TTU+ user guide

Specifications
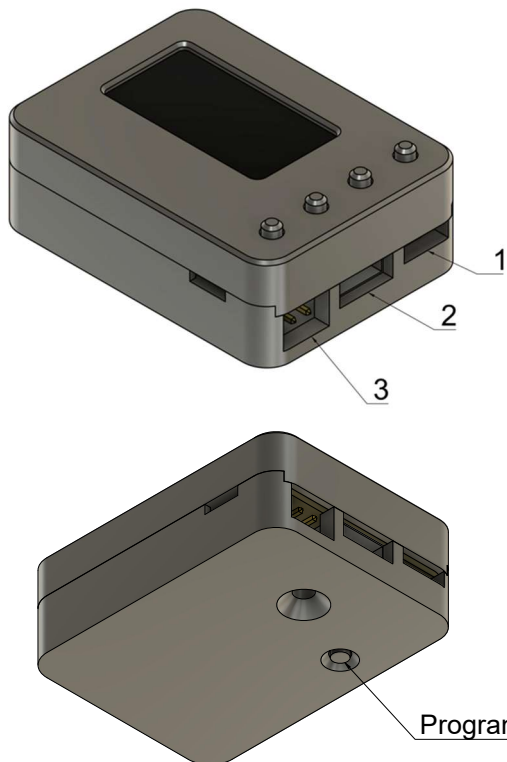
Supported turbines

- ProJET
- JetCat
- Xicoy v10
- Xicoy v6
- Digitech
- EvoJet
- Kingtech

Supported radios

- Jeti
- Spektrum
- Futaba
- Graupner
- FrSky

Device can be powered up to 12volts

Description

The device has a OLED 128x64 screen and 4 buttons on the front.
On the righ side, there are 3 connectors as show on the image:

1. Telemetry connector
2. Telemetry connector (Spektrum)
3. Turbine connector

On the bootm face, there is the program button.
It is used during the firmware upgrade.

Display

Most of the information on the screen are self-explaining, however the bottom indicators need some explanation:

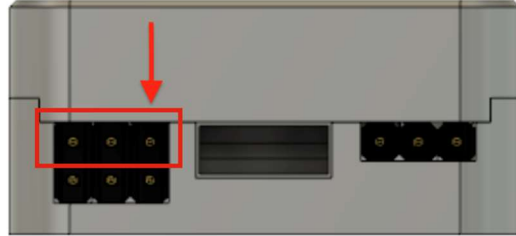| RX icon	Is the status of the radio signal, when on, it means that TTU+ communicates with the receiver using the telemetry protocol.
ECU icon	Indicates the status of the communication with the ECU or FADEC, when on, this means that TTU+ is connected and retrieving data from the turbine.
FUEL icon	This icon indicates that the signal to reset the fuel counter is received (only visible on Futaba or Jeti radio systems)
CFG icon	this icon blinks when a change has been made on the configuration and it has not been saved yet.

At the bottom right corner of the screen there is the voltage of the ECU battery

Setup

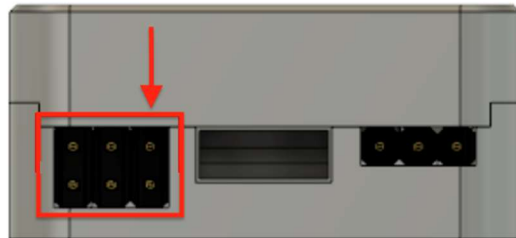### Step 1 : Connect the TTU+ to the turbine ECU or FADEC

Xicoy v10, Kingtech G2, EvoJet
Connect the GSU (or DTU) output of the ECU to the turbine port of the TTU+. Use the top three pins of the turbine data connector. The negative is the pin indicated by the red arrow.

JetCat, Projet, Xicoy v6, Digitech
Connect the GSU (or DTU) output of the ECU to the turbine port of the TTU+. Plug the provided adapter cable. The negative is the pin indicated by the red arrow.

Step 2: Connect the TTU+ to the telemetry port on your radio system

For all radios (except Spektrum)
Connect the telemetry output of the receiver to the telemetry port of the TTU+. Use the three-pin telemetry port. The negative is the pin indicated by the red arrow.
ATTENTION! Jeti radios: this is an EX port (not an Ext port)

For Spektrum radios use the Spektrum port to connect the telemetry output of the receiver to the TTU+.

Step 3: Configure the TTU+

Power on the radio transmitter, the ECU and the radio receiver.
TTU+ will power on and show the idle screen.
Press any key to enter into the configuration Menu.
Menu tree and options are as follow

Menu	Options	Comments
ECU Type	ProJET JetCat Xicoy v10 Xicoy v6 Digitech EvoJet Kingtech	Set as per your ECU or FADEC type
Radio System	Jeti Spektrum Futaba Graupner FrSky	Set as per your radio system
Telemetry Mode	JetCat Individual	This option appears only when Futaba radio system is selected
	Native Scripted	This option appears only when FrSky radio system is selected
Sensor Slot	1 to 26	This option appears only when Futaba radio system is selected
Device ID	None, 1 to 4	This option appears only when Jeti radio system is selected
Tank Size	0 to 9900	This option is not shown when JetCat or ProJET ECUs are selected.
Pump Factor	50 to 150	This option is not shown when JetCat or ProJET ECUs are selected.
Fuel Reset Channel	1 to 16	This option appears only when Futaba or Jeti radio systems are selected
Language	English French Spanish German Netherlands	
Configuration	Save or Cancel	Once changes on the configuration made, go to this menu and press '+' key if you want to save the parameters or '-' key if you want to discard them.
System		Shows the current firmware version

Step 4: Set special parameters and considerations depending on turbine and radio type

ECU Type	Actions
JetCat	Set the size of the tank on the ECU
ProJET	Set the size of the tank on the ECU Activate the telemetry on the ECU, set the data to be sent 4 times per second maximum.
Xicoy Digitech EvoJet Kingtech	The pump factor may need to be tuned after the first flights. If the remaining amount of fuel on the tank is greater than the volume indicated by the TTU+, increase the pump factor. If the remaining amount of fuel on the tank is smaller than the volume indicated by the TTU+, increase the pump factor.

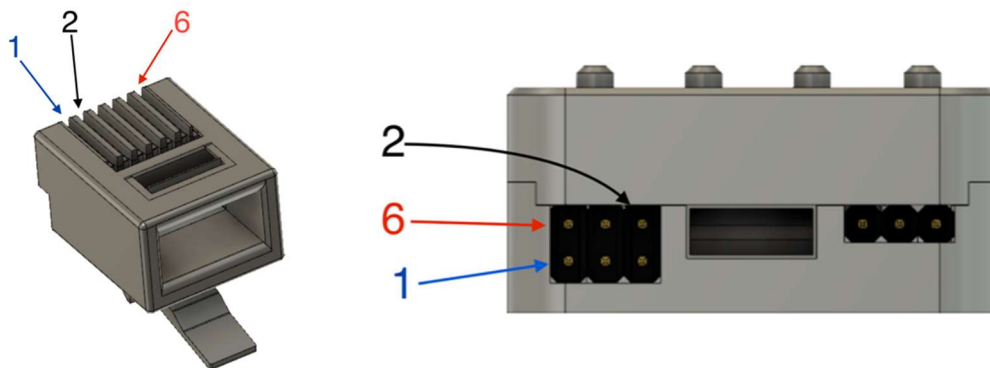| Radio System	Actions
Futaba	Either Jetcat type sensor or individual sensor can be used. JetCat sensor uses several slots and may be a problem if the plane has another telemetric unit or more than one engine is used. Using individual sensors will reduce the number of slots used to 5 as follow: RPM, EGT, Fuel% (using a TEMP125 sensor), Battery and pump voltage (using a voltage sensor). TTU+ does not uses the standard Futaba procedure to set the slot numbers on the radio (by connecting the sensor to the back of the radio). Thus, the sensors slots must be set manually on the radio.
Jeti	If more than one engine is used, set the Device ID to 1, 2, 3 or 4, otherwise, let it to None
FrSky	Set the telemetry mode to native or scripted depending on the method that will be used to show data on the radio. A script is provided in order to show data on scripted mode, it can be adapted or reused if needed.

After this point, the device is operational

Firmware update procedure

1. Download the desired firmware version
2. Using a Chrome browser, open the following page:
   https://daniel-maiorano.github.io/webdfu/dfu-util/
3. Unplug all ports on the TTU+ (receiver and turbine).
4. Press and hold the program button
5. Connect the TTU+ to the computer and then release the program button
6. Go to the web page, and click on "Connect"
7. A popup should appear, in this popup, choose "STM Bootloader" from the list and click "Connect". If the "STM Bootloader" is not present on the list, please follow the Driver troubleshoot procedure. This procedure can be found following the link on the bottom of the firmware update page.
8. A new popup will appear, select the first item on the list (Internal flash)
9. Then click on "Select interface"
10. Now, back on the webpage, click on "Choose file" and search the previously downloaded
11. Now click on "Download" and wait until the process is ended.
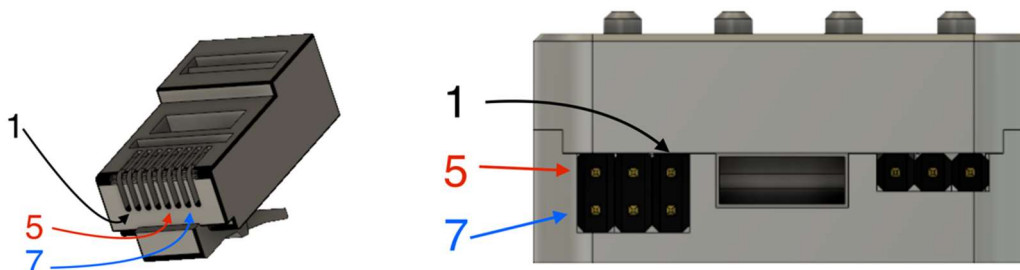
Custom cables

In order to make a longer (or shorter) cable to the ECU, please use the following pinout.

JetCat or ProJET

Xicoy v6 or Digitech

Konformitätserklärung
Declaration of Conformity
Déclaration de)Dichiarazione di conformità

Hersteller / Verantwortliche Person   Sandor Kruise
Manufacturer / responsible person
Fabricant / Personne responsable
Fabbricante / Persona responsabile

erklärt, dass das Produkt   Digitech TTU+
declares that the product
déclare que le produit
dichiara, che il prodotto

folgenden Normen entspricht:
complies following standards: EN 6100060950-1 ed.2
correspond aux suivantes norms   EN 61000-3-3 ed. 2
corrisponde alle seguenti norme   ROHS 2002/95/EU
                                          CE Lable on/auf Produkt

Anschrift / Address /
Adresse / Indirizzo   Digitech , Valkenburgerweg 19A, NL-AS Voerendaal

Ort, Datum   Voerendaal, 22-07-2019
Place and date of issue
Lieu et Date
Data e luogo

Name und Unterschrift   / Name and signature / Name Nom et signature/ Nome e firma

Sandor Kruise

General Manager