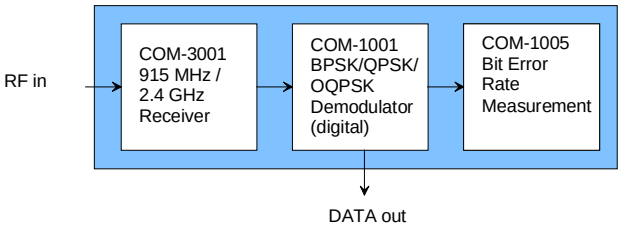
MSS-318 915 MHz / 2.4 GHz BPSK/QPSK/OQPSK RECEIVER

Key Features

- Digital BPSK/QPSK Demodulator.
- Variable data rates up to 20 Mbps (QPSK) / 10 Mbps (BPSK).
- Differential / non-differential decoding.
- Includes raised cosine square root filter with 20%, 25%, or 40% rolloff options.
- Dual-band, [902-928 MHz] and [2.025 – 2.5 GHz] receiver, software selectable.
- Sensitivity: -56 dBm RF input for full scale 10-bit output samples.
- Built-in RF AGC, 70 dB dynamic range.
- Low phase-noise frequency synthesizer can be tuned over entire range by steps of 100 KHz.
- Dual 10-bit Analog-to-Digital converters, 40 Msamples/s.
- Bit error rate measurement.
- Single 5V DC supply

Block Diagram



The MSS-318 is a custom assembly of three ComBlock modules. Detailed information about the individual modules can be found as follows:
COM-3001:
http://www.comblock.com/download/com3001.pdf

COM-1001:
http://www.comblock.com/download/com1001.pdf

COM-1005:
http://www.comblock.com/download/com1005.pdf

Electrical Interface

Inputs / Outputs

Analog Signals	Definition
RF_IN	902 – 928 MHz or 2025 – 2500 MHz. SMA male connector. 50 Ohm impedance. Receiver sensitivity: -56 dBm at RF input for full scale signal at A/D converter. AGC range: 70 dB.
DATA_I_OUT[3:0]	4-bit soft-quantized demodulated bits, real axis. Unsigned representation: 0000 for maximum amplitude ‘0’, 1111 for maximum amplitude ‘1’. When the serial output mode is selected, I and Q samples are transmitted one after another on this interface. I is transmitted before Q.

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DATA_Q_OUT[3:0]	4-bit soft-quantized demodulated bits, imaginary axis. Same format as DATA_I_OUT. When the serial output mode is selected, this interface is unused.
BIT_CLK_OUT	Demodulated bit clock. One CLK-wide pulse. Read the output signal at the rising edge of CLK when BIT_CLK_OUT = '1'.
CARRIER_LOCK	'1' when the demodulator is locked, '0' otherwise.
Serial Monitoring & Control	DB9 connector. 115 Kbaud/s. 8-bit, no parity, one stop bit. No flow control.

Operations

Monitoring and Control

The MSS-318 is controlled and monitored over a single serial interface from a host PC running Microsoft windows operating system. A graphical user interface (ComBlock Control Center) is provided. For installation instructions, please read http://www.comblock.com/download/ccchelp.pdf

Step 1: Install the ComBlock Control Center from the CD.

Step 2: Start the Comblock Control Center from the desktop menu Start | Programs | ComBlock Control Center.

Step 3: Configure the individual ComBlock modules. Each ComBlock module is configured through 8-bit registers. See specifications for details.

Configuration Example

2. 49999 Mbit/s, QPSK, 915 MHz.

COM-3001:
REG0 = 0xC0
REG1 = 0xCA
REG2 = 0x89
REG3 = 0x36
REG4 = 0x80
REG5 = 0x08
REG6 = 0x08
REG7 = 0x92
REG8 = 0x00

COM-1001:
REG0 = 0xFF
REG1 = 0xFF
REG2 = 0x0F
REG3 = 0x00
REG4 = 0x00
REG5 = 0x00
REG6 = 0xB2
REG7 = 0x1C

COM-1005:
REG0 = 0x0D

Firmware Upgrades

Occasional firmware upgrades are posted at the ComBlock web site: www.comblock.com/download.htm . New firmware can be installed into the MSS-318 by using the ComBlock Control Center.

Frequency Reference

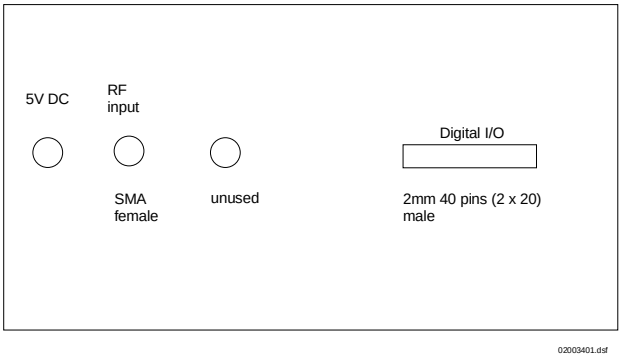
The receiver center frequency error (due to the crystal 50ppm stability) was measured at –28.5 KHz at 915 MHz.

This is equivalent to –76 KHz at 2.45 GHz.

This error can be compensated for by entering a compensation factor in registers REG3,4,5 of the COM-1001 demodulator.

Filter changes

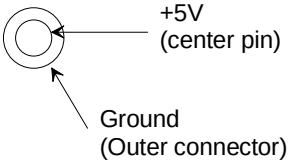
Raised cosine square root filters can be configured with different rolloff factors (sharpness). Changing the filter rolloff requires loading new firmware for the COM-1001 module using the ComBlock Control Center.



Front Panel

Power Supply

5V DC +/- 0.25V



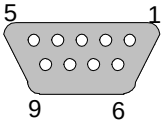
Mechanical

Width :8”
Depth : 5”
Height: 3”
Color: black
Weight: 3 lbs.

Pinout

Serial Link

The DB-9 connector is wired as data circuit terminating equipment (DCE). Connection to a PC is over a straight-through cable. No null modem or gender changer is required.



DB-9 Female

2 Transmit
3 Receive
5 Ground

Ordering Information

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