

Quick Guide to the Quorum Communications MetCom DSP Receiver

The Drivebay receiver has clock and data available on SMA connectors. These are jumpered for 50 ohm TTL. You can change them to 93 ohm TTL by removing the cover from the bottom of the unit and moving the jumpers as shown on the board.

The general purpose data interface is on the 16 pin IDC connector. The pinout is:

- 1 - RS-422 Data +
- 2 - RS-422 Data -
- 3 - RS-422 Clock +
- 4 - RS-422 Clock -
- 5 - TTL Serial Control Data from receiver (when enabled)
- 6 - TTL Serial Control Data to receiver (when enabled)
- 7 - 50/93 ohm TTL Data
- 8 - Signal Ground
- 9 - 50/93 ohm TTL Clock
- 10 - Signal Ground
- 11 - TTL Data (when enabled)
- 12 - Signal Ground
- 13 - TTL Clock (when enabled)
- 14 - Signal Ground
- 15 - TTL level data polarity control
- 16 - TTL level control select (RS-232 default when open)

The RS-422 and 50/93 ohm clock and data signals are always present. By default, the data is positive true ($0v = 0$, $5v = 1$) and the data changes on the falling (1 to 0) edge of the clock. This can be changed with the serial control interface.

The TTL level data polarity input is normally open. When grounded, it inverts the polarity of the data output on all interfaces. This is intended to be used with a hardware control for DMSP data polarity and is normally not used.

The TTL level control select input is normally left open. This selects control of the receiver by means of the RS-232 serial input and disables TTL level clock and data output from pins 11 and 13. When grounded, it disables the RS-232 control input and enables control of the receiver by means of TTL level serial data on pins 5 and 6. TTL level clock and data are also enabled on pins 11 and 13. This is intended to be used with an internal control / frame formatter board (ISA or PCI). Serial control of the receiver is at 9600 baud, 8 data bits, 1 stop bit and no parity. The pinout of the serial interface 10 pin IDC connector is:

- 1 - Carrier Detect (always on)
- 2 - Data Set Ready (tied to DTR)
- 3 - Receive Data (transmit data from receiver)

- 4 - Request to send (tied to CS)
- 5 - Transmit Data (received data to receiver)
- 6 - Clear to Send (tied to RS)
- 7 - Data Terminal Ready (tied to DSR)
- 8 - Ring Indicator (not used)
- 9 - Signal Ground
- 10 - Signal Ground

This interface is really just a 2 wire TX data / RX data interface with the other control signals wrapped around. The pinout is directly compatible with the 9 pin serial interface on an IBM PC. No gender changers or null modems are required.

The receiver has 2 RF inputs, Input 0 and Input 1. Although only one of these inputs is active at a time, each of them has a set of independently selectable parameters that are retained between input selections and power up / down. This means that the receiver will power up with the last configuration and can easily switch modes by selecting 1 of the 2 inputs. The parameters for each input are:

Downconverter Offset - 0000.000 MHz to 9999.975 MHz in 0.025 MHz steps
Receive Frequency - 0000.000 MHz to 9999.975 MHz in 0.025 MHz steps

The resultant frequency actually tuned by the receiver which is the programmed receive frequency minus the downconverter offset must be in the range of 126.000 to 154.000 MHz.

Received Clock Polarity
Received Data Polarity
Downconverter Power On / Off
Demodulator Mode (on multi-mode receivers)

The receiver display shows the current operating configuration and looks like:

1685.700MHz GVAR
-63.2dBm LK I0P0

The I0P0 field changes every 2 sec to C0D0

This shows the current receive frequency and demod mode on the top line, the current signal level in dBm, the demod status LK = locked, SR = searching for a signal and VF = trying to verify signal.

The signal level readout has a relative accuracy of 0.1dB and an absolute accuracy of about 2 dB and is derived from a true log amp. Sun noise measurements can be made with this.

The IOP0 and C0D0 fields have the following meanings:

I0 - Input 0 is selected
I1 - Input 1 is selected
P0 - No power is being output from the inputs
P1 - Input 0 is outputting 12V
P2 - Input 1 is outputting 12V
P3 - Both inputs are outputting 12V
C0 - Data changes on the falling edge of the clock
C1 - Data changes on the rising edge of the clock
D0 - Data is positive true
D1 - Data is negative true

Commands:

The serial control interface is intended for machine use and uses a simple format. By default and on power up it sets to a "brief" mode that does not echo input. It can be changed to a more human friendly "verbose" mode by sending 'v'. This mode echos characters and appends new lines.

The command structure is:

Cxx\r

where C is a single letter command, xx is one or more required parameters and \r is a return character.

Commands that are recognized return a single letter, k if it was accepted or x if rejected. Commands are rejected if the parameters are out of range. You always get back to the beginning by sending \r.

The commands are:

f1685.700\r - tune frequency, must be a 25KHz value and result in an actual tuned frequency of 126.0 to 154.0 MHz

o1553.500\r - set downconverter offset

i0\r, i1 - select RF input

p0\r, p1 - turn off / on downconverter power on selected input

c0\r, c1 - set data change on clock falling / rising edge

d0\r, d1 - set data to positive / negative true

di\r - invert data polarity (does not change configuration, use as a software invert method)

mg\r - set mode to GVAR

mode commands generally take the first letter of the mode, h for hrpt, d for dmsp, g for gvar

S commands return status

sf\r - return current frequency - f1685.700\r

so\r - return offset - o1553.500\r

si\r - return input - i0\r

sp\r - return power - p0\r

sc\r - return clock - c0\r

sd\r - return data - d0\r

sm\r - return mode - GVAR\r

ss\r - return signal - -65.2dBm\r

sv\r - return signal voltage - 2.304volts\r

sl\r - return demod lock status - LK\r

s0\r - return all status for input 0

s1\r - return all status for input 1

sa\r - send signal and lock status automatically every 0.5 sec - -63.4dBm LK\r

sn\r - stop sending automatic status

v - verbose mode

b - brief mode

When in verbose mode, you can backspace once the command is started. Also, + and - will add or subtract 25 KHz.