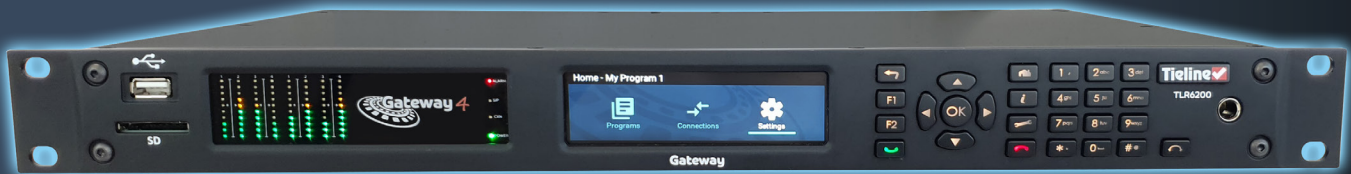


# Gateway 4



## The New Generation 4 Channel IP Audio Codec

The Gateway 4 provides two stereo connections, or one stereo and two mono connections, or up to 4 mono connections.

### AoIP Protocols

AES67 | ST 2110-30 | ST 2022-7 | WheatNet-IP

Livewire+ | RAVENNA | Dante | NMOS | Ember+



[www.tieline.com](http://www.tieline.com)

**Tieline**<sup>®</sup>  
The Codec Company

# Gateway 4 (TLR6200-4)

The Gateway 4 is a powerful DSP-based 1RU IP codec designed for live remote broadcasting applications, as well as STL or SSL links. The Gateway 4 enables transport of multiple channels of mono or stereo audio across the Public Internet or any QoS-enabled IP network, including T1 and T3 connections and private WANs with MPLS.

## Gateway 4 Speaks More Languages...

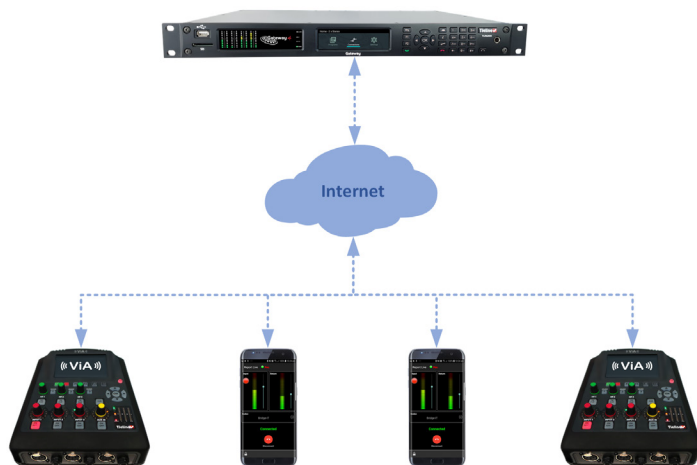
The Gateway 4 streams up to 4 IP audio channels with support for AES67, ST 2110-30, ST 2022-7, RAVENNA, Livewire+, NMOS IS-04 and IS-05, Ember+, AES3 and analog I/O as standard. An optional WheatNet-IP card available at purchase delivers WheatNet-IP compliant streaming, or an optional Dante card can be installed at purchase to support Dante AoIP networking. With native support for AES67, ST 2110-30, ST2022-7, Livewire+ and RAVENNA, plus options like WheatNet-IP and Dante, the Gateway 4 delivers comprehensive AoIP protocol interoperability with equipment from vendors supporting these standards.

## Applications

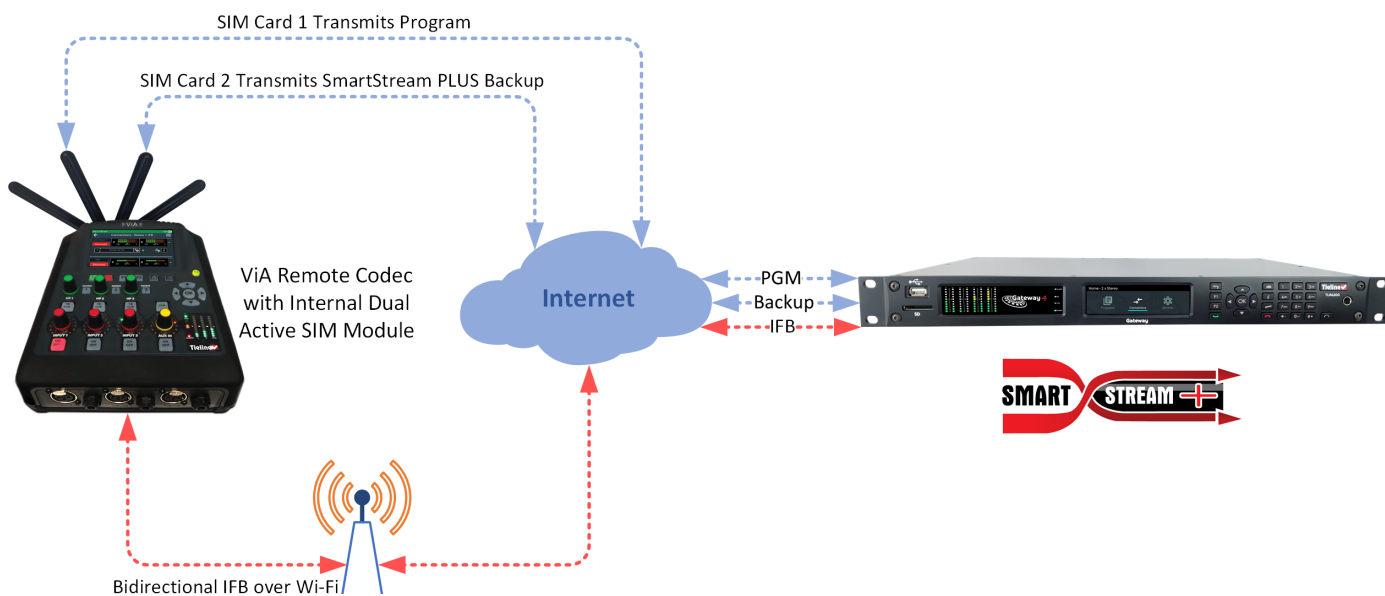
The new generation Gateway 4 delivers best-in-class DSP-based reliability and performance for mission critical broadcast streaming applications. It is ideal for:

- Remote broadcast applications.
- Studio-to-Transmitter Links (STLs)
- Studio-to-Studio Links (SSLs)
- HTTP Icecast or Shoutcast streaming

The Gateway 4 is designed for solutions requiring up to 4 audio streaming channels with advanced redundancy features and remote configuration and control. It supports 4 full-duplex audio channels in 1RU and is backward compatible with all Tieline IP codecs. The Gateway 4 provides two stereo connections, or one stereo and two mono connections, or up to 4 mono connections.



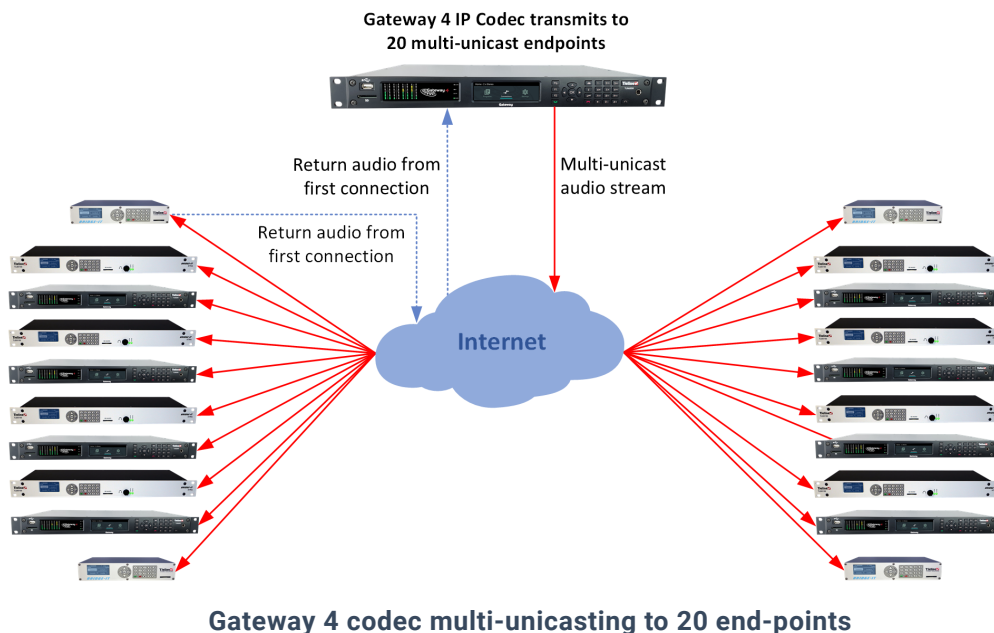
**Gateway 4 codec connects 4 full-duplex remote connections to ViA and Report-IT**



**Gateway 4 codec connects in stereo using SmartStream PLUS over cellular, with IFB over Wi-Fi**

For larger networks the Gateway 4 is ideal for transmitter sites, remote trucks or rack-mounted remote kits. For affiliates and smaller stations, it can be used to transport studio-to-studio links, or a stereo studio-to-transmitter link signal plus another stereo connection, or other mono connections for remotes.

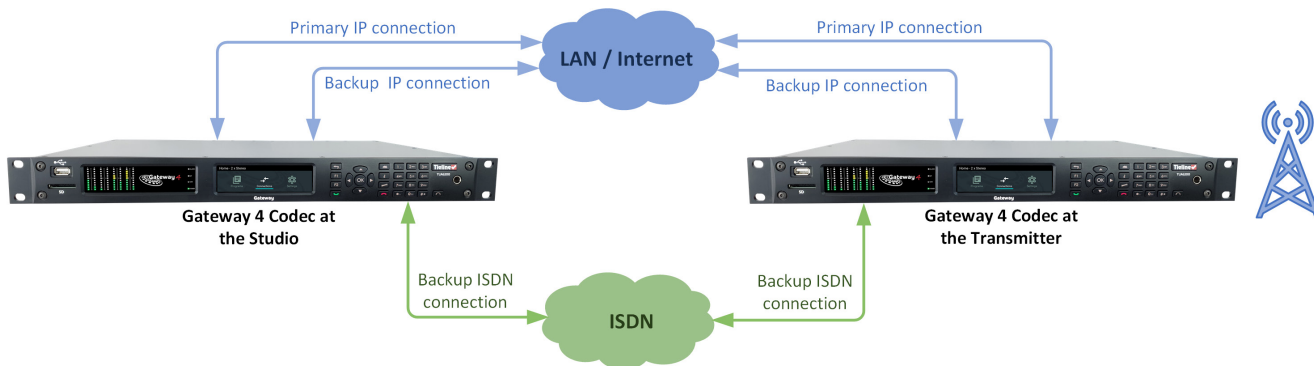
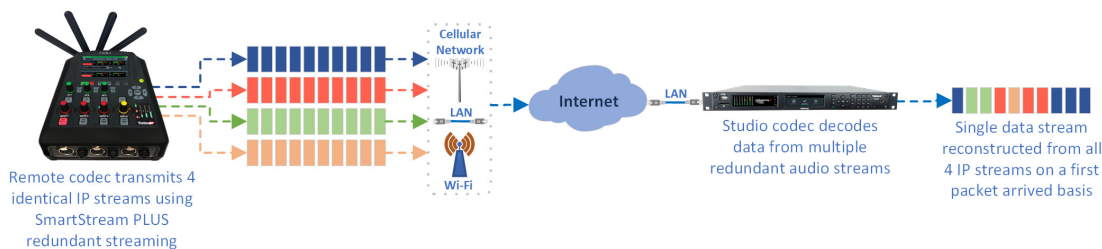
The Gateway 4 also supports multiple unicasting to up to 20 endpoints and multicasting.



## Multiple Layers of Redundancy

The Gateway 4 seamlessly integrates with all Tieline IP codecs and delivers hitless packet switching using SmartStream PLUS redundant streaming. A primary and 3 redundant streams can be configured for each connection, delivering multiple layers of IP network redundancy.

The codec also supports bandwidth aggregation using Fuse-IP technologies over internet connections. It features dual internal power supplies, dual LAN ports and dual AoIP ports. Automated network failure detection provides automatic switching to a backup IP LAN connection or fail over to an ISDN connection using an optional Euro ISDN module. Automatic silence detection can fail over to alternative audio sources, including file playback.



## WheatNet-IP

Order an optional WheatNet-IP card when you purchase the codec and it will appear as a Blade in Wheatstone's Navigator software.

## Dante

Order an optional Dante card at purchase and seamlessly support stream discovery and advertisement over Dante AoIP networks.

## Interoperability and Remote Control

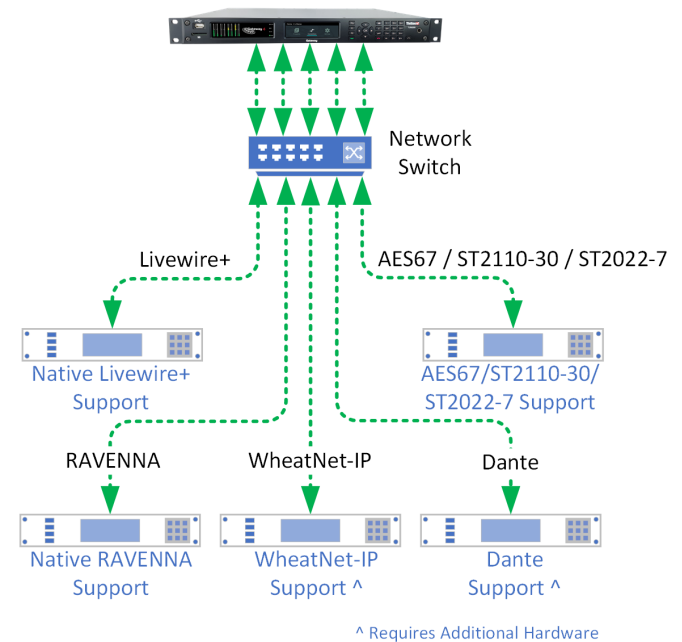
Its feature-rich and compact design is interoperable with all Tieline IP codecs and compatible over SIP with all EBU N/ACIP Tech 3326, 3347 and 3368 compliant codecs and devices. The codec is also fully AES67, ST 2110-30, ST 2022-7, Livewire+ and RAVENNA compliant for AoIP streaming. An optional WheatNet-IP or Dante card can be purchased for seamless operation using these protocols.

The Gateway 4 is also NMOS IS-04, IS-05 and IS-07 compliant for AoIP discovery, registration, connection management and notifications, simplifying setup and configuration of networked AoIP devices and systems. The Ember+ control protocol is also supported.

Maintain connectivity and interoperability with legacy ISDN networks as required with the optional Euro ISDN module and integrate with IP audio streams simultaneously. Gateway is configurable through an embedded HTML5 Toolbox Web-GUI interface and is also fully controllable using Tieline's Cloud Codec Controller.

## Key Features

- Up to 4 bidirectional mono or 2 bidirectional stereo IP streams
- Bidirectional stereo plus dual mono IP streams
- 8 hardware GPIOs, plus 3 virtual inputs, 56 logical outputs, 64 WheatNet or Livewire Logic Inputs/Outputs and 64 Ember+ GPIOs
- Ideal for contribution/remotes, STL, and SSL applications
- Stream IP audio over WANs using dual Ethernet ports
- Fully AES67, ST 2110-30, ST 2022-7, Livewire+ and RAVENNA compliant for AoIP streaming
- Optional WheatNet card at purchase supports WheatNet-IP.
- Optional Dante card at purchase supports Dante AoIP streaming.
- Interoperable with Dante and WheatNet-IP in AES67 compatibility mode if no card installed.
- Support for Ember+ and NMOS IS-04, IS-05 & IS-07
- Supports multicasting and multi-unicasting to 20 endpoints
- HTTP Icecast or Shoutcast streaming support
- Dual DSP based platform with dual internal power supplies, dual Ethernet ports and dual AoIP ports.
- Supports uncompressed audio or a huge range of encoding options
- SD card slot for firmware upgrades and memory options
- Fully SIP EBU N/ACIP 3326, 3368 and 3347 compliant to operate with 3rd party codecs
- Module slot for optional ISDN module, future technologies, and hardware upgrades
- Fully remote control using the Toolbox HTML5 Web-GUI, or the Cloud Codec Controller, plus SNMP support
- 10 Band EQ, Compressor and IGC Limiting on all analog inputs



**Gateway 4 codec supports connecting with a variety of AoIP protocols**

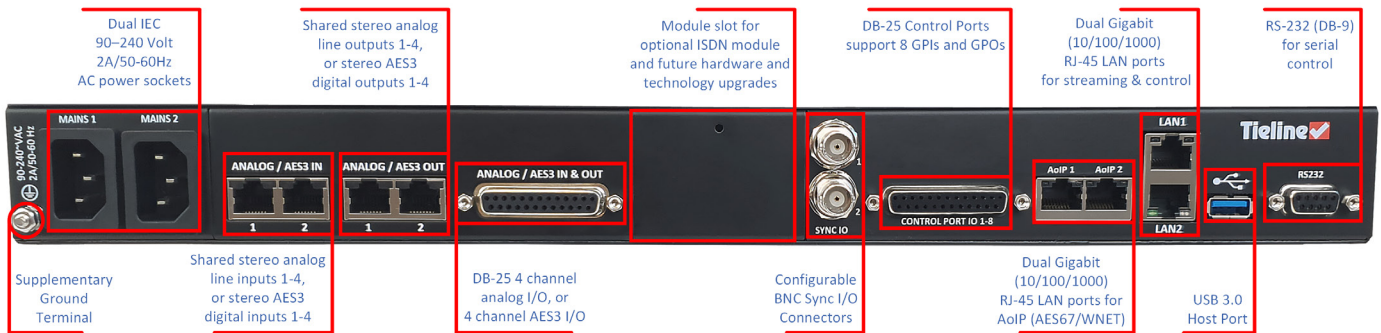
## Front Panel Interfaces

The Gateway front panel has 8 PPMs to view input and output streams. It also features a high-quality color LCD screen for at-a-glance monitoring and configuration. Silicon menu, navigation and keypad buttons deliver simple configuration, control and audio monitoring. An SD card slot allows simple access for firmware upgrades.



## Rear Panel Interfaces

The Gateway rear panel facilitates maximum flexibility with support for analog, AES3 and AES67 / ST 2110-30 / ST-2022-7 I/O. Tieline also offers optional WheatNet-IP or Dante compatibility via dual AoIP ports. The codec supports 8 GPIOs as well as software logic I/Os. The module slot allows an optional Euro ISDN module to be installed in the codec for network connection flexibility and redundancy. This module slot can also be used for future hardware innovation upgrades to maximize the effective life of the codec.



# Specifications

## Input and Outputs

RJ45 Analog Inputs 1-4/AES3 Inputs 1-4	Shared analog stereo line inputs 1-4, or stereo AES3 digital inputs 1-4
RJ45 Analog Outputs 1-4/AES3 Outputs 1-4	Shared analog stereo line outputs 1-4, or stereo AES3 digital outputs 1-4
Female DB-25 Analog/AES I/O	Optional analog or digital inputs/outputs x 4 (Tascam pinout)
Gigabit LAN Ports	2 x Gbit Ethernet ports for IP streaming over WANs (4 bidirectional mono, bidirectional stereo plus mono, or 2 bidirectional stereo streams)
Gigabit AoIP Streaming Ports	2 x Gbit Ethernet ports for AES67/ ST 2110-30/ ST 2022-7; Optional WheatNet-IP or Dante streaming via AoIP1
Front Panel USB 2.0 Host Port	Supports USB to LAN or USB Wi-Fi for control only
Rear Panel USB 3.0 Host Port	Supports USB to LAN for Control only
Front Panel Headphone Output	1 x 6.35mm (1/4") headphone Jack
Front Panel SD Card Slot	Full size push-push SD card slot for firmware upgrades
BNC Sync Input/Output	2 configurable input/output BNC sync connectors (Wordclock, AES3 Input, AES11id, PTP Sample Clock, and Fixed)
Female DB-25 Control Port In/Out	Dual DB-25 Control panel support 8 CMOS control inputs and 8 opto-isolated solid-state relay outputs
Analog Input Impedance	> 10k ohm
Analog Output Impedance	< 30 ohm balanced
Clipping Level	Nominal output level +4dBu with maximum output + 24 dBu
A/D & D/A Converters	24 bit
AES3 (AES/EBU)	24 bit inputs with support for sample rates from 32kHz to 192 kHz[2]; 24 bit outputs
Frequency Response	20Hz to 22kHz
Total Harmonic Distortion	<0.002% at +22dBu unweighted
Signal to Noise Ratio	>100dB at +24dBu, unweighted, 20Hz – 20kHz
Crosstalk	< -95dB between adjacent channels

## Data and Control

Configuration and connectivity	HTML5 Toolbox Web-GUI, Cloud Codec Controller (CCC)
Serial (DB-9)	RS232 up to 115kpbs with or without CTS/RTS flow control can be used as a proprietary data channel
Software Logic I/Os (SLIO)	8 hardware GPIOs, plus 3 virtual inputs, 56 logical outputs, and 64 WheatNet or Livewire Logic Inputs/Outputs, 64 Ember+ GPIOs
ISDN	Optional via module slot; 2 B channels supported

## Encoding and IP Streaming

Encoding Formats	Timeline Music, Timeline MusicPLUS, Opus, G.711, G.722, MPEG Layer 2, MPEG Layer-3 LC-AAC, HE-AAC, HE-AACv2, AAC-LD, AAC-ELD, 16/24 bit aptX® Enhanced algorithm, MPEG audio technologies licensed by Fraunhofer IIS ( <a href="http://www.iis.fraunhofer.de/audio">http://www.iis.fraunhofer.de/audio</a> )
Uncompressed IP	Linear PCM16/24 bit 32kHz, 44.1kHz, 48kHz, 96kHz sampling
IP Sample Frequencies	8kHz, 16kHz, 32kHz, 44.1kHz, 48kHz, 96kHz
Phase-locked Surround Sound Channels	Stream 4 digital channels in phase-locked mode to deliver live surround sound content
Asymmetric encoding	Supports asymmetric multi-format encoding
Protocols	RTP, DHCP, SNMP, DNS, HTTP, IGMP, IPv4/IPv6, RTCP, STUN, SSL Security Certificate, RIST, RTSP, RFC5109, RFC5888, RFC4756, RFC3388, RFC2733, RFC3190
SmartStream PLUS	Primary plus 3 redundant streams supported (algorithm dependant)
Multi-unicasting	Support for 1 or 2 Multi-unicast streams (20 connections in total)
Multicasting	Support for 1 or 2 Multicast streams to unlimited endpoints over compatible IP networks
Fuse-IP	Bond IP interfaces to aggregate data

## AoIP Standards & Specifications

EBU N/ACIP 3326	Audio Contribution Over IP Compliant
I3P EBU Tech 3347	Intercom Over IP Compliant
EBU N/ACIP 3368	SIP Profiles Compliant
AES67 Compliant	44.1kHz, 48kHz, 96kHz Sample rates; 16 & 24 Bit, 1-8 Channels, SDP; supports 1 AES67 stream in 8 Channel mode (up to 4 active channels)
ST 2110-30 Compliant	Class A, Ax, B, Bx Sender and Receiver Compliant
ST 2022-7 Seamless Protection Switching	Compliant with requirements for sending multiple redundant streams of RTP packets to enable seamless protection switching.
RAVENNA Compliant	RAVENNA Stream Discovery and Advertisement
Livewire+ Compliant	Livewire+ Stream Discovery and Advertisement
NMOS Compliant	NMOS IS-04 & IS-05 Discovery, Registration and Connection Management, NMOS IS-07 Event Notifications
Ember+	Supports Ember+ control protocol
WheatNet-IP (Optional)	WheatNet-IP card supports streaming over AoIP1 (4 bidirectional mono or 2 bidirectional stereo)
Dante (Optional)	Install an optional Dante card at purchase for Dante AoIP streaming support.
Supported Audio Frames	125us, 250us, 333us, 1ms, 4ms

## Advanced Networking

VLAN Tagging	IEEE 802.1Q,802.1p
Quality of Service (QoS)	Support for DiffServ (DSCP)
Synchronization	IEEE 1588-2008(PTPv2)
Multicasting	IGMP v2 and v3 and IGMP v3 SSM
SAP	SAP v2 (Session Announcement Protocol) as defined in RFC 2974

## General

Display	24-bit Color LCD Screen (480 x 128 pixels)
Keypad	26 button silicon keypad
Navigation	5 navigation and selection buttons
Size	1U x 19" Rackmount
Dimensions	19" x 1 3/4" x 11 13/16" [482mm (W) x 44.45mm (H) x 300mm (D)] excluding rear connectors
Weight	4 Kg /8 lb 13.100 oz
AC Power	Dual AC 90-240V IEC power inlets; 2A 50-60 Hz
Nominal Power	20W
Maximum Power	45W
Inrush Current (cold start)	60A 230 VAC (per PSU) ; 30A/115VAC (per PSU)
Operating Temperature	0°C to 45°C (32°F to 113°F)
Humidity Operating Range	10% ≥ RH ≤ 90% (0 to 45°C/32°F to 113°F), non-condensing

### Americas

Tieline America LLC  
6505 East 82nd Street, Suite 201  
Indianapolis, IN 46250  
Direct Ph: 317-845-8000  
Fax: 317-913-6915  
E-mail: sales@tieline.com

### International

Tieline Pty Ltd  
4 Bendsten Place  
Balcatta WA 6021 Australia  
Ph: +61 8 9413 2000  
E-mail: info@tieline.com

