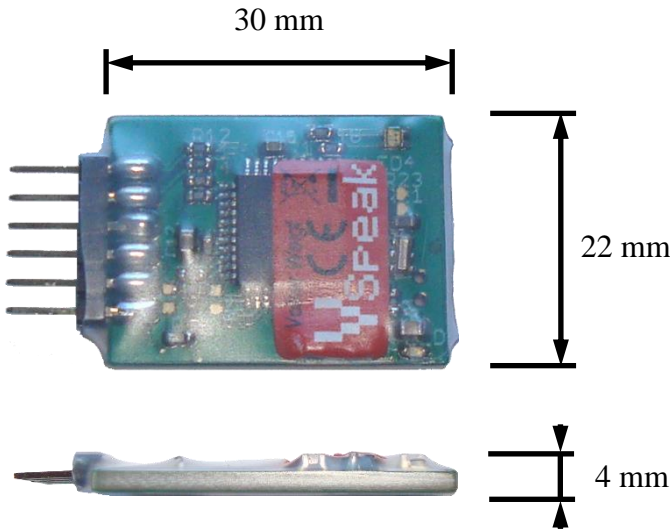




ECU converter Kolibri / Xicoy V6

Electrónica SL

Manual Version 1.1



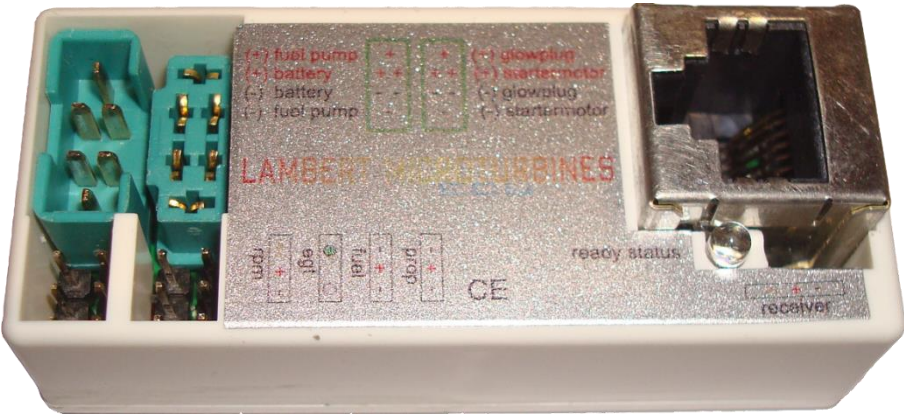
Introduction

The VSpeak ECU Converter provides the data of the ECU on the telemetry system of your remote control system.

The ECU Converter calculates the fuel consumption and also transmits it to the respective transmitter of the model pilot.

Settings of the VSpeak converter can be made directly from the transmitter for Jeti, HoTT and PowerBox, for all other RC systems with the aid of the HDT included in the scope of delivery of the turbine.

Supported ECU (example Kolibri):



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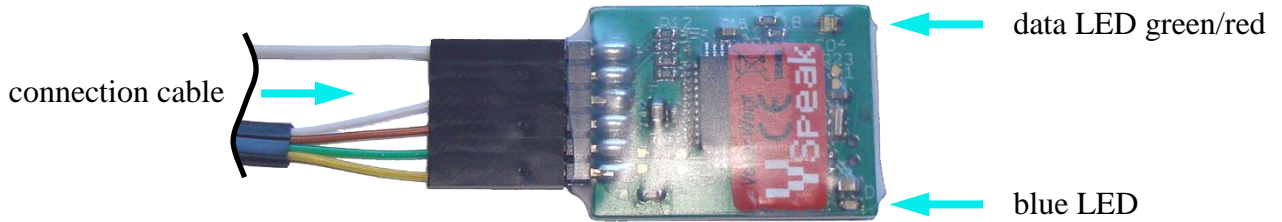
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1 Hardware

- Data LED: green (ON) → receiving data from the ECU
- green (flashing) → receiving data from the ECU **and** data transfer to the receiver (at Jeti only then, if JetiBox buttons are activated)
- red (ON) → programming mode using HDT

The blue LED is blinking every second to signal the normal function of the ECU Converter



The connection cable included in the scope of delivery is connected with the 6-pin plug to the pin header of the converter as shown above, the other two plugs as follows:

Connection: 1. ECU



The RJ45 Western plug is connected to the ECU at the slot labeled HDT.

The data exchange between the ECU and the VSpeak converter is signaled in **green** by the 2-color Data LED.

2. Telemetry data

Jeti / MSB / HoTT / Futaba

JR PROPO / FrSky / PowerBox:

UNI servo plug

The 1-wire UNI servo plug is plugged into the telemetry port of the respective receiver



O R, in the **Spektrum** – version:

X-Bus plug

The X Bus plug of the ECU Converter is connected to the X-BUS connector of TM1000 or Spektrum receiver with X-BUS connector.



The attachment of the VSpeak ECU converter in the model can be done with velcro tape, double sided tape or cable ties.

2 Telemetry

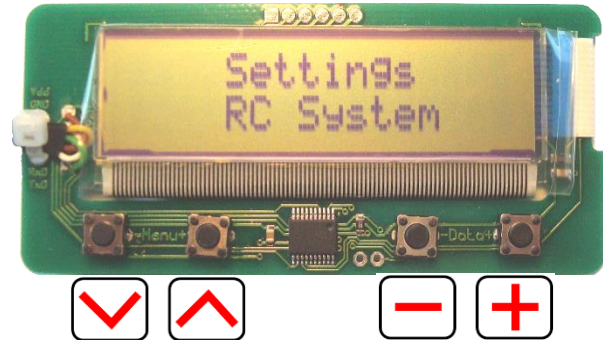
The voltage for the VSpeak ECU Converter is supplied by the ECU.

The telemetry of the ECU converter can be switched between the systems Jeti Duplex, Multiplex, HoTT, Futaba, FrSky, JR PROPO, PowerBox and Spectrum, see section 2.0.

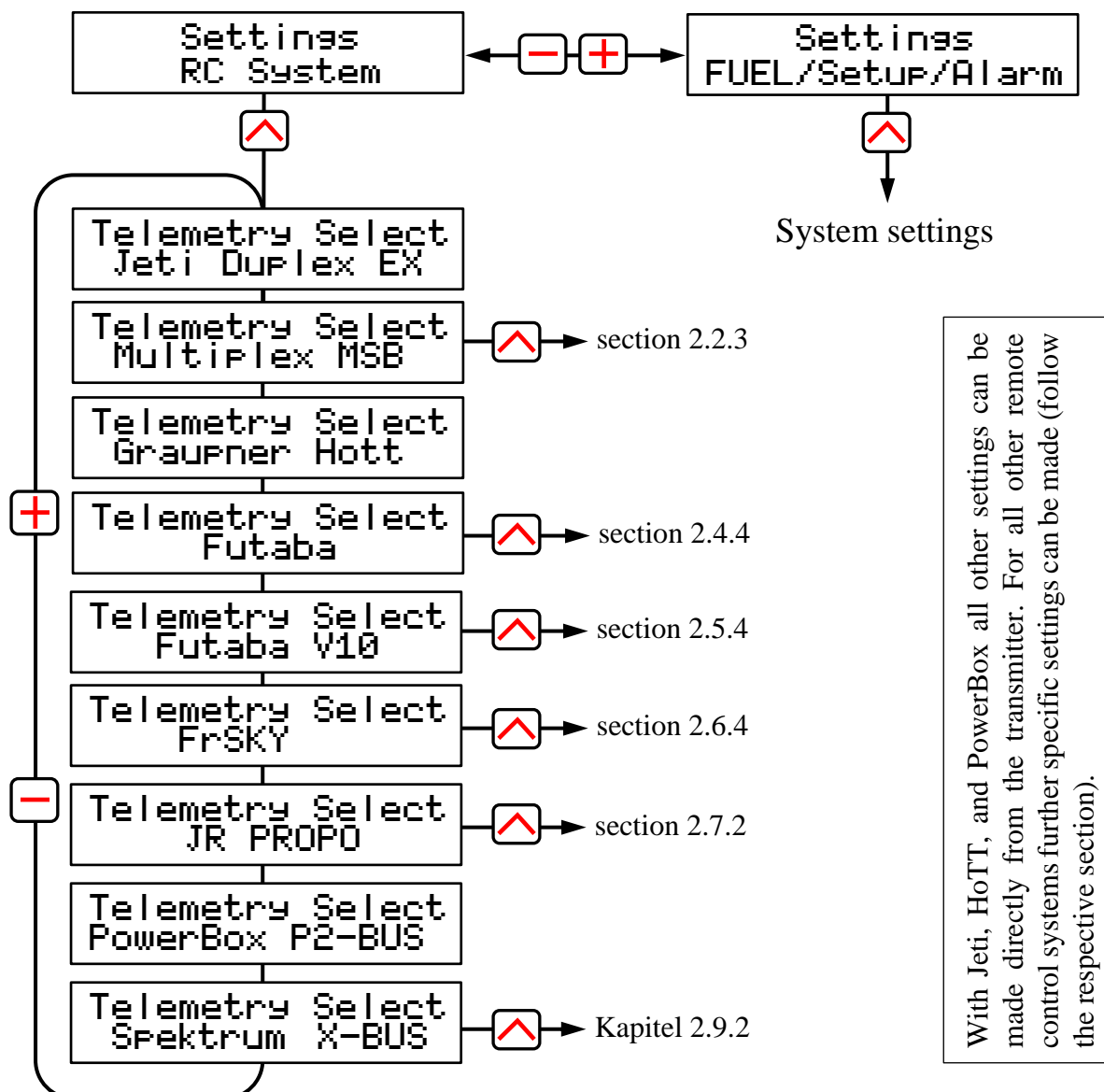
2.0 Selection of the telemetry system / System settings

The telemetry system can be set using the programming adapter (see chapter Accessories) and the HDT.

If the ECU converter, HDT, receiver or turbine battery is connected to the programming adapter, the following display appears after a short initialization:

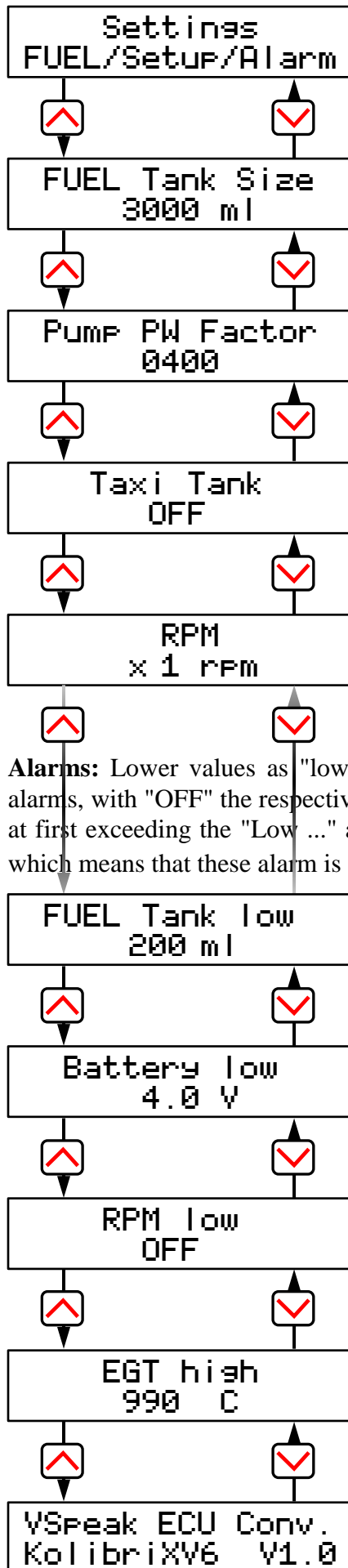


The handling of the HDT is done in the usual way, so "scroll" between the parameters with - value change with Each time the parameter is changed, the previously changed value is stored in the ECU converter.



System settings

The System settings menu contains all the parameters that are effective for several telemetry systems (The parameters are largely self-explanatory):



FUEL Tank Size is the capacity of the main tank in ml. The tank size is required for the fuel consumption and for the calculation of the FUEL alarm.

Values: 200 20000 ml Step size: 50 ml

The calculation of the fuel flow and ultimately the fuel consumption is based on the pump PW value.

The parameter **Pump PW Factor** adjusts to the respective turbine size and installation situation.

An increase in value causes a higher calculated fuel consumption, reduction correspondingly less.

Values: 5 2500 Step size: 5

Option Taxi Tank, ON / OFF s. section 2.0.2.1

The actual turbine speed is the displayed value multiplied by the parameter **RPM**.

Values: 1, 10, 100 and 1000

Alarms: Lower values as "low" thresholds and exceeding of the "high" thresholds trigger alarms, with "OFF" the respective alarm is deactivated. The "low..." alarms are activated after at first exceeding the "Low ..." alarm threshold. The low RPM alarm ends at Pump PW = 0, which means that these alarm is suitable for signaling a **turbine flameout**.

Values: OFF, 50 2500 ml Step size: 10 ml

Values: 4.0 14.0 V Step size: 0.1V

Values: OFF, 20000 100000 Step size: 100

Values: 400 990 °C Step size: 5°C

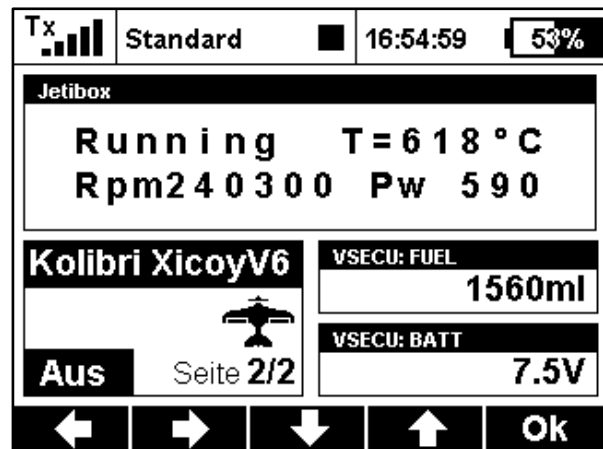
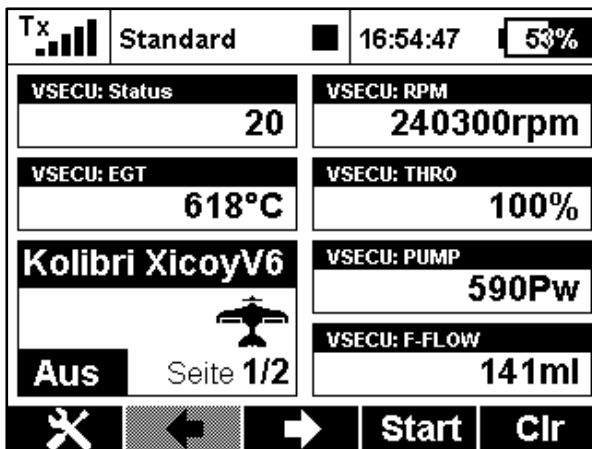
2.0.1 Option Taxi Tank

For models where a taxi tank is plugged into the main tank until the model is lifted off, set "Taxi Tank = ON". If the turbine is in the "Running" status, then when THROTTLE = 80% is exceeded for the **second time**, the FUEL will "reset", ie the displayed FUEL is only once set to "full" (the value set at "Fuel Tank Size") again at this time.

2.1 Jeti Duplex EX

2.1.1 EX-data DC/DS-radio

(VSECU ... VSpeak ECU converter):



Status	Description
21	Running
14	FuelRamp
13	SwitchOver
12	Pre Heat
11	Ignition
10	Start On
9	BurnerOn
7	GlowTest
6	StickLo!
4	Ready
3	Cooling
2	Stop
1	User Off
0	Trim Low
-1	Unknown
-2	Glow Bad
-3	IgntrBad
-4	Time Out
-5	Weak Gas
-6	StartBad
-7	Low Batt
-8	Overload
-9	PumpLimit
-10	RxPwFail
-11	Failsafe
-12	SpeedLow
-13	TempHigh
-14	FlameOut

2.1.1.1 JetiBox

The ECU display shows the assignment of the Jeti keys to the original terminal as shown in the picture above.

- left- button: (long pushed)
return to expander menu
(if ECU converter is shared with other sensors are connected via an expander)
- left-/ right-button: together pushed
Setup ECU converter
(s. section 2.1.1.3)

2.1.1.2 Turbine status – numerical Values

The turbines status messages are also displayed as numerical values. The assignment is given in the table.

These status values can be used in Jeti radios, e.g. in logical links, or in LUA-supported radios for LUA scripts.

2.1.1.3 Alarms / Parameterization

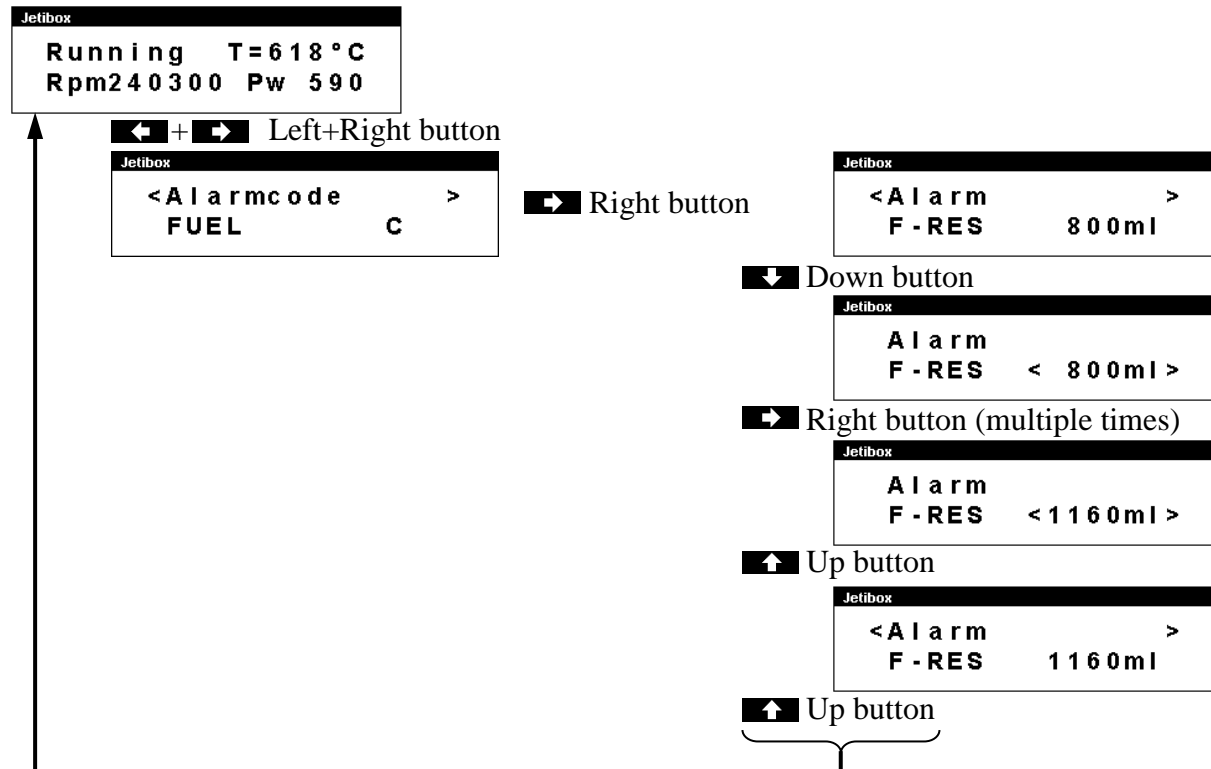
From the ECU data display, the parameter display can be accessed by pressing the **←** + **→** Left+Right button.

With the **↑** Up button the parameter display will left (..to ECU data display). Within the parameter display you can scroll with the **→** Right button - or - **←** Left button between the parameter groups "Alarm", "Alarmcode", "FUEL Tank Size", "Pump PW Factor", "Taxi Tank", "RPM Factor" and "ECU-EX-Name".

When the desired parameter group is selected, the parameter can be changed by using **↓** Down and **↑** Up button.

Value changes are made with the **→** Right button – or- **←** Left button.

Example of parameter selection and parameterization:



Parameter-group	Parameter	Value range	Step size	Set-Value (Default)
Alarm	F-RES	OFF, 50 ... 2500 ml	10 ml	200 ml
	BATT	4.0 ... 14.0 V	0.1 V	4.0 V
	RPM	OFF, 20.000 ... 100.000 rpm	100 rpm	OFF
	EGT	400 ... 990 °C	5 °C	990 °C
Alarmcode	FUEL	A, B, C, ..., X, Y, Z		C
	BATT			U
	RPM			L
	EGT			T
Fueltank	Size	200 ... 20.000 ml	50 ml	1.000 ml
Pump PW	Factor	5 ... 2500	5	400
RPM	Factor	1, 10, 100, 1000		1
RPM	Factor	1, 10, 100, 1000		1
Jeti-Sensor	EX Name	VSECU, L-ECU, R-ECU, 1LECU, 2RECU		VSECU

Alarms

Irrespective of the possibility to program alarm thresholds for the "EX" values in Jeti transmitters the VSpeak ECU Converter has the ability to set alarms (by using alarm codes) that are ECU status depending. These alarms can also be announced by the Profibox as voice messages.

As can be seen in the table, the alarms for F-RES and RPM can be switched OFF, if no alarm is to be given at BATT and EGT, the alarm thresholds can be set to "inaccessible" values.

Permanently pending alarms, e.g. FUEL or BATT, max. 3 times repeated.

- **FUEL**
The alarm Fuel is signaled when the fuel rest is lower than the F-RES set value.
- **BATT**
The alarm BATT is signaled when the battery voltage is lower than the BATT set value.
- **RPM (turbine)**
The alarm RPM is signaled when the turbine rotation speed is lower than the RPM threshold value.
The speed monitoring is started after at first exceeding RPM alarm threshold and ends with Pump PW = 0.
The RPM alarm is suitable for signaling a "turbine flameout".
- **EGT**
The alarm EGT is signaled if the temperature exceeds the value set at EGT.

Fuel consumption

The VSpeak ECU Converter can calculate the current fuel flow rate (F-FLOW) and the fuel consumption (FUEL) based on the Pump PW value output by the ECU. An adaptation to the turbine size and the respective parameters can be made with the parameter **Pump PW Factor**. An increase in value causes a higher calculated fuel consumption, reduction correspondingly less.

Fuel tank Size is the capacity of the main tank in ml. The tank size is required for the calculation of the alarm (F-RES) for the fuel consumption.

Jeti EX sensor name

In a 2-turbine model 2 VSpeak ECU converter can be used on Jeti Systems via an expander or CentralBox. The EX names are:

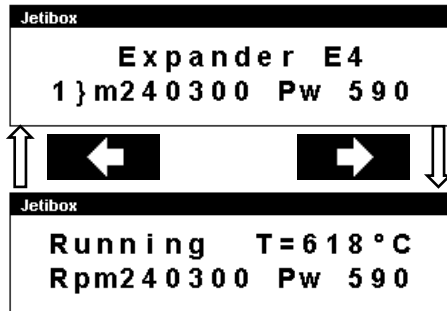
"**1LECU**" for **L**eft turbine ECU on input **1** and

"**2RECU**" for **R**ight turbine ECU at the expander input **2**.

Taxi Tank

For models where a taxi tank is plugged into the main tank until the model is lifted off, set "Taxi Tank = ON". If the turbine is in the "Running" status, then when THROTTLE = 80% is exceeded for the **second time**, the FUEL will "reset", ie the displayed FUEL is only once set to "full" (the value set at "Fuel Tank Size") again at this time.

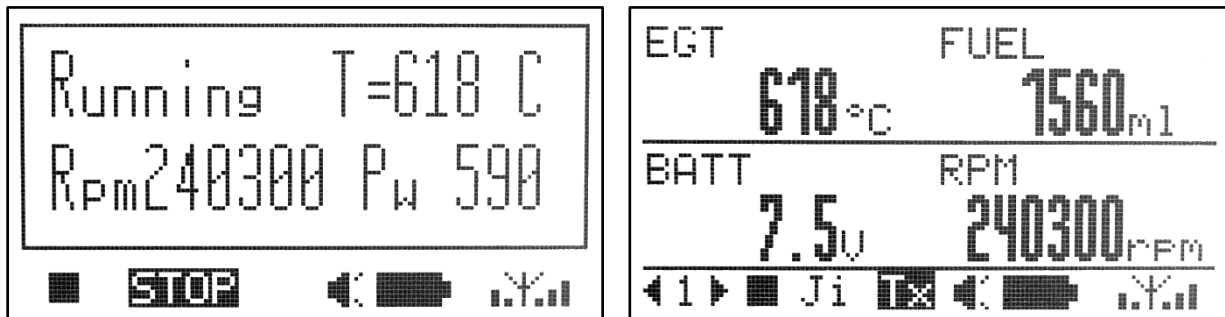
2.1.1.4 Expandermenu



If the VSpeak ECU Converter is connected to an Expander or Centralbox and the ECU Converter display is activated with the Right button, the only way back to the expander menu is pressing the Left button (more than 3 sec).

2.1.2 Profibox - autonomous telemetry system for Kolibri / Xicoy-ECU


Using a Jeti Profibox incl. RSat receiver and the VSpeak ECU converter the telemetry data from a Kolibri / Xicoy ECU can be transferred completely self-sufficient to the pilot. Not only the settings using the Profibox can be made, as was shown in the previous chapters - all EX-data and the important alarms are displayed: EGT, FUEL, ECU battery voltage . . . are given as voice messages again.



2.2 Multiplex MLink (MSB)

2.2.1 Address-Assignment / Alarms

The VSpeak ECU Converter at delivery uses following addresses:

ECU	 Adresse	Description
ECU Status Alarm	2	ECU status
FUEL Alarm	3	Fuel Level in ml
BATT Alarm	4	Battery voltage in V
RPM Alarm	5	Turbine RPM
EGT Alarm	6	Exhaust Gas Temperature in °C
THROTTLE	7	Throttle Value in %
Pump PW	8	Pump pulse width in m
FUEL-FLOW	9	FuelFlow in ml

ECU Status	
Running	RUN...
FuelRamp	MainFStrt
SwitchOv	Keros.FullOn
Pre Heat	PreHeat1
Ignition	Ignite...
Start On	acceler.
BurnerOn	Stby/START
GlowTest	GlowPlug!
StickLo!	-OFF-
Ready	Stby/START
Cooling	Cooling
Stop	-OFF-
User Off	-OFF-
Trim Low	-OFF-
Unknown	-OFF-
Glow Bad	GlowPlug!
IgntrBad	IgnTimOut
Time Out	AccTimOut
Weak Gas	FuelFail
StartBad	AccTimOut
Low Batt	BattryLow
Overload	OverCurr
PumpLimi	WrongPmp
RxPwFail	RC-Off
Failsafe	FailSafe
SpeedLow	Low-Rpm
TempHigh	OverTemp
FlameOut	Disabled

For the values marked "Alarm" in the above table, alarm thresholds can be set using the HDT (see section 2.0).

Furthermore, the MSB addresses can be set arbitrarily with the help of the HDT (s. section 2.2.3).

2.2.2 Turbine status

To display the turbine status, texts are stored in the multiplex transmitters of the PROFI TX series as well as in the "gooseneck" telemetry display.

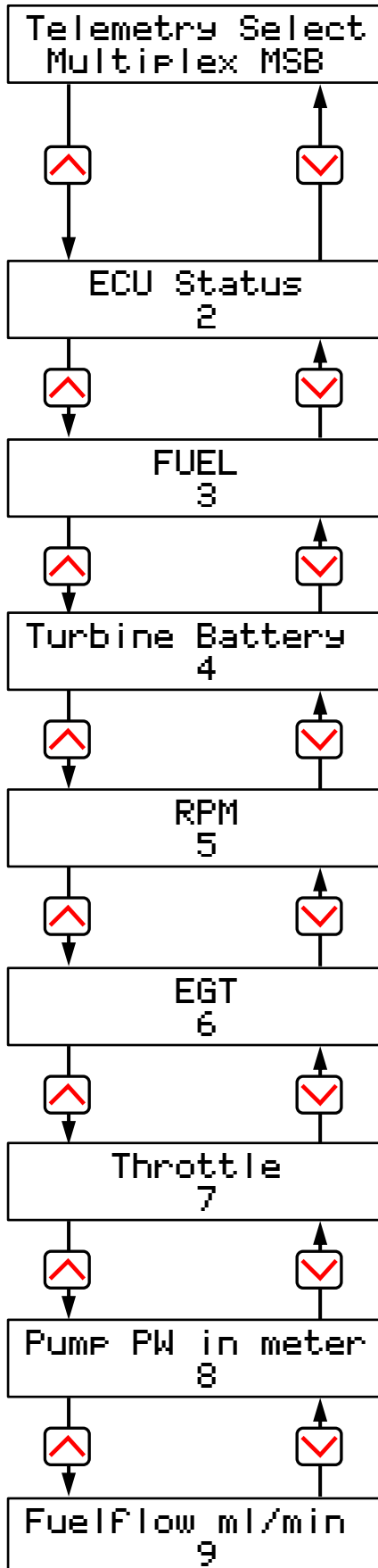
These do not 1 : 1 correspond to the status messages of the ECU.

The assignment is shown in the adjacent table.

All error messages are displayed inversely on the display.

2.2.3 Setup

With the help of the HDT, the MSB addresses can be set arbitrarily - an address duplication within the ECU converter is excluded. Values that should not be displayed can be set to "OFF".



2.3 Graupner HoTT

Using the HoTT System there are 2 ways to transmit telemetry data, on the one hand as "text" and on the other hand only the pure values.

Using text mode it is possible to establish a bi-directional data transfer, meaning you can use the keys of the radio or the Smartbox in order to change/enter values in the sensor. Using speech output is not possible in this mode.

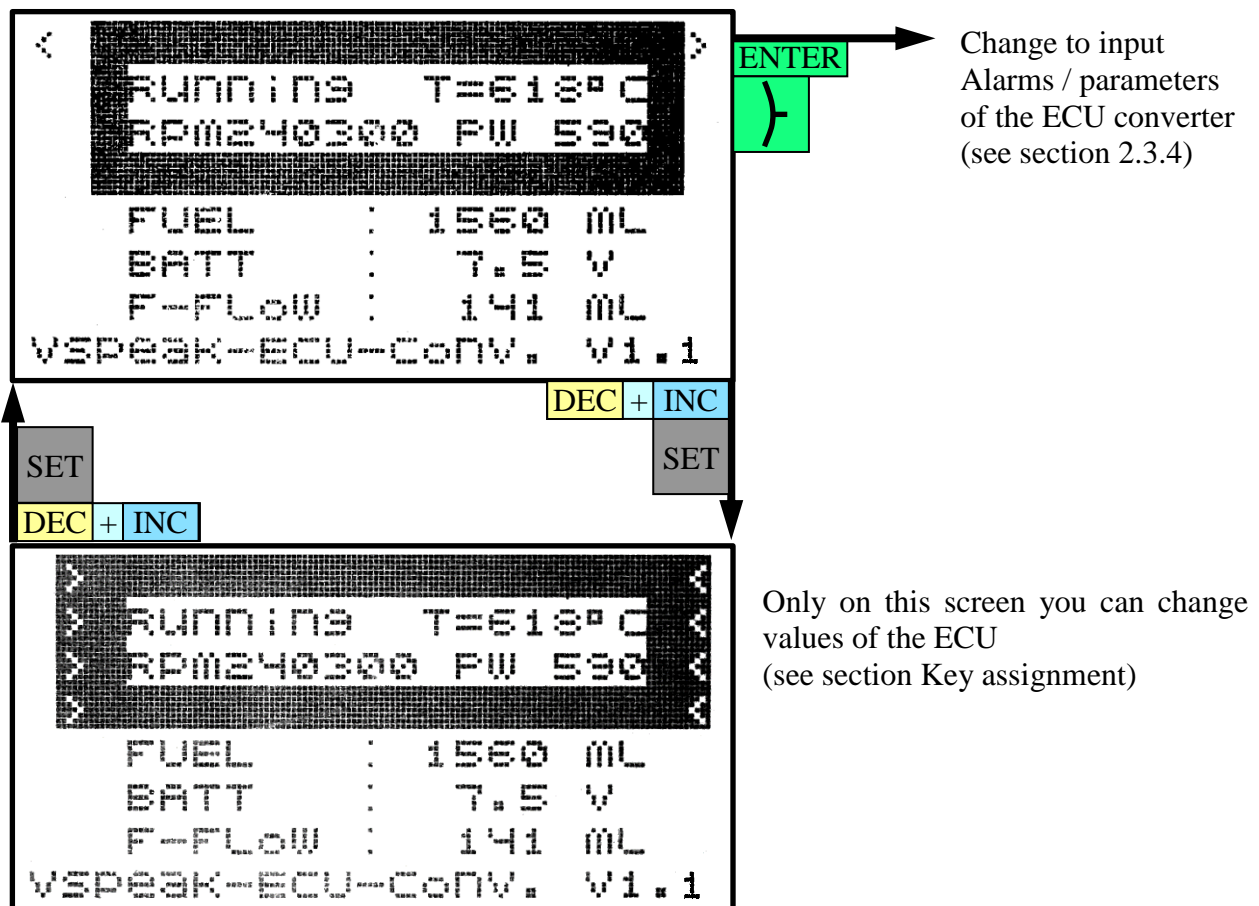
In data-mode the values are only transmitted in a fixed format in one direction. The format is defined by the sensor type. In this mode it is possible to have speech output for the sensor values.

2.3.1 Sensortype

The VSpeak ECU Converter for HoTT is a GAM (General Air Modul), a ESC (Electronic Speed Controller) – or a VAR (Vario). Please select this sensor-type on your radio or Smartbox.

2.3.2 Textdisplay

Using the text-display you can see the current ECU data and you can also change parameters of the ECU.



The functionality of the HDT can be mostly replicated with the HoTT buttons. For further details on the specific values please consult the manual of the ECU.

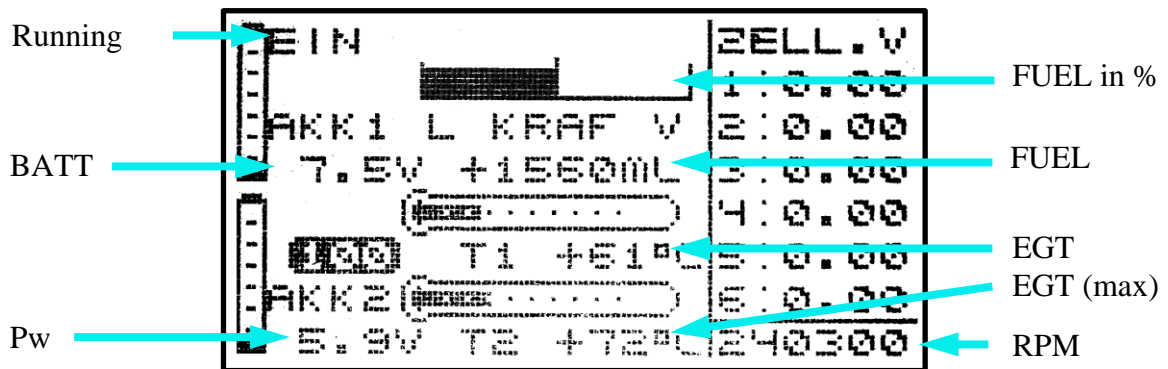
2.3.2.1 Key assignment

HDT				
	ESC	DEC	INC	ENTER

MX-12	
MX-16	
MC-16	
MC-20	
MC-32	
⋮	

2.3.3 Data-Display/Speech

2.3.3.1 GAM - General Air Modul



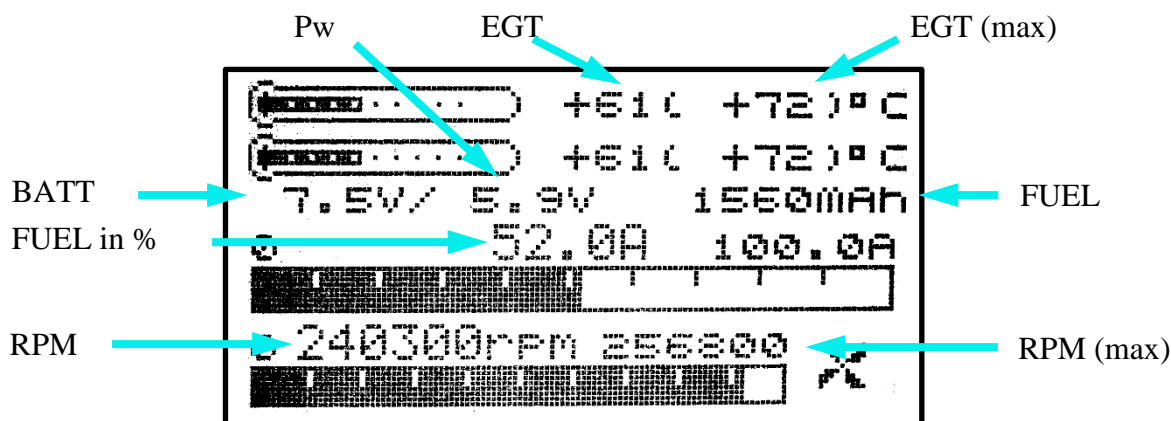
"EIN" indicates that the turbine is in the "Running" status.

Since the GAM can only display temperatures up to 235°C, the temperature is divided by 10. If you see a value of 61°C on the display, you have a "real" temperature of 610 - 619°C.

The PumpPw value is displayed as a voltage divided by 10, that is, 5.9V = 590 ... 599Pw.

The fuel level is shown as gauge in % and as numbers in ml. To calculate the percentage of tank volume value F-SIZE is 100% fully set when turned on.

2.3.3.2 ESC - Electronic Speed Control



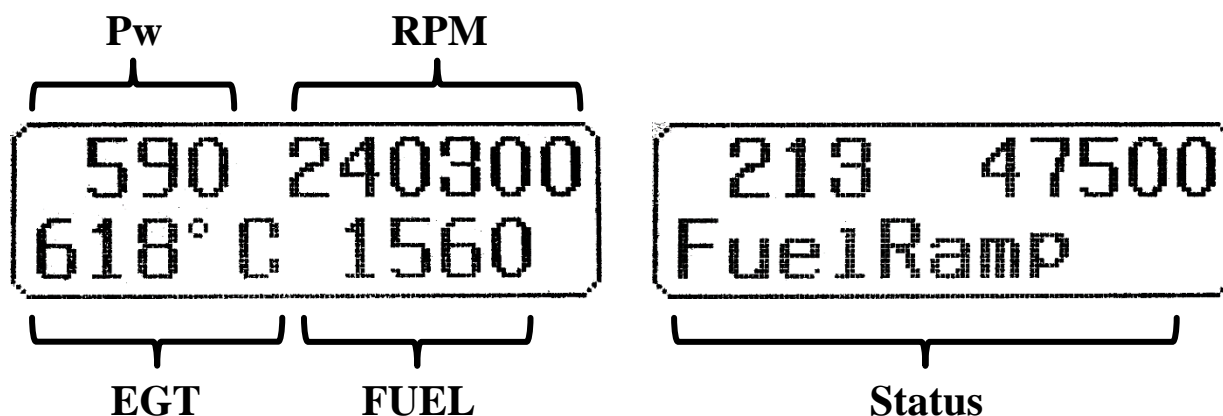
The ESC temperature display is limited to 235 ° C, so the turbine jet temperature is shown divided by 10, or the other way around: 61 ° C in the display corresponds to 610 ... 619 ° C.

The PumpPw value is displayed as a voltage divided by 10, that is, 5.9V = 590 ... 599Pw.

The fuel consumption is displayed on the display as capacity value, ie, 1560mAh are 1560ml. On the other hand, the percentage tank level is displayed as the current, ie, 52.0A correspond to 52.0% tank level. The tank level is thus easy to read via the associated bar display. To calculate the percentage of tank volume value F-SIZE is 100% fully set when turned on.

2.3.3.3 VAR – Variometer

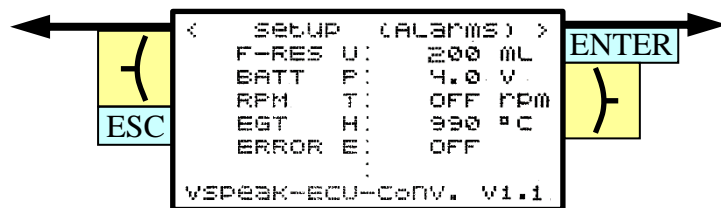
The HoTT Vario offers the possibility to display texts, in the example two lines with an MC20. The bottom line shows the turbine status or error messages. If the turbine is in the "Running" status, the lower line shows the EGT and the remaining fuel in ml.



The tank level is converted in a percentage and displayed as altitude, e.g. 52m corresponds to 52% tank level (can be used for the speech output). To calculate the percentage of tank volume value F-SIZE is 100% fully set when turned on.

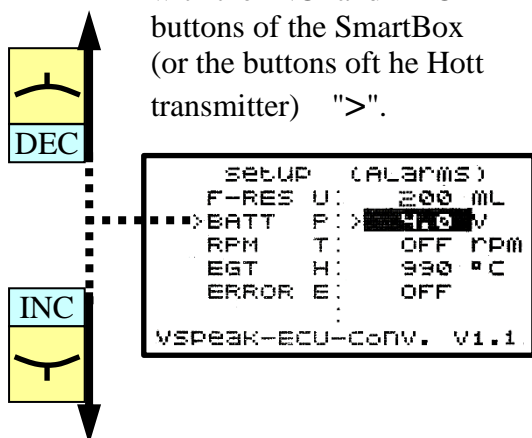
Furthermore, the alarms according to section 2.3.4. are also effective here.

2.3.4 Parameterization



The change of sides takes place with Enter and ESC button of the SmartBox or with the appropriate buttons on the HoTT transmitter.

The parameter is selected with the INC- and DEC-buttons of the SmartBox (or the buttons of the HoTT transmitter) ">".



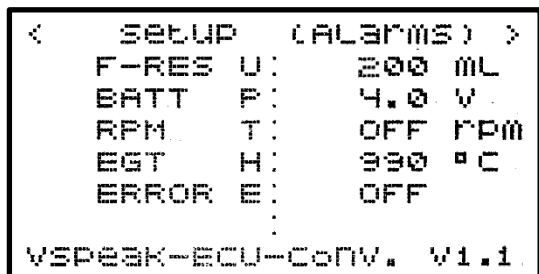
With **INC+DEC** or **SET** the value of the selected parameter is enabled for change (inverted).

With **INC** the value can be increased,

With **DEC** it can be reduced.

Stored is after **INC+DEC** or **SET**

2.3.4.1 Alarms



Settings		
Value range	Step size	Signal tone
OFF, 50 ... 2500 ml	10 ml	U
4.0 ... 14.0 V	0.1 V	P
OFF, 20 ... 100 x 1000rpm	100 rpm	T
400 ... 990 °C	5 °C	H
ON / OFF		E

Upon delivery, the warning thresholds are set as shown in the picture.

- **F-RES**
The alarm Fuel Reserve is signaled if the remaining fuel is lower than set at F - RES.
- **BATT**
The alarm SUPP is signaled when the battery voltage is lower than the BATT set value.
- **EGT**
The alarm EGT is signaled if the temperature exceeds the value set at EGT.
- **RPM**
The alarm RPM is signaled when the turbine rotation speed is lower than the RPM threshold value.
The speed monitoring is started after at first exceeding RPM alarm threshold and ends with PumpPw = 0.
The RPM alarm is suitable for signaling a "turbine flameout".
- **ERROR**
As "Error" are **all** Error status messages signaled.

2.3.4.2 FUEL consumption / Sensor ID

The VSpeak ECU Converter can calculate the current fuel flow rate (F-FLOW) and the fuel consumption (FUEL) based on the Pump PW value output by the ECU. An adaptation to the turbine size and the respective parameters can be made with the parameter **PwFact**. An increase in value causes a higher calculated fuel consumption, reduction correspondingly less.

F- SIZE is the capacity of the main tank in ml. The tank size is required for the calculation of the alarm for the fuel consumption (see above alarms: F RES).

Settings	
Value range	Step size
200 ... 20.000ml	50 ml
5 ... 2500	5
OFF, ON	
GAM / ESC / VAR	

< SETUP (FUEL)
F-SIZE : 1000 ml
PWFACt. : 400
TAXI : OFF
SENSOR : GAM
VSPEAK-ECU-CONV. V1.1

Upon delivery, the warning thresholds are set as shown in the picture.

For models where a taxi tank is plugged into the main tank until the model is lifted off, set "Taxi = ON". If the turbine is in the "Running" status, then when THROTTLE = 80% is exceeded for the **second time**, the FUEL will "reset", ie the displayed FUEL is only once set to "full" (the value set at "Fuel Tank Size") again at this time.

In sensor the sensor type can be GAM, ESC or VAR. The change of the sensor type will only take effect after restarting the ECU converter.

2.4 Futaba S.BUS2

The VSpeak ECU converter is fully compatible with S.BUS2. Registration and connection are established as with any other S.BUS2 sensor

Caution:

We generally recommend a strict separation between sensor values and servo data. Although the S: BUS 2 can transmit servo data, the S.BUS2 should exclusively be used for the transmission of sensor data and only the S.BUS1 should be used for the servos. In this way, the servo data are excluded from influencing on failure of a sensor..

2.4.1 Registration at the transmitter

The VSpeak ECU converter must be registered on the transmitter like any S.BUS2 sensor.

The slot allocation is required only once, this can be done manually.

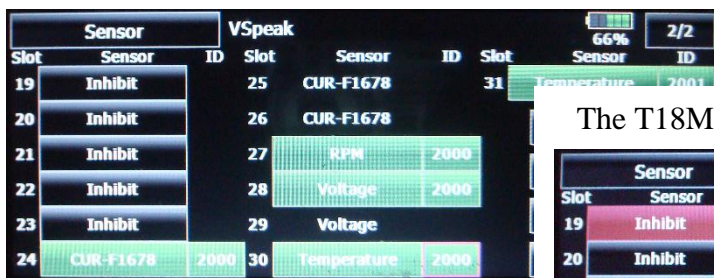
Manual Slot Allocation:

1. Select the desired sensor at free slot addresses on the transmitter (see Table Assignment Sensor - ECU Values).
2. Using the HDT, set the slot addresses set in the transmitter in the VSpeak ECU converter (see section 2.4.4).

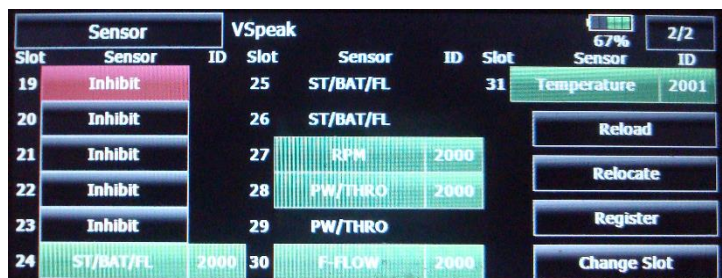
Assignment sensor - ECU values

No	Sensor name	Slots	Start (default)	original Sensor value	ECU value
1	CUR-F1678	3	24	CURRENT	Turbine status (s. section 2.4.2)
				VOLTAGE	BATT in V
				CAPACITY	FUEL in ml
2	SBS-01RM/O	1	27	R.P.M	RPM in rpm
3	SBS-01V	2	28	BATTERY	PUMP PW in V (eg.: 590Pw =59,0V)
				EXT-VOLT	THROTTLE in %
4	SBS-01T	1	30	TEMP	F-FLOW in ml/min
5	SBS-01T	1	31	TEMP	EGT in °C

E.g. using a T18MZ transmitter: The sensors are displayed after registration as seen below:



The T18MZ has the ability to rename the sensors:



Telemetry		VSpeak	
Receiver	External	ST/BAT/FL(Capacity)	PW/THRO(Ext. Battery)
3.4V	0.0V	1560mAh	99.9V
ST/BAT/FL(Current)	27. RPM(Magnet)	F-FLOW	
21.0A	240300rpm	141°C	
ST/BAT/FL(Voltage)	PW/THRO(Battery)	31. Temperature	
7.5V	59.0V	618°C	

2.4.2 Turbine status – numerical "Current"-Values

Futaba CUR-F1678 CURRENT	Description
21.0 A	Running
14.0 A	FuelRamp
13.0 A	SwitchOv
12.0 A	Pre Heat
11.0 A	Ignition
10.0 A	Start On
9.0 A	BurnerOn
7.0 A	GlowTest
6.0 A	StickLo!
4.0 A	Ready
3.0 A	Cooling
2.0 A	Stop
1.0 A	User Off
0.0 A	Trim Low
- 10.0 A	ERROR
- 20.0 A	like -10.0A, but only once for 2 seconds

The turbines status messages are displayed numerically as current values. Please refer to the table.

As "Error" and thus current value "-10.0A" **all others** errors, not listed in the table are interpreted messages, which are errors that can lead to a shutdown of the turbine or not even allow it to start.

If an alarm of lower MINUS 15.0A is programmed in the transmitter, all error messages of the ECU are signaled as a current alarm in the transmitter for a duration of 2 seconds.

2.4.3 Telemetry Box



On the Telemetry Box, the data of the ECU converter can also be displayed (in the picture e.g. fuel consumption 1560ml) and alarms corresponding section 2.4.5 are generated:

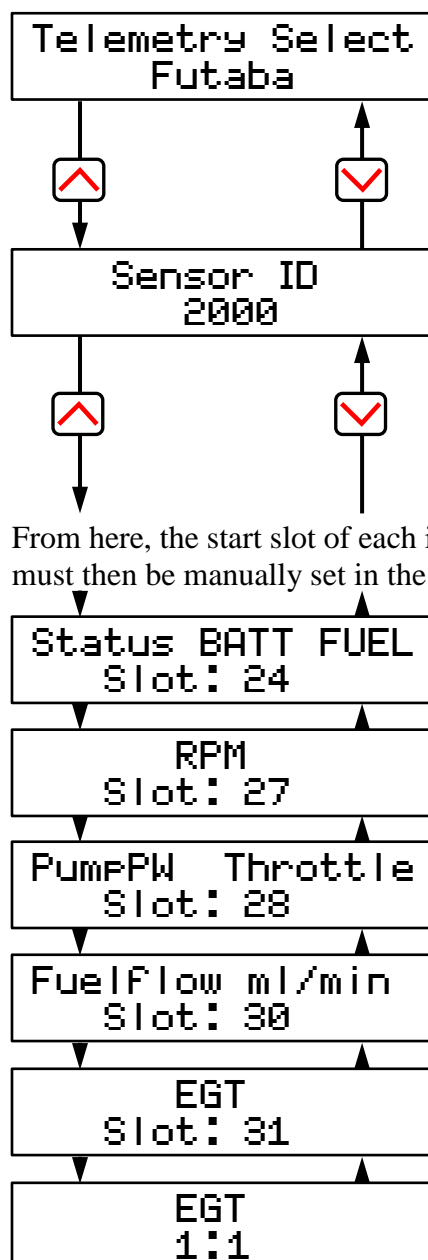
STATUS, BATT, FUEL and RPM

With the latest software (V1.003 - as of May 2015) the sensors **SBS-01V** and **SBS-01T** are not supported yet.

Caution:

The VSpeak ECU converter sends its data **always taking advantage of all sensors**, including the sensors 1 x SBS-01V and 2 x SBS-01T. These occupy the slots in accordance with the table in section 2.4.1 - or the last saved values.

2.4.4 Setup



For the Futaba SBUS2 system a variety of settings in VSpeak ECU converter using the HDT can be made. In the overview the complete menu structure for all possible range of settings is shown.

Here the sensor start ID can be set, with which the sensors of the VSpeak ECU converter are registered on the Futaba system.

The ID applies to CUR-F1678, SBS-01V and the first temperature sensor SBS-01T (F-FLOW).

The second temperature sensor SBS-01T then has the sensor start ID + 1.

From here, the start slot of each individual sensor can be set manually, and the assigned sensor must then be manually set in the transmitter at the relevant slot address.

Slot "OFF" deactivates the sensor in question - it is thus also deactivated for logging on to the transmitter.

Display of EGT "1:1" - or – "divided by 10".

Since the adjustable temperature alarm threshold in Futaba transmitters is only possible for max. 200 °C, here is the possibility to transfer the temperature value divided by 10.

2.4.5 Alarms

In the Futaba system alarms can be generated according to the set alarm thresholds for each value in the transmitter or the Telemetry Box. In the sensors itself no alarms can be set. This is for most sensor data also sufficient, such as an alarm for monitoring the EGT temperature.

But for alerting the fuel consumption and the speed monitoring the VSpeak ECU converter for Futaba offers the following options: (s. section 2.0 **FUEL Tank low** and **RPM low**)

2.4.5.1 FUEL Tank low

1. Setting value = OFF

Fuel is transferred 1 : 1.

However, if an alarm threshold of e.g. <200 is programmed, then, after the tank level is lower, the alarm is also triggered - but the alarm only stops, if the transmitter is switched off. That's why:

2. Setting value = 200ml (as example)

After lowering the tank reserve, the current value 3 x is transferred alternately for 5 seconds as a negative value, followed by 10 seconds as normal positive value.

2.4.5.2 Rotation speed monitoring / RPM low

Thus, the speed is displayed correctly, you have to set the speed display to type: magnet and gear ratio 1.

1. Setting value = OFF

The current speed is transfer 1 : 1.

If an alert threshold of for example <35,000 rpm is programmed in the transmitter, then the alarm is already active at the switching on of the turbine and the receiving system. That's why:

2. Setting value = 35.000rpm (as an example)

The speed is transferred to the transmitter divided by a factor of 10. Only in the alarm case, speeds less than the setting value are transferred 1 : 1. The alarm is active AFTER exceeding the set value.

In the example, the speed monitoring is only activated after exceeding 35,000 rpm. The actual 40.000rpm are displayed on the transmitter as 4.000rpm, 35,100 as 3.510rpm. If speed decreases further then 35.000rpm speed transfer is 1 : 1. Has the transmitter an alarm threshold set to > 15.000rpm, the alarm starts. If turbine speed falls below 15.000rpm - for example, turbine was switched off, then the alarm stops because speed is now less than the alarm threshold value.

2.4.5.3 Flameout / Status

Turbine status messages are transmitted as numerical "Current" values.

If in the transmitter an alarm threshold for the current of e.g. less than MINUS 15.0A is set, all turbine shutdowns are signaled as a current alarm for a period of 2 seconds.

2.5 Futaba S.BUS2 V10

The VSpeak ECU converter is fully compatible with S.BUS2. Registration and connection are established as with any other S.BUS2 sensor

Caution:

We generally recommend a strict separation between sensor values and servo data. Although the S: BUS 2 can transmit servo data, the S.BUS2 should exclusively be used for the transmission of sensor data and only the S.BUS1 should be used for the servos. In this way, the servo data are excluded from influencing on failure of a sensor.

2.5.1 Registration at the transmitter

The VSpeak ECU converter must be registered on the transmitter like any S.BUS2 sensor.

The slot allocation is required only once, this can be done manually.

Manual Slot Allocation:

1. Select the desired sensor **Jetcat V10** at a free slot address on the transmitter.
2. Using the HDT, set the slot address set in the transmitter in the VSpeak ECU converter (see section 2.5.4).

Sensor		VSpeak		55%		1/2	
Slot	Sensor	ID	Slot	Sensor	ID	Slot	Sensor
1	Inhibit		7	Inhibit		13	JetCat V10
2	Inhibit		8	JetCat V10	2200	14	JetCat V10
3	Inhibit		9	JetCat V10		15	JetCat V10
4	Inhibit		10	JetCat V10		16	JetCat V10
5	Inhibit		11	JetCat V10		17	JetCat V10
6	Inhibit		12	JetCat V10		18	JetCat V10

Telemetry		VSpeak		66%		1/2	
Receiver	External	8. JetCat V10(Pump)	5.90V	8. JetCat V10(Fuel co...)	1560ml		
8. JetCat V10(RPM)	240300rpm	8. JetCat V10(Set RPM)	0rpm	8. JetCat V10(Fuel flow)	141ml/min		
8. JetCat V10(Temper...)	618°C	8. JetCat V10(Thrust)	0.0N	8. JetCat V10(Altitude)	0m		

Telemetry		VSpeak		66%		2/2	
8. JetCat V10(Fuel qu...)	100%	8. JetCat V10(Speed)	0km/h				
8. JetCat V10(Battery)	7.50V	8. JetCat V10(Status)					
8. JetCat V10(Current)	21.0A	8. JetCat V10(Second ...)	0rpm				

2.5.2 Assignment JetCat V10 - ECU Values

JetCat V10 sensor occupies 14 slots, the assignment is as follows:

Nr.	JetCat V10	ECU
1	RPM	RPM
2	Temperature	EGT
3	Pump	Pump PW (Bsp.: 590 Pw =5,90V)
4	Set RPM	-
5	Thrust	-
6	Fuel	FUEL
7	Fuel flow	FuelFlow
8	Altitude	-
9	Fuel quality	THROTTLE
10	Battery	BATT
11	Current	ECU- status as numerical current value (s. section 2.5.3)
12	Speed	-
13	State	-
14	Second Shaft	-

2.5.3 Turbine status – numerical "Current"-Values

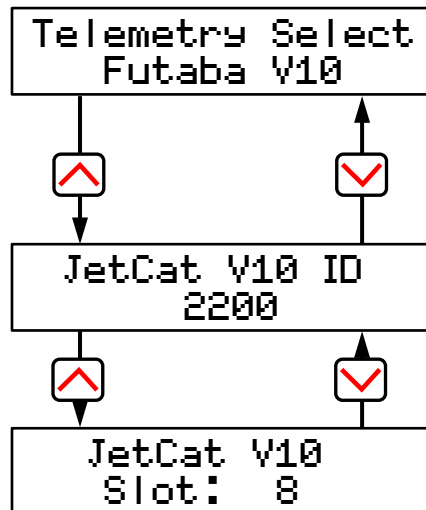
The turbines status messages are displayed as numerical "Current" values (s. table below).

ECU Status	Futaba CURRENT	Futaba Status JetCat V10
Running	21.0 A	Running
FuelRamp	14.0 A	Starting
SwitchOv	13.0 A	Starting
Pre Heat	12.0 A	Starting
Ignition	11.0 A	Starting
Start On	10.0 A	Starting
BurnerOn	9.0 A	Starting
GlowTest	7.0 A	OFF
StickLo!	6.0 A	OFF
Ready	4.0 A	OFF
Cooling	3.0 A	OFF
Stop	2.0 A	OFF
User Off	1.0 A	OFF
Trim Low	0.0 A	OFF
Unknown	49.0 A	HDT Off
Glow Bad	49.0 A	Glow Plug defective
IgntrBad	49.0 A	Ignition timeout
Time Out	49.0 A	Acceleration time out
Weak Gas	49.0 A	Fuel fail
StartBad	49.0 A	Acceleration time out
Low Batt	49.0 A	Low Battery
Overload	49.0 A	Over Current
PumpLimi	49.0 A	Pump error
RxPwFail	49.0 A	RC-off
Failsafe	49.0 A	Fail Safe Off
SpeedLow	49.0 A	Low rpm Off
TempHigh	49.0 A	Over temperature
FlameOut	49.0 A	Low temperature Off
	55.0 A	

As "Error" and thus current value "49.0A" all ECU errors displayed, which can lead to a shutdown of the turbine or not even allow it to start.

The current value "55.0 A" is signaled once for 2 seconds as a "total alarm" for all error messages with the current value "49.0 A".

2.5.4 Setup



For the Futaba SBUS2 system a variety of settings in VSpeak ECU converter using the HDT can be made. In the overview the complete menu structure for all possible range of settings is shown.

Here the sensor start ID can be set, with which the **Jetcat V10** sensor of the VSpeak ECU converter is registered on the Futaba system.

Here, the StartSlot can also be set manually, in the sender then also manually set **Jetcat V10** at the relevant slot address.

2.5.5 Alarms

In the Futaba system alarms can be generated according to the set alarm thresholds for each value in the transmitter or the Telemetry Box. In the sensors itself no alarms can be set. This is for most sensor data also sufficient, such as an alarm for monitoring the EGT temperature.

But for alerting the the speed monitoring the VSpeak ECU converter for Futaba offers the following options: (s. section 2.0 **FUEL Tank low** and **RPM low**)

2.5.5.1 Rotation speed monitoring / RPM low

Thus, the speed is displayed correctly, you have to set the speed display to type: magnet and gear ratio 1.

1. Setting value = OFF

The current speed is transfer 1 : 1.

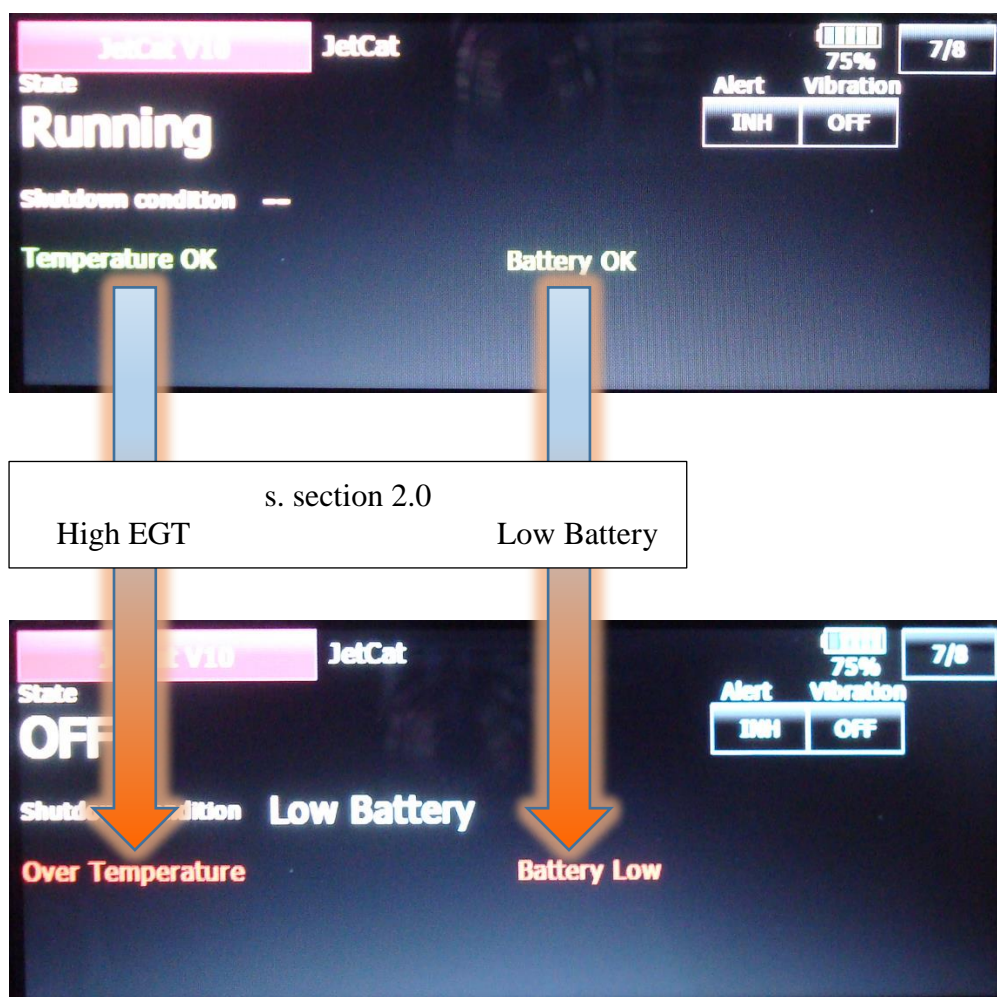
If an alert threshold of for example <35,000 rpm is programmed in the transmitter, then the alarm is already active at the switching on of the turbine and the receiving system. That's why:

2. Setting value = 35.000rpm (as an example)

The speed is transferred to the transmitter divided by a factor of 10. Only in the alarm case, speeds less than the setting value are transferred 1 : 1. The alarm is active **AFTER** exceeding the set value.

In the example, the speed monitoring is only activated after exceeding 35,000 rpm. The actual 40.000rpm are displayed on the transmitter as 4.000rpm, 35,100 as 3.510rpm. If speed decreases further then 35.000rpm speed transfer is 1 : 1. Has the transmitter an alarm threshold set to > 15.000rpm, the alarm starts. If turbine speed falls below 15.000rpm - for example, turbine was switched off, then the alarm stops because speed is now less than the alarm threshold value.

2.5.5.2 Battery low / EGT high



2.5.5.3 Flameout / Status

Turbine status messages are transmitted as numerical "Current" values (s. section 2.5.3)

If in the transmitter an alarm threshold for the current of e.g. more than 105.0A is set, all turbine shutdowns are signaled as a current alarm for a period of 2 seconds.

2.6 FrSKY S.Port

The data of the VSpeak ECU converter is available on the FrSky Smart Port as follows:

FrSky ECU data	ECU
A3	BATT in V
A4	Pump PW (5.90V = 590 Pw)
Fuel	FUEL in ml
RPM	RPM
Thro (...vorher Fuel)	THROTTLE in %
Tmp1	EGT in °C
Tmp2	ECU Status as Temperature (s. section 2.6.3)





For the provided LUA scripts on the website of VSpeak exactly this spelling is necessary, otherwise the LUA script does not work correctly.

The second "Fuel" value with the unit% has been renamed "**Thro**".

For "Fuel" the PREZISION should be changed from 0.00 to 0.- - ml and for A3 (BATT) from 0.00 to 0.0 V.







2.6.1 LUA script für Taranis

(X9D and X9E)

 RPM x1000 240.3	 FUEL (ml) 750	THROTTLE 100%
 EGT 618	STATUS Running	 7.5V PumpPw 590


On the website of VSpeak you can download the packed file [VS_Taranis_LUA.zip](#) for free, a **Readme.pdf** file is included.

2.6.2 LUA script for Horus (openTX)

Demo			 13 Nov 17:30
 RPM x1000 240.3	 FUEL (ml) 750	Throttle 100%	
 EGT 618	STATUS Running	 7.5V PumpPw 590	
Xicoy/Kolibiri			

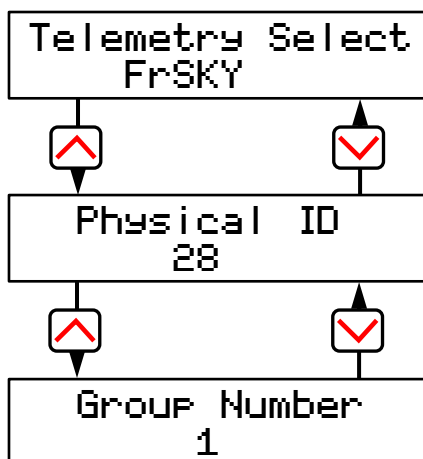
On the website of VSpeak you can download the packed file [VS_Horus_LUA.zip](#) for free, a **Readme.pdf** file is included.

2.6.3 Turbine status – numerical „Temperature“-Values

 Tmp2	Description
21	Running
14	FuelRamp
13	SwitchOver
12	Pre Heat
11	Ignition
10	Start On
9	BurnerOn
7	GlowTest
6	StickLo
4	Ready
3	Cooling
2	Stop
1	User Off
0	Trim Low
-1	Unknown
-2	Glow Bad
-3	IgntBad
-4	Time Out
-5	Weak Gas
-6	StartBad
-7	Low Batt
-8	Overload
-9	PumpLimit
-10	RxPwFail
-11	Failsafe
-12	SpeedLow
-13	TempHigh
-14	FlameOut

The turbines status messages are also displayed numerical values. The assignment is given in the table.

2.6.4 Setup



For the FrSky system a variety of settings in VSpeak ECU converter using the HDT can be made.

In the overview the complete menu structure for all possible range of settings is shown.

2.6.5 Alarms

At FrSky system, alarms can only be set in the transmitters, so here the alarms described in Section 2.0 have no meaning.

2.7 JR PROPO

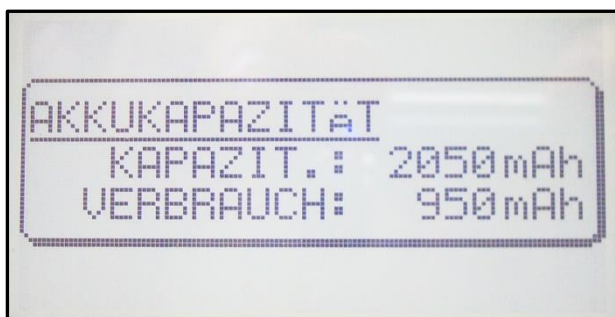
The displays are described below using the example of an XG8.



JR Display (Ex. XG8)	ECU
F-AKKU	OFF / ON
F-PACK A	ECU-Status as numerical current value (s. section 2.7.1)
F-PACK W	Fuel-Flow (ml/min) or Throttle (%) (s. section 2.7.2)
F-PACK V	Battery or PumpPW (s. section 2.7.2) (eg.: 273 Pw = 2.73V)
F-PACK C	FUEL (remaining fuel) in ml
TEMP.	OFF / ON
RPM	OFF / ON (s. section 2.7.2)

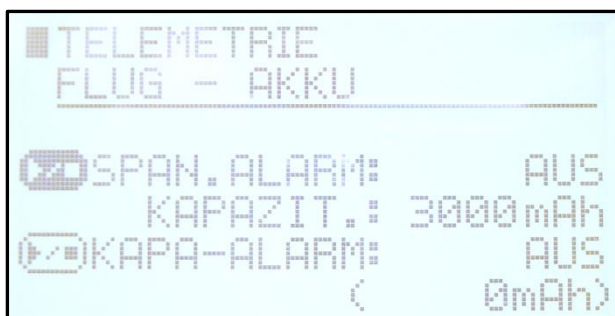
In order to display the rotation speed correctly, the parameters for RPM must be set to: GEAR RATIO , PROPELLER and MAGNET POLE to INH.

The parameter type (MAGNETIC , OPTICAL or MOTOR) does not matter.




The ECU converter transmits the consumed FUEL (950ml) – but on the radio the remaining fuel is displayed.

This means that the actual tank size must be parameterized in ml in the settings in the radio, here in the example the main tank has 3000 ml volume, which is set as capacity 3000mAh.



2.7.1 Turbine status – numerical "Current"-Values

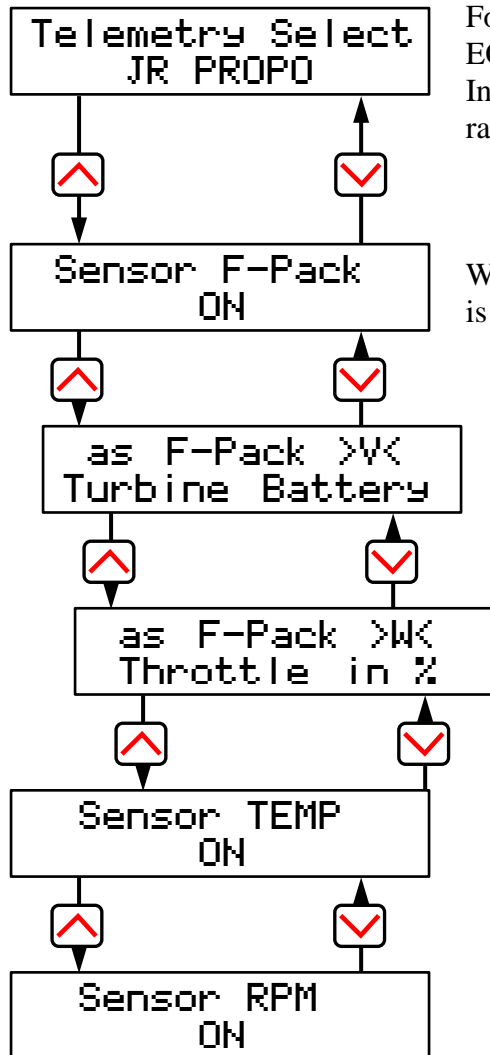
The turbines status messages are displayed as numerical "Current" values. The assignment is given in the following table.

 F-AKKU A	Description
21.0 A	Running
14.0 A	FuelRamp
13.0 A	SwitchOver
12.0 A	Pre Heat
11.0 A	Ignition
10.0 A	Start On
9.0 A	BurnerOn
7.0 A	GlowTest
6.0 A	StickLo!
4.0 A	Ready
3.0 A	Cooling
2.0 A	Stop
1.0 A	User Off
0.0 A	Trim Low
100.0 A	ERROR
111.0 A	like 100.0A, but only once for 2 seconds

As "Error" and thus current value "100.0A" all ECU errors displayed, which can lead to a shutdown of the turbine or not even allow it to start.

The current value "111.0 A" is signaled once for 2 seconds as a "total alarm" for all error messages with the current value "100.0 A".

2.7.2 Setup



For the JR PROPO system a variety of settings in VSpeak ECU converter using the HDT can be made. In the overview the complete menu structure for all possible range of settings is shown.

With "ON" / "OFF" you can set whether the relevant sensor is used for data transmission from the ECU converter.

F-PACK, as voltage in **V**:

- Turbine Battery
- Pump PW

F-PACK, as power in **W**:

- Throttle in %
- Fuelflow in ml/min

2.7.3 Alarms

At JR PROPO system, alarms can only be set in the transmitters, so here the alarms described in Section 2.0.2 have no meaning.

2.8 PowerBox P²Bus

Auf dem P²Bus werden die Turbinendaten wie auf den folgenden Bildern übertragen:



Weiterhin können die 2 Displayzeilen des Kolibri HDT angezeigt werden.

Bei Turbinenstörungen wird die jeweilige „Status“ Meldung zusätzlich mit einem Alarm versehen.

2.8.1 Einstellungen

Sämtliche relevante Einstellungen können direkt vom Sender aus vorgenommen werden.

Änderungen der nachfolgend mit **gelben Hintergrund** gekennzeichneten Parameter werden erst nach einem Sensor-Rescan wirksam.

2.8.1.1 FUEL



Taxi Tank

Für Modelle, bei denen ein Taxitank bis zum Abheben des Modells am Haupttank angesteckt wird, ist „Taxi Tank“ zu aktivieren. Ist die Turbine im „Running“, dann wird beim **zweiten** Überschreiten von THROTTLE = 80%, die Tankanzeige „resetet“, d.h. der bis dahin abgenommene Tankinhalt wird zu diesem Zeitpunkt einmalig wieder auf „voll“ gestellt, also den bei „Tank Size“ eingestellten Wert gestellt.

Tank Size

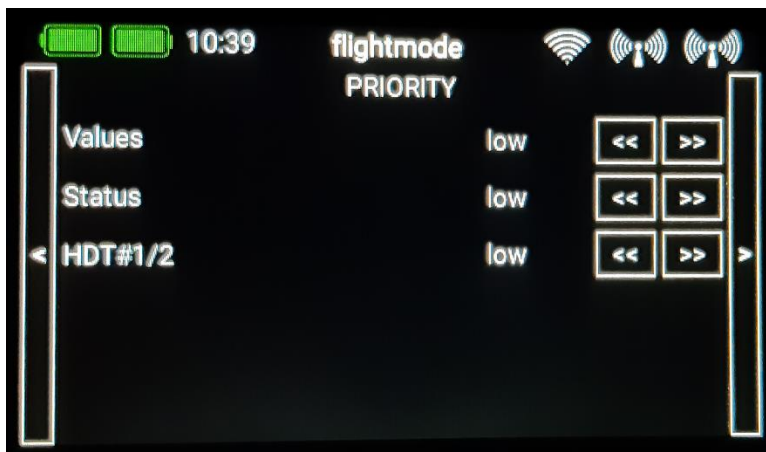
Volumen des Haupttanks in ml.

Pump PW Factor

Die Berechnung des Kraftstoffdurchflusses und letztlich des Treibstoffverbrauchs erfolgt anhand des PUMP Pw Wertes. Mit dem Parameter Pump PW Factor erfolgt eine Anpassung an die jeweilige Turbinengröße und Einbausituation.

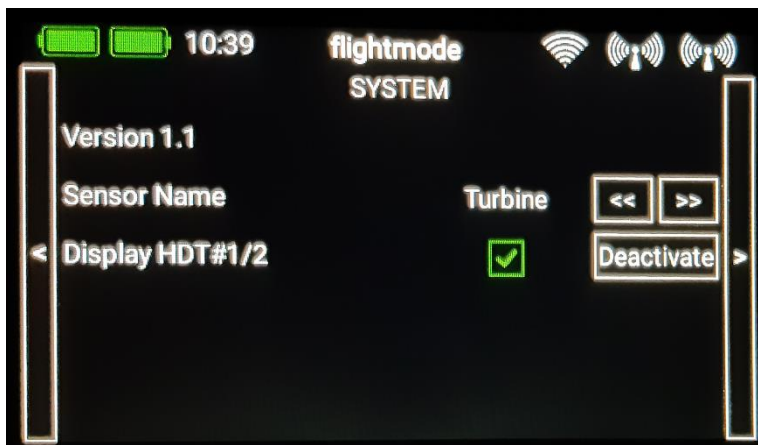
Eine Wertvergrößerung bewirkt einen höheren berechneten Treibstoffverbrauch, Verkleinerung entsprechend weniger.

2.8.1.2 PRIORITY



Hier kann die Priorisierung der Datenabfrage für die Gruppe der ECU Werte (**Values**), den **Status** sowie der HDT Zeilen (**HDT#1/2**) eingestellt werden, es kann zwischen: low / high / higher / at highest gewählt werden, wobei low völlig ausreichend ist.

2.8.1.3 SYSTEM



Version #.#

Anzeige der aktuellen Softwareversion.

Sensor Name

Es können mehrere VSpeak ECU Konverter am P²Bus gleichzeitig angeschlossen werden, z.B. bei mehrstrahligen Modellen. Die Vergabe der Sensoradresse managt der PowerBox Sender – bitte lesen Sie dazu in der Bedienanleitung Ihres PowerBox Senders.

Zur Unterscheidung mehrerer gleichzeitig aktiver ECU Konverter können bei Sensor Name unterschiedliche Namen ausgewählt werden, z.B.:

Turbine Turbine [1] [2] [3] [4] [A] [B] [C] [D] [L] [M] [R] ...

Display HDT#1/2

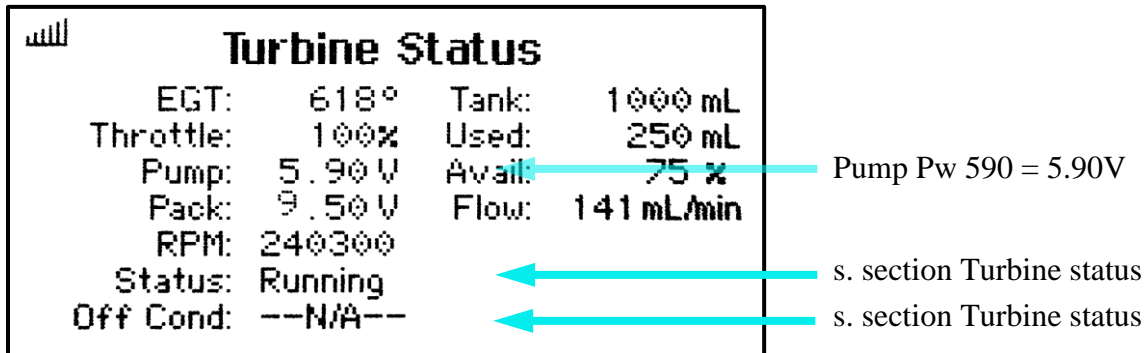
Anzeige der beiden HDT Zeilen.

Ist Display HDT#1/2 deaktiviert, werden die beiden HDT Zeilen nicht nur nicht zur Anzeige gebracht, sie werden auch nicht am P²Bus übertragen, entlastet somit das P²Bus Protokoll.

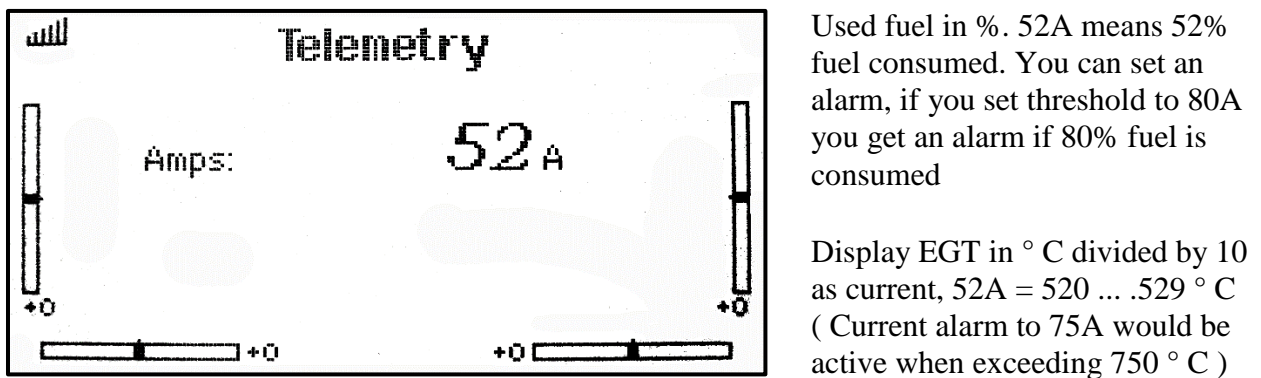
2.9 Spektrum (X-Bus)

You need at least a DX9, DX10T, DX18... in order to view ECU Telemetry. DX6, DX7s and DX8 do not support this sensor.

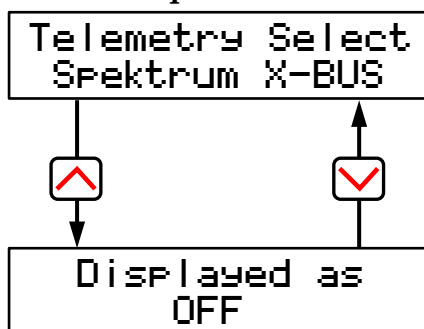
2.9.1 Telemetry display



Fuel consumption and EGT can also be displayed as a "current".



2.9.2 Setup




For the Spektrum system, the following settings can be made in the VSpeak ECU Converter using the HDT:

Selection of values to be displayed as amps:

- OFF ... Display is not used
- Consumed FUEL %
- EGT divided 10

2.9.3 Turbine status

To display the turbine status, texts are stored in the Spektrum transmitters. These do not 1 : 1 correspond to the status messages of the ECU. The assignment is shown in the table:

ECU Status	 Status	 Off Cond:
Running	Running	--N/A--
FuelRamp	FuelRamp	--N/A--
SwitchOver	SwitchOv	--N/A--
Pre Heat	Pre Heat	--N/A--
Ignition	Ignition	--N/A--
Start On	Start On	--N/A--
BurnerOn	BurnerOn	--N/A--
GlowTest	GlowTest	--N/A--
StickLo!	STANDBY	--N/A--
Ready	Ready	--N/A--
Cooling	Cooling	--N/A--
Stop	Stop	--N/A--
User Off	Off	--N/A--
Trim Low	Trim Low	--N/A--
Unknown	Undefined	--N/A--
Glow Bad	Off	Glow Plug Defective
IgntrBad	IgntrBad	--N/A--
Time Out	Off	Acceleration Timeout
Weak Gas	WeakFuel	--N/A--
StartBad	Ign.Fail	--N/A--
Low Batt	Off	Low Battery
Overload	Overload	--N/A--
PumpLimit	PumpLimi	--N/A--
RxPwFail	ERROR	--N/A--
Failsafe	Off	Fail Safe Off
SpeedLow	SpeedLow	--N/A--
TempHigh	TempHigh	--N/A--
FlameOut	FlameOut	--N/A--

2.9.4 Alarms

At Spektrum system, alarms can only be set in the transmitters, so here the alarms described in Section 2.0 have no meaning.

6 EG Declaration of Conformity

Manufacturer

VSpeak-Modellbau (Volker Weigt)
Priestewitz



We hereby declare that the product

VSpeak ECU Converter

complies with the following European directives:

2004/108/EC	EMC Directive
2006/95/EC	Low Voltage Directive (LVD)
2011/65/EC	Restriction of Hazardous Substances (RoHS)

The presumption of conformity is taken by applying the following harmonized standards:

EN60065	Audio-, video- and similar electronic apparatus - Safety requirements
EN60332	Tests on electric and optical fibre cables under fire conditions
EN60950	Information technology equipment - Safety
EN61000-6-1	Electromagnetic compatibility (EMC)
EN61000-6-3	
EN55022	Information technology equipment - Radio disturbance characteristics

Priestewitz, 2019/04/01

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Signature
Volker Weigt
Managing Director

7 Version history

Vers.	Date	Comment
1.0	04.2019	first retail version
1.1	01.2020	Futaba V10 revised PowerBox Menu, all settings of the converter directly via the transmitter

8 Contact

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