Universal Switching Corporation

Specification Sheet G2S44-001
Solid-State High Performance 20-250MHz
Non-Blocking IF Switching Array (no expanders)
Series G2S44

CE

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General

The solid-state G2S44 analog switching module is offered for applications demanding high performance analog IF switching. The non-blocking full fanout switching module is available in a maximum configuration of 32 inputs and 32 outputs. The switching array is a "fixed" size and does not contain expander looping ports as does the model G2S47 and other similar units. This fact makes the G2S44 slightly less costly than a similar sized unit from the G2S47 series.

It provides a very cost effective switching solution. It's available in the sizes shown in the table on page 2 as standard configurations. The size of the array is determined by the model number. Additional configurations are available on special order.

The switching array is non-blocking with full fanout allowing the user to connect any given input to one, many, or up to all outputs at any given time. No input loading or impedance mis-matches are presented to the user due to the architecture of the switching array, and the use of high performance power splitters and amplifiers.
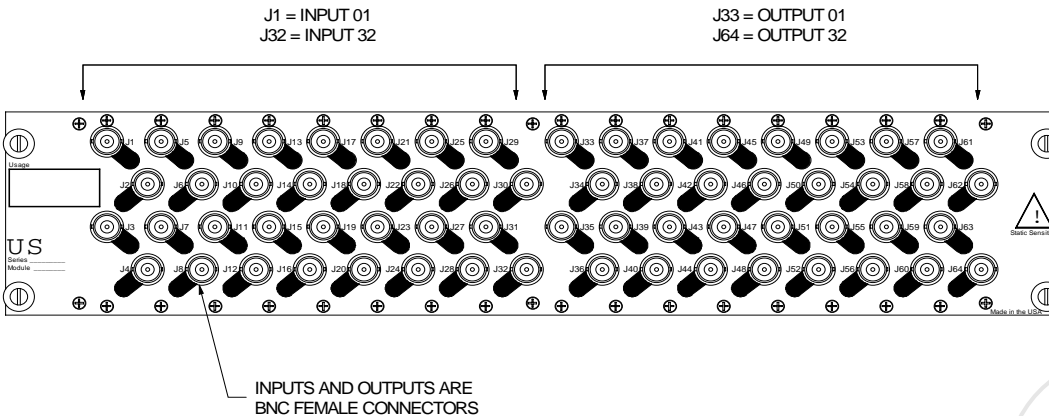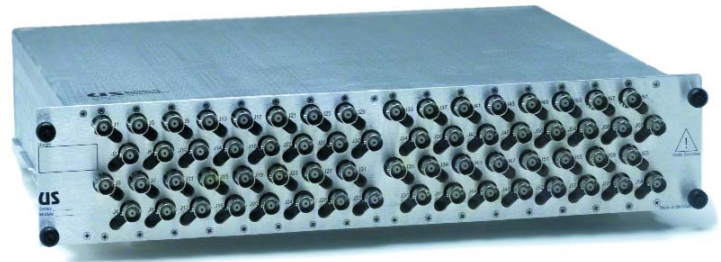
The suffix of the model number detemines the impedance or the module or unique features or additional performance specifications (consult the factory). For control and DC power, the module must be installed into any G2 type mainframe controller. They must be configured with the -207 or -D207 power supply configuration.

Applications

- Airborne surveillance systems
- Communication installations
- Uplink and downlink IF routing
- Satellite control centers
- Ground station IF signal routing

Features

- Solid-state GaAs switching elements
- Wide 20MHz to 250MHz bandpass (min)
- BNC signal connectors standard, TNC or SMA optional
- Hot-Swap module technology
- Designed for low level, low noise IF applications
- Full fanout, non-blocking design
- Unity gain, high isolation signal path

J1 = INPUT 01
J32 = INPUT 32

J33 = OUTPUT 01
J64 = OUTPUT 32

INPUTS AND OUTPUTS ARE
BNC FEMALE CONNECTORS

G2

G2S44-001

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Construction

The diagram on page 1 shows the physical rear configuration of the G2S44 module. Three sides of the module contains venting slots for flow through cooling for proper operation in extreme temperature environments. The rugged aluminum enclosure provides a shielded environment for low level, low noise signals. The module also provides aluminum slides for additional grounding to the host mainframe.

The module contains all solid-state components for extreme reliability, suitable for critical applications. Internally, an embedded CPU controls the switching operations of the array.

Example Module Usage

Many high-performance IF applications can be served by the G2S44 switching module. The module provides a complete switching array, or can be used as a versatile building block for constructing even larger switching arrays up to 256x512. Since the G2S44 does not contain internal expansion ports, the module would have to be coupled with additional equipment such as distribution amps or possibly additional switching to achieve the desired configuration.

There is no limit to the number of modules that can be cascaded together, though some minor performance degradation (loss, noise figure and IP3) does occur on larger configurations.

Universal Switching Corporation builds systems utilizing this and other modules to meet customer applications. Many other possibilities can be realized when coupling multiple modules together. Interconnection cabling can be provided by the factory using high performance coaxial cabling insuring the best possible performance.

Configurations

50 ohm input, 50 ohm output versions
- G2S44-1608-25 . . . . . .8 input, 8 output   4 slots
- G2S44-2408-25 . . . . . .16 input, 8 output   4 slots
- G2S44-2416-25 . . . . . .8 input, 16 output   4 slots
- G2S44-3216-25 . . . . . .16 input, 16 output   4 slots
- G2S44-4024-25 . . . . . .16 input, 24 output   4 slots
- G2S44-4832-25 . . . . . .16 input, 32 output   4 slots
- G2S44-5640-25 . . . . . .16 input, 40 output   6 slots
- G2S44-6048-25 . . . . . .16 input, 48 output   6 slots
- G2S44-4016-25 . . . . . .24 input, 16 output   4 slots
- G2S44-4824-25 . . . . . .24 input, 24 output   4 slots
- G2S44-5632-25 . . . . . .24 input, 32 output   4 slots
- G2S44-6444-25 . . . . . .24 input, 40 output   6 slots
- G2S44-6048-25 . . . . . .24 input, 48 output   6 slots
- G2S44-4816-25 . . . . . .32 input, 16 output   4 slots
- G2S44-5624-25 . . . . . .32 input, 24 output   4 slots
- G2S44-6432-25 . . . . . .32 input, 32 output   4 slots

50 ohm input, 75 ohm output versions
- G2S44-1608-27 . . . . . .8 input, 8 output   4 slots
- G2S44-2408-27 . . . . . .16 input, 8 output   4 slots
- G2S44-2416-27 . . . . . .8 input, 16 output   4 slots
- G2S44-3216-27 . . . . . .16 input, 16 output   4 slots
- G2S44-4024-27 . . . . . .16 input, 24 output   4 slots
- G2S44-4832-27 . . . . . .16 input, 32 output   4 slots
- G2S44-5640-27 . . . . . .16 input, 40 output   6 slots
- G2S44-6048-27 . . . . . .16 input, 48 output   6 slots
- G2S44-4016-27 . . . . . .24 input, 16 output   4 slots
- G2S44-4824-27 . . . . . .24 input, 24 output   4 slots
- G2S44-5632-27 . . . . . .24 input, 32 output   4 slots
- G2S44-6444-27 . . . . . .24 input, 40 output   6 slots
- G2S44-6048-27 . . . . . .24 input, 48 output   6 slots
- G2S44-4816-27 . . . . . .32 input, 16 output   4 slots
- G2S44-5624-27 . . . . . .32 input, 24 output   4 slots
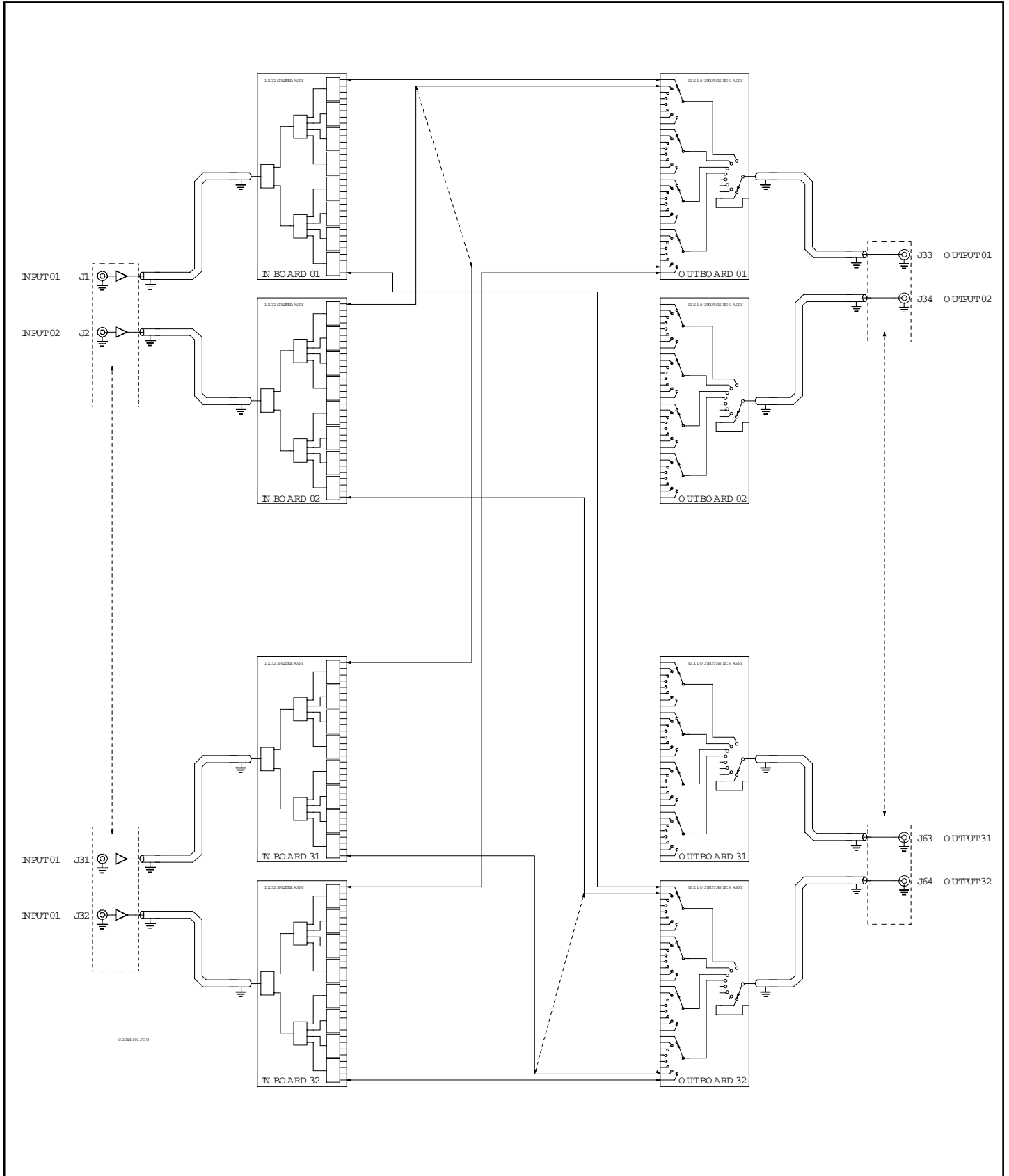- G2S44-6432-27 . . . . . .32 input, 32 output   4 slots

75 ohm input, 75 ohm output versions
- G2S44-1608-277 . . . . .8 input, 8 output   4 slots
- G2S44-2408-277 . . . . .16 input, 8 output   4 slots
- G2S44-2416-277 . . . . .8 input, 16 output   4 slots
- G2S44-3216-277 . . . . .16 input, 16 output   4 slots
- G2S44-4024-277 . . . . .16 input, 24 output   4 slots
- G2S44-4832-277 . . . . .16 input, 32 output   4 slots
- G2S44-5640-277 . . . . .16 input, 40 output   6 slots
- G2S44-6048-277 . . . . .16 input, 48 output   6 slots
- G2S44-4016-277 . . . . .24 input, 16 output   4 slots
- G2S44-4824-277 . . . . .24 input, 24 output   4 slots
- G2S44-5632-277 . . . . .24 input, 32 output   4 slots
- G2S44-6444-277 . . . . .24 input, 40 output   6 slots
- G2S44-6048-277 . . . . .24 input, 48 output   6 slots
- G2S44-4816-277 . . . . .32 input, 16 output   4 slots
- G2S44-5624-277 . . . . .32 input, 24 output   4 slots
- G2S44-6432-277 . . . . .32 input, 32 output   4 slots
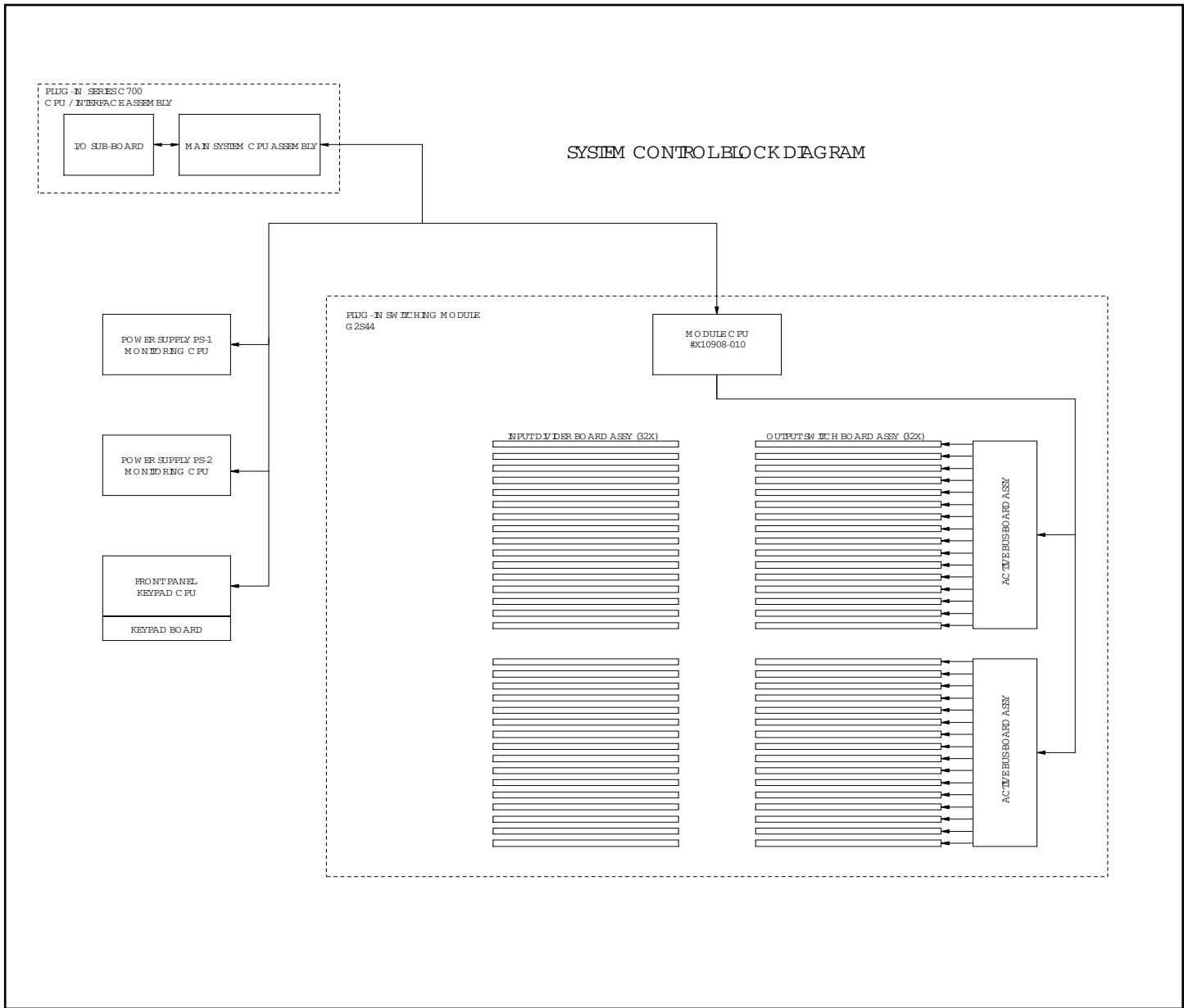
NOTE-1: Add a "T" suffix for TNC connectors or "S" for SMA though not recommended due to the high density of the signal I/O.

NOTE-2: Other configurations ar available upon request.

Simplified Signal Diagram

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System Block Diagram (when installed into a mainframe)

SYSTEM CONTROL BLOCK DIAGRAM

PLUG-IN SERIES C700
CPU / INTERFACE ASSEMBLY

I/O SUB-BOARD — MAIN SYSTEM CPU ASSEMBLY

POWER SUPPLY PS-1
MONITORING CPU

POWER SUPPLY PS-2
MONITORING CPU

FRONT PANEL
KEYPAD CPU

KEYPAD BOARD

PLUG-IN SWITCHING MODULE
G2S44

MODULE CPU
#X10908-010

INPUT DIVIDER BOARD ASSY (32X)

OUTPUT SWITCH BOARD ASSY (32X)

ACTIVE BUS BOARD ASSY

ACTIVE BUS BOARD ASSY

Signal Specifications

Switching elements . . . . . .Solid-State GaAs
Number of inputs . . . . .See configuration table
Number of outputs . . . . . . .See configurations table
Expander ports . . . . .Not included
Type of array . . . . .Non-blocking, unity gain, full fanout
Signal type . . . . .Single-ended, AC coupled
Signal connector . . . . .BNC standard, TNC or SMA optional
Frequency range . . . . .20MHz - 250MHz (min)
Impedance . . . . .50 ohm
Crosstalk isolation . . . .>58dB @ 70MHz
Input VSWR . . . .<1.5 : 1
-1dB compression . . . .+3dBm
Noise figure . . . .<10dB typical (config dependent)
Third order intercept . . . . .>18dBm typical (config dependent)
Switching speed . . . .<250uS (plus control time)

General Specifications

Module size . . . . .4 or 6 slot height
Control type . . . . .G2 compatible
Sparing . . . . .Hot-Swappable
Construction . . . . .Shielded aluminum case
DC power . . . .-207 configuration
+5V (digital), +7, -5V (analog)
Weight . . . .<6.5lbs (32x32)
Operating temp . . . . .0 to +70C
Non-operating temp . . . . .-20 to +85C
Humidity . . . . .0 to 95% (NC @ +25C)
MTBF . . . .>88,500 hours
(per MIL-HDBK-217F, N1
ground benign @ +25C)

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