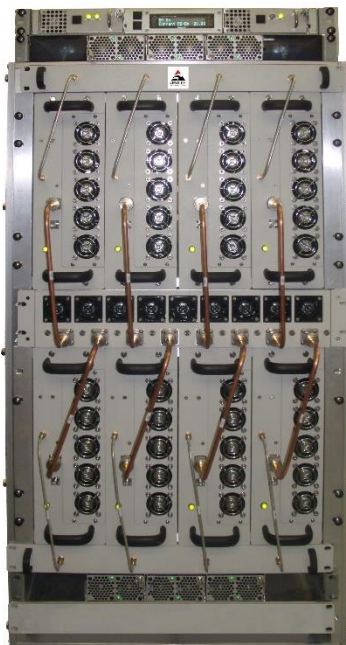


## 12kW Solid State Pulse Amplifier MODEL APRA-L12000A



### Features

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- Modular architecture
- Fast pulse rise/fall times (<100 ns)
- Duty cycle up to 12%
- Minimal pulse droop (<1% @ 100  $\mu$ s)
- High stability (phase and amplitude)
- Gain compensation over temperature
- Remote monitor and control capability via RS485
- Input and output sample monitor ports
- Power factor correction
- Hot swappable elements
- No rear access required for operation or maintenance

### Overview

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The Advantech Wireless Model APRA-L12000A, L-Band solid-state pulse amplifier operates over the band of 1.2 – 1.4 GHz. The peak power at the output connector is 12,000W.

The APRA-L12000A is fully modular. The design of the product is based on Advantech's tradition of high power and high efficiency line of amplifiers.

Built-in features such as duty cycle monitor and pulse width monitor ensure trouble free operation.



## 12kW Solid State Pulse Amplifier MODEL APRA-L12000A

### Description

The design of the APRA pulse amplifier is based on Advantech Wireless' industry proven reliable solid state power amplifiers. The following is a description of the system elements and their salient features.

The APRA pulse amplifier contains the following elements:

- Redundant Input/Driver Module
- Splitter panel, one per amplifier chassis
- RF chassis each containing four 1.5 kW pulse amplifier modules
- Power supply modular package, one per amplifier chassis
- High Power combiner.

### Redundant Input/Driver Module

This 1 RU unit contains hot-swappable 1:1 redundant driver modules and provides the M&C interface for the entire system.

The interface panel provides for:

- Input RS422 DB9 connector for the pulse enabling
- Output RS485 DB9 connector for the serial port interface

The Interface panel is connected to each amplifier module via the blind-mate connectors and also to the power supply shelves.

### Input Splitter panel

The output of the Driver module passes through a 1:2 splitter and then to the 1 RU Input Splitter panel which is a 1:4 splitter. One is associated with each RF chassis. The output ports are accessible from the front. Each output port is connected to the input of each amplifier module.

### Amplifier module

The individual amplifier module provides 1.5 kW of output power. Each amplifier module is pre-adjusted for a normalized phase and gain. The units are hot-swappable. The input and output connectors are on the front of the module and all other connections are via a blind-mate connector at the back of the module. A micro-controller is included in each amplifier module to specify the timing specs and provide an RS485 interface. The amplifier module reports on fault conditions and internal temperature.

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## 12kW Solid State Pulse Amplifier MODEL APRA-L12000A

| Technical Specifications          |                                                                   |                                                                    |                         |
|-----------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------|-------------------------|
|                                   | Full system                                                       | Amplifier Module                                                   |                         |
| Operating Frequency Range         | 1.2 – 1.4 GHz                                                     |                                                                    |                         |
| Peak Output Power                 | 12,000W min (70.8 dBm)                                            | 1,800W typical (62.5 dBm)                                          |                         |
| Input Drive Level                 | 0 dBm                                                             | +28 dBm                                                            |                         |
| Gain Variation                    | 2dB p-p over frequency range                                      |                                                                    |                         |
| Duty Cycle                        | 12% max                                                           |                                                                    |                         |
| Pulse Width                       | 1 – 100 $\mu$ s                                                   |                                                                    |                         |
| Pulse Repetition Rate             | 500 – 1150 pulses/s                                               |                                                                    |                         |
| Pulse droop                       | <1% max at 100 $\mu$ s                                            |                                                                    |                         |
| T-rise/T-fall                     | <100ns                                                            |                                                                    |                         |
| Harmonics                         | -45 dBc max                                                       |                                                                    |                         |
| Non-Harmonic Spur                 | - 75 dBc                                                          |                                                                    |                         |
| Input Impedance                   | 50 Ohms                                                           |                                                                    |                         |
| Input Return Loss                 | 18 dB                                                             |                                                                    |                         |
| Input Connector                   | N-type /Female/                                                   |                                                                    |                         |
| Output Impedance                  | 50 Ohms                                                           |                                                                    |                         |
| Output Return Loss                | 18 dB                                                             | 18 dB                                                              |                         |
| Output Connector                  | 7/16 type                                                         | N-Type                                                             |                         |
| Gain variation over frequency     | 2 dB p-p                                                          |                                                                    |                         |
| Gating Signal                     | TTL to precede RF pulse by 5 $\mu$ s                              |                                                                    |                         |
| Decay Interval                    | Amplifier output will cease 2 $\mu$ s after loss of gating signal |                                                                    |                         |
| Monitor Output (optional)         |                                                                   | Calibrated output sample loop with 48dB attenuation. SMA connector |                         |
| Dimensions                        | 19" rackmount<br>17U high (29.75")<br>20" deep                    | H<br>D<br>W                                                        | 6U (11.5")<br>17"<br>4" |
| Combiner (Qty 1/system)           |                                                                   |                                                                    |                         |
| Insertion loss                    | 0.8 dB typical                                                    |                                                                    |                         |
| Power handling capacity           | > 12,000W @ 12% duty ratio                                        |                                                                    |                         |
| Input connector                   | Qty 8 N-type                                                      |                                                                    |                         |
| Output connector                  | 7/16 type                                                         |                                                                    |                         |
| Power Supply shelf (Qty 2/system) |                                                                   |                                                                    |                         |
| Operating Input Voltage           | 220V nominal (180 – 164V) AC 47-63 Hz or 3phase                   |                                                                    |                         |
| Power factor                      | 0.97                                                              |                                                                    |                         |
| Total capacity (N+1)              | 4.5 kW                                                            |                                                                    |                         |
| Dimensions                        | 19" rackmount, 1U high, 17" deep                                  |                                                                    |                         |

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## 12kW Solid State Pulse Amplifier MODEL APRA-L12000A

| Splitter Panel (Qty 2/system)  |                                           |
|--------------------------------|-------------------------------------------|
| Output ports                   | 4                                         |
| Input/Output connectors        | SMA (F)                                   |
| Dimensions                     | 19" rackmount 1U high                     |
| Interface Panel (Qty 1/system) |                                           |
| Gating signal connector        | DB9 P                                     |
| Serial port Interface          | RS485 DB9S                                |
| Total power consumption        | 4.5kW max                                 |
| Cooling system                 | Forced air                                |
| Environmental Conditions       |                                           |
| Operating temperature range    | 0°C to +50°C                              |
| Non-operating                  | -55°C to +85°C                            |
| Humidity                       | 5% to 95%, non-condensing                 |
| Altitude                       | 10,000' AMSL, derated 2°C/1000' from AMSL |

### SAFETY FEATURES

To protect the amplifier from permanent damage, the following features are incorporated in the amplifier modules:

- Automatic shutdown in the event of pulse width exceeding 120  $\mu$ s
- Automatic shutdown with excessive duty cycle
- Amplifier output will cease 2  $\mu$ s after loss of gating signal

Ref.: PB-APRA-L12000A -001-18243

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