DP-666 High Sensitivity Color Screen Radio

Product Manual V1.0（Based on PE5PVB 2.11 firmware）

Product Introduction:

DP-666 is a high-sensitivity radio based on NXP's high-performance automotive-grade TEF6686 chip, which has excellent selectivity and ultra-high sensitivity. This automotive DSP tuner has a wide range of functions and advanced algorithms (CEQ, EMS, iMS and PACS, noise canceller...), SDR(software-defined radio) signal processing, especially for improvement of multipath, adjacent frequency interference, weak signals There are significant advantages in processing and noise cancellation.

DP-666 is a radio built on PE5PVB's open source project TEF6686_ESP32. In addition to listening to radio stations, the project also supports a wealth of advanced features, such as: almost all RDS (Radio Data System) data display, automatic/manual station scanning, squelch function, battery voltage display, changeable themes, multilingual, station presets, and more.

We redesigned the circuit board with reference to the mature TEF6686 front-end receiving circuit, and equipped the DP-666 with a 2.8-inch LCD color screen with resistive touch based on the open source project. While ensuring the portability of the machine, it can display rich RDS information (RDS information requires local radio support); a numeric keypad is added to facilitate users to quickly input frequencies; and a large-capacity 5000mAH battery supports longer standby time.

In short, I hope you will be satisfied with this portable high-sensitivity travel radio!

As the firmware is still under development and new features will be introduced, this manual is bound to have omissions and errors. Please understand.

PE5PVB project : https://github.com/PE5PVB/TEF6686_ESP32

DP-666 project : https://github.com/flyoob/TEF6686_ESP32

Basic Parameters:

Main control chip: ESP32-WROOM-32U, Flash 4MB, Wi-Fi + Bluetooth dual-core module

Display technology: 2.8-inch 320x240 resolution, IPS full-viewing angle LCD screen with resistive touch

Control method: Default numeric keyboard input and knob tuning, also supports third-party touch screen firmware*

Frequency range:

FM	65-108MHz	Suitable for Russia/Eastern Europe
	76-95MHz	Suitable for Japan
	76-108MHz	Suitable for campus broadcasting
	87-108MHz	Suitable for Europe/Oceania/Africa/Asia
	87.5-108MHz	Suitable for China/United States
	OIRT default stepping is 30kHz, FM stepping is 50/100/200kHz, default is 100kHz	
SW	1700-27000kHz	Default stepping 5kHz
MW	522-1791kHz	Default stepping 9kHz
	520-1720kHz	Default stepping 10kHz
LW	144-513kHz	Default stepping 9kHz

Receiving indicators:

	Telescopic antenna receiving sensitivity	Selectivity
FM	FM(S/N=30dB) ≤ 0.5uV	FM ≥ 60dB(±150kHz)
SW	SW(S/N=20dB) ≤ 10uV	SW ≥ 60dB(BW=3kHz/±5kHz)
MW	MW(S/N=20dB) ≤ 10uV	MW ≥ 60dB(BW=3kHz/±9kHz)
LW	LW(S/N=20dB) ≤ 10uV	LW ≥ 60dB(BW=3kHz/±9kHz)

Antenna interface: Full-band external antenna, standard SMA female connector

Speaker output: Using TI audio amplifier chip TPA6211A1, driving 45x45mm large-size sound cavity speaker, power 4Ω/3W, lower output noise and less distortion.

Headphone output: Using AD headphone amplifier chip MAX97220, standard 3.5mm audio connector output, independent dual amplifier design for speakers and headphones, optimized separately without affecting each other.

Battery: 3.7V/5000mAh, 18.5Wh, lithium battery size 65x55x10mm

Current consumption: About 3.7V/350mA, use time about 15 hours

Communication interface: Built-in CH340 USB to serial port chip, through TYPE-C interface

Dimensions and weight: 142*30*80mm (excluding antenna connector and antenna), body weight 300g

* DP-666's firmware does not support touch screen operations, but you can burn into a third-party touch firmware for touch screen testing, please check the special description: https://deepelec.com/2024/09/08/dp-666-touchscreen-testing

How to Operate:

Basic Operations:

Main Switch: The main switch of the unit, the OFF position disconnects the battery, and the ON position connects the battery.
Please turn this switch OFF when the unit is not used for a long time to prevent the power from being turned on by mistake.

POWER: Power button, short press to switch the unit between on and off state.

TUNING Knob: Rotate to adjust the frequency, short press to switch the steps, long press to turn on iMS and EQ

VOLUME Knob: Volume adjustment

SQL Gear: Squelch level adjustment

BW: Bandwidth selection

In FM mode, short press: Stereo/mono switch

In FM mode, long press: Bandwidth switch, switch between 56/64/72/84/97/114/133/151/168/184/200/217/236/254/287/287/311kHz/AUTO BW, you can also press and hold the BW button and use the TUNING knob to select.

In AM mode, short press: Bandwidth switch, switch between 3/4/6/8kHz

MODE: Tuning Mode

Short press: MAN (Manual frequency tuning), AUTO (Automatic search), MEM (Store operation)

Long press: Open the menu page

BAND: Band Selection

Short press: Band switch, switch between LW/MW/SW/OIRT/FM

In FM mode, long press: Open Advanced RDS view / Alternative Frequency view

Press and hold for more than 5 seconds: Sleep or turn off the screen

How to store a station:

（1）Tune to the station you want to store in a preset.

（2）Toggle the MODE button until you see "MEM" highlighted.

（3）Press the TUNING Knob button and "MEM" will turn red.

（4）Select the desired memory channel.

You will see colors on the preset numbers: red means there are frequencies stored on this preset, green means there are no frequencies stored on this preset.

（5）Press the TUNING Knob button again to store the preset.

Advanced Operations:

Change the encoder direction: Press and hold the BW button when powering on.

Rotate the screen: Press and hold the MODE button when powering on.

Restore default settings: Press and hold the BW and TUNING Knob button when powering on.

Expanded keyboard:

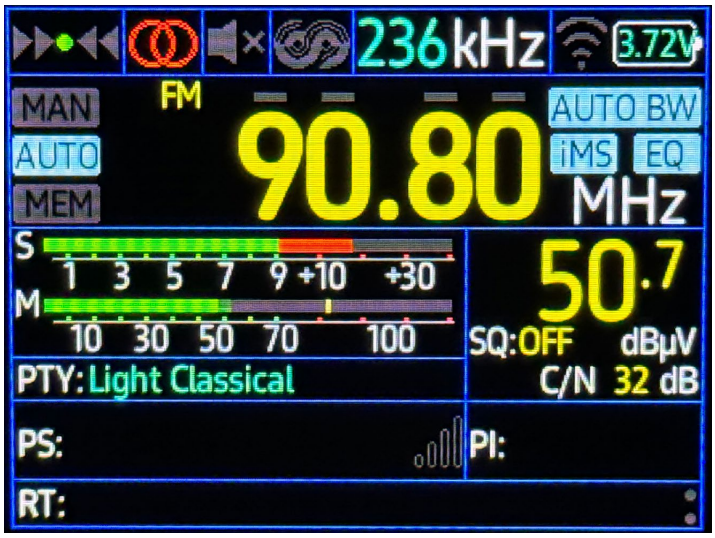
Number keys 0-9: Input the corresponding frequency value

DX button: Start/Stop FMDX Scan

Enter key: Confirm Input

Main Interface and Icon Meanings:

The main interface of the machine is as follows:



	Frequency deviation status display
	Current stereo mode indication. 2 circles represent stereo mode, 1 circle represents mono mode.
	Squelch status indicator. Highlight means the squelch is activated.
	The RDS icon is displayed, and a bright icon indicates that the RDS information is successfully demodulated.
	Current demodulation bandwidth indication.
	WIFI status indication (WIFI function is under development)
	Battery voltage/charge percentage indicator.
	Current tuning mode: MAN (Manual frequency tuning) AUTO (Automatic search) MEM (Store operation)
	Current working mode, LW/MW/SW/ORIT/FM
	Current frequency, the small horizontal bar above the frequency number highlights the corresponding step value; All off means using the default step.

	Demodulation bandwidth setting, manually select bandwidth or automatically adjust bandwidth.
	FM Improved Multipath Suppression
	FM Channel Equalization
	Current signal strength meter
	Current modulation level
	Current signal strength value
	Displays the squelch level. OFF means squelch is off.
	Carrier-to-noise ratio
	RDS Information, Programme Type
	RDS Information, Programme Service Name
	RDS Information, Programme Identification
	RDS Information, Radio Text

Menu Description:

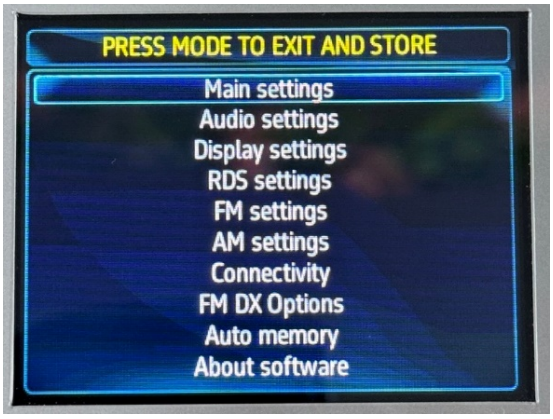
Open the menu page: Long press the MODE button

Exit the menu page: Short press the MODE button

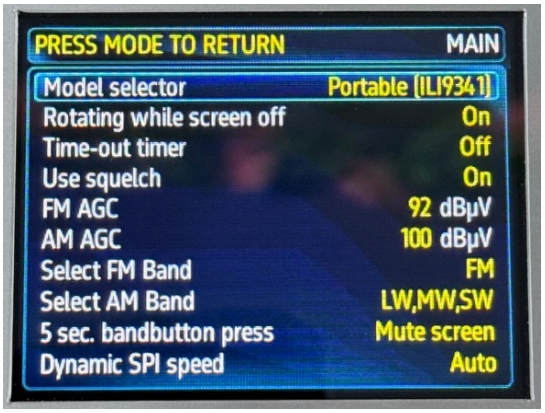
Select menu content: Turn the TUNING knob

Confirm menu content: Short press the TUNING knob

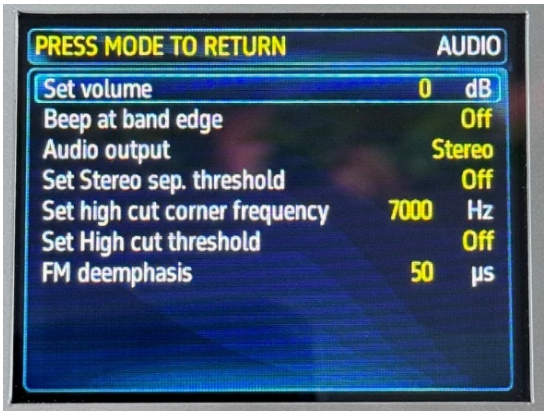
Menu page



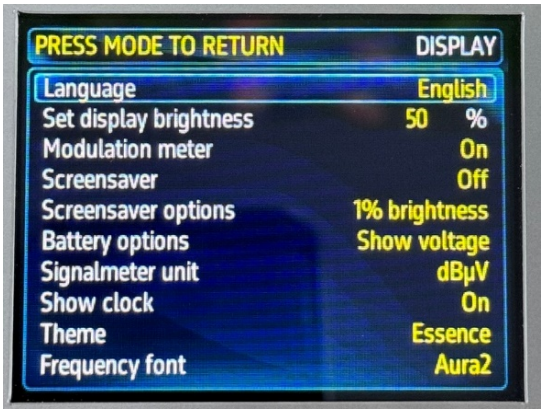
MAIN



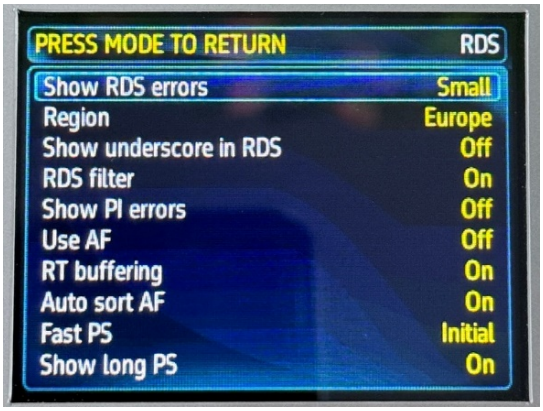
AUDIO



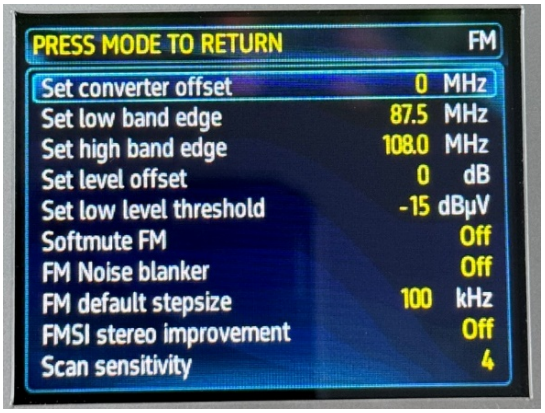
DISPLAY



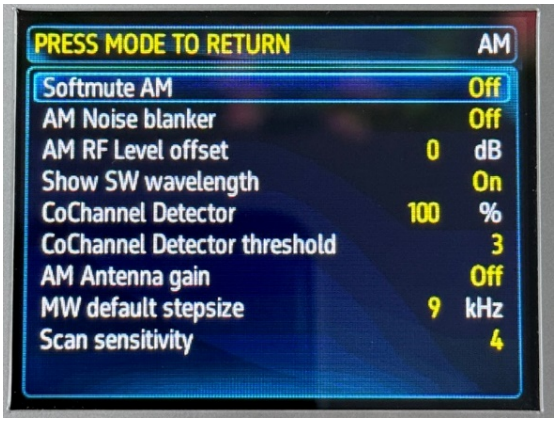
RDS



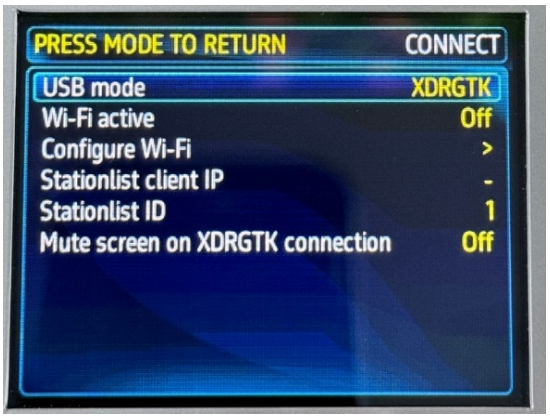
FM



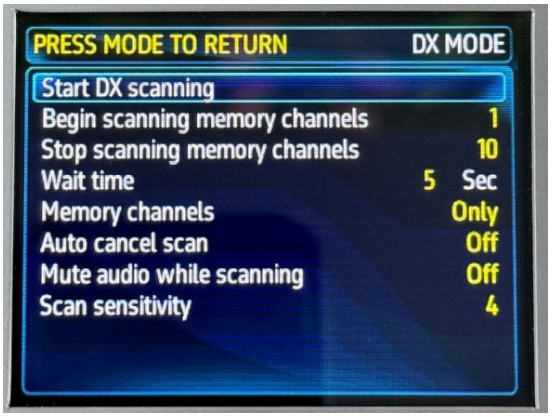
AM



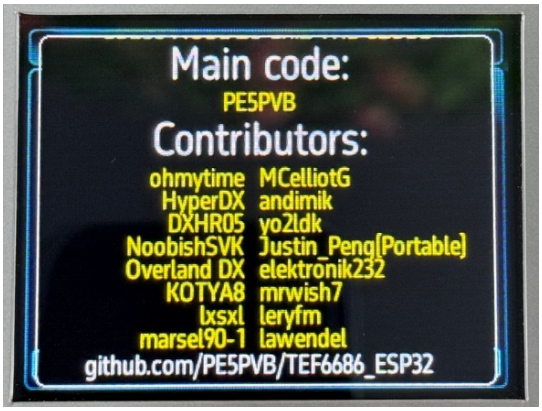
CONNECT



DX MODE



Firmware info



Charging Instructions:

This machine is charged via a TYPE-C port, and there is a charging LED above the TYPE-C port.

Please use a charging head with a voltage of 5V and a current of 1A or above to charge the machine.

The maximum charging power is 5W and fast charging is not supported.

It is recommended to charge with the device turned off.

The charging LED turns red ❋ when charging and turns green ❋ when fully charged.

Packing List:

1. Host *1 (with 3.7V/5000mAh lithium battery installed)
2. High quality telescopic antenna with SMA connector *1
3. USB-A to TYPE-C 1 meter data cable *1
4. Storage bag *1

Packaged weight 450g, packaged size: 20*14*4CM

Firmware Upgrade:

1. Upgrade via the TYPE-C port. Use the included data cable to connect the radio to the computer. A new COM port will appear on the computer.
2. Press and hold the ESP32 BOOT button, then turn on the radio to enter upgrade mode.

For firmware downloads, please visit: https://deepelec.com/dp-666