Remote control system

The DTMF remote control has 1-7 individual outputs that can be statically high, low, or programmed to transmit low or high pulses of 1-7 outputs from 100 mS to 4 minutes in 13 steps (Table 1).

7 LEDs indicate status of outputs 1-7, while LED 8 indicates PTT function, LED 9 displays DTMF signal, LED 10 shows +12V DC power supply.

After the successful DTMF control code is received, a CW message is sent, so the PTT function is required to start the transmitter.

The state of output 1-7 is noted by the controller, i.e., after switching on the panel, the ports are restored to the last state before switching off.

The delay between the PTT acting and the “R” acknowledgement may be adjusted between zero and 30 seconds using output 8.

The complete (16-key) DTMF keyboard is required for commands.

The three-digit password is pre-programmed (default 123), which can only be changed by reprogramming the PIC EEDATA memory. Acceptable values in EEDATA are 00,01,02,03,04,05,06,07,08,09,0A,0B,0C,0D.

The DTMF command line always starts with a "\*" character.

Hardware:

DTMF decoder: MT8870,

program storage and logic: PIC 16F628A microcontroller,

output: ULN2803 (8 darlington transistors each capable of switching 50V, 500mA).

Examples: (\* 123 is the default encoder password)

Simultaneous control of all outputs:

\* 1230 # sets the output 1-7 to a high level at the same time

\* 1239 # sets the output 1-7 to a low level at the same time

Control outputs individually:

\* 123510 # sets output 5 to a continuous high level and stores this status

\* 123 = password

5 = output number

1 = set to high

0 = status must be stored

\* 123500 # sets output 5 to a continuous low level and stores this status

\* 123 = password

5 = output number

0 = set to low

0 = status must be stored

Output pulse control:

\* 123612 # sending a 200mS positive pulse to output 6

\* 123 = password

6 = output number

1 = positive pulse sending

2 = pulse length

Note positive pulse is only displayed when the output is at a low level

\* 123602 # sending a 200mS negative pulse to output 6

\* 123 = password

6 = output number

0 = send negative pulse

2 = pulse length

Note Negative Pulse appears only when the output is at a high level

\* 123 802 # sets the PTT delay at 2 seconds

\* 123 = password

8 = timer function

0 = tens

2 = units

Note maximum value of 30 seconds (\*123830#)

Rules:

"\*" Always restarts the code input, so if we noticed that the code was in error, you only need to close the entry with the "\*" character.

If there is no DTMF tone for 7 seconds, the encoder will reset and wait for a "\*" character.

"#" Starts executing the line of the entered command.

Only after receiving a valid command cue, the PTT output changes to an active low level and after the 2sec wait, outputs the "R" morse, then the PTT becomes inactive and then executes the command.

After receiving the pulse command, two “R” codes are transmitted, the first indicating the successful reception of the code, the second “R” indicating the completion of the pulse.

Until the timer finishes a new command, the encoder cannot receive another.

Table 1:

Pulse code Pulse length

1 100 mS

2 200 mS

3 300 mS

4 400 mS

5 500 mS

6 1 sec

7 2 sec

8 3 sec

9 4 sec

A 1 min

B 2 min

C 3 min

D 4 min

E and F (\* #) disabled

The password is stored in the PIC EEDATA in the first three locations.

This can only be changed with a PIC programmer.

Morse code "R" is also stored in PIC EEDATA at 40,41,42.

At other locations, the status of the outputs is stored, and all ports are inactive in the default position.