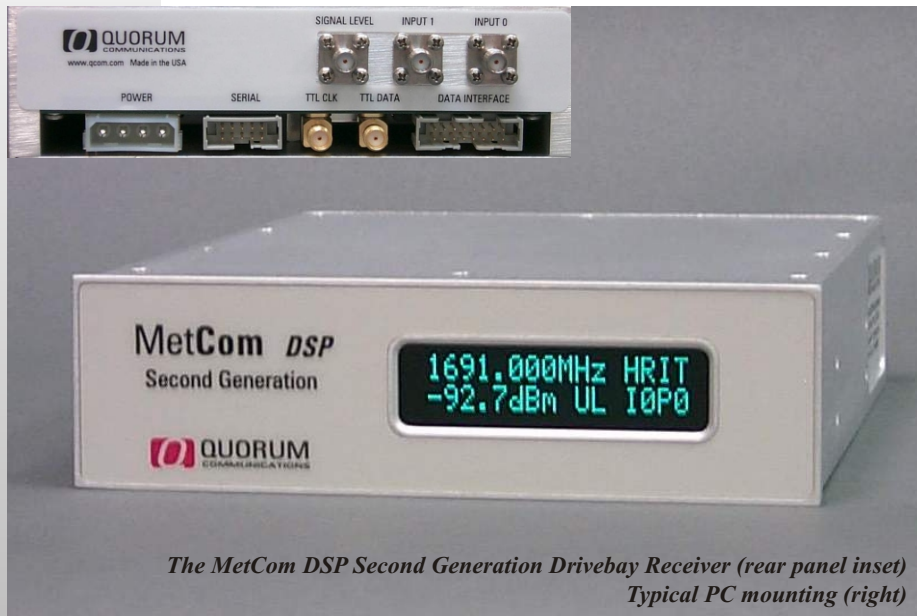


MetCom DSP SG Receiver

Second Generation DSP Data Receiver in a Drivebay Format



*The MetCom DSP Second Generation Drivebay Receiver (rear panel inset)
Typical PC mounting (right)*



Features

- QPSK / BPSK / PSK demodulation up to 2.7 MSPS
- QPSK / BPSK performance within 1 dB of theoretical, 0.5 dB typical
- Built in Viterbi decoding for next generation downlinks
- Direct 70 MHz IF conversion at 50 MSPS and 10 bit resolution
- Selectable RF inputs and IF bandwidths for multimode flexibility
- -90 dBm to -50 dBm input range
- RS-422, LVDS, TTL and 50 ohm TTL clock and NRZ data outputs
- Flexible 5 ¼" Drivebay format fits easily in most PC and Workstation enclosures
- RS-232 and TTL level serial control for setup, tuning, mode selection and status
- 2 line 16 character Vacuum Fluorecent display for status and signal level readout

Description

The MetCom DSP Second Generation Receiver is a versatile digital receiver for all current (11/2002) and many future weather satellite formats. The 5 ¼" drivebay format allows easy installation in most PC and workstation enclosures. The MetCom DSP SG can also be mounted in a standard external enclosure designed to support a CDROM or hard disk.

The MetCom DSP SG converts the incoming RF signal to a bandwidth limited and AGCed 70 MHz IF which is then directly digitized at 50 MSPS (million samples per second) with 10 bit resolution. Digital Signal Processing techniques are used to implement tuning, AGC, carrier tracking and symbol recovery. The demodulated data is then processed in a gate array to convert the varied signal formats to NRZ data and clock. Hardware Viterbi decoding is implemented when required. BER performance is within 1 dB of theoretical. DSP advantages include repeatable performance, long term operation without component drift and flexible multi-mode operation.

The Metcom DSP SG currently supports MSG HRIT, MSG LRIT, MTSAT HiRID, MTSAT LRIT, GOES GVAR, GOES LRIT, GMS S-VISSR, Meteosat PDUS, NOAA HRPT, DOD DMSP, Fengyun 1 CHRPT and Fengyun 2 S-VISSR reception.

The MetCom DSP SG is controlled by a PC compatible RS-232 connection. The user can set up downconverter offsets, tune frequencies, select demodulator modes (which may internally select IF SAW filters), select RF inputs, supply power to downconverters, control clock and data polarities and read signal levels, lock status and other receiver status by means of this serial link.

Multiple demodulator modes can be supported by a single MetCom DSP SG receiver. Data and clock outputs include RS-422, LVDS, TTL and 50 ohm TTL on IDC and SMA connectors to facilitate connection to typical decryption units and frame formatters.

Specifications (subject to change without notice)**RF**

Input Frequency	126 to 154 MHz
Input Dynamic Range.....	-90 to -50 dBm nominal
Image Rejection	>60 dB
Input Impedance.....	50 ohms
Input Return Loss.....	>15 dB selected input >10 dB unselected input
Input To Input Isolation.....	>60 dB
IF Frequency	70 MHz
IF Bandwidth.....	0.5 to 5.0 MHz, 0.5 MHz increments SAW filter(s) depends on mode(s)
IF Filters (SAW).....	1 standard, 2nd optional
LO Frequency.....	196 to 224 MHz in 25 KHz steps
Signal Strength (RSSI) Output.....	0 to 4 VDC, 30 mV/dB nominal -50 dBm = 2.50 volts

Demodulator (DSP)

Demodulator Modes.....	QPSK, BPSK, PSK
Demodulator Implementation Loss....	< 1 dB at 10E-6 BER (QPSK / BPSK) 0.5 dB typical
Demodulator Type.....	Digital Costas Loop
Baseband Filters	Root Raised Cosine (RRC) typical = 0.4

Data

Supported Data Encoding	NRZ-L, NRZ-S, NRZ-M, Biphase-L
Supported Symbol Rates	0.1 to 2.7 MSPS
Convolutional Decoding	Viterbi rate $\frac{1}{2}$ K=7, G1=171 G2=133, V.35 CCITT and IESS descrambling, 5.2 dB coding gain at 10-5 BER

Electrical / Mechanical

Supply Voltage	5 V @ 0.75 A, 12 V @ 0.65 A, 1.65 A max if powering 2 downconverters
Downconverter Power Output.....	2 x 12V at 500 ma (thermal fuse)
Power Connector.....	4 pin PC power connector
RF Input Connectors	SMA female
Signal Strength Output Connector	SMA female
Size.....	$\frac{1}{2}$ high, 5 $\frac{1}{4}$ " drivebay 5.85" W x 8.5" D x 1.7"H (14.7 cm W x 21.6 cm D x 4.32 cm H)
Weight	3.1 lbs (1.41 Kg)
Operating Temperature.....	32 to 122 F (0 to 50 C), non-condensing

Interface

Control Interface	RS-232 and TTL serial at 9600 baud
Control Interface Connector.....	RS-232 - 10 pin IDC
Data / Clock Interface	RS-422, LVDS, TTL and 50 ohm TTL
Data / Clock Interface Connector.....	RS-422, LVDS and TTL - 16 pin IDC 50 ohm TTL - SMA female 93 ohm TTL available by special order

Supported Modes

- MSG HRIT (Europe)
1.148 MBPS, QPSK, NRZ
with viterbi
- MSG LRIT (Europe)
146.942 KBPS, BPSK, NRZ
with viterbi
- GOES LRIT (USA)
64 and 128 KBPS, BPSK, NRZ
with viterbi
(final specifications are
pending)
- MTSAT LRIT (Japan)
75 KBPS, BPSK, NRZ
with viterbi
- MTSAT HiRID (Japan)
Fengyun 2 S-VISSR (China)
GMS S-VISSR (Japan)
660 KBPS, BPSK, NRZ-M
- GOES GVAR (USA)
2.11 MBPS, BPSK, NRZ-S
- Meteosat PDUS (Europe)
166.66 KBPS, PSK, Biphase-L
- NOAA HRPT (USA)
665.4 KBPS, PSK, Biphase-L
- DOD DMSP RTD (USA)
1.024 MBPS, BPSK, NRZ
- Fengyun 1 CHRPT (China)
1.3308 MBPS, PSK, Biphase-L