

FATSHARK DOMINATOR GOOGLES DIVERSITY MODULE

INSTRUCTIONS FOR USE

Ref. firmware version 23

Hardware description

Receivers: 2, based on BOSCAM RX5800 module, SPI version, 5V

Microcontroller: MICROCHIP 18F25K20, 8 bit, 32K Flash, 1 Usart, 11 ADC@10bit,RAM 1536B,EEPROM 256B

Clock: 64MHz

Power : 5Vcc, external source , about 420 mA when display on, 380 in lock state (display off)

Video out : 1Vpp@75Ohm

USB Interface: FT230X (Ftdi) product id modified in \$6001(FT232) for native visibility under android OS

External power required not to overload internal googles power supply. Even if it could work getting power from the dominator googles, it surely overloads the internal regulator so to avoid damage the external power solution has been preferred. Module can be powered both from an Y connector or from an additional battery on the other side of googles. Obviously the battery discharge will be faster.

Assembly

Install module directly in the relevant vane and lock in position with the snap in accessory.

Diversity module has two separate receivers, with two separate antennas. Best results are achieved using two identical patch directional antenna differently oriented.

At power up, on display the message Un followed by the firmware version number will appear briefly.

After some other seconds, the receivers will be locked on the channel previously stored.

Receiver has the 5 'usable' bands: (frequencies in MHz)

Band "A" (1)

5865, 5845, 5825, 5805, 5785, 5765, 5745, 5725

Band "B" (2)

5733, 5752, 5771, 5790, 5809, 5828, 5847, 5866

Band "E" (3)

5705, 5685, 5665, 5645, 5885, 5905, 5925, 5945

Band "F" (4)

5740, 5760, 5780, 5800, 5820, 5840, 5860, 5880

Band "r" (5) Raceband

5658, 5695, 5732, 5769, 5806, 5843, 5880, 5917

Joystick.

Movements are always referred as watching the module in front of you. This means that 'LEFT' is towards antenna connectors. ENTER means pressing the center button

Moving through the channels is easy, you can change band moving joystick left/right and change channel within the band using up/down

The digit on the left shows the band number/letter, the digit on the right shows the channel.

The decimal point ALWAYS shows the selected receiver. The left digit point on means that the receiver linked to the upper connector is selected, while the right dot means the lower connector selected.

Shortly pressing the joystick at center will show the actual frequency of the selected channel. First two digits, then other two.

If you press ENTER on the joystick for a long time, the display will show AC and start to scan all channels, selecting the one that has the highest received rssi. This is useful when you're alone in the field and you don't know exactly what is your vtx channel. Prior to activate autoscan, please move away at least 10 meters from vtx, otherwise input channels may be saturated and not able to correctly evaluate the rssi values.

While in lock state, pressing ENTER shortly will show the actual channel selected and then the channel's frequency

While in lock state, pressing ENTER for a long time will start autoscan

When in lock state, press joystick to left to unlock

When in lock state press up to read upper antenna rssi value

When in lock state press down to read lower antenna rssi value

When in lock state press UP and RIGHT to read time percentage of upper antenna use, followed by commutations number

When in lock state press DOWN and RIGHT to read time percentage of lower antenna use, followed by commutations number

When in lock state, press UP and LEFT will start the free channel utility. Display will show LS blinking, when finished the most 'free' channel for each band is shown so user can choose the best channel to set his vtx on. Useful in crowded environment. Press ENTER to exit

Selected channel is stored automatically after some seconds of inactivity of the joystick, and is indicated by a short time -- sign on display-

After the r band (or prior to the A band) the P 'band' is shown. This is actually not a 'band' but the parameters setup menu.

There are 3 parameters that can be changed:

Specifically:

P0 Possible values : 0,1

0 means that the bands are shown in literal format (A,B,E,F,r)

1 means bands are shown numerically (1,2,3,4,5)

P1 Possible vales: 2..30

This parameter sets the hysteresis for receiver swapping decision. Setting default is 7%. This means that the receiver is changed if the values differs for more than a 7%. Smallest values gives more receiver swappings . Swapping between receivers is normally not too much visible, even if sometimes a really short glitch may be noticed. When using the module in best conditions, antenna swapping is not frequently necessary so an higher value is suggested

P2 Possible values: 0,1

This parameter enables (1) or disables (0) the AUTOLOCK funcion.

Autolock, if enabled, locks the joystick from accidental press after about 10 seconds inactivity. To unlock again, you need to keep the joystick pushed in one random direction for more than 2 seconds.

Please take care that leaving the display always on heats up the regulator due to display's current.

P3 Outdoor (ou) or Indoor (in) use

This parameter defines the 'location' of the air field. Selecting outdoor reduces receiver swapping as they are usually not so much necessary while Indoor is absolutely suggested in relevant places. Indoor plus a lower P1 value are suggested for best performances

P4 Trigger

This parameter is active only in outdoor mode. Possible values between 50 and 95. The trigger sets the limit of the rssi signal to be considered for decision between switching receivers. For example, If set on 75 this means that if rssi is higher than 75% non swapping action will be performed. This limits unwanted swapping outdoor when often frequent swapping are not necessary.

The diversity system obviously drains more current from battery, for the simple fact that it uses two receivers. So it is normal to expect a shorter duration of battery charge. Also, a high temperature can be reached by the module, so please avoid touching it, Temperatures up to 80% on the small heatsink are normal and does not cause damages.

SETUP PROCEDURE

Modules are supplied tested and configured.

Anyway, it may be necessary to setup up it again.

There are some operations that can be easily done to perform initial setup.

Please consider that receivers are not always exactly the same. The signal that comes out is slightly different and for having a correct receiver swap a setup is necessary for what regard the maximum and the minimum received signals value.

The method is described below:

First, set up minimum. Being aware that no Vtx is up and transmitting in the near field, switch on the goggles keeping the joystick moving DOWN until the symbol uu appears on display. Mimimum value for both receivers is setup and stored

Then, go for the maximum

Turn on a vtx, no matter the power or the channel, and place it line of sight but some meters away from receivers. This due to saturation that may occur of vtx is too close to receivers.

Now turn on the goggles keeping the joystick moving UP until the symbol ^^ (double reversed u) appears on display. Maximum is now set up and stored.

After use you can check the percentage of use of the receivers moving the joystick to UP+RIGHT to read the upper antenna usage percentage followed by the number of swappings (4 digit, most significant first) while doing the same but DOWN+RIGHT will show lower antenna percentage.

Moving the stick down and left will reset counters

USB Connector

This is used for updating the firmware (instructions provided in the firmware update manual) Or to connect to an android device using an OTG cable.

Download the DMMODEL DIVERSITY MODULE app from the store and install it. You will be able to access all the scanner functions and other useful functions