Controlling the Frequency Reference Remotely Over USB

The Frequency Reference board includes an FTDI interface. By using a USB to FTDI adapter you can send commands to the Frequency Reference to choose a frequency from the common frequency table, or set the mode, the divisor and the prescaler value. All commands are ASCII text so they can be sent from a terminal emulator. Alternatively, you could create an application with a nice "Front Panel" or that controls the Frequency Reference dynamically.

The FR expects to communicate at 8-N-1 bits at a baud rate of 9600.

The Frequency Reference is controlled by messages in the format “#PCNNNNN.” defined as follows.

- ‘#’ start of message. If the first character has any other value the entire message will be ignored.

- P: a single ASCII character denoting message type. The initial value is ‘b’. All undefined values will cause the message to be ignored.

- C: a single ASCII character indicating the command. All undefined values will cause the message to be ignored. Valid values are;

‘T’ – choose a frequency value from the table based on NNNNN. (Sets mode to TABLE_VALUES.)
‘D’ – set the divisor to NNNNN. (Sets mode to DIVISOR,)
‘P’ – set the prescaler based on NNNNN. (See NOTE.)
‘M’ – set the mode based on NNNNN. (Table index / divisor are left unchanged.)

NOTE: Setting the prescaler to a value other than 1 will cause the display to read incorrectly. Setting the prescaler persists until another set prescaler command or the unit is reset (turned off and on).

- NNNNN: a five-digit decimal number. Non-digit characters or incorrect number of characters will cause the message to be ignored. Valid number ranges are as follows. Invalid numbers will cause the message to be ignored.

‘T’ – NNNNN range is 0 to 37.
‘D’ – NNNNN range is 0 to 65535.
‘P’ – NNNNN range is 0 to 5.
NNNNN = 0; turn the divider off (no output)
NNNNN = 1; prescaler set to 1
NNNNN = 2; prescaler set to 8
NNNNN = 3; prescaler set to 64
NNNNN = 4; prescaler set to 256
NNNNN = 5; prescaler set to 1024

'M' – NNNNN range is 0 to 1.

NNNNN = 0; set mode to table (rotary picks from table)

NNNNN = 1; set mode to divisor (rotary increments/decrements divisor directly)

- '.' end of message. If this character is omitted or has any other value the entire message will be ignored.

Examples

Set the frequency to 50kHz via the table: "#bT00014."
Set the frequency to 2.5MHz via the divisor (divisor = 20,000,000/(2*2,500,000)-1 = 3): "#bD00003."
Set the frequency to 12,500 Hz via the divisor (divisor = 20,000,000/(2*12,500)-1 = 799): "#bD00799."
Set the frequency to 12,345 Hz via the divisor (divisor = 20,000,000/(2*12,345)-1 = 809): "#bD00809."
Actual frequency will be 20,000,000/(2*(809+1)) = 12,345.679 Hz
Set the prescaler to 1024: "#bP00004."