

6300 Series

Modular Signal Switching and Distribution System

Summary

The 6300 Series is a modular and intelligent switching and distribution system that provides ultra-low-noise phase performance for demanding ground station, metrology and national time scale applications. The 6300 Series' modular and flexible distribution architecture enables a wide range of signal formats—low-noise sine waves, IRIG timecodes or pulse formats—all from a single chassis. The 6300 Series is available in both a 1U and 4U rack-mount chassis. All plug-in modules are hot swappable and interoperate in both chassis types. The robust design includes redundant hot-swappable power supplies that can be configured for AC/AC, DC/DC or AC/DC.



Model 6300-1



Model 6300-4

Key Features

- Low additive phase noise
- High channel isolation
- Modular design enables variety of signal formats
- LED status indicators for all inputs and outputs
- Scalable to hundreds of outputs
- Ethernet interface for management and alarms
- Redundant AC or DC power or combination of AC and DC
- Hot-swappable modules and power supplies

Overview

The 6300 Series is a hot-swappable, modular distribution system that supports high-performance RF, pulse and AM IRIG distribution. Designed for metrology applications, the 6300 Series delivers high-performance signaling without degradation.

The 6300 Series is available in a 4U (6300-4) and a 1U (6300-1) chassis configuration. Both versions use the same distribution modules. The 4U version can accommodate up to 12 distribution modules while the 1U version can accommodate two distribution modules.

Most of the distribution modules come in two types of configurations. The switch module provides two inputs and four outputs. The two inputs provide a switching function that can be manually triggered or set up to automatically switch upon an input fault. The second type of module is a standard distribution module that provides one input and six outputs. In many configurations of the 6300 Series, a combination of both types of modules is installed in the chassis.

Configuration Options

The 6300 Series provides a high level of flexibility in the way it can be configured. First let's consider a high-capacity configuration of 10 MHz signals as illustrated in the diagram below.

10 MHz in	10 MHz out	10 MHz out	10 MHz out	10 MHz out	10 MHz out	10 MHz out	10 MHz out	10 MHz out	10 MHz out	10 MHz out	Mgmt
6	6	6	6	6	6	6	6	6	6	6	6
3	3	3	3	3	3	3	3	3	3	3	3
9	1	1	1	1	1	1	1	1	1	1	9
1	5	5	5	5	5	5	5	5	5	5	5

High-Capacity Configuration

In this configuration, a 10 MHz switch module (6391) accepts two inputs and its four outputs are used to feed the 6315 modules located next to the 6391 module. Next, the 6315 modules can daisy chain 10 MHz signals to the additional 6315 modules in the chassis.

Cable lengths should be considered to optimize coherency across the signal outputs.

In the next example, distribution of multiple signal types is configured from a single chassis. For example, in the first instance 10 MHz inputs are fed into a switch module, which then feeds the output modules. Separately, but in the same chassis, 1 PPS inputs are fed into a 1 PPS switch module, which then feeds 1 PPS output modules. Separate from the 10 MHz and 1 PPS distribution, IRIG inputs are fed to an IRIG switch module that feeds the IRIG outputs.

10 MHz in	10 MHz out	10 MHz out	B L A N K	1 PPS in	1 PPS out	1 PPS out	B L A N K	IRIG in	IRIG out	IRIG out	Mgmt
6	6	6		6	6	6		6	6	6	6
3	3	3		3	3	3		3	3	3	3
9	1	1		9	3	3		9	5	5	9
1	5	5		3	2	2		2	9	9	5

Multi-Signal Configuration

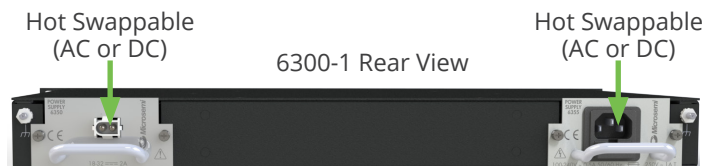
Fault Monitoring

In a 6300-4 module, the rightmost slot (slot 12) can be populated with the fault monitor module (6395) to monitor the signal inputs/outputs, the power supplies and the switch modules in the other chassis slots. The monitor module has bicolor LEDs to indicate the status of the individual slots as well as the power supplies. An Ethernet connection allows communication with the application software. A tab off the end of the module will prevent insertion into any slot except the rightmost slot.

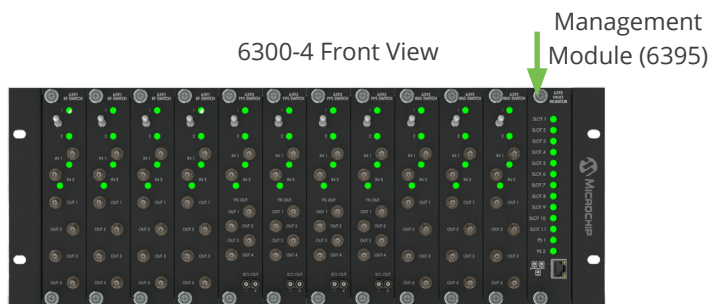
The 6300-1 module has the fault monitor built into the center front of the chassis and provides similar functions as the 6395 module.



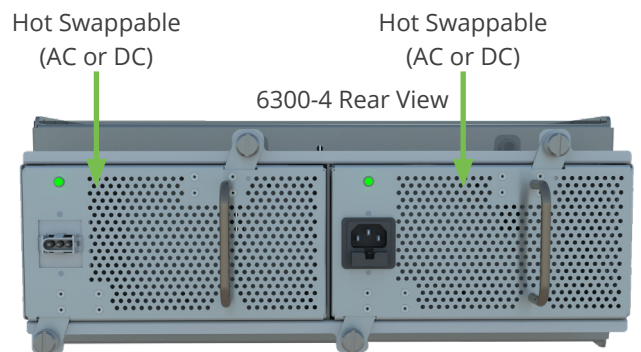
6300-1 Front View



6300-1 Rear View



6300-4 Front View



6300-4 Rear View

Specifications

RF Distribution	Guaranteed	Typical
RF Input	> 13 dBm	14 dBm
Bandwidth	1–20 MHz	
Gain (@ 5 MHz)	±0.5 dB	
Impedance		
Input	50 Ohms	
Output	50 Ohms	
Return Loss		
Input @ 5 MHz	> 25 dB	35 dB
Output @ 5 MHz	> 20 dB	35 dB
Distortion		
Input +13 dBm	< -40 dBc	
Output +16 dBm		-30 dB
Isolation		
Output to Output	> 120 dB	
Output to Input	> 120 dB	
Temperature-Delay Coefficient		
0°C–50°C	< 2 ps/°C	1 ps/°C
25°C–35°C	< 2 ps/°C	1 ps/°C
Phase Noise		
Offset Frequency (Hz)	dBc/Hz	dBc/Hz
	1 Hz	-144
	10 Hz	-159
	1 kHz	-171
	10 kHz	-171
Pulse Distribution	Guaranteed	Typical
Rise/Fall Time	< 5 ns	2 ns
Propagation Delay	< 12 ns	2 ns
Differential Delay (Channel to Channel)	< 0.5 ns	
Impedance		
Input	50 Ohms	
Output	50 Ohms	
Pulse levels (Input and Output 50 Ohm Load)	4.5V logic 1	
Temperature-Delay Coefficient (0–50°C)	< 5 ps/°C	
Jitter (rms)	< 1 ns	50 ps
Power Requirements		
Module Voltage	+12 Vdc/-12 Vdc	
Module Current	< 200 mA	
Chassis Voltage		
AC	100–240 V _{AC} , 50/60 Hz	
DC	18–32 V _{dc}	
Chassis Current	< 1.5A	

Ordering Information

Item Description	Part Number
4U Chassis	6300-4
1U Chassis with Fault Monitor	6300-1
DC Power Supply for 1U Chassis	6350
AC Power Supply for 1U Chassis	6355
DC Power Supply for 4U Chassis	6340
AC Power Supply for 4U Chassis	6345
Blank Panel	6301
Distribution Module (PPS, DC IRIG), 1 × 6, 3V (50 Ohm)	6310B
Distribution Module (PPS, DC IRIG), 1 × 6, 5V (50 Ohm)	6332B
Distribution Module (PPS, DC IRIG), 1 × 8, Differential ECL	6312
Pulse Format Converter, Single-Ended to Differential ECL	6313
Pulse Distribution Amp 50 Ohm In, 10 Ohm Differential Out	6320
Pulse Distribution Amp 100 Ohm In, 100 Ohm Differential Out	6321
RF Distribution (5 MHz, 10 MHz), 1 × 6	6315
RF Frequency Converter, 1 MHz In × 10 MHz Out	6316
Distribution Module AM IRIG	6359
2 In/4 Out RF Switch Module	6391
2 In/4 Out IRIG Switch Module	6392
2 In/4 Out Pulse Switch Module	6393
Fault Monitor Module for 6300-4	6395

Environmental, Dimensions and Weight

Item Description	Specification
Operating Temperature	0°C to 50°C
Storage Temperature	-40°C to 70°C
6300-1 Dimensions and Weight	Height: Std 1U, Width: Std 19-inch, Depth 14.75 inches Weight: 25 lbs. (approximately)
6300-4 Dimensions and Weight	Height: Std 4U, Width: Std 19-inch, Depth 10 inches Weight: 30 lbs. (approximately)
CE Compliance	6300-4 only