

THPR
EVOLUTION

Longer Range | Higher Data Rates | Lowest SWaP

The THPR1070, a Triad High Power Radio (THPR), contains a Silvus Streamcaster SC4400 radio at its core and combines with our high-power RF subsystems in a low SWaP package. This 4 channel, C-Band amplified radio integrates the necessary Silvus radio, RF amplification, control circuitry, and interfaces to achieve higher RF output power, greater throughput, and longer link distances than the stand-alone radio. Offering +22 to +32 VDC Input Voltage, this THPR contains BDAs, RF filtering, and innovative SoC-based monitoring and controls, with real-time power measurement and link diagnostics.



THPR1070

TABLE OF CONTENTS

- THPR1070 Features
- Link Distance Capabilities
- RF Performance Specifications
- Electrical Specifications
- Environmental Specifications
- Mechanical Specifications
- Mechanical Drawing
- DC/Control Connectors

THPR SERIES FEATURES

- Fully Integrated High-Power RF Sub-System & Radio
- Extended Range/Data Rate over Stand-Alone Radio
- Enhanced RF Link Control via USB
- Wide Vin, Single DC Supply

THPR SERIES APPLICATIONS

- Long Distance High Data Rate ISR Links
- UAS, UGV and USV Video/Data Links
- Military MANET
- Maritime High-Throughput LOS/NLOS Systems
- Point-To-Point and Mesh Networking



FEATURES

Internal Microcontroller

The THPR has an internal microcontroller that can be used for UART communication via USB.

A complete list of features and commands can be provided upon request.

Thermal Protection

Each RF module in the THPR1070 is capable of independently shut off automatically when the amplifier baseplate has reached approximately +90 °C.

When a thermal trip has occurred, the module remains off until the temperature has dropped to approximately 10 degrees below the trip point.

External Accessories

Two +5V outputs will be available for external accessories.

Output 1 can provide 1A max (from THPR internal supply)

Output 2 can provide 400mA max (from radio internal supply)

Outputs cannot be combined/connected.

Grounding

The THPR1070 has a optional #10 set screw to be used as a GND stud.

The bottom surface will not be anodized to allow use in grounding.

LEDs

LEDs are enabled by default and can be disabled via USB command.

RF Modules: The RF module LEDs will turn Blue when in RX, Green when in TX, and Red during an error condition.

Radio: The Radio LED will function as per SC4400 user manual. It will also turn Blue when the THPR is in STANDBY mode.

Additionally, the LED will be off when RF Blank is enabled.

Pressure Equalization Vent

The THPR has two vents for equalizing internal and external pressure due to temperature changes, altitude changes, etc.

Fans

The heatsink/fan assembly is designed to keep the THPR below its max operating temperature while being used at its max ambient temperature.

Fans can be enabled manually via USB command or automatically via temperature. As a default, fans will automatically turn on after reaching +50 °C and turn back off after dropping to +40 °C by default.

When OFF, fan will remain spinning at a decreased RPM.

RF Blanking

A pin is available to manually disable the RF output:

When the pin is high/floating, RF output will be enabled.

When the pin is low or GND, RF output will be disabled. **Radio may lose link when RF output is disabled**

The pin is internally pulled high via a 47 kOhm resistor.

RF output enabled/disabled switching speed will be less than 1mS (Does not include time to re-establish a link).

Standby Mode

The THPR1070 features a standby mode, which can be triggered via the POWER ENABLE pin (16).

During this mode, the THPR will be powered on, but all RF modules and Radio will be powered down.

Radio will require a reboot after enabling operating mode.

The pin is internally pulled to +3.3V through a 47kOhm resistor.

The THPR will default to operating mode when ON.

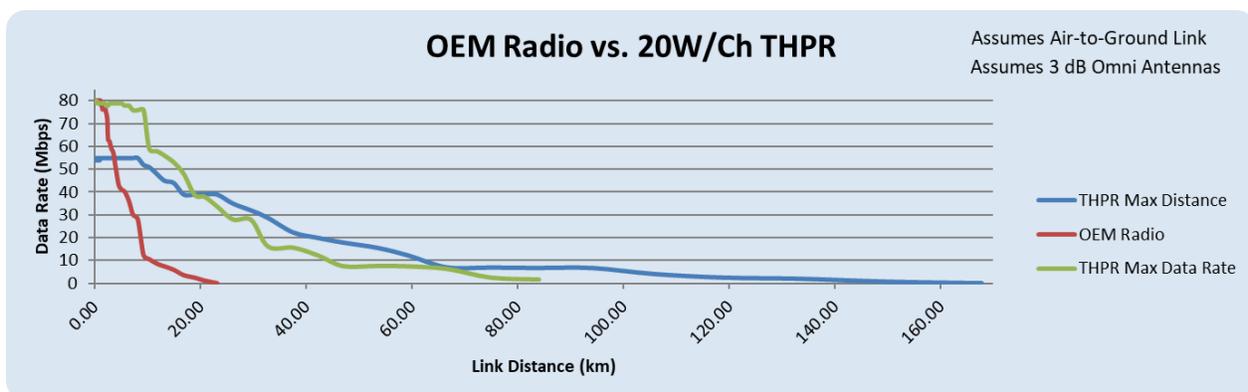
Standby Mode is able to be activated by two different methods, which are selectable via USB command and cannot be run simultaneously:

Method 1: When the Power Enable pin is high/floating, Operating Mode is activated. When Power Enable is pulled low, Standby Mode is activated.

Method 2: Standby Mode and Operating Mode will switch each time the Power Enable pin is pulled low.

LONG DISTANCE CAPABILITIES

The chart below provides estimates for our THPR series' achievable link distances, based on typical bandwidth needs and antenna configurations. Contact Triad for our expert ISR link team to assess your link requirements.



CHARACTERISTICS/SPECIFICATIONS

Electrical Characteristics

Parameter	Min.	Typ.	Max	Unit	Notes
Operating Frequency	4700	—	5000	MHz	Operating frequency of SC4400
Power output per Channel (Low Data Rate)	—	20	—	W	Typical RF output power per stream (4 total) achievable by the system when the SC4400 is operating at a low data rate MCS.
Power output per Channel (High Data Rate)	—	5	—	W	Typical RF output power per stream (4 total) achievable by the system when the SC4400 is operating at a high data rate MCS.

Electrical Specifications

Parameter	Min.	Typ.	Max	Unit	Notes
Supply Voltage Range	+22	+28	+32	VDC	Designed for MIL-STD-704F
Average Operating Current Draw (Idle)	—	0.7	1	A	+28V supply voltage.
Average Operating Current Draw (Low Data Rate)	—	9	12	A	+28V supply voltage, RF power is set to minimum of 20W per Stream operating at a low data rate MCS.
Average Operating Current Draw (High Data Rate)	—	7.5	10.5	W	+28V supply voltage, RF power is set to minimum of 5W per Stream operating at a high data rate MCS.

Environmental Specifications

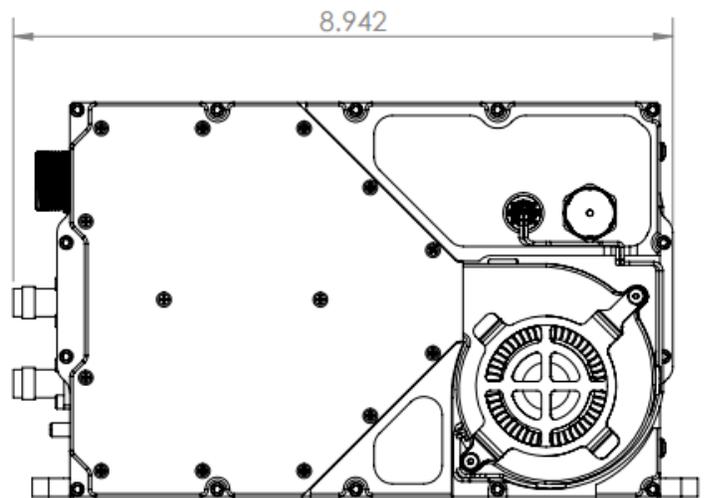
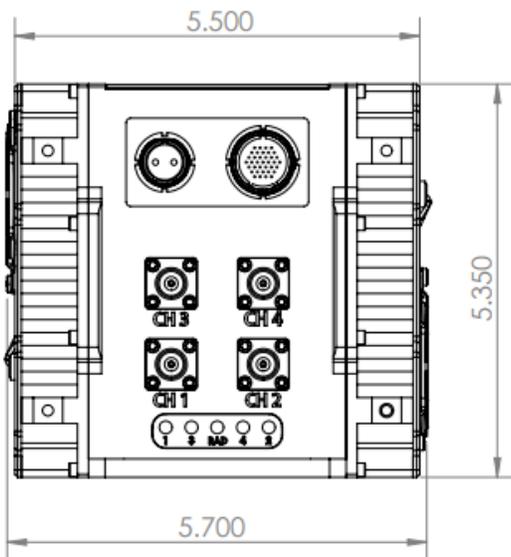
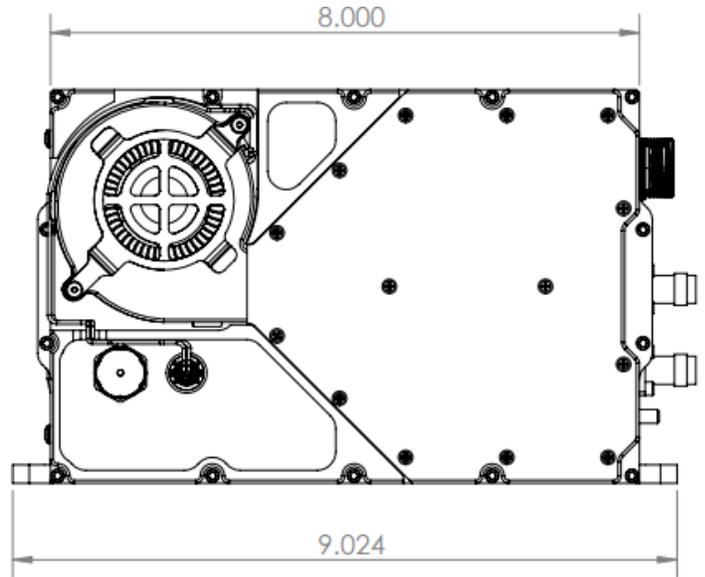
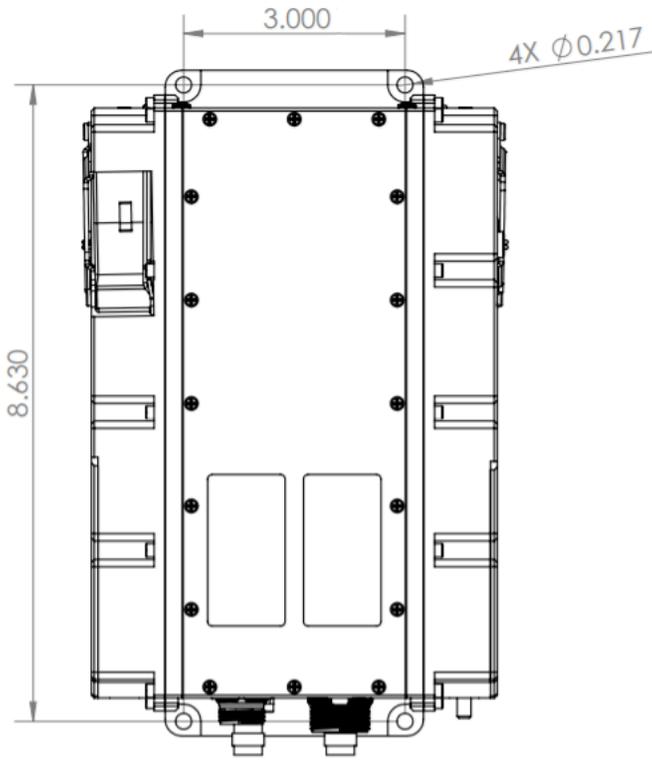
Parameter	Min.	Typ.	Max	Unit	Notes
Operating Temperature	-40	—	+70	°C	Ambient Temperature (Dependant on User Variables)
Cooling	Conduction/convection, Forced Air			—	Non-Condensing
Altitude	0	—	25,000	ft.	
Shock / Vibration	Designed to MIL-STD-810 Tested DO-160			—	
Ingress Protection Rating	IP67			—	With exception of LRU replaceable fan

Mechanical Specifications

Parameter	Value	Unit	Notes
Dimensions	9.024 x 5.70 x 5.35 (229.2096 x 147.32 x 135.89)	in (mm)	L x W x H
RF Connectors	TNC-F	Connector Type	Mating Connector Type: TNC-M
DC Connector	801-011-07M10-2PA	Part Number	Mating Connector PN: 801-007-16M10-2SA
Signal Connector	801-011-07M13-37PA	Part Number	Mating Connector PN: 801-007-16M13-37SA
Mounting	M5 Through Holes	—	See Mechanical Drawing Below
Weight	150 (4252)	oz (g)	
Finish	Anodized Matte Black	—	MIL-A-8625



MECHANICAL DRAWING



DC/CONTROL CONNECTORS

J1 Connector - DC Connector (Glenair PN: 801-011-07M10-2PA)

Pin	Description	Type	I/O	Notes
1	+Vin	Power	Input	Power Supply In
2	-Vin	Power	Input	Isolated from GND

J2 Connector - Signal Connector (Glenair PN: 801-011-07M13-37PA)

Pin	Description	Type	I/O	Notes
1*	MPS5	Data	Input	Multi- Position Switch Pin 5
2*	MPS3	Data	Input	Multi- Position Switch Pin 3
3*	MPS4	Data	Input	Multi- Position Switch Pin 4
4*	MPS2	Data	Input	Multi- Position Switch Pin 2
5*	MPS6	Data	Input	Multi- Position Switch Pin 6
6*	MPS1	Data	Input	Multi- Position Switch Pin 1
7*	AUDIO GND	Signal	Output	GND reference for AUDIO OUT Isolated from chasis GND
8*	AUDIO OUT	Signal	Output	Audio Output
9*	USB0 GND	Data	Input	GND for Radio USB0 Connected to chasis GND
10	RS232 GND	Data	Input	GND for Radio RS232 Connected to chasis GND
11	+5V1 GND	Power	Output	GND for +5V1 Output Connected to chasis GND
12	+5V2 GND	Power	Output	GND for +5V2 Output Connected to chasis GND
13	GND	Signal	—	General Purpose Ground
14*	USB0 D-	Data	Input	Data- for USB0
15*	USB0 D+	Data	Output	Data+ for USB0
16	Power Enable	Power	—	3.3V TTL High/ Floating = Shutdown Low/ GND = Enable
17*	MIC IN+	Signal	Input	Microphone Input
18	RF BLANK	Power	Input	High/Floating = RF Output Enabled Low/GND = RF Output Disabled
19*	PTT	Signal	Input	Push-To-Talk
20*	USB0 VBUS	Data	—	Voltage Bus for Radio USB0
21*	USB1 D -	Data	—	Data- for Radio USB1
22*	USB1 GND	Data	—	GND for Radio USB1

Continues on next page



J2 Connector - Signal Connector (Continued)

(Glenair PN: 801-011-07M13-37PA)

Pin	Description	Type	I/O	Notes
23	MPS5	Data	Input	Multi- Position Switch Pin 5
24*	MPS3	Data	Input	Multi- Position Switch Pin 3
25*	MPS4	Data	Input	Multi- Position Switch Pin 4
26*	MPS2	Data	Input	Multi- Position Switch Pin 2
27*	MPS6	Data	Input	Multi- Position Switch Pin 6
28*	MPS1	Data	Input	Multi- Position Switch Pin 1
29*	AUDIO GND	Signal	Output	GND reference for AUDIO OUT Isolated from chassis GND
30	AUDIO OUT	Signal	Output	Audio Output
31*	USB0 GND	Data	Input	GND for Radio USB0 Connected to chassis GND
32*	RS232 GND	Data	Input	GND for Radio RS232 Connected to chassis GND
33*	+5V1 GND	Power	Output	GND for +5V1 Output Connected to chassis GND
34	+5V2 GND	Power	Output	GND for +5V2 Output Connected to chassis GND
35	GND	Signal	—	General Purpose Ground
36*	USB0 D-	Data	Input	Data- for USB0
37*	USB0 D+	Data	Output	Data+ for USB0

* Denotes pin is directly connected to the radio.

CABLE OPTIONS

For available cable options, please [contact us](#) at inquiries and pricing.

