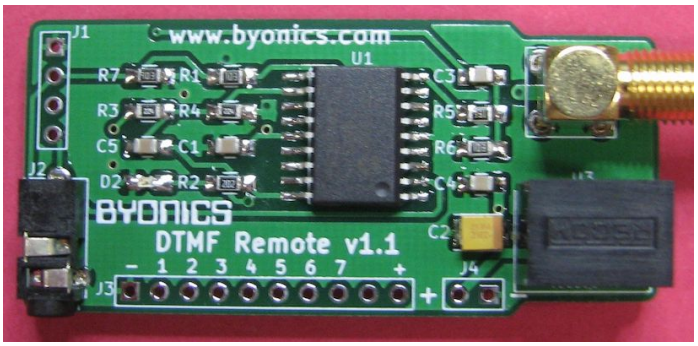
DTMF Remote Manual

Version 0.5 – June 28, 2019

Overview



The Byonics DTMF Remote is a miniature DTMF decoder intended for remote control applications. It includes a VHF transceiver and password controlled access to seven digital output lines. The DTMF Remote can be configured with any terminal program and can optionally transmit a tone sequence to acknowledge receipt of a command. Typical applications are high-altitude balloon cut-down commands, remote rocket ignition, and high power relay controls for remote sites such as repeaters or digipeaters.

Receiver

The Byonics DTMF Remote can be accessed via any VHF transmitter with a DTMF keypad operating between 135 and 174 MHz. Options for password protection, frequency choice, and DCS or CTCSS decoding provide for a high level of protection from intentional or accidental access.

Outputs

The Byonics DTMF Remote has seven logic level outputs that may be momentary or latched, and can be globally configured as active high or active low. It was designed to optionally use low-cost eBay relay boards for AC and high power operations. The highly efficient switching power supply on the decoder provides power through a ten-pin ribbon connector cable (not included) to source up to one ampere for the relay board.

Command Acknowledgement

The DTMF Remote can transmit a tone sequence to identify and confirm received commands. The tones are followed by an amateur radio callsign in Morse code. Note that the remote can receive between 135 and 174 MHz, but it will only transmit in the amateur radio 2-meter band. The RF output of the transmitter is nominally 1 watt and an amateur radio license is required to utilize this feature.

LED

The DTMF Remote includes an LED to indicate the status of the unit. The LED will be on solid when transmitting, flash quickly when receiving DTMF tones, and flash slowly when locked.

Power Wiring

The DTMF Remote is powered with 8-28V DC applied to the J4 port. Current draw is about 320mA during transmit, 30mA when receiving, and 10mA when idle.

Configuration

The Byonics DTMF Remote is configured via the 2.5mm TRS serial I/O jack J2 using the Byonics USB-2.5 or DB9-2.5 cable. It can also be configured and powered via the 1x4 serial & power holes marked J1 using the Byonics USB-TTL cable. Pin 1 of J1 is the corner square pad for ground/black, pin 2 is serial in/green, pin 3 is 5V/red and pin 4 is serial out/white. Since J1 can provide power, powering via J4 is not necessary. It is not necessary to solder a connector to J1, just insert the pins and slightly tilt to make a good contact. Any computer and operating system with a terminal program can be used. In addition to controlling the digital outputs, any decoded DTMF tone or sequence will be output through the serial port.

To access the configuration menu, set a terminal program to the corresponding COM port, set the parameters to 9600 baud N81 and connect the cable to either J2 (2.5mm) or J1 (1x4). If using J2, apply power via port J4. The product name and firmware version should appear in the terminal. Press ESC and the config menu shown on the right will appear with the current value shown after each setting. Enter the number of the setting to be changed, press Enter, and then enter the new value and press Enter. After setting all desired options, cycle power to return to normal operation.

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Byonics DTMF Remote v0.7
Config Menu
1>RX Freq (144.3300)
2>RX Tone (0)
3>RX Powersave (0)
4>TX Enable (0)
5>TX Freq (144.3300)
6>TX Tone (0)
7>TX ID (DTMF)
8>Unlock Code (12345)
9>Active Low (0)
Enter Selection>
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1> RX Freq - Enter a frequency from 135 to 175MHz using all four digits after the decimal point
2> RX Tone - Enter a value from 1 and 121 to select CTCSS or DCS decoding, or 0 to disable
3> RX Powersave - Enter 1 for periodic receiver sleep, or 0 for continuous receive
4> TX Enable - Enter 1 to enable transmission acknowledgements, 0 to disable
5> TX Freq - Enter a frequency from 144 to 148MHz using all four digits after the decimal point
6> TX Tone - Enter a value from 1 and 121 to select CTCSS or DCS encoding, or 0 to disable
7> TX ID - Enter an amateur radio callsign to legally identify the transmissions
8> Unlock Code - Enter an up to 6 digit number as a security key
9> Active Low - Enter 1 for active low outputs (inverts all outputs), 0 for active high outputs

DTMF Commands and Response

There are five commands used to control the DTMF remote and its outputs. These are transmitted by holding down the controlling radio PTT switch, and pressing the appropriate DTMF key.

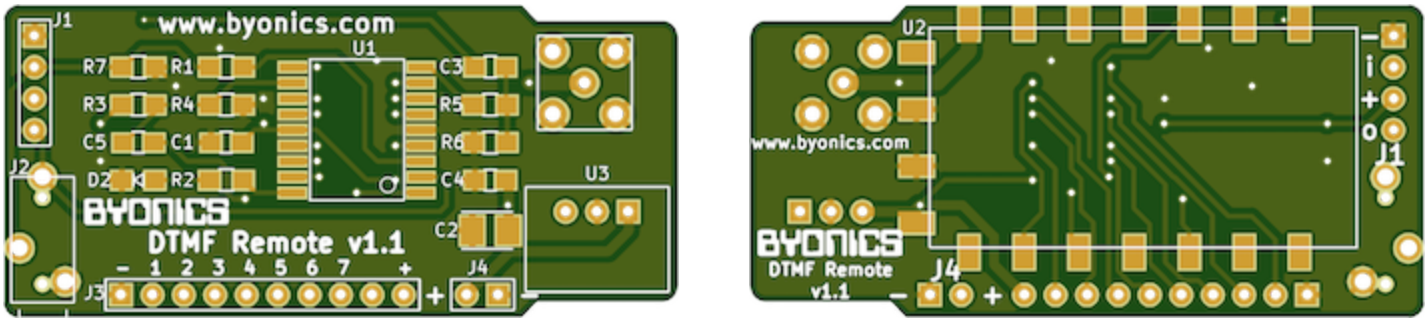
- **DTMF A key followed by a series of number keys 1-7** - Sets the corresponding outputs HIGH as long as the DTMF number key is sent. The output returns to low when the DTMF number key is released. If enabled, the remote will respond with a number of beeps indicating the last switched output followed by the Morse ID.
- **DTMF B key followed by a series of number keys 1-7** - Sets the corresponding outputs high, and leaves them in that state (latching). If enabled, the remote will respond with a number of beeps indicating the last latched output, then a higher beep, followed by the Morse ID.

- **DTMF C key followed by a series of number keys 1-7** - Sets the corresponding outputs LOW, and leaves them in that state (latching). If enabled, the remote will respond with a number of beeps indicating the last latched output, then a lower beep, followed by the Morse ID.
- **DTMF STAR** - Locks unit to prevent any operations. If enabled, the remote will respond with a decreasing tone sequence, followed by the Morse ID.
- **DTMF STAR followed by unlock code** - Unlocks unit and allows for the above operations. If enabled, the remote will respond with an increasing tone sequence, followed by the Morse ID.

Notes

- Attempting to control output 9 will control output 1. Attempting to control output 0 or 8 will have no effect.

PCB



Schematic