Frequency Counter 50 MHz

The frequency counter is a flexible device with programmable IF offset allow make measurement guaranteed up to 50MHz frequency. Frequency counter could display the actual frequency of with user defined IF offset.

- PIC16F628A processor
- 16x2 character LCD
- Pre-programmed IF offsets
- Direct frequency measurement (no IF offsets)
- Indirect frequency measurement (IF+VFO, VFO-IF, IF-VFO)
- Accuracy ±10Hz
- Frequency resolution 10Hz
- PCB dimensions: 82 x 38 mm
- Power supply +7..12V, 20mA
- Input frequency: 100Hz..50MHz

Operation

All normal Operating modes required Jumper J3 "A"-"B" to be fitted.

The LCD display contrast can be adjusted by R1. The input buffer sensitivity can be adjusted by R5. It's optimum sensitivity is usually found when the voltage on Q1 collector is between 1.8 to 2.2 volts.

Switch settings (SW1-SW4)

The default switch settings are switches SW1 to SW4 all OFF (not fitted)

SW1	OFF	Normal operation – the frequency displayed is the actual frequency of input signal
	ON	IF Offset Operation – the frequency displayed using the IF offset (as selected by SW2)
SW2	OFF	Frequency + IF
	ON	Frequency - IF
SW3	OFF	Extended mode disabled
	ON	Extended mode – the IF offset frequency is displayed on the 2nd line of LCD and power up sequence has additional information
SW4	OFF	Compact mode – the frequency is displayed as 0.00000 MHz
	ON	Compact mode – the frequency is displayed as 0.000 MHz

Selecting IF offsets

IF Offset select required Jumper J3 "B" – "C" to be fitted at power up of device

Any IF offset frequency can be programmed into the memory of process. To make life easy there is a preprogrammed table of most used IF offset frequencies. Also, possible to define the IF offset manually.

IF offset select using the table of frequencies (step by step)

- Power device off
- Jumper SW1 to be fitted. SW2, SW3, SW4 to OFF.
- Remove the shorting link from jumper pins "A" and "B"
- Put the shorting link between jumper pins "B" and "C"
- Power device on
- The frequency counter will display the IF offset frequency
- Change the Switch SW3&SW4 settings whilst in this mode till you have the desired IF offset
    - SW4 – ON, steps forward in table (SW4=OFF – do nothing)
    - SW3 – ON, steps backwards in table (SW3=OFF – do nothing)
- To store the new IF Offset simply remove the jumper from Pins "B" and "C"
- The display will show "Saving settings" for 1 second and device will revert to normal operation
- Put the shorting link back on Pins "A" and "B" to normal mode.
- Reboot the device.

Pos	Frequency	Pos	Frequency	Pos	Frequency	Pos	Frequency
1	0.000 MHz	8	0.480 MHz	15	3.180 MHz	22	9.216 MHz
2	0.450 MHz	9	1.560 MHz	16	3.955 MHz	23	9.720 MHz
3	0.455 MHz	10	1.600 MHz	17	5.138 MHz	24	10.700 MHz
4	0.460 MHz	11	1.650 MHz	18	5.500 MHz	25	11.200 MHz
5	0.465 MHz	12	2.075 MHz	19	6.000 MHz	26	11.700 MHz
6	0.470 MHz	13	3.035 MHz	20	8.000 MHz	27	11.800 MHz
7	0.475 MHz	14	3.045 MHz	21	9.000 MHz	28	21.400 MHz

IF offset select using the Manual setup (step by step)

- Power device off
- SW1, SW2, SW3, SW4 to OFF.0
- Remove the shorting link from jumper pins "A" and "B"
- Put the shorting link between jumper pins "B" and "C"
- Power device on
- The frequency counter will display the IF offset frequency
- Change the Switch SW3&SW4 settings whilst in this mode till you have the desired IF offset
    - SW4 – ON, increment the IF offset in 1 MHz steps (SW4=OFF – do nothing)
    - SW3 – ON, increment the IF offset in 100 KHz steps (SW3=OFF – do nothing)
    - SW2 – ON, increment the IF offset in 10 KHz steps (SW2=OFF – do nothing)
    - SW1 – ON, increment the IF offset in 1 KHz steps (SW1=OFF – do nothing)
- To store the new IF Offset simply remove the jumper from Pins "B" and "C"
- The display will show "Saving settings" for 1 second and device will revert to normal operation
- Put the shorting link back on Pins "A" and "B" to normal mode.

Note: the maximum IF offsets that can be set is 45.999 MHz

Calibration

Method 1 – Hardware

Simply connect to a known frequency source and adjust the trimmer capacitor so the correct value is displays.
If you are unable to adjust the displayed frequency, then use the software method, described below.

Method 2 – Software

Software calibrarion setup required all switches SW1 – SW4 to be OFF and jumber J3 "A" to "C" to be fitted at power up.

- Power device off
- SW1, SW2, SW3, SW4 to OFF.
- Remove the shorting link from jumber pins "A" and "B"
- Put the shorting link between jumper pins "A" and "C"
- Power device on
- The frequency counter will display input frequency
- To increase the displayed frequency set SW1 to ON position – frequency will step up.
- To decrease the displayed frequency set SW2 to ON position – frequency will step down.
- Once you are satisfied with the adjustment, remove the jumper from Pins "A" and "C"
- The display will show "Saving settings" for 1 second and device will revert to normal operation
- Put the shorting link back on Pins "A" and "B" to normal mode.
- Reboot the device
- Final adjustment should be done as for Method 1 (hardware)

50MHZ Frequency Counter

WH1602A

R1

SW1
SW2
SW3
SW4

C4

C5

+

RV3YF

C3 Q1

C2

R10 R9

Частотомер - ЦШ с ЖКИ v2.0

1

1   16

R3

R2

A
B
C

J3

К
Б
Э

VT1

R6
R4
L1
R8

C6   C7

R5

DD2

VD1

C8

+

R7

C1

J1

−
+

Input signal

J2