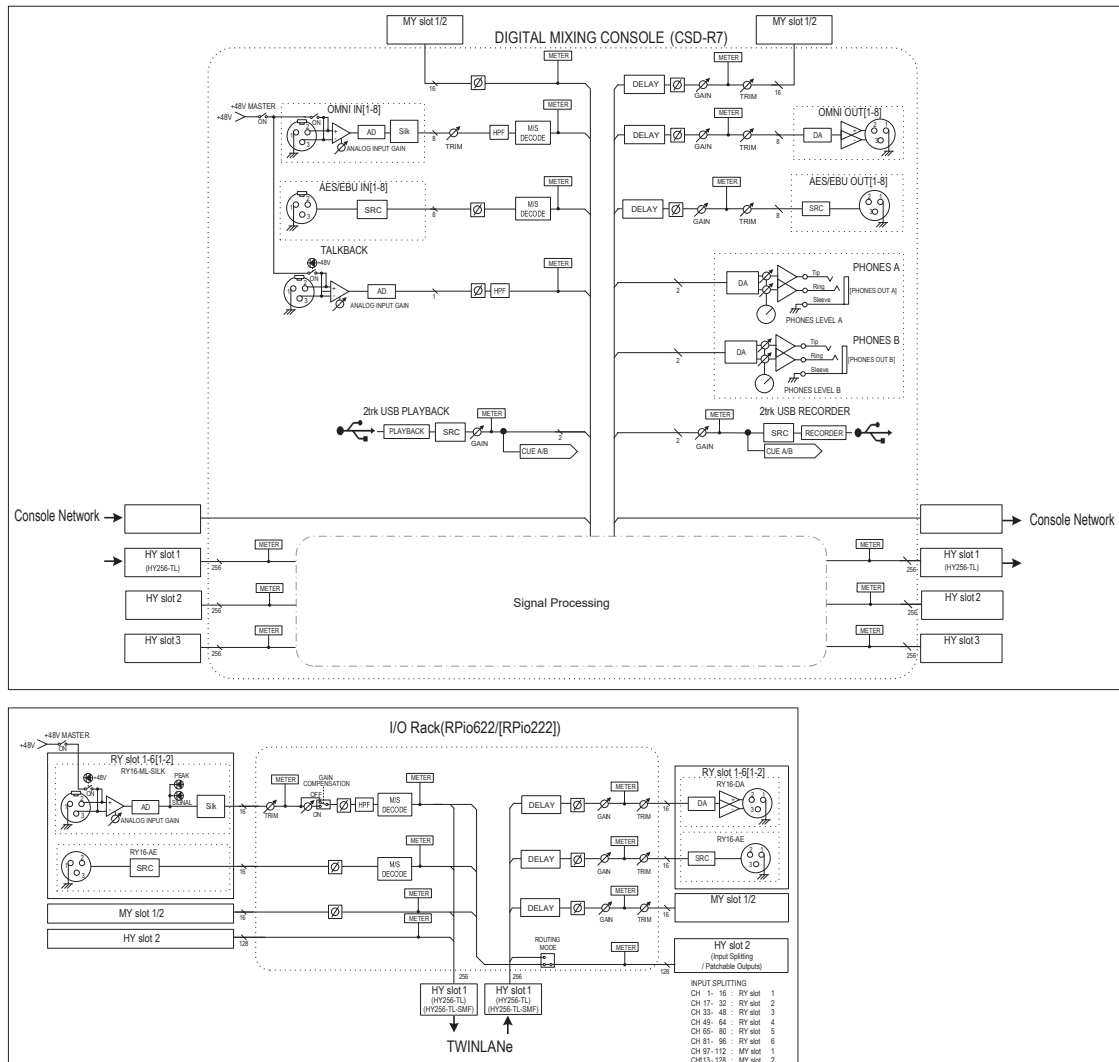
(*2) Supported cards: TWINLANE network cards and other HY card



Block Diagrams

2/9

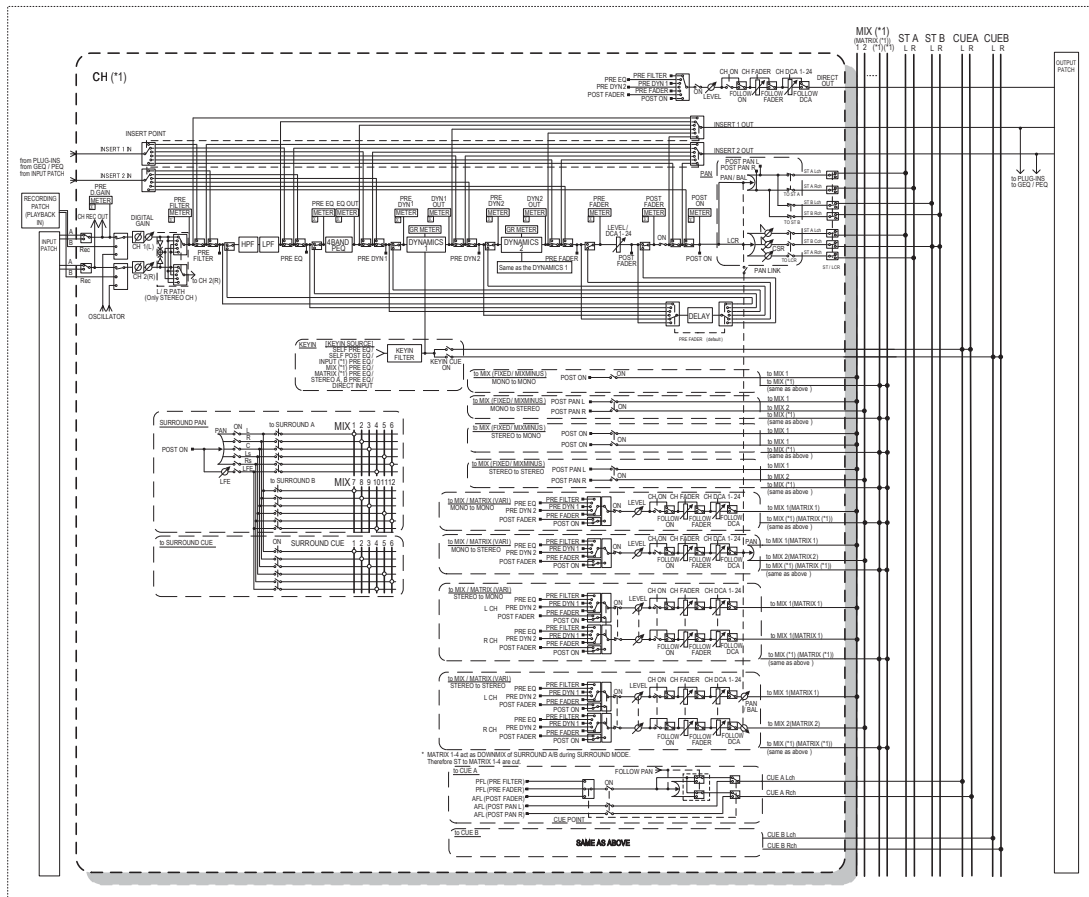
Digital Mixing Console, I/O Rack



Block Diagrams

3/9

CH (*1)



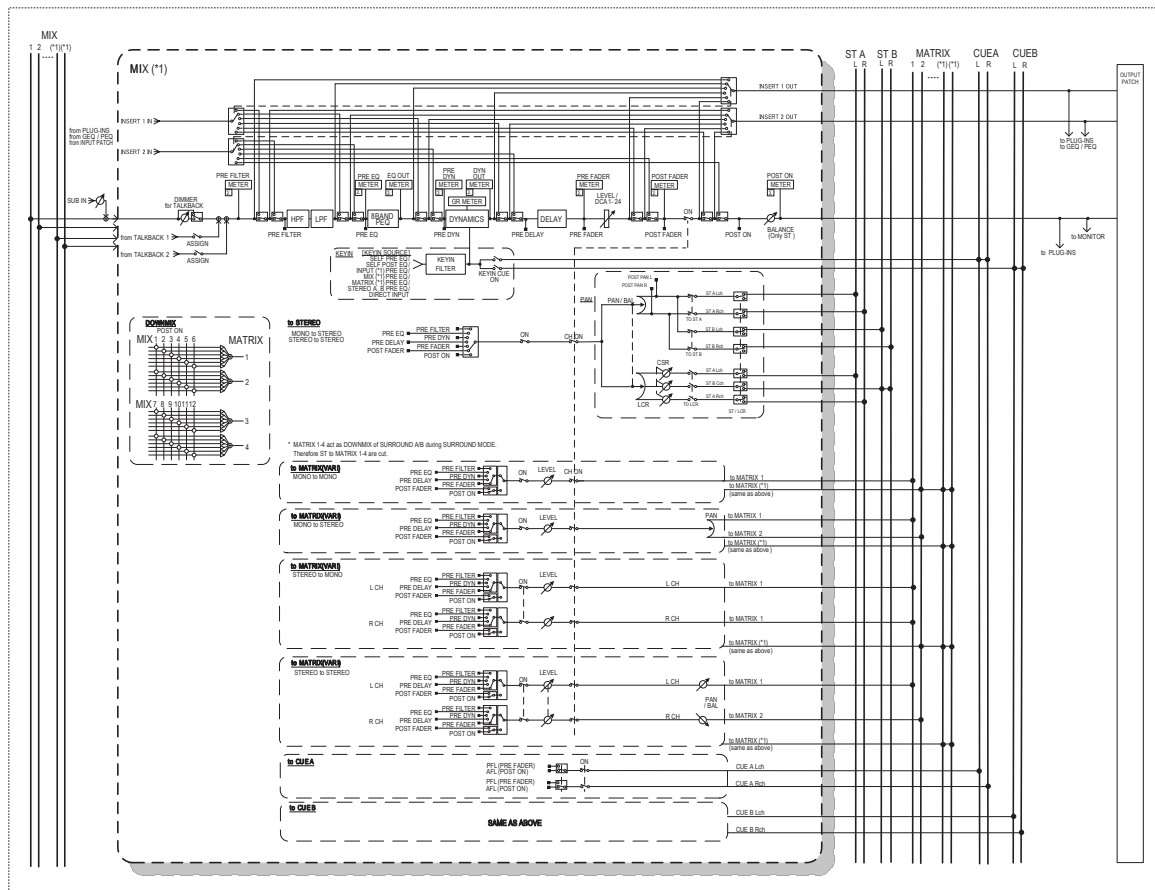
(*1) The number of channels varies depending on the model. Refer to the following information.

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

4/9

MIX (*1)



(*1) The number of channels varies depending on the model. Refer to the following information.

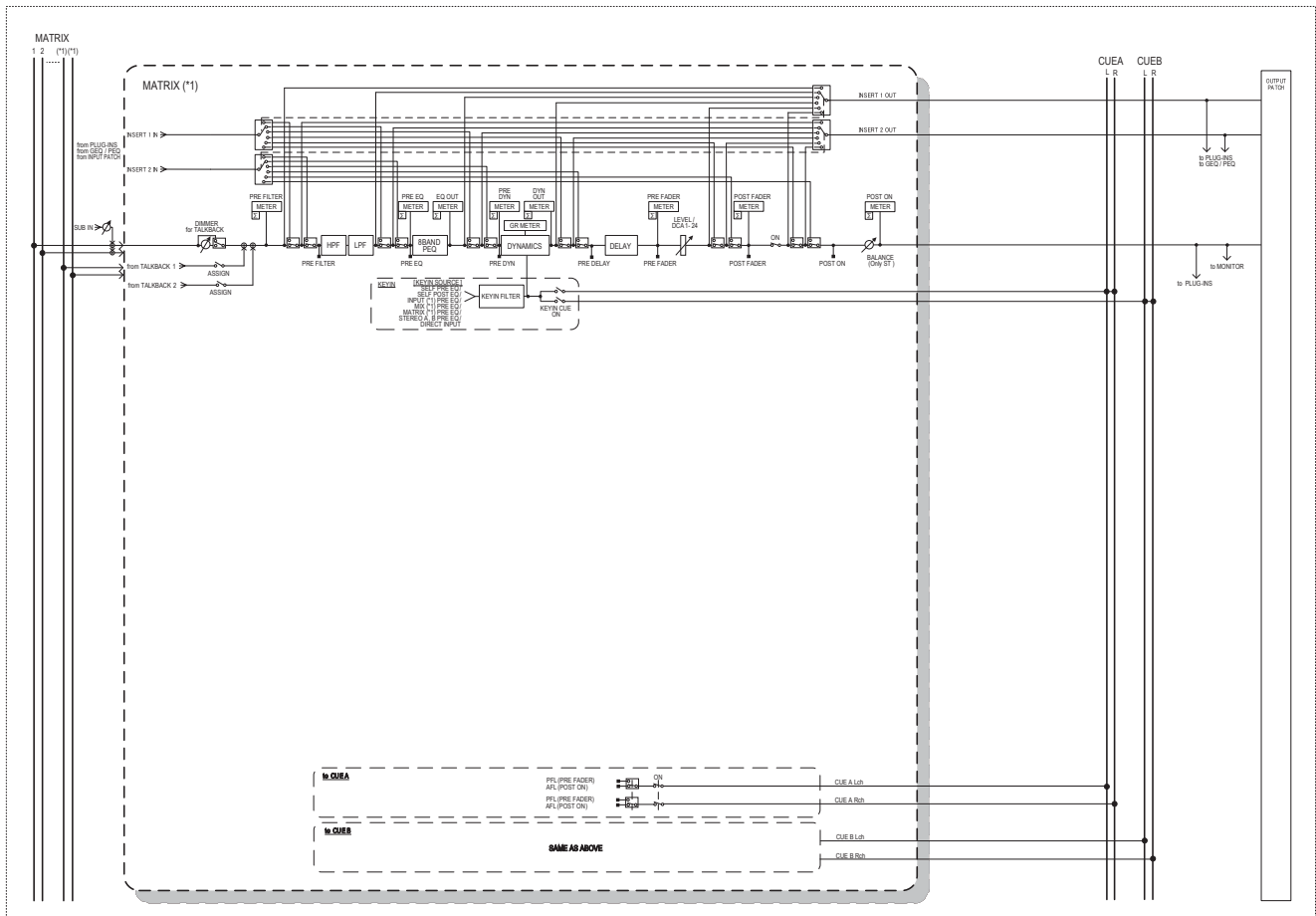
CSD-R7: INPUT 1-144, MIX 1-60, MATRIX 1-36
 DSP-R7D: INPUT 1-144, MIX 1-72, MATRIX 1-36
 DSP-R7X-EX: INPUT 1-288, MIX 1-72, MATRIX 1-36
 DSP-R7X: INPUT 1-120, MIX 1-48, MATRIX 1-24

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

Block Diagrams

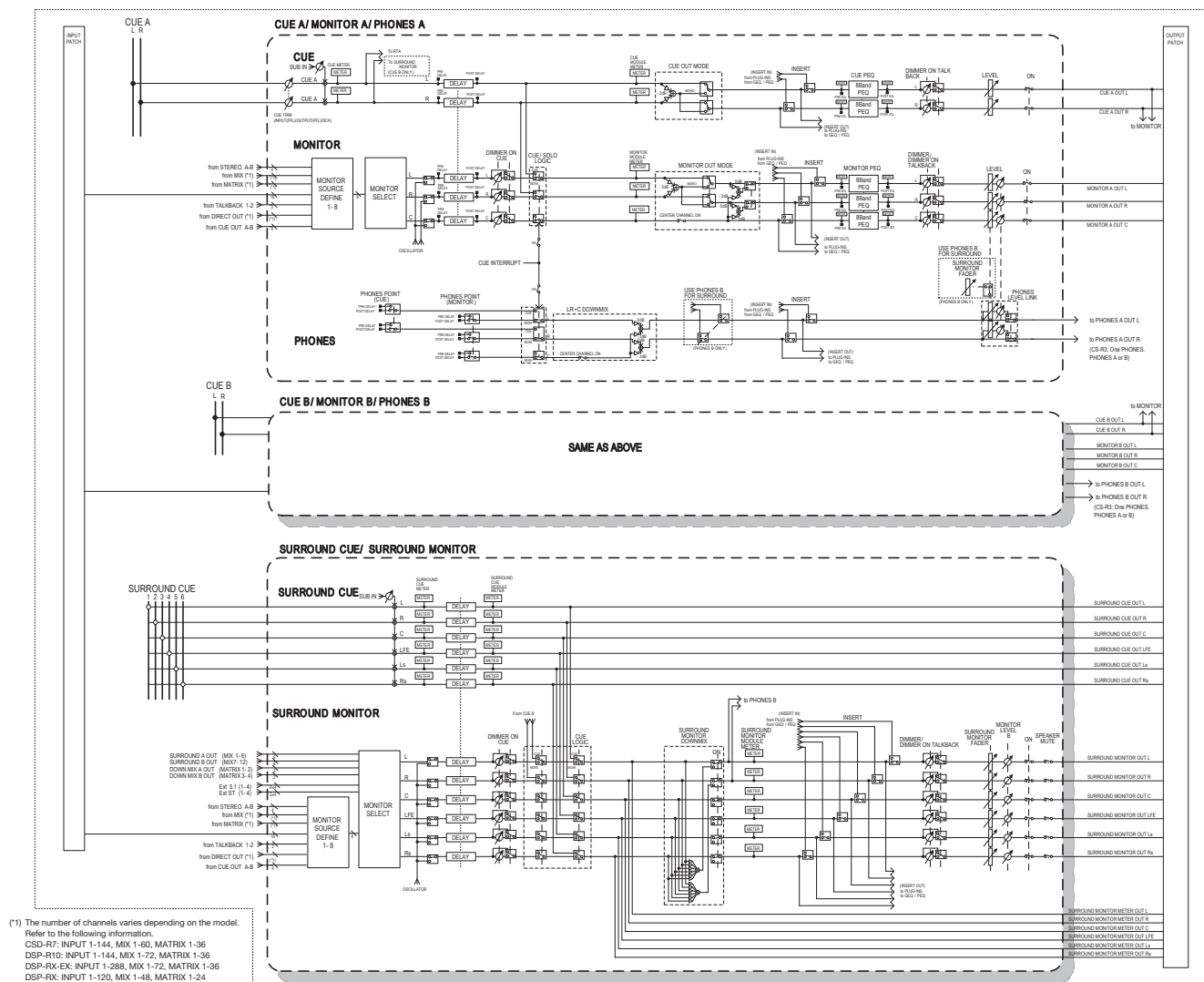
6/9

MATRIX (*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

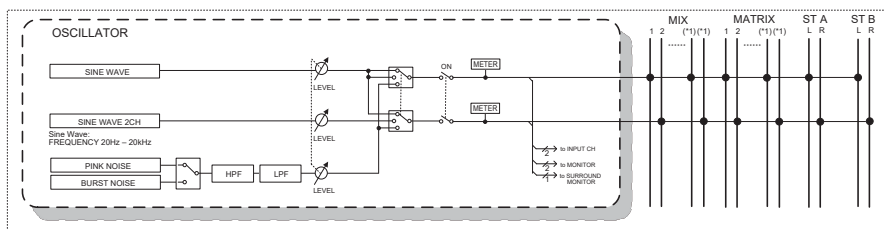
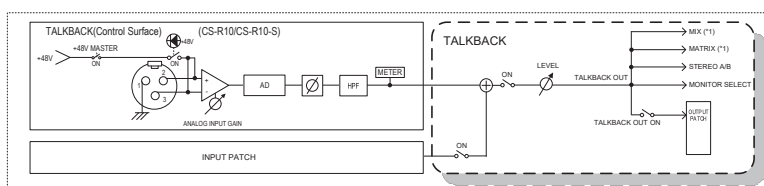
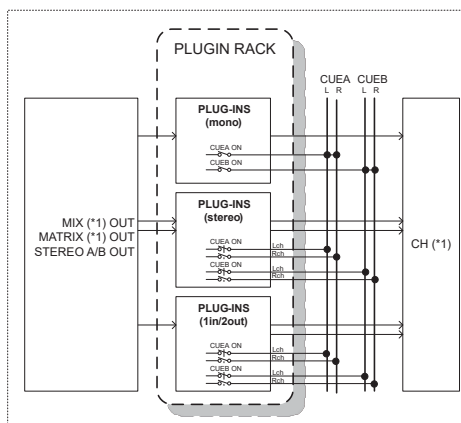
CUE/MONITOR/MISC.



Block Diagrams

8/9

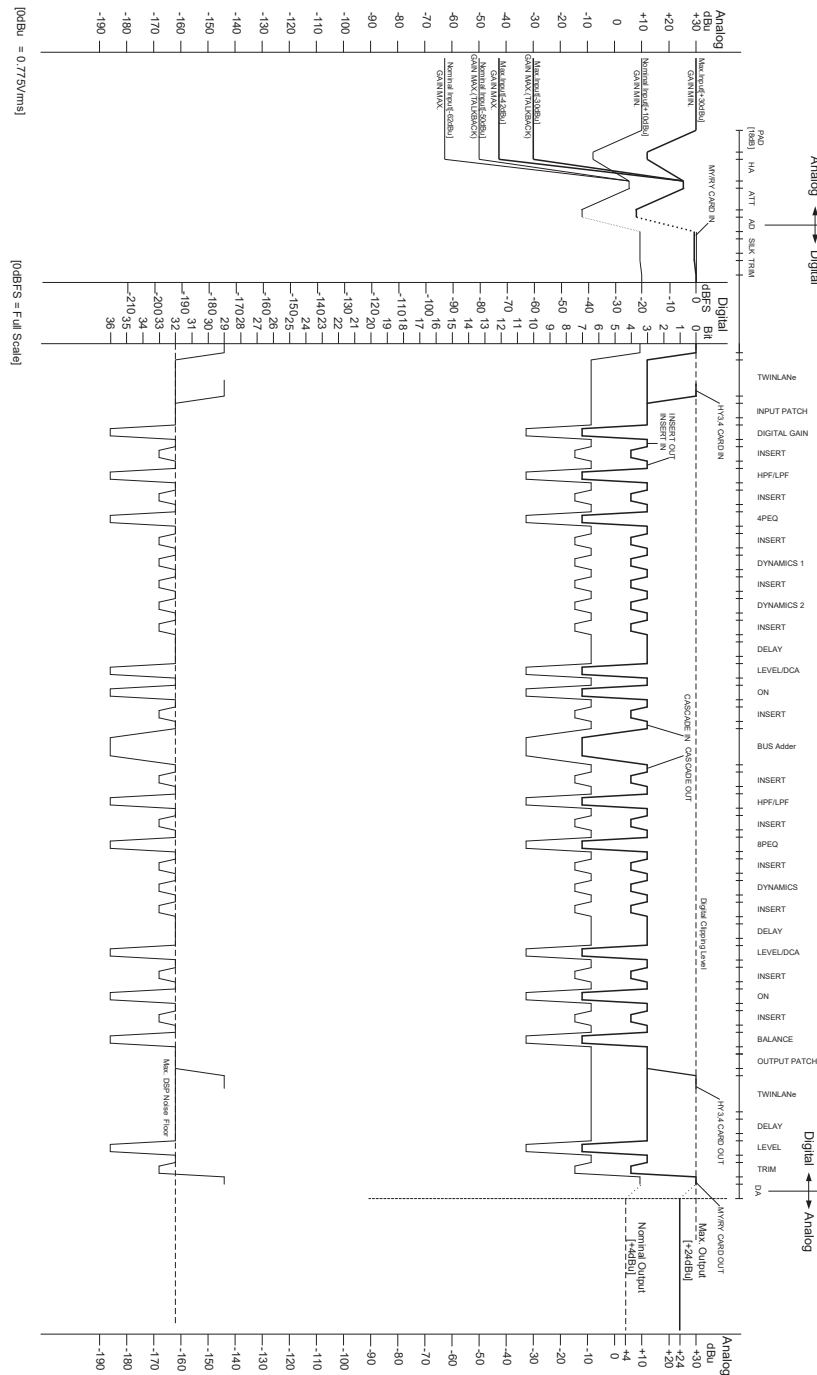
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DSP-R10: INPUT 1-144, MIX 1-72, MATRIX 1-36
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DSP-RX: INPUT 1-120, MIX 1-48, MATRIX 1-24



Block Diagrams

9/9

Level Diagram



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