Working with video HD systems

Integration of Zbig & Pitlab FPV System 4.0 with video HD systems.

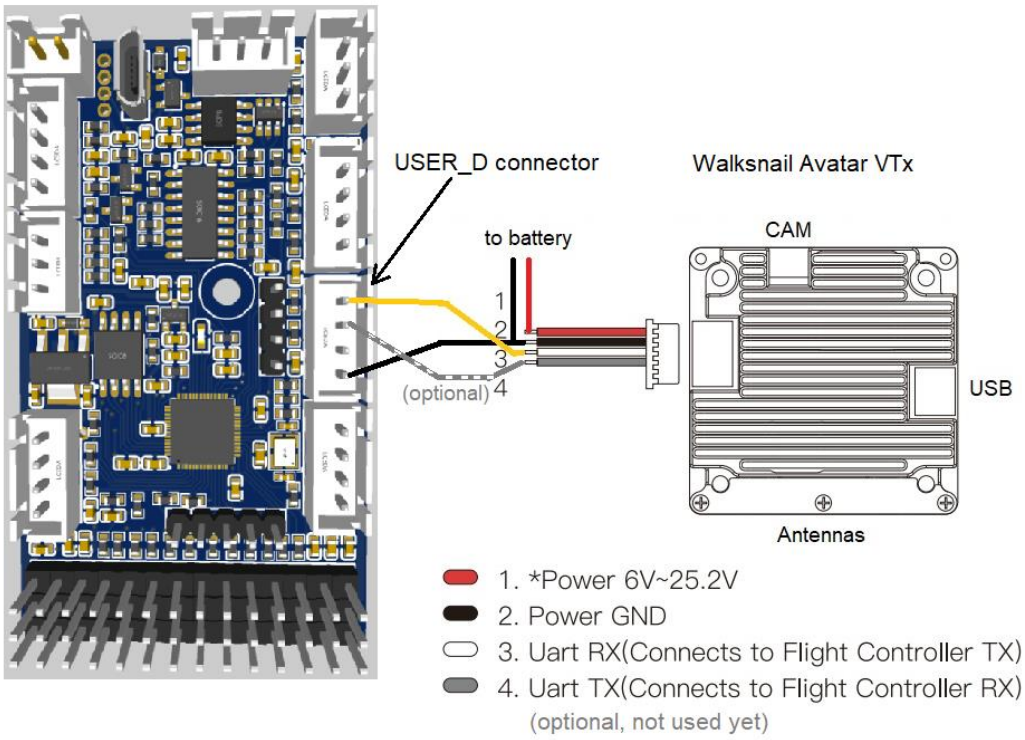
General information

Zbig & Pitlab FPV System from version 4.00b allows to simultaneously generate OSD overlays (HUD) for standard video signals (PAL or NTSC) and also send the current OSD layout and menu to high-resolution video systems, such as DJI, HD Zero and Walksnail Avatar / SharkByte.

For the HD system, it is necessary to install the set of font glyphs and icons (provided with the FPV System software) into HD gogle/receiver device, and for the DJI system, additional software must be installed.

Electrical connection

For communication with these systems, the MSP Displayport protocol is used, which allows the presentation of texts and icons on the screen of goggles or an HD monitor. For communication with the transmitter of the HD system, the USER A/D connector is used, operating as a UART serial port with a speed of 115200bps. One-way communication is used (it is required to connect the grounds wires and the Tx signal from the OSD to the Rx input in the VTx transmitter). An example connection with the Avatar HD system is shown in the figure below.



Configuration of the MSP Displayport protocol

In order to activate the MSP Displayport communication protocol in the FPV System, one of two actions must be taken:

- Select the OSD menu **Service->USER_D** and set the **MSP Displayport (HD)** option.
  (The second Off option disables the MSP Displayport protocol)
- Connect the autopilot board to the PC with a USB cable, run the FPV_manager program and on the **Autopilot->Settings** page, in the **USER D** frame, select the **(*) MSP Displayport** option, and then click the [Save] button in the lower right corner of the window.

MSP Displayport protocol works by default on 115200 bps speed.

Installing fonts on the HD system

For proper cooperation with HD systems, the autopilot/OSD software version at least 4.00b is required, we recommend installing the latest version of the software (firmware), available at https://www.pitlab.com/fpv-system/download.html

The package (zip) with the latest software also contains the current set of fonts and graphic symbols that must be uploaded to the HD system. After downloading the file, unpack it and follow the description for the given HD system.

Walksnail Avatar, SharkByte

We recommend checking the firmware version (transmitter and receiver should have this same versions). We recommend updating the software to the latest version published on the manufacturer's website.

To install a font set:

- copy to the root directory of the microSD card all files from the AvatarHD subdirectory of the latest firmware.
- insert the SD card into the goggles or receiver and turn on its power.
- Open the goggles/receiver menu and select **Settings->Display->Update font** and confirm the command.
- If this is your first font installation, choose from the menus:
  Settings->Display->Custom OSD: **Custom**
  Settings->Display->Custom font: **Pitlab**
- Select **Settings->Display->OSD position** and set the expected OSD position (left and top margins)

After a font update, the SD card can be removed from the headset/VRx and the font files may be removed from the card.

DJI

For the DJI system, it is necessary to install additional software from https://github.com/fpv-wtf/wtfos

This page also provides information about the supported versions of the DJI system and its firmware, as well as instructions for updating the firmware.

To install a font set:

• copy to the root directory of the microSD card all files located in the DJI subdirectory from the latest firmware.

• insert the SD card into the goggles and turn on its power.

HDZero

The HDZero system supports the MSP Displayport protocol, but at the time of writing this document, integration with this system has not yet been empirically confirmed.

Font files for the HD Zero system are located in the HDZero subdirectory, and the instructions for uploading files to the HDZero system can be found here:

https://github.com/hd-zero/hdzero-osd-font-library

Limitations and known issues

Due to the fact that the MSP protocol is character only (not full graphics), the appearance of the OSD overlay is similar but not identical to the appearance of the fully graphical OSD overlay on the PAL/NTSC video signal and presented in the layout designer in the FPV_Manager program.

The differences include:

- Appearance of icons and symbols, changing the presentation of graphic elements
- unavailability of some settings for fields, resulting from the unavailability of graphics required for their presentation.
- The positioning of the OSD fields on the screen of the HD system is always in the grid of characters (24x36 or 36x54 pixels).

In addition, when using cooperation with HD systems, only two built-in languages are available and correctly presented: Polish and English. In particular, national (accented) characters and non-Latin languages are not supported.

For better compatibility of screen layouts, we recommend using layouts with large fonts only (the [ ] Small fonts option is disabled for all layout fields), and enabling the option to show the grid in the layout designer (menu view->grid)

Since the overlapping of OSD information takes place only in the HD video receiver on the basis of information (packets) sent from the flight controller, in the case of flights at the edge of the system's coverage, when there are communication failures and loss of some packets, flickering (disappearance) of some OSD fields related to lost packets may occur , or momentarily freezes all OSD content on the screen. After the connection is restored, the OSD overlay image returns to normal and the flickering stops.

We wish you many successful flights.