

# DMIX System - GUI and Device Integration Specification

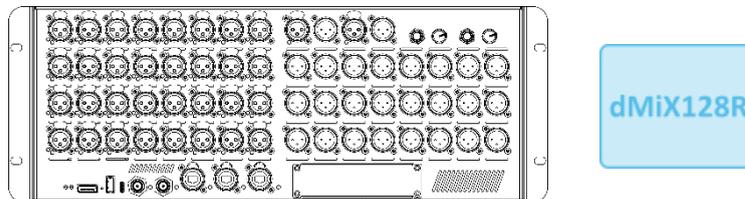
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## 1. System Overview

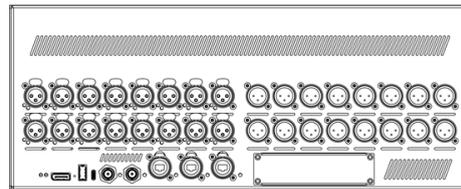
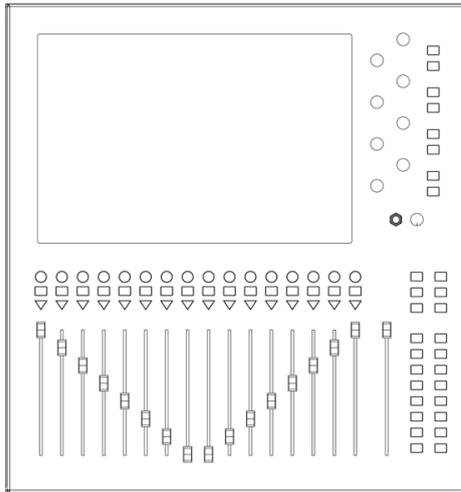
This document defines the expected behavior and configuration parameters for the DMIX system and its associated devices. It is intended to guide remote development teams in implementing the user interface and behavior for both local and remote device management.

### 1.1 Product Variants

- **DMIX128R**
  - 128-Channel Mixer
  - 88 Buses
  - 16x16 Matrix
  - 8 ARM FX / 4 FPGA FX
  - 32 DYNEQ (4-band)
  - 32 GEQ (31-band)
  - 192 Network Channels
  - I/O: 32 Inputs, 24 Outputs, 2 Headphones, 2 AES3, 1 MADI, 1 Expansion Slot, 2 AES67 Ports

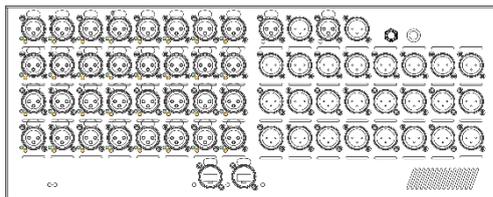


- **DMIX128C**
  - Same DSP features as DMIX128R
  - 16 Motorized Faders, 12" Touchscreen
  - I/O: 16 Inputs, 16 Outputs, 1 Headphone, 1 MADI, 1 Expansion Slot, 2 AES67 Ports



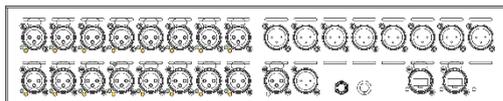
dMiX128C

- **DIO32**
  - I/O: 32 Inputs, 24 Outputs, 2 Headphones, 2 AES3, 2 AES67 Ports



dIO32

- **DIO16**
  - I/O: 16 Inputs, 8 Outputs, 1 Headphone, 1 AES3, 2 AES67 Ports



dIO16

## 2. Driver Interfaces

- **CoreAudio Driver (macOS)**
  - Supports 128x128 channels
  - Operates at 48kHz or 96kHz



- **ASIO Driver (Windows)**
  - Supports 128x128 channels
  - Operates at 48kHz or 96kHz

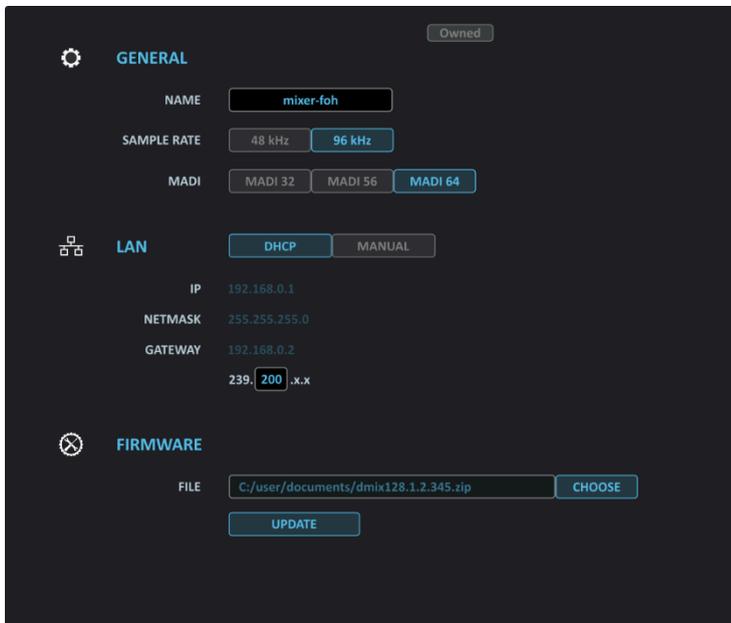


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### 3. Local Device Configuration

The following parameters are configurable locally on each device:

- **Name**
- **Sample Rate:** 48kHz / 96kHz (DSP and ADC)
- **MADI Sample Rate Options:**
  - 32 (96kHz)
  - 56 (48kHz)
  - 64 (48kHz)
- **IP Configuration:**
  - Mode: Manual / Auto
  - IP Address / Subnet Mask / Gateway
- **Multicast Base Address:** 239.AAA.0.0 (default AAA: 200, configurable)
- **Firmware:**
  - Firmware Version
  - Mixer GUI Version
  - Engine (FPGA) Version
  - Update: Upload and send firmware file



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### 4. Remote Device Selection

- Four **Device Slots** are available for networked hardware.

- Two **Driver Slots** are available for CoreAudio and ASIO devices.



#### 4.1 Expected Behaviors

- Selecting a device from the right-hand list:
  - Center button shows **ADD** to assign the device to a slot.
- Selecting a device in a slot:
  - Center button shows **REMOVE** to release the device.
- Selecting both a slot and a matching device from the list:
  - Center button shows **MATCH** to assign the configuration of the slot to the selected device.
- **Driver slots** support only ADD and REMOVE.

#### 4.2 Device List Fields

- **Name:** User-defined network name
- **Model:**
  - DMIX128R / DMIX128C / DIO32 / DIO16 / CoreAudio Driver / ASIO Driver
- **Control Status:**
  - Free: No owner
  - Owned: Managed and locked

- o Shared: Managed but accepting new connections
- **Gain Control Status:**
  - o Locked: Leader assigned
  - o Unlocked: Leader can be selected

## 5. Remote Device Configuration

The interface is divided into several sections for configuring a mixer setup:

- LOCAL:** Contains a slot for **dMiX128** with the mixer **mixer-foh**. Role is **Owned** and Gain is **Leader**.
- DEVICE1:** Contains a slot for **dCon16** with the mixer **mixer-mon**. Role is **Owned** and Gain is **Leader**.
- DEVICE2:** Contains a slot for **dIO32** with the mixer **stage-left**. Role is **Shared** and Gain is **Follower**.
- DEVICE3:** Contains a slot for **dIO32** with the mixer **stage-right**. Role is **Shared** and Gain is **Agnostic**.
- DEVICE4:** An empty slot.
- DRIVER1:** Contains a slot for **WIN** with mixer **rec-pc**. Channels: 128, Sample Rate: 48/96.
- DRIVER2:** Contains a slot for **MAC** with mixer **plugin-mac**. Channels: 16, Sample Rate: 48/96.
- SELECTED DEVICE:** A detailed configuration panel for the selected device (MADI 64). It includes options for **DHCP** (selected) or **MANUAL**, IP address (192.168.0.1), NETMASK (255.255.255.0), GATEWAY (192.168.0.2), and a **FIRMWARE** section with a text input (dmix128.1.2.345.zip) and **CHOOSE** button, followed by an **UPDATE** button.
- Additional Elements:** A **Clock** section with **AUTO** and **FORCED** buttons. A list of mixers on the right includes **mixer-foh**, **mixer-mon**, **stage-l**, **stage-r**, **Internal**, **AES1**, **AES2**, **MADI**, and **EXP**.
- Device List:** A scrollable list of devices with their names, roles, and gain statuses:
  - dIO32** (Name: dIO32\_22222, Role: Free, Gain: Unlocked)
  - dIO32** (Name: dIO32\_12345, Role: Shared, Gain: Unlocked)
  - dIO32** (Name: stage2-a, Role: Owned, Gain: Locked)
  - dIO32** (Name: stage2-b, Role: Owned, Gain: Unlocked)

Each device added to the slots are part of the mixer setup and have two configurable parameters.

## 5.1 Roles



- **Owned:** Exclusive use by current mixer
- **Shared:** Shared use among multiple mixers
- **Free:** No mixer assigned

## 5.2 Gain Modes



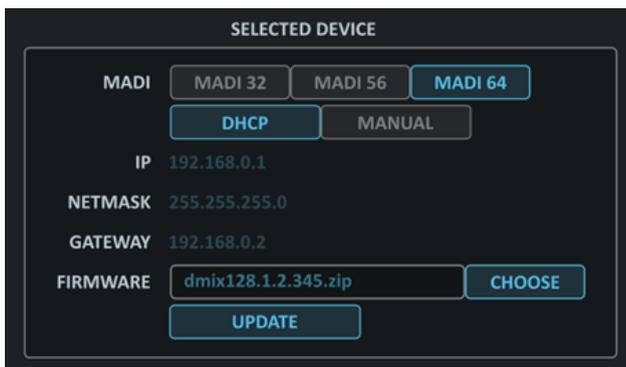
- **Leader:** Controls analog gain
- **Follower:** Uses digital trim based on Leader
- **Agnostic:** Manual trim independent of analog gain

## 5.3 Clock



- **Auto:** IEEE1588 PTP selects clock master automatically
- **Forced:** User selects master device/interface, propagated via PTP

When an owned device is selected, extra parameters are available.



## 5.4 DMIX128R / DMIX128C

- Name
- MADI Sample Rate: 32 / 56 / 64
- IP Mode: Manual / Auto
- IP / Mask / Gateway

- Firmware: Version, Mixer GUI, Engine (FPGA), Update via file

## 5.5 DIO32 / DIO16

- Same as above, excluding MADI Sample Rate

## 5.6 CoreAudio / ASIO Drivers

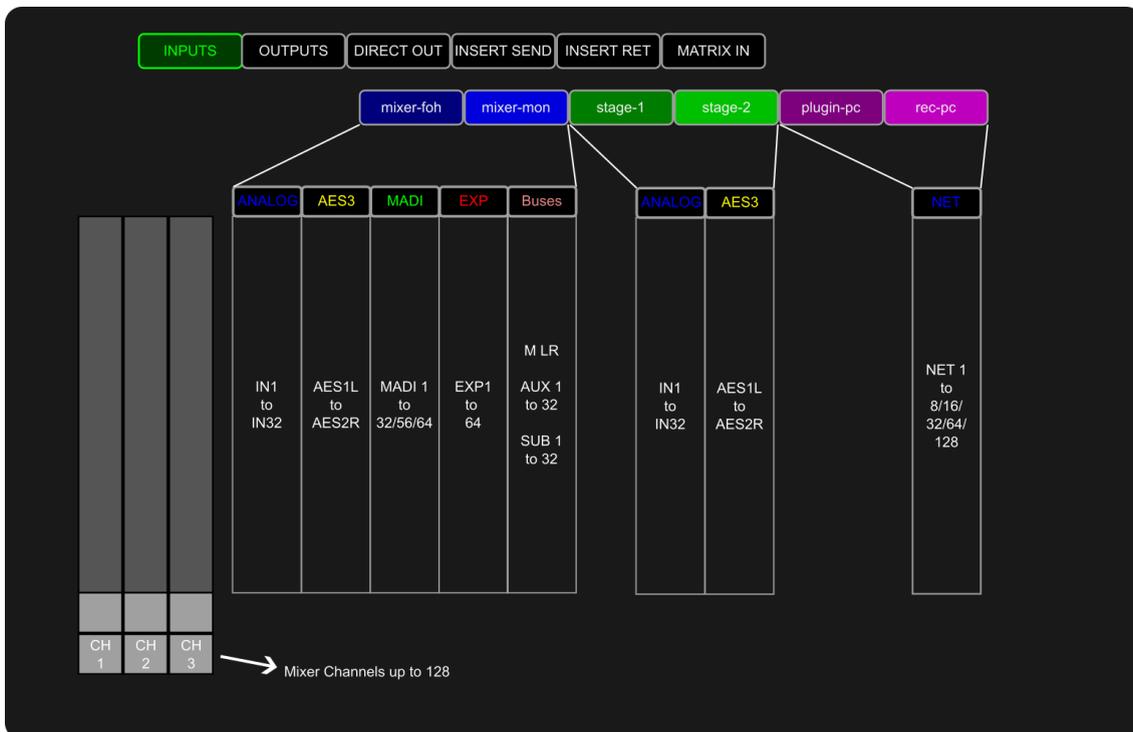
- Channel Count: (8x8 to 128x128). This parameter is set by the user on the driver. For the mixer it is a status.
- Sample Rate: Set by the Mixer (48kHz / 96kHz)

## 6. Signal Routing

Routing functionality is split across several views:

- Input Patch
- Output Patch
- DirectOut Patch
- Insert Send
- Insert Return
- Matrix IN Patch
- Matrix OUT Patch

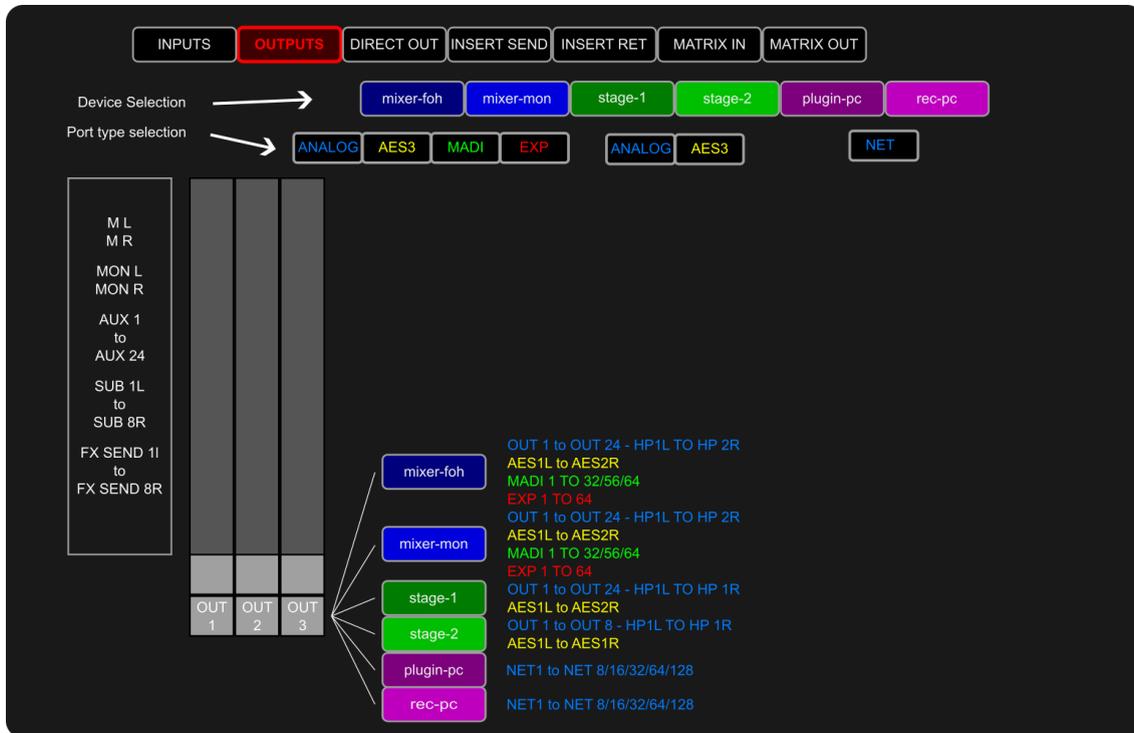
### 6.1 Input Patch



- Maps source channels to mixer inputs (1–128)

- Hierarchical selection:
  - o Level 1: Device
  - o Level 2: Input Type (Analog, AES3, MADI, Expansion, NET)

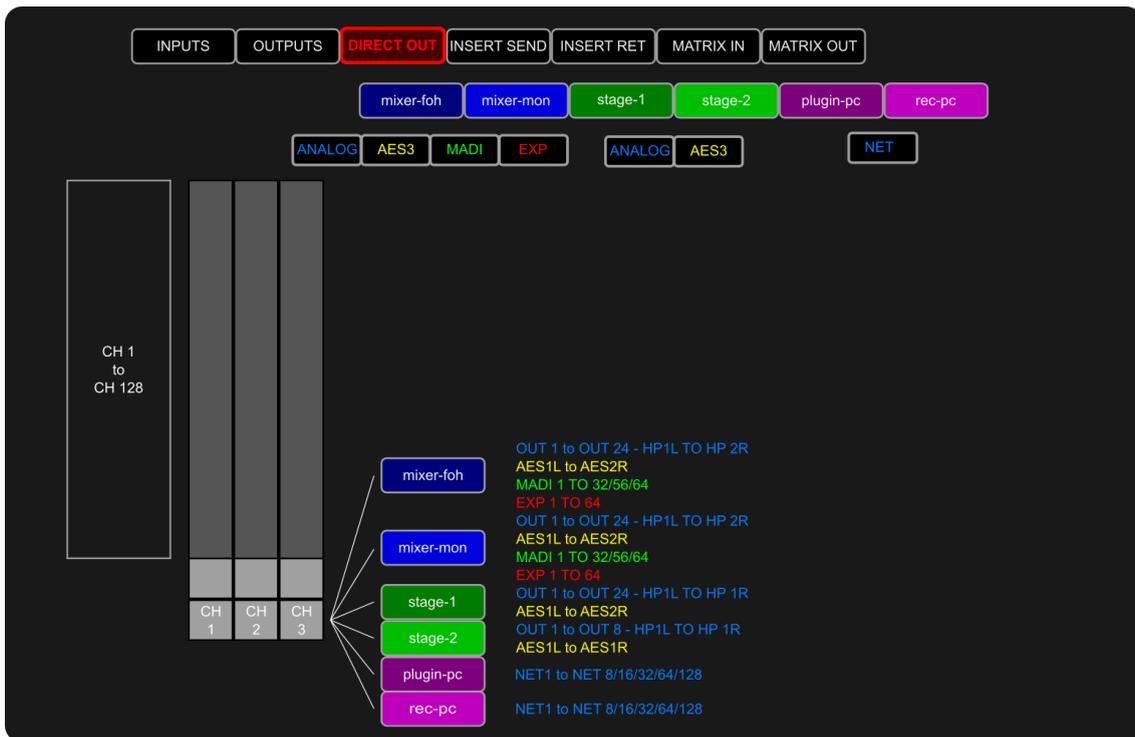
## 6.2 Output Patch



- Assigns mixer outputs to destination ports
- Same hierarchical device/channel type filtering

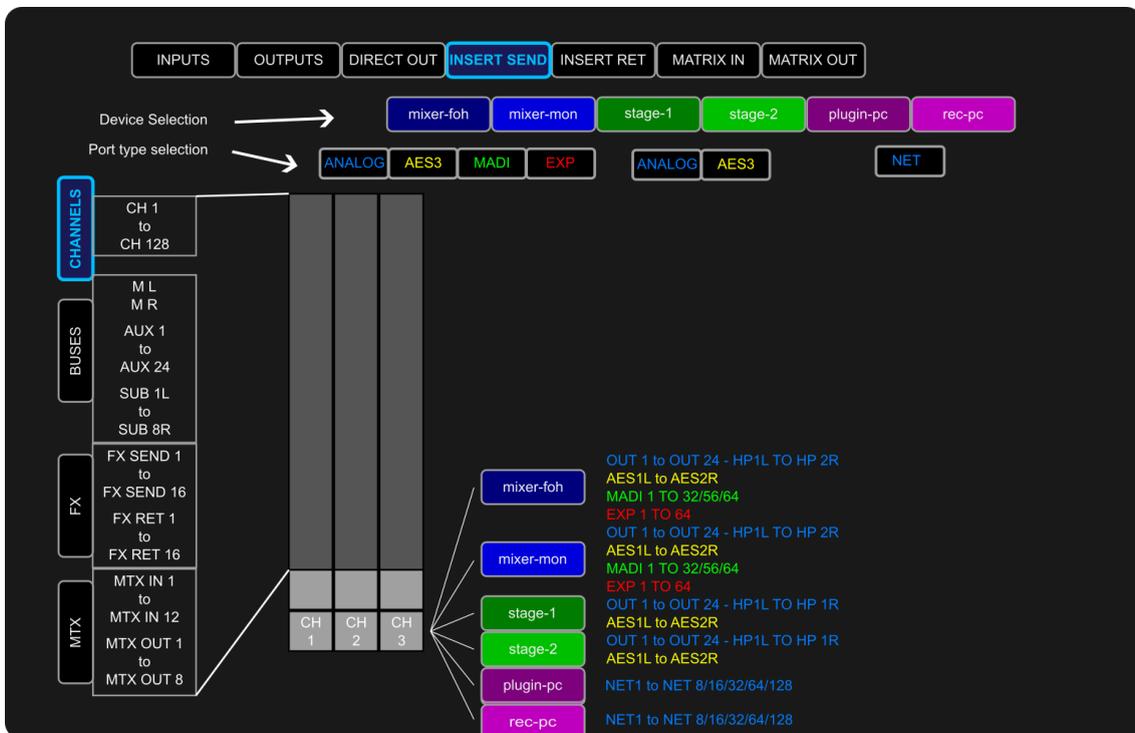
When a box and a type are selected, bottom line changes accordingly

## 6.3 DirectOut Patch



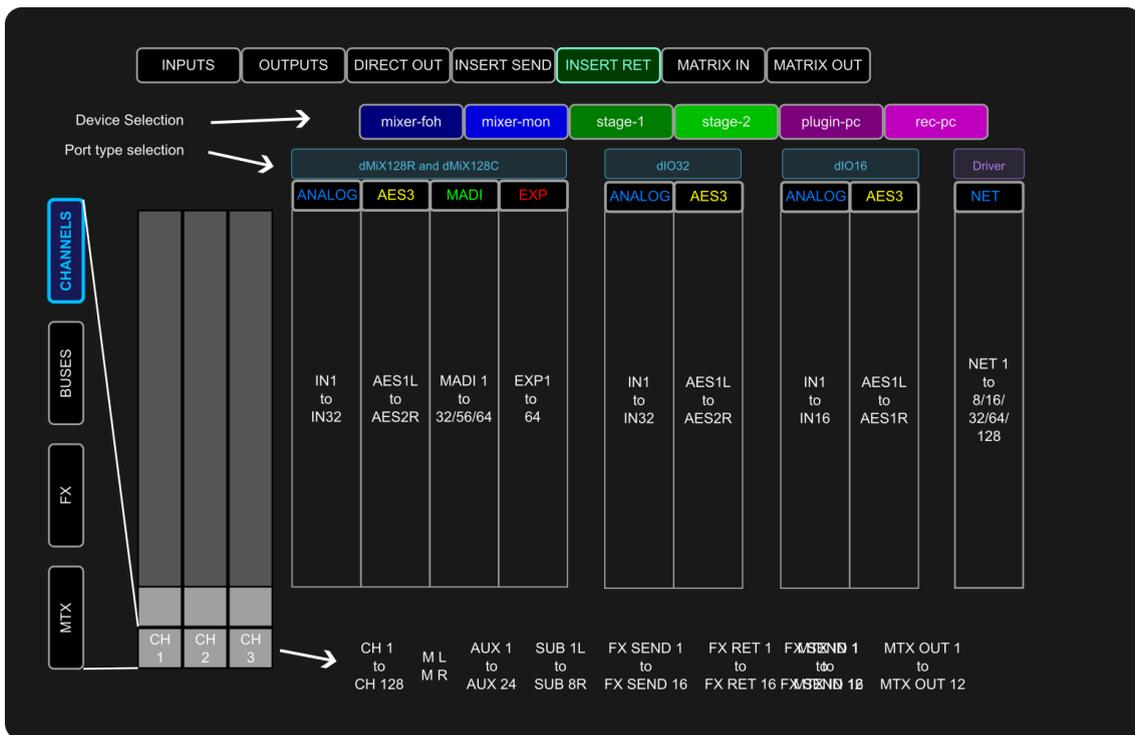
- Allows each input (post-trim) to be routed to any output
- Filtered by device and output port type

## 6.4 Insert Send



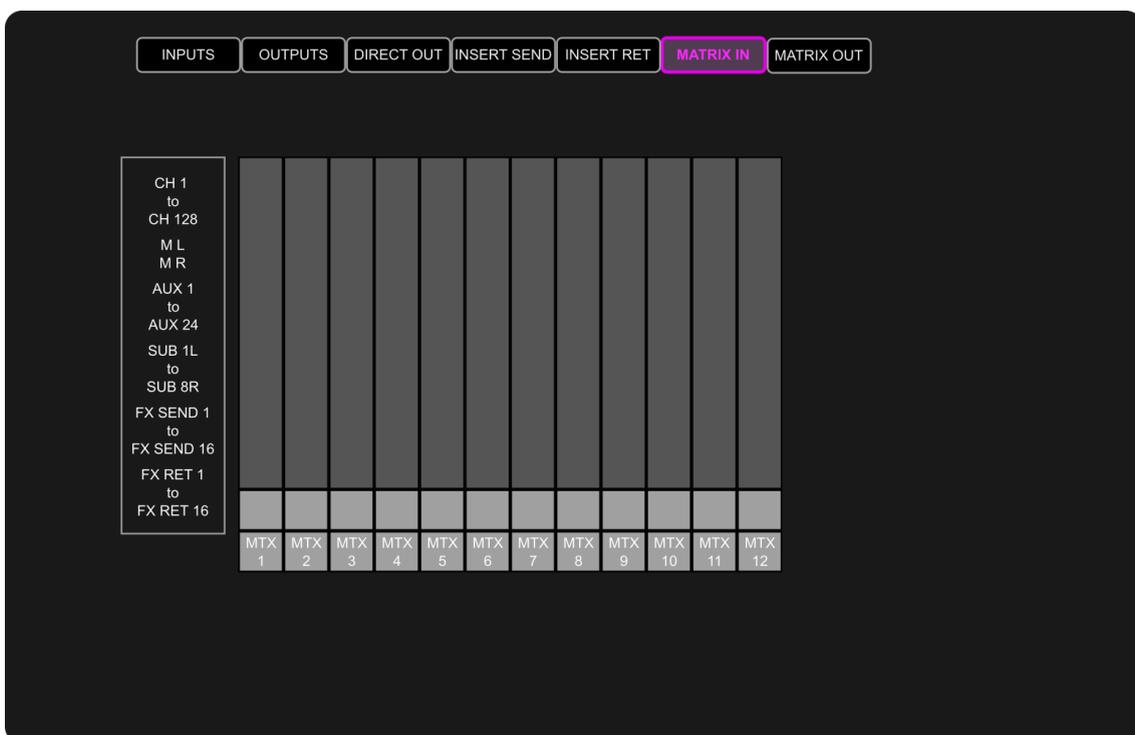
- Each mixer channel or bus has a virtual insert output
- Column: Source channels (inputs, buses, FX, matrix)
- Bottom: Output patch filtered by destination

## 6.5 Insert Return



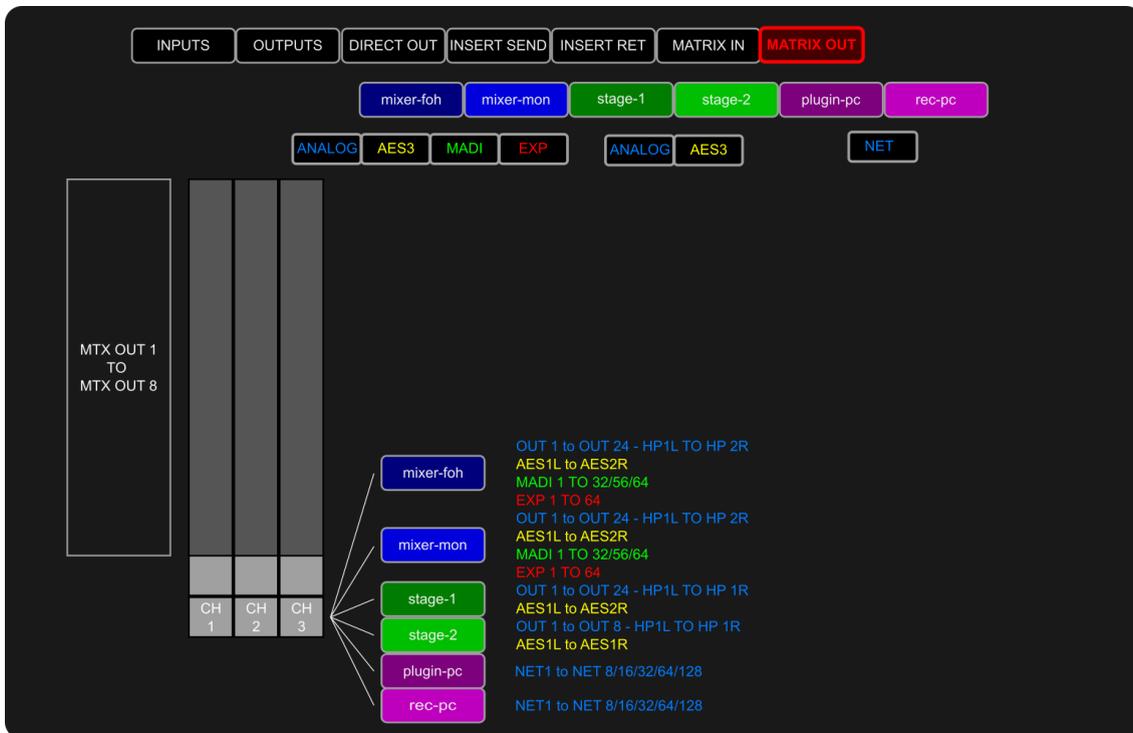
- Assigns insert return to any available input
- Column: Input ports filtered by device/type
- Bottom: Insert destinations (same groups as Insert Send)

## 6.6 Matrix IN Patch



- Selects sources for Matrix IN channels (1–12)
- Sources: all mixer input and output types

## 6.7 Matrix OUT Patch



- Destination patching for Matrix OUT channels (1–8)
- Follows same logic as Output Patch

## 7. Patch Keys

Base rule: {sink\_channel.src}={source\_channel}

Sink and Source channels are composed of:

`#{device_name}.#{ch_type}.#{ch_index}`

Device\_name is the name previously configured on GUI page. Local channels are also referred by the device name.

Channel type varies if they are sink or source channels.

Sink types (logical):

- i = Mixer input channel
- ii = Mixer insert return for input channels
- im = Mixer Master insert return
- ia = Mixer AUX insert return
- is = Mixer SUBGROUP insert return
- if = Mixer FX SEND insert return

- ir = Mixer FX RETURN insert return
- ixi = Mixer Matrix IN insert return
- ixo = Mixer Matrix OUT insert return

#### Sink types (physical):

- h = analog outout
- aes = aes3 output
- madi – madi output
- exp – expansion output
- n – pc network output

#### Source (logical)

- m = Mixer master bus
- a = Mixer AUX bus
- s = Mixer Subgroups bus
- f = Mixer FX send bus
- xo = Mixer Matrix OUT bus
- i = Mixer Directout of an input channel
- ii = Mixer channel insert send
- im = Mixer master insert send
- ia = Mixer AUX insert send
- is = Mixer SUBGROUP insert send
- if = Mixer FX SEND insert send
- ir = Mixer FX RETURN insert send
- ixi = Mixer Matrix IN insert send
- ixo = Mixer Matrix OUT insert send

#### Source (Physical)

- h = analog input
- aes = aes3 input
- madi – madi input
- exp – expansion input
- n – pc network input

### Examples:

Patching analog input 1 to mixer channel 1:

- `$mixer-foh.i.1.src=$mixer-foh.h.1`

Patching analog input 1 of stagebox “stage-center” to mixer channel 2:

- `$mixer-foh.i.2.src=$stage-center.h.1`

Patching Master L/R to stagebox “stage-left” aes3 output 1:

- `$stage-left.aes.1.src=$mixer-foh.m.1`
- `$stage-left.aes.2.src=$mixer-foh.m.2`

Patching insert send and return of channel 48 to driver channel 11 on PC called "plugin-pc"

- `$plugin-pc.n.11.src=$mixer-foh.ii.48`
- `$mixer-foh.ii.48.src=$plugin-pc.n.11`

## 8. Network Topology

(Section placeholder – to be expanded with actual topology or network behavior.)

