Entwicklung von Modellbauelektronik

SM MODELL BAU

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JLog2 data logger

Special JIVE logger and more

Description and Instruction Manual

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1 Introduction

JLog is a special data logger processing the diagnostic data stream of a **JIVE** series ESC – data of the **JIVE's** internal sensors and other data of the ESC. The logger stores the output as log files on a microSD card and drives a live stream through an USB interface or telemetry. Plotting of logs is preferably done by **LogView**

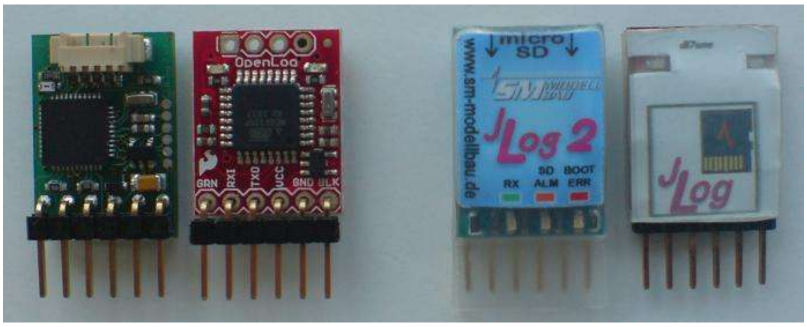
Unique features are:

- high data capacity, small dimensions, low power requirement
- no data transfer required prior to data evaluation
- no complex cabling
- capturing of data that a native logger can't provide
- measurement readings not integrated (no rms values) what leads to real-life amplitudes
- configurable alarms - alarms by telemetry and/or alarm lines
- configuration and updating from the SD card

(The logger can be used with every JIVE regardless of its firmware version.)

2 Differences between *JLog2* and *Jlog1*

Both loggers are of identical dimensions ("stamp") but based on different hardware:



JLog2

- connections for additional JLog-own sensors:
  - analog temperature sensor or
  - up to 5 digital temperature sensors or
  - RPM sensor or
  - up to 2 alarm lines
  - (With a simple D.I.Y. adaptor also temperature sensor(s) and RPM sensor may be connected at the same time, or one type of sensor and an alarm line.)
- connection for live data via an optional USB interface or telemetry
- 9 instead of 4 alarm types before
- motor current calculation now more granular at all and more exact in border areas
- floating offset for calibration of values for motor and BEC current
- calculation of cumulative mAh more precise once again
- now 31 in place of before 13 (respectively 18 with v.2.7) log values in **LogView**
- alternative to configure the logger also without a PC (*JLC*) by a **JETIbox**
- updating *JLog2* is no more individualized and done by a file on the mSD.

Because of more exactly calculating the motor current in the upper border area peaks at high slew rates of the current can reach up to 7% higher in the log than with *JLog1*.

3 Data logged and displayed by *JLog2*

Measurement readings and signals:

U-BEC [V]	BEC output voltage	**I-BEC [A]**	BEC output current
U-BAT [V]	main battery voltage	**I-Motor [A]**	motor current
I-Motor/Int [A]	motor current (integrated)	**Throttle [%]**	throttle impulse length
PWM-Motor [%]	ESC "opening"	**RPM-Uni [1/min]**	rotor or propeller RPM
RPM-Motor [1/min]	motor's RPM	**Capacity [mAh]**	cumulative mAh
Temp-PA [°C]	temperature of the PA	**Temp-BEC [°C]**	temperature of the BEC
Power [W]	motor input power	**Power/Int [W]**	motor input power (integrated)
IbecMax [A]	peak BEC current	**ImotMax [A]**	peak motor current

ALARM: Capacity [S]	alarm on cumulative mAh	**ALARM: Ubat [S]**	alarm on main battery voltage
ALARM: TempPA [S]	alarm on PA's temperature	**ALARM: UbecDrop [S]**	alarm on drop of BEC voltage
ALARM: EXT: T1 [S]	alarm on ext. temperature 1	**ALARM: EXT: T2 [S]**	alarm on ext. temperature 2
ALARM: EXT: T3 [S]	alarm on ext. temperature 3	**ALARM: EXT: T4 [S]**	alarm on ext. temperature 4
ALARM: EXT: T5 [S]	alarm on ext. temperature 5	**EXT: Temp1 [°C]**	external temperature 1
EXT: Temp2 [°C]	external temperature 2	**EXT: Temp3 [°C]**	external temperature 3
EXT: Temp4 [°C]	external temperature 4	**EXT: Temp5 [°C]**	external temperature 5
EXT: RPM [1/min]	external RPM		

4 LOGmodes

Before LOGmode we have the SYSmode

- SEQLOG-Mode: data subsequently appended to a log file
- NEWLOG-Mode: with each power-up a new subsequent numbered log file is written
  This is the preferred SYSmode.

The LOGmodes:

- LOGmode 0 (OF/LV) recording log files as **OpenFormat** for **LogView with extension „.txt“**
- LOGmode 2 (SER) for recording of any serial data into log files with **Extension „.slg“**
- LOGmode 8 (JLV) recording binary data of a **JIVE** into log files with **Extension „.jlg“**

5 Connecting the logger

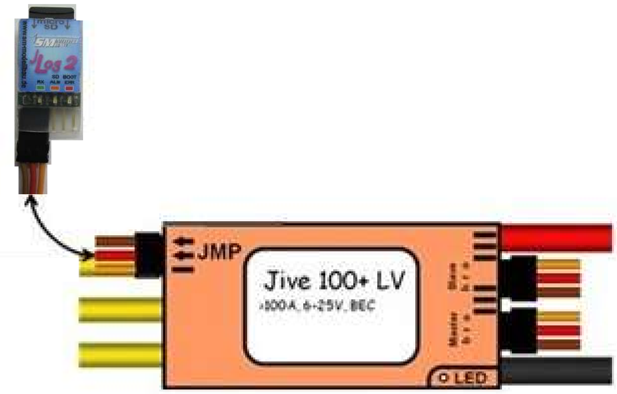
JLog2 is connected by a servo patch cable to the diagnostic connector of the **JIVE**. This is the connector otherwise used for modus programming with a jumper. The brown wire of the cable (ground) points to the outer face of the **JIVE**.

WARNING: The connection assembly of the logger should be in no case connected to other R/C equipment or the „Master” or „Slave“ socket of the **JIVE** because the logger could be damaged by that!

The jumper should not be connected to the **JIVE** during power-up because the ESC wouldn't send no data though! Best is to have the logger already connected before connecting the main battery.

Please keep in mind that the logger on its serial interfaces uses a voltage level that isn't compatible to that of computer interfaces, of your PC for example! Connecting to a computer interface would destroy the logger!

Note also that the servo cable connecting the JIVE is atypical assigned. The yellow wire is (+), the red is signal!
This assignment holds danger of reverse polarity – although this wouldn't damage the logger.



On necessity the cable to the **JIVE** can be extended to a maximum length of two meters.

Reverse polarity and wrong connection:

All connections of the logger are protected against reverse polarity as long as the voltage range does not exceed +/- 6 volts, - 6 volts is the maximum BEC voltage of the **JIVE**.

Anyway double check the connection not to have reverse polarity.

If running the logger autonomous – without a **JIVE** with another supply voltage – please note:

Do not exceed a maximum supply voltage of 6 volts!
Do not wire the supply voltage wrong way around!

6 Configuring the logger

With each startup *JLog2* learns the configuration from the file „CONFIG.txt“ located in the root directory of the SD card. A user modifies the content of that file by a PC for modification on the configuration of the logger. Alternatively a **JETIbox** can be used for configuration, provided **JETI** telemetry is switched on.

If „CONFIG.txt“ inadvertently have been deleted, *JLog2* will automatically re-create it with the last configuration stored in the processor.
Faulty insertions into „CONFIG.txt“ will be recognized by *JLog2*, ignored and the config file will be automatically corrected.

Creation/modification of CONFIG.txt on the SD card is done by the PC tool *JLog Configurator (JLC)* – which you please install on your PC. The installation software can be found for download on the web site of SM-Modellbau or that of *JLog* respectively. *JLC* has a built-in help.

Not only *JLC* than also the logger provides for obviousness of the content of CONFIG.txt. That means that also the logger itself checks the configuration and will correct it if necessary. He’s doing that concerning the setup he found in his non-volatile memory (EEPROM) and also while reading CONFIG.txt if the file is existing during startup. CONFIG.txt will always be rewritten by he logger in result of a check.

The logger stores the last read and as good considered configuration in his non-volatile memory, the EEPROM. That means you may insert an empty SD card - the logger will create CONFIG.txt by itself - and also all other files and a necessary sub-directory (the next one following the running number) for log files.

Also the running log file number is stored by the processor. If the RST flag (reset) is set by *JLC*, the number will be reset to zero and all log files and log directories will be deleted with the next start. *JLog2* will clear the flag then and rewrite the config file with an unset flag.

„Basics“

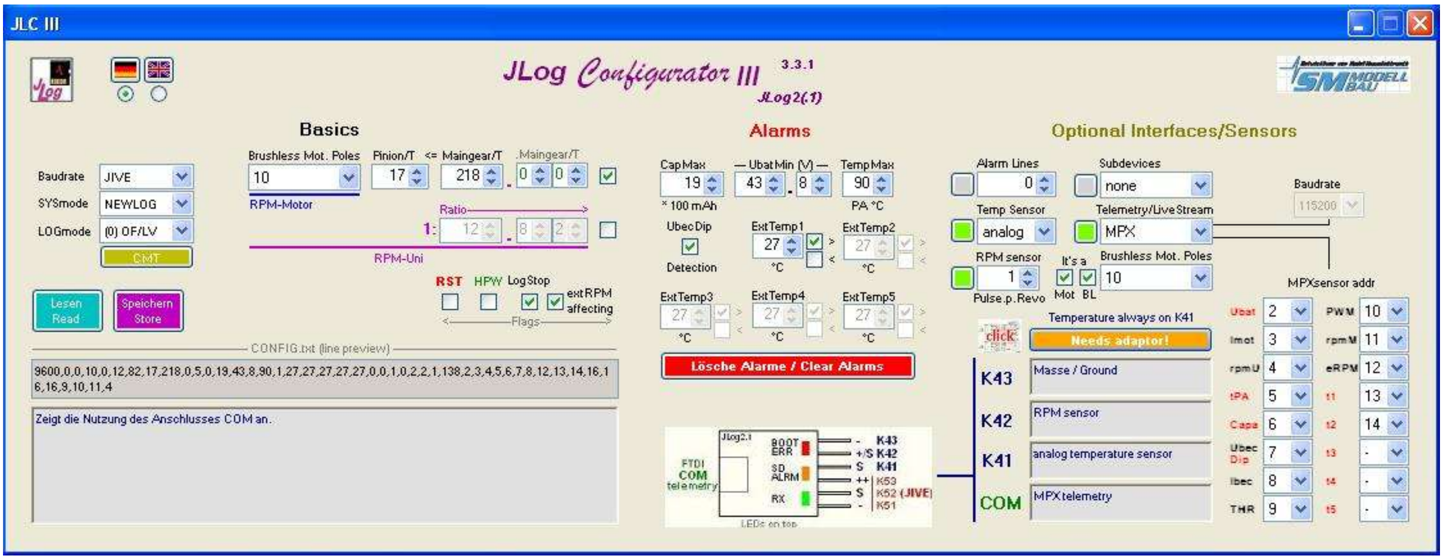
JLC provides concerning „RPM-Uni“ - RPM of the rotor of a helicopter or that of a propeller with a geared motor - three ways of input:

1. Input of the integer number of tooth of the pinion and the main gear (1-stage gear)

2. Use of the real pinion and a virtual main gear at which it is possible to run fractions of a tooth (two decimal places). This can be helpful for helicopters with multiple-stage gears. In this case one often only knows the overall reduction gear ratio but not the number of tooth of the involved cog wheels or drive pulleys.

3. Direct input of the reduction gear ratio

For proper recording of „RPM-Uni“, at first „RPM-Motor“ have to be okay for which the accurate number of magnetic poles of the brushless motor has to be used. (The selection in *JLC* offers named motor types also. It cannot be guaranteed that the corresponding number of poles behind is the right one. Please always check the manufacturer’s web site on how many poles a motor has.)



JLC III

JLog Configurator III 3.3.1 JLog2(.1)

Basics

Baudrate: JIVE
SYSmode: NEWLOG
LOGmode: (0) OF/LV

Brushless Mot. Poles: 10
Pinion/T: 17 <= Maingear/T: 218 . 0 0 ☑
Ratio 1: 12 . 8 2 □

RST □ HPW □ LogStop ☑ ☑ extRPM affecting

CONFIG.txt (line preview)

```
9600,0,0,10,0,12,82,17,218,0,5,0,19,43,8,90,1,27,27,27,27,27,0,0,1,0,2,2,1,138,2,3,4,5,6,7,8,12,13,14,16,1
6,16,9,10,11,4
```

Zeigt die Nutzung des Anschlusses COM an.

Alarms

CapMax: 19 * 100 mAh
UbatMin (V): 43 . 8
TempMax: 90 PA °C
UbecDip ☑ Detection
ExtTemp1: 27 °C ☑ > □ <
ExtTemp2: 27 °C
ExtTemp3: 27 °C
ExtTemp4: 27 °C
ExtTemp5: 27 °C

Optional Interfaces/Sensors

Alarm Lines: 0
Subdevices: none
Temp Sensor: analog
Telemetry/LiveStream: MPX
Baudrate: 115200
RPM sensor: 1 Pulse.p.Revo
It's a ☑ Mot ☑ BL
Brushless Mot. Poles: 10

Temperature always on K41

K43: Masse / Ground
K42: RPM sensor
K41: analog temperature sensor
COM: MPX telemetry

MPXsensor addr

Ubat	2	PWM	10
Imot	3	rpmM	11
rpmU	4	eRPM	12
tPA	5	t1	13
Capa	6	t2	14
Ubec Dip	7	t3	-
Ibec	8	t4	-
THR	9	t5	-

Alarms

Four of the possible alarms correspond to values from the **JIVE**, five more to temperatures of up to five optional temperature sensors connectable to the logger.
The four **JIVE** alarms are:

CapMax alarm if cumulative milliamphours exceed the configured trigger value
The value reads as n x 100mAh.
UbatMin alarm if main battery’s voltage drops below the configured trigger value
TempMax alarm if the PA’s temperature exceeds the configured value

UbecDip alarm if the BEC voltage in more than four subsequent gauges drops >0.5 volts below the value measured during startup of **JIVE**/*JLog2*. The average time interval is 500 milliseconds.

UbatMin is not directly used as gauged battery voltage than as integrated measurements, - very special here for alarm triggering. This avoids alarms triggered by short term voltage drops.

The five other alarms are: **ExtTemp1 [°C]**, **ExtTemp2 [°C]**, **ExtTemp3 [°C]**, **ExtTemp4 [°C]**, **ExtTemp5 [°C]**. In contrast to the above mentioned alarm triggers, it is possible here to use „greater than“ (**>**) or „lower than“ (**<**).
Depending on the selected type of temperature sensor there are different allowed value ranges which *JLC* accounts.

Generally for alarms applies: A zero value for an alarm trigger means that this alarm is disabled!

„Optional Interfaces/Sensors“ (Hardware Configurator)

The logger has two optional signal pins used for own sensors or alarm lines - and an additional serial interface for the **OpenFormat** livestream or for connection to a telemetry system (*„COM“*).
Originally there can be only ONE servo plug used on connection K4 – for ONE sensor or up to two alarm lines in one servo lead.
The configurator *JLC* works like a little expert system. The configurator takes notice of user requests, coordinates with possibilities for fulfillment – in which sensors have priority over alarm lines – and displays effective use of the interfaces. Should fulfillment of a configuration request only be possible by use of an adaptor, then this will be signalized and the schematic of an adaptor will be displayed on demand. An adaptor must be compiled as D.I.Y. but it is quite simple.

Here also applies: Numeric input of a zero means that the sensor or the alarm line is not configured.

The usage of this part of the configurator is as self-explanatory by a built-in help as all other functions. The following shall be pointed out anyway:

- ➔ Having configured a RPM sensor you may add it to the LogStop function by „extRPM affecting“ in „Basics“. LogStop will not be going active as long as in addidtion to the conditions given by Imot and Ibec the rotation speed from a *JLog2*-own RPM sensor is not zero.

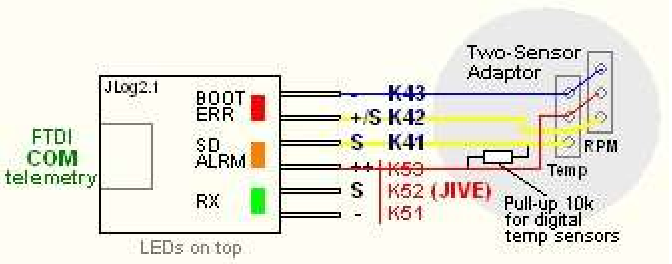
- „Pulse p.Revo“ defines „pulses per revolution“ that a RPM sensor generates as long as it is no brushless RPM sensor.

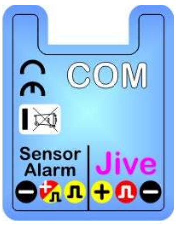
- The checkbox „It’s a Mot“ („it’s a motor“) alters the timeout behavior of the RPM measurement. In case that pulses stop to drop in, the only thing the logger can do is to set the speed to zero – for low speeds later than for higher ones. This checkbox lowers the time after which – in case pulses drop out – the speed is corrected to zero.

- If „It’s a Mot“ is checked you may in addition check „BL“ (brushless motor) so you can select the number of poles the motor has. RPM pulses are awaited now to come from a brushless sensor.

- Digital temperature sensors are of type Dallas DS18B20 connected via an One-Wire-Bus with the Dallas-One-Wire-Protocol. You may connect an arbitrary number between one and five of those sensors. Only the software is limiting the number to a maximum of five. Each sensor of this type carries a world-wide unique lasered marker - the so-called “ROM code” (64 bits). With each start the logger scans these ROM codes of sensors connected to the bus. The order of recognition is determined only by the code of each sensor, what means that the ordering of sensors into the five measurements of external temperatures is always the same. If you wish to connect more than one digital sensor you have to use conventional Y servo leads. The electrical sequence of the sensors has no influence on the sequence of order regarding the five measured values. Only the ROM codes affecting it.

- If digital temperature sensors are connected via a required adaptor – means a RPM sensor or an alarm line in parallel – an additional pull-up resistor of 10 kiloohms is needed – between signal and (+). (+) in this case is the positive end of the **JIVE**'s voltage, as found on K5-3. – Without an adaptor, if connecting digital temperature sensors by a servo jack to K4, this pull-up is not needed because it a) exists in the logger itself, switched-on by the software following the configuration and b) K4-2 provides a positive voltage of about 3 volts. That way the internal pull-up goes effective.

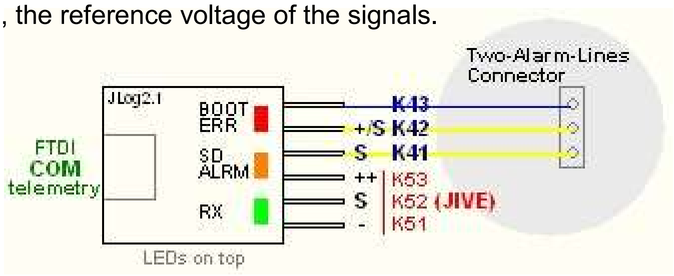




- An analog temperature sensor does not need an additional pull-up resistor.

- If two alarm lines are configured, the second line is controlled by alarms on cumulative mAh.

- Alarm lines are low-active, they supply about 3.3 volts and drive up to 33 milliamps (on short-circuit) if no alarm is issued, and near zero volts by an alarm. In contrast to a sensor, an alarm line does not need a pin for voltage supply. Thus <u>the use of two alarm lines</u> – an additional sensor is no more possible – <u>not really needs an adaptor than a single servo lead</u> like with a single sensor type. <u>The two alarms use the yellow and the red wire</u> whereas the black or brown wire is ground, the reference voltage of the signals.



micro SD
www.sm-modellbau.de
SM MODELL BAU
JLog 2
RX
SD ALM
BOOT ERR

Alarm devices in a R/C model will possibly be obsolete if a *JLog2*-supported telemetry system is used.
Schematic propositions for alarm devices can be find on the website of *JLog*.

7 microSD card and file system

Please use as possible the SD card which we offer under the item number #2810. SD cards show depending on the type and exemplar big differences in access times in particular during write operations. A too slow card may disturb the timing of the logger software which appears by wrong calculated mAh (by lost of data packets from the **JIVE**) or even by time gaps in the log file.

A good card is specified to belong to a „class“, visible by a number in a circle reaching from 2 to 10 for 2..10mbytes/sec. Use a class 3 at minimum. But a rated card may charge-dependent scatter very much.
The card offered by us has been selected in tests and is comparatively very fast although it does not belong to a class. Here to be seen one more time the difference between global specification and practical experience.

7.1 Inserting and extracting the microSD card

The card will be inserted at the front edge/front side – printed side facing outwards, in direction to the pins of the logger. In contrast to the hardware of *JLog1* there is no cogging torque.
For extracting, the card is simply pulled out.
Avoid unnecessary touching of the contacts of the card!
The card can be inserted also if the logger is already supplied by voltage. Inserting will cause a restart of the logger.
Removing from the running logger should not be done as possible in LOGmode 2 (SER) and in all other modes only if LogStop is used and currently active - respectively ***JLog2*** is detached from the **JIVE**.

The SD socket has a contact which opposite to *JLog1* is connected and used.
The logger detects if the card is extracted and signalling this with its LEDs.

In return, via the socket contact it will be detected that the card has been just inserted. Did that happen with an adequate speed (not too slow on part of contact making) the logger will be reset and start over – in the same manner as if when the supply voltage just have been connected.
But did it happen too slow – the socket doesn’t have the accelerating mechanism like with *JLog1* – then a reset followed by adjacent initializing of the card could not be done. ***JLog2*** signalling this by a dimmed glowing of all three LEDs. In this case the card has to be inserted again.

7.2 Apparently defective SD card

The situation cannot occur if the card is exclusively used with ***JLog2*** but it could be that you try to use a card that have been used in other devices before. The problem appears like that the card isn’t readable by the logger but may be still usable by a native operating system.

Although a card definitely can successfully be formatted under such an OS - in this case it is essential to format the card by a special **SD-Formatter** which you can download from here: http://www.sdcard.org/consumers/formatter/#download

A SD card of a capacity of more than 2GB is a so-called **SDHC Card** („HC“ for high capacity) formatted with the file system FAT32.
JLog2* does not support FAT32! SDHC Cards therefore are not usable!** ***JLog2 makes exclusive use of FAT16.
Don’t use cards of a too low capacity. With them the file system FAT12 is used which indeed is supported by the boot loader – but not by the real software of the logger, the application!

7.3 The file system

Please do not copy your own files or directories into the file system of the SD card. You could accidentally break the conventions of the file system by that – and after that wouldn’t be no more able to use the file system, would have to format the card by your PC.
In the NEWLOG SYSmode ***JLog2*** creates up to 65535 log files. To conform with the conventions of the file system ***JLog2*** automatically creates sub-directories in which he writes the log files. Each 511 log files will be stored into a sub-directory. Those sub-directories are named – for better locating of log files - like „d000-510“ or „d65024-65534“.

7.4 The running file number

With each start of ***JLog2*** (supply voltage connected) the logger generates a new file number which is stored inside the processor. The name of the next log file will be determined and – if necessary – a new log-directory created. The log file will be created but not starting to fill-up before serial data is running in – in LOGmodes 0 (OF/LV) and 8 (JLV) not until the motor current goes above zero at least one time. Before, the **JIVE** must have initialized, prior it does not send time stamps which act as time base for the logger. In LOGmode 2 (SER) the log file will be recorded as soon as serial data is running in. LogStop doesn’t act a part in LOGmodes 0 and 8.

This way log file numbers - from the names of the files in a log-directory - may seemingly overleap or empty log files may be stored.

Five seconds after non-appearance of valid data from the **JIVE** the logger will switch to his own time base and start to record logs. This will happen in LOGmode 0 (OF/LV) only. There is no effective LogStop in this case. Naturally this mode of operation makes only sense if *JLog2*-own sensors for temperature or RPM are operated. LOGmode 8 (JLV) will only record if valid data of a **JIVE** is running in, whereas LOGmode 2 (SER) will cause recording as long as serial data is available.

Because LOGmode 8 (JLV) is also passing through the data processing, as LOGmode 0 does, it drops a switchable live stream as **OpenFormat** too - or doing this in telemetry format depending on which is configured and independent of the conditions of the recording. Of course there is no live stream or telemetry output in LOGmode 2.

7.5 The *LogStop*

Binary data of a **JIVE** ESC is continuously analyzed by *JLog2* and processed to record it in a log file. An exception is here LOGmode 2 (SER) which records the serial data stream without a processing of it. Only LOGmode 0 (OF/LV) records processed data in **OpenFormat** for **LogView**.

A function whose necessity is derived from continuous data analysis is the so-called **LogStop**:

LogStop starts recording by *JLog2* as soon as a motor current or BEC current > 2.9 amps is drawn – and stops recording if for at least 5 seconds no motor current or BEC current <= 2.9 amps have been gauged. Recording is restarted if motor current is again drawn or BEC current > 2.9 amps. In this way it is guaranteed that a regular cut from the main battery will not cause data lost. Should it happen that during a write onto the SD card the supply voltage drops out – then write failures are not to exclude. If it happens that single files on the SD card appear defective, the complete content of the card should be backed up if needed and the card fresh formatted.

With LOGmode 2 (SER) LogStop is generally not active because incoming serial data is not analyzed - it consists „foreign data“ which is unvalued recorded in a log file.

LogStop is used in LOGmode 8 (JLV) also.

Peak currents IbecMax and ImotMax will not be updated if LogStop is currently active but only if the source of their origin is just logged as I-BEC or I-Motor respectively - thus LogStop is not active. Because the live stream - **OpenFormat** or telemetry - if switched on and despite of LogStop continuously outputs effective data – the logger uses extra stores for IbecMax and ImotMax.
Until the **JIVE** has not initialized (sound sequence with the motor) it doesn't send no time stamp – thus a log will not be recorded.
Did the logger not see any data from the **JIVE** until 5 seconds after its start (the logger is possibly operated for a dedicated application without a **JIVE** and supplied by a foreign voltage) it will start recording on its own time base, whereas 10 records a second will be written. As soon as under this condition the logger gets data from a **JIVE** he changes the time base to the time stamps received from the ESC. Operating the logger without a **JIVE** make only sense of course if is connected to optional sensors for temperature(s) or/and RPM, means for gauges outside of the **JIVE**.
If required LogStop can be switched-off with the above mentioned risk – for example to measure and log the BEC current in a motor glider constantly. Disabling is done by the config file <SD>:\CONFIG.txt which is handled by *JLog2 Configurator (JLC)* or you configure the logger "in the field" by a **JETIbox**.

8 LEDs of the logger

The logger has three LEDs, red, orange and green.

LED – red:

🟥

- Continuous glow after start: Boot loader searching the file system for an update file. Does the logger not start after, red LED continuing to glow, then there is no software in the flash ROM that the logger could start.
- Flashing shortly after start: Boot loader enforcing an update.
- Continuous glow in operation: A serious error occured on the part of the SD card. It is quite possible that the logger can anyway continue to work.

LED – orange:

🟧

- „Twinkle“ during operation: Signalling write access into the file system, the log file is being written, respectively passes of data processing.
- Continuous glow in operation: Signalling as „general alarm“ that one of the nine programmable alarms have been raised – and goes out if all enabled alarms have been cleared. („CapAlarm“, as trigger for an amount of cumulative mAh, cannot clear itself – the orange LED will keep glowing statically.)

LED – green:

🟩

- „Twinkle“ during operation: Signals receiving of serial data (from **JIVE** or another device). In *LOGmode* 2 the LED apparently will glow continuously because there is no data processing.

A running light of all three LEDs means that no SD card has been found or he card has been removed in operation.

A “statically dimmed” glowing of all three LEDs means inserting the SD card into the logger in operation have been too slow. Repeat the action.

Synchronous flashing of all three LEDs appears in operation if HPW (High PWM Warning) is configured and the HPW condition have been reached.

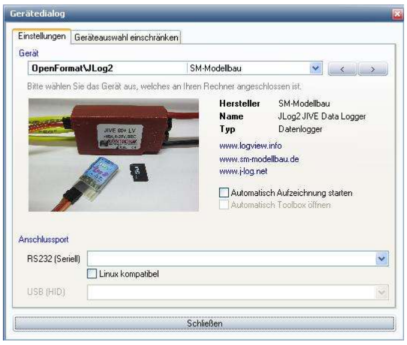
Identical flashing appears for 30 seconds after start and before the logger continues with regular operation if in the boot session before (with the last flight) a HPW condition was detected and stored.

9 Evaluation of log files

Main application is log files ending in „.txt“, *LOGmode* 0 (OF/LV). These are logs in **OpenFormat** for **LogView**. **LogView** is donationware and downloadable from here: http://www.logview.info/vBulletin/downloads.php?do=cat&id=2

A log file will be loaded into the running **LogView** by ***import devicefile***..

***Import devicefile*, not *Open… (same as double click in an explorer)*, not frequently enough to point out after the experiences with *JLog1*!**



OpenFormat\JLog2 | SM-Modellbau

Bitte wählen Sie das Gerät aus, welches an Ihren Rechner angeschlossen ist.

Hersteller SM-Modellbau
Name JLog2 JIVE Data Logger
Typ Datenlogger

www.logview.info
www.sm-modellbau.de
www.j-log.net

□ Automatisch Aufzeichnung starten
□ Automatisch Toolbox öffnen

RS232 (Seriell)
□ Linux kompatibel
USB (HID)

Open can **LogView** only files with extension „.lov“, those are exports out of **LogView**, also **OpenFormat** but with a header describing the device to use, plus further setup like colors etc.

The ***Device*** describes for **LogView** which data per log record (line) is expected and how to interpret it.

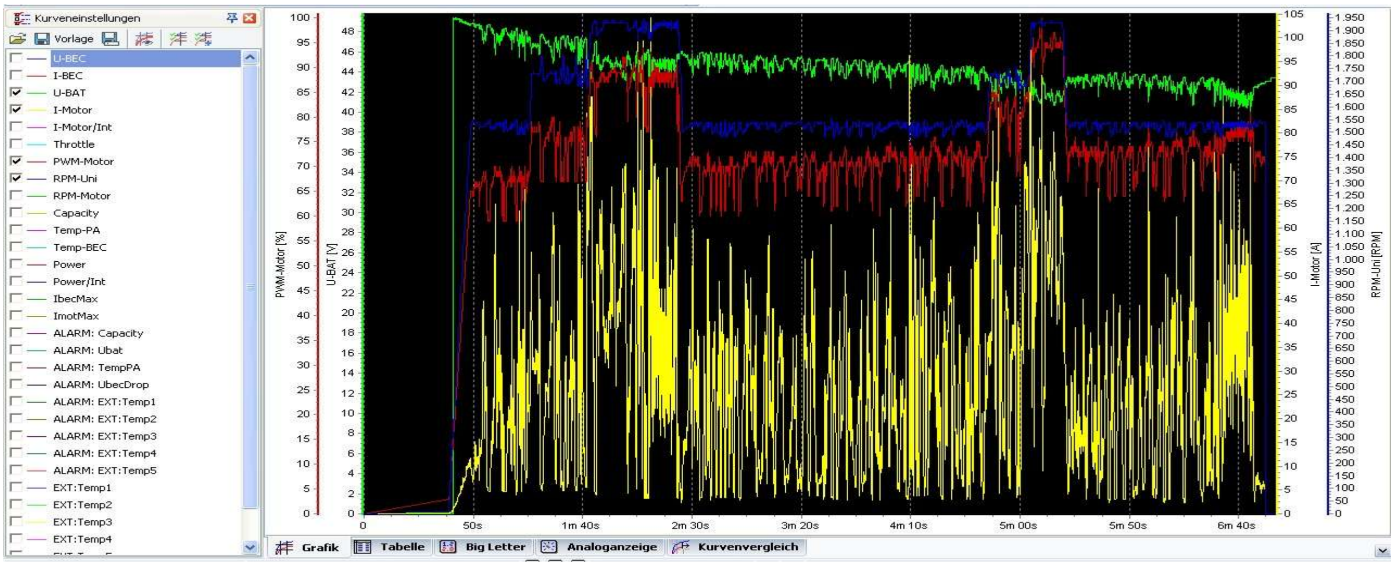
At first we have to configure an applicable device in **LogView** what is done by ***Device -> Choose device and port***. The ***Device Dialog*** is opening and we go into ***Reduce usable devices*** to select all devices we want to see in the future. The applicable INI-file for ***JLog2*** to be find as „OpenFormat\JLog2“. Now we go back to ***Settings*** in ***Device Dialog*** (my version shows up with ***„Gerätedialog“*** although English is configured) and switch through the devices. Please select ***JLog2***. The selection for ***Port*** is only needed if we own an USB interface and plan to display the **OpenFormat** live stream of the logger in **LogView**.

At the moment **LogView** does not know about ***JLog2*** originally. To have the device ***JLog2*** LogView selectable, we need to copy the files ***JLog2***.ini and ***JLog2***.jpg into the **LogView** device directory of the PC user. The location of that directory varies over the operating systems from version to version, names within a directory area also depend on the language version of the OS. As below it is commonly describable:

%appdata%\ LogView\Geraete\OpenFormat\***JLog2***.ini
%appdata%\ LogView\Geraete\***JLog2***.jpg

The JPEG file is only needed to get a picture of the logger displayed in ***Device Dialog*** (***Geräteauswahl***).

The logger will show up in **LogView** now as seen below:



Kurveneinstellungen
Vorlage

☐ U-BEC
☐ I-BEC
☑ U-BAT
☑ I-Motor
☐ I-Motor/Int
☐ Throttle
☑ PWM-Motor
☑ RPM-Uni
☐ RPM-Motor
☐ Capacity
☐ Temp-PA
☐ Temp-BEC
☐ Power
☐ Power/Int
☐ IbecMax
☐ ImotMax
☐ ALARM: Capacity
☐ ALARM: Ubat
☐ ALARM: TempPA
☐ ALARM: UbecDrop
☐ ALARM: EXT:Temp1
☐ ALARM: EXT:Temp2
☐ ALARM: EXT:Temp3
☐ ALARM: EXT:Temp4
☐ ALARM: EXT:Temp5
☐ EXT:Temp1
☐ EXT:Temp2
☐ EXT:Temp3
☐ EXT:Temp4

In the download you will find the file Example_***JLog2***.lov. Simply open that file by an existing or first installation of **LogView** to let **LogView** conveniently learn the ***Device JLog2***. The above described installation of the file ***JLog2***.ini is no more necessary by that. Only to let ***Device Dialog*** (***Gerätedialog***) come up with a picture of the ***Device*** one need to copy ***JLog2***.jpg into its location in ***Geraete*** of the **LogView** user directory.

We may now export an imported log file (***devicefile***) by **LogView** into a file „*.lov“. This file contains already all setup including those from ***JLog2***.ini.

One may send a .lov file to another person who only needs a **LogView** installation to view it.

By opening a file with extension „.lov“ with **LogView** (***file open***) it will automatically learn the device necessary for proper reading of contained log data.

LogView – by the ***JLog2*** device setup – is run with the time base of the logger and this way with the timing circuit of the **JIVE**. Time starts as soon as the **JIVE** has initialized (sound sequence after initialization). Otherwise the internal time base of the logger took over because no **JIVE** has been seen.

Regarding usage of **LogView**: It makes relatively less sense to consider a log only as “Potpourri of colored lines” in an integral view on it. The graphical resolution can play a trick on us. Also: Points of interest should be zoomed then! Things can qualify by that and give us a “light bulb moment”. Therefore ImotMax and IbecMax have the purpose to be able better to find peak values in a general display, in a more readable manner. – But then it should be zoomed there also!

Between extreme values you will see lines (diagonals) connecting two of them. Possibly it is only **LogView** doing that – following its default setup. This is modifiable by ***Graph editor (basic)*** and within it for each relevant measurement by clicking the check button ***Stairs***.

Please also play a bit with all the other comprehensive functions of **LogView**, the export into a spread sheet for example or ***Analysis -> Min/Max***.

9.1 Info file in the file system of the microSD card

In addition to log files created by LOGmodes 0 (OF/LV) and 8 (JLV), a file <SD>:\JIVEinfo.txt is originating and updated during the start of a new log session in the above mentioned LOGmodes.

The file contains two informational items in a line, separated by a space:

1. A cipher or number naming the software version of your **JIVE**, a „9“ for version 9 for example.
2. A number which refers to the overall runtime (seconds after initialization) of your **JIVE**.

From release 9 on there is no more the runtime given out by the **JIVE**, the corresponding field contains „N.A.“.

If a **JIVE**’s data stream have never been seen, the first field will contain „?“.

With LOGmodes 0 and 8 ***JLog2*** is processing data running in from the **JIVE** and extracting by that also this information. These will be stored in the non-volatile memory (EEPROM) within the current log session. At the start of a new log session (***JLog2*** off/on) both data will be transferred into the file <SD>:\JIVEinfo.txt. Means the runtime found in the file refers to the start time of the log session before.

9.2 High PWM Warning (HPW)

Motivation:

This function is a quick help **for** setup of the **JIVE modes 4 and 11, governor** modes**.** Depending on the power and applied load and the battery voltage respectively, the ESC has to control the motor PWM (according to the value of throttle also), - commonly referred as “opening”. Considered over the log time there is a slow factor, - the decreasing average battery voltage, - and two fast factors, - RPM drops by the performance limit of the motor and voltage drops by the internal resistance of the battery, - which force the ESC to counteract by raising PWM. The higher throttle was now chosen, the more likely it is towards 100% PWM – if above components due to their performance cause a RPM drop which is to be compensated.

If motor PWM is often at the limit of 100%, the ESC has no reserves to control.

HPW as a quick display without having a PC at hand for evaluation of logs:

If PWM is now for more than or at least the half of the commutation time (runtime of the motor) greater than 95%, then this will be registered in the running log session by the logger, by a flag in its EEPROM. Concurrently the logger lets all three LEDs synchronously flashing, what you usually can’t see.;) At the next start of the logger that flag will be checked and if set now also all three LEDs will flash synchronously, 10x fast (50ms pulses) with a break of half a second each. **The logger will remain now for 30 seconds in this flashing loop and then continue and start recording.** The flag have been reset already at the beginning of the flashing.

The function counts only data for which throttle was greater than 15%, and if that condition persist for at least 2:50 minutes within a log session. This can prevent, in general, that the warning is triggered by **JIVE** modes without governor.

Should the warning be triggered frequently in modes 4 and 11, then it is recommended to lower throttle a bit or give the pinion a tooth more if applicable.
In all other modes the warning could be fired also but is meaningless so far.
Activating/deactivating of HPW is done by „CONIG.txt“, modified with the ***JLog Configurator*** or with the **JETIbox**.

9.3 Safety Cut-Offs and Logging

The **JIVE** has a number of security mechanisms that are implemented in software and hardware – and result in the triggering event as a delayed or immediate shutdown of the commutation of the motor. These measures will protect your investment in the form of the controller, as well as your model, the motor and battery. The mechanisms are designed so, that in case of dangerous exceeding of limits or a faulty commutation if possible no damage to the power FETs of the ESC, the motor or battery can occur and above all no fire can get these components.

Because of the speed and uncompromising done with such trips in the interior of the ESC, there is usually neither the time nor technical feasibility, accompanying extreme readings like I-Motor to bring more to the issue, they will commonly not appear in the log.

10 Telemetry

JLog2 supports two telemetry systems to which the logger can be connected optionally:

- **JETI**
- **Multiplex M-Link**

In case telemetry via ***COM*** have been configured by *JLC* and LOGmode 0 (OF/LV) or LOGmode 8 (JLV) is in use, the logger can be connected to a telemetry-ready receiver from **JETI** or **Multiplex** by the cable option #2556.

The telemetry cable has three plugs, the smallest one will not be used. This cable is identical to that which **Unilog** uses, here the small plug in addition is connected to **Unilog**, but is left unconnected with *JLog2*.
The servo connector at the end of the telemetry cable is plugged into the receiver at the appropriate socket, whereas the bigger four-pole is connected to the ***COM*** socket of *JLog2*.

10.1 JETI telemetry

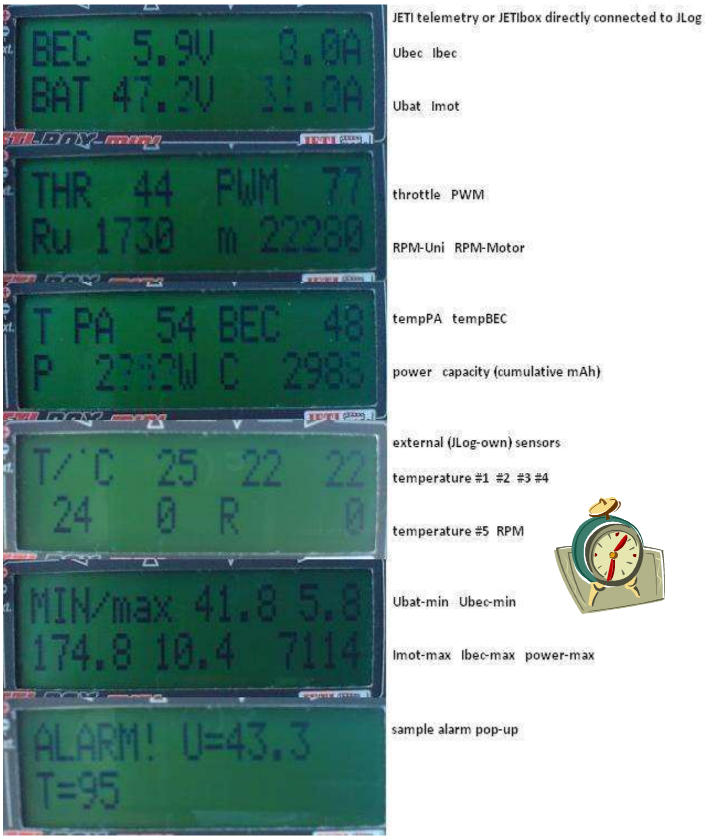
JETI requires no further configuration other than his selection in the configurator *JLC*.

The philosophy of **JETI** is based on the terminal **JETIbox**, that can be used bidirectionally because it has four cursor keys **→ ← Up Down**. With **JETIbox** there are now three versions, the classic **JETIbox** with a membrane keyboard and designed as a multifunction device, the **JETIbox mini**, a pure terminal, and more recently the **JETIbox Profi**, the first two of these were tested with *JLog2*.

The **JETIbox** is connected to the **JETI-TX-Module**, transmitter end.
The box is now as terminal connected to the first hop, the **TX-Modul** as a mediator, and may be put through this interactive to the TX or the receiver or through the receiver to a remote (external) sensor. *JLog2* here is an external multi-sensor. Given the **TX-Modul**, creates a menu on the display of the **JETIbox** that offers a choice ***Tx***, ***Rx*** and ***Mx***, where ***Mx*** is the sensor bus on the receiver. By selecting ***Mx*** connects the **JETIbox** directly to *JLog2*. From *JLog2* to return to the main menu, press and hold the **Up** button.

Between receiver and sensor, a **JETI Expander** can be used. The **Expander** enables you to connect to up to 4 sensors. Through the **Expander**, TX→RX→Expander→, the terminal, the **JETIbox**, can connect interactively to each sensor behind the **Expander**.
Alternatively, the **Expander** works for unidirectional output of up to 2 sensors as a split screen, with each of the second row of a display page of a sensor simultaneously with the second row of the display of another sensor is represented by the **Expander**, one above the other.
This type of issue on sensor data, however, is totally inadequate for a multi-sensor as *JLog2* that itself creates 5 display pages with telemetry data (interactive switchable), plus an alarm pop-up page, for a total of 10+2 lines (23 values) , - of which only displaying one line via an **Expander** is of course poor. Thus, an **Expander** in split-screen mode with a multi-sensor, as represented by *Jlog2*, makes actually relatively little sense.

With the buttons **→** und **←** it can be switched between the pages.



The data of pages 1 and 3 are only about every 300ms updated due to the persistence of vision to give the viewer a chance. The "mobility" of the values I-Motor, I-BEC and power would otherwise be very high.

On alarm an alert page pops up that displays all currently active alarms with their instantaneous values. The instantaneous values are updated continuously - they are not a static image from the time of reaching/exceeding the alarm threshold. The presentation of alarms is limited to one page – therefore, not all nine alarms can be displayed simultaneously. Complete simultaneity is in practice very unlikely.

Parallel to the alarm display is an audible alarm with the piezo buzzer in the **TX-Modul**. The audible alarm is Morse code for each one character:

„V“	**…_**	for „**V**oltage“ as Ubat alert
„B“	**_…**	for „**B**EC“ as UbecDip (drop) alert
„C“	**_._.**	for „**C**apacity“ as alert for a threshold of cumulative mAh
„T“	**_**	for „**T**emperature“, temperature alarm concerning the **JIVE** PA
„X“	**_.._**	for „e**X**ternal“, temperature alert of the up to 5 optional temperature sensors

If more than one alarm type is triggered at the same time, Morse codes replace each other subsequently.

■ An alert page keeps for 30 seconds at maximum, even if the triggering alarms are still active. The timeout of 30 seconds restarts with every new upcoming alarm.
■ If the alert page disappears, the display returns to the previous telemetry page.
■ The user can stop the alert page prematurely by depressing any key.
■ In case triggering alarms disappear during display of the alert page, „Alarms cleared“ is displayed for three seconds and after that returns to the active telemetry page automatically.

■ An active alarm of type „C“ is always displayed together with other alerts (C-value updated continuously) but cannot trigger an alarm by itself again.

Clearing an alarm on one of the ways described above also terminates the corresponding audible alarm.
Control signals for audible alarms on the bus pass through an **Expander** in the direction of the alarming **TX-Module** even if the **JETIbox** is not connected to ***JLog2***, means if the **Expander** is in the split-display mode.

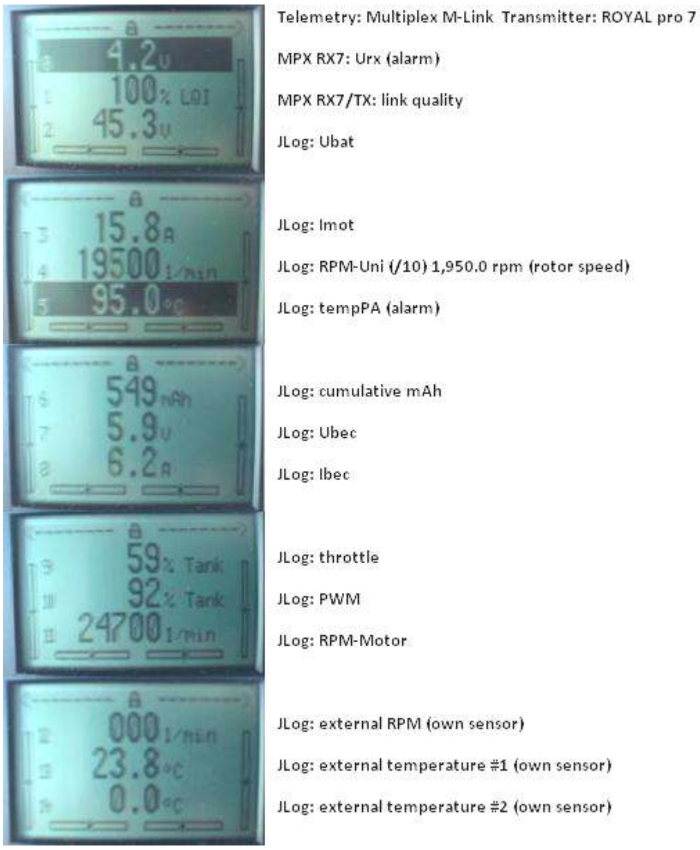
If JETIbox is not connected to „Mx“, there are no audible alarms!
In watching page 5, Maxima/Minima, you will notice that UbatMin has been seen already below the alert threshold before UbatAlarm is triggered. This is due to that Ubat is integrated for alarm evaluation, whereas UbatMin represents non-integrated measures.
The **JETI** display starts only if data is processed, if **JIVE** data is running in or the logger operates on its own time base.

10.2 Multiplex M-Link telemetry

This type of telemetry have not only to be switched on by ***JLC*** than also the addresses of the virtual sensors of the multi-sensor ***JLog2*** have to be configured. The **Multiplex** sensor bus knows about 16 sensors and accordingly 16 sensor addresses 0..15. Depending on which M-Link receiver you have, sensor addresses may be preset already, with RX7 for example addresses 0 and 1 for Urx and LQ (Link Quality). Select addresses for sensors that way that is doesn’t lead into collisions.
In general, the addresses of **Multiplex** equipment, receivers and M-Link sensors, are also changeable.

You may want to parallel ***JLog2*** and sensors from **Multiplex** or compatible on the sensor bus, means to connect to the corresponding socket of a M-Link receiver. All you have to consider is the above assignment of addresses for such sensors. Connections can be made by Y servo cords.
Data from the sensor bus is displayed by the M-Link transmitter according to the sensor addresses 0..n, at which numeric value and measurement unit of a sensor is defined by the data class it belongs to.

The number of sensors a **Multiplex M-Link** transmitter can display and what way, depends on the model of the transmitter. A transmitter „ROYAL pro“, for example knows about addresses 0..14, 15 of the 16 possible sensors. It displays them as each 3 sensors on one of 5 pages. A „Cockpit SX M-Link“ knows about only 8 sensors (according to the manual, not tested with ***JLog2***) and displays only one of them at a time.



A particularity with **Multiplex** telemetry is the display of rotation speeds:
The used data class of the sensor bus, „Drehzahl 100 1/min“, shows up with RPM of a resolution 1/min but an accuracy of 100 RPM – by awaiting a value from a sensor divided by 100 and multiplying it by 100 before display.

That’s sufficient for RPM-Motor, in the sample this is sensor (row) number 11. The snapshot indicates „24700 1/min“, the next discrete value would be „24800“, or „24600“, respectively.
But for a rotor speed calculated by ***JLog2*** from a reduction gear ratio, in the picture the sensor with the address 4, it is less satisfying not to can be more accurate than 100 RPM for display through telemetry. The same for measurement with an optional RPM sensor of ***JLog2*** (row 12 in the picture), if there should be a slowly spinning object.

That’s why RPM-Uni is given by ***JLog2*** by factor 10 too high onto the sensor bus and accordingly shows up in the display factor 10 too high. One has now to think a decimal point one place from the right, but obtains the advantage of an adequate accuracy of 10 RPM.
The optional RPM sensor of the logger, extRPM, is designed as configurable for a broadband speed from 10x 1/min up to a brushless motor. Accordingly the factor applied to the value for display is also flexible:

As long as „It’s a Mot“ is not checked in the configurator *JLC*, the value is given undivided to the transmitter for display, thus by factor 100 too high. Therefore we have to think a decimal point two places from the right, getting an accuracy of 1x 1/min.
Did we check „It’s a Mot“, the speed is divided by 100 and the numeric value in the display is correct like with RPM-Motor, without a thought decimal point, the accuracy is 100 1/min.

Values for „throttle“ and „PWM“, each 0..100%, appear in the display of the M-Link transmitter as „Tank“, because this is the only data class of the **Multiplex** sensor bus that suits, - in the picture sensor address 9 for “throttle” and 10 for “PWM-Motor”.

In case of an alert on a sensor value, - that triggers *JLog2* according to the alarm thresholds defined with *JLC*, - the corresponding row will display inverse by the transmitter. Should the alarming value not be located within the current page of the display, it jumps to the appropriate one. Alerts can be displayed in parallel - each sensor which triggered an alarm is displayed inverse.
The display of the transmitter will jump to a sensor’s page if it has triggered an alarm. Thus we did not have to stay in the sensor section of the transmitter’s display.
Concurrently, with an upcoming alarm, the piezo buzzer of the transmitter generates a short sound sequence, the same with each alarm regardless which sensor (address) it was and to which data class it belongs.

10.3 „jb“*JLC* - The JETIbox for configuring *JLog2*

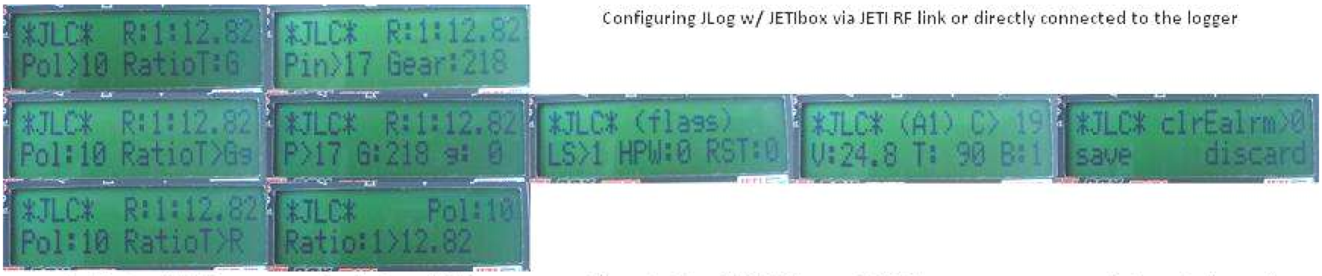
As the box is an interactive terminal, it makes sense to use them also to configure the logger. Because of their relatively poor display it cannot replace the facilities of the PC application *JLC* of course, but it offers the opportunity to configure “in the field” without the need for *JLC* and a PC to run the configurator.
The configurator via **JETIbox** is called therefore „*jb*“*JLC*, where „jb“ stands for **JETIbox**.

By *JLC* **Telemetry/LiveStream** have to be set to **JETI** !

jbJLC (**JETI**), **MPX** and **FTDI livestr** exclude each other.

To get into „jb**JLC**“ depress the buttons **Up**+**Down** together.

With the buttons **Up** and **Down** you change between the items, a „**>**“ marks the position of the cursor.



Configuring JLog w/ JETIbox via JETI RF link or directly connected to the logger

```
*JLC*  R:1:12.82
Pol>10 RatioT:G

*JLC*  R:1:12.82
Pin>17 Gear:218

*JLC*  R:1:12.82
Pol:10 RatioT>Gg

*JLC*  R:1:12.82
P>17 G:218 g: 0

*JLC* (flags)
LS>1 HPW:0 RST:0

*JLC* (A1) C> 19
V:24.8 T: 90 B:1

*JLC* clrEalrm>0
save     discard

*JLC*  R:1:12.82
Pol:10 RatioT>R

*JLC*      Pol:10
Ratio:1>12.82
```

page 1 ratio type 1|2|3 page 2 ratio type 1|2|3 page 3 flags: LogStop, HPW, RST page 4 JIVE alarms page 5 clear ext. alarms / save

With ← and → you change a value, if you hold a button it continues to count up or down until the value’s limit is reached.
By briefly pressing of **Up**+**Down** you will return to the previous telemetry page, changes are discarded.

On page 5 of „jb**JLC**“ changes can be saved by „save“ (→ == Enter). The changed configuration items are stored in the EEPROM of the processor as well as getting effective immediately. The configuration file “CONFIG.txt” on the SD is cleared simultaneously. It is restored with the new settings if the logger is next started.

If „throttle“ is greater zero the configurator cannot be entered. If throttle exceeds zero while you are in the configurator, it will immediately exit back to the last telemetry page and reject all changes.

Page 1: „Pol“ for number of motor poles, „RatioT“ == G | Gg | R for type of reduction ratio, integer tooth ratio | fractional tooth ratio (main gear) | direct ratio
Page 2: Depending on the type of „RatioT“, Pin (pinion), Gear (main gear), g (fractional tooth of the main gear), ratio (1:n)
Page 3: Flags as in „Basics“ of *JLC*: LS (LogStop on/off), HPW (High PWM Warning on/off), RST (Reset)
Page 4: The 4 alarms on values from **JIVE**: C (Capacity), V (U-Bat), T (tempPA), B (UbecDip)
Page 5: clrEalrm (Clear External Alarms 0=no/1=yes): Clears possibly existing alarm thresholds on temperatures, measured with the up to 5 optional temperature sensors, saved or discarded and back to telemetry
The 5 external temperature alarms are not configurable with the **JETIbox**, they can only be switched off if configured by *JLC*.

The hardware configurator, „Optional Interfaces/Sensors“ in *JLC*, is intentionally not included in „jb**JLC**“, one would possibly thereby sawing off the branch on which one sits.;)

10.4 Using the JETIbox without JETI R/C equipment – for configuration and Live-Display

Because the **JETIbox** is a terminal, it can of course also directly connect to the logger. Even without having a **JETI**-based R/C system, you can use the relatively inexpensive **JETIbox** to reconfigure the logger „in the field“ without a PC, or you can use the terminal for live display of measured values, without having try a PC with **LogView** and the **OpenFormat** live stream.

Tested have been the „classic“ **JETIbox** with the foil keyboard and the **JETIbox mini**, but not the new **Profibox**. If there are no special features in parts of the hardware of the **Profibox**, it should just be as usable.
Both boxes, the „classical“ and the „mini“, have two serial interfaces, only one of them can be used to power the box.

JETIbox mini

There is a cable with a servo plug at the rear side which is the main serial connection and also the only power input of the box. From about 4 volts on the display has enough contrast, but the switchable back light is still weak.
The telemetry cord has a servo plug. A voltage is NOT here! The plug goes into the socket at the front of the **JETIbox** (alternative serial input), possibly with the need to switch to that input by a button existing for doing this. By the servo plug at the cable of the box it has to be supplied with sufficient voltage. If one wants to get the voltage from the logger, a home made adapter is needed, providing with the **JIVE** BEC voltage by two of the three pins of the servo connector.

„Classical“ **JETIbox**

The difference here is that the suitable connector of the box is a servo „socket“ (male), means no cable with a servo plug.
The box needs more voltage for a sufficient contrast of the dot matrix display, should be about 4.8 volts. There is no back light.
The telemetry cable goes into the servo socket the box, that one which is marked.

The „classical“ **JETIbox** generally and the **JETIbox mini** at the main circuit (cable) requires a pull-up resistor of 10 kOhms between the signal (serial) pin and (+) so that they can be operated directly on the logger. On the **JETI-TX-Module** they will work without this resistance. When connecting the logger to the front of the **JETIbox mini** no pull-up is required.

11 This and That

11.1 Updates

JLog2 has a ***SecureBootLoader*** (version III in *JLog2*) that allows the user to flash the logger by himself (update). He copies only the update file into the root directory of the SD card. With every start the boot loader searches the file system of the card for an update file:

- The name of the update file is arbitrary and irrelevant.
- The file must have a marking which defines their applicability on the hardware type of the device.
- The file has a version label. The logger reads it and compares it with the mark currently the flash ROM (program memory) has. If the label of the file is not equal to that of the ROM, the boot loader will flash the ROM with the content of the file (overwriting), and in case of success the label of the ROM will be rewritten with that of the file. An update file is thus flashed only once, just as long as the version marking of the ROM and the file differ.
- The update process is thus downgrade-able. It does not matter if the version of an update file is higher than that of the ROM (the logger), they just have to be different in order to trigger the flash.
- During the flashing the red LED flashes in time with the written memory pages.
- All copies of *JLog2* use the same update file, an individualization with random numbers as „serial number“, as in *JLog1*, no longer exists.

When indicated, update files will be provided on the download page of SM-Modellbau or that of *JLog* respectively.

With each start, the logger writes a file version.txt in the root directory of the file system, which contains the version number of the firmware currently being flashed.

11.2 JLog is a specialized Logger

Apart from its optional own sensors and future possibilities to obtain additional or alternative measurement data from other intelligent units, *JLog* specializes in the diagnostic protocol of an ESC of type **Kontronik** **JIVE**. Applicability of the logger to other ESCs of this manufacturer or that of other manufacturers is currently not provided.

There is no guanrantee that after a future software update of a **JIVE** above the current versions, the diagnostic protocol, processed by *JLog*, will still exist or that it did not obtain significant restrictions!

11.3 Order numbers

JLog2	#2800			
telemetry cord	#2556			
temperature sensor (analog) with magnet	#2220	without magnet	#2221	
temperature sensor (digital)	#2225			
RPM sensor optical	#2210	magnetic	#2211	brushless #2213
USB interface	#2550			
microSD Card for *JLog2*	#2810			
JETIbox mini	JDBOXMINI			

For servo-Y-cable for interconnection of up to 5 digital temperature sensors #2225 visit your local model shop.

As an USB interface only the FTDI #2550 is usable, NOT the FTDI of *JLog1*!