



UniTest 2

Description and User's Manual

Contents

| | |
|--|----|
| 1. The idea | 2 |
| 2. What UniTest 2 can do | 2 |
| 3. Technical data..... | 4 |
| 4. Charging the internal battery | 5 |
| 5. Using UniTest 2..... | 6 |
| 5.1. Turning on and off..... | 6 |
| 5.2. Connectors | 6 |
| 5.3. Menu structure | 7 |
| 6. Functions | 8 |
| 6.1. Drive measurement | 8 |
| 6.2. Servo tester | 14 |
| 6.3. Servo impulse measurement | 17 |
| 6.4. Displaying frequency band using scan receiver | 18 |
| 6.5. Displaying single values using scan receiver | 21 |
| 6.6. Data memory | 22 |
| 6.7. Stopwatch | 24 |
| 6.8. Large display | 25 |
| 6.9. SM-Interface | 25 |
| 6.10. Setup | 28 |
| 7. Software update..... | 30 |
| 7.1. Connection..... | 30 |
| 8. Version history..... | 31 |

Before operating for the first time, the internal battery has to be charged! See Chapter 4. Use the charging time to read this user's manual!

1. The idea

The idea was to design a multifunctional device for RC modeling. It was supposed to achieve the regular tasks in the shop and in the field. The result is the new **UniTest 2** as an improved version of the successful **UniTest**.

This versatile little electronic helper helps in measuring electric drives, but also as a servo tester and scanner.

2. What UniTest 2 can do

Drive measurement:

- Complete measurement of electric drives with current, voltage, power, capacitance, energy and rpm measurement. Also capable of measurement of charge and discharge curves of batteries.
- Everything in one tool and everything visible at once.
- Large internal data storage space for over 2000 data sets.
- Storage rates from 0.5s to 10s allow data collection up to 6 hours.
- Data transmission to a PC either live during the measurement or afterwards by reading the internal data storage.
- Built-in servo tester allows the measurement of electric drives without TX/RX by direct control of an ESC.
- Integrated stopwatch.
- Connection of an external electronic scale for thrust or torque measurements possible.
- Additional universal connectors for external rom and temperature sensors.
- Universally usable switching output with adjustable switching limits.

Servo tester:

- Digital highly precise servo tester with integrated servo current, battery voltage, power, and capacitance measurement.
- Manual and automatic mode.
- Servo control over dial potentiometer with middle detent for fast middle determination
- Display of impulse width in microseconds and in percent according to a computer transmitter
- Fixed servo data for many different servos and transmitters. 100% at the servo tester corresponds to exactly 100% at the specific transmitter.
- Servo travel is adjustable separately for both directions.
- Additional function for exact middle adjustment.

Servo impulse measurement:

- Digital servo impulse measurements with integrated servo current, battery voltage, power, and capacitance measurement.
- Display of the servo impulse amplitude (voltage).
- Display of the measured servo impulse width in microseconds and in percent according to a computer transmitter.
- Display of frame rate (repetition rate) of the servo impulses in milliseconds.

Frequency scanner:

- Complete frequency observation for 35MHz, 40MHz, or 41MHz in connection with a scan receiver (ACT SmartSCAN, ACT DDS10(L)) or Simprop SCAN 7, SCAN 7 V2, SCAN 9 DS).
- Automatic frequency band identification when hooking up the specific scan receiver.
- Display in easy to read bar graph format with manually adjustable or automatic damping.
- All channels of the frequency band are visible in one view (A and B band simultaneously for 35MHz).
- Alternatively also display of field strength for the single channels in percent of maximum value.
- Alternatively observation of a single channel with acoustic warning when exceeding a specified field strength.

Stopwatch:

- Full stopwatch functionality with adjustable alarm.
- Adjustable acoustic signal order.
- Stopwatch or countdown functionality.
- Display can be changed to large clock numbers (whole display).

SM-Interface:

- Other SM-Modellbau products can adjusted and used with the **UniTest 2**. At the moment **UniLog**, **LiPoWatch**, **V-Kabel2** and **InfoSwitch** can be read and adjusted completely through UniTest 2.

Software update via PC:

- The UniTest 2 software can be updated at any time using the included **USB-Interface**.
- Software updates are available free of charge at www.sm-modellbau.de.

3. Technical data

The **UniTest 2** is a universal measurement tool for the RC hobbyist. It is controlled by a microcontroller and has a four line LCD screen with backlight. It is operated through 4 buttons and a dial potentiometer for the servo tester.

The **UniTest 2** has a built-in battery that power the device itself as well as the connected servos and other peripherals such as the scan receiver or external sensors.

- Power consumption: approx.. 8mA without and 100mA with screen backlight
- Built-in battery: 4 cells AAA (Micro) 700mAh
- Temperature range: 32F to 104F; current and voltage measurements are calibrated at 70F
- Connectors: Graupner/Futaba/universal for servos and external sensors
- Green Multiplex high current connector for electric drive measurements
- Dimensions: 115mm(+16mm potentiometer) x 65mm x 27mm
- Mass: 165g

Drive measurement:

- Current: -10 to +80A; display in 0.01A steps; accuracy +/- (1.5% + 3 digits)
- Voltage: 0 to 50V; display in 0.01V steps; accuracy +/- (1% + 2 digits)
- Power: 0 to 4000W; display in 0.1W steps
- Capacitance: 0 to 30,000mAh; display in 1mAh steps
- Energy: 0 to 1400Wh; display in 0.01Wh steps
- Current measurement over built-in 1mOhm shunt resistor
- Temperature measurement over external magnetic sensor (Order no. 2220) von -40C to +125C
- Measurement of an arbitrary sensor between 0 to 1500mV on analog connector A2
- Negative current measurement also possible for simple recording of charge curves
- RPM measurement for 1-20 blade propellers between 100 to 100,000 rpm, either using internal or external (Order no. 2210) optical rpm sensor
- Display of efficiency (eta) by n100W method from the measured rpms. Propeller selection from table or input your own n100W value

Servo tester:

- Impulse generation exactly according to the programmed transmitter model
- Impulse width adjustable within the limits of the selected transmitter model (for example: 900 to 2100 microseconds for Graupner or -150% to 150%)
- Impulse resolution 0.5microseconds; Accuracy +/- (0.5% + 2 digits)
- Current: -200mA to +4500mA; Display in 1mA steps; Accuracy +/- (1.5% + 3 digits)
- Voltage: internal 0 to 10V; external 0 to 20V; Display in 0.01V steps; accuracy +/- (1% + 2 digits)

- Power: 0 to 90W; display in 0.01W steps
- Additional display of the maximum measured servo current
- Adjustable current limit for the servo outputs with automatic cutoff
- Mode for measurement of servo speed

Servo impulse measurement:

- Measurement range: impulse width 0 to 10,000 microseconds; display in 0.5 microsecond steps
- Frame rate 5ms to 50ms; display in 0.01ms steps
- Accuracy +/- (0.5% + 2 digits)
- Display of percentage based on selected transmitter model
- Servo current, voltage, power, capacitance measurement just like servo tester

Frequency scanner:

- Connection of a scan receiver (ACT SmartSCAN, ACT DDS10(L), Simprop SCAN 7 or SCAN 9 DS) over an adapter cable
- Power supply of the scan receiver through the **UniTest 2**
- No additional battery necessary

Software update by PC:

- USB interface
- Update software runs on any Windows PC

4. Charging the internal battery

The **UniTest 2** has a built-in battery consisting of 4 cells AAA (Micro) 700mAh. On the right side of the case you can find the connector for charging the battery. This connector is identical to the connector used on Graupner/JR transmitters. A charging cable for the **UniTest 2** is available under Order no. 2202.

Attention: the outer contact is Plus, the inner contact is Minus!

You must set your charger to the following values:

- **Maximum charging current 1A**
- **Cell number 4**
- **Battery type NiMH**
- **Maximum charge amount 700mAh**

Overcharging the internal battery can destroy the **UniTest 2!**

5. Using UniTest 2

The **UniTest 2** has four buttons for navigating the menu and a potentiometer for moving the servos.

5.1. Turning on and off

The power switch is also a button and turns the **UniTest 2** on/off electronically. A long press of the button (approx. 1 sec) activates the device.

After turning on, first you will see a startup screen with software version and serial number and after that, for one second or as long as the power button remains pushed, the internal battery voltage will be displayed as a number and in a bar graph.

To turn the device off, just keep the power button pushed for at least a second. A message on the screen will confirm the shutdown.

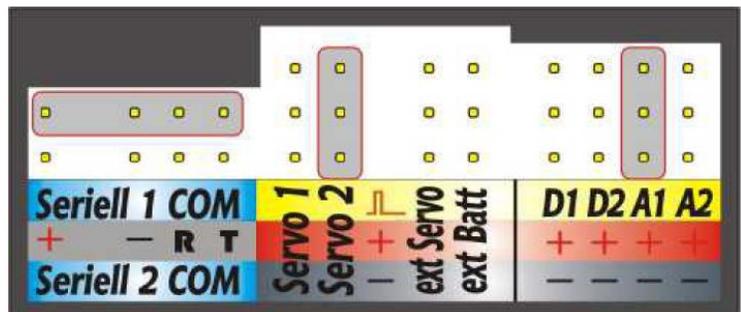
```
*****UniTest 2*****
www.sm-modellbau.de
Software          v1.23
Seriennummer     99999.9
```

```
-----
Akkuspannung     5.15V
■■■■■■■■■■■■■■■■
4.60-----5.60
```

5.2. Connectors

A large connector bar is located on the left side of the **UniTest 2**. Here you connect the servos, a PC, the scan receiver and the external sensors.

In the example you see a **USB-Interface** connected to "**Seriell 1 COM**", a servo connected at "**Servo 2**" and an external temperature sensor is connected at "**A1**".



The servos and sensors should be connected to **UniTest 2** according to the color convention of their cables. So the brown/black (-) cable should always be towards the bottom of **UniTest 2**.

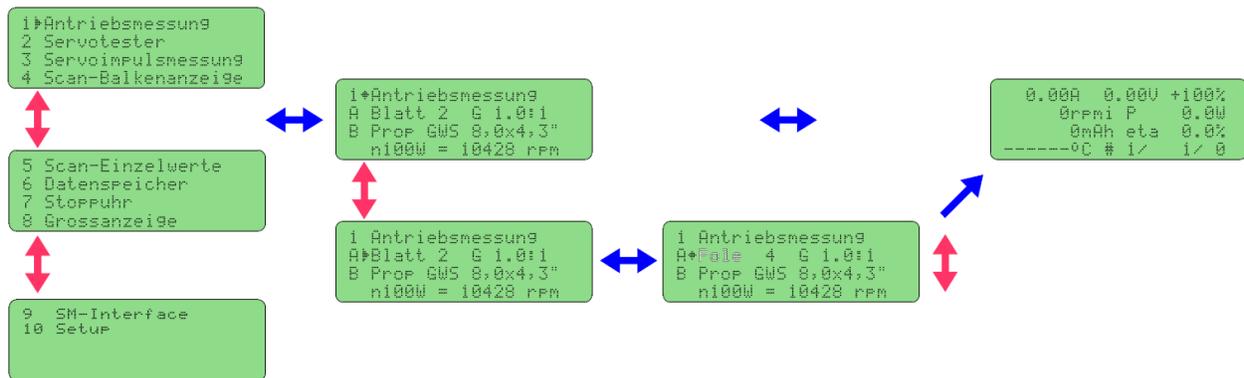
"**D1**" and "**D2**" are digital inputs/outputs, "**A1**" and "**A2**" are analog inputs.

5.3.Menu structure

UniTest 2 is used through a menu with three (four) levels. You navigate through this menu using the four push buttons. **“Enter”** and **“Esc”** move between the levels to the left or right. Using **“Plus”** and **“Minus”** allows you to select menu bullets or change adjustable values.

The last selected function will be kept in memory even after shutdown and will be reactivated when the device is turned on again. For example, when you are installing a servo, you don't have to reactivate the servo tester every time, it will be available to you immediately.

Menu structure example: Drive measurement



Selection level

Adjustment level

Changing values

Display level



selecting menu bullets or changing adjustable values using **“Plus”** and **“Minus”**



jumping between menu levels using **“Enter”** and **“Esc”**

6. Functions

6.1. Drive measurement

Menu item 1 **“Antriebsmessung”** allows the simultaneous measurement of current, voltage, rpm, capacitance, power and energy for electric drives. UniTest 2 also outputs a servo impulse that can be used to drive the ESC directly. A complete setup of a transmitter or an additional servo tester is not necessary.

The voltage and current measurement uses the looped cable between battery and ESC

UniTest 2 has to be turned on before the main battery is connected because the zero point is reset upon power up.

The rpm measurement uses an optical sensor located on the front side of the device body. It only works when exposed to natural light (sunshine) or artificial DC light (flashlight).

Hint: You can also measure rpm in your shop under artificial light. Just make sure you point a sufficiently strong flashlight directly onto the sensor. This prevents the AC light sources from having any adverse effects on your measurement.

6.1.1. Settings

We show how to adjust the **UniTest 2** settings using the example of drive measurement. All adjustments follow this principle and will from now on only be listed.

```
1+Antriebsmessung
A Blatt 2 G 1.0:1
B #01 AAA 10,0x10,0"
n100W = 10000 rpm
```

Select **“Antriebsmessung”** on the selection level by pressing **“Enter”**. Then the adjustable values will be displayed.

The adjustable values can be selected using the Plus and Minus buttons. Pushing Minus (down) moves the cursor to the row for rpm measurement adjustments. The cursor will be in the shape of an arrow. Another push of Minus moves the cursor to the third row to adjust prop values. Listed here are propeller number (#01), then three letters for the propeller name and then the propeller size in inches. The numbers #01 to #16 are freely programmable, numbers #17 and above include a few pre-programmed propeller values.

```
1 Antriebsmessung
A▶Blatt 2 G 1.0:1
B #01 AAA 10,0x10,0"
n100W = 10000 rpm
```

If you want to change the blade number of a propeller, push **“Enter”** in row A. The cursor changes to the shape of an arrow and the adjustable value starts to blink.

```
1 Antriebsmessung
A+Pole 4 G 1.0:1
B #01 AAA 10,0x10,0"
n100W = 10000 rpm
```

This value can now be changed using **“Plus”** and **“Minus”**. You can change between **“Blatt”** (blades) and **“Pole”** (poles) to allow rpm measurements at the propeller (using optical sensor) or at the motor (using brushless rpm sensor).

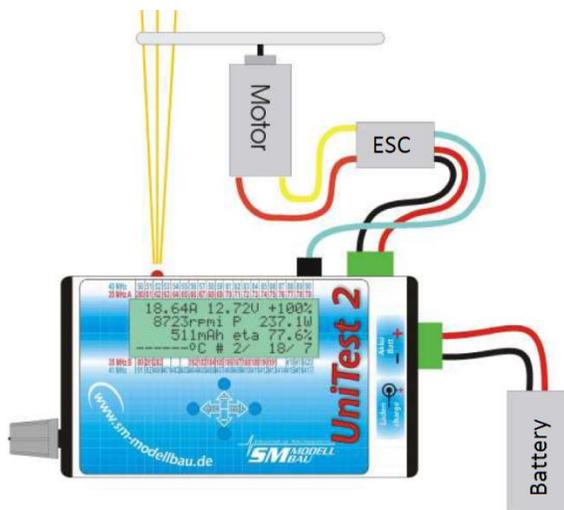
6.1.2. Efficiency measurement with n100W values

UniTest 2 can display the efficiency of an electric drive using so called n100W values. The n100W value is a characteristic of the installed propeller. It specifies how fast (rpm) the propeller will turn at exactly 100W shaft power. Using rpm and the electric drive's input power, we can then compute how much of the consumed power actually makes it to the shaft. This value is the efficiency η . **UniTest 2** displays η during drive measurement.

Due to variations in production and elasticity of the propeller, this method is not very accurate. But it allows you to choose the most efficient motor by a simple comparison test when using different electric motors with the same propeller.

On the adjustment level of the drive measurement menu, you can choose the used propeller out of a list. The first 16 propeller entries are freely programmable. By choosing row B and pushing "Enter" you can choose the propeller list. By pushing "Enter" again, you can assign 3 letter long names to any of the first 16 programmable propeller entries. After that, propeller diameter and pitch (both in inches) can be programmed and in the lowest row the n100W value for this propeller can be adjusted.

6.1.3. Connection



The diagram to the left shows the connection of all components for drive measurement using an ESC with built-in BEC.

IMPORTANT:

ESCs with built-in BEC must be plugged into "Regler/ESC" as shown in the diagram.

Controllers with opto coupler have to be connected through one of UniTest 2's regular servo outputs (Servo 1 or Servo 2).

When measuring a drive that is already built into a model, input to the controller will usually happen through the RC transmitter.

SAFETY FEATURE:

For your safety, all servo outputs and the ESC connector will output only the Motor Stop impulse until the potentiometer is moved to the stop position. During this time, "STOP!" is displayed on the screen instead of the regular throttle percentage display. This feature can be disabled in the setup.

6.1.4. Connecting a scale for thrust or torque measurements

Starting with software version 1.10 (software updates available for free at www.sm-modellbau.de), an external scale can be connected to UniTest 2 through “Seriiell 2 COM” connector.

Currently the following scales can be chosen:

- IBN-5000/RS (formerly order # 2260)
- Lutron GM-500/GM-5000 (formerly order # 2250)
- Kern 440

Additionally, a multiplication factor for the scale output value can be programmed in the setup menu under “**L Waage Faktor**”. This factor allows you to adjust the scale output value to reflect the lever arm ratios used in your homemade thrust measurement setup. If the motor pushes onto the scale with a lever arm ratio of 2:1, then setting the factor to 2.0 will automatically display and save the scale output multiplied with 2.

Instead of “**Waage Faktor**” you can also set a value for “**Waage Hebel**”. This is the lever arm length when the scale is used to measure the motor torque. Using a suitable motor test stand, this allows you to measure all relevant values of an electric motor including efficiency.

When you have chosen a scale in the setup menu and a value for “Waage Hebel”, the scale output is directly converted and displayed as a torque in N*cm units. The displayed efficiency value is then no longer calculated using the n100W value of the propeller, but rather using the actual output power computed from motor rpm and torque!

Since the scales only supplies measurements every 1 second, it makes sense to adjust the data rate to 1 second or higher in the **UniTest 2** setup menu. The IBN-5000/RS scale has a higher data rate, so here you can set the **UniTest 2** data rate to 0.5 sec.

Specific connector cables are necessary to connect the scales to the **UniTest 2**. The cable is included for the IBN-5000/RS scale. For Lutron GM-500 and GM-5000, the cable can be ordered separately using order # 2235. For the Kern 440 scale cable, use order # 2236.

6.1.5. External analog connector A2

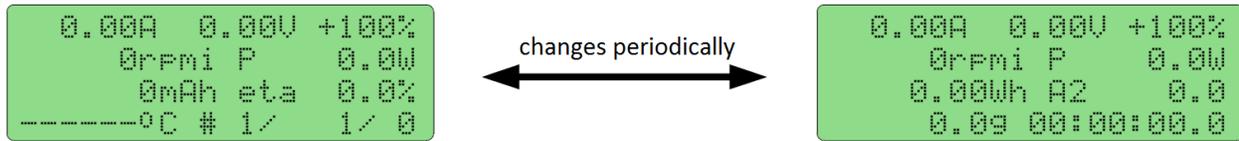
Connector A2 allows you to connect an arbitrary analog sensor. You can use a standard Graupner servo cable as a connector.

The three wire leads are defined as follows:

- Black (bottom) → Ground (must not be connected to any other **UniTest 2** ground connector!)
- Red (middle) → +3.6V to power the sensor (10mA max!)
- Yellow (top) → Signal input

The measurement range lies between 0 to 1500mV. The input is **not** protected against reverse current or overload. The measurement range must be maintained at all times! Damages to the device due to improper connection of external sensors will not be covered under warranty!

6.1.6. Displayed values



- Row 1 shows the motor current, the battery voltage and the throttle value in % according to the settings made in the servo tester.
- Row 2 shows the rpm and the power. **rpm**i means that the **internal** rpm sensor is used and **rpm**e shows that an **external** rpm sensor (order # 2210) is connected to input D1. Selection of this setting is done in the setup menu described later.
- Row 3 shows capacitance and the efficiency according to the propeller used. Efficiency is computed from the n100W value, the current rpm value and the consumed power. If a digital scale is connected and motor torque is measured directly on an appropriate test stand, the efficiency eta is computed using the actual output power from rpm and torque.
Row 3 periodically changes to display other values. Instead of the capacitance, the energy in Wh is displayed. If an external sensor is connected to analog input A2, this sensor's value is displayed in mV instead of the efficiency eta.
- Row 4 shows the temperature supplied by an external temperature sensor (order # 2220) and the status of the internal data memory. The temperature sensor is connected to input A1 and is able to measure values in the range between -40 to +125 degrees C. If no sensor is connected to the device, only dashes are displayed.

The memory status is displayed as:

number of the dataset being written/current set of measurement values/memory allocation in %.

Like row 3, row 4 changes periodically to display other values. Instead of temperature, the output of an external scale connected to "**Seriell 2 COM**" is displayed. Depending on the programmed mode, the scale's output is displayed in grams [g] or as a torque [N*cm]. The detailed settings for the scale can be found in menu item 8 "**Setup**".

In exchange with the memory status, a stopwatch is shown in the format hours/minutes/seconds/tenths of seconds. The stopwatch starts as soon as data is saved to memory.

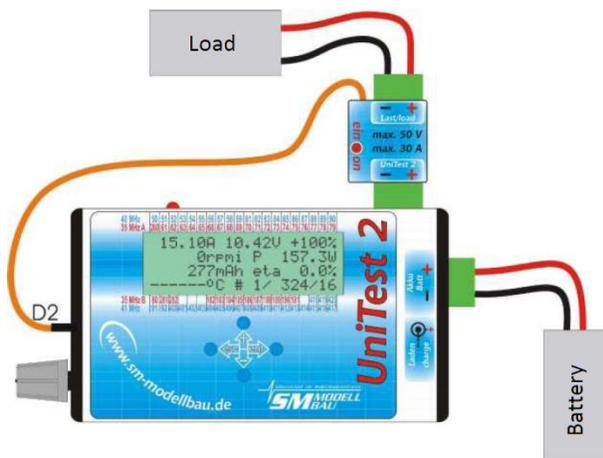
6.1.8. PC analysis software

Data analysis software for your PC is available at the website www.sm-modellbau.de under "Download". This program is executed as an Excel Macro and therefore requires Microsoft Excel Version 2000 or newer. It allows you to generate data plots directly during a measurement or using saved data. A detailed explanation is included with the software.

Data analysis is also possible using the program LogView from www.logview.info. This software supports a wide selection of devices used by RC hobby enthusiasts.

6.1.9. Switching output

Output "D2" can be used to switch external devices during drive measurements. A typical application is a low voltage cutoff when recording battery discharge curves. The cutoff parameter can be set under menu item "Setup". As soon as a value is being observed, it will be marked with a blinking star behind its name. The switching output remains turned on as long as all values stay within the allowed intervals defined by you. If a value leaves its interval, a triple beep will sound and the switch output is turned off. A blinking arrow is displayed behind the offending value, the direction of the arrow depending on whether the value was too high (arrow up) or too low (arrow down). A data collection to memory can be stopped automatically when the switching output is turned off (this functionality can be enabled in "Setup").



A suitable switching module for **UniTest 2** is available separately under order # 2240. It is connected directly to **UniTest 2**'s green MPX connector (ESC/load) and allows the switching of up to 50V and 30A. A control LED shows the switch state. The diagram on the left shows the proper connection of the module. As a load you can either connect a current sink, a power resistor or an array of 12V car headlights.

Attention: Current flow can only be interrupted in the direction battery → load! The switching module cannot prevent current from flowing from load to battery (built-in diode)!

Specifications of output D2 (if you want to build your own switching module):

- logic level output from the processor
- low (off) approx. 0V
- high (on) approx. 3.6V, 3mA maximum with a 1 kOhm serial resistor

The switching output can only be used to drive a suitable logic level MOSFET transistor. It is important that only the switch/signal wire from D2 is connected to the transistor gate. The transistor is connected to Ground directly through the green MPX connector.

A Ground connection between D2 and the green MPX connector is not allowed and would falsify the measurement!

6.2. Servo tester

Menu item 2 "Servotester" allows the manual, semiautomatic or fully automatic control of servos. Simultaneously UniTest will display the servo current, the battery voltage, the used capacitance, the power and the temperature supplied by the external temperature sensor. Additionally a servo speed measurement is possible.

6.2.1. Settings

```
2+Servotester
A Servo max. 750mA
B Modus manuell
C Graupner We9e
```

Under menu item A you can adjust the maximum servo current. If this value is exceeded, the servo output is turned off and a warning message is displayed together with a warning beep.

This message has to be confirmed by pressing "Enter"!

The value 5000mA works without a limit!

Menu item B lets you adjust the mode to manual, semiautomatic or automatic.

"**manuell**": the servo is controlled manually using the potentiometer dial.

"**auto Poti**" the servo is constantly moved back and forth between its two endpoints. The servo speed can be adjusted using the potentiometer dial.

"**einzeln Poti**": pushing "Minus" will cause the servo to move to its -100% endpoint. Pushing "**Plus**" will cause it to go to its +100% endpoint. Servo speed for this movement is again adjusted using the potentiometer dial.

"**auto**" and "**einzeln**" mode are very close to "**auto Poti**" and "**einzeln Poti**", respectively. However, here the servo speed can be programmed directly as a number value instead of using the potentiometer dial. The time value specified is the time for the servo to travel from its middle position to one of its endpoints. The potentiometer dial has no effect in these two modes.

Under menu item C you can adjust different transmitter standards. **UniTest 2** always simulates exactly the programmed transmitter. If you change the transmitter type, the screen will switch back and forth showing the manufacturer as well as the saved settings specific to that transmitter.

The new very fast Hubi servos are also listed here. They are controlled with extremely fast pulses. If normal servos are driven with these pulses, they might be damaged! Please pay close attention to choose the correct settings that match the servos used!

Example: the values for Graupner:

- Neutral position: 1500 microseconds (=1.5ms) pulse width
- Servo travel: 400 microseconds (=0.4ms) per side
- Frame length: 22.00ms

That means that the total pulse width range is between 1100 and 1900 microseconds. This is equivalent to the -100% and +100% values displayed in your transmitter and in the UniTest 2 servo tester. The frame length is the time between two consecutive servo pulses.

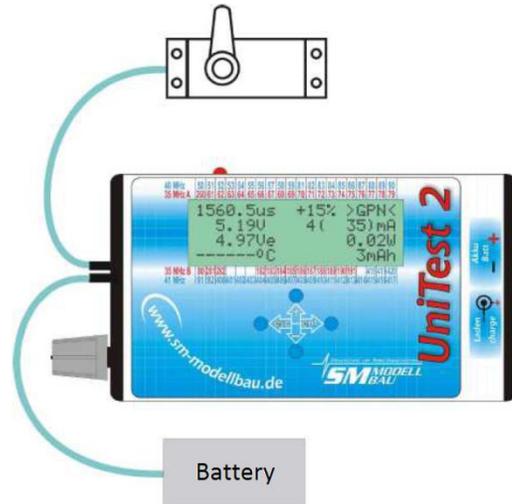
6.2.2. Connection



The diagram to the left shows the proper connection of a servo when performing a servo test. The servo can be connected to "**Servo 1**" or "**Servo 2**". You can also connect two servos at the same time. In this case the current consumption displayed by **UniTest 2** is the total current consumption of both servos combined. When connected like this, the servos are powered using **UniTest 2**'s internal battery. This battery has four cells and is comparable to a standard receiver battery.

If you want to drive a servo with a battery other than the internal battery, you can connect the servo to "**ext Servo**" and an external battery to "**ext Batt**". Then the servo is powered directly by this battery. Current and voltage will be displayed by **UniTest 2**. As soon as an external battery is connected, the power displayed will be calculated using the external battery's voltage.

You can define the fixed neutral position by pushing "**Enter**". A long beep will sound as confirmation. Now the servo is fixed to its neutral position. Pushing "**Enter**" again or moving the potentiometer returns the device back to normal use and will be confirmed by a double beep.



Servo travel can be set between 0% and 150% independently for each side. Move the potentiometer to the desired side's maximum position, then adjust the servo travel using "**Plus**" and "**Minus**". Pushing "Plus" and "Minus" simultaneously causes the value to be reset to 100%. After turning on **UniTest 2**, the value is set to 100% by default.

This travel setting also applies to the servo pulses during drive measurement!

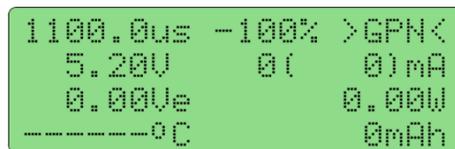
Hint: the potentiometer dial has a slight detent in its middle position. Usually this is sufficient to quickly find the middle position.

Safety feature:

As soon as an external battery is connected to **UniTest 2**, all servo and controller outputs will only output the motor stop pulse (-100%) until the pulse output has actively been approved. To do so in "*manuel*" (manual) mode, move the potentiometer dial to its stop position once. In the other modes, press "*Minus*" once.

As long as no approval has been given, "**STOP!**" is displayed on the screen in place of the throttle value in %. This safety feature can be disabled in the Setup menu under item "U".

6.2.3. Screen layout



```

1100.0us -100% >GPN<
 5.20V 0( 0)mA
 0.00Ve 0.00W
-----°C 0mAh
  
```

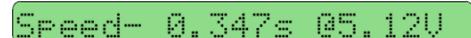
- Row 1 shows the pulse length in microseconds, the % value according to the transmitter and the specified transmitter model (GPN=Graupner, MPX=Multiplex, FUT=Futaba).
- Row 2 shows the voltage of the internal battery that supplies "Servo 1" and "Servo 2", the current consumption of all servos combined and the maximum measured current in parentheses.
- Row 3 shows the voltage of the external battery at "ext Batt" that is used to power the servo connected to "ext Servo". It also shows the servo's consumed power.
- Row 4 shows the temperature supplied by the external temperature sensor and the used capacitance.

In automatic mode, row 4 periodically changes to display the programmed servo speed in seconds for 100% travel (half of total servo travel) and also the number of completed servo cycles. The servo cycles counter can be reset by turning the device on/off.

6.2.4. Servo speed

"**Servospeed**" as a mode under item "B" of the settings allows a direct measurement of the servo speed. If this mode is selected, pushing "**Enter**" will cause the servo to move from one endpoint to the other and its speed is measured.

The bottom row of the screen displays the values as follows:



```

Speed- 0.347s @5.12V
  
```

In the negative direction "Speed-" the speed was measured as 0.347s with a median voltage of 5.12V. When pushing "**Enter**" again, the servo will move into the opposite direction and the speed will be displayed as "Speed+".

If you want to measure the servo speed for a specific travel distance (for example 45 or 60 degrees), the servo can be brought to the desired endpoint using the potentiometer dial and then the servo travel adjusted using "**Plus**" and "**Minus**". The speed measurement will then be performed using these endpoints.

The measurement uses the current consumption during the servo travel. Servos with inconsistent

current consumption or oscillations can cause measurement errors. Therefore it might be necessary to repeat a measurement several times and ignore obviously wrong values.

6.3. Servo impulse measurement

Menu item 3 "*Servoimpulsmessung*" allows you to measure and check servo pulses. Simultaneously **UniTest 2** measures the current consumed by a connected servo, the battery voltage, the used capacitance and the power.

6.3.1. Settings

```

3+Impulsmessung
A Servo max.      750mA
B Graupner Wege
  1500±400µs 22.00ms
  
```

Just like in the servo tester menu, the servo current can be limited. Additionally you can choose between Graupner, Multiplex and Futaba. **UniTest 2** relates the measured pulse values to the chosen transmitter manufacturer.

6.3.2. Connection

The diagram to the right shows the connection of a receiver and a servo for "*Servoimpulsmessung*".

The receiver is connected to the "*ext Batt*" connector like an external receiver battery. Additionally a servo can be connected to "*ext Servo*". This servo will be driven directly from the receiver signal.

UniTest 2 is connected between receiver and servo and measures the pulse width, pulse amplitude (voltage), frame length, external voltage and current consumed by the servo.

The cable from receiver to **UniTest 2** is a regular servo cable with a servo connector (JR/Universal) on both ends. Such a cable is available as an accessory under order # 2230.



6.3.3. Screen layout

```

1733.0us  +58% >GPN<
 5.15V    0( 0)mA
 4.32VImp 0.00W
22.03msFr 0mAh

```

- Row 1 shows the measured pulse width in μs , the % value according to the selected transmitter and the selected transmitter type (GPN=Graupner, MPX=Multiplex, MPu=Multiplex/Uni, FUT=Futaba).
- Row 2 shows the voltage of the external battery, the current consumed by a servo connected to “**ext Servo**”, and the maximum recorded current in parentheses.
- Row 3 shows the pulse amplitude in Volt. Additionally the servo power is displayed.
- Row 4 shows the frame rate of the measured servo pulses in ms and the used capacitance. The frame rate is the time between two consecutive pulses.
In automatic and semiautomatic mode, row 4 periodically changes to display the programmed servo speed in s for 100% travel and the number of completed servo cycles.

6.4. Displaying frequency bands using scan receiver

Menu item 4 “**Scan-Balkenanzeige**” allows you to scan the frequency band in combination with a scan receiver (not included).

The following receivers can be connected to **UniTest 2**:

- ACT SmartSCAN at 35MHz and 40/41MHz with connector cable (order # 9041)
- ACT DDS10 and DDS10L at 35MHz with connector cable (order # 9042)
- Simprop SCAN7 and SCAN7 V2 as well as SCAN9 DS at 35MHz and 40MHz with connector cable (order # 9043)

The scanning process is performed by the selected scan receiver and the data is displayed on **UniTest 2** in the form of bar graphs.

The scan receiver is connected to **UniTest 2** using the appropriate connector cable. The entire system will be powered by **UniTest 2**'s internal battery.

Attention: Do not connect a battery to the scan receiver!

The following channels are displayed:

35MHz (SmartSCAN, DDS10(L), SCAN7, SCAN9 DS):

- A-band channel 61-80 and B-band channel 182-191
- All 30 channels in one view!
- The new channels 260, 281, 282 are only displayed by DDS10(L), channels 281 and 282 are also displayed by SCAN7 and SCAN9 DS. SmartSCAN only shows a small symbol in place of measurement values.

40/41MHz (SmartSCAN, SCAN7, SCAN9 DS):

- 40MHz mode channel 50-59 and 81-92
- 41MHz mode channel 400-420
- All 43 channels in one view!

During the scanning process the receiver runs through all channels in the frequency band and calculates the field intensity.

One scan takes about three seconds with SmartSCAN and one second with DDS10(L). That means that each channel value is updated about one every three (one) second(s).

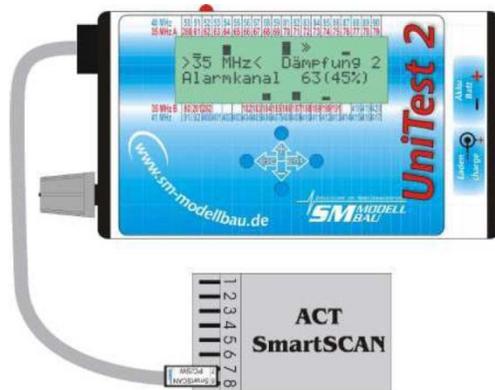
Version 1 of the SCAN7 by Simprop is not able to scan continuously. Instead you have to keep the scan button pressed to start a scanning process. The process will then be repeated about once every 6-8 seconds.

The newer SCAN7 V2 with software version V2.2 or higher and the SCAN9 DS have a special operating mode "special mode for service" (marked by five blinks). In this mode, scan data is sent to **UniTest 2** continuously and without the push of a button.

To enable **UniTest 2** to read the data, the connected scan receiver must be selected in the **UniTest 2** setup menu under item "J".

6.4.1. Settings

An acoustic monitoring can be activated for one channel for each of the 35 Mhz and 40/41 MHz bands. The desired channel has to be set as the alarm channel and the alarm value has to be programmed. If the alarm value is set to above 90%, then the alarm is turned off. The alarm sound is a beeping noise that sounds as soon as the alarm value on the chosen channel is exceeded during the scanning process.

6.4.2. Connection

The diagram to the left shows how to connect a SmartSCAN scan receiver.

The connection cable (order # 9041) is connected to **UniTest 2** through the "Seriell 2 COM" connector. That is the lower of the two serial connectors. On the SmartSCAN side the cable is connected to slots 7 and 8.

UniTest 2 recognizes the connected receiver automatically and confirms this with a beep.

The DDS10(L) receiver is connected to **UniTest 2** as described above. The connection cable with order # 9042 is required for the connection. On the DDS10(L) side the cable is connected to the small DSL connector.

To connect SCAN7 and SCAN9 DS receivers by Simprop, the connection cable with order # 9043 is required. On the SCAN7/9 DS it is connected to "DAT". The SCAN7 must be adjusted to 6 channel mode,

the SCAN9 DS must be adjusted to 8 channel mode! Detailed information can be found in the receiver manuals.

No battery should be connected to any of the scan receivers!

6.4.3. Screen layout



Row 2 shows which frequency band was programmed/detected and the programmed damping amount.

Row 3 shows the alarm channel number and the alarm value.

Rows 1 and 4 show the bar graphs. Each sign is one channel. The channel number can be read off the numbering lines above or below the screen for the appropriate frequency band.

In the example case depicted above, the red channel numbers are significant because a 35 MHz receiver is connected. **UniTest 2** has detected transmitters on channels 61, 64, 70, 76 and in the bottom row channels 184, 187, and 190.

Each bar has 8 levels. If no signal is detected, the display field remains empty. When receiving a signal at full intensity, the display field is filled completely.

In the example you see channel 61 with only one bar. That means the transmitter is only very weak. Channels 184 and 187 have about half and channel 70 has maximum intensity.

The double arrow pointing to the right moves through the frequency band continuously and signals to the user which channel is currently being scanned. This allows you an overview when which channel value will be updated again.

In order to distinguish between real transmitters and small disturbances from neighboring channels, **UniTest 2's** bar graph display is scalable:

the damping of the display is adjustable in 10 steps by pushing "**Plus**" and "**Minus**". Doing so scales the maximum value. At maximum damping (9) the full bar display is already reached at 10% field intensity. Without any damping (0) a full bar display is reached at 100% field intensity.

A decision about which channel is a real transmitter and which channel merely displays a disturbance can simply be made by adjusting the scaling.

Besides the manual scaling described above, an **automatic scaling** option is also available. This adjustment follows after the value "**Dämpfung 0**". Now the scaling is adjusted automatically such that the strongest received signal is displayed with a full bar height.

The channels 418, 419 and 420 in a 40/41 MHz receiver are located above channels 415, 416 and 417.

6.6. Data memory

Menu item 6 “**Datenspeicher**” allows you to read, delete and transmit data from the internal memory to a PC. Connection of a PC to the device is explained in chapter “**Software update**”.

6.6.1. Selection

```
A Speicher anzeigen
B Speicher -> PC
C Speicher löschen
```

Here we choose if data is to be displayed (“**Speicher anzeigen**”), transmitted to a PC, or deleted (“**Speicher loeschen**”).

6.6.2. Show memory directly in UniTest 2

```
0.00A 0.00V LESEN
 0rFmi P 0.00
 0mAh eta 0.0%
-----°C # 1/ 1/ 0
```

When reading data from the internal memory, the screen layout is very similar to that during drive measurement. In the upper right hand corner, “**LESEN**” (=“**READ**”) shows that we are currently only reading saved data and not measuring.

“**Plus**” and “**Minus**” allows you to scroll through consecutive sets of data. “**Enter**” allows you to jump directly to the next data set.

In the lower right hand corner the same values are displayed as during drive measurement:

number of the dataset being written/current set of measurement values/memory allocation in %.

6.6.3. Send memory to PC

```
Datensatznummer aus-
wählen und mit ENTER
senden.
Nummer: alle
```

“**Plus**” and “**Minus**” allows you to choose the specific data set that you want to transmit to the PC. Alternatively you can also transmit all data sets at once.

The transmission is starting by pushing “**Enter**”. During the transmission the progress is reported in the lower right hand corner of the screen.

When using the software for Excel that can be downloaded from www.sm-modellbau.de, there are two different ways to transmit data to the PC:

- During data collection through the Excel menu “Live values”.
- The entire memory can be read from **UniTest 2** through the Excel menu “Data control”.

You do not have to adjust anything on the **UniTest 2**. Excel control the entire transmission. You only have to connect **UniTest 2** to the PC and turn it on. Please also read the instructions included with the Excel software.

Data format when transmitting live values or when transmitting from UniTest 2 internal memory:

- **Interface:** 115200 baud; 8 data bits, no parity bit, one stop bit (115200,8,N,1)
- The **baud rate** can be adjusted in setup.
- **Data format:** ASCII string with fixed position of each data point
- One **data packet** consists of the following 71 Byte:

AAAA,A;BB;CC,CC;DDD,DD;EEEEEE;FFFFFF;GGGGG,GG;HHHH,H;IIIII,I;JJJJJ,J;[cr/lf]

Please note that in German a comma has the meaning of a decimal point!

- A: Time in s with one decimal place
 B: Data set number
 C: Voltage in V with two decimal places
 D: Current in A with two decimal places (also negative values)
 E: Angular velocity in revolutions per minute
 F: Capacitance in mAh
 G: Energy in Wh with two decimal places
 H: Temperature in degrees C from external sensor with one decimal place (empty without sensor)
 I: Analog value at connector A2 in mV with one decimal place (range 0-1500 mV)
 J: Measurement value of an external scale with one decimal place
 [cr/lf]: The end of a packet is made of a carriage return and line feed. The next data set will start in a new line.

Example: 167,5; 1; 12,76; 38,57; 10345; 1798; 23,32; 45,7; 253,7; 476,5;

- 167.5 seconds
- Data set number 1
- 12.76 V
- 38.57 A
- 10345 rpm
- 1798 mAh
- 23.32 Wh
- 45.7 degrees C
- 253.7 mV at analog input A2
- 476.5 g

6.6.4. Delete memory

```
Datensatznummer aus-
wählen und mit 2 sec
ENTER löschen.
ab Nummer 1
```

You can use **“Plus”** and **“Minus”** to adjust which data sets should be deleted from memory. A long push on **“Enter”** will execute the deletion.

The selected data set number has the following meaning: all data sets with that number and higher will be deleted from memory.

So for example, when you have chosen data set 5, it means that data sets 5, 6, and all following will be deleted. If new data is recorded, this data will start with data set number 5. The data sets 1 through 4 remain unaltered.

If you want to delete the entire memory, simply select to delete starting at data set 1.

6.8. Large display

Menu item 9 “**Grossanzeige**” allows you to display a single measurement value on the whole screen in real time, just like when using the stopwatch.

One of the following values can be selected:

- Drive voltage → Voltage of the battery powering the motor
- Drive current → Current consumed by motor
- Internal voltage → Voltage of the internal **UniTest 2** battery
- External voltage → External battery voltage connected through “**ext Batt**”
- Temperature from A1 → Value of external temperature sensor connected at A1
- Angular velocity → Angular velocity of an internal or external rpm sensor (depending on the choice made in Setup)

6.9. SM-Interface

Menu item 9 “**SM-Interface**” allows you to control and adjust other products produced by SM-Modellbau with your **UniTest 2**.

At this time, the **V-Kabel 2**, the **Infoswitch** and the **UniLog** can be controlled completely and their data read through **UniTest 2**.

UniTest 2 can also read data from other manufacturers’ products like the Hyperion LBA10 balancer.

The desired device has to be selected from the menu before connecting it to the UniTest 2.

6.9.1. Connection with V-Kabel 2

In order to program and display data from **V-Kabel 2**, connect the device to the bottom serial port of **UniTest 2** (Seriell 2 COM) using the programming cable (order # 2232). **V-Kabel 2** can either be normally connected to a receiver or plugged into the **UniTest 2** servo output.

```
Servo1 => Mitte +0%
W+100% Z 0.0s L+150%
W-100% Z 0.0s L-150%
FS 1500us Out 1500us
```

As soon as a connection is established, **UniTest 2** will emit a beep and the screen will show the servo menu for the **V-Kabel 2**. Now all settings of **V-Kabel 2** can be adjusted through **UniTest 2**.

Adjustable settings for **V-Kabel 2**:

- **Servo1** (servo or menu item choice): choose from Servo1 to Servo4 followed by Setup
- => or <= (running direction)
- **Middle** (servo middle position): -100% to +100%
- **W** (servo travel): 0% to 200%, adjustable separately for both sides
- **Z** (Servo speed): 0.0s to 10.0s, adjustable separately for both sides
- **L** (Limit/Travel): 0% to 200%, adjustable separately for both sides
- **FS** (Failsafe/HOLD): 700 μ s to 2300 μ s (corresponds to -200% to +200% travel with Graupner) or HOLD

A detailed description of all possibilities can be found in the **V-Kabel 2** manual.

6.9.2. Connection with InfoSwitch

In order to program and display data from **InfoSwitch**, connect it to **UniTest 2** through the bottom serial connector (Seriell 2 COM) using the connector cable (order # 2305). As soon as a connection has been established, **UniTest 2** will emit a beep and the screen will show the menu for the **InfoSwitch**.

```
*SM InfoSwitch*
1▶Live-Werte
2 Setup
```

In the menu you can choose between a live display of values or the setup menu of the **InfoSwitch** by pushing "**Enter**".

A detailed description of all possibilities can be found in the **InfoSwitch** manual.

6.9.3. Connecting the Hyperion LBA10 balancer

Using a connector cable (order # 2233), **UniTest 2** can be connected to the data output of the Hyperion LBA10 LiPo balancer. The cable is connected to the "Data Port" of the balancer and to the bottom serial connector of the **UniTest 2** (Seriell 2 COM).

With this setup, you can monitor all single cell voltages of a connected LiPo battery up to 12 cells (using two LBA10 with Net cable) at the same time.

```
4.208V 4.199- 4.207V
4.210+ 4.205V 4.206V
4.202V 4.209V 0.000V
0.000V 0.000V 0.000V
```

The cell voltages are displayed in the order of their cell number. The first row shows cell no. 1 to no. 3 and so on.

The lowest voltage is marked with a "-" behind it, the highest with a "+".

```
4.208V 4.199- 4.207V
4.210+ 4.205V 4.206V
4.202V 4.209V 0.000V
8 cells mode I M-S
```

You can display additional information in the last row by pushing "**Plus**" and "**Minus**":

the detected number of cells, the operating mode, and the Master-Slave mode ("M-S") if two LBA10 are connected.

```
4.208V 4.199- 4.207V
4.210+ 4.205V 4.206V
4.202V 4.209V 0.000V
max ± 0.011V ( 4- 2)
```

The next screen will display the largest voltage difference and the corresponding pair of cells.

6.9.4. Connection with UniLog

In order to program and display data from **UniLog**, connect it to **UniTest 2** through the bottom serial connector (Seriell 2 COM) using the connector cable (order # 2305). Additionally **UniLog** needs to be connected to a power supply, either through an Rx cable from **UniTest 2** or from a current sensor inside your model or from the connected receiver.

As soon as a connection has been established, **UniTest 2** will emit a beep and the screen will show the menu for the **UniLog**.

```
1 live          *****
2 show data    * Uni *
3 settings     * LoG *
4 clear memo   *****
```

The menu allows you to choose between the live view (live), the saved measurement data (show data), the settings (settings), and deleting the **UniLog** memory. Make the selection by pushing "**Enter**".

A detailed description of all possibilities can be found in the **UniLog** manual.

6.9.5. Connection with LiPoWatch

In order to program and display data from **LiPoWatch**, connect it to **UniTest 2** through the bottom serial connector (Seriell 2 COM) using the connector cable (order # 2305). Additionally **LiPoWatch** needs to be supplied with power through the balancer leads, a2s LiPo is sufficient for this.

As soon as a connection has been established, **UniTest 2** will emit a beep and the screen will show the menu for the **LiPoWatch**.

6.10. Setup

Menu item 10 “**Setup**” includes the basic settings for the operation of the **UniTest 2**. All items and their possible settings are listed below.

| Parameter | Values | Definition |
|---|---|--|
| LCD Licht (= LCD light) | off / on / auto 20s / auto 60s | Turns the LCD background lighting on and off. Auto mode turns the lighting off after no buttons have been pushed or the potentiometer hasn't been moved for the specified time. The light will come back on the next time a button is pushed. |
| Speicherrate (= Recording rate) | 0.5s / 1.0s / 2.0s / 5.0s / 10.0s | Defines the rate at which data is saved to memory during the drive measurement. This also defines the maximum recording time (2000 data sets max): 0.5s → 16 minutes 40 seconds 1.0s → 33 minutes 20 seconds 2.0s → 1 hour 6 minutes 40 seconds 5.0s → 2 hours 46 minutes 40 seconds 10.0s → 5 hours 33 minutes 20 seconds |
| Auto-off | off / 5 min / 20 min / 60 min | If no button is pushed or the potentiometer is not moved in the specified time, UniTest 2 turns off automatically. Shortly before it will display a warning message on the screen. If data is being recorded, the device will not turn off automatically. |
| Tastenklick (= Button click) | off / on | Each button click is confirmed with a short click sound. |
| Baudrate | 1200 / 2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200 | Defines the baud rate for the data transmission to a PC through the serial port. Should always be set to 115200 to allow the fastest possible transmission. In this case the transmission of the total memory takes about 20s. Attention: PC and UniTest 2 must both be set to the same baud rate! |
| Ein-Melodie (= Startup melody) | on / off | Acoustic startup message |
| Aus-Melodie (= Shutdown melody) | on / off | Acoustic shutdown message |
| Lautstaerke (= Volume) | 1 / 2 / 3 / 4 / 5 | Volume of the internal beeper. Error messages are always output at maximum volume. |
| RPM Sensor | Internal / external | Switching between an internal rpm sensor and an external sensor connected through “ D1 ”. The menu “ Antriebsmessung ” will display “ rpm ” or “ rpme ”, respectively. |
| Scan Empfaenger (= Scan receiver) | ACT SmartSCAN ACT DDS10 Simprop SCAN7 Simprop SCAN9DS | Adjustment of the connected scan receiver. The receiver needs to be connected to “ Seriell 2 COM ” the appropriate connector cable. |

| Parameter | Values | Definition |
|--|--|---|
| Speicher Stop (= Record Stop) | yes / no | Activates the automatic stop of data collection when exceeding the switch limit. 10 data sets are computed after the switch is triggered. |
| Waage (= Scale) | none Kern 440 Lutron 500(0) IBN-5000/RS | Settings of a scale connected to " Seriell 2 COM " to measure static thrust or torque. |
| Waage Faktor/Hebel (= Scale factor/ leverarm) | Factor 0.1 to 10.0 Leverarm 5cm to 50cm | Multiplication factor for the static thrust measurement using a scale or a leverarm for the torque measurement using a scale. |
| Zuleitung (= Connector cable) | 0 - 20mOhm | Resistance value for the battery connector cable including connector. UniTest 2 will then show the correct voltage directly at the battery without the cable's influence. |
| Schalt Umin (= Min switch voltage) | 0.00V - 49.00V | Switching value for switching output D2 – minimum voltage. Can be disabled by pushing " Plus " and " Minus " simultaneously. Fast adjustment of the minimum and maximum value by pushing " Minus " / " Plus " and " Enter " simultaneously. |
| Schalt Umax (= Max switch voltage) | 1.00V – 50.00V | Switching value for switching output D2 – maximum voltage |
| Schalt Imin (= Min switch current) | 0.00A – 79.00A | Switching value for switching output D2 – minimum current |
| Schalt Imax (= Max switch current) | 1.00A – 80.00A | Switching value for switching output D2 – maximum current |
| Schalt Cmax (= Max switch capacitance) | 1mAh – 9999mAh | Switching value for switching output D2 – maximum capacitance |
| Schalt Tmax (= Max switch temp) | 0.0 – 125.0 degrees C | Switching value for switching output D2 – maximum temperature |
| STOP aktiv | yes/no | Choosing no will disable the safety feature with controller STOP (see chapter 6.1.3 and 6.2.2). This will enable you to activate the programming mode for many motor controllers. |
| Werkseinstellungen (= Factory default) | | A long push of the " Enter " button will reset all settings to the factory default. |

7. Software update

The **UniTest 2** software can be updated using the included **USB-Interface**. For this you need a Windows PC with a USB port that has the necessary drivers for the **USB-Interface** installed.

If software updates are available, a file with an updated software version will be posted on our home page under "Softwareupdates".

After successful download to your computer, the .zip file first has to be unpacked. Then the .exe file can be started. The installation software will then guide you through the remaining update steps.

Please download the necessary drivers for the **USB-Interface** from our homepage under "Softwareupdates". Follow the installation steps outlined in the .pdf file that is included with the driver software.

7.1. Connection



Connect the **USB-Interface** to a free USB port on your PC. Connect the other end to the "**Seriell 1 COM**" connector of the **UniTest 2**.

Requirements:

The PC needs to be an IBM compatible PC with Windows 98/Me/2000/XP with a free USB port. The necessary drivers for the **USB-Interface** need to be installed. You must be able to address interfaces COM1 to COM16. A detailed description for the software update procedure is included with the software download.

8. Version history

| Version | Date | Comment |
|---------|---------|--|
| 1.00 | 08.2004 | Version start |
| 1.01 | 09.2004 | <ol style="list-style-type: none"> 1. Channels 91 and 92 at 40 MHz were missing 2. auto damping added to scan single values |
| 1.10 | 01.2005 | <ol style="list-style-type: none"> 1. DDS10 and SCAN7 added as scan receivers 2. Servo tester values for Multiplex-Uni added 3. Menu item "9 Large Display" added 4. Connection for scales added to the thrust and torque measurement 5. Data format for ASCII output changed (Scale and A2) 6. If desired, data saving now stops when reaching a switching value (10 additional values will be saved) 7. Switching output D2 is now being controlled by the stopwatch as well (Timer) 8. Analog input A2 is measured and saved; value is displayed in exchange with efficiency eta 9. 16 own n100W values for propeller can now be saved with name (3 letters), diameter and pitch |
| 1.11 | 01.2005 | <ol style="list-style-type: none"> 1. Error in eta calculation from n100W values corrected |
| 1.12 | 04.2005 | <ol style="list-style-type: none"> 1. IBN-5000/RS scale added 2. Connection of SM V-Kabel 2 added as extra menu item → menu item 9 "SM-Interface" 3. Servo tester: modes "auto" and "einzeln" with fixed time preset (without potentiometer) added; mode "automatisch" renamed to "auto Poti" and "halb-auto" renamed to "einzeln Poti" 4. Drive measurement: the observed values (switching module) are marked with a blinking star |
| 1.14 | 12.2005 | <ol style="list-style-type: none"> 1. Menu item "Werkseinstellungen" added to Setup: now all settings can be changed back to factory default 2. Additional values added for the servo speed: 12.5s, 14.7s, 19.2s 3. Servo pulse set to "STOP" when an observed value exceeds bounds 4. Adjustment for the Simprop SCAN7 V2 as scan receiver <ul style="list-style-type: none"> - receiver with software version V2.2 or higher are now correctly detected and displayed - a selection of the frequency band in the Setup is no longer necessary, UniTest 2 identifies the connected receiver automatically |
| 1.15 | 05.2006 | <ol style="list-style-type: none"> 1. Connection to SM InfoSwitch added under menu item 9 "SM-Interface" |

| Version | Date | Comment |
|-------------|---------|---|
| 1.16 | 09.2006 | <ol style="list-style-type: none"> 1. Simprop SCAN9 DS added as scan receiver 2. Error in the SCAN7 DS 40 MHz channel display corrected 3. Connection to Hyperion LBA10 balancer added under menu item 9 "SM-Interface" 4. Safety feature Motor STOP can now be disabled in Setup |
| 1.17 | 04.2007 | <ol style="list-style-type: none"> 1. Support for the UniLog added. Complete adjustment, data collection and live display now also possible with UniTest 2 |
| 1.18 | 05.2007 | <ol style="list-style-type: none"> 1. Error in the servo outputs corrected from 1.17 |
| 1.19 | 05.2007 | <ol style="list-style-type: none"> 1. Adjustment to UniLog firmware v1.03 |
| 1.20 | 08.2007 | <ol style="list-style-type: none"> 1. Adjustment to UniLog firmware v1.04 2. USB-Interface is included with UniTest 2 from now on |
| 1.21 | 10.2007 | <ol style="list-style-type: none"> 1. Adjustment to UniLog firmware v1.05 2. Support for Brushless rpm sensor added → Motor pole number and gear ratio can now be added |
| 1.22 | 11.2007 | <ol style="list-style-type: none"> 1. Error in the external rpm measurement corrected |
| 1.23 | 12.2009 | <ol style="list-style-type: none"> 1. Connection to LiPoWatch added 2. Adjustment to UniLog firmware v1.10 3. New servo types added → high speed digital servos 4. Error in the puls amplitude measurement corrected 5. Servo speed measurement added as a new mode in the servo tester menu |