

Red 16Line

64 in / 64 out Thunderbolt™ 3 audio interface – with Pro Tools | HD and Dante™ network audio connectivity

User Guide



FFFA001540- 01

Focusrite®
www.pro.focusrite.com

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About this User Guide

This user guide applies to the Red 16Line Thunderbolt Interface. It provides information about installing and operating the unit and how it can be connected into your home or studio system.

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Dante™ is a trademark of Audinate Pty Ltd.

Thunderbolt™ is a trademark of Intel Corporation or its subsidiaries in the U.S. and/or other countries.

Box Contents

- Red 16Line unit
- IEC AC mains cable
- 2m Thunderbolt 3 cable (20Gbps, 60W)
- Product registration card – which provides the following important information:
 - Unit serial number
 - Bundle code *(for registering your product and for accessing your free software)*

System Requirements

- Apple Mac with at least one Thunderbolt*, Thunderbolt 2* or Thunderbolt 3 port, or Pro Tools | HD system for mini DigiLink connection. (*An Apple Thunderbolt 2 to Thunderbolt 3 adapter will be required for these devices, this requires Mac OS Sierra or above.)
- Internet connection for downloading and installing software and driver

INTRODUCTION

Thank you for purchasing the Focusrite Red 16Line.



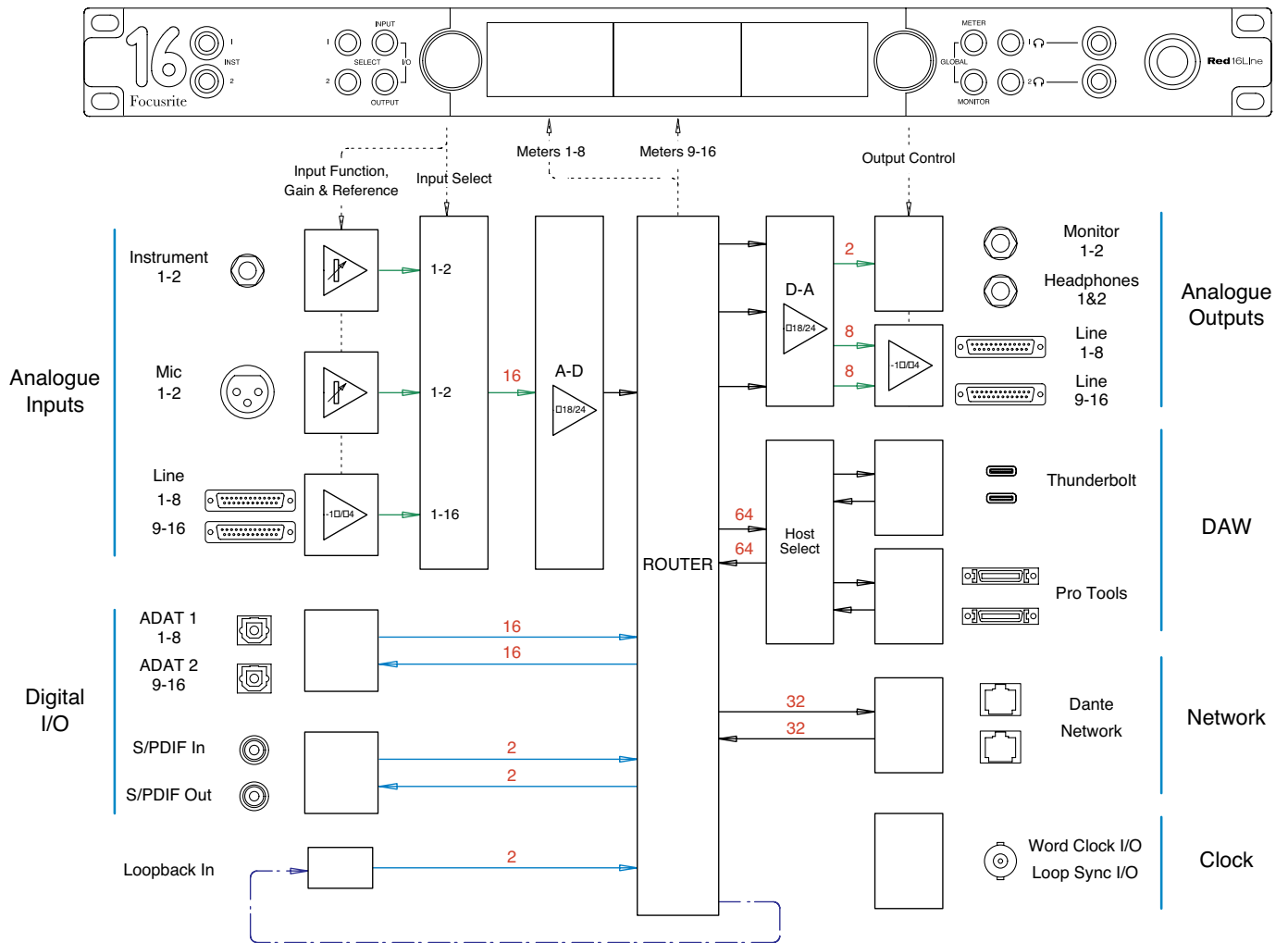
Red 16Line is a dual Thunderbolt 3 & Pro Tools | HD audio interface and preamplifier, suitable for a wide range of audio integration applications.

The Red 16Line features Mic, Line and Instrument analogue inputs and 22 analogue output channels – including independent loudspeaker and headphone monitoring plus 16-channel LCD meter displays. Red 16Line provides an interface for Pro Tools | HD equipped workstations and, with its built-in Dante card, is ready for networked audio expansion via the dual Ethernet ports.

Key Features

- Two Thunderbolt 3 Interface ports for direct or chained connection.
- 16 line-level input and output signals via DB25 connectors on the rear panel.
- Line Input operating level selectable to +18 dBu or +24 dBu globally or for each channel.
- Two remote controlled microphone preamps providing up to 63dB of gain, each with phantom power, high-pass filter, phase-reverse and 'Air' mode. *See Appendix 3 on p.28 for further information.*
- Two instrument inputs accessed via front-mounted 1/4" jacks.
- Analogue monitoring via dedicated balanced 1/4" jack outputs on the rear panel, plus two independent headphone outputs on the front panel.
- Digital devices can be accommodated via the S/PDIF and dual optical ADAT I/O connections.
- Two Primary Mini DigiLink connectors provide up to 64 input and 64 output channels of I/O to Pro Tools | HD.
- Dual Ethernet ports provide up to 32 x 32 channels of networked audio expansion over Dante.
- BNC connectors allow Red 16Line to sync or slave to external devices via Word Clock or Loop Sync.
- Two 8-channel LCD meter displays show 16 Inputs, 16 Outputs or a combined I/O view.
- Simple host and sync selection setup.
- Focusrite Control application allows full remote hardware operation, plus mixing and routing control.

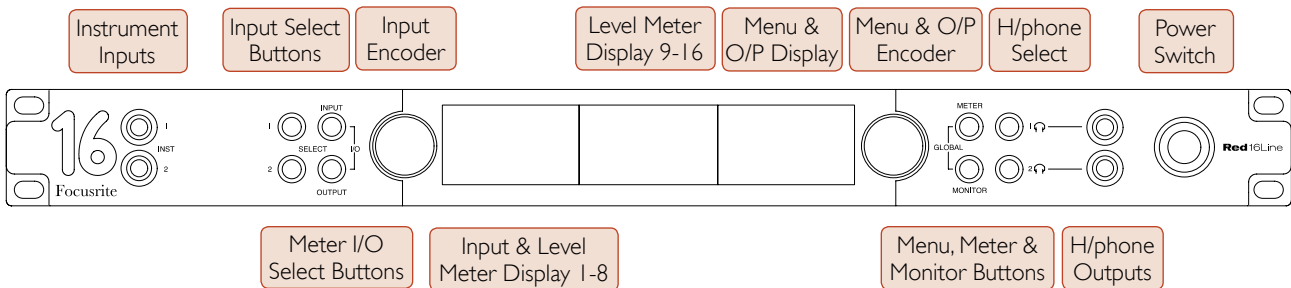
System Block Diagram



Numbers indicating channel capacities relate to a 44.1/48 kHz sample rate. Refer to the Channel I/O tables on pages 26–28 for the channel counts at higher sample rates.

Red 16Line Controls and Connections

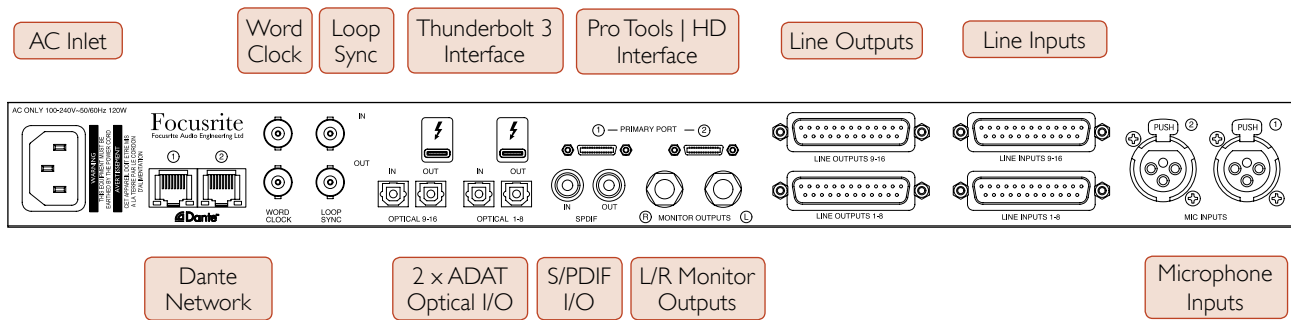
Front Panel



- **Instrument Inputs.** Two high-impedance unbalanced inputs on 1/4" jack sockets.
 - **Input Select buttons** provide direct access to the menu settings for analogue input channels 1&2.
 - The **Input Encoder** and its associated **Input Display** is used to select and adjust the configuration menu settings for the input channels; it also functions as the input gain control for inputs 1&2.
 - The **Level Meter Displays 1-8** and **9-16** are switchable LCD meters able to show inputs, outputs or a combined I/O display. Display selection is made using the **Input** and **Output** buttons – pressing both buttons simultaneously selects combined I/O.
 - The **Output Encoder** functions as the volume control for the monitor and headphone outputs. It is also used to configure the global system settings, control the meter selection and select the monitor dim and mute features. Its function is determined by the adjacent Monitor, Meter and Headphone Select buttons.
 - The **Meter** button calls up the selection menu for the level meters onto the **Output Display**.
 - The **Monitor** button assigns the **Output Encoder** to the monitor loudspeaker functions.
- Pressing the **Meter** and **Monitor** buttons simultaneously enters Red 16Line's **Global** configuration menu, where host, clock, power-up and network settings are assigned.*

- The **Headphone 1** and **2** buttons assign the **Output Encoder** to the selected headphone control functions.
- **Headphone Outputs** are standard 1/4" TRS jacks.

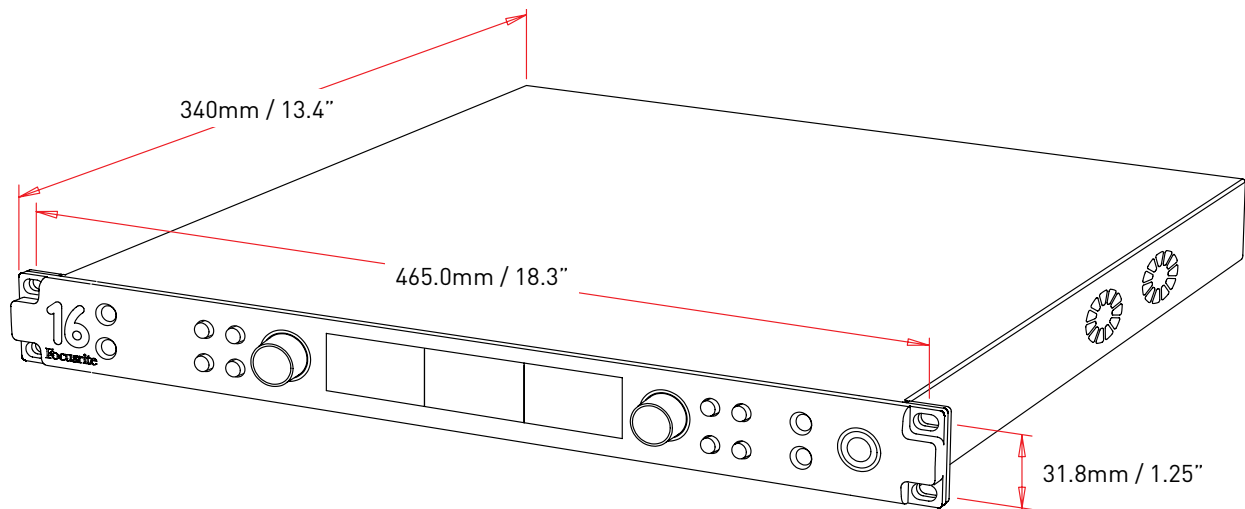
Rear Panel



- **AC Mains Inlet.** Standard IEC receptacle for connection of AC mains. Red 16Line features a 'Universal' PSU, enabling it to operate on any supply voltage between 100 V and 240 V AC.
- **Word Clock – Input** allows synchronisation to word clock.
- **Word Clock – Output** provides an output of the chosen system clock reference.
- **Loop Sync I/O** sockets allow Red 16Line to integrate with a standard Pro Tools system I/O chain.
- Dual **Thunderbolt 3** Connection. Two ports allow either direct or chained connection to your workstation.
- **Pro Tools | HD Interface.** Two Mini DigiLink Primary connectors; use Mini DigiLink cables to connect to a Pro Tools | HD HDX PCIe card or Pro Tools | HD Native system.
- **Line Outputs** on two 25-way DB25 female connectors.
DB25 connectors are wired according to the AES59 Standard (also known as the TASCAM Analogue standard).
- **Line Inputs** on two 25-way DB25 female connectors.
Note that Line input circuits 1 & 2 can be re-assigned to the Microphone and/or Instrument connectors so may not always be available on the input connector. See page 10 for further information.
- **Microphone Inputs** on two XLR-3 female connectors.
- **Network.** Two RJ45 Ethernet connectors for the Dante network. The connectors form an integral 2-port switch, allowing either to be used on the network.
- **ADAT I/O 1 and 2.** Two independent 8-channel ADAT optical inputs and outputs using standard TOSLINK connectors. Optical I/O 1 can also be used in 'Optical S/PDIF' mode.
- **S/PDIF I/O.** 2-channel digital interface on RCA (phono) connectors.
- **Monitor Outputs.** Balanced 1/4" TRS jacks for connection of Left and Right monitor loudspeakers. Outputs are at line level so unpowered speakers will require external amplification.

See Appendix 1, page 24 for the connector pinouts.

Physical Characteristics



Red 16Line dimensions are illustrated in the diagram above.

Red 16Line requires 1U of vertical rack space and at least 400mm of rack depth, to allow for cables. Red 16Line weighs 5.04kg and for installations in a fixed environment (eg., a studio), the front-panel rack mountings will provide adequate support. However, if the units are to be used in a mobile situation (eg., flight-cased for touring, etc.), it is recommended that side support rails or shelves are used within the rack.

Cooling is by fan assistance from side to side; the fans used are low-speed and low-noise. Do not mount the unit immediately above any other equipment which generates significant heat, for example, a power amplifier. Also, ensure that when mounted in a rack, the side vents are not obstructed.

Note. The maximum operating environmental temperature is 40°C / 104°F.

Power Requirements

Red 16Line is mains-powered. It incorporates a 'Universal' power supply which can operate on any AC mains voltage from 100 V to 240 V. The AC connection is via a standard 3-pin IEC connector on the rear panel.

A mating IEC cable is supplied with the unit – this should be terminated with a mains plug of the correct type for your country.

The AC power consumption of the Red 16Line is 120W.

Please note that there are no fuses or other user-replaceable components of any type in Red 16Line. Please refer all servicing issues to the Customer Support Team (see "Customer Support and Unit Servicing" on page 33).

OPERATION

Inputs

Red 16Line has the capacity to accommodate sixteen analogue inputs, two independent 8-channel ADAT inputs, a 2-channel S/PDIF input plus 32 Dante input channels. (Additionally, an internal 2-channel loopback signal can be added as an extra stereo input – see page 13 for details.)

Analogue Inputs

Analogue input channels **1 & 2** can be assigned to the Instrument, Microphone or Line input connectors. Line input gains can be independently or globally switched between +18 dBu and +24 dBu operating level.

Input Controls

Input selection and configuration for channels 1 and 2 is carried out using the two Preamp **Select** buttons and the **Input Encoder**.

The illuminated Select button identifies the channel being controlled.

- Pressing a Select button makes that channel the active channel
Power-up always selects channel 1
- The Input Encoder acts as the gain control for the active channel
- Pushing ('clicking') the Input Encoder selects menu options or operates the Toggle function (see page 12)



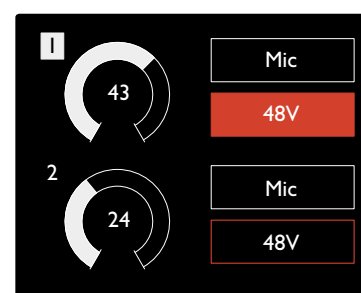
Select Buttons / Input Encoder

Preamp Overview Screen

Pressing either of the Select buttons shows the Overview display on the Left LCD display. It shows at-a-glance the current input type, gain value and phantom power status for inputs 1 & 2.

The highlighted number indicates the currently active channel.

A clipping channel will be indicated by its gain level bar changing to red – reset by pressing the channel's Select button.

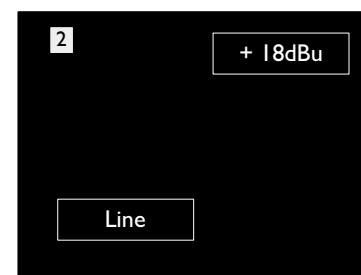


Preamp Overview Screen

Preamp Focus Screen

Pressing an input Select button brings up the Focus screen which provides additional detail about that channel's current settings.

If no changes are made within approximately 3 seconds, the display will revert to the Overview screen.



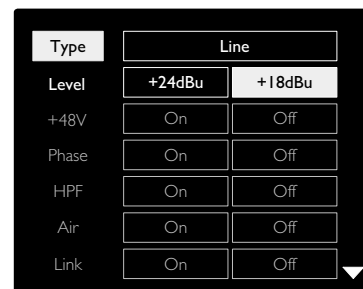
Preamp Focus Screen

Input Configuration

The settings for input channels 1 & 2 – its input type and function options – are selected via the Config Menu.

- To enter the Config Menu, press-and-hold a channel's Select button

To exit this screen, press any of the channel Select buttons (or, rotate the Input Encoder to the 'Back' option and then click).



Channel Config Menu Screen

Input Functions

The following channel functions can be set, or toggled On/Off, from the Config Menu screen:

Note that 'Level' will be the only option available when input type is set to 'Line'

- **Type** selects the signal input type to be used for the channel: Instrument > Mic > Line
- **Level** sets the operating level for the selected channel
- **+48V** enables phantom power for the microphone input
- **Phase** applies phase inversion to the selected channel
- **HPF** switches in the 80Hz high-pass filter
- **Air** changes the microphone and instrument input characteristics to 'Air' mode. See Appendix 3, page 29 for further information
- **Link** combines channels 1 and 2 so they operate as a stereo pair. When linked, Gain changes to either of the paired channels will be applied to both

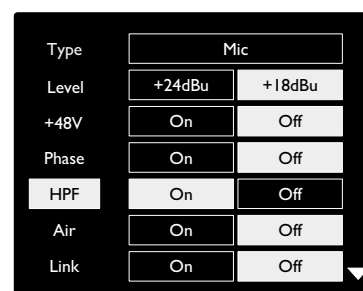
When linked, any difference in gain settings between the two channels will be maintained.

- **Back** exits the Config Menu screen and returns to the Overview display

Pressing any of the channel Select buttons will also exit the Config menu screen

To change an input function:

- 1 Rotate the Input Encoder until the required function is highlighted
- 2 Push the Input Encoder to step through the input types or to toggle the selection



Channel Function Selection

Encoder Toggle Function

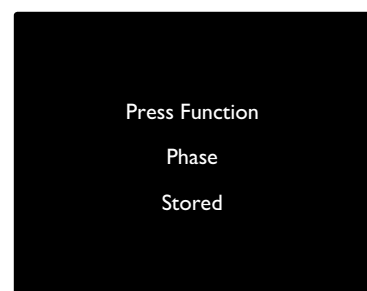
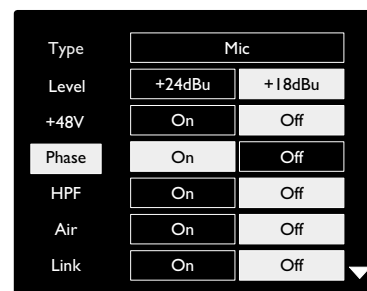
The Input Encoder can be programmed to toggle any one of the input functions with a single push (ie., without having to enter the Config Menu screen). *This can be very useful when, for example, experimenting with microphone phasing.*

To select a function for the Input Encoder toggle feature:

- 1 Enter the Config Menu screen
- 2 Scroll to the function required for the toggle feature
- 3 Press-and-hold the Input Encoder until the confirmation message appears in the input display

The selected function will now toggle on/off each time the Input Encoder is clicked*. (If 'Type' is selected, clicking the Input Encoder will step through the available inputs.)

**Selecting a function that is not available for the current input type will have no effect, but the function will be stored and become active when an appropriate input type is selected.*



Input Encoder Toggle Confirmation

Line Inputs 1 – 16

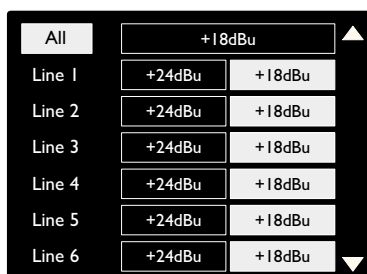
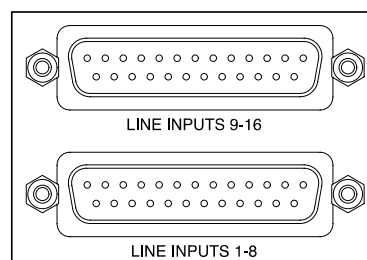
Whilst Line inputs 1 and 2 are switchable between Mic, Line and Instrument, Line input channels 3 to 16 are always available on the DB25 connectors.

Operating Level Selection

The operating level for each Line input can be switched between +18 dBu and +24 dBu to correctly match additional studio equipment.

To set the level:

- 1 Press and hold the **Input** button until the Level Selection menu appears on the Input Display
- 2 Scroll to the required channel number for individual selection or to **All** for global selection
- 3 Click the Input Encoder to toggle between +18 dBu and +24 dBu
- 4 Press the Input button again to exit



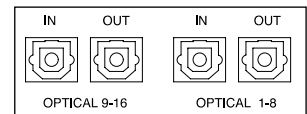
Digital Inputs

ADAT

ADAT inputs 1 and 2 are accessed via the rear panel connectors. Signals will be available if the source is connected and the system is synced to a common clock.

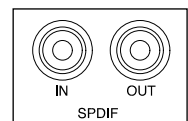
Each In/Out connection provides:

- 8ch at 44.1 / 48 kHz
- 4ch at 88.2 / 96 kHz (SMUX)
- 2ch at 176.4 / 192 kHz (SMUXII)



S/PDIF

A two-channel S/PDIF I/O connection is accessed via the RCA/Phono connectors on the rear panel, or via the optical TOSLINK connectors.



Loopback Input

The Red 16Line's virtual Loopback inputs allow you to record any mix within Focusrite Control back into your DAW. This could be the audio output of another software application, or an entire monitor mix within Focusrite Control including analogue or digital inputs mixed with any playback signals that you wish to capture in your DAW.

Loopback uses the Red 16Line's virtual inputs, which have no physical connectors on the hardware interface itself, but may be selected in the DAW as signal sources for recording in the same way as any other.



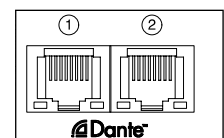
Focusrite Control –
Loopback Signal Routing

For Focusrite Control information, see page 21.

Dante Connection

Two switched RJ45 connectors for the Dante network are located on the rear panel. Use a standard Cat 5e or Cat 6 network cable to connect to the Dante audio network.

Incorporated into each socket are LEDs which illuminate to indicate a valid network connection and network activity.



Note that the Dante connectors are configured for a single, switched network – they cannot be used as primary and secondary ports on a redundant network.

For more information on Dante networks, see Audinate's website: <http://www.audinate.com/>

Monitoring

Monitors

Monitor outputs, at line level, are provided via the 1/4" balanced jack outputs on the rear panel.

- The Output Encoder will adjust the monitor output level whenever the **Monitor** button is illuminated

Monitor Display

The monitor display shows the current volume level and whether either Dim or Mute is active. 'Dim' attenuates the signal by 18dB.

The L/R meter display shows a pre-fade level (the signal level present before the Output Encoder).

The display also shows the Global Host and Sync settings and their lock status flags (see 'Global Settings' on page 20).

Mute and Dim

Mute and Dim functions are individually enabled via the Monitor Setup menu. Additionally, the Output Encoder can be programmed to toggle either the Dim or Mute function when clicked.

Menu activation:

- 1 Press-and-hold the **Monitor** button to enter the Setup menu
- 2 Rotate the Output Encoder to highlight either Dim or Mute
- 3 Click to select On or Off
- 4 To exit, press Monitor again (or select the 'Back' option)

Toggle Function programming:

- 1 Enter the Monitor Setup menu as above
- 2 Rotate to highlight the function to be programmed
- 3 Press-and-hold the Output Encoder until the confirmation message appears

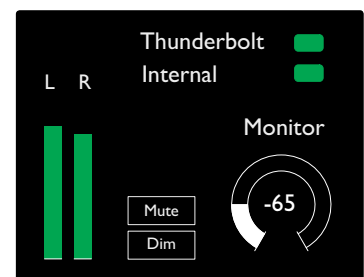
The selected function will now toggle on/off each time the Output Encoder is clicked.

Headphones

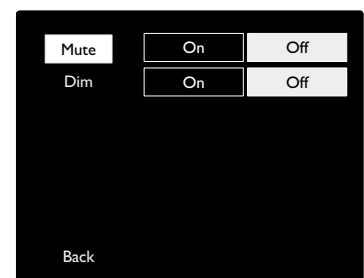
Two independent stereo headphone outputs are available on the front panel.

- To adjust a headphone's volume level – or to activate Dim or Mute for that output – press one of the **Headphone Select** buttons
Also see: *Focusrite Control – Monitor Controls*, on page 22

For Dim and Mute activation and programming, refer to the 'Mute and Dim' section above but substitute 'Monitor button' with the appropriate Headphone Select button.



Monitor Display



Monitor Setup Menu



Encoder Toggle Confirmation



Headphone Select Buttons

Meter Displays

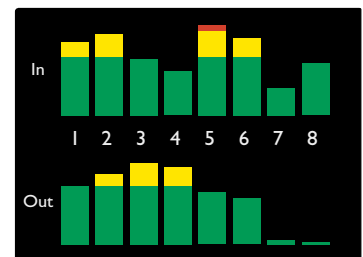
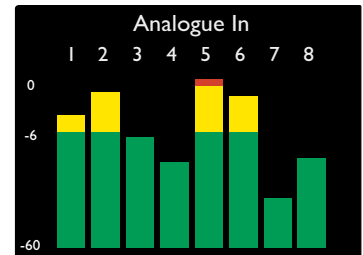
Level Meters 1–8 and 9–16

The left and centre LCD screens each display level meters. These indicate the internal signal level of channels 1–16, after A-D conversion, with 0 dBFS being at full scale.

A red clip indicator is displayed on channels that reach clipping point.

The meter source is selected as follows:

- Press the **Input** button to display input channels 1–8 and 9–16.
- Press the **Output** button to display output channels 1–8 and 9–16.
- Press both Input and Output buttons simultaneously to select the combined **I/O** view.



Combined I/O Display

Output Meter

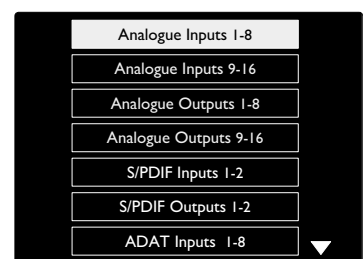
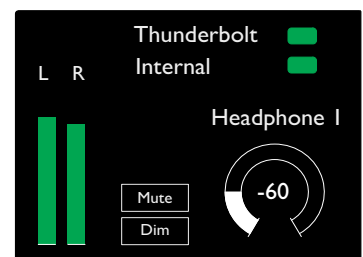
The Output screen normally shows the Monitor or Headphone 1 or 2 level meters (as well as the interface status flags).

This screen is also used to select the meter source for displays 1 and 2.

Meter Source Selection

To select the signal source for the Left and Center LCD displays:

- 1 Press the **Meter** button on the front panel to access the Meter Source-List
- 2 Use the Output Encoder to scroll to the required input
- 3 Click the Output Encoder to make the selection
- 4 Press Monitor or one of the Headphone buttons to exit



Meter Source List

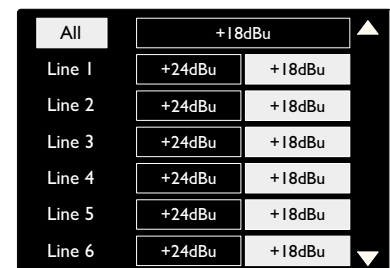
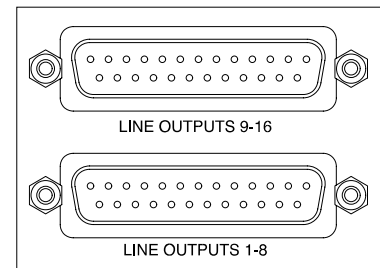
Analogue Outputs

16 analogue outputs are provided on the two DB25 female connectors on the rear panel.

Operating Level Selection

The operating level for each Line input can be switched between +18 dBu and +24 dBu to correctly match additional studio equipment.

- 1 Press and hold the **Input** button until the level selection menu appears on the Input Display
- 2 Scroll to the required channel number for individual selection or to **All** for global selection
- 3 Click the Input Encoder to toggle between +18 dBu and +24 dBu
- 4 Press the Input button again to exit

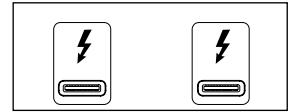


Thunderbolt Connection

Confirm that Red 16Line's Host setting is set to 'Thunderbolt', see *Global Host Settings* on page 20.

Two Thunderbolt 3 connectors are located on the rear panel.

Connect to the host or into the chain using standard Thunderbolt cables (one supplied).



See *appendix 2*, pages 26–28 for the channel I/O allocation tables.

Logic Pro X Setup

- From the menu bar, go to: **Logic Pro X** > **Preferences** > **Audio...**
- Under the **Devices** tab, set: **Input Devices** and **Output Devices** to 'Focusrite Thunderbolt'



Pro Tools Connection

Confirm that Red 16Line's Host setting is set to 'Pro Tools', see *Global Host Settings* on page 20.

Connect both rear panel PRIMARY ports to a Pro Tools |HDX card using Mini DigiLink cables.

Each Pro Tools |HDX PCI/PCIe card provides two Mini DigiLink ports (giving the card a capacity of 64 inputs and 64 outputs), thus one Red 16Line may be connected to each card.

A Red 16Line will appear as four devices in Pro Tools:

A: 1-16 (Port 1)

B: 1-16 (Port 1)

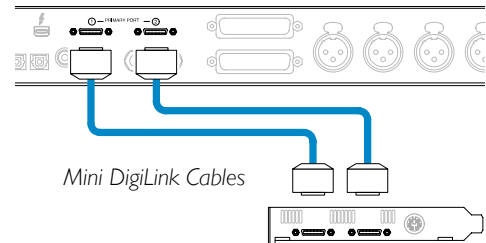
C: 1-16 (Port 2)

D: 1-16 (Port 2)

A maximum of 3* Red 16Line units can be connected, giving a total I/O capability of 174 inputs and 192 outputs.

* Or one Red 16Line if using an HD Native system.

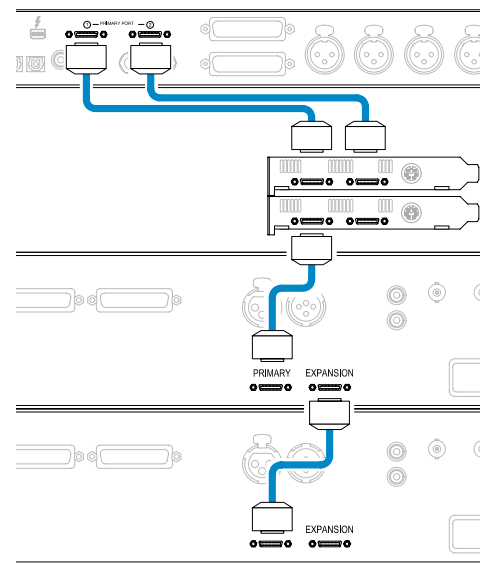
Note that both Red 16Line ports are Primary connectors; this means that an additional Pro Tools interface cannot be added in series – Red 16Line does not operate in Expansion mode.



Using Red 16Line with other Pro Tools | HD interfaces

Pro Tools |HD I/O audio interfaces may be used on the same Pro Tools system as Red 16Line. Pro Tools interface units can be added by using additional Pro Tools |HDX PCIe interface cards.

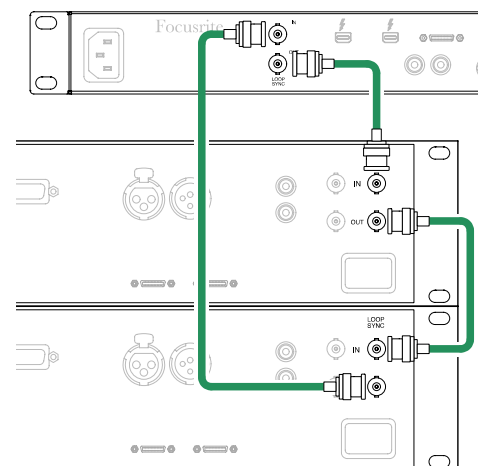
Connection to a Pro Tools |HD system would require the use of DigiLink -to- Mini DigiLink adapter cables.



Loop Sync

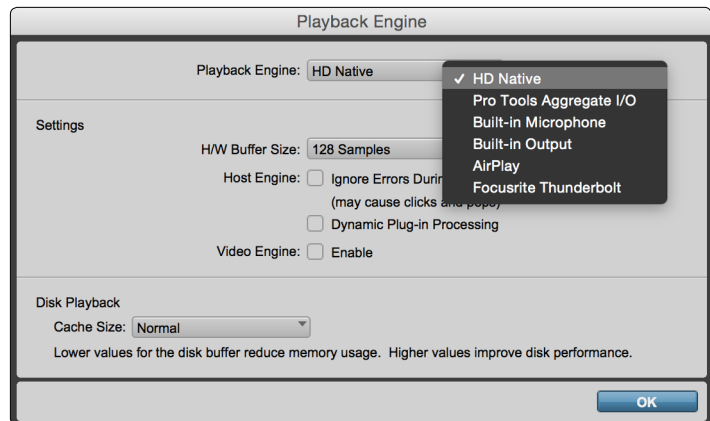
It is important when using additional I/O devices that the Loop Sync connection is complete between all units:

- Using 75Ω BNC cables, connect each LOOP SYNC OUT connector to the LOOP SYNC IN connector on the next I/O unit
- Complete the chain by connecting LOOP SYNC OUT on the final I/O unit back to LOOP SYNC IN on the first unit



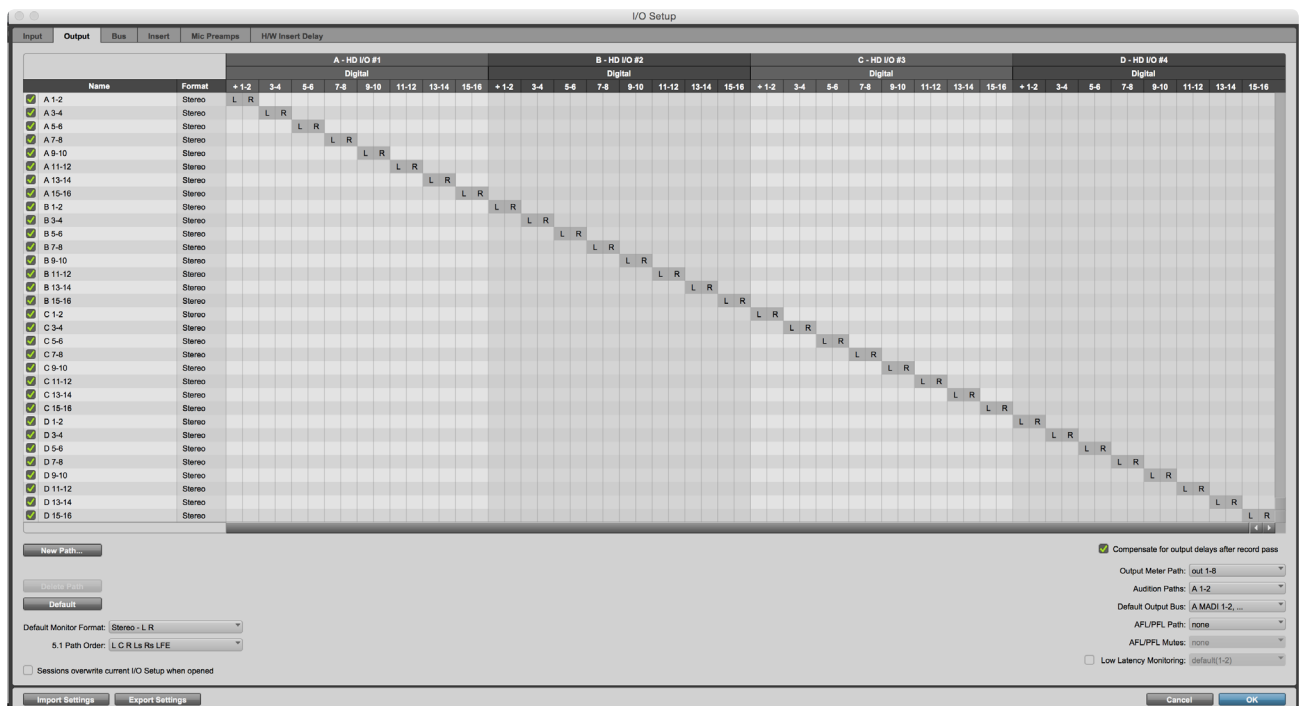
Pro Tools Setup

- From the Pro Tools menu bar, go to: **Setup > Playback Engine...**
- In the **Playback Engine** menu pop-up, select: 'HDX' or 'HD Native', as appropriate for your system



The following steps are optional but will simplify signal routing:

- From the menu bar, go to: **Setup > I/O Setup...**
- Ensure your input and output routing tables are routed as follows by selecting the **Default** tab at the bottom left of the page.



Notes

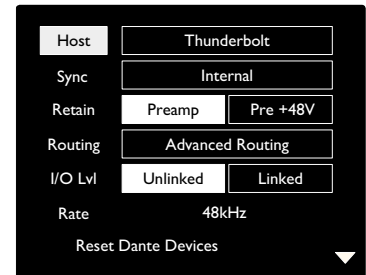
1. The number of input and output channels available is dependent on the sample frequency (see channel allocation tables in Appendix 2, pages 26–28)
2. The Loopback input is not available in the Pro Tools host mode
3. Output routing using Focusrite Control is not available in the Pro Tools Host mode

GLOBAL SETTINGS

Press the **Meter** and **Monitor** buttons simultaneously to enter the global settings menu.

- Rotate the Output Encoder to select a menu item
- Click the Output Encoder to step through the available options

To exit the Global settings screen press the Monitor button (or select the 'Back' option).



Global Settings Menu

Host

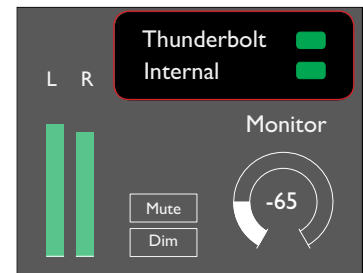
Selects the connection used for the DAW host: Thunderbolt or Pro Tools. The Lock flag in the Monitor display will show green when locked to the DAW host.

Note: changing Host type will cause the device to perform a power reset.

Sync

Selects the Red 16Line's sync source:

- Internal – Internally generated. *This is the default selection*
- Word Clock – Received via the BNC Word Clock In connector
- ADAT 1 – Received via the rear Optical In 1-8 connector
- ADAT 2 – Received via the rear Optical In 9-16 connector
- S/PDIF – Received via either the rear RCA In connector, or Optical port 1
- Dante – Provided by the Dante network connection
- Loop Sync – Only applicable when in Pro Tools host mode



Host and Sync Settings and Lock Status

When sync is established, the Lock status will change to green. A red flag indicates no sync.

Retain

Choose whether the previous phantom power settings for channels 1 & 2 are restored on power-up:

- Preamp – All previous settings are returned except the 48V settings, which will be set to Off
- Preamp +48V – All previous settings are returned

I/O level

- Linked – Changes to a channel's I/O Reference level settings will be applied to the Input and Output values simultaneously. *This is the default selection*
- Unlinked – Channel Input and Output Reference settings can be assigned independently

Selecting the "Linked" option when Input and Output levels are set to different values will not force a change in either value. The settings must be matched manually before subsequent changes will track.

FOCUSRITE CONTROL



The Focusrite Control application provides remote control of all Red 16Line's front panel hardware functions and system settings via a graphical interface on your DAW.

Please note: This manual includes information relating to Red 16Line's specific front panel controls and device settings. For compactness, however, the Mixing and Routing operations are not included here but are fully described in the separate 'Focusrite Control User Manual'; this manual can be downloaded at the following link:

<https://focusrite.com/downloads?product=Red+16Line>

System Requirements

Please visit the following link for up-to-date information on computer and operating system compatibility for Focusrite Control: [Compatibility](#)

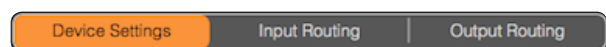
Software Installation

The Focusrite Control application for Red 16Line can be installed as follows:

- Using your browser, go to www.focusrite.com/register.
- Follow the on-screen instructions, entering the "Bundle Code" into the form where prompted. *Your Bundle Code can be found on the back of the Important Information Guide packed with Red 16Line.*
- Enter the unit's serial number, which can also be found on the back of the Important Information Guide.
- You will then be able to access the "My Products" page. Click "Downloads and Activation Codes" beneath the Red 16Line in your account.
- Download and install Focusrite Control, which contains the necessary drivers for your interface. Follow all on-screen instructions.
- When the installation is complete, you will be prompted to restart your computer.
- After a restart, connect Red 16Line to your computer with a Thunderbolt cable.

Operation

The software control page is divided into three tabs:



Device Settings

Allows hardware configuration and control via a GUI. *See next page for details.*

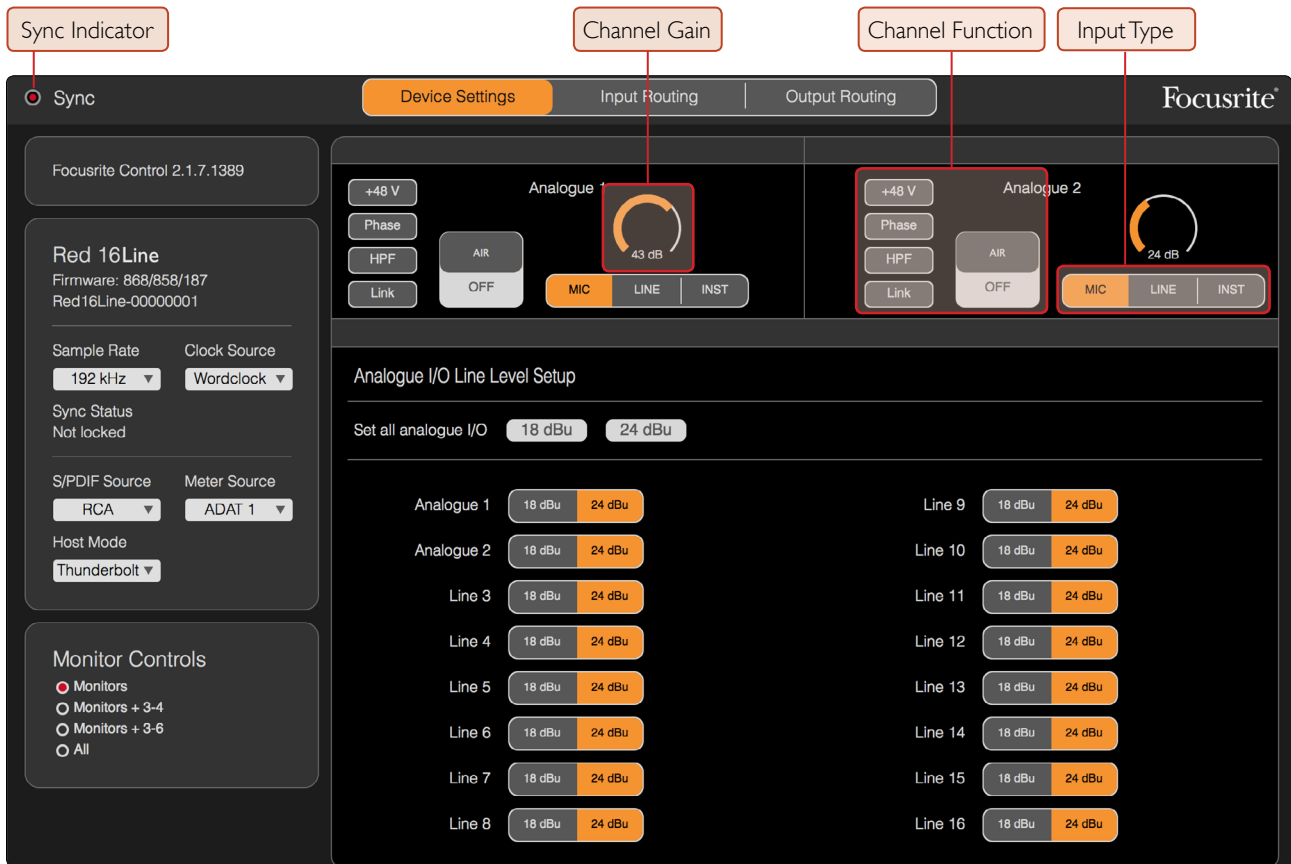
Input Routing

With more channels available on Red 16Line than the DAW I/O maximum of 64, Input Routing allows the input channel allocation to be reconfigured so that any signals required can be made available – even when operating at higher sample rates. *See page 23.*

Output Routing

Allows control of output routing and DAW allocation via a GUI. Please refer to the separate Focusrite Control User Manual for full details – see link above.

Device Settings GUI



Sync Indicator – Will be illuminated if Red 16Line is locked to a valid clock source.

Channel Gain – Sets the input gain on analogue channels 1 & 2; click-and-drag to change.

Channel Function – Click to select an input function. See page 11 for Function descriptions.

Input Type – Click to select the input signal type. Also see page 11 for Type descriptions.

Sample Rate – Select from: 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, 192kHz.

Clock Source – Internal, S/PDIF, ADAT 1 & 2, Word Clock, Dante, Loop Sync (*Pro Tools host mode*).

S/PDIF Source – RCA, Optical.

Meter Source – Internal, S/PDIF, ADAT 1 & 2.

Host Mode – Thunderbolt or Pro Tools. Changing Host type will cause the device to perform a power reset.

Analogue I/O Line Level Setup – Click to select channel I/O gains globally or by individual channel.

Monitor Controls – Click to select which channels are being controlled by the unit's Output Encoder:

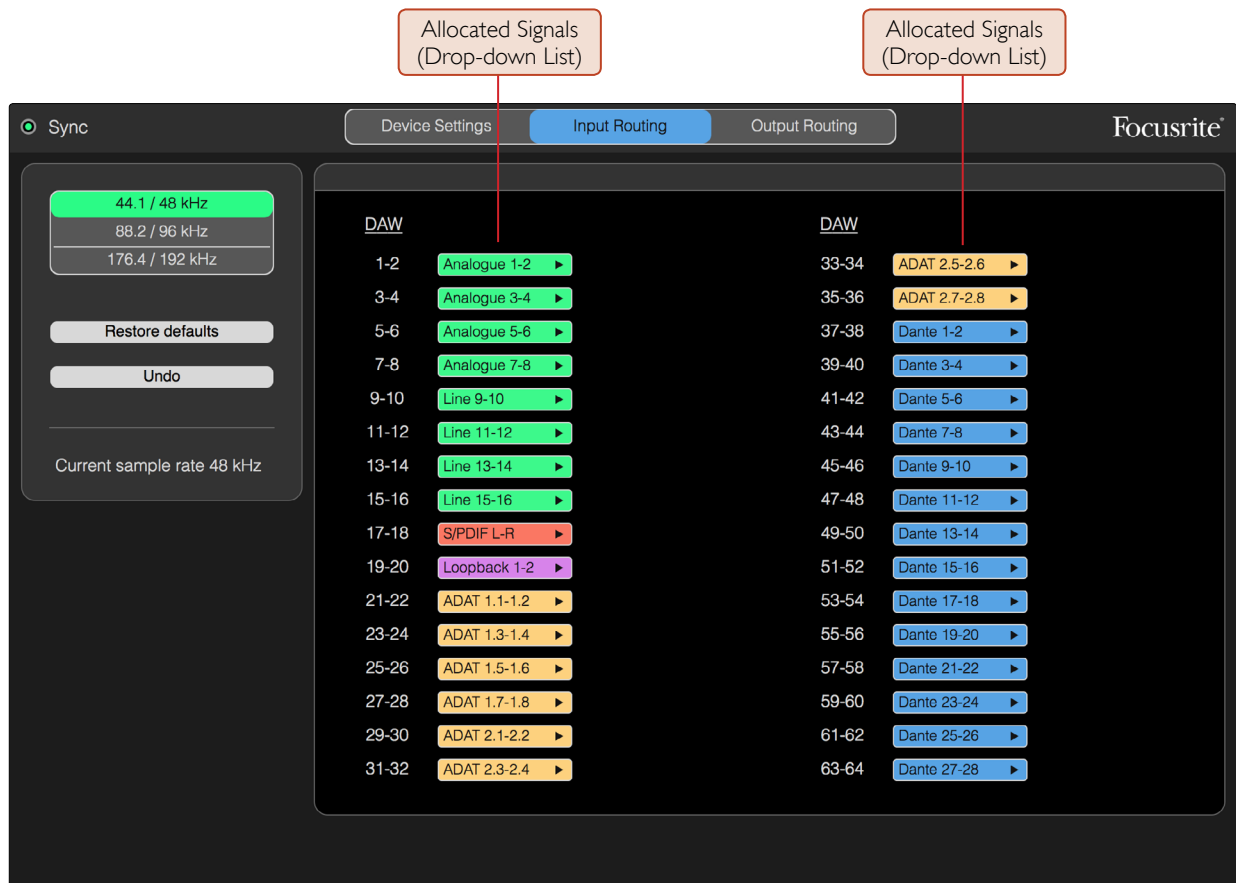
- Monitors: Monitor L/R Outputs
- Monitors + 3-4: Monitor L/R Outputs + Line Outputs 3-4
- Monitors + 3-6: Monitor L/R Outputs + Line Outputs 3-6
- All: Monitor L/R Outputs + Line Outputs 1-16

Input Routing

Because the number of channels available reduces when operating at higher sample rates, Input Routing allows the channel order to be re-arranged so that all input signals required can be accessed.

Use each drop-down list in the table to move input channels in pairs. For example, in the image below, ADAT inputs 5-6 are being sent to DAW channels 1-2. This means that when selecting inputs 1-2 on a track in a DAW, ADAT inputs 5-6 on the Red 16Line will be recorded.

Each DAW input channel pair can be allocated independently.



Sample Rate – The default routing can be modified independently for each of the three sample rates.

Restore Defaults – Returns the routing to the standard layout defined in the routing tables.

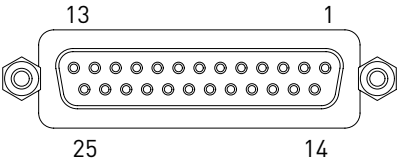
Undo – Cancels change made to the last input selection.

APPENDICES

Appendix 1 – Connector Pinouts

DB25 (AES59) Connector

Connector type: DB25 Female
 Applies to: Analogue Line Input / Line Output

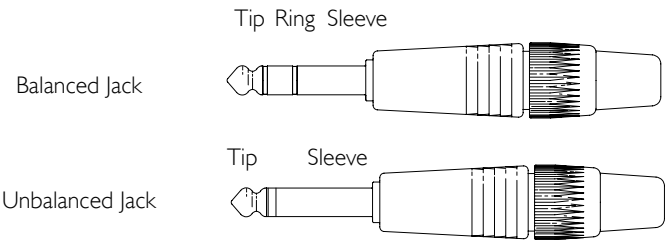


Pin	Signal
1	Channel 8 +
14	Channel 8 -
2	Ground
15	Channel 7 +
3	Channel 7 -
16	Ground
4	Channel 6 +
17	Channel 6 -
5	Ground
18	Channel 5 +
6	Channel 5
19	Ground
7	Channel 4 +
20	Channel 4 -
8	Ground
21	Channel 3 +
9	Channel 3 -
22	Ground
10	Channel 2 +
23	Channel 2 -
11	Ground
24	Channel 1 +
12	Channel 1 -
25	Ground
13	n/c

1/4" Jack Connectors

Connector type: Balanced socket
 Applies to: Monitor Outputs
 Connector type: Unbalanced socket
 Applies to: Instrument Inputs

Pin	Signal
Tip	Hot (+ve)
Ring	Cold (-ve)
Sleeve	Screen



Appendix 1 – Connector Pinouts *Continued...*

Pro Tools Interface

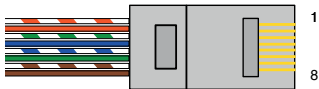
Connector type: Mini DigiLink receptacle
Applies to: PRIMARY 1 & 2

BNC Connectors

Connector type: 75Ω BNC Socket
Applies to: WORD CLOCK IN/OUT
LOOP SYNC IN/OUT

Ethernet Connector

Connector type: RJ-45 receptacle
Applies to: Ethernet (Dante)



Pin	Cat 6 Core
1	White + Orange
2	Orange
3	White + Green
4	Blue
5	White + Blue
6	Green
7	White + Brown
8	Brown

Appendix 2 – Default Channel Allocation

Sample Rate: 44.1 / 48 kHz

Note

Output channel allocations are only fixed when operating on Pro Tools | HD host mode.

Inputs		
1	Mic/Line/Inst	1
2		2
3	Line	3
4		4
5		5
6		6
7		7
8		8
9		9
10		10
11		11
12		12
13		13
14		14
15		15
16		16
17	Loopback	L
18		R
19	S/PDIF	L
20		R
21	ADAT 1	1
22		2
23		3
24		4
25		5
26		6
27		7
28		8
29	ADAT 2	9
30		10
31		11
32		12
33		13
34		14
35		15
36		16
37	Dante	1
38		2
39		3
40		4
41		5
42		6
43		7
44		8
45		9
46		10
47		11
48		12
49		13
50		14
51		15
52		16
53		17
54		18
55		19
56		20
57		21
58		22
59		23
60		24
61		25
62		26
63		27
64		28
65		29
66		30
67		31
68		32

Outputs		
1	Line (Monitor/HP1)	1 (L)
2		2 (R)
3	Line	3
4		4
5		5
6		6
7		7
8		8
9		9
10		10
11		11
12		12
13		13
14		14
15		15
16		16
17	Headphone 2	L
18		R
19	S/PDIF	L
20		R
21	ADAT 1	1
22		2
23		3
24		4
25		5
26		6
27		7
28		8
29	ADAT 2	9
30		10
31		11
32		12
33		13
34		14
35		15
36		16
37	Dante	1
38		2
39		3
40		4
41		5
42		6
43		7
44		8
45		9
46		10
47		11
48		12
49		13
50		14
51		15
52		16
53		17
54		18
55		19
56		20
57		21
58		22
59		23
60		24
61		25
62		26
63		27
64		28
65		29
66		30
67		31
68		32

Appendix 2 – Default Channel Allocation

Continued...

Sample Rate: 88.2 / 96 kHz

Note

Output channel allocations are only fixed when operating on Pro Tools | HD host mode.

Inputs		
1	Mic/Line/Inst	1
2		2
3	Line	3
4		4
5		5
6		6
7		7
8		8
9		9
10		10
11		11
12		12
13		13
14		14
15		15
16		16
17	Loopback	L
18		R
19	S/PDIF	L
20		R
21	ADAT 1	1
22		2
23		3
24		4
25	ADAT 2	9
26		10
27		11
28		12
29	Dante	1
30		2
31		3
32		4
33		5
34		6
35		7
36		8
37		9
38		10
39		11
40		12
41		13
42		14
43		15
44		16
45		17
46		18
47		19
48		20
49		21
50		22
51		23
52		24
53		25
54		26
55		27
56		28
57		29
58		30
59		31
60		32
	Not available	

Outputs		
1	Line (Monitor/HP1)	1 (L)
2		2 (R)
3	Line	3
4		4
5		5
6		6
7		7
8		8
9		9
10		10
11		11
12		12
13		13
14		14
15		15
16		16
17	Headphone 2	L
18		R
19	S/PDIF	L
20		R
21	ADAT 1	1
22		2
23		3
24		4
25	ADAT 2	9
26		10
27		11
28		12
29	Dante	1
30		2
31		3
32		4
33		5
34		6
35		7
36		8
37		9
38		10
39		11
40		12
41		13
42		14
43		15
44		16
45		17
46		18
47		19
48		20
49		21
50		22
51		23
52		24
53		25
54		26
55		27
56		28
57		29
58		30
59		31
60		32
	Not available	

Appendix 2 – Default Channel Allocation

Continued...

Sample Rate: 176.4 / 192 kHz

Note

Output channel allocations are only fixed when operating on Pro Tools | HD host mode.

Inputs		
1	Mic/Line/Inst	1
2		2
3	Line	3
4		4
5		5
6		6
7		7
8		8
9		9
10		10
11		11
12		12
13		13
14		14
15		15
16		16
17	Loopback	L
18		R
19	S/PDIF	L
20		R
21	ADAT 1	1
22		2
23	ADAT 2	9
24		10
25	Dante	1
26		2
27		3
28		4
29		5
30		6
31		7
32		8
33		9
34		10
35		11
36		12
37		13
38		14
39		15
40		16
	Not available	

Outputs		
1	Line (Monitor/HP1)	1 (L)
2		2 (R)
3	Line	3
4		4
5		5
6		6
7		7
8		8
9		9
10		10
11		11
12		12
13		13
14		14
15		15
16		16
17	Headphone 2	L
18		R
19	S/PDIF	L
20		R
21	ADAT 1	1
22		2
23	ADAT 2	9
24		10
25	Dante	1
26		2
27		3
28		4
29		5
30		6
31		7
32		8
33		9
34		10
35		11
36		12
37		13
38		14
39		15
40		16
	Not available	

Appendix 3 – Air information

Air is the name we give to the sonic signature of the classic transformer ISA Preamp. Our customers first coined this name as a simple description of the effect the ISA preamp added to their sound recordings. The three most significant attributes of the transformer design that create the “Air” effect are:

- Microphone interaction, created by the unique input impedance of the transformer coupling with the microphone output impedance.
- Clarity, created by the low distortion and high linearity of the transformer and preamp design.
- Frequency response tilt created by the transformer resonance resulting in an emphasis in the higher frequency content of the sound.

Engaging the Air switches the impedance of the preamp, and enables the “transformer resonance effect”, giving your microphone recordings the air and clarity of an ISA transformer-based mic pre recording.

PERFORMANCE AND SPECIFICATIONS

Microphone Inputs	
Gain Range	0-8 to 63 dB in 1dB steps
Maximum Input Level	>+19dBu
Input Impedance	6.2 k Ω , electronically balanced Air Mode: 2.2 k Ω
Dynamic Range	119 dB 'A'-Weighted (typical), minimum gain
Frequency Response	20 Hz – 35 kHz ± 0.2 dB Air Mode: 2dB boost at 10 kHz and -2 dB at 20 kHz (ref. 1 kHz)
THD + N	-101dB (0.0009%) @ -1 dBFS
HPF	-3 dB @ 80 Hz, 12 dB/octave
EIN	<-129 dBu 'A'-Weighted (typical)

Line Inputs 1 –16	
Maximum Input Level	+18 or +24 dBu 0 dBFS switchable per channel
Dynamic Range	119 dB 'A'-Weighted
Frequency Response	20 Hz – 35 kHz ± 0.2 dB Air Mode: 2dB boost at 10 kHz and -2 dB at 20 kHz (ref. 1 kHz)
THD + N	-102dB (0.0008%) @ -1 dBFS
HPF	-3 dB @ 80 Hz, 12 dB/octave <i>Channels 1 & 2 only</i>
CMRR	-70 dB 50/60 Hz

Instrument Inputs	
Gain Range	0-8 to 63 dB in 1dB steps
Maximum Input Level	>+15dBu
Input Impedance	2.3 M Ω
Dynamic Range	117 dB 'A'-Weighted
Frequency Response	20 Hz – 35 kHz ± 0.2 dB Air Mode: 2dB boost at 10 kHz and -2 dB at 20 kHz (ref. 1 kHz)
THD + N	-100dB (0.001%) @ -1 dBFS
HPF	-3 dB @ 80 Hz, 12 dB/octave

Line Outputs 1 – 16	
Maximum Output Level	+18 or +24 dBu 0 dBFS switchable per channel
Dynamic Range	121 dB 'A'-Weighted
Frequency Response	20 Hz – 35 kHz ± 0.3 dB
THD + N	<-104dB (0.0006%) @ -1 dBFS

Monitor Outputs	
0 dBFS Reference Levels	+18 dBu
Dynamic Range	120 dB 'A'-Weighted
Frequency Response	20 Hz – 35 kHz ± 0.2 dB
THD + N	-80 dB (0.01%) @ -1 dBFS

Headphone Outputs	
Maximum Output Level	+16 dBm ± 0.5
Dynamic Range	114 dB 'A'-Weighted
Frequency Response	20 Hz – 20 kHz ± 0.2 dB
THD + N	-75dB (0.018%) @ -1 dBFS
Output Impedance	10 Ω
Headphone Impedance	32 – 600 Ω

Digital Performance	
Supported Sample Rates	44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz 24 bit
Clock Sources	Internal, ADAT, S/PDIF, Word Clock, Loop Sync or from Dante Network Master

Connectivity	
Front Panel	
Instrument Input	2 x 1/4" TS stereo Jack
Headphone Output	2 x 1/4" TRS stereo Jack
Rear Panel	
Thunderbolt	2 x Thunderbolt 3 connections
Pro Tools HD	2 x Mini DigiLink
Dante	2 x Ethernet standard RJ45 (Cat 5e and above)
Mic Input	2 x XLR-3F
Line Input	2 x DB25-F
Line Output	2 x DB25-F
ADAT	2 x TOSLINK input, 2 x TOSLINK output
S/PDIF	RCA Phono (TOSLINK up to 96 kHz) input, RCA Phono (TOSLINK up to 96 kHz) output
Monitor Output	2 x 1/4" TRS stereo Jack
Loop Sync	BNC 75 Ω input, BNC 75 Ω output,
Word Clock	BNC 75 Ω input, BNC 75 Ω output,
PSU	IEC

Dimensions	
Height	44 mm / 1.73" [1RU]
Width	483 mm / 19"
Depth	340 mm / 13.4"

Weight	
Weight	5.04 kg / 11.11 lbs

Power	
PSU	Internal, 100-240 V, 50/60 Hz, consumption 120 W

EMC Compliance <i>(These are the recommended cables based on EMC testing)</i>	
Analogue Ports	Good quality screen cables (24AWG)
Clock Ports	High quality BNC cables e.g. F-CT100 type cables and adapters
Thunderbolt Ports	Supplied Focusrite Thunderbolt 3 cable, or quality 20Gbps 60W Thunderbolt 3 cable
Ethernet Ports	Cat 6FTP cable

Focusrite Red 16Line Warranty and Service

All Focusrite products are built to the highest standards and should provide reliable performance for many years, subject to reasonable care, use, transportation and storage.

Very many of the products returned under warranty are found not to exhibit any fault at all. To avoid unnecessary inconvenience to you in terms of returning the product please contact Focusrite support.

In the event of a Manufacturing Defect becoming evident in a product within 12 months from the date of the original purchase Focusrite will ensure that the product is repaired or replaced free of charge.

A Manufacturing Defect is defined as a defect in the performance of the product as described and published by Focusrite. A Manufacturing Defect does not include damage caused by post-purchase transportation, storage or careless handling, nor damage caused by misuse.

Whilst this warranty is provided by Focusrite the warranty obligations are fulfilled by the distributor responsible for the country in which you purchased the product.

In the event that you need to contact the distributor regarding a warranty issue, or an out-of-warranty chargeable repair, please visit: www.focusrite.com/distributors

The distributor will then advise you of the appropriate procedure for resolving the warranty issue. In every case it will be necessary to provide a copy of the original invoice or store receipt to the distributor. In the event that you are unable to provide proof of purchase directly then you should contact the reseller from whom you purchased the product and attempt to obtain proof of purchase from them.

Please do note that if you purchase a Focusrite product outside your country of residence or business you will not be entitled to ask your local Focusrite distributor to honour this limited warranty, although you may request an out-of-warranty chargeable repair.

This limited warranty is offered solely to products purchased from an Authorised Focusrite Reseller (defined as a reseller which has purchased the product directly from Focusrite Audio Engineering Limited in the UK, or one of its Authorised Distributors outside the UK). This Warranty is in addition to your statutory rights in the country of purchase.

Registering Your Product

Please register your product at: www.focusrite.com/register

Customer Support and Unit Servicing

You can contact our Customer Support team:

Email: focusriteprosupport@focusrite.com

Phone (UK): +44 (0)1494 836 384

Phone (USA): +1 (310) 450 8494

Troubleshooting

If you are experiencing problems with your Red 16Line, we recommend that in the first instance, you visit our Support Answerbase at: <https://pro.focusrite.com/technical-support>