1 + 1 Redundancy Configuration Options For Sophia KAx Series Products

Ka Band Outdoor Waveguide Switch network and indoor 1U Rack Mount Redundancy Controller

ORDER AS KAx-RDKIT

KEY FEATURES:

- Ultra reliable operation for mission-critical applications
- Hot swap redundancy
- Indoor Rack Mount 1U controller with faceplate signal diagram and LED indicators and manual/automatic controls
- Detects fault conditions and automatically switches to backup unit
- Outdoor, fully weatherproof waveguide switch and input power splitter
- Aluminum brackets hold two KAx outdoor SSPA's in rigid frame with waveguide switch
- KAx's ultra-small size allows two SSPA's to be mounted in the space normally occupied by one SSPA.
- Redundancy Controller allows remote monitor and control via Serial Port
- Kit includes all wire harnesses and indoor-to-outdoor cable (customer specifies length)

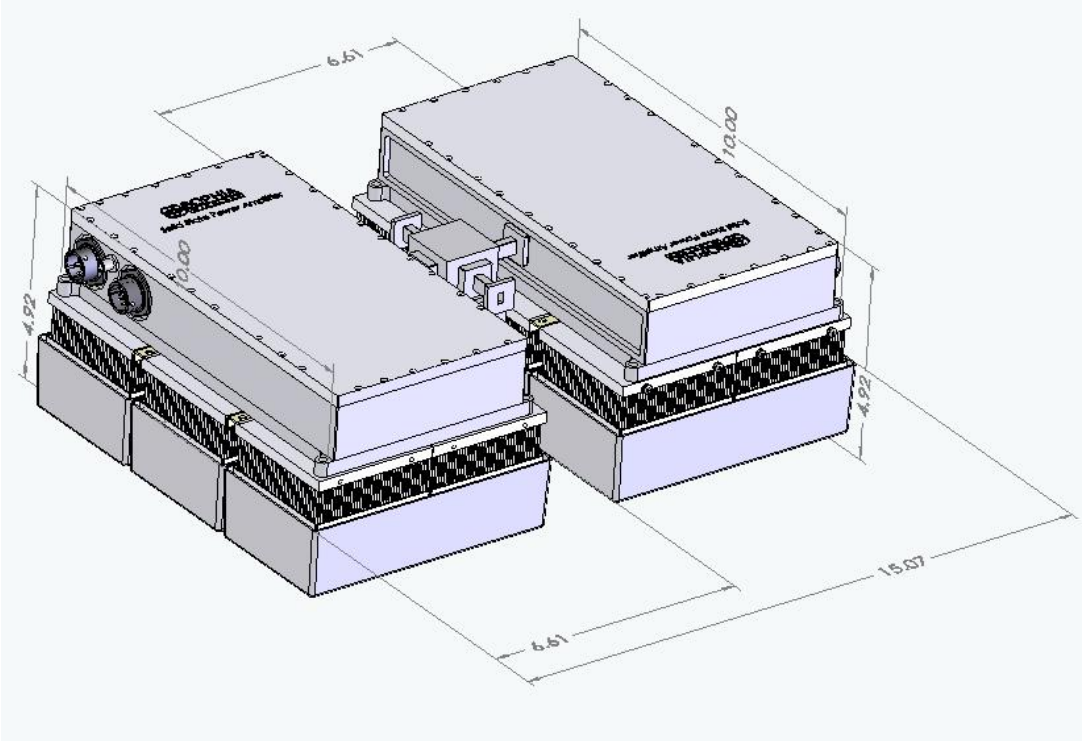


Fig 1: Example outdoor redundancy assembly with two KA6 amplifiers.

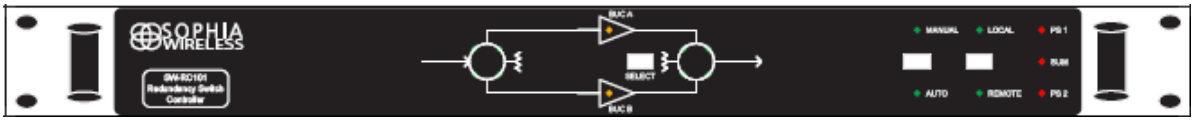


Fig 2: Faceplate of 1U rack mount controller. Colored LEDs indicate fault and waveguide switch status.

Note on ordering/pricing:

The redundant system is shipped fully assembled, with amplifiers and waveguide switch preassembled, as well as input divider and outdoor interconnections. For ordering/pricing, order quantity 2 amplifiers of desired model number (each with option FA for outdoor use) and quantity 1 KAx-RDKIT. Order one KAx-RDKIT for every pair of amplifier

Overall Redundancy Kit Components:

The fully assembled redundancy system is shipped from the factory including two Solid State Power Amplifiers (SSPAs). These amplifiers' output are both connected by wavegudie piping to a central waveguide switch. The amplifiers are also mounted on rigid rails to keep them in a fixed position relative to the waveguide switch. Any standard external mounting points on the amplifiers may be use to secure the overall system.

The waveguide switch is fully weatherproof. The inputs of both amplifiers are connected to a coaxial power divider, whose 2.9mm coaxial input port serves as the overall RF input for the system. The waveguide switch is driven by 24VDC signals. A custom wire harness connects the indoor 1U rack mount controller to the outdoor assembly, carrying fault monitor lines from the M&C outputs of the individual SSPAs, and carrying lines from the indoor controller for driving the 24VDC control signals to the waveguide switch.

The indoor rack mount controller is a 1U unit, as fully described below.

Introduction to Rack Mount Controller

This document provides the general operational information for the Sophia Wireless, model number SW-RC101, Satellite Communications redundancy switch controller. The SW-RC101 is a compact state of the art 1U 19in rack mount controller that provides manual and automatic redundancy switch over control of 1x1 switching subsystem located in microwave and satellite communications transmission systems. The controller also provides full local front panel status and manual control, along with full remote control capabilities via standard serial remote interface.

Description of Rack Mount Controller

The SW-RC101 Controller is used to monitor the health status of 2 BUCs connected to a standard 1x1 switching subsystem and provide automatic reconfiguration of the switching subsystem in the event of a failure of an online BUC. The Controller provides the user with clear indications of the current health of all devices in the system, along with the health and position status of the switches in the system, via various LED indicators and circuit diagram located on the controller’s front panel. The controller’s front panel provides the user full local manual control of the unit and the associated switching subsystem, while full remote monitor and control capabilities are provided via the standard RS-232 and RS-422 (4wire) serial ports.

Rack Mount Controller Architecture

The Controller consists of 4 main subsystems as follows:

1. Microcontroller subsystem
2. I/O Collection Subsystem

3. I/O Breakout Subsystem
4. Redundant 24V Subsystem

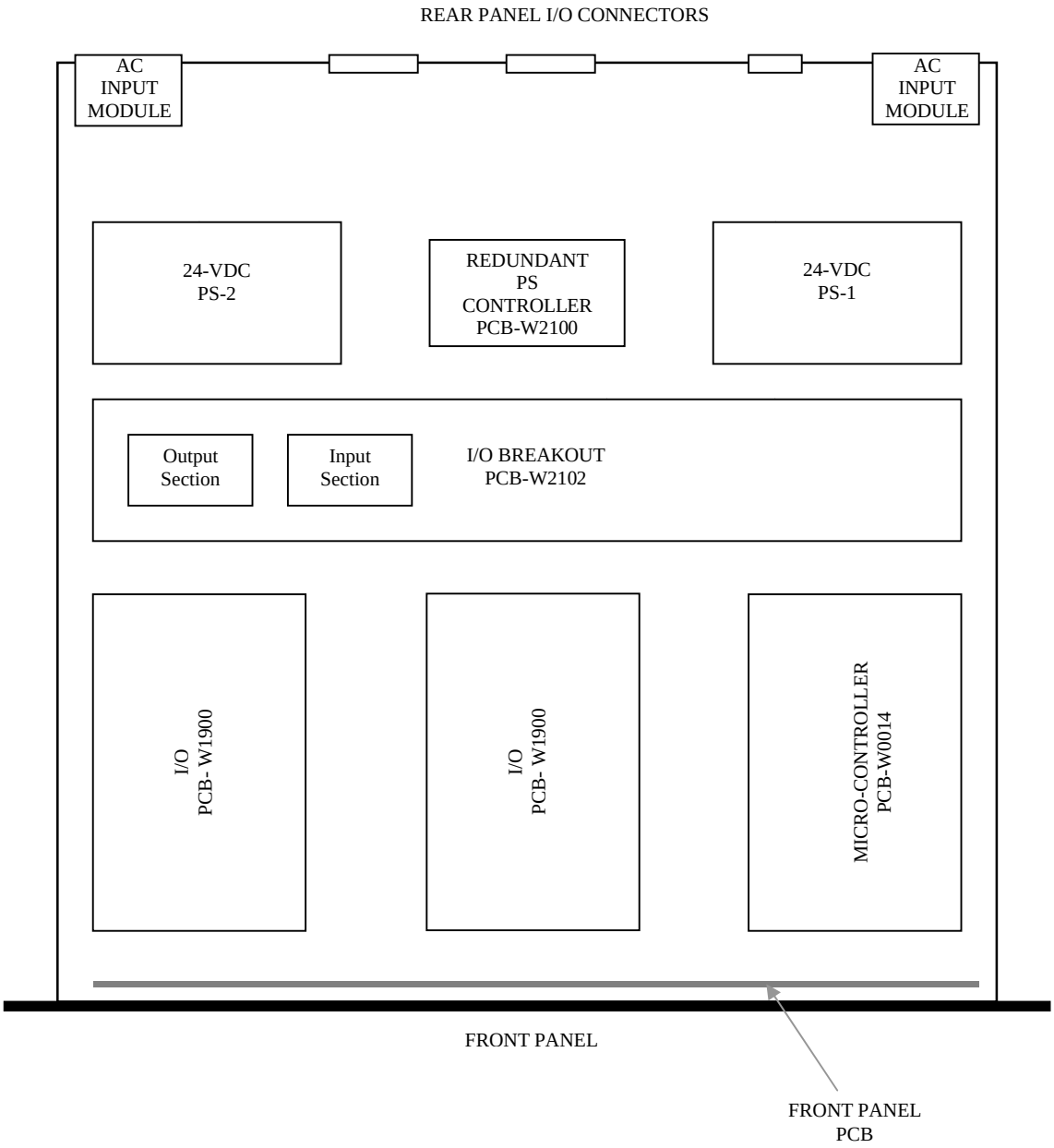
The Microcontroller subsystem is the heart of the controller and consists of the W0014 Microcontroller PCB. The W0014 controls all aspects of the controller's functionality from automatic switching logic and front panel indications, to remote serial interface processing. The firmware image that the W0014 runs is the brains of the system and is contained in the EEPROM device located on the PCB. This ensures there are no moving parts (hard drives) or batteries in the system that can fail over time ensuring the longest possible product life cycle. The remaining 3 subsystems all interface in one way or another to the W0014.

The I/O Collection Subsystem provides the electrical conduit for all the status and control points in the system to reach the Microcontroller subsystem and consists of the W1900 I/O PCBs. Each W1900 provides 3 groups of interface points (Opto-isolated inputs, from A relay contact closure outputs, and TTL level outputs) to which all the discrete input and output points in the system connect. These points are then sent/received to/from the W0014 Microcontroller PCB via the system interconnect bus for processing.

The I/O Breakout Subsystem provides selectable signal conditioning of all the I/O points in the system along with a common interconnect mechanism and 24Volt to 5Volt conversion and consists of the W2102 I/O Breakout PCB.

The Redundant 24Volt Subsystem provides the system with a fully redundant wired Ored 24Voltage supply and consists of the 2 AC to DC 24 Volt power supplies along with the redundant power supply controller W2100 PCB. The W2100 takes the 24 volt DC outputs from the 2 AC to DC power supplies and provides a single redundant 24 volt DC supply to the rest of the system while also providing monitor points and a reference voltage that is used by the A/D section of the Microcontroller PCB to provide PS1 and PS2 health status.

Controller Layout



Electrical & Mechanical Specifications of outdoor assembly:

RF Parameters	Specification
Frequency Band (GHz)	27.0-32.0 GHz
Waveguide Switch insertion loss	0.25 dB (power ratings will be reduced by this amount)
Input power divider insertion loss	3.5 dB (total amplifier gain will be reduced by this amount)
Total outdoor assembly system size/weight (includes two amplifiers, waveguide switch and power divider)	2 x KA1 model SSPA: 15.1"x3.5"x4.9", 10.0 lbs 2 x KA2 model SSPA: 15.1"x4.6"x4.9", 13.0 lbs 2 x KA4 model SSPA: 15.1"x7.3"x5.0", 19.0 lbs 2 x KA6 model SSPA: 15.1"x11.0"x5.0", 28 lbs 2 x KA8 model SSPA: 15.1"x14.6"x5.0", 37 lbs

Specifications subject to change without notice 7/14/08

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Model KA6 1+1 redundant system dimensions:
Two SSPAs, each model KA6 with Option FA (outdoor), plus KAx-RDKIT redundancy kit: