T112 / T112C

TitanONE Smart Mainframe Power Amplifiers

General Description

The AtlasIED TitanONE T112 and T112C Smart Mainframe Power Amplifiers provide the latest signal automation, processing and amplification technologies in one modular solution. The modular design allows up to seven (7) TitanONE Series power amplifier cards (sold separately) to be easily inserted into the mainframe. This offers twelve (12) main channels of amplification and two (2) backup channels for redundancy. Each channel has a complete library of DSP filter options. The TitanONE T112 is networkable offering IEDNet+ IP-based system control and digital audio transport via Dante™. The TitanONE T112C offers the same solutions utilizing CobraNet™ rather than Dante™ for the digital audio transport. TitanONE T112 / T112C integrates IED's world-renowned SystemAssured™ Supervision for entire system monitoring and fault detection to ensure worry-free 24/7 operation. The TitanONE T112 / T112C doesn't stop there, it also incorporates AtlasIED's patented smart technology called AlwaysHEAR™. This ensures the audio levels are automatically adjusted to always be set at the perfect sound level. The TitanONE T112 / T112C offers over eight technologies in a single compact form factor and is the perfect solution for life safety systems and everyday installations. For simplicity, in the remainder of this document, the term "T112" will be used to refer to either the Dante™ or CobraNet™ products.

Meets Life-Safety Systems Standards

The T112 meets the stringent standard requirements for life safety and mass notification systems. It has undergone ETL testing and conforms to UL Standards 864 & 2572, and it can easily be incorporated into most fire or life safety systems.

Modular Card Design

The T112 Mainframe with DSP can provide up to twelve (12) main channels of amplification and two (2) backup channels for redundancy. Six of the amplifier cards function as primary cards to drive connected loudspeaker circuits. The seventh card functions as a redundant backup that is automatically switched to in the event of a card failure. The T112 Modular Mainframe can also be used to provide power, house and configure via software, a dual channel line output card T2LD - T1 (TitanONE) 2-channel line driver to drive external systems, or to provide processing for self-powered loudspeaker arrays.

Integrated DSP

The T112 digital signal processing provides twelve (12) individual channels. If an amp card fails, the processing is automatically switched to the backup amplifier card. Each processing channel includes level controls, page routing, automatic ducking of background music, equalization (up to eight (8) parametric bands per amplifier channel plus high-pass filter), signal delay, and patented technology for ambient analysis-based automatic level control. Other signal processing includes delay, matrix mixing of available inputs and compression on analog inputs.

Networkable with IEDNet+ System Control

Being fully networkable, the T112 incorporates dual 1GB network ports. The first is used for primary connection and the second for redundant backup. The T112 supports IEDNet+, an Ethernet-based system control protocol. It offers software-based routing, control, and supervision of AtlasIED devices. IEDNet+ builds on the 20+ year IEDNet control and supervision protocol with the addition of Real-time IP Layer 3 Transport Protocol.

Digital Audio Transport Over Ethernet

In addition, the mainframe provides digital audio network connections utilizing either Dante™ or CobraNet™ technology from an AtlasIED audio network controller such as a GLOBALCOM®.IP IP100 Series Announcement Control System. Local program or background music (BGM) inputs can connect to analog connections located on the back of the mainframe.

AlwaysHEAR™ Ambient Noise Analysis

Patented Technology for Real-Time Control ensures announcements are heard at the perfect sound level. This AtlasIED software measurement technology automatically and continuously tests the ambient noise levels within an environment and dynamically raises or lowers the loudspeaker levels to compensate for noise changes. The T112 has connectors on the back of the chassis for up to twenty-four (24) IED540S ambient analysis sensors. One or two sensors can be used per main amplifier channel. Each ambient sensor intelligently reports the noise level at its location. The T112 mainframe uses this information to automatically compensate the individual output channel levels for optimum sound pressure performance in that specific location only. Additionally, other output channels that don't have sensors may be slaved to a channel which does have ambient sensors.

LifeLine™ Supervision and Backup Amp Switching

The T112 continuously monitors the installed TitanONE amplifier cards, all critical components, and the loudspeaker lines attached to the frame. Each channel is monitored in multiple locations, including the amplifier output voltage, amplifier output current, and loudspeaker lines. Loudspeaker lines are supervised for ground fault conditions as well as large changes in load, indicating either a break in the loudspeaker lines or failure of loudspeakers on the line. This supervision is enhanced by the use of the appropriate End-of-Line (EOL) module, either the 5410EOL or 5411EOL. Faults in the system are reported via LEDs and over the network to any monitoring controllers via IEDNet+. If a backup amplifier card is inserted into the frame, it will be used as an automatic backup for any failed main amplifier card.

Easy Setup and Configuration

The T112 may be configured from the GLOBALCOM®.IP System Management Center as part of a GLOBALCOM®.IP 100 Series system. Optionally it may be configured via its integrated web based software when used stand-alone or in third-party systems.

Rack Space and Connections

The mainframe requires only 4 rack units (7") of vertical space in a 19" equipment rack / cabinet. All cooling is front to back, so no additional vertical space is required in the rack for cooling. Connections for local program or BGM inputs are provided on the back using plug-in lugless compression-type screw terminals. Loudspeaker connections are made using larger scale terminals of the same type. Dual-redundant network connections are available, as are logic inputs which may be assigned various functions when used in conjunction with an IP100 Series announcement controller. Power amp cards slide in from the front and may be replaced individually. The CPU / DSP card also plugs in from the front.

Accepts TitanONE Amplifier Cards – Sold Separately

Several models of TitanONE power amplifier cards are available in dual channel configurations. Different models are capable of driving 70-volt distributed and 100-volt distributed loads. There are also three different models by power level available: 150-watt, 300-watt, and 600-watt on each channel. A full mainframe is capable of driving up to 12 channels of 600-Watts or 7200-Watts, burst, total.

Required Modular Cards and Optional Accessories - Sold Separately

The following or their approved equal, shall be employed:
Integrated Power Amplifier Mainframe T112

Amplifier Cards
T302-230V - T1 (TitanONE) 300W Total, 2 CH x 150W, 100V
T302-120V - T1 (TitanONE) 300W Total, 2 CH x 150W, 70V
T602-230V - T1 (TitanONE) 600W Total, 2 CH x 300W, 100V
T602-120V - T1 (TitanONE) 600W Total, 2 CH x 300W, 70V
T1202-230V - T1 (TitanONE) 1200W Total, 2 CH x 600W, 100V
T1202-120V - T1 (TitanONE) 1200W Total, 2 CH x 600W, 70V

Line Driver Card
T2LD - T1 (TitanONE) 2 CH Line Driver for T112 Mainframe

Capacities	
Amplifier Card Slots	6 + Backup
CPU Card Slots	1 (Dante™ or CobraNet™ Enabled)
Network Audio Inputs	16 Dante™ / 8 CobraNet™
Balanced Audio Inputs	12
Loudspeaker Outputs	12
Max Page Zones per Frame	12

Connections	
Ethernet	2 (Redundant)
Balanced Audio Inputs	12
Logic Inputs (contact closure)	4
Ambient Sensor Inputs	24 (2 / Channel)
Test Tone Out	1 (Differential)
Monitor Signal Out	1 (Balanced)
Test Signal In	1 (Balanced)
Monitor Signal In	1 (Balanced)
Speaker Out	12
AC Power Cord	2 – 20 Amp

DSP Functions	
Level Control	Per Channel BGM, Page and Overall
Equalization	8 Parametric Plus High-Pass Per Channel
Compression On Audio Inputs	12
Signal Delay	1 Second Per Amp Channel
Matrix Routing	28 x 24 Static + 16 x 12 Dynamic
Monitor Signal Out	Normal, Priority & Network Paging Inputs For Each Amp Channel
Test Signal In	Up To Two Sensors Per Channel
Monitor Signal In	Local and Over Network

Electrical	
Frequency Response	±1 dB, 22 kHz BW
Total Harmonic Distortion (THD)	< 0.01%, 14dBu, 22KHz BW
Signal to Noise Ratio	90 dB, 22kHz BW, +14dBu
Maximum Input	+14dBu Max
Maximum Test & Monitor Balanced Out	+14dBu Max

Gain:
    Via Network
    Balanced Inputs
	
	Unity
	-6 dB

A/D Converter	24 Bit
D/A Converter	24 Bit
Sample Rate	48K
Latency	< 1ms
Crosstalk	< -90 dB, f = 1 kHz
Backup Amplifier Switch Time	< 4 Seconds

AC Power / Cooling Requirements	Current Draw	Real Power Consumption	Rack Cooling Requirement
No Power Amplifier Cards (Quiescent) @120VAC/60Hz	0.53A	39.5W	135 BTU/hr
No Power Amplifier Cards (Quiescent) @240VAC/50Hz	0.27A	41.5W	142 BTU/hr

Notes:

For wattage and BTU calculations, use TitanONE Modular Amp Data Sheet, (DOC1226A), for specifications on specific amplifiers. Multiply by the number of amplifiers in the mainframe.

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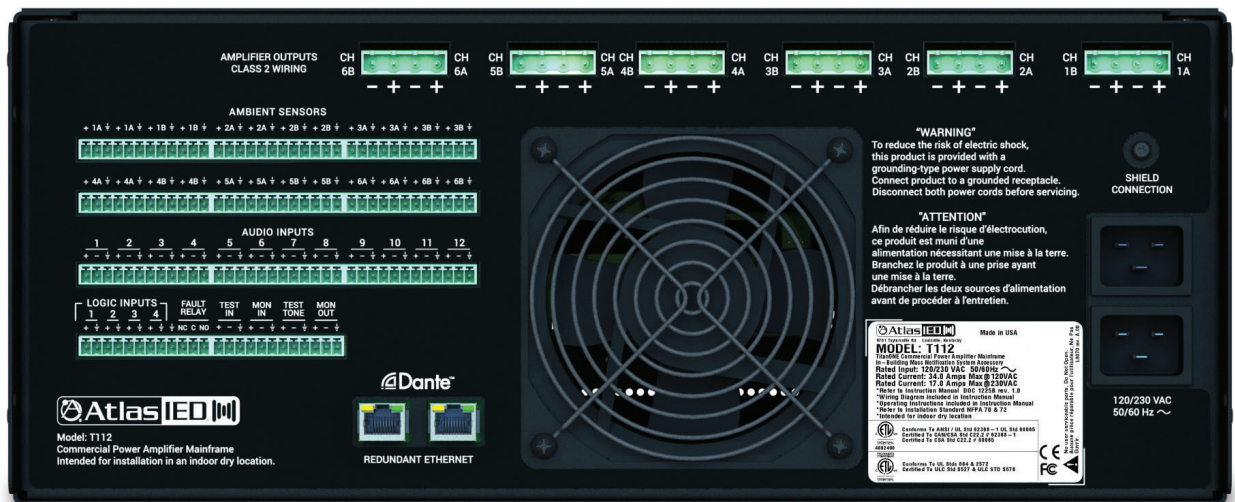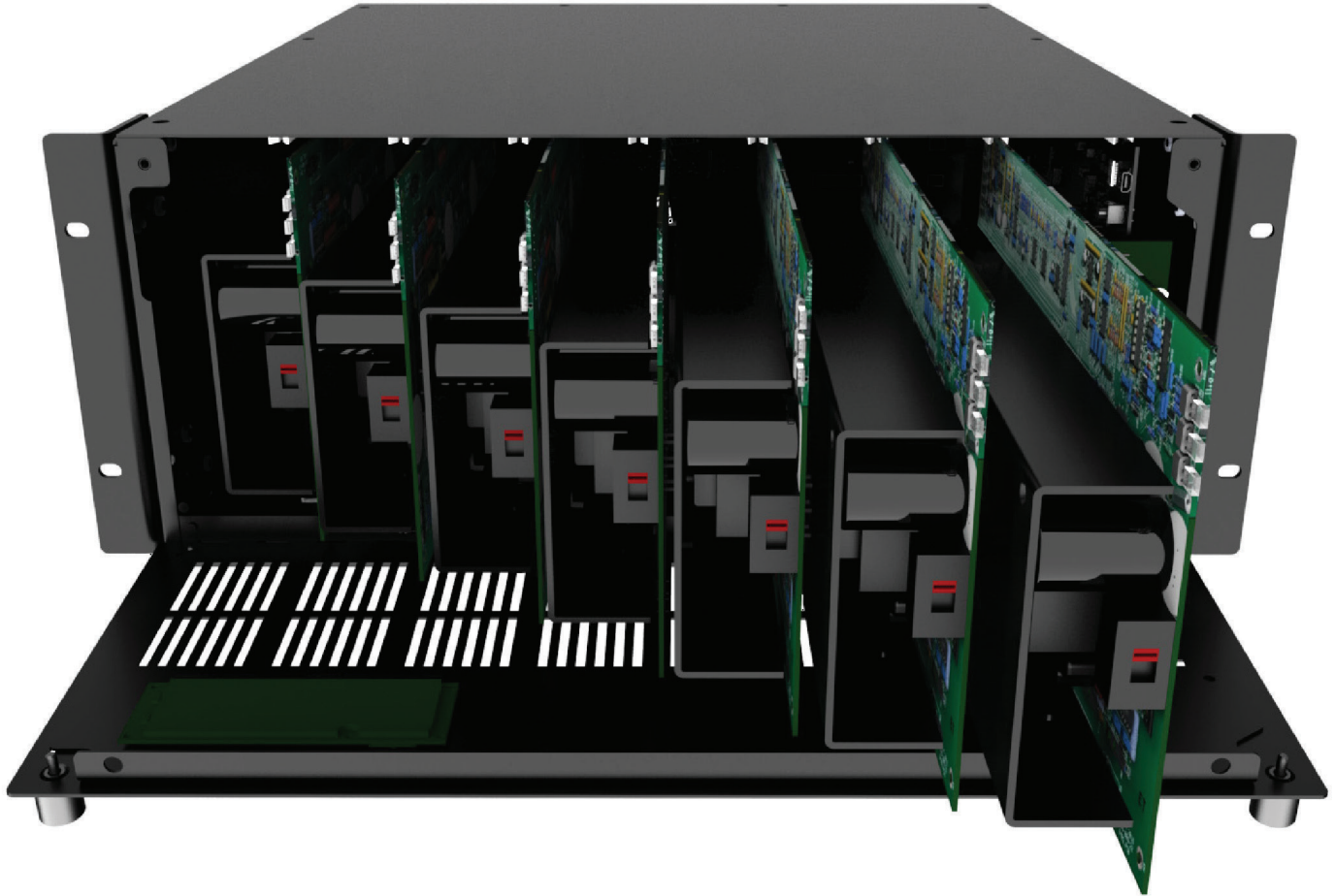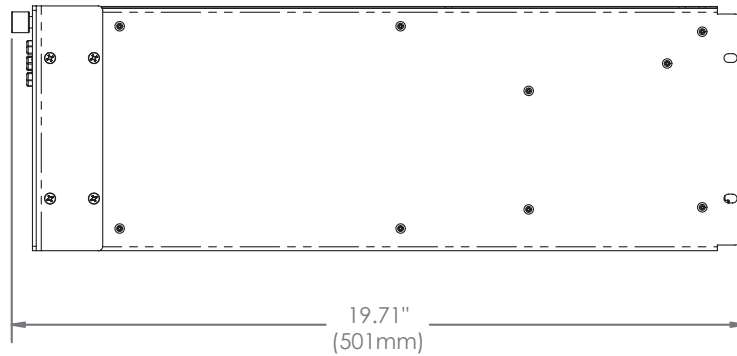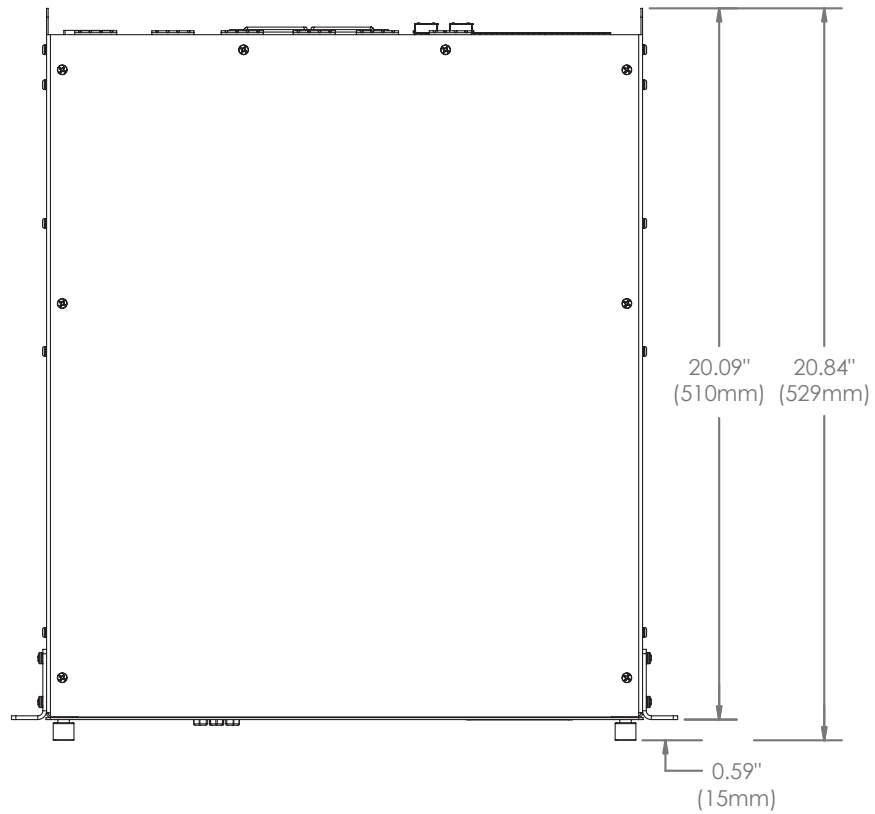| Mechanical (For proper operation add a minimum of 2" (51mm) clearance)	
Product Dimensions (HxWxD)	7" x 17" x 19.5" (178mm x 432mm x 495mm) - With Rack Ears 7" x 19" x 19.5" (178mm x 483mm x 495mm)
Shipping Dimensions (HxWxD)	13" x 24" x 24" (330mm x 610mm x 610mm)
Unit Weight	31.25 lbs. (14.17kg) (No Amps or CPU)
Shipping Weight	44.2 lbs. (20.05kg) (No Amps / With CPU)
Cooling Fan	120mm x 120mm, 152 CFM max
Environmental	
Operating Temperature Range (Applicable for typical voice paging and background music applications)	+32°F-+104°F (0°C-+40°C)
Storage Temperature Range	-40°F-+158°F (-40°C-+70°C)
Power Amplifier Card Options	
T302-230V - T1 (TitanONE) 300W Total, 2 CH x 150W, 100V	
T302-120V - T1 (TitanONE) 300W Total, 2 CH x 150W, 70V	
T602-230V - T1 (TitanONE) 600W Total, 2 CH x 300W, 100V	
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T1202-230V - T1 (TitanONE) 1200W Total, 2 CH x 600W, 100V	
T1202-120V - T1 (TitanONE) 1200W Total, 2 CH x 600W, 70V	
Line Driver Card Options	
T2LD - T1 (TitanONE) 2 CH Line Driver for T112 Mainframe	
Listings / Certifications	
Conforms to ANSI / UL Std. 62368 & 60065	
Certified to CAN / CSA Std. C22.2# 62368	
Certified to CSA Std. C22.2# 60065	
Conforms to UL Std. 864 & 2572 (Recognized Component)	
Certified to ULC Std. S527 & S576 (Recognized Component)	
FCC Part 15 Subpart B, "Class A" Compliant	
ICES-003 EMC Compliant (Canada)	
European EMC EN 55024, EN 55032, IEC 61000-3-2, IEC 61000-3-3	

RECOGNIZED COMPONENT

Amp Card Installation

Dimensional Drawings

4.00"
(102mm)

6.97"
(177mm)

18.29"
(465mm)

18.97"
(482mm)

20.09"
(510mm)

20.84"
(529mm)

0.59"
(15mm)

19.71"
(501mm)

Architect and Engineer Specifications

The Smart Mainframe Power Amplifier shall be the AtlasIED TitanONE T112. It shall house, supply power to, and control up to seven (7) TitanONE Series amplifier cards and a DSP / CPU card. In addition, the Smart Mainframe Power Amplifier shall have a provision to provide digital audio connections via a Dante™ or CobraNet™ audio distribution. Local program or BGM (background music) inputs shall connect via twelve (12) analog inputs at the rear panel via provided connectors. The integrated NIC (Network Interface Card) shall include dual ports for redundant network connections. The Smart Mainframe Power Amplifier shall house six (6) active single or dual channel amplifier cards (150W, 300W or 600W 70.7V/100V load) and a seventh (7th) active spare that is automatically engaged should a failure condition be reported. The system shall detect a failure in any of the primary amplifier cards and replace the effected amplifier without loss of service. The integrated digital signal processor shall provide up to 12 channels of processing to include level control of individual circuits, up to 8 bands of parametric equalization, high pass filter, signal delay, compression (on analog inputs) and ambient analysis control. All setup, monitoring, configuration, testing and control shall be under software control.

The Smart Mainframe Power Amplifier shall be capable of live or delayed paging, pre-recorded message playback, and muting of individual amplifier channels, zones and zone groups in any combination when used with optional GCK software deployment.

Ambient analysis and control shall be accomplished via an adjustment of signal levels via external noise sensing and / or computer commands. Connections for 24 ambient sensors shall be incorporated via rear panel connections and allow for single or dual sensor control of desired zones. Ambient analysis and control shall be in real time.

The Smart Mainframe Power Amplifier shall include internal audio bus monitoring and provide for visual as well as audio monitoring of the internal signal chain. Testing of the Smart Mainframe Power Amplifier shall be automatic or manually on demand and allow selection of the monitor points in the signal chain internal to the amplifiers and current level to the speaker lines and report with a resolution of 0.5dB.

The Smart Mainframe Power Amplifier shall require 4 rack units of vertical space in a 19" rack and all connections shall be in on the rear panel. The front panel shall provide for slide in cards and a visual indicator of amplifier status.

The Smart Mainframe Power Amplifier shall be the AtlasIED T112 or T112C TitanONE Mainframe with DSP and Processor.