



### Features

- Modular architecture
- High stability (phase and amplitude)
- Gain compensation over temperature
- Remote monitor and control capability via RS485 or Ethernet ports
- Input and output sample monitor ports
- Power factor correction
- Hot swappable elements
- No rear access required for operation or maintenance
- Adjustable ALC provided
- Protection against open or short circuit loads

### Overview

The Advantech Wireless Model ARMA-S2500A, S-Band Solid-State Power Amplifier operates over the band of 1.7 – 1.96 GHz or 1.9 – 2.1 GHz.

The ARMA-S2500A is fully modular. The design of the product is based on Advantech's tradition of high power and high efficiency line of amplifiers.

## Description

The design of the ARMA Modular 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 ARMA Modular Amplifier contains the following elements:

- Redundant Input/Driver Module
- Splitter panel, one per amplifier chassis
- RF chassis each containing four 500 W 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::

- Output RS485 DB9 connector for the serial port interface
- Ethernet (TCP/IP) RJ45 port

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 500 W 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.

Due to the modular system architecture, a failed RF module may be removed safely and without service interruption. Furthermore, a single failed RF amplifier will cause only a 1.16 dB drop in the total output power of the system.

### Monitor & Control System

The M&C system operates at the module level via RS485. The amplifier module reports on fault conditions and internal temperature. The power supply shelf also provides an RS485 serial port interface. The complete system may be monitored via the RS485 interface port on the Driver Module. A laptop may also be used with appropriate adapter.

# 2.5 kW S-Band Modular Amplifier

## **RF Chassis**

The RF chassis contains four (4) amplifier modules. Each chassis is 7U high. The 2.5kW system contains two chassis.

## **Power supply shelf**

A Power Supply shelf is associated with each chassis. The 1U high power supply shelf is modular, containing 4 individual power supplies. Failure of a single power module will have no impact on the operation of the system as they operate in a load-sharing configuration with three power supplies being sufficient to power the associated RF Chassis. The power supply modules are hot-swappable. The output of the power supply is connected to each amplifier module in the RF chassis via the blind-mate connector. The power supply shelf has an RS485 serial port for M&C

## **High-Power Combiner**

The high power combiner is contained in a 2U chassis having eight (8) inputs and a single output. The special design of the combiner emphasizes low insertion loss and high power handling capability. The input connectors are special N-type and the output is 7/16 type specially modified to avoid voltage breakdown and to ensure good thermal flow.

Technical Specifications		
	Full system	Amplifier Module
Operating Frequency Range	1.7 – 1.96 GHz or 1.9 – 2.1 GHz	
Output Power (P <sub>SAT</sub> ) nominal	2,500 W (64 dBm)	500W typical (57 dBm)
Output Power (P <sub>1dB</sub> ) min	2,000 W (63 dBm)	400W (56 dBm)
Input Drive Level	0 to +5 dBm	+20 dBm
Small Signal Gain	58 – 63 dB	36 dB
Gain Variation	2dB p-p over frequency range ± 0.2 dB over any 18 MHz bandwidth	
Output Power adjustability	0 – 20 dB	
Harmonics	- 80 dBc typical (with harmonic filter)	
Non-Harmonic Spur	- 60 dBc max @ 2kW output	
AM/PM Conversion	4°/dB @ 2kW output	
Intermodulation (IMD3)	-25dBc @ 7 dB back-off from	
Group Delay	Linear 3.0 ns/MHz max Parabolic 2.0 ns/MHz <sup>2</sup> Ripple 4.0 ns peak-peak	
Input / Output Impedance	50 Ohms	
Input / Output VSWR	2:1 max	
Load VSWR for full compliance	2:1 max with protection against open or short circuit loads	
Input Connector	N-type /Female/	
Output Impedance	50 Ohms	
Output Connector	CPR 430G	N-Type
Monitor Output (optional)		Calibrated output sample loop with 48dB attenuation. SMA connector
Dimensions	19" rackmount (48.26 cm) 23 U high (40.25") (102.24 cm) 20" deep (50.8 cm)	H 7U (12.25") D 14" W 4"
Combiner (Qty 2/system)		
Insertion loss	0.6dB typical	
Power handling capacity	> 1,500 W	
Input connector	Qty 4 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 3-phase 415/240 V	
Power factor	0.97	
Total capacity	10.0 kW	
Dimensions	19" rackmount, 1U high, 17" deep	
Splitter Panel (Qty 2/system)		
Output ports	4	
Input / Output connectors	SMA (F)	
Dimensions	19" rackmount 1U high	
Interface Panel (Qty 1/system)		
Serial port Interface	RS485 DB9S	
Ethernet (TCP/IP)	RJ45	
Environmental Conditions		
Operating temperature range	-10°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	

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