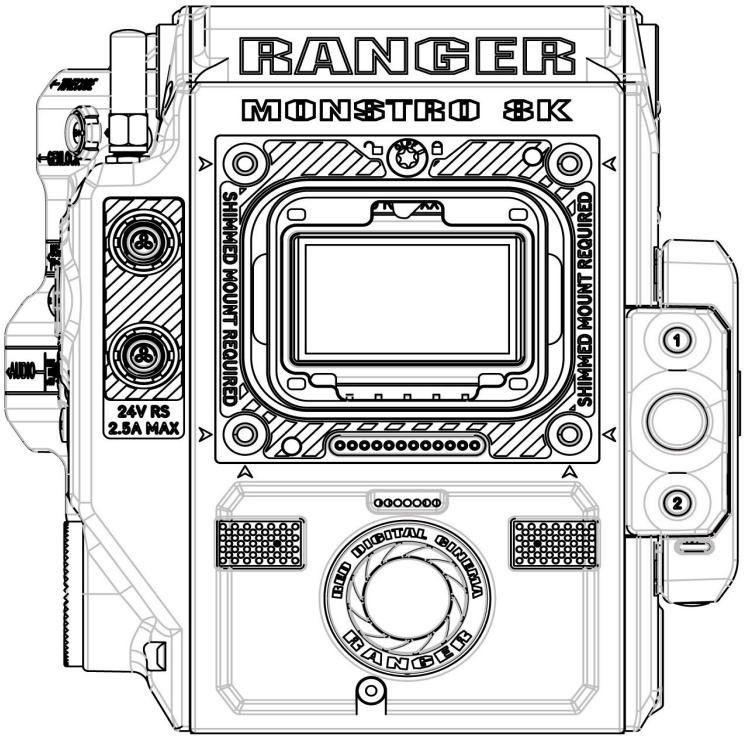
RED RANGER
OPERATION GUIDE



MONSTRO 8K VV | V7.2

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CHAPTER 3:
BASIC OPERATIONS

POWER OPERATIONS

This section describes the basic power operations of the camera system.

NOTE: Lens mounts are NOT HOT SWAPPABLE, meaning you cannot remove or install these items while the camera is turned on. Before installing or removing these items, you MUST turn off the camera. Failure to do so may result in damage to the item or camera that is not covered under warranty.

WARNING: While third-party batteries may be mechanically compatible with the camera system, the manufacturer is responsible for the performance and stability of third-party options, not RED®. Damage to the camera system or third-party devices caused by using third-party power options is not covered under warranty. The camera may be unable to determine and display the voltage or remaining battery capacity of third-party power options.

POWER PRIORITY

When multiple power sources are connected to the camera, power consumption is prioritized in this sequence:

1. Any power supply connected to the DC IN port
2. Rear battery

POWER CONSUMPTION

The camera draws approximately 4.2 A (63 W) when configured with the DSMC2 RED Touch 7.0" LCD and RED MINI-MAG® 512GB.

Under typical conditions batteries provide the following operating time:

- **REDVOLT-V**: Powers the camera and accessories for approximately 24 minutes.
- **RED BRICK**: Powers the camera and accessories for approximately 96 minutes.

POWER STATUS

The power status of the current primary power source displays in the Lower Status Row of the graphical user interface (GUI). Navigate to the Power In menu at **Menu** > **Power** > **Power In** for the status of all connected power sources. For more information, go to "Power Menu" on page 85.

APPROVED EXTERNAL DC POWER

The camera accepts input voltages of 11.5 V DC to 32 V DC, and can draw a maximum current of 14A. The camera can be powered continuously by connecting one (1) of the following to the DC IN port on the camera:

- **XLR DC power source**: Use the 3-PIN XLR-TO-4-PIN 2B POWER CABLE (10') to connect the DC-IN port to third-party 24/28V output power, such as Anton Bauer VCLX or Bebob Cube 1200 batteries

APPENDIX B:
MECHANICAL DRAWINGS

RED RANGER WITH V-LOCK

NOTE: Dimensions are shown in mm.

The optical axis height of the camera is 95.90 mm.

FRONT VIEW

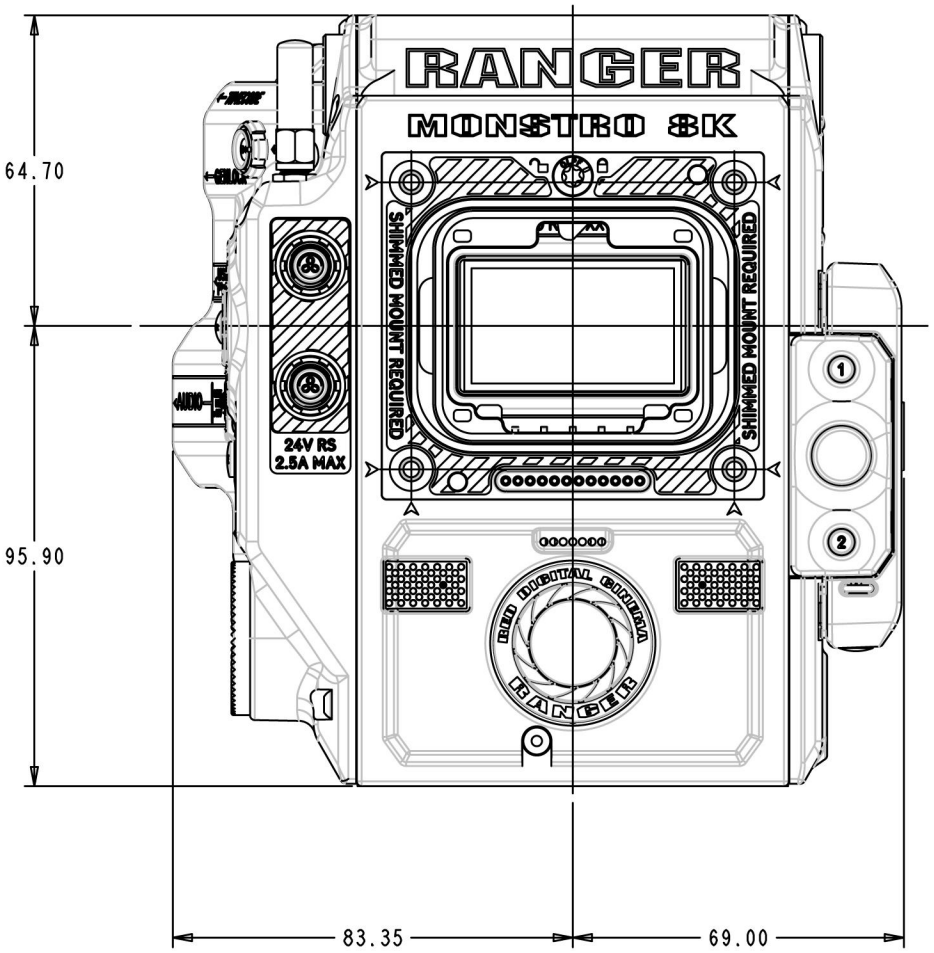

Figure: Camera Front View

BACK VIEW

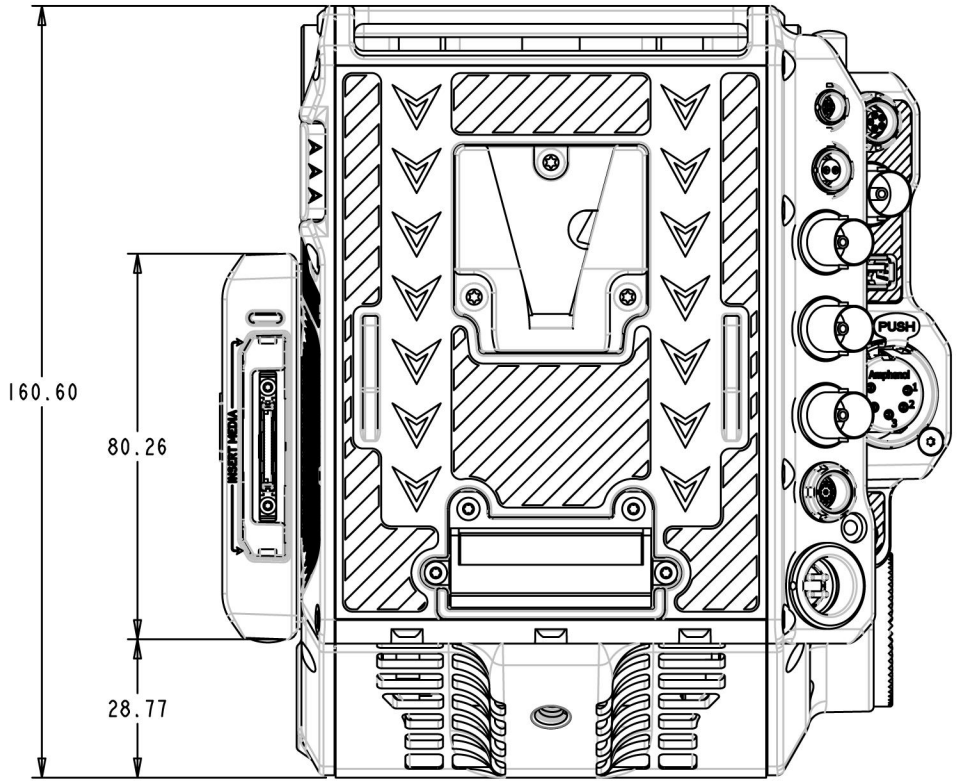

Figure: Camera Back View

SIDE VIEW (RIGHT)

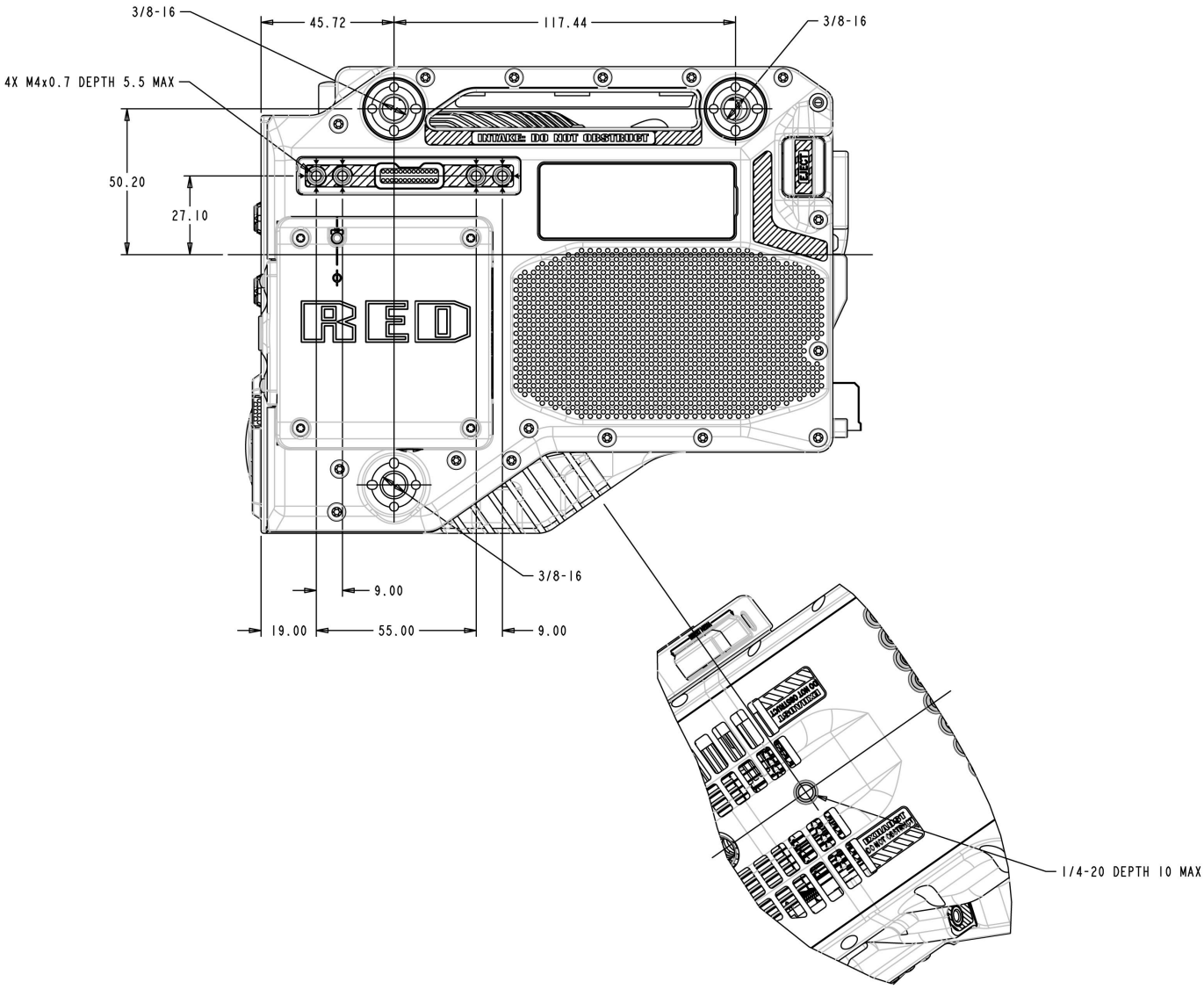

Figure: Camera Side View (Right)

SIDE VIEW (LEFT)

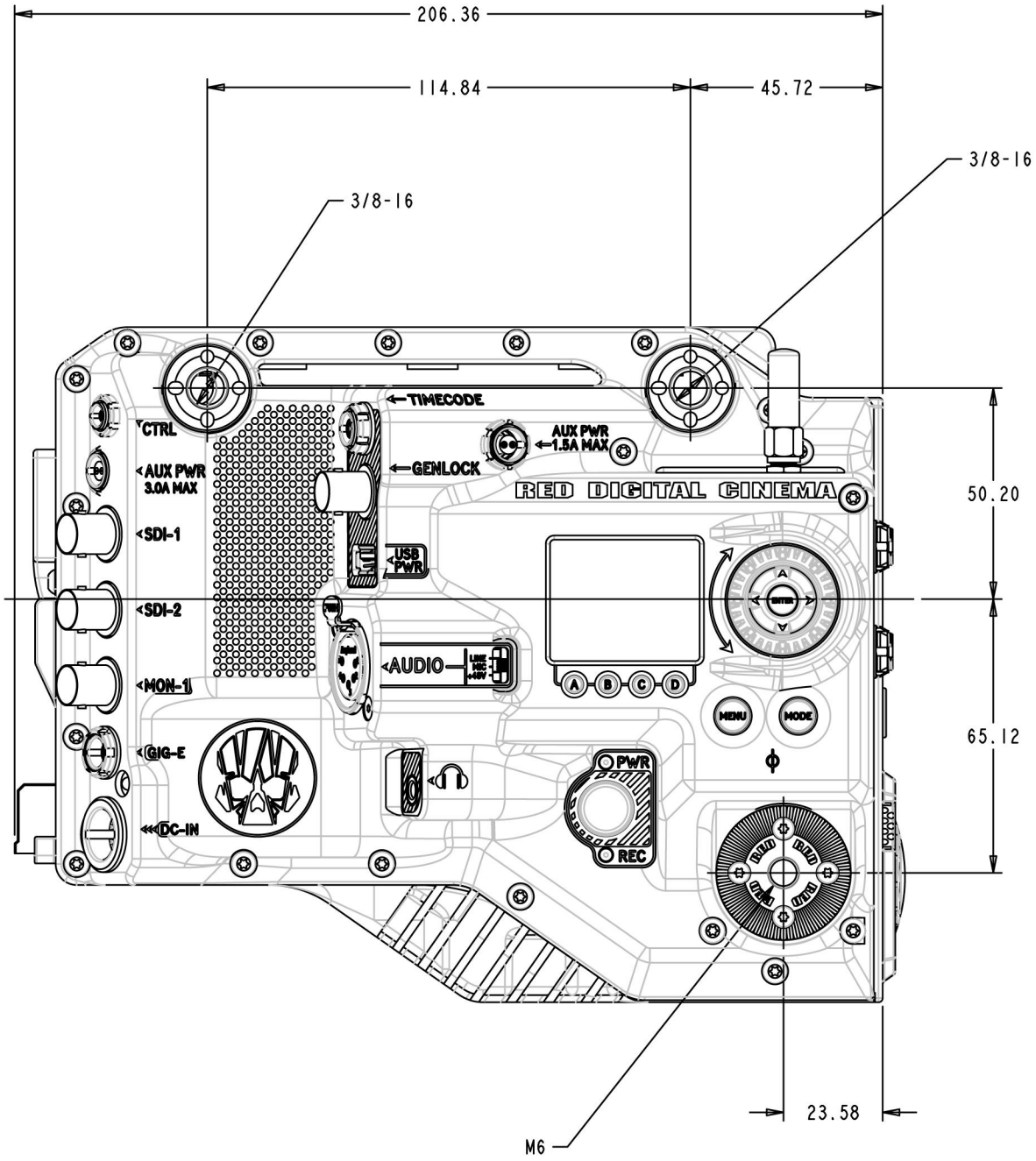

Figure: Camera Side View (Left)

TOP VIEW

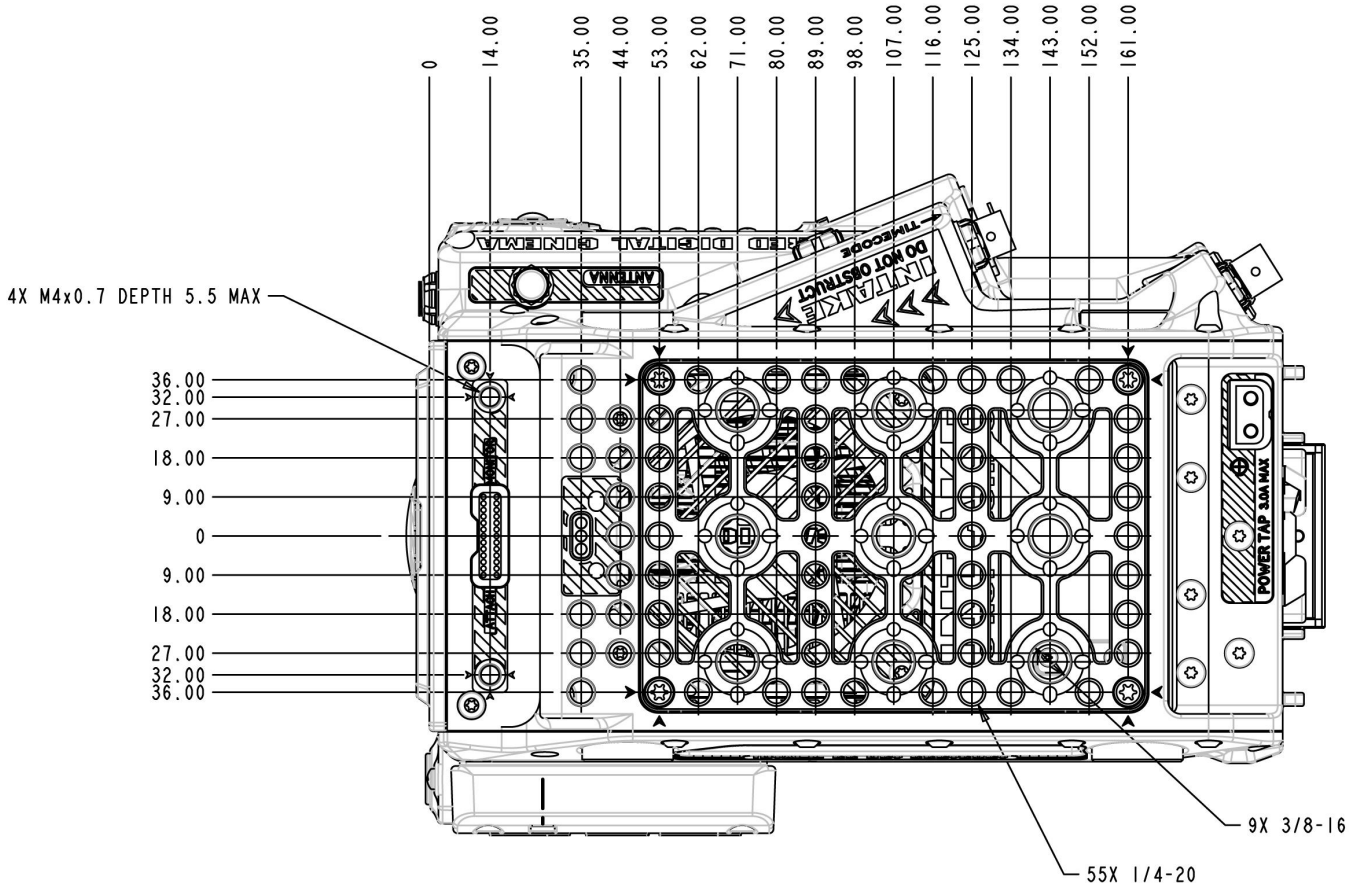

Figure: Camera Top View

APPENDIX C: INPUT/OUTPUT CONNECTORS

This appendix provides pinout information for the input/output connectors on the camera.

NOTE: When connecting a cable to a connector, align the key and red marker on the cable connector with the corresponding key and marker on the device connection.

NOTE: Connector diagram images are for reference only. Diagrams are not to scale.

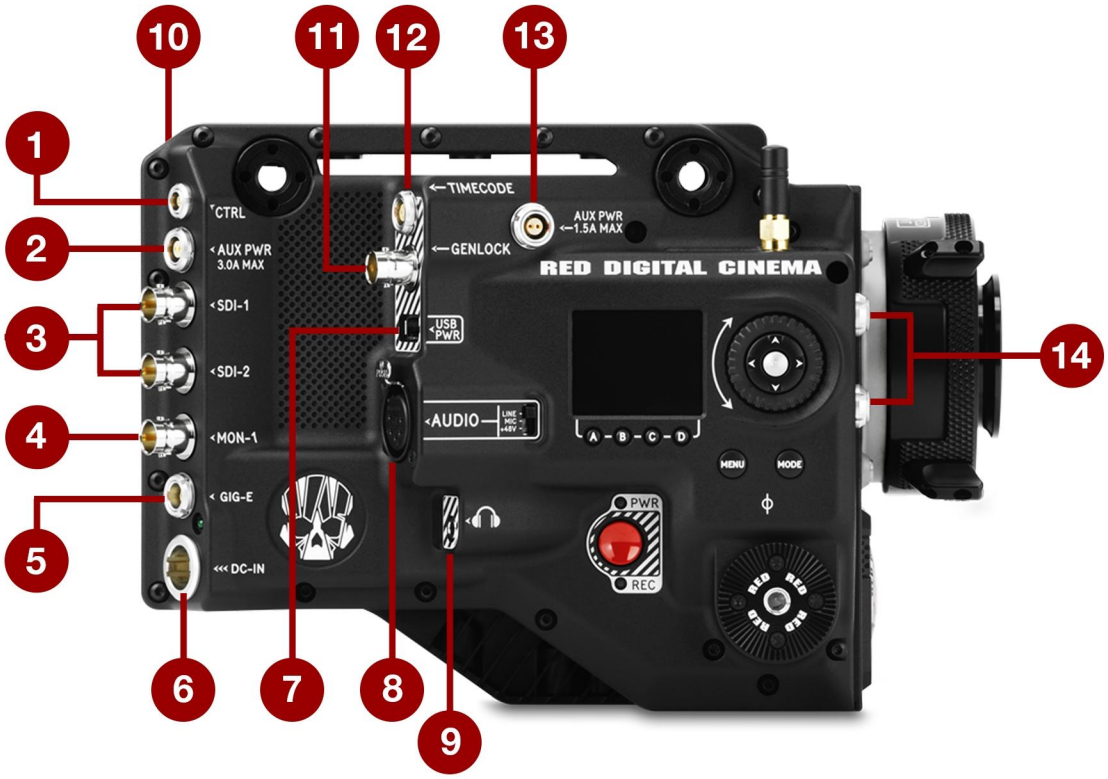

Figure: RED RANGER I/O

#	CONNECTOR	CONNECTOR TYPE	DETAILS
1	CTRL	4-pin 00B	"CTRL (RS232 Control)" on page 197
2	AUX PWR, 3.0A MAX	2-Pin 0B	"AUX Power 2-Pin 0B, 3.0A" on page 203
3	SDI 1 and 2	BNC	"3G-SDI (HD-SDI) Out" on page 195
4	MON-1	BNC	"MON-1" on page 196
5	GIG-E	9-pin 0B	"GIG-E (Ethernet)" on page 199
6	DC IN	4-pin 2B	"DC IN (Power Input)" on page 202

#	CONNECTOR	CONNECTOR TYPE	DETAILS
7	USB	USB 2.0 Type A (power only)	"USB Power" on page 204
8	AUDIO	5-pin XLR	"Audio" on page 201
9	Headphone Jack	3.5mm stereo	"Headphone" on page 201
10	POWER TAP	P-Tap 2-pin Female	"AUX Power (P-Tap)" on page 205
11	GENLOCK	BNC	"Genlock" on page 198
12	TIMECODE	5-Pin 0B	"Timecode" on page 198
13	AUX PWR, 1.5A MAX	2-Pin 0B	"AUX Power 2-Pin 0B, 1.5A" on page 204
14	24V RS 1 and 2	3-pin Fischer	"24V RS" on page 200

RECORD/MONITOR OUT PORTS

3G-SDI (HD-SDI) OUT

SDI-1 and SDI-2 output a cloned 3G-SDI signal.

A standard 75 ohm BNC connector provides the following output:

- Legal range of HD-SDI signals
- Broadcast specification 3G-SDI (HD-SDI) video output (default mode is Clean)
- Two (2) channels of embedded audio
- Time of Day and Edge timecode
- Record Tally flag
- Clip name information (as SMPTE RP-188 VITC2 HANC metadata)

The 3G-SDI (HD-SDI) output provides the formats described in the table below:

3G-SDI (HD-SDI) OUTPUT FORMATS[1]

VIDEO FEED[2]	FREQUENCY (HZ)[3]	SMPTE STANDARD
720p	23.98, 24.00, 25.00, 29.97, 30.00, 50.00, 59.94	SMPTE ST 292-1 (1.485 Gbps)
1080p 10-bit 4:2:2	23.98, 24.00, 25.00, 29.97, 30.00	SMPTE ST 292 (1.485 Gbps)
1080p 10-bit 4:2:2	50.00, 59.94, 60.00	3G-SDI SMPTE ST 424 (2.970 Gbps) SMPTE ST 425 (2.970 Gbps)

1. Ensure that you select a frequency supported by your monitor.
2. The output is progressive scan (p); it does not support progressive segmented frame (PsF) or interlaced (i) scan formats.
3. The frequency options depend on project time base. If you have a non-drop frame project time base (such as 24.00), you can select only non-drop frame frequencies. If you have a drop frame project time base (such as 23.98), you can select only drop frame frequencies.

75 OHM BNC CONNECTOR

PIN	SIGNAL	DESCRIPTION	DIRECTION
Center	3G-SDI	SMPTE ST 424	Out
Shield/Screen	GROUND	Camera ground	N/A

COMPATIBLE CABLE

- **790-0341**: RED® HD-SDI Cable (6')

MON-1

The MON-1 port provides an additional monitor feed that is separate from the SDI-1 and SDI-2 cloned feeds.

The MON-1 output provides the formats described in the table below:

MON-1 OUTPUT FORMATS[1]

VIDEO FEED[2]	FREQUENCY (HZ)[3]
720p	50.00, 60.00
1080p	24.00, 25.00, 30.00, 50.00, 60.00

1. Ensure that you select a frequency supported by your monitor.
2. The output is progressive scan (p); it does not support progressive segmented frame (PsF) or interlaced (i) scan formats.
3. Supports only non-drop frame frequencies.

75 OHM BNC CONNECTOR

PIN	SIGNAL	DESCRIPTION	DIRECTION
Center	SDI	SDI out	Out
Shield/Screen	GROUND	Camera ground	N/A

COMMUNICATION PORTS

CTRL (RS232 CONTROL)

The 4-Pin 00B CTRL Connector supports RS232 remote control for 3D camera communication and third-party metadata ingest applications. For more information, go to "BRAIN GPIO" on page 130.

The General Purpose Out (GPO) tally presents 3.3 V at a maximum of 0.04 A between pins 1 and 3. When used as a record tally, the rising edge of the pulse indicates start of record, falling edge represents end of record.

For more information about controlling the camera via RS232, download the R.C.P.™ SDK, available at www.red.com/developers.

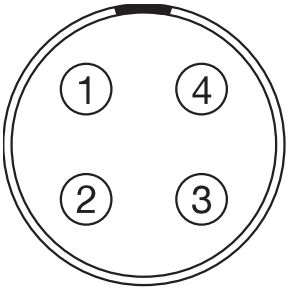

Figure: Front Face of the CTRL (RS232) Connector (Looking at the Camera)

4-PIN 00B CTRL CONNECTOR

PIN	SIGNAL	DESCRIPTION	DIRECTION
1	GROUND	Common ground	N/A
2	232 RX	RS232 RX	In
3	SS/GPO	Shutter sync/general purpose output	Out
4	232 TX	RS232 TX	Out

NOTE: Mating connector is FGG.00.304.CLAD.

COMPATIBLE CABLES

- **790-0154, 790-0643**: 3BNC-to-00 Sync Cable
- **790-0187, 790-0648**: 4-Pin 00B-to-Flying Lead
  - **White**: Ground
  - **Yellow**: RS232 RX
  - **Blue**: Shutter/sync, general purpose output
  - **Red**: RS232 TX
  - **Black**: Shield
- **790-0415**: RED Start/Stop Cable (14-Pin 1B to SYNC, CTRL, BNC)

GENLOCK

The 75 ohm BNC connector accepts incoming sync and genlock signals.

75 OHM BNC CONNECTOR			
PIN	**SIGNAL**	**DESCRIPTION**	**DIRECTION**
Center	SYNC	SMPTE ST 274 RS 170A Tri-Level Sync	In
Shield/Screen	GROUND	Camera ground	N/A

TIMECODE

The LEMO EAG.0B.305.CLN connector supports SMPTE timecode input and output. Pins 2 and 3 can be used together to receive a balance SMPTE 12M serial timecode input. Pin 2 can be used by itself (leave pin 3 open) to receive a single-ended SMPTE 12M serial timecode input. Pin 5 is a timecode output.

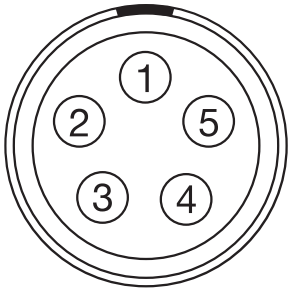

Figure: Front Face of Timecode (LEMO EAG.0B.305.CLN) Connector (Looking at the Camera)

LEMO EAG.0B.305.CLN CONNECTOR			
PIN	**SIGNAL**	**DESCRIPTION**	**DIRECTION**
1	GROUND	Camera Ground	N/A
2	TIMECODE IN(S)	Timecode input - SMPTE single ended	In
3	N/A	No connection (NC)	N/A
4	+5 V OUT	+5 V out, 200 mA max	Out
5	TIMECODE OUT	SMPTE 12 M Timecode output	Out

NOTE: Mating connector is FHG.0B.305.CLAD.

COMPATIBLE CABLE

- **790-0212**: Pro I/O Time Code Cable 3'

GIG-E (ETHERNET)

The GIG-E 9-pin 0B connector provides a 1000BASE-T (IEEE 802.3ab) gigabit Ethernet connection for remote camera setup, master/slave camera communication, and external metadata ingest. Since the GIG-E connector does not support slower speeds (10BASE-T and 100BASE-T), ensure that any device you connect to supports 1000BASE-T.

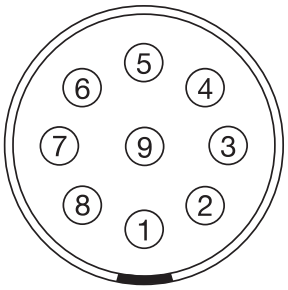

Figure: Front Face of the GIG-E Connector (Looking at the Camera)

9-PIN 0B GIG-E CONNECTOR

PIN	SIGNAL	DESCRIPTION	DIRECTION
1	BI_DC+	Data pair C+	N/A
2	BI_DC-	Data pair C-	N/A
3	BI_DD+	Data pair D+	N/A
4	BI_DD-	Data pair D-	N/A
5	BI_DA-	Data pair A-	N/A
6	BI_DA+	Data pair A+	N/A
7	BI_DB+	Data pair B+	N/A
8	BI_DB-	Data pair B-	N/A
9	N/A	Do not connect	N/A

NOTE: Mating connector is FGG.0B.309.CLAD.

COMPATIBLE CABLES

- **790-0159**: RED GIG-E Straight-to-CAT5E Ethernet Cable (9')
- **790-0557, 790-0655**: RED GIG-E Right-to-CAT5E Ethernet Cable (9')
- **790-0163**: Master/Slave Gig-E Cable (4')

24V RS

The two (2) Fischer 3-pin 102 connectors supply a combined 24V power out at a maximum sustained current draw of 2.5A. Each connector also includes a run/stop (R/S) trigger input. To operate the contact closure style trigger, short Pin 3 (R/S) to Pin 1 (ground).

When the camera is powered by an on-board battery or DC-IN with less than 24V input, the connector output is 24V (regulated). When the camera is powered by DC-IN with more than 24V input, the connector output matches the camera input voltage.

WARNING: DO NOT apply voltage to Pin 3 (R/S).

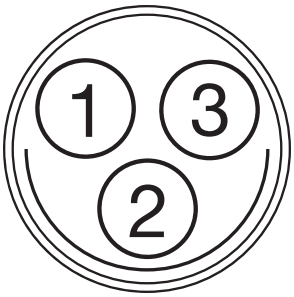

Figure: 24V RS (Looking at the Connector)

FISCHER 3-PIN CONNECTOR			
PIN	**SIGNAL**	**DESCRIPTION**	**DIRECTION**
1	GROUND	Common ground	N/A
2	+24 V OUT	+24 V out, 2.5A max (shared between the connectors)	Out
3	R/S	Active Low to start/stop record (3.3V pull up)	In

CONTACT CLOSURE STYLE TRIGGER BUTTON CIRCUIT (24V RS)

The diagram below shows the contact closure style trigger button circuit on the 24V RS connector.

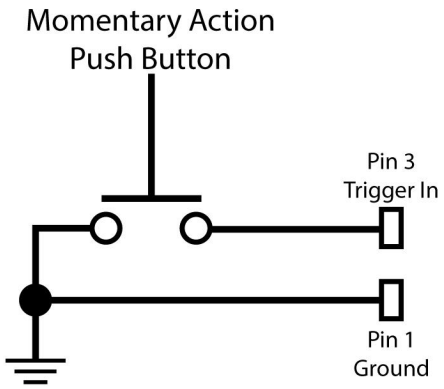

Figure: Contact Closure Style Trigger Button Circuit Diagram (24V RS)

AUDIO PORTS

AUDIO

The 5-pin XLR connector provides input for two (2) audio channels. Use the adjacent Audio switch to set the audio channels to line in (Line), Microphone level in (Mic), or microphone level in with 48 V 10mA phantom power (+48V). The switch controls both channels together; the channels cannot be controlled independently.

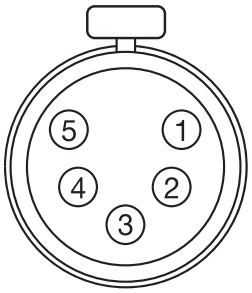

Figure: Front Face of Audio Input (5-Pin XLR) Connector (Looking at the Camera)

5-PIN XLR CONNECTOR

PIN	SIGNAL	DESCRIPTION	DIRECTION
1	GROUND	Camera ground	N/A
2	CH1_P	Channel 1 (left), positive voltage	In
3	CH1_N	Channel 1 (left), negative voltage	In
4	CH2_P	Channel 2 (right), positive voltage	In
5	CH2_N	Channel 2 (right), negative voltage	In

HEADPHONE

The 3.5mm stereo jack provides two (2) channels of audio for monitoring. For maximum quality, use high impedance headphones.

HEADPHONE JACK

PIN	SIGNAL	DESCRIPTION	DIRECTION
TIP	LEFT	Left channel audio	Out
RING	RIGHT	Right channel audio	Out
SLEEVE	GND	Camera ground	N/A

POWER PORTS

DC IN (POWER INPUT)

The 4-Pin 2B connector accepts DC input power from 11.5 V DC to 32 V DC. A built-in power conditioner protects against reverse-polarity connections, electrostatic discharge (ESD), undervoltage, overvoltage, and overcurrent.

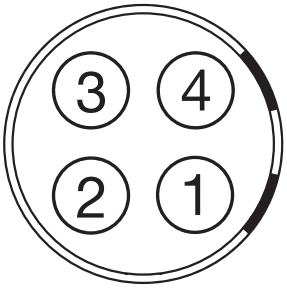

Figure: Front Face of the DC IN Power Input Connector (Looking at the Camera)

4-PIN 2B DC INPUT CONNECTOR		
PIN	**SIGNAL**	**DESCRIPTION**
1	N/A	No connection (NC)
2	N/A	No connection (NC)
3	VIN	Power input, +11.5 to +32 V DC
4	GROUND	Power return (camera ground)

NOTE: The mating connector is FGJ.2B.304.CLLD62Z (LEMO).

COMPATIBLE CABLES

- **790-0665**: 3-PIN XLR-TO-4-PIN 2B POWER CABLE (10')

AUX POWER 2-PIN 0B, 3.0A

The 2-Pin 0B connector (LEMO EEG.0B.302.CLL) supplies unregulated (+) 11.5 to 17 VDC battery pass-through power. The maximum sustained current draw is 3.0A.

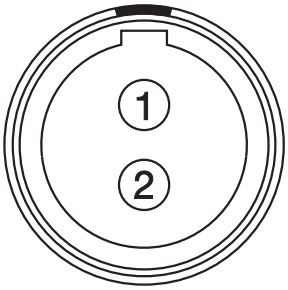

Figure: Front Face of Connector (Looking at the Camera)

LEMO EEG.0B.302.CLL CONNECTOR			
PIN	**SIGNAL**	**DESCRIPTION**	**DIRECTION**
1	GROUND	Common ground	N/A
2	+11.5 to +17 VDC	+11.5 to 17 VDC unregulated battery pass-through power	Out

NOTE: Mating connector is FGG.00.302.CLAD35Z.

COMPATIBLE CABLE

- **790-0410**: RED W.M.D. Power Cable 2-Pin 1B to 2-Pin 0B (18")

AUX POWER 2-PIN 0B, 1.5A

The 2-Pin 0B connector (LEMO EEG.0B.302.CLL) supplies unregulated (+) 11.5 to 17 VDC battery pass-through power. The maximum sustained current draw is 1.5A.

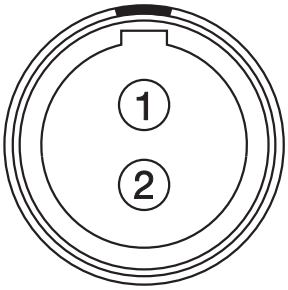

Figure: Front Face of AUX PWR Connector (Looking at the Camera)

LEMO EEG.0B.302.CLL CONNECTOR			
PIN	**SIGNAL**	**DESCRIPTION**	**DIRECTION**
1	GROUND	Common ground	N/A
2	+11.5 to +17 VDC	+11.5 to 17 VDC unregulated battery pass-through power	Out

NOTE: Mating connector is FGG.00.302.CLAD35Z.

COMPATIBLE CABLE

- **790-0410**: RED W.M.D. Power Cable 2-Pin 1B to 2-Pin 0B (18")

USB POWER

The USB power out connector supplies 5 V of power. The maximum sustained current draw is 1.5A.

NOTE: The USB connector only offers power out, and does NOT support USB communication.

AUX POWER (P-TAP)

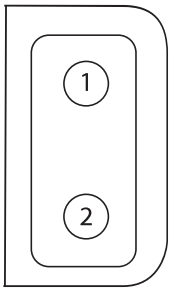

Figure: P-Tap Connector (Looking at Camera)

The AUX power out connector features an industry-standard P-Tap connector and supplies conditioned VBATT at a maximum of 3.0A of power.

2-PIN P-TAP CONNECTOR

PIN	SIGNAL	DESCRIPTION	DIRECTION
1	GROUND	Common ground	N/A
2	+11.5 to +17 VDC	+11.5 to 17 VDC unregulated battery pass-through power	Out