MULTIPLEX®

PROFI TX 9
PROFI TX 12
PROFI TX 16

Instructions

MULTIPLEX Modellsport Gmbh & Co.KG • Westliche Gewerbestraße 1 • Bretten • Germany

www.multiplex-rc.de

Contents

1 Introduction

We are pleased that you have decided to purchase the PROFI TX radio control system.

The new PROFI TX M− tray-type transmitter offers numerous innovative and pioneering features and 2.4 GHz transmission technology:

- Integrated aerial technology (IOAT)
- Secure, ultra-fast signal transmission
- Clean, clearly arranged menu structure
- Operationally secure LiFePo4 battery with battery management
- 25 h transmitter operating time with one battery charge

Prior to initial setup, please read these operating instructions and observe all safety instructions.

1.1 Concept of the PROFI TX

When we initially mapped out the basic philosophy of the PROFI TX, we placed particular emphasis on providing a high level of user-friendliness, flexibility and the greatest possible standardization.

User-friendliness is achieved thanks to the clean overall menu structure, informative and clearly arranged menus and many other useful features which facilitate programming and operating the transmitter.

Flexibility is guaranteed because you can implement almost any customisations to all pre-defined "ready for use" elements. Controls (sticks, sliders and switches) and servos can be assigned freely. Pre-defined mixers can also be adjusted as required.

Thanks to pre-defined model templates, you need to press only a few buttons to store your model in the memory and start operating it.

Operation

- Digital trim system
    - Trims specific to each flight phase, clearly arranged graphic on-screen trim display
    - Audible support
    - Variable trim increments
- Battery monitor with variable warning threshold and audible alarm
- Battery management system

    - Transmitter battery monitor with display of residual charge in mAh
    - Calculated display of remaining operating time (time to empty) in hours
- Servo monitor with graphical or numerical display for checking settings without the model
- Code lock PIN (4-digit) for protecting the transmitter against unauthorised data access

Hardware

- Modern, ergonomically efficient case design with ultra-precise, customisable, swivelling ball-raced stick units
- Graphics screen with high contrast
- Modern FLASH processor technology (updated software can be downloaded from the Internet)
- Wireless, selective trainer mode, unique Quick-Select assignment of control functions to teacher and student
- 5 Timers: frame, sum, interval, uptime for model and transmitter

Programming

- Clearly designed, efficiently structured menus for simple programming
- Quick and easy operation thanks to menu buttons and central wheel
- Clear text menu system, screen texts can be displayed in various languages

Model-specific settings

- 4 flight phases for fixed-wing models and helicopters, variable transition time
- Servo calibration using 2, 3 or 5 points for compensation of mechanical discrepancies
- 4 Timers: frame, sum, interval with configurable alarm time and audible alarms, model uptime without alarm
- Convenient model memory management
    - Free-text model names, up to 20 characters
    - Copy and erase functions
    - Model templates and extensive help functions to facilitate the creation of new models
- Comprehensive setup and mixer options for fixed-wing model aircraft and helicopters

Differences between transmitter versions

	PROFI TX 9	PROFI TX 12	PROFI TX 16
Channels	9	12	16
Model memories	50	100	200

1.2 Contact

We have made every effort to design these operating instructions in such a way that you can find an answer to each question quickly and easily. Should you still have any questions regarding your PROFI TX, please feel free to contact your specialist dealer who will be happy to assist you.

Service partners

The addresses of our service partners are available on our website:

www.multiplex-rc.de

1.3 About these operating instructions

These operating instructions describe the PROFI TX tray-type transmitter and contain the following chapters:

- **Chapter 1 "Introduction"** provides an overview of the PROFI TX concept.
- **Chapter 2 "Safety instructions"** contains important information concerning safety, intended use and warranty.
- **Chapter 3 "Transmitter"** describes:
  - The PROFI TX hardware.
  - How to setup the transmitter for operation.
  - Mechanical operations that may have to be carried out on the transmitter, e.g. for installing additional controls.
  - How to charge the transmitter battery including battery management.
  - How to switch the transmitter on and off.
  - How to perform a range check and the binding procedure.
  - How to operate in trainer mode.
  - How to trim your model aeroplane.
- **Chapter 4 "Model templates"** describes the model templates available in the PROFI TX.
- **Chapter 5 "Menus"** describes the software used in the PROFI TX:
  - Navigation within the software.
  - The status displays.
  - All menus and their parameters.
- **Chapter 6 "Operating the transmitter"** describes:
  - How to operate the transmitter and software by means of the keypad, the central wheel and, if necessary, the optional digi-adjusters.
  - How to assign controls and switches. This defines which controls are used to operate the various functions in the transmitter or model.
- **Chapter 7 "Operating the transmitter using the PC"** describes how to connect the transmitter to the PC and the options provided by this connection.

- **Chapter 8 "Creating and customising models"** describes step by step using two examples how to create and configure your own fixed-wing and helicopter models.
- **Chapter 9 "Maintenance and care"** describes briefly how to maintain your transmitter.
- **Chapter** Fehler! Verweisquelle konnte nicht gefunden werden. **"**Fehler! Verweisquelle konnte nicht gefunden werden.**"** lists frequently asked questions and the corresponding answers.
- **Chapter 10 "Appendix"** lists the transmitter specifications and optional accessories available at the time of printing of these operating instructions.

1.4 Change history

Release	Changes	Chapter
December 2012	Initial release	
May 2013	Revision based on V0.78	all

2 Safety instructions

Make sure to read and observe the following operating and safety instructions!

Knowledge of these operating instructions and their observance are a prerequisite for safe use as well as safe operation and maintenance.

The following basic safety instructions and warnings are an essential component of these operating instructions and are fundamentally important for product handling.

Keep the operating instructions within reach and pass them on to the new owner on resale of the product.

Failure to observe the safety instructions can result in material damage, injuries or even death.

Signal words and their meaning

DANGER DANGER identifies an immediate possible dangerous situation with a high risk that will result in death or severe personal injury if not avoided.

WARNING WARNING identifies a possible dangerous situation with a medium risk that may result in death or (severe) personal injury if not avoided.

CAUTION CAUTION identifies a possible dangerous situation with a low risk that might result in minor or moderate personal injury if not avoided.

NOTICE NOTICE indicates the possibility of misuse which could cause damage to the product.

INFORMATION that is important for the PROFI TX operator.

2.1 Basic safety instructions

The following basic safety instructions and warnings are an essential component of these operating instructions and are fundamentally important for device handling.

NOTICE

Read the instructions carefully!

Make sure that you have carefully read these operating instructions and the following safety instructions before setting up the device for operation.

WARNING

Radio-controlled models are not toys in the usual sense. Assembly, installation, and operation of the RC system require technical knowledge, care, safety-awareness and responsibility. Errors or negligence can lead to considerable damage. Since the manufacturer or the seller does not have any influence and control over the proper setting up and operation of a model, such risks are expressly pointed out here and any liability whatsoever is excluded.

A model that goes out of control for whatever reasons can cause significant damage to property or personal injury. Be aware of safety at all times. Make sure to take out general liability insurance.

NOTICE

Do not modify the radio control system. Use only original accessories and spare parts.

NOTICE

If the device is operated in combination with third-party products, ascertain their quality and functional reliability. Each new or changed combination must undergo careful functional testing, including a range check. Do not operate the device or model if there appear to be any problems. First identify the error and troubleshoot it.

NOTICE

In particular, have the radio control transmitter and the receiver inspected at an authorised MULTIPLEX Service Centre (see section 10.1 "Specifications" on page 212) at regular intervals (every 2 to 3 years).

CAUTION

Operate the transmitter only in the permissible temperature range (see section 10.1 "Specifications" on page 212). Bear in mind that condensation may form in the transmitter due to sudden temperature changes (e.g. warm car, cold environment). Moisture may impair the function of the transmitter and other components of the radio control system.

If moisture accumulates in electrical devices, immediately stop using the device, disconnect it from the power supply and allow it to dry in the open state as far as possible (up to a few days). Thereafter, perform a careful functional test. In case of major condensation, have the device inspected at an authorised MULTIPLEX Service Centre (see section 1.2 "Contact" on page 9).

CAUTION

Caution: static electrical charges!

In extremely dry air static charges tend to build up in the transmitter and / or the pilot. The discharge takes the form of static sparking which can cause interference or damage to the transmitter and other components of the radio control system.

Operation of the radio control system is allowed without restrictions within EU territory and Switzerland.

Program a new model at home in peace. Make sure that the power system of the model cannot start up unexpectedly. Check all functions carefully. Completely familiarize yourself with the operation of the transmitter before putting the model in operation.

2.2 Safety instructions for the transmitter battery

NOTICE The transmitter battery is responsible for the power supply to this device, and plays an important role in operational safety. The charging circuit integrated in the transmitter matches the battery. Do not charge the battery outside the device.

Batteries are not toys and must be stored out of the reach of children.

NOTICE Damaged or defective batteries must not be used and should be disposed of properly (see section 2.8 "Disposal" on page 22).

WARNING Do not heat, incinerate, open or short-circuit rechargeable batteries, do not charge or discharge them at excessive currents, do not overcharge them, and do not charge with reversed polarity. Take note of the admissible temperature range for the battery.

WARNING Mis-handling the battery incurs the risk of combustion, explosion, corrosion and burning.

2.3 ESD notes for electronic sub-assemblies

The sub-assemblies of radio control transmitters (main circuit board, RF module, Channel-Check module, Scanner module) are fitted with electrostatically sensitive components. These parts can be destroyed, suffer imperceptible damage or have their useful life shortened if static discharges take place (potential equalisation through electro-static discharge) when the sub-assembly is touched.

The following protective measures are essential if you have to handle electrostatically sensitive sub-assemblies:

- Before fitting or removing such sub-assemblies, equalise the electrical potential difference between yourself and your environment (e.g. by touching a heating radiator).
- Open the basic device and touch it over a large area in order to equalise the potential relative to the base unit.
- Do not remove any sub-assemblies from their conductive anti-static bags until you have equalised the potential. Avoid touching electronic components or solder pads directly. Hold the sub-assembly by the edges of the circuit board only.
- Once removed from the basic device, the sub-assembly should only be stored in the conductive anti-static bag in which it was delivered. Never allow the sub-assembly to make direct contact with a conventional, non-ESD compatible container made of foam, Styrofoam or other plastic.

2.4 Intended use

The PROFI TX transmitter is intended exclusively for operation of models by radio control.

NOTICE Always follow the switching on/off sequence in order to avoid any uncontrolled, dangerous start-up of the power system:

Switching on

1. Transmitter
2. Receiver
3. Connect the flight battery or switch the power system ON

Switching off

1. Disconnect the flight battery or switch the power system OFF
2. Receiver
3. Transmitter

Assemble the model carefully

- Install and adjust all control surface linkages in such a way that the surfaces move smoothly and freely, and are not stalled even at maximum travel. Don't use the transmitter to regularly limit servo travels. It is always better to adjust levers and pushrods mechanically and as thoroughly as possible. Avoid lost motion (sloppy linkages). Use configuration options on the servo side of the transmitter only for fine-tuning.

  The measures mentioned above are essential in order to minimise the load on the servos.This in turn allows them to perform at their best, and they will also last longer and operate more reliably.
- Provide effective protection from vibration to the receiver, battery, servos and other RC and electronic components. Observe the advice included in the relevant operating instructions. Balance propellers and rotor blades before use and replace them at any sign of damage. Install I.C. engines on vibration-absorbing mounts and replace motors or motor parts which are damaged or do not run true.
- Do not strain or bend cables; protect them against rotating parts.
- Avoid unnecessarily long or superfluous servo extension cables.

- Use cables with sufficient cross-section.
- Do not coil up or shorten the receiver aerial. Do not lay the aerial on or close to electrically conductive components. Deploy aerials outside of fuselages with a shielding effect (carbon fibre, metallic painted finish).

Observe also the advice included in the relevant receiver operating instructions!

- Ensure that the receiver power supply is of adequate capacity. For servos up to about 40 Ncm torque you can estimate the required battery capacity using the following formula:
  Capacity [mAh] ≥ servo count x 200 mAh.
  Use the next larger size of battery!
- Take care to maintain sufficient distance between cables carrying heavy currents (e.g. electric power system) and the RC system. Especially the cables between brushless electric motors and their actuators must be kept as short as possible (guide value: max. 10 to 15 cm).

Check the model regularly

- Free movement and zero backlash of rudders and linkages.
- Stability and flawless condition of rods, linkages, hinge joints, etc.
- Carry out a visual check for fractures, cracks, possible shear points etc. on the model itself, and in its components such as the RC and power systems.
- Flawless condition and contact stability of cables and plug connections.
- Absolutely essential: Examine the power supply and its wiring, including the switch harness, and the external condition of the battery.

This entails regular maintenance of the battery and periodic checks of the voltage curve and capacity, employing a charge process and battery charger suitable for the type of battery in use.

Pre-flight checks

- Charge the transmitter, receiver and flight batteries carefully, and verify their state of charge at regular intervals.
- Ensure that the correct model memory is active.
- Carry out a range check (see section 3.6 "Range check" on page 47).
- Check the function and effect of all primary and secondary control systems.

NOTICE If you discover any irregularities, do not fly. Locate the problem, eliminate it, and then check again.

When operating the model:

- If you have never flown a radio-controlled model before, it is highly recommended you consult an experienced model pilot when getting started. A trainer (buddy-box) system is ideal for taking the first steps in learning to fly.
- Models should only be operated at suitable sites.
- Never fly or drive over or towards spectators.
- Do not carry out any high-risk flying or driving manoeuvres.
- Know your limits: do not over-estimate your abilities and skills.
- If you detect any sign of a problem or interference, land or cease operations immediately.

2.5 Liability and indemnification

The model sport with radio-controlled models is a fascinating hobby. However, model aeroplanes, vehicles and ships are not toys. Their assembly and operation require a high level of technical knowledge, careful craftsmanship, safety-awareness and responsibility. Errors, inattentiveness or even negligence can lead to considerable damage to property or severe personal injury. Generally, you as operator are responsible for any threat arising from your model. This absolute liability will not be assumed by the manufacturer. This is also applicable in the event of uncontrollable external influences and interferences. You are expected to exercise extreme care as operator of a model.

Since manufacturers or dealers cannot have any influence on proper setting up, maintenance and operation of the model and the radio control system, such risks are expressly pointed out here.

MULTIPLEX Modellsport GmbH & Co.KG does not assume any liability for loss, damage or costs which arise through the improper use and operation of our products, or which are connected with such operation in any way.

As far as is legally permissible, the obligation to provide compensation for damages, on whatever legal basis, is limited to the invoice amount of the quantity of MULTIPLEX goods that were directly affected by whatever incident gave rise to the damage. This does not apply if MULTIPLEX is obliged to accept unlimited liability in accordance with mandatory law for deliberate or gross negligence.

Furthermore, MULTIPLEX Modellsport GmbH & Co.KG does not extend any warranty for the completeness and correctness of the documents enclosed with the radio control components.

Observe also the advice included in the relevant transmitter documentation!

2.6 Warranty

Our products are covered by the currently valid statutory warranty regulations. If you wish to make a claim under warranty, please contact the model shop where you purchased the product.

The warranty does not cover malfunctions caused by the following:

- improper operation, wrong connections, terminal reversal
- use of third-party components not authorised by us
- modifications / repairs that were not authorised or carried out by an authorised MULTIPLEX Service Centre
- accidental or deliberate damage
- defects due to improper use and / or normal wear and tear
- operation of the equipment outside the technical specifications

Observe also the advice included in the relevant transmitter documentation!

2.7 EC declaration of conformity

The PROFI TX devices were assessed in accordance with the relevant harmonised European directives.

You are therefore the owner of a product whose design fulfils the protective aims of the European Community relating to the safe operation of equipment.

The detailed declaration of conformity can be downloaded from our website:

www.multiplex-rc.de
under
DOWNLOADS / Product Information

If required, you may also request us for the declaration of conformity:

MULTIPLEX Modellsport GmbH & Co.KG
Customer Service
Westliche Gewerbestraße 1
D-75015 Bretten-Gölshausen

Germany

2.8 Disposal

Do not dispose of electrical equipment marked with the crossed-out wheelie bin symbol in the standard household waste, but take them to a suitable disposal system.

WEEE - Waste of Electrical and Electronic Equipment, directive 2002/96/EC:
In the countries of the EU (European Union), electrical equipment must not be disposed of via the household or residual waste system. Unwanted equipment must be taken to your nearest local authority waste collection point or recycling centre. There, equipment will be disposed of correctly and free of charge.

Remove the batteries before disposing of the equipment. (Rechargeable) batteries are recycled separately.

By returning your unwanted equipment you can make an important contribution to protecting the environment.

Recycling of rechargeable batteries

Do not dispose of depleted rechargeable batteries in household waste.

Take them to a suitable recycling system. Rechargeable batteries must be discharged and short-circuit safe. Tape over the terminals with non-conducting adhesive tape.

3 Transmitter

3.1 Transmitter overview

3.1.1 Top view

Fig. 1: Top view of the transmitter

1 Power button with annular light (see section 0 "Switching on" on page 44).

The annular light indicates the status of the RF module during operation (see section "Annular light" on page 25).

2 UV-stable, anti-glare graphic LCD unit (256 x 64 dots) featuring high contrast.

The contrast can be optimised for the screen (see section 5.3.8 "Transmitter" on page 109), and the screen can be raised as required.

3 Warning lights for sensors used on the model. The warning lights indicate whether the alarm values for certain sensor groups have been exceeded (see section "Warning lights" on page 25).

4 Two extremely low-friction, ball-raced stick units for controlling the four primary axes.

- The stick ratchet for throttle / spoiler can be activated to the right or left (see section 3.3.2 "Adjusting stick units" on page 33).
- Both stick units can be swivelled to suit the pilot's ergonomic preferences (see section 3.3.2.1 "Swivelling stick units" on page 33).

The stick tops can be rotated and freely adjusted in length, and are available in different variants.

5 Two slide potentiometers with position markers for freely assignable channel and / or switched functions.

6 Buttons for digital trim of the four stick units (see section 3.8 "Digital trim" on page 51).

7 Central wheel for navigating through the menus and editing set values.
The wheel can be turned in increments to the left or right and can be pressed (see section 6.2 "Operation using the wheel" on page 163).

8 Keypad, consisting of eleven buttons in two rows

- The six buttons in the upper row are used for quick and direct access to the six main menus (see section 6.1.1 "Direct access buttons" on page 160).
- The five buttons in the second row are used for programming the transmitter (see section 6.1.2 "Buttons for special functions" on page 161).
- With the exception of the **ENTER** button, all the buttons have a dual function for text input. Text is entered in a similar way to mobile phones (see section 6.1.3 "Text input" on page 162).

9 Installation slots for additional controls and digi-adjusters (see section 3.3.4 "Installing additional controls" on page 3.3.4).

10 Lug for attaching a support strap (# 8 5161 or # 8 5646).

Annular light

The annular light indicates the status of the RF module during operation:

- Yellow flashing light:
  Normal mode, full RF power.
- Red flashing light:
  Reduced transmitting power for the range check (see page 47).
- Rapidly flashing orange light:
  Device in binding mode (see page 48).
- Steady yellow light:
  No RF signal is emitted; a PC or battery charger is connected. Battery charging in progress. The power is supplied by the battery charger.
- Steady red light:
  No RF signal is emitted; a PC or battery charger is connected. The battery is charged and does not need charging. The battery runs down as the power is drawn from it. Once the charge has dropped to 98%, the charging circuit is switched on again.

Warning lights

The warning lights serve as markers for the sensor alarms.
The following warning lights are assigned to the sensors:

- Battery icon: all voltage sensors
- Thermometer: all temperature sensors
- Petrol pump: all sensors for fuel status and battery charge
- IC icon: ECU (Engine Control Unit)
- Warning sign: all sensors for speed, power, reception quality
  (LQI = Link Quality Indication)

Press the **ENTER** button to clear the warning bar if status display #2 is shown.

It is also possible to assign a switch to clear the warning lights and mute the sensor alarm (see "Assigning switches" on page 171).

3.1.2 Underside view

Fig. 2: Underside view of the transmitter

1 Recessed control for the sliding latch for USB sockets (see section 3.1.5 "Connections" on page 29)

2 Fasteners for opening the case (see section 3.3.1 "Opening and closing the case" on page 31)

3 Carry bars

3.1.3 Carry handle / bars

The carry bars are located inside a drawer which also serves as a handle to carry the transmitter.

3.1.3.1 Carry handle

If you want to use the drawer as a carry handle, pull it out completely (figure). The carry bars are locked in this position.

3.1.3.2 Carry bars

Pull out the drawer only up to the point where the inside bar is fully exposed. This is the only position where the bars are unlocked and can be swivelled out (figure).

Carefully swivel out the bars until they snap into place. The drawer can be pulled out completely to serve as a carry handle or pushed into the transmitter back cover to be stored away.

NOTICE Only in this position of the drawer (figure) are the carry bars unlocked. In all other positions, the carry bars cannot and must not be swivelled out.
Using force will damage the swivel mechanism!

3.1.4 The interior

Fig. 3: The interior of the transmitter

1 RF module with IOAT aerial

2 Transmitter battery (see section 3.4 "Transmitter battery" on page 41)

3 Control units

4 microSD card

5 Covers for the sockets for controls installable on the front

6 4 sockets for additional modules (see section 3.3.4 "Installing additional controls" on page 37)

7 2 clamp terminals for connecting the controls installable on the stick tops

8 TORX screwdriver

3.1.5 Connections

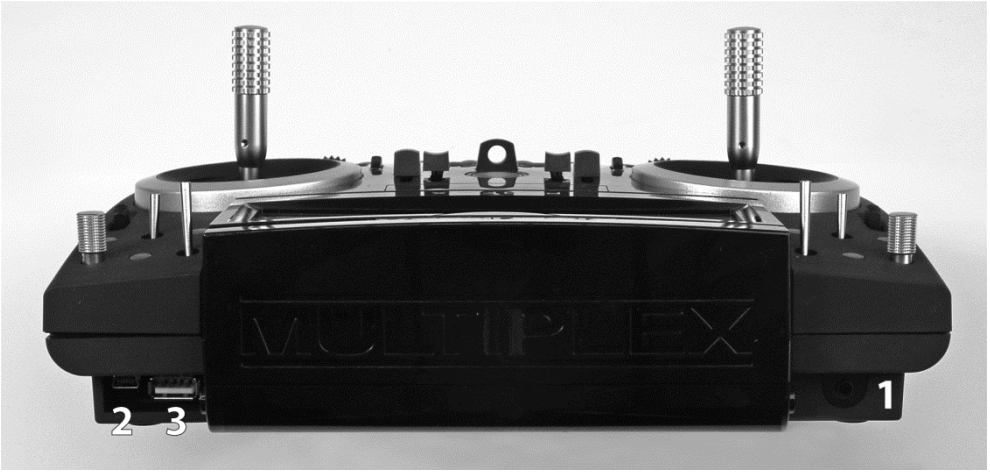


Fig. 4: Connections on the transmitter

1 Connection for headset (stereo jack); when a headset is connected, the loudspeaker of the PROFI TX is switched off

2 Mini USB socket for connecting the PROFI TX to a PC and for charging the battery via the charging socket (see section 3.4.1 "Charging the battery" on page 41)

3 USB-A socket for future expansions

3.2 Initial setup

The following steps should be performed during initial set up of your PROFI TX. Refer to the relevant sections listed below for a detailed description.

1. Briefly charge the battery. It is sufficient to charge the battery for one hour on the PC (500mA) or for 20 minutes via the charging socket (1.5A):
   Refer to section 3.4 "Transmitter battery" on page 41 for details.
2. Switch on the transmitter: Press and hold the Power button until the annular light is fully lit. The device is switched on when you release the button.
   Refer to section 3.5.1 "Switching on" on page 45.
3. Select the language to be used in the menus and the texts in the model templates:
   Refer to section "Switching on for the first time" on page 46.
4. Switch off the transmitter: Press the Power button until the annular light turns off. The device is switched off when you release the button (see section 3.5.2 "Switching off" on page 46).
5. Open the case of the transmitter:
   Refer to section 3.3.1 "Opening and closing the case" on page 31.
6. Adjust the stick units to suit your ergonomic preferences.
   - If necessary, swivel the stick units:
     Refer to section 3.3.2.1 "Swivelling stick units" on page 33.
   - Activate the stick ratchet:
     Refer to section 3.3.2.2 "Adjusting ratchet, friction and centring spring force" on page 34.
7. If necessary, install additional switches:
   Refer to section 3.3.4 "Installing additional controls" on page 37.
8. Install the receive system and connect the servos.

- Perform the binding procedure to bind the receiver with the transmitter:
  Refer to section "Binding" on page 48.

3.3 Mechanical operations on the transmitter

3.3.1 Opening and closing the case

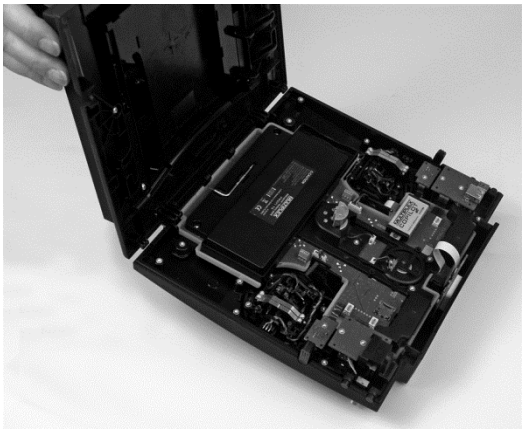
WARNING **Danger of short-circuit!**

Switch **off** the transmitter before opening the case.

Opening the case

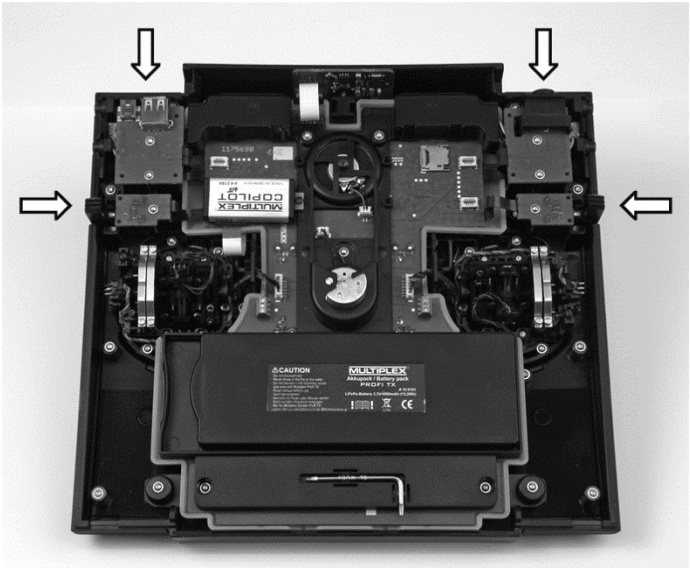
1. Switch off the transmitter.
2. Remove the USB and headset cable.
3. Place the transmitter upside down on a soft surface.
4. Press and hold the two fasteners on the side of the screen and gently lift the back case cover.

5. Let go of the fasteners, flip up the back case cover and remove it.



Closing the case

6. Remove the USB and headset cable.
7. Place the transmitter upside down on a soft surface.
8. Move the controls on the side to the centre position.



9. Place the lower edge of the back cover vertically onto the case.

10. Swivel the back cover to the front, push down and press gently to snap it into place.

3.3.2 Adjusting stick units

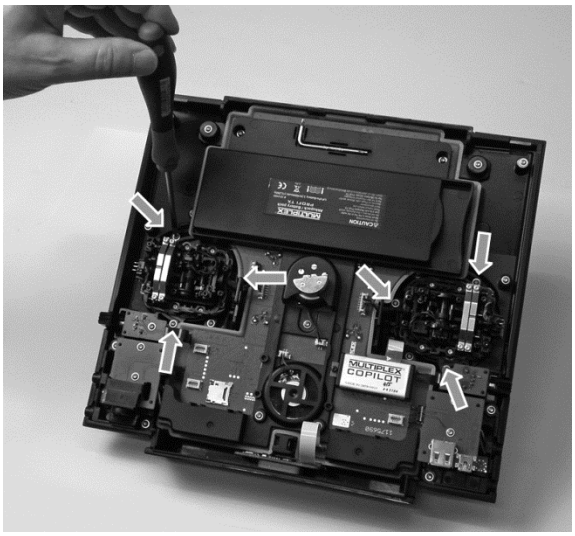
3.3.2.1 Swivelling stick units

The "natural working axis" of your hands is at a more or less pronounced angle. The stick units of the PROFI TX can be swivelled to perfectly suit your ergonomic preferences. The swivelling range is approx. 15°.

Fig. 5: Swivelling stick units

Proceed as follows:

1. Using the TORX screwdriver, loosen the three TORX screws retaining the appropriate stick unit until the unit can be swivelled.



2. Rotate the stick unit to the most comfortable angle for use.
3. Tighten the screws again.

NOTICE Take care not to over-tighten them or you might strip the threads.

3.3.2.2 Adjusting ratchet, friction and centring spring force

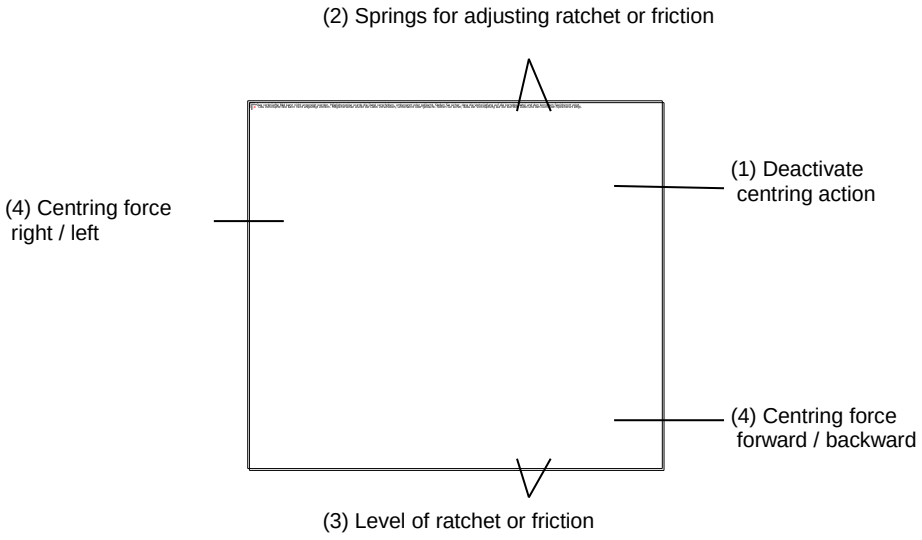


Fig. 6: Adjuster screws on the stick unit

Ratchet and friction

The PROFI TX is supplied as standard with self-centring sticks. The springs for use with a ratchet or friction system are already fitted to both stick units, and can be activated quickly and easily.

The screws (2) hold the springs. The screws (3) adjust the level of ratchet / friction action. The more the screw is tightened, the harder the ratchet or friction.

If required, you can set a superimposed ratchet / friction action by activating both springs on one stick. This will help you achieve perfect control as needed.

1. Switch off the transmitter and open it.
2. Using the TORX screwdriver, tighten the TORX screw (turn clockwise) on the appropriate neutralising lever (1) to the point where the stick centring action is completely disabled.

NOTICE Take care not to over-tighten the screws.
Do not remove the neutralising lever and / or centring spring!

Centring force of the stick unit

The centring force or "hardness" of the centring spring can be adjusted separately for each of the four stick axes. The picture on page 34 shows how adjustments are made.

Turn the screws (4) clockwise to increase the "hardness" of the stick axes.

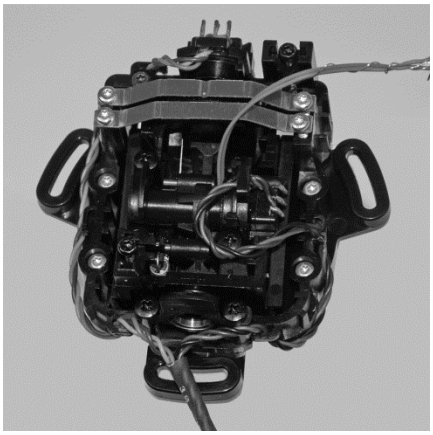
3.3.3 Installing stick tops with a switch or button

MULTIPLEX® offers three different stick tops with switch or button for the PROFI TX (see section 10.2 "Accessories" on page 213).

To install a new stick top, proceed as follows:

1. Switch off the transmitter and open it.
2. Remove the battery[1].
3. Loosen the grub screw at the bottom of the stick top (1.5mm slot-head screwdriver).

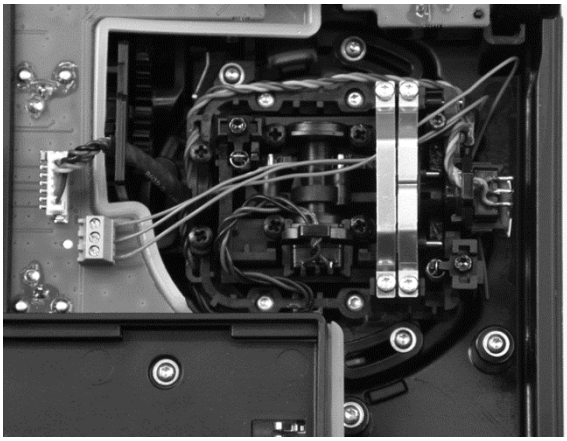
4. Pull off the top from the stick shaft.
5. Wrap the flexible wires of the new stick top with a thin enamelled copper wire. Tightly bend back the insulated section. Thread the wire through the threaded coupler of the stick shaft until it is visible at the bottom of the stick unit. Use a pair of pliers to pull the wire out until you can grab it with your fingers.



[1] After re-inserting the battery, the date and time need to be set again.

6. Gently pull on the wire until you can grab the flexible wire with your fingers. This will be easier if you turn the stick shaft on the side opposite the point where the wire exits.
7. Slide the stick top onto the stick shaft, simultaneously pulling the flexible wire completely through.
8. Tighten the grub screw on the stick top.
9. You can see one three-pin terminal clamp next to every stick unit on the main circuit board of the transmitter. Remove the wire.

   Clamp the blue flexible wire to the centre terminal and the red wire(s) to the output terminal(s).



10. Insert the battery and close the transmitter.
11. Switch on the transmitter.
12. Verify that the switch operates correctly.

    To test this, assign the new stick switch to any switched function in the Setup > Switch menu.

Stick tops

The standard tops can be replaced with the following stick tops (see also section 10.2 "Accessories" on page 213):

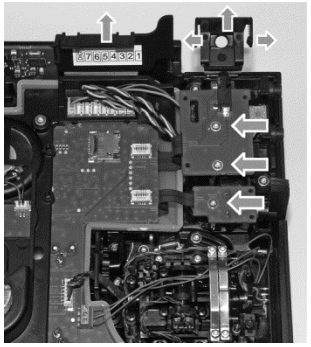
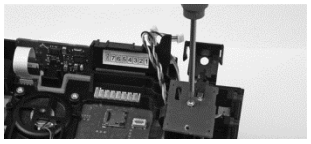
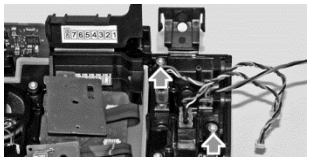
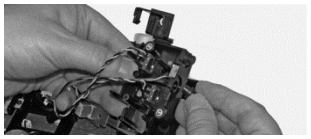
- Aluminium stick top, long, with 2-position switch
  Item No. 85940
- Aluminium stick top, long, with 3-position switch
  Item No. 85941
- Aluminium stick top, long, with push-button
  Item No. 85942

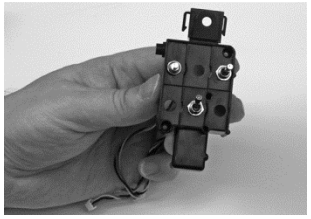
3.3.4 Installing additional controls

You can install 7 controls on each side of the PROFI TX (see section 3.1 "Transmitter overview" on page 23).

- Controls can be buttons, 2- or 3-position dip-switches, or rotary potentiometers in any arrangement.
- In addition, a digi-adjuster can be installed on each side. You can assign a parameter for direct configuration to each digi-adjuster (see section 6.3 "Digi-adjuster" on page 164).

To install a control proceed as follows:

1	Switch off the transmitter.
2	Disconnect the headset and USB cables.
3	Unscrew the tops from all the digi-adjusters and potentiometers.
4	Open the transmitter.
5	Remove the battery.
6	Open the cable cover on the side where you wish to install the additional control and pull out all the connectors. On the headset socket side, release the cover by pulling the two clips apart (picture). Fold the cover out to the front. 
7	Loosen the screws on the circuit boards on top of the switch tray using the TORX screw driver. 
8	Lift off the boards and place them nearby. Remove the two screws on the switch tray. 
9	Lift out the switch tray and remove the blind plugs from the required installation slots. 

10	Install the controls. Observe the installation direction for dip-switches: The red cable must face the transmitter front. 
11	Replace the switch tray and secure it using the screws.
12	Replace the circuit boards and secure them using the screws. Replace the cover over the headset socket and make sure that the clips snap into place.
13	Refit the connectors of the controls.
14	Close the cap on the slots.
15	Insert the battery and close the transmitter.
16	Switch on the transmitter.
17	Verify that the controls operate correctly. To test this, assign the new controls to any switched function in the Setup > Switch menu.
18	The date and time have to be set again in the Timer menu, as the battery was removed.

Additional controls

The following additional controls can be installed in the PROFI TX (see also section 10.2 "Accessories" on page 213):

- 2-position switch (micro), short
  Item No. 75750
- 2-position switch (micro), long
  Item No. 75751
- 3-position switch (micro), short
  Item No. 75752
- 3-position switch (micro), long
  Item No. 75753
- Digi-adjuster (micro)
  Item No. 75755
- Rotary knob (micro)
  Item No. 75756
- Push-button (micro)
  Item No. 75754

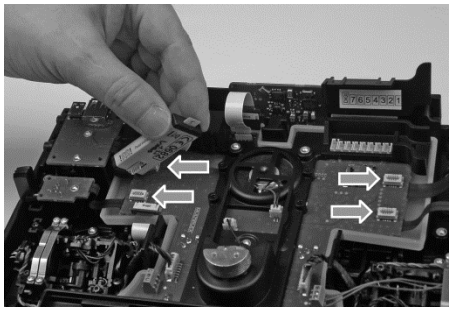
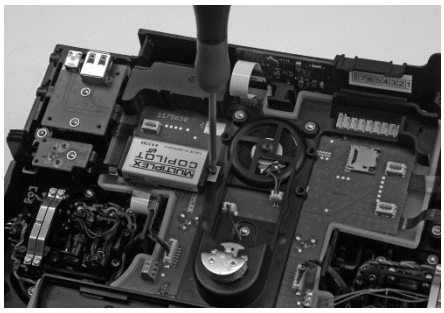
3.3.5 Installing additional modules

You can add four modules to the PROFI TX.

NOTICE Never install two identical modules!

When these operating instructions were released for print, only the COPILOT module (item no. 45184) was available (see section 10.2 "Accessories" on page 213).

To install a module proceed as follows:

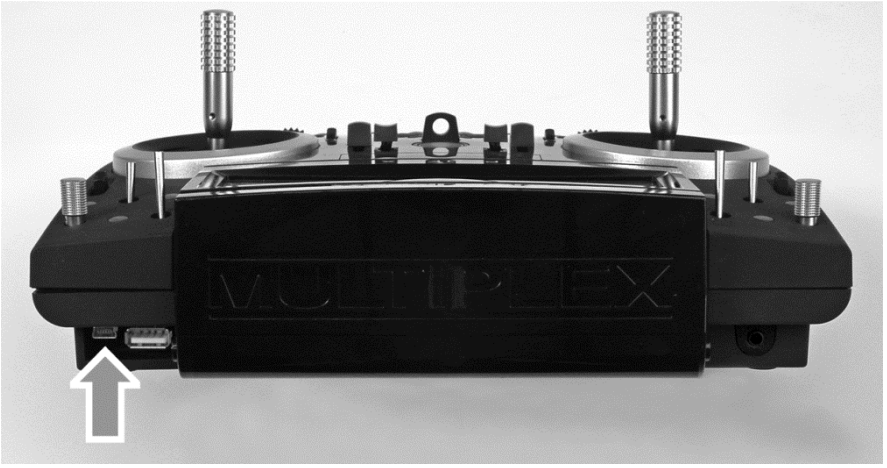
1	Switch off the transmitter.
2	Disconnect the headset and USB cables.
3	Open the transmitter.
4	Insert the module in one of the 4 slots and make sure that the respective fixing clip faces the transmitter centre and is aligned with a fixing bore on the central plastic part. 
5	Tighten the screw supplied. Do not apply excessive force when tightening the screw. 
6	Close the transmitter.
7	Switch on the transmitter.
8	Verify that the module operates correctly. Refer to chapter "Trainer mode" on page 50 for more information.

3.4 Transmitter battery

The PROFI TX is powered by a very robust and durable **LiFePO4** battery.
The battery is installed with the electronic system for battery management in a welded case. If the battery is new, the battery capacity of 4000mAh provides an uptime of more than 25 hours. Additionally installed components increase power consumption and shorten the operating time. If the device is exposed to very low temperatures, the operating time is significantly reduced.

3.4.1 Charging the battery

The PROFI TX features two USB sockets at the front on the right-hand side of the case, which are protected by a sliding latch. The mini USB socket is used for charging (see section 3.1.5 "Connections" on page 29).



The following options are available for charging the PROFI TX:

- Via your PC or laptop
- Via the MULTIPLEX USB car plug-in charger 12V DC
  (item no. 145533)
- Via the MULTIPLEX USB plug-in charger 100-240V AC
  (item no. 145534, see section 10.2, "Accessories" on page 213)

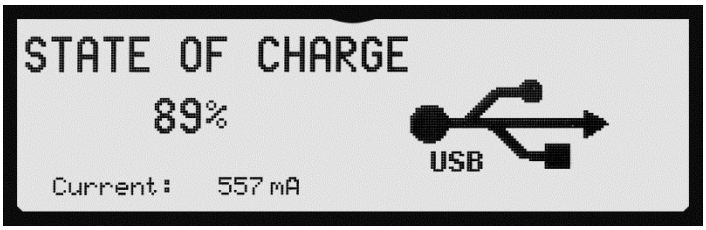
NOTICE **The transmitter must not be connected to a charger when no battery is installed!**

Without a consumer, the charger can provide unacceptably high output voltages. These voltages can damage the transmitter.

3.4.1.1 Charging the battery via the PC

Proceed as follows:

1. Switch off the PROFI TX.
2. Lift the device. The recessed control for the sliding latch is located on the underside of the case.
3. Slide the sliding latch towards the device centre.
4. Switch on the PC or laptop. Connect the supplied USB cable to a USB socket on the PC and to the mini USB socket on the PROFI TX.
    - The PROFI TX starts automatically in charging mode.
    - The USB icon is shown on the right side of the screen and the state of charge and the charging current are displayed on the left. Maximum current: 500 mA.



The PROFI TX logs into the PC as mass storage with the name "PROFI TX".

NOTICE When used for the first time, the PC automatically installs the required device drivers. Do not switch off the PC and/or the transmitter and do not disconnect the USB cable while the installation is in progress. This may take several minutes. Some operating systems require an active Internet connection for this process.

If you press and hold the Power button until the annular light is fully lit, the transmitter switches from charging mode to normal mode. The PROFI TX logs off from the PC as USB mass storage and logs in again as a game controller (see chapter 7 "Operating the transmitter " on page 174).

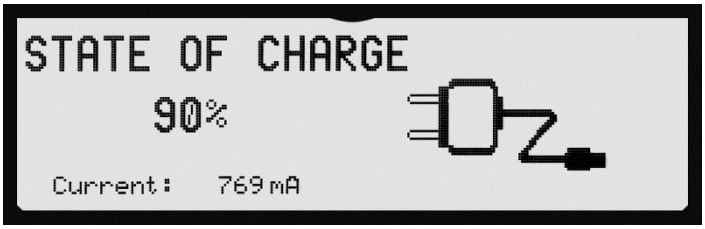
The RF module is disabled while a USB connection is established. It also remains switched off after disconnection. Otherwise, the RF module would be re-enabled when the host (PC, laptop, etc.) is switched off.

3.4.1.2 Charging the battery using the plug-in charger

Proceed as follows:

1. Lift the device (the recessed control for the sliding latch is located on the underside of the case).
2. Slide the sliding latch towards the device centre.
3. Connect the supplied USB cable to the plug-in charger and to the mini USB socket on the PROFI TX.
4. Connect the plug-in charger to a mains outlet.

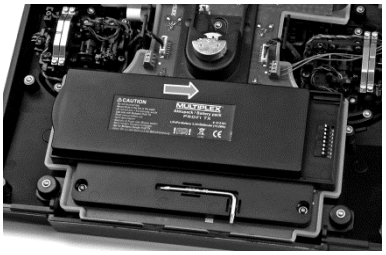
   The plug-in charger icon is shown on the right side of the screen and the state of charge and the charging current are displayed on the left. Maximum current (depending on charger and state of charge): 1500mA.



3.4.2 Removing the battery

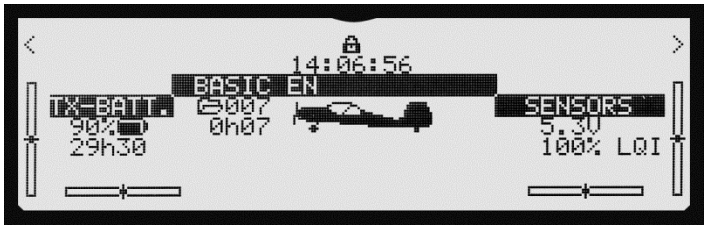
1	Open the transmitter.	
2	Slide the battery to the left towards the empty area in the battery dock.	
3	Remove the battery.	
4	Place the battery on a non-conducting, dry surface.	

3.4.3 Inserting the battery

1	Insert battery on the left side of the battery dock, with the rounded side facing to the left.	
2	Slide the battery to the right until the stop is reached.	

3.4.4 Battery management

The PROFI TX records the current during transmitter operation and while loading the transmitter battery. The available battery charge is calculated on the basis of the power meter reading, the temperature and the voltage. The remaining operating time (time to empty) is calculated from charge and current and is shown on status display #2 (see page 87). The calculation takes into account that current consumption slightly decreases with decreasing battery voltage.



Battery alarm

If the remaining operating time (time to empty) falls below the set threshold, an audible alarm is issued. The respective displays flash on status display #2.

The factory setting for the alarm threshold is 60 minutes. This value can be changed in the `Setup` > `Transmitter` > `Battery alarm` menu (see section 5.3.8 "Transmitter" on page 109).

Self-discharge

If the transmitter is stored for a prolonged period, the available battery charge is calculated on the basis of multiple parameters when the transmitter is switched on. The displayed charge and time to empty are not initially very accurate. Precise values are displayed after a few charging / discharging cycles.

Under-voltage cut-off

If the operating voltage falls below 2.8V the device is automatically switched off without further warning. If the voltage is below 2.9V, it cannot be switched on: The following message is briefly displayed on the screen: `BATTERY DOWN!`

NOTICE

Charge the transmitter battery!

If voltage is low, recharge batteries as soon as possible (within 1-2 days) to avoid damage due to total discharge. Observe the notes on charging (see section 3.4 "Transmitter battery" on page 41).

3.5 Switching the transmitter on / off

NOTICE

Charge the transmitter battery!

The PROFI TX is supplied with a partially charged transmitter battery. You should charge the battery prior to setup. Observe the notes on charging (see section 3.4 "Transmitter battery" on page 41).

3.5.1 Switching on

To switch on the device proceed as follows:

1. Press and hold the Power button until the annular light is fully lit. The device is switched on when you release the button.

If you press and hold the Power button for a prolonged period, the annular light turns off again and the device is not switched on when you release the button (power-on protection).

2. At this point, either a confirmation prompt is displayed on the screen:

Or the language selection screen is shown, if the menu language has not yet been selected (see "Switching on for the first time" on page 46).

The RF module is switched off until the safety check is completed to prevent the servo from moving to an undesired position.

3. Check if safety-related controls such as landing gear switches, flight phase switches, and throttle sticks are in the proper position.
4. Press a button on the keypad: The safety check is completed, the RF module is switched on, and status display #2 is shown.

   You can switch the safety check on and off in the Memory > Safety check menu. The safety check is activated by default when you create new model templates (see page 159).

Switching on in Binding mode

- Press and hold the button until the status display is shown (see section "Binding" on page 48).

Switching on for range check

Press and hold the button until the status display is shown. The device starts up with reduced transmitting power when the range check is performed (see section 3.6 "Range check" on page 47).

Switching on for the first time

The very first time you switch on the PROFI TX is a special case. After switching on, the language selection menu is displayed on the screen. In this menu, you select the language used on the transmitter to display

1. the menus,
2. the names of mixers and control functions in the model templates.

The language is selected using the keypad (up/down/ENTER). If you select "skip/später", transmitter functionality is restricted: Only one model memory is available and its contents are not stored on the SD card. The menus are shown in English.

3.5.2 Switching off

Press and hold the Power button until the red annular light turns off completely to switch off the device. The device is switched off when the annular ring turns off and the button is released. If you press and hold the button for a longer period, the annular ring returns to ready status. Now, you can release the button without the device switching off (power-off protection).

3.6 Range check

Regular range checks are necessary for ensuring the reliable functioning of the radio control system and for timely detection of changes in transmission properties. Always perform a range check after:

- installing, modifying or rearranging components in the model,
- reusing components in the model that were involved in a crash,
- irregularities when operating the model.

When performing a range check, the transmitting power is significantly reduced enabling shorter distances between transmitter and model.

While the range check is active the status displays #2 to #8 show the flashing message: RANGE! with the annular ring flashing red. An alarm tone is emitted in all the status displays starting from #2 to alert the operator.

Recommended minimum distance: 40m to 100m, depending on receiver type. Refer to the receiver operating instructions for detailed information.

NOTICE Always perform a range check before starting up the model.

A second person must always be present for the range check to secure and observe the model.

Large metal objects within or in close proximity to the checking range (wire fences, cars) affect the result of the range check.

Procedure

1. If the model is fitted with a power system, switch it off!
2. Press and hold the button on the transmitter as you switch the transmitter on.
3. Switch on the receiver.
4. In the Servo > Test run menu, activate the test run for a control function, e.g. Elevator. This allows you to check that the receiving system responds to control commands with distinct, regular movements of the control surfaces.
5. Increase the distance between transmitter and model. You have reached the range limit when the servos start to jitter.
6. Repeat the check with the power system running. Secure the model. Perform the check using throttle positions that vary between idle and full throttle. In case of electric power systems, the most significant interferences occur at half throttle.

   The range should not diminish significantly.
7. Otherwise, eliminate the cause of the interference (engine or motor, installed position of the receive system, power supply).

Factors influencing the radio range

The following factors have significant influence on the radio range:

- Environmental conditions
  Hilltops, ground characteristics, type of terrain, and the atmospheric conditions affect radio range.
- Receiver technology and sophistication
  Technically sophisticated receivers have greater range than simple, cheap receivers.
- Radio installation in the model
  Installation position / arrangement of the aerials and the distance to batteries, power systems, servos, ignition systems, metal / carbon fibre parts influence the radio range.

Binding

The binding procedure binds the receiver with the transmitter.

M-LINK uses "frequency hopping" and "spread spectrum".

No fixed transmission channel is used for "frequency hopping", but all 39 channels are used in a sequence that is defined by the transmitter.

For "spread spectrum", every data bit is coded in 64 bits (spread). This procedure provides a high level of interference resistance. During binding, the transmitter passes "hopping sequence“, "spreading code", and "response time" to the receiver.

Procedure

1. Press and hold the tool button and switch the transmitter on. Once activated, the safety check display is shown. Follow the instructions shown.
   - The (flashing) message "BINDING" is shown in the status displays #2 to #8.
   - The annular light of the Power button is flashing in orange.
2. Switch on the receiver by pressing and holding the SET button (connect the power supply).

   The receiver LED is flashing rapidly.

The binding procedure is completed within a few seconds:

- The annular light returns to flashing yellow.
- The receiver LED is flashing slowly.
- The servos that are connected to the receiver can now be controlled.

If the binding procedure does not automatically complete within a few seconds, move the transmitter front closer to the receiver aerial(s).

3.7 Trainer mode

The trainer mode (teacher / student) is the safest method for beginners to get started in model sport.

An experienced model pilot has control over the model as the teacher. The trainer can transfer control functions to the student by operating a button. Initially these will be individual control functions, and later all the main control functions.

The PROFI TX can be configured either as a teacher transmitter or as a student transmitter. The teacher and student transmitters are inter-connected using a second M-LINK radio link.

If the radio link between the student and the teacher is interrupted, all the control functions are returned to the teacher.

Student mode

In Student mode, the control signals of the sticks and sliders are transferred via M-LINK to the teacher transmitter (without trim and travel settings).

A second PROFI TX with COPILOT module or another MULTIPLEX transmitter with trainer stick can be used as the teacher transmitter.

Refer to "Training" on page 96 for details.

Teacher mode

A free switch on the teacher transmitter and the COPILOT module are required for the Teacher mode (see section 10.2 "Accessories" on page 213):

- Refer to section 3.3.4 "Installing additional controls" on page 37 for installation instructions.
- The assignment of the switch to the trainer function is described in section 6.4.2 "Assigning switches" on page 171.
- Refer to section 3.3.5 "Installing additional modules" on page 40 for information on how to install the COPILOT module.

In Teacher mode, the selected control functions can be controlled by the student transmitter. These control functions are selected in the Setup > Training menu. The selection list is only available in Teacher mode.

3.8 Digital trim

3.8.1 Overview

"Trimming" refers to the adjustment of the model aircraft to fly straight and level when you leave the sticks exactly at centre.

Digital trim has two essential advantages:

- The physical position of a conventional trim with trim slider corresponds to the actual trim value, while digital trim buttons do not. The digital trim position is displayed on the screen, and any change to the trim values is stored in the model memory. If you switch model memories, there is no need to move the trim sliders to the correct position to suit the model. The correct trims are immediately available.
- In models for which you have set up multiple flight phases each flight phase has its own trim memory, i.e. it is simple to trim each flight phase accurately, and independently of the trims in the other phases.

Example

The model aircraft should fly straight and level when you leave the sticks exactly at centre. If this is not the case, the neutral point of the causal control function should be corrected / trimmed.

Centre trim

The PROFI TX enables digital trim on each of the four stick axes.

"Centre trim" (the centre trim principle) is applied to the main control functions "Aileron", "Elevator", and "Rudder". The trim only affects the control centre, but not the end-points. Unlike standard trim, this offers the advantage that no control travel must be reserved for trimming: the servo travel is used fully.

Both servo end-points remain unchanged, regardless of the current trim position.

3.8.2 Trim buttons

In the case of the PROFI TX, trimming is carried out using the buttons arranged below and to the side of each stick unit (see section 3.1.1 "Top view" on page 23). They are located in an ergonomically efficient position, and are easily reached when using the transmitter, whether hand-held or in a tray.

The effect of each button-press is to shift the trim of the associated control axis in the corresponding direction. If you hold the trim button pressed in for longer than

about 0.8 sec., the trim value changes continuously until you release the button again (AUTO-REPEAT function). When the trim reaches centre, the AUTO-REPEAT function stops briefly.

Each trim increment is accompanied by an acoustic signal. On reaching the trim centre and on reaching the maximum trim range, specific acoustic signals are emitted to alert the user. The volume of the acoustic signals during trimming can be configured in the `Setup > Transmitter > Volume` menu (see section 5.3.8 "Transmitter" on page 109).

3.8.3 On-screen trim display

Graphic display

The trim positions are displayed as bars at both sides and at the bottom of the screen in the status displays #2 to #8:

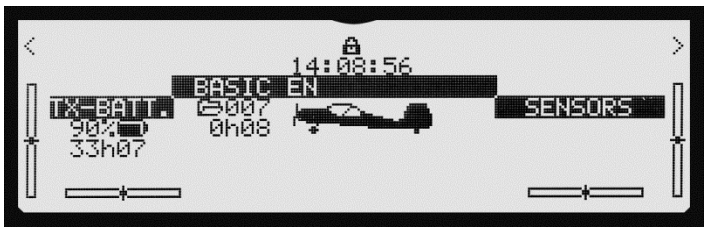


Fig. 7: On-screen trim display

Starting from the trim centre position, the trim range is 20 increments in both directions. The trim increment (step, or adjustment rate) can be set to any of four values (`0.5%`, `1.5%`, `2.5%`, `3.5%`) (`ControlFunctions` > `respective control function`, `Step size` parameter, see section 5.4 "ControlFunctions main menu" on page 112).

Switching the step size changes the trim value percentage since the number of stored trim increments remains the same. This means if you alter the trim increment size, you must remember to re-trim the model.

The design of the graphic trim display can be selected (`Setup` > `Transmitter` > `Display`, `Trim graph` parameter, see section 5.3.8 "Transmitter" on page 109).

4 Model templates

PROFI TX provides the following model templates:

- Templates for fixed-wing models

  BASIC, see page 57

  ACRO, see page 59

  GLIDER+, see page 59

  DELTA WING, see page 64

  FLYING WING, see page 66

  BIG SCALE, see page 68

- Templates for helicopter models:

  FUNCOPTER, see page 73

  eHeli FBL, see page 74

  HELImech., see page 75

  HELIccpm, see page 75

- Templates for land- or water-based models and tracked vehicles

  CAR / TRUCK, see page 78

  SHIP / BOAT, see page 80

  TRACKED V., see page 83

Switch assignment

In the PROFI TX, all the switches can be installed and connected as needed. For this reason, switched functions that are usually assigned to dip-switches or buttons cannot be pre-set in the model templates. You have to configure these assignments yourself according to the existing switches.

Using timers

The Frame, Sum, and Interval timers are only functional if a switch has been assigned to them. The same control used for the Throttle control function is assigned to the sum timer in all model templates. For this reason, this timer is immediately functional. You activate the other timers by assigning a switch to them.

Control mixers (Ctrl.Mix)

The control mixers Ctrl.Mix are not initialised in the templates.

4.1 Templates for fixed-wing models

All the templates for fixed-wing models use similar names for the 15 control functions. Only the Throttle and Spoiler assignments differ:

- For power models, Throttle is assigned to the stick and Spoiler to slider <E.
- For glider-type models, Spoiler is assigned to the stick and Throttle is assigned to slider <E.

Controls assignment, control function, and settings

Control function	Control	Setting	Parameter
Aileron	[Mode]	Trim FP4	0%
		Step size	1.5%
		Expo FP4	0%
		D/R	100%
		Travel FP4	100%
Elevator	[Mode]	Trim FP4	0%
		Step size	1.5%
		Expo FP4	0%
		D/R	100%
		Travel FP4	100%
Rudder	[Mode]	Trim FP4	0%
		Step size	1.5%
		Expo FP4	0%
		D/R	100%
		Travel FP4	100%

Control function	Control	Setting	Parameter
Throttle	BASIC, ACRO, DELTA WING, BIG SCALE: stick GLIDER+: <E	Trim[FP4] Step size Mode Expo Slow	0% 1.5% HALF 0% 0.0s
Spoiler	BASIC, ACRO, DELTA WING, BIG SCALE: <E GLIDER+: stick	Slow Fixed value [FP4]	0.0s OFF
Flap[1]	F>	Slow Fixed value [FP4]	0.0s OFF
Retract.Gear	---	Slow Fixed value [FP4]	0.0s OFF
Towing dog	---	-	-
Wheel Brake	---	-	-
Gyro	---	Type of Gyro Damping/ Heading[FP4] Suppression	Heading Control OFF
Mixture	---	-	-
Aux-1	---	Slow Fixed value [FP4]	0.0s OFF

[1] Camber-changing or landing flap

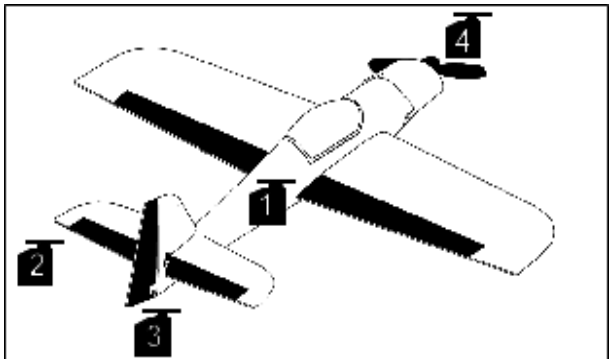
Control function	Control	Setting	Parameter
Aux-2	---	Slow Fixed value [FP4]	0.0s OFF
Aux-3	---	Slow Fixed value [FP4]	0.0s OFF
Aux-4	---	Slow Fixed value [FP4]	0.0s OFF

[FP4] = 4 flight phases

4.1.1 BASIC model template

This model template is designed for simple power or glider-type models and for models without aileron. On account of its simplicity this model template is ideally suited to model flying simulators.

Servo assignment



	Function
1	Aileron
2	Elevator
3	Rudder
4	Power system

Fig. 8: BASIC servo assignment

If you install a second aileron servo to provide separate linkage for the ailerons, simply assign the Aileron function to a free servo (see "**Assignment**" starting from page 142). Would you like to raise the ailerons as an airbrake? In that case, assign the AILERONS+ mixer to both aileron servos at the same position. In the extended state, the airbrake will cause major load distribution changes: Change the elevator to ELEVATOR+. It is then possible to compensate for the effects of Throttle and Spoiler (airbrake).

Pre-defined mixers on the control side, with 2 more that can be defined by the operator.

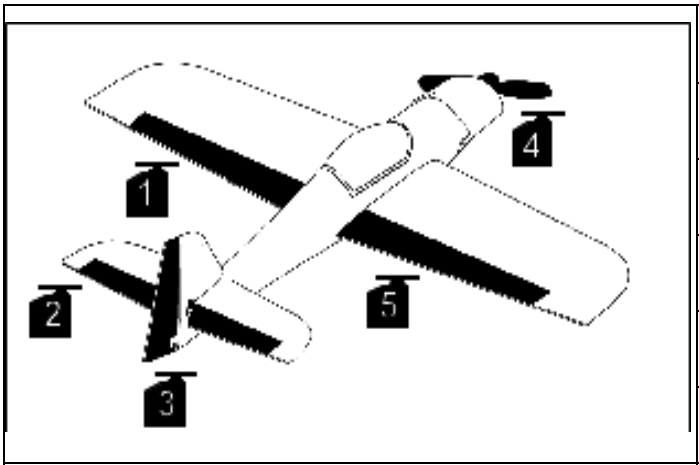
Name	Mixer inputs	Options & settings	Value
Makes it easier to fly accurate turns:			
Combi-Switch	Ail <> rudder	Ail < rudder	OFF
Optimises flying turns:			
Differnt.Ail	Aileron	Mode Differnt.Ail	OFF 50%

Pre-defined mixers on the servo side in the BASIC template

Name	Mixer inputs	Options & settings		Value	
Compensation**:**					
ELEVATOR+	Elevator	⇕	Up and down travels are asymmetrical	100%	100%
	Throttle-T (untrimmed)	↧–	Single-sided travel, with deadband	OFF	OFF
	Spoiler		Single-sided travel, with intermediate point	OFF	OFF
Do you use a V-tail model? Reset the control functions "Rudder" and "ELEVATOR+" to "V-TAIL+" in the "Servo>Assign" menu.					
V-TAIL+	Elevator	⇕	Up and down travels are asymmetrical	70%	70%
	Rudder	⇕ 2	Right and left travels are asymmetrical, 2 directions	70%	70%
	Throttle-T (untrimmed)	↧-	Single-sided travel, with deadband	OFF	OFF
	Spoiler	⇟	Single-sided travel, with intermediate point	OFF	OFF
For airbrake and aileron differential. Requires 2 AILERONS+ servos.					
AILERONS+	Aileron	⇕ 2	Travels are symmetrical	100%	100%
	Spoiler	↧+	Single-sided travel, with offset	OFF	OFF

4.1.2 ACRO model template

- The ACRO model template is suitable for power models with up to 4 flaps, optionally with snap flap.



	Function
1	AILERONS+
2	ELEVATOR+
3	Rudder
4	Power system
5	AILERONS+

Fig. 9: ACRO servo assignment

Pre-defined mixers on the control side, with 2 more that can be defined by the operator.

Name	Mixer inputs	Options & settings	Value (%)
Combi-Switch	Ail <> rudder	Ail < rudder	OFF
Differnt.Ail	Aileron	Mode Differnt.Ail	+SPOILER 50%

Pre-defined mixers on the servo side

Name	Mixer inputs	Options & settings		Value (%)	
ELEVATOR+	Elevator	⇕	Up and down travels are asymmetrical	100%	100%
	Throttle-T (untrimmed)	↧–	Single-sided travel, with deadband	OFF	OFF

Name	Mixer inputs	Options & settings		Value (%)	
	Landing flaps		Single-sided travel, with intermediate point	OFF	OFF
	Spoiler		Single-sided travel, with intermediate point	OFF	OFF
V-TAIL+	Elevator		Up and down travels are asymmetrical	70%	70%
	Rudder	2	Right and left travels are asymmetrical, 2 directions	70%	70%
	Throttle-T (untrimmed)	-	Single-sided travel, with deadband	OFF	OFF
	Landing flaps		Single-sided travel, with intermediate point	OFF	OFF
	Spoiler		Single-sided travel, with intermediate point	OFF	OFF
AILERONS+	Aileron	+2	Travel is symmetrical, 2 directions, with offset	100%	100%
	Landing flaps (increase in lift)	+	Single-sided travel, with offset	OFF	OFF
	Spoiler (airbrake)		Single-sided travel, with intermediate point	OFF	OFF
	Elevator-T (snap flap)		Up and down travels are asymmetrical	OFF	OFF

FLAPS+	Flaps (increase in lift)	↧+	Single-sided travel, with offset	100%	OFF
	Aileron	⇕ 2	Up and down travels are asymmetrical, 2 directions	OFF	OFF
	Spoiler (airbrake)	⤓	Single-sided travel, with intermediate point	OFF	OFF
	Elevator-T (snap flap)	⇕	Up and down travels are asymmetrical	OFF	OFF

4.1.3 GLIDER+ model template

- The model template is suitable for glider-type models with up to 8 flaps, optionally with snap flap.

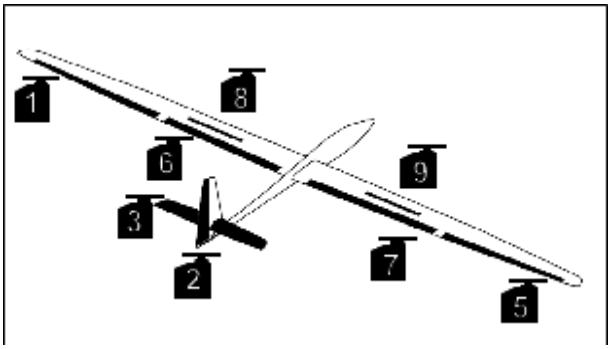


Fig. 10: GLIDER+ servo assignments

	Function
1+5	AILERONS+
2	ELEVATOR+
3	Rudder
4	Throttle
6+7	FLAP_INNR+
8+9	Spoiler

Servo assignment

Pre-defined mixers on the control side, with 2 more that can be defined by the operator.

Name	Mixer inputs	Options & settings	Value
Combi-Switch	Ail <> rudder	Ail < rudder	OFF
Differnt.Ail	Aileron	Mode Differnt.Ail	ON 50%

Pre-defined mixers on the servo side

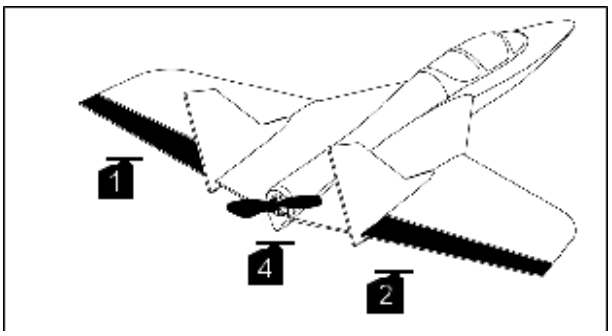
Name	Mixer inputs	Options & settings		Value	
ELEVATOR+	Elevator	⇕	Up and down travels are asymmetrical	100%	100%
	Spoiler	⇟	Single-sided travel, with intermediate point	OFF	OFF
	Flap	⇕	Up and down travels are asymmetrical	OFF	OFF

Name	Mixer inputs	Options & settings		Value	
	Throttle-T (without trim)	↓-	Single-sided travel, with deadband	OFF	OFF
V-TAIL+	Elevator	↕	Up and down travels are asymmetrical	70%	70%
	Rudder	↕ 2	Right and left travels are asymmetrical	70%	70%
	Spoiler	↓+	Single-sided travel, with offset	OFF	OFF
	Throttle-T (untrimmed)	↓-	Single-sided travel, with deadband	OFF	OFF
AILERONS+	Aileron	↕ 2	Travel is symmetrical, 2 directions	100%	100%
	Spoiler	↓+	Single-sided travel, with offset	OFF	OFF
	Flap	↕	Up and down travels are asymmetrical	OFF	OFF
	Elevator-T (snap flap)	↕	Up and down travels are asymmetrical	OFF	OFF
FLAP_INNR+ FLAP_CNTR+ [1]	Flap	↕	Up and down travels are asymmetrical	OFF	OFF
	Spoiler	↓+	Single-sided travel, with offset	OFF	OFF
	Aileron	↕ 2	Up and down travels are asymmetrical	50%	50%

[1] For centre flap pairs.

4.1.4 DELTA WING model template

This model template is suitable for delta models.



	Function
1+2	DELTA+
3	Rudder
4	Throttle

Fig. 11: DELTA WING servo assignment

Pre-defined mixers on the control side, with 2 more that can be defined by the operator.

Name	Mixer inputs	Options & settings	Value
Combi-Switch	Ail <> rudder	Ail < rudder	OFF
Differnt.Ail	Aileron	Mode Differnt.Ail	ON 50%

Pre-defined mixers on the servo side

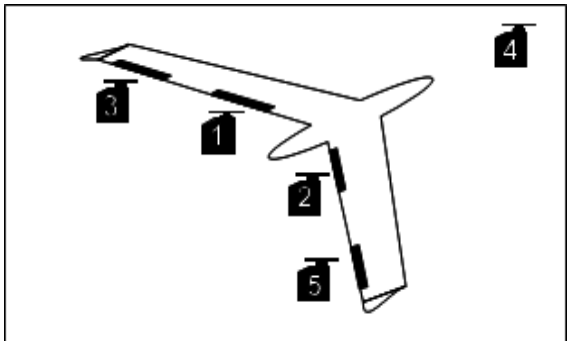
Name	Mixer inputs	Options & settings		Value	
DELTA+	Aileron	2	Up and down travels are symmetrical	70%	70%
	Elevator		Up and down travels are asymmetrical	70%	70%
	Throttle-T		Single-sided travel, with deadband	OFF	OFF

Name	Mixer inputs	Options & settings		Value	
V-TAIL+	Elevator	⇕	Up and down travels are asymmetrical	70%	70%
	Rudder	⇕ 2	Right and left travels are asymmetrical	70%	70%
	Throttle-T	↧–	Single-sided travel, with deadband	OFF	OFF

4.1.5 FLYING WING model template

This model template is suitable for models with up to 4 flaps.

Servo assignment



	Function
1+5	FLAP_INNR+
2+3	FLAP_OUTR+
4	Throttle

Fig. 12: FLYING WING servo assignment

Pre-defined mixers on the control side, with 2 more that can be defined by the operator.

Name	Mixer inputs	Options & settings	Value
Combi-Switch	Ail <> rudder	Ail < rudder	OFF
Differnt.Ail	Aileron	Mode Differnt.Ail	ON 100%

Pre-defined mixers on the servo side

Name	Mixer inputs	Options & settings		Value	
FLAP_INNR+ Inboard flap pair	Aileron	2	Up and down travels are asymmetrical	70%	70%
	Elevator		Up and down travels are asymmetrical	70%	70%
	Flap (camber-changing flaps)		Up and down travels are asymmetrical	OFF	OFF
	Spoiler	+	Single-sided travel, with offset	OFF	OFF
	Throttle-T	–	Single-sided travel, with deadband	OFF	OFF
FLAP_OUTR+ Outboard flap pair	Aileron (inboard)	2	Up and down travels are symmetrical	70%	70%
	Elevator		Up and down travels are asymmetrical	70%	70%
	Flap (camber-changing flaps)		Up and down travels are asymmetrical	OFF	OFF
	Spoiler	+	Single-sided travel, with offset	OFF	OFF
	Throttle-T	–	Single-sided travel, with deadband	OFF	OFF

4.1.6 BIG SCALE model template

This model template is suitable for large-scale power models with 2 elevator servos and landing flaps.

Servo assignment

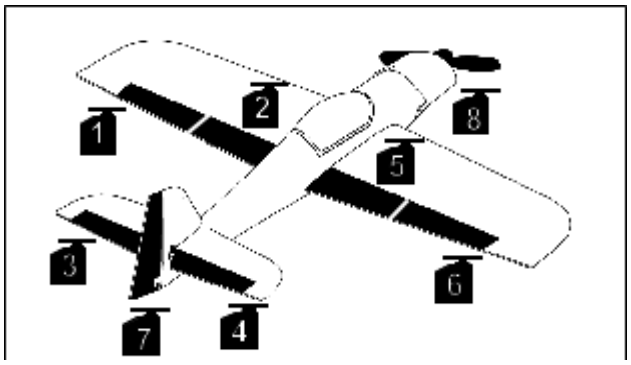


Fig. 13: BIG SCALE servo assignment

	Function
1+6	AILERONS+
2+5	FLAPS+
3+4	ELEVATOR+
7	Rudder
8	Throttle

Pre-defined mixers on the control side, with 2 more that can be defined by the operator.

Name	Mixer inputs	Options & settings	Value (%)
Combi-Switch	Ail <> rudder	Ail < rudder	OFF
Differnt.Ail	Aileron	Mode Differnt.Ail	+SPOILER 50%

Pre-defined mixers on the servo side

Name	Mixer inputs	Options & settings		Value (%)	
ELEVATOR+	Elevator	⇕	Up and down travels are asymmetrical	100%	100%
	Spoiler	↧	Single-sided travel, with centre	OFF	OFF
	Flap	⇕	Up and down travels are asymmetrical	OFF	OFF

	Throttle-T (untrimmed)	↧–	Single-sided travel, with deadband	OFF	OFF
V-TAIL+	Elevator	⇕	Up and down travels are asymmetrical	70%	70%
	Rudder	⇕ 2	Right and left travels are asymmetrical, 2 directions	70%	70%
	Spoiler	↧+	Single-sided travel, with offset	OFF	OFF
	Throttle-T (untrimmed)	↧–	Single-sided travel, with deadband	OFF	OFF
AILERONS+	Aileron	⇕+2	Travel is symmetrical, 2 directions, with offset	100%	100%
	Landing flaps (increase in lift)	↧+	Single-sided travel, with offset	OFF	OFF
	Spoiler (airbrake)	⇟	Single-sided travel, with intermediate point	OFF	OFF
	Elevator-T (snap flap)	⇕	Up and down travels are asymmetrical	OFF	OFF
FLAPS+	Landing flaps (increase in lift)	↧+	Single-sided travel, with offset	100%	OFF
	Aileron	⇕ 2	Up and down travels are asymmetrical, 2 directions	50%	50%
	Spoiler (airbrake)	⇟	Single-sided travel, with intermediate point	OFF	OFF
	Elevator-T (snap flap)	⇕	Up and down travels are asymmetrical	OFF	OFF

4.2 Templates for helicopter models

Model templates are provided for 4 helicopter types:

FUNCOPTER for throttle-controlled electric helicopters

eHELI FBL for flybarless helicopters

eHELIccpm for electric helicopters with electronic main rotor mixer

HELIccpm for I.C. helicopters with electronic main rotor mixer

HELImech for I.C. helicopters with mechanical main rotor mixer

Controls assignment, control function, and settings

Control function	Control	Setting	Parameter
Aileron	[Mode]	Trim FP4 Step size Expo FP4 D/R Travel FP4	0% 1.5% 0% 100% 100%
Elevator	[Mode]	Trim FP4 Step size Expo FP4 D/R Travel FP4	0% 1.5% 0% 100% 100%
Rudder	[Mode]	Trim FP4 Step size Expo FP4 D/R Travel FP4	0% 1.5% 0% 100% 100%
Throttle	⅄	Governor Trim FP4 Step size Mode Expo Slow	ON e / OFF v 0% 1.5% HALF 0% 0.0s
Aux-1	---	Slow Fixed value FP4	0.0s OFF

Aux-2	---	Slow Fixed value [FP4]	0.0s OFF
Retract.Gear	---	Slow Fixed value [FP4]	0.0s OFF
Switch-1	---	-	-
Switch-2	---	-	-
Gyro	<E	Type of Gyro Heading [FP4]/ Damping/Control Suppression	Heading Control: <E OFF
Switch-3 [e] Mixture [v]	---	-	-
Aux-3	---	Slow Fixed value [FP4]	0.0s OFF
Aux-4	---	Slow Fixed value [FP4]	0.0s OFF
Collective	same as Throttle	Slow Fixed value [FP4]	0.0s OFF
Thr.Limiter	F>	Slow Fixed value [FP4]	0.0s OFF

[FP4] = 4 flight phases

[v] = I.C. engine

[e] = electric motor

All the model templates contain the same set of mixers:

- Four free, flight phase-enabled control mixers; e.g. to mix Aileron, Elevator, Rudder in Throttle.
- Tail rotor mixer
- Main rotor mixer

Name	Mixer inputs	Settings	Value
TAIL ROTOR	Rudder, Collective	Offset Coll.++/- Coll. zero point Rudd.Diff.	OFF OFF 0% OFF
MAINROTOR-R.	Rudder, Elevator, Collective	Geometry Rotation Lever +/-	90% 0° 0%
MAINROTOR-L.	Rudder, Elevator, Collective		
MAINROTOR-FB	Rudder, Elevator, Collective		
MAINROTOR-4	Rudder, Elevator, Collective		

4.2.1 FUNCOPTER model template

This model template is suitable for throttle-controlled helicopters with electric motor. This template cannot be adapted to the other helicopter templates as the collective pitch channel is not available.

Servo assignment

Servo	FUNCOPTER assignment
1	Aileron
2	Elevator
3	Rudder
4	Collective
5	Throttle
6	Gyro
7..16	---------- (free)

4.2.2 eHeli FBL model template

In the basic configuration, this model template is optimised for helicopters with flybarless controller. The classic configuration can easily be restored by assigning tail rotor mixers and main rotor mixers on the servo side.

The template is equally suited to collective pitch-controlled electric helicopters with mechanical main rotor mixer. The "Governor mode" option is activated for Throttle. Switch off this option if you prefer to work with throttle curves (see "Throttle (helicopter)", page 118).

Servo assignment

Servo	FBL assignment	Classic assignment with mixers (restore to flybars)
1	Aileron	MAINROTOR-FB
2	Elevator	MAINROTOR-L.
3	Rudder	TAIL ROTOR
4	Collective	MAINROTOR-R.
5	Throttle	Throttle
6	Gyro	Gyro
7..16	---------- (free)	

4.2.3 eHeliccpm model template

For collective pitch-controlled electric helicopters with rotor head for electronic mixing (Collective Cyclic Pitch Mixer).

The "Governor mode" option is activated for Throttle. Switch off this option if you prefer to work with throttle curves (see "Throttle (helicopter)", page 118).

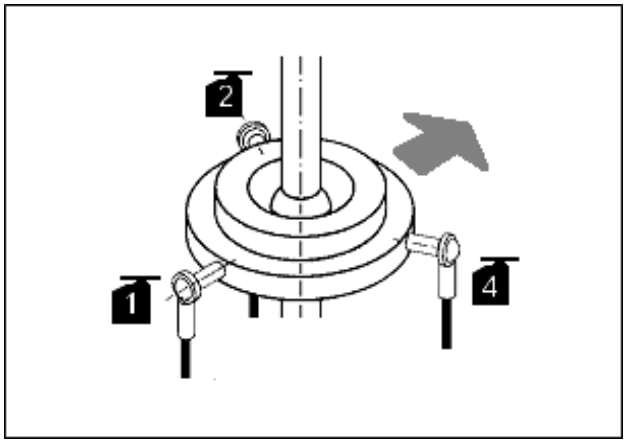


Fig. 14: Servo assignment for electronically mixed rotor heads

	Function
1	MAINROTOR-FB
2	MAINROTOR-L.
3	TAIL ROTOR
4	MAINROTOR-FB
5	Throttle
6	Gyro

Mixer

Name	Mixer inputs	Settings	Value
TAIL ROTOR	Aileron, Collective *Collective and Offset are switched off if the gyro operates in Heading-hold mode.*	Offset FP4 Coll.+ Coll.- FP4 Zero point Rudd.Diff. FP4	OFF OFF OFF 0% OFF
MAINROTOR-R.	Rudder, Elevator, Collective	Geometry	120%
MAINROTOR-L.	Rudder, Elevator, Collective	Rotation	0°
MAINROTOR-FB	Rudder, Elevator, Collective	Lever +/-	0%
MAINROTOR-4	Rudder, Elevator, Collective		

FP4 = 4 flight phases; for helicopters, the fourth flight phase is always AUTOROT (auto-rotation).

4.2.4 HELIccpm model template

For collective pitch-controlled I.C. helicopters with rotor head for electronic mixing (Collective Cyclic Pitch Mixer).

Governor mode is switched off in the throttle channel. The Switch-3 control function was replaced by Mixture for mixture configuration. If you are using a speed controller, switch on the Governor mode to switch off the throttle curve (page 118).

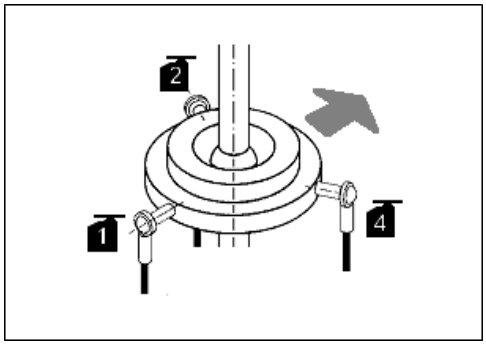


Fig. 15: Servo assignment for electronically mixed rotor heads

	Function
1	MAINROTOR-FB
2	MAINROTOR-L.
3	TAIL ROTOR
4	MAINROTOR-FB
5	Throttle
6	Gyro

Mixer

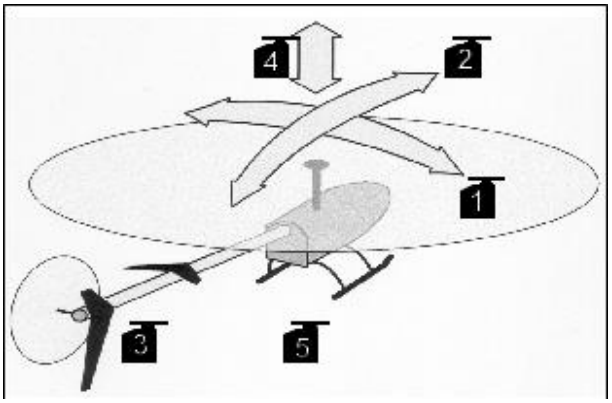
Name	Mixer inputs	Settings	Value
TAIL ROTOR	Aileron, Collective *Collective and Offset are switched off if the gyro operates in Heading-hold mode.*	Offset [FP4] Coll.+ Coll.- [FP4] Zero point Rudd.Diff. [FP4]	OFF OFF OFF 0% OFF
MAINROTOR-R.	Rudder, Elevator, Collective	Geometry	120%
MAINROTOR-L.	Rudder, Elevator, Collective	Rotation	0°
MAINROTOR-FB	Rudder, Elevator, Collective	Lever +/-	0%
MAINROTOR-4	Rudder, Elevator, Collective		

[FP4] = 4 flight phases; for helicopters, the fourth flight phase is always AUTOROT (auto-rotation).

4.2.5 HELImech. model template

This template is intended for collective pitch-controlled I.C. helicopters with mechanically mixed rotor head.

Governor mode is switched off in the throttle channel. The Switch-3 control function was replaced by Mixture for mixture configuration.



	Function
1	Aileron
2	Elevator
3	Rudder
4	Collective
5	Throttle

Fig. 16: HELImech. servo assignment

Mixer

Name	Mixer inputs	Settings	Value
TAIL ROTOR	Aileron[1], Collective	Offset	OFF
		Coll.+	OFF
		Coll.-	OFF
		Zero point	0%
		Rudd.Diff.	OFF

If you convert the configured helicopter to electronic mixing, you just need to rename the Aileron, Elevator, and Collective servos to MAINROTOR-L, MAINROTOR-R, etc. in the Servo > Assign menu. The main rotor mixer is then available in the Mixer menu.

[1] Collective and Offset are switched off automatically if the gyro operates in Heading mode.

4.3 Templates for land- or water-based models and tracked vehicles

4.3.1 CAR / TRUCK model template

This model template is suitable for all types of vehicle models.

The control functions Support Legs, Ramp, Light, and Aux-1 to Aux-4 provide the Slow function. This allows operating support legs and ramp at a realistically slow speed. Smooth transition for Light is also possible.

Flight phase switching originates from model flying, as the names suggests. This function has been left activated for vehicle models. Smart modellers will have good ideas for practical application.

Control function assignments and names can be changed as required.

This template does not contain pre-defined mixers. To personalise control, 4 mixers on the control side and 7 mixers on the servo side are provided, each with eight outputs.

Controls assignment, control function, and settings

Control function	Control	Parameter	Value
Gimbal h	Horizontal stick axis. Assignment by means of controls mode.	Trim FP4 Step size Expo FP4 D/R Travel FP4	0% 1.5% 0% 100% 100%
Gimbal v	Vertical stick axis. Assignment by means of controls mode.	Trim FP4 Step size Expo FP4 D/R Travel FP4	0% 1.5% 0% 100% 100%
Steering	Horizontal stick axis. Assignment by means of controls mode.	Trim FP4 Step size Expo FP4 D/R Travel FP4	0% 1.5% 0% 100% 100%

Throttle	↥	Trim[FP4] Step size Mode Expo Slow	0% 1,5% CNTR 0% 0.0s
Support Legs	---	Slow Fixed value [FP4]	0.0s OFF
Ramp	---	Slow Fixed value [FP4]	0.0s OFF
Light	---	Slow Fixed value [FP4]	0.0s OFF
Headlight	---	–	–
Horn	---	–	–
Gear	---	–	–
Sound	---	–	–
Aux-1	---	Slow Fixed value [FP4]	0.0s OFF
Aux-2	---	Slow Fixed value [FP4]	0.0s OFF
Aux-3	---	Slow Fixed value [FP4]	0.0s OFF
Aux-4	---	Slow Fixed value [FP4]	0.0s OFF

[FP4] = 4 flight phases

Servo assignment

Servo	Control function / mixer	Curve points
1	Steering	3
2	Throttle	3
3 –	unused	

4.3.2 SHIP / BOAT model template

This model template is suitable for all types of water-based models.

The control functions Spoiler, Flap, Light, and Aux-1 to Aux-3 provide the Slow function. This allows operating support legs and ramp at a realistically slow speed. Smooth transition for Light is also possible.

Flight phase switching originates from model flying, as the names suggests. We left this function activated for boat / ship models. Inventive modellers will have good ideas for practical application.

Control function assignments and names can be changed as required.

This template does not contain pre-defined mixers. To personalise control, 4 mixers on the control side and 7 mixers on the servo side are provided, each with eight outputs.

Controls assignment, control function, and settings

Control function	Control	Setting	Parameter
Gimbal h	Horizontal stick axis. Assignment by means of controls mode.	Trim FP4 Step size Expo FP4 D/R Travel FP4	0% 1.5% 0% 100% 100%
Gimbal v	Vertical stick axis. Assignment by means of controls mode.	Trim FP4 Step size Expo FP4 D/R Travel FP4	0% 1.5% 0% 100% 100%
Rudder	Horizontal stick axis. Assignment by means of controls mode.	Trim FP4 Step size Expo FP4 D/R Travel FP4	0% 1.5% 0% 100% 100%
Throttle	⊥	Trim FP4 Step size	0% 1.5%

Control function	Control	Setting	Parameter
		Mode Expo Slow	HALF 0% 0.0s
Flap	---	Slow Fixed value [FP4]	0.0s OFF
Spoiler	---	Slow Fixed value [FP4]	0.0s OFF
Light	---	Slow Fixed value [FP4]	0.0s OFF
Headlight	---	–	–
Horn	---	–	–
Gear	---	–	–
Sound	---	–	–
Mixture	---	Slow Fixed value [FP4]	0.0s OFF
Aux-1	---	Slow Fixed value [FP4]	0.0s OFF
Aux-2	---	Slow Fixed value [FP4]	0.0s OFF
Aux-3	---	Slow Fixed value [FP4]	0.0s OFF

[FP4] = 4 flight phases

Servo assignment

Servo	Control function / mixer	Curve points
1	Rudder	3
2	Throttle	3
3 - 16	not assigned	

4.3.3 TRACKED V. model template

This model template is suitable for tracked vehicles.

Control function assignments and names can be changed as required.

Completed tracked vehicle models typically contain a functional building block that combines "Throttle" and "Steering" for the two power systems.

If you are using 2 separate speed controllers, it is recommended to change the servo assignment for Steering and Throttle to TRACK+ (page 142).

TRACK+ stands for a mixer that combines "Throttle" and "Steering". You configure the required settings in the Σ Mixer menu (page 126).
Set a small deadband value in the mixer for Steering. If "Steering" and "Throttle" are assigned to the same stick unit, opening the throttle often involves a small steering movement. Applying a deadband to "Steering" solves this problem.

To personalise control, 4 mixers on the control side and 6 mixers on the servo side are provided, each with eight outputs.

Controls assignment, control function, and settings

Control function	Control	Setting	Parameter
Turret turn	Horizontal stick axis. Assignment by means of controls mode.	Trim FP4 Step size Expo FP4 D/R Travel FP4	0% 1.5% 0% 100% 100%
Gun up/down	Vertical stick axis. Assignment by means of controls mode.	Trim FP4 Step size Expo FP4 D/R Travel FP4	0% 1.5% 0% 100% 100%
Steering	Horizontal stick axis. Assignment by means of controls mode.	Trim FP4 Step size Expo FP4 D/R Travel FP4	0% 1.5% 0% 100% 100%

Throttle	↥	Trim[FP4] Step size Mode Expo Slow	0% 1.5% CNTR 0% 0.0s
Weapon sel.	---	Slow Fixed value [FP4]	0.0s OFF
Gear	---	Slow Fixed value [FP4]	0.0s OFF
Aux-1	---	Slow Fixed value [FP4]	0.0s OFF
Light	---	-	-
Headlight	---	-	-
Gyro	---	Type of Gyro Damping/Heading [FP4]/ Control Suppression	Heading ---- OFF
Horn	---	-	-
Aux-2	---	Slow Fixed value [FP4]	0.0s OFF
Aux-3	---	Slow Fixed value [FP4]	0.0s OFF
Aux-4	---	Slow Fixed value [FP4]	0.0s OFF
Aux-5	---	Slow Fixed value [FP4]	0.0s OFF

[FP4] = 4 flight phases

Servo assignment

Servo	Control function / mixer	Curve point
1	Steering optional TRACK+	3
2	Throttle optional TRACK+	2
3	Turret turn	3
4	Gun up/down	3
5	Weapon sel.	3
6 - 16	unused	

Mixer

Name	Mixer inputs	Options & settings		Value	
TRACK+	Steering	⇕-2	Travel is symmetrical, 2 directions, with deadband	50%	50%
	Throttle	⇕	Forward and backward travels are asymmetrical	OFF	OFF

5 Menus

The PROFI TX software is divided into status displays and menus that are structured in several levels.

5.1 Status displays

Eight status displays provide information about transmitter, model and sensors. The status display is shown after transmitter start-up or when exiting the main menus.

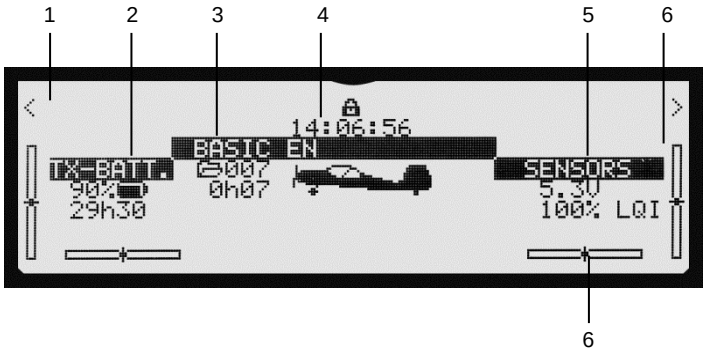
Press the **+** or **–** buttons or use the central wheel to toggle between screens. Every clockwise increment on the central wheel cycles to the next status display (see also chapter 6 "Operating the transmitter" on page 160).

5.1.1 Status display #1

Status display #1 provides an overview of the current battery and device status:

- The device name is shown in the first line. You can overwrite this name with customised text (menu: Setup > Transmitter > User data > Name parameter, see section 5.3.8 "Transmitter" on page 109).
- The left side of the table provides information about the battery, e.g. battery voltage, remaining operating time (time to empty), etc.
- The right side of the table provides information about the device, e.g. serial number, uptime count, etc.

5.1.2 Status display #2



1 Digi-adjuster

Set values and their names, which can be edited using the retro-fittable digi-adjusters.

The padlock icon in the centre opens when the values are unlocked for editing (see section 6.3 "Digi-adjuster" on page 164).

2 Battery status

- TX-BATT. (TX is short for "transmitter")
- Battery charge of the transmitter
- The operating time remaining with this charge is displayed.

These displays start to flash when the remaining operating time (time to empty) reaches the set alarm time (menu: Setup > Transmitter > Battery alarm parameter, see section 5.3.8 "Transmitter" on page 109).

3 Model memories

- Name of the model memory (inverted as heading)
- Below the name: model memory number, uptime count for the model and the respective ID number, if an ID receiver is used.
- Next to the name: icon for the type of model used

Current time

4 Flashing warnings and notifications in capital letters. Warnings contain an exclamation mark.

MEMORY ERROR!	Displayed when errors occur while loading a model memory (page 159).
RANGE!	Transmitting power is reduced for the range check (page 93).
RF ERROR!	The RF component is defective.
STUDENT MODE!	The Student mode is enabled.
STUDENT	Only in Teacher mode: The selected control functions are transferred to the student.
MULTIFLIGHT	A MULTIFlight stick was detected: The mixers on the servo side are switched off.

5 Sensors

Values for sensor addresses 0, 1, and 15 if a receiver with downlink is used. The value is shown crossed out if no sensor signal is received for several seconds.

If the sensor reports an alarm:

- The sensor value starts to flash.
- The appropriate warning light for the sensor group below the screen starts to flash (see section 3.1.1 "Top view" on page 23).
- The device also starts to vibrate if the vibration alarm is activated (see section 5.3.4.2 "Vibra.Alarm" on page 100).

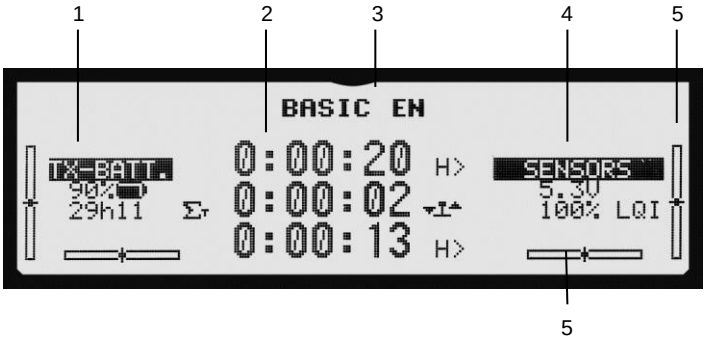
*If the sensor clears the alarm the displayed value stops flashing. The vibration alarm and warning light remain active until they are cleared by pressing the **ENTER** button.*
*Notice: In other status displays the **ENTER** button has different functions.*

6 Trim display

Trim settings for the 4 stick axes. The trim display can be customised in the Setup > Transmitter menu.

5.1.3 Status display #3

Status display #3 provides an overview of the timers (see section 5.7 "Timer main menu" on page 145). The other elements are identical to status display #2.



1 Battery status (see section 5.1.2 "Status display #2" on page 87)

2 Timers:

- Counting direction of the respective timer
- Indication of the timer type
- Assigned switch

3 Name of the model memory or status of the digi-adjusters, if used (see section 5.1.2 "Status display #2" on page 87)

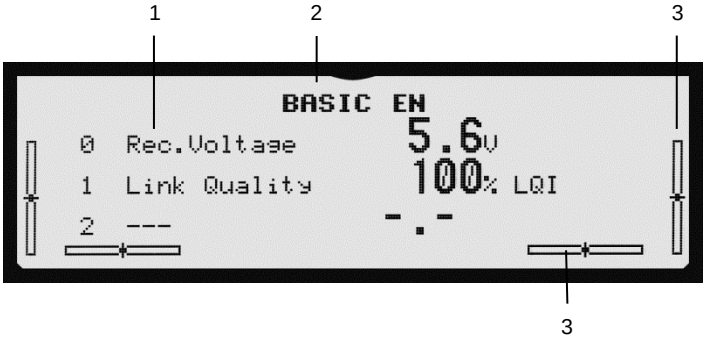
4 Values for sensor addresses 0, 1, and 15 (see section 5.1.2 "Status display #2" on page 87)

5 Trim display (see section 5.1.2 " Status display #2" on page 87).

Pressing the **REV/CLR** button in status display #3 resets all timers.

5.1.4 Status displays #4 to #8

The status displays #4 to #8 show three sensor values each.



1 Sensors:

- Sensor address
- Sensor name
- Sensor value
- Unit

The inverted display of a line indicates that the sensor reports an alarm.

The value is shown crossed out if no sensor signal is received for several seconds.

The minimum / maximum values are displayed while pressing and holding the **ENTER** button. This is only possible if a receiver with backlink provides data to display!

3 Alternative:

- Status of the digi-adjusters, if used (see section 5.1.2 "Status display #2" on page 87).
- Name of the model memory, if no digi-adjuster is assigned.

3 Trim display (see section 5.1.2 "Status display #2" on page 87).

All minimum / maximum memories are erased when you press the **REV/CLR** button in the status displays #4 to #8.

5.2 Menu structure

The PROFI TX menus are structured in several levels:

- Main menus

  The 6 main menus are opened via the 6 direct menu access buttons (see section 6.1.1 "Direct access buttons for menus" on page 160).

  The main menus only provide links leading to the menus themselves.

  Each link is always indicated by a succeeding series of four full stops.

- Menus

  The menus can contain both links to sub-menus and parameters.

- Sub-menus

  The sub-menus only contain parameters.

- Parameters

  Parameters are set values which appear in menus and sub-menus. Some only provide information, but others can be edited.

  Uneditable parameters are skipped when browsing.

Navigation in the menus

You can use the buttons or the central wheel to navigate through the menus:

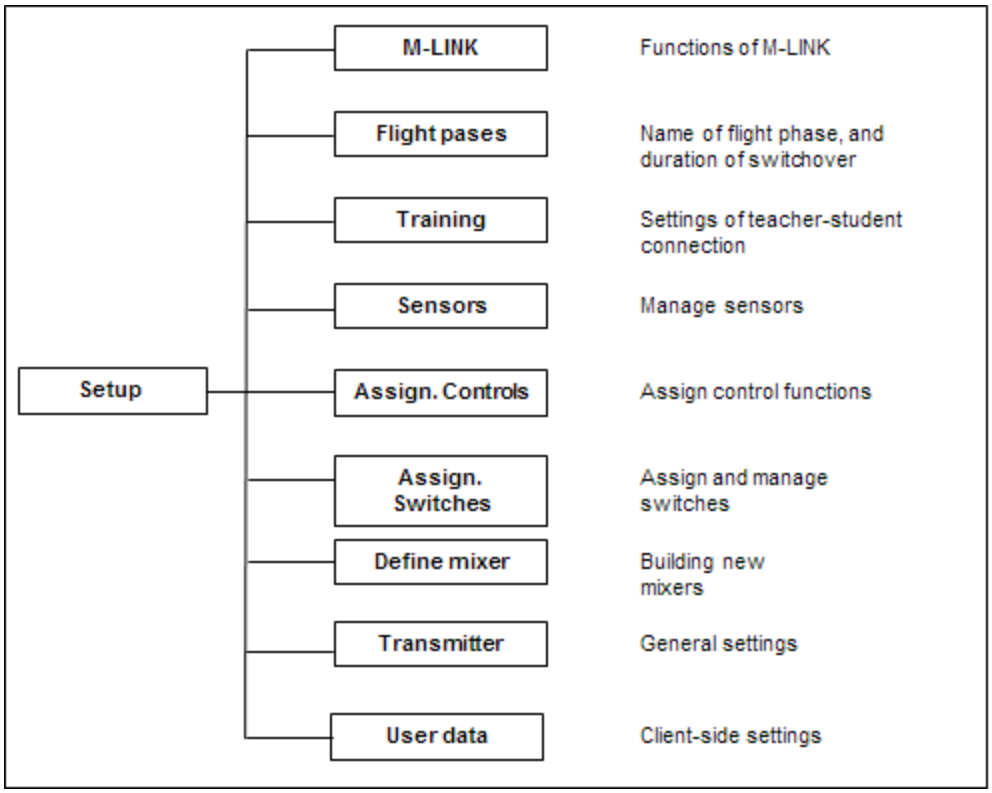
1. Press one of the direct access buttons to open the respective main menu.
2. Use the central wheel or press the **+** or **–** buttons to select a menu item.
3. Press the wheel or the **ENTER** button to access the respective sub-menu.
4. Press the wheel or the **ENTER** button to move to an input field.

Refer to chapter 6 "Operating the transmitter" on page 160 for detailed information on how to navigate in menus and enter values.

A ▼ or ▲ arrow on the left edge indicates that the menu contains more lines than can be displayed on screen.
Continue to browse using the central wheel or the **+** / **–** buttons to scroll to the top or end of the list.

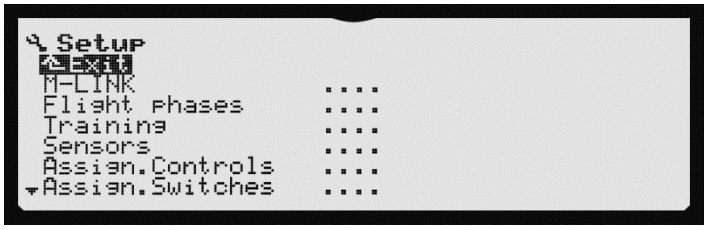
5.3 Setup main menu

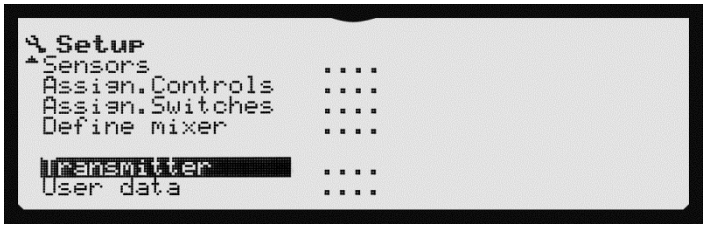
Overview



Opening the main menu

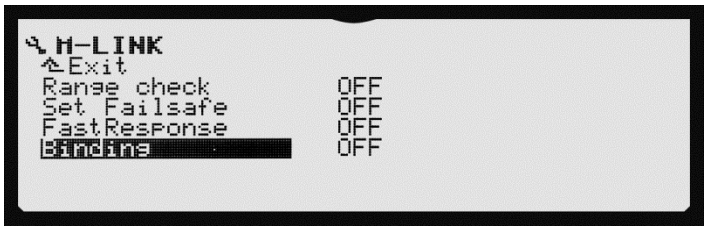
To open the main menu: button





5.3.1 M-LINK

The radio link functions are set in the M-LINK menu.



Range check

When performing a range check, the transmitting power is significantly reduced to allow shorter distances between transmitter and model (see section 3.6 "Range check" on page 47).

Set Failsafe

The current servo positions are stored in the receiver.

If Failsafe positions were stored in the receiver the servos return to these positions after 0.5 seconds.

- Use the respective PROFI TX controls to move the servos (surfaces) of your model to the desired positions.
- Set the value to ON. After a few moments, it reverts to OFF.
- Check the Failsafe function by switching the transmitter off.

FastResponse

FastResponse reduces the transmission cycle from 21 ms to 14 ms. This reduces the response time for control commands. Only 12 servos can be controlled when FastResponse is active.

NOTICE Not all servos work properly with FastResponse. Incompatible servos may vibrate excessively in idle position. Check your servo before starting off on the first flight.

FastResponse has a noticeable effect only on extremely agile models that are equipped with fast servos.

Binding

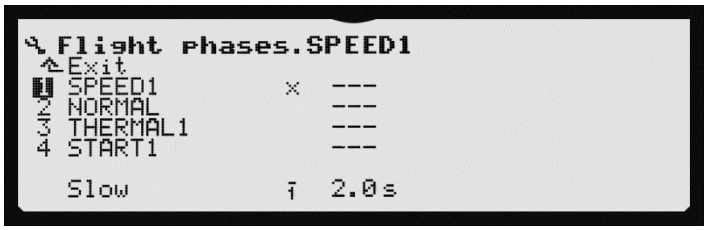
- Activates the binding procedure and displays the current binding status (see section "Binding" on page 48).

RX-ID:	The binding procedure is completed. If the receiver has an ID, this ID number is displayed.
seeking ...	The device is locating the receiver, the binding procedure is in progress.

5.3.2 Flight phases

It is useful to have different settings and trims for specific flight phases when flying models. The flight phases technology in the PROFI TX provides an easy and convenient way to realize this. You can copy settings for one flight phase to another, lock flight phases if they are not needed, assign switches to flight phases, etc.

Refer to section 8.2.10 "Working with flight phases" on page 207 for information on how to work with flight phases, assign switches to flight phases, lock / unlock flight phases, etc.



Flight phase number (1, 2, 3, or 4)

Identifies the flight phase in other menus. In the control function menus, all settings that can differ between flight phases are accompanied by the respective identifying number 1 to 4 for the flight phase.

Flight phase name (e.g. SPEED1)
You can select the designations for the flight phases from a list of 13 pre-set names (see section 8.2.10.5 "Changing flight phase names" on page 210).

After activating the input field for the name, select a suitable name by pressing the **+** / **–** buttons or by using the central wheel.

Locked flight phases are shown crossed out.

×

Identifies the active flight phase.

Switch (e.g. 1>)

Switch that is assigned to the flight phase; the arrow indicates if the left (<) or right (>) switch is associated.

Three dashes "---" indicate that no switch has been assigned for switching between flight phases.

Slow

Transition time to the next flight phase.
Switching flight phases may involve major surface position changes. Sudden major changes e.g. to camber-changing flaps or airbrakes make controlling the model difficult and lead to undesired, hard transitions to the next flight phase. These problems do not occur when the transition is performed slowly. The transition is automatically calculated in such a way that all servos move to their new positions in a synchronized manner and within the selected time frame. The control commands by the pilot are not slowed down.

Possible range: 0.1 to 6.0 seconds

Pressing **REV/CLR**

Locks or unlocks the selected flight phase.

5.3.3 Training (principle)

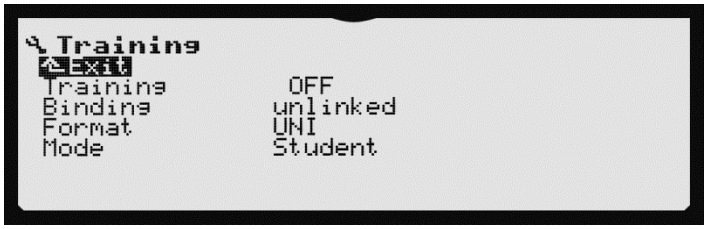
In trainer mode (teacher / student), a wireless connection is established between two Multiplex transmitters via M-LINK.

The teacher transmitter controls the model and must be bound to the model (Binding). The student transmitter transfers the stick signal to the teacher transmitter via M-LINK. The teacher can transfer a freely definable group of control signals to the student.

The teacher transmitter requires a receiving device for the student signal. On older transmitters with DIN socket, the trainer stick is the receiving device; the PROFI TX uses the COPILOT module.

The trainer stick or the COPILOT module are bound in the same way to the student transmitter (Binding) as receivers.

5.3.3.1 Student mode



- Set Training to ON. This activates the training system.
- Set "Format" to MPX if the teacher uses an older Multiplex transmitter that does not support the UNI format.
- Set Mode to Student.
- Now, the student transmitter must be bound to the receiving device of the teacher transmitter. For this, "Binding" must be activated on both sides.
    - Activate "Binding": The display changes to seeking...
    - Now, activate "Binding" on the receiving device of the teacher transmitter. Place the front of the PROFI TX close to the receiving device of the teacher transmitter.
    - After a few moments, the "Binding" display changes from seeking.. to Teacher.

This indicates that the radio link to the receiving device of the teacher transmitter has been established.

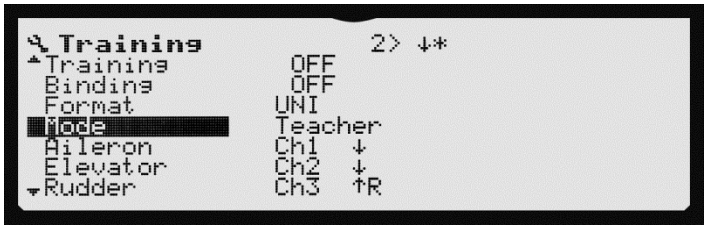
The message STUDENT MODE flashes on the status displays #2 to #8 while the Student mode is active.

NOTICE Both transmitters must use the same Format setting; otherwise, the centre positions of the control signals will differ.

Remember to set "Training" to OFF if you wish to control the model directly.

5.3.3.2 Teacher mode

For Teacher mode, a COPILOT module and an assigned switch are required (see section 3.7 "Trainer mode" on page 50).



- Set "Training" to ON. This activates the training system. In Teacher mode, the COPILOT module is switched on. This increases the power consumption by 30 mA.
- Choose the same servo format setting as on the student transmitter. Otherwise, the neutral positions of the servos will not match.
- Set the Mode menu item to Teacher. This switches the COPILOT module on. The power consumption increases by 40 mA. Now, 7 control functions are displayed below, which can be transferred to the student individually or in groups.
- Activate "Binding" on the student transmitter.
- Open the "Binding" menu item and turn the wheel by one clockwise increment. The display changes from OFF to seeking.. The COPILOT module is now bound to the student transmitter. After a few seconds, the display should change from seeking.. via OFF to Student. If this is not the case, hold the PROFI TX over the aerial of the student transmitter (the COPILOT is positioned below).
- The following elevator example illustrates how control functions are assigned to the student.
    - Open the "Elevator" menu item.
    - Operate the elevator stick on the student transmitter vigorously.

- The servo channel used by the student transmitter for transmitting the elevator signal is displayed next to `Elevator`, usually `Ch2`.
- Check on the model if the rotation direction of the student signal is correct. You can reverse the direction by pressing the REV/CLR button.

⚠ CAUTION Make sure that the model motor cannot start up!

- Close the menu item.

- Repeat these steps to assign all control functions that the student is allowed to control.
- If the teacher switch is switched on and the connection to the student transmitter is established, the student controls the assigned control functions.

Important information:

- If the control functions are transferred to the student, the message `STUDENT CONTROLS` flashes on the status displays #2 to #8.
- If the connection to the student transmitter is lost, all control functions are returned to the teacher.
- Binding can be switched off by rotating the wheel to the left while the menu item is open.

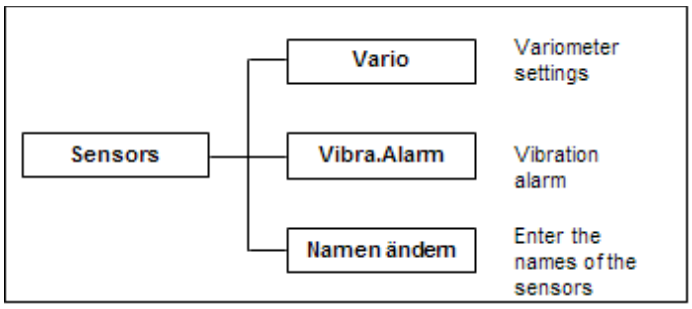
NOTICE Turn OFF the training system after completing the training. Otherwise, the student may inadvertently re-establish the student connection by switching on the transmitter and take control of your model.

Besides, the power consumption of the COPILOT module reduces the operating time.

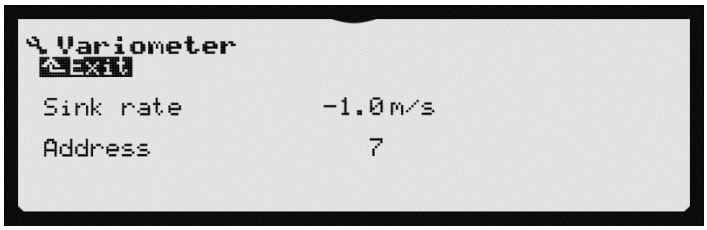
5.3.4 Sensors

You can use the Sensors menu to define or edit sensor names, to configure the setting and sensor address of the variometer and to switch the vibration alarm on or off.

Overview



5.3.4.1 Variometer



Sink rate

Sink rate of your model.

Possible range: -0.1 m/s to -2.0 m/s

How the variometer tones change from climbing to descending is adjusted accordingly:

Climbing

High tone; pitch and interval frequency increase proportionally with the climb rate.

Descending

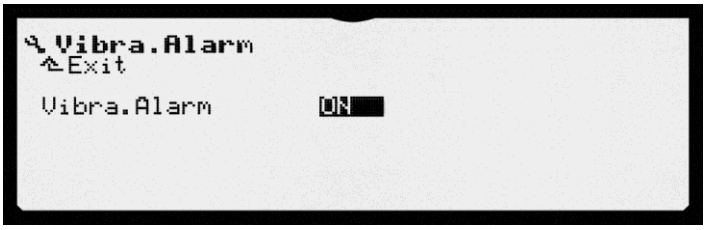
Low tone (hum);

- From "0 m/s" to "Sink rate": pitch and interval frequency are proportional to the climb rate.
- Below sink rate: continuous low tone without interval.
- From "-3 m/s": no tone.

Address

Sensor address of the variometer.

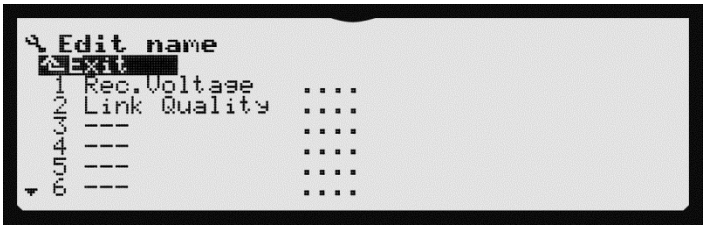
5.3.4.2 Vibra.Alarm



Vibra.Alarm

Activates/deactivates device vibration to report sensor alarms.

5.3.4.3 Edit name

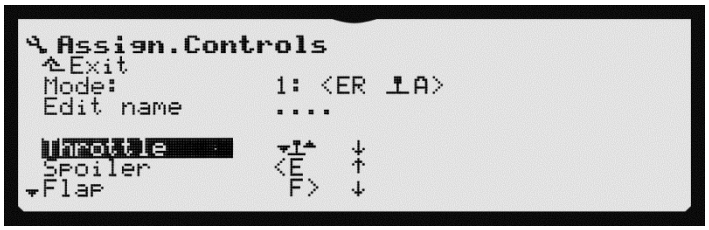


Used to define new sensor names or edit existing sensor names:

1. Select a name or an empty line.
2. Confirm your selection. The sub-menu is opened.
3. Enter a name or edit the name as desired (see section 6.1.3 "Text input" on page 162).
4. Confirm your input.

5.3.5 Assign.Controls

You can use the Assign.Controls menu to assign controls (actuators) to control functions, set the actuation direction, and define or edit the name of control functions.



Ctrl Mode

The controls mode defines how the main control functions are assigned to the sticks (see section "Controls mode" on page 169).

Edit name

You can customise the names of the control functions as needed for your model:

- Select a name or an empty line.
- Confirm your selection. The sub-menu is opened.
- Enter a name or edit the name as desired (see section 6.1.3 "Text input" on page 162).
- Confirm your input.

List of control functions to which controls can be assigned as desired. The control functions "Aileron", "Rudder", and "Elevator" are not included in this list as they are assigned to the sticks using the controls mode.

- Refer to section "Control functions of the model templates" on page 170 for a list of the control functions.
- The freely assignable controls are listed on page 169.

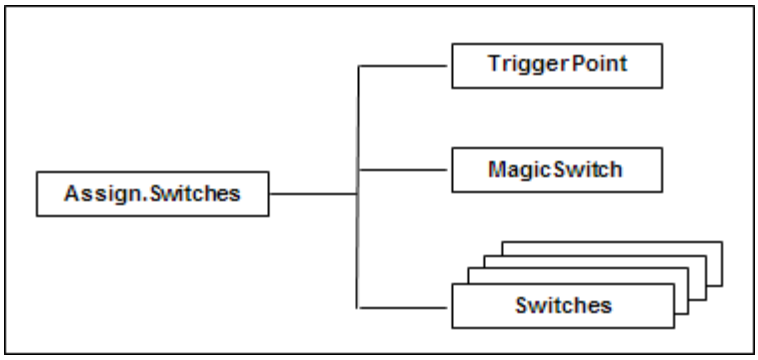
To assign a control function proceed as follows:

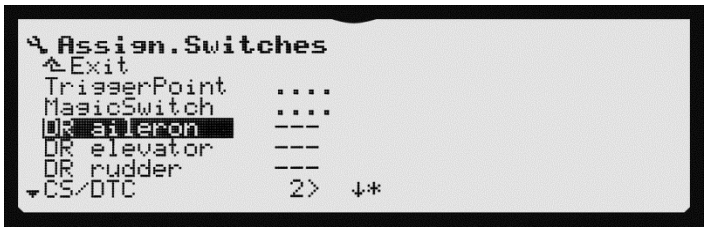
- Open the desired input field.
- Assign a control by pressing the **+** / **–** buttons, by using the central wheel or by operating the control.
- To set the actuation direction keep the control in the desired zero position and close the input field. Alternatively, you can invert or erase the input by pressing the **REV/CLR** button, if required.

5.3.6 Assign.Switches

You can use the Assign.Switches menu to assign the controls to switched functions, set the actuation direction, and configure the control switch and MagicSwitch.

Overview

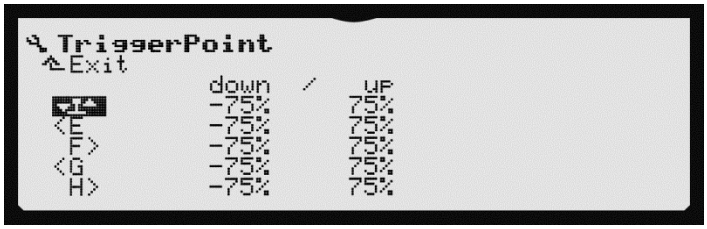




5.3.6.1 TriggerPoint

The TriggerPoint sub-menu shows the analogue controls that can also be assigned as function switches. The switching threshold for the stick and for the sliders E, F, G, and H is set in this sub-menu.

The function switches work like a switch with centre position. For improved functionality, the upper and lower switching thresholds can be configured separately. When the control is positioned between the switching thresholds this position corresponds to the centre position of a 3-position switch.



down / up

Upper or lower switching threshold, respectively

E, F, G, H

Sticks and sliders for which the thresholds are set.

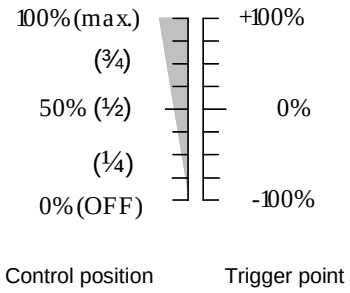
The arrow points to the side on which the control is installed:
left (<) or right (>).

To set a switching threshold proceed as follows:

1. Select the desired control.
2. Open the down switching threshold.
3. Adjust the value by pressing the **+** or **–** buttons or using the central wheel.
4. Open the up switching threshold.
5. Adjust the value.

Using throttle/spoiler as a switch:

The drawing below illustrates the correlation between control position and switching threshold. If you wish to start the motor run time e.g. at ¼-throttle, the threshold for the respective control must be set to -50%.

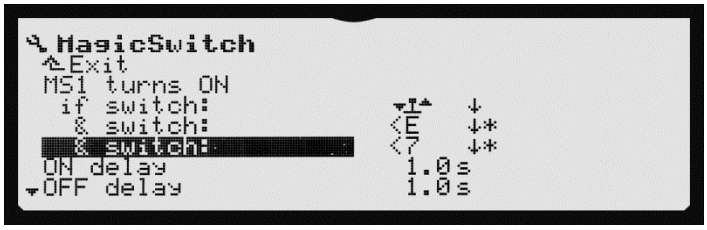


Example - switching on timer at ¼ throttle:

As the values range from -100% to +100% the trigger point for ¼ throttle must be set to -50%.

5.3.6.2 MagicSwitch

You can use the MagicSwitch sub-menu to change the configuration and settings for the two MagicSwitches MS1 and MS2 (see section "MagicSwitch" on page 173).



The following settings are available for both MagicSwitches:

Switch

Switch assignment and combinations.

ON delay, OFF delay

Delay time for switching the MagicSwitch output; OFF and ON delay can be configured separately.

To assign a MagicSwitch proceed as follows:

1. Open the desired input field.
2. Assign the desired switch using the central wheel.
3. Set the switch to the ON position or select it using the **REV/CLR** button.
4. Close the input field.

5.3.6.3 Switch

The following parameters in the menu indicate the switchable functions provided in the software. Refer to section 6.4.2 "Assigning switches" on page 171 for the list of functions.

To assign a control function proceed as follows:

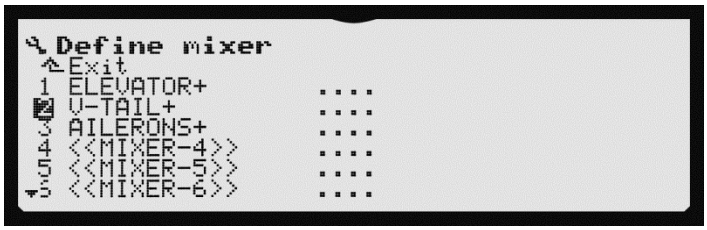
1. Open the desired input field.
2. Assign the desired switch by operating it.
3. Set the switch to the ON position or select it using the **REV/CLR** button.
4. Close the input field.

5.3.7 Define mixer

You can use the Define mixer menu to define how the mixers on the servo side are construed. The parameters are configured in the Mixer menu (see section 5.5 "Mixer main menu" on page 126).

The mixer definition determines the structural design of the mixer. Each mixer can combine up to eight control functions (mixer inputs). A switch can be assigned to every input. The mixer method is defined using options.

The number of mixers depends on the model template selected. Helicopters have 2 of these mixers, all other models have 7. Depending on the template, several mixers are pre-defined and have descriptive names. These names are used to assign the mixer outputs to the servos.



Each mixer has the following sub-menu:

5.3.7.1 Name

The Name parameter shows the name of the mixer.

You can enter a new name or edit the name as desired (see section 6.1.3 "Text input" on page 162).

5.3.7.2 Mixer inputs

The name of the mixer is followed by eight numbered lines with three input fields each.

Control function

You select the mixer input in the first field simply by operating the desired control function. Naturally, this only works if the control (actuator) has a control function assigned. Alternatively, you can use the **+** / **–** buttons or the central wheel to select a control function as mixer input.

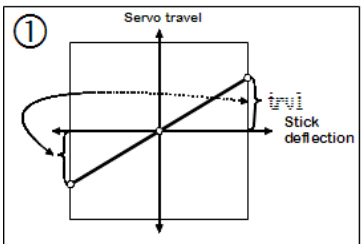
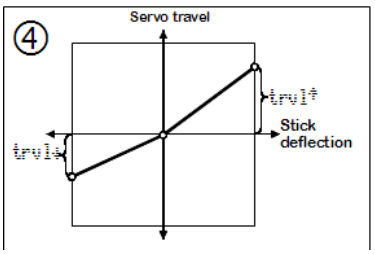
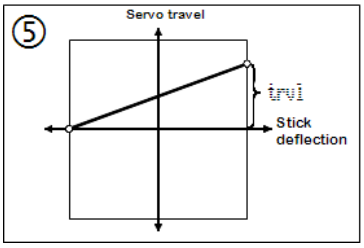
Switch

In the second field the mixer input can be configured as switchable. To do this, simply operate the desired switch. Upon exiting the input field the switch position is ON. The arrow next to the switch name points in the direction of the ON position (↑ or ↓). When the switch is switched on an asterisk "*" appears next to the arrow.

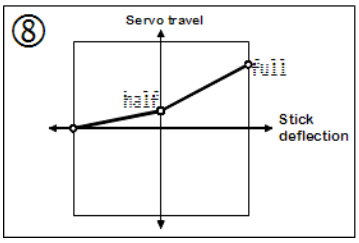
Alternatively, you can assign the switch using the **+** / **–** buttons or the central wheel. The switch can be reversed by pressing the REV/CLR button.

Mixer option

8 options are available for adapting the mixing method. The options are represented by icons:

Icon	Effect	Picture
	The neutral position of the control function is in the centre (ailerons, elevator, rudder). The control travels on both sides of the neutral position are identical.	
	The neutral position of the control function is in the centre (ailerons, elevator, rudder). The travels on both sides of the neutral position can be configured separately.	
	The neutral position is located on one side (end-point) of the control. The end-travel is set.	

The neutral position is located on one side (end-point) of the control. The control travel is set at half and at full travel.

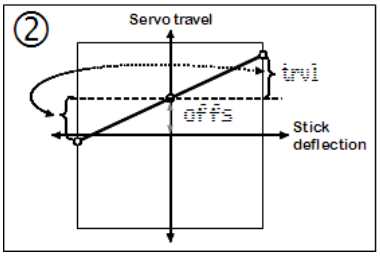


2

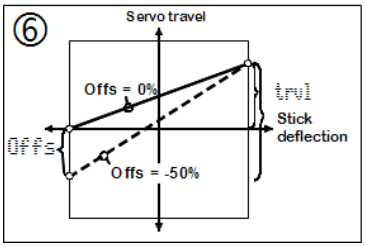
The input control function (usually aileron) changes direction upon each assignment of this mixer to a servo. Example: The aileron moves up on one wing panel and down on the other. This option can be combined with , and Cu.

+

The icon represents the offset. An offset shifts the zero point of the mixer to one side. Example: The ailerons are raised as spoilers. The travel distance up (spoiler) is long, the travel distance down of the aileron is short.



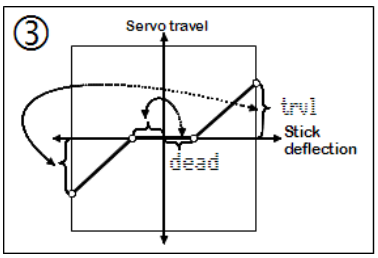
Part of the servo travel remains unused. The offset is used to shift the neutral position of the mixer down. This option can be combined with and .

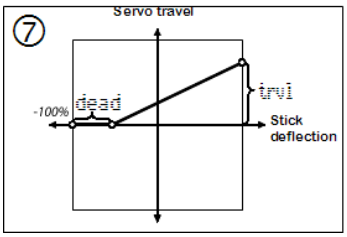


–

The icon represents the deadband. Mixing does not start immediately at the neutral position, but after the control has passed the set deadband.

This option can be combined with and .





Cu	The input passes through a 7-point curve before mixing. You can choose from 8 curves. The same curve can be used for multiple inputs in different mixers. This eliminates extra configuration effort.

When scrolling through the 3rd column of the mixer definition you will see any combination of the icons described above in the following order:

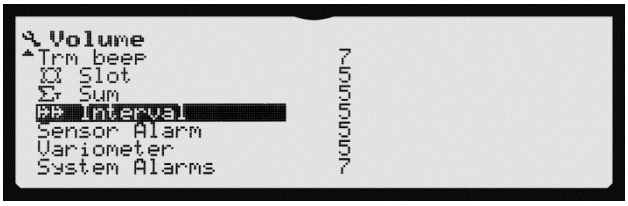
Icon	Effect
⬍ 2	Symmetrical, for surface pairs moving in opposite directions
⬍+ 2	Symmetrical, for surface pairs moving in opposite directions with offset
⬍+	Symmetrical, with offset
⬍− 2	Symmetrical, for surface pairs moving in opposite directions with deadband
⬍−	Symmetrical, with deadband
⬍	Symmetrical
⬍̸	Asymmetrical
⬍̸ 2	Asymmetrical, for surface pairs moving in opposite directions
↓	Single-sided
↓+	Single-sided, with offset
↓−	Single-sided, with deadband
↧	Single-sided, with additional set point at half travel
Cu1 to Cu8	Curve mixer: The mixer input passes through one of 8 control curves.
Cu1 2 to Cu8 2	Curve mixer as described above, for surface pairs moving in opposite directions

5.3.8 Transmitter

You can use the Transmitter menu to configure transmitter-related settings such as audible signals, battery warning threshold, contrast, etc.

The settings in this sub-menu only apply to the transmitter. They are not stored in the respective active model memory on the SD card, but in a dedicated memory area.

Volume



The volume of audible signals can be configured and switched off in groups. For system alarms, it is only possible to reduce the volume.

Battery alarm

Remaining operating time (time to empty) at which the device starts to issue audible warnings.

Possible values: 20 to 60 minutes

Factory setting: 60 minutes

The alarm tone interval reduces with decreasing remaining operating time (time to empty). To save power, the last 5 minutes are indicated by a shortened alarm tone. Please note that several charge / discharge cycles are required before the remaining operating time (time to empty) is displayed accurately.

Screen

Screen settings:

Contrast	Optimise the contrast. Possible values: +8 to -8 Factory setting: 0
Trim graph	Visualisation of the stick trim positions in the lower corners of the screen. Possible values: 0 to 5 (6 designs) Factory settings: 0

Menu direction

Direction of menu navigation (see chapter 6 "Operating the transmitter" on page 160).

5.3.9 User data

Personal data, the PIN for locking data entry, the menu language and free text (max. 32 characters) can be configured in this menu to customise the transmitter according to your needs.

PIN

Any PIN entry that differs from the pre-set value 0000 activates the code lock. Entering 0000 deactivates the lock.
When the code lock is active the user is prompted for the PIN before an input field is opened. The PIN is entered via the buttons on the keypad. The PIN must be known in order to be able to change any settings.
If you have forgotten the PIN the code lock cannot be deactivated: Please contact one of our Service Centres.

After PIN entry, the code lock is activated when the device is switched on again.

- With active code lock, the user is prompted for the PIN when opening an input field.
- Upon entry of the correct PIN, all input fields remain unlocked until the device is switched off again.
- If the wrong PIN is entered the input fields remain locked. The PIN prompt is displayed every time you try to open an input field.

Language

Used for changing the menu language.
In general, language pairs are used: always English and an alternative language (German, French, Italian).

- You can use the update function to change the language pair (see section 7.3 "Software update" on page 176).
- User-configurable texts in the model memories remain unchanged.
- New model memories are created in the new language.

Name

5. Any text, e.g. the name of your device; this text is shown in status display #1 on line 1 (see page 86).
   Max. length: 32 characters.
   Refer to section 6.1.3 "Text input" on page 162 for details.

5.4 ControlFunctions main menu

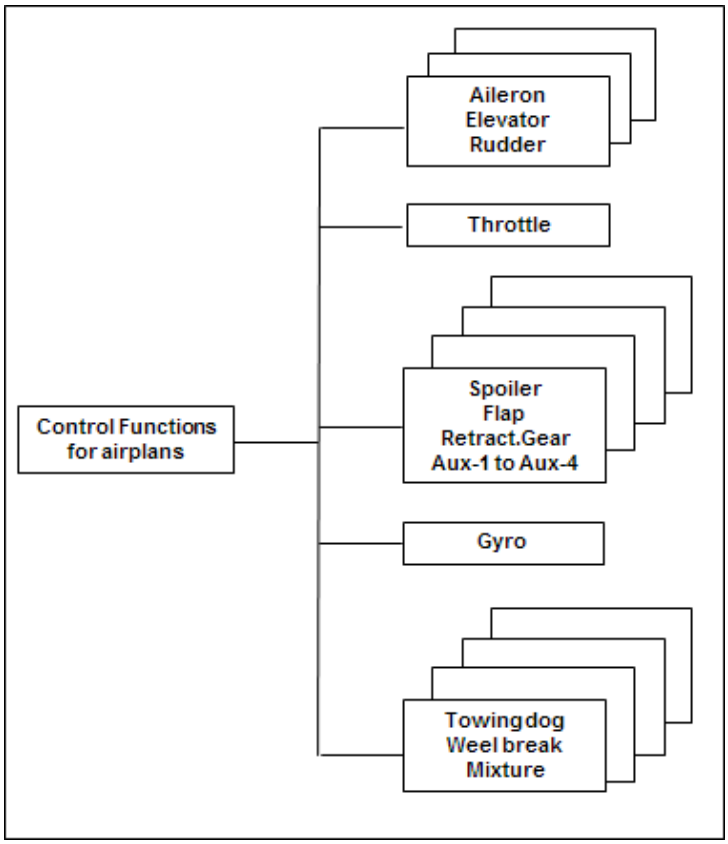
You can use this menu to adjust the settings for control functions, e.g. trims, travels, control curves, etc.

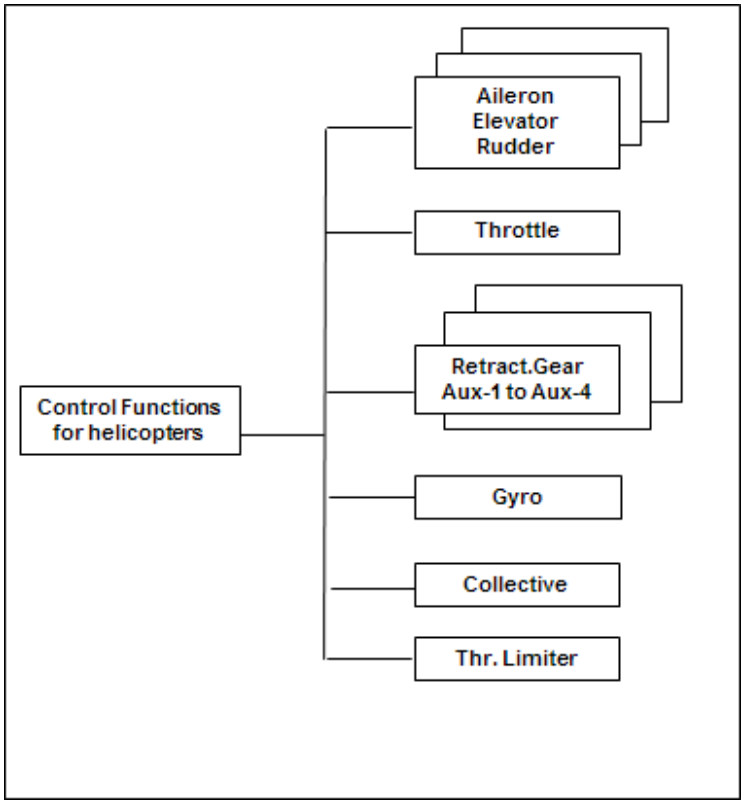
The menu is dynamic:

- It lists only the control functions that are actually used, i.e. the control function must control at least one servo—either directly or indirectly using mixers.
- The menu content differs for vehicle models, fixed-wing models, and helicopter models.
- Control functions that do not have configurable parameters are not shown (Wheel Brake, Mixture, Towing dog).

Refer to section "Control functions of the model templates" on page 170 for a list of the control functions offered by the PROFI TX model templates.

Overview

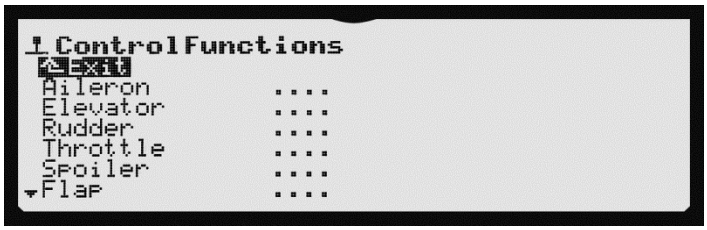




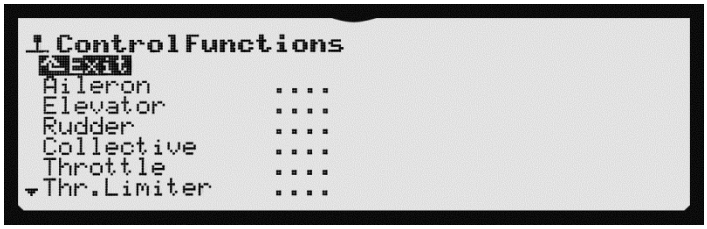
Opening the main menu

To open the main menu: button

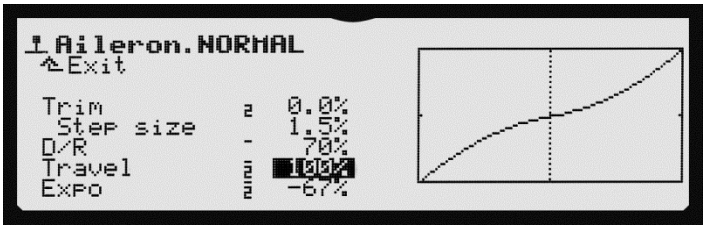
Fixed-wing models:



Helicopter models:



The general screen layout is identical for all menus. This example shows the screen for the Aileron control function:



- Designation of control function and active flight phase

  At the top, the designation of the control function is shown followed by the name of the activated flight phase (in the example: NORMAL).

- Parameter list

  On the left, all parameters for the selected control function are listed with their set values.

  - Values that can be assigned to a digi-adjuster are marked by a horizontal dash preceding the input field (see section 6.3.1 "Allocating a set value" on page 164).
  - The number next to the parameter name identifies the flight phase (in the example: 1) to which this value applies (see section 5.3.2 "Flight phases" on page 94).

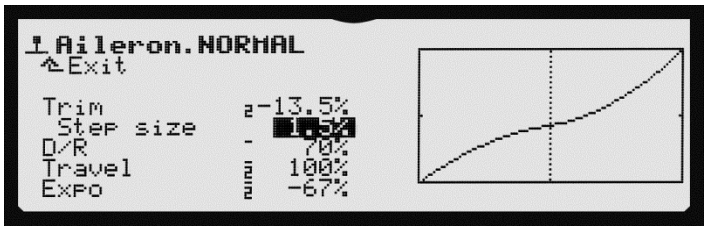
- Graph

  The effect of all settings is visualized in the graph on the right. The graph immediately shows the setting changes and illustrates the behaviour of the function. The dotted vertical line indicates the current position of the control.

5.4.1 Aileron, Elevator, Rudder

The following control functions operate identically:

- Aileron, Elevator, and Rudder for fixed-wing models
- Aileron, Elevator, and Rudder for helicopter models



Trim

Current trim setting of the control in the respective flight phase (only display).

Step size

Trim increment: 0.5%, 1.5%, 2.5%, 3.5%

Step size defines the trim change (in %) per trim increment (see section 3.8 "Digital trim" on page 51).

For general-purpose use an increment size of 1.5% has proved a good compromise. For very fast models with accurate control surface linkages or models with very large control surface travels (e.g. FunFlyers) a trim increment size of 1.5% could be too large. In this case, the Step size can be set to 0.5% providing very fine trim control.

D/R

Dual rate: 10% to 100%

The dual rate setting is used to change the control sensitivity of the control. If the D/R for a control function (e.g. Aileron) is set to 50% you can use the assigned switch to reduce the control surface travels on the model by half for finer control. The control curve in the graph changes accordingly when you operate the switch assigned to D/R.

Travel

Setting for the control travel (flight phase specific): 0% to 100%

You can influence the control sensitivity of a control during a specific flight phase using the Travel parameter. That means you can configure a different value for each flight phase, e.g. in the flight phase NORMAL = 100% for maximum control surface effectiveness, in the flight phase SPEED1 = 60% for finer control.

Make sure to activate the desired flight phase first before making any changes!

Expo

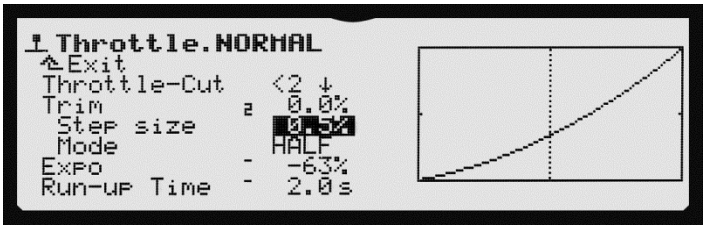
Flight phase specific: -100% to +100%

The Expo parameter can be used to assign an exponential characteristic to a control curve.

- For Expo = 0%, the control works in a linear fashion.
- The effect of negative Expo values is that the control generates smaller control surface travels around the centre position providing finer control.
- The effect of positive Expo values is that control surface travels are increased around the centre position.
- The end-travels remain unchanged when Expo is used. So, full travel is still available when required.

5.4.2 Throttle (fixed-wing models, vehicles, boats, and funcopters)

The Throttle control function provides the following functions for fixed-wing models:



Throttle-Cut

Throttle cut switch for the motor (only display)

Trim

Current trim setting of the control in the respective flight phase (only display).

Step size

Trim increment: 0.5%, 1.5%, 2.5%, see page 115.

Mode

Used for switching the trim from centre trim to idle trim and adjusting the idle height for models with internal-combustion engines.

CNTR	Centre trim. For vehicles with "reverse gear".
HALF	Idle trim; the trim is only effective for idle to half throttle.
FULL	Idle trim; the trim is effective for idle to full throttle.

Expo

-100% to +100%, see page 116.

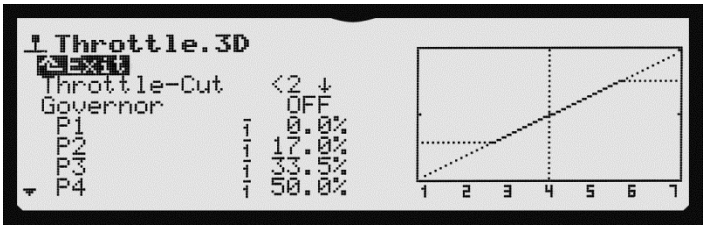
Run-up Time

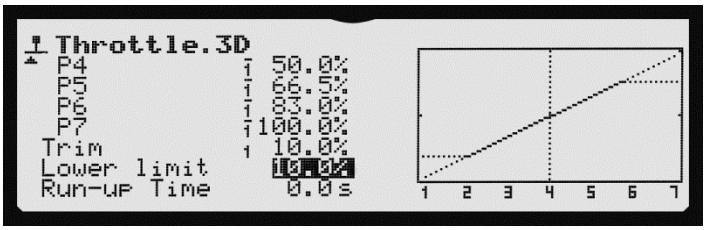
Delay time: 0.0s to 6.0s

As its name implies, the delay time is only effective when the throttle is opened.

5.4.3 Throttle (helicopter)

The Throttle control function provides the following functions for the templates eHELI FBL, eHELIccpm, HELIccpm, and HELImech.:





Governor

Choose between throttle curve or controller with active Governor mode (speed controller).

OFF The throttle curve is used. Individual curves are used for each flight phase.

ON A controller with active Governor mode is used: Each flight phase has a fixed value.

Governor OFF

P1 to P7

7-point curve, flight phase specific:

0.0% to 100.0% (= full throttle) for all points on the curve P1 to P7.

Resolution: 0.5%.

Exception: In the auto-rotation flight phase (AUTOROT) all curve points have the same values.

Refer to section 5.4.3.1 "Throttle curves" on page 119 for a description of the throttle curves.

Governor ON

Throttle

Fixed value, flight phase specific: 0.0% to 100.0%

`Trim`

Display of the throttle trim value

`Lower limit`

Defines the lower limit for the throttle curve to ensure safe idle speed.
This setting is overridden in the auto-rotation flight phase (AUTOROT).
Not required for models with electric power system: Thus, set to `0%`. The flight phase-dependent throttle trim is added to the lower limit and thus increases the lower limit by the trim value.
The horizontal dotted line in the graph shows the position of the throttle limiter in all flight phases.

`Run-up Time`

Slow function for throttle: 0.0s to 6.0s
This parameter defines the time for running up from idle to full throttle. This does not affect the run-down time.

5.4.3.1 Throttle curves (Governor OFF)

For each of the flight phases 1 to 4 a separate throttle curve with 7 points can be configured to achieve optimum adaptation of the motor power to the throttle curve setting for the respective flight phase.

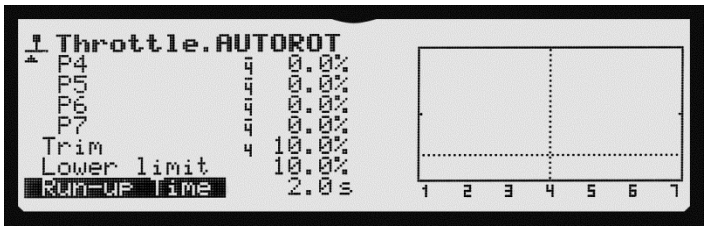
The aim is to achieve a constant system speed over the entire collective pitch range. Ultimate fine-tuning of the throttle curve is only possible in flight and depends on many parameters (motor power, motor setting, power characteristics, setting for the collective pitch curve, rotor blades used, etc.). If a parameter is changed fine-tuning of the throttle curve must usually be repeated.

Tip: Switch a digi-adjuster to the curve point to be configured. Refer to page 164 in chapter "Digi-adjuster" for details.

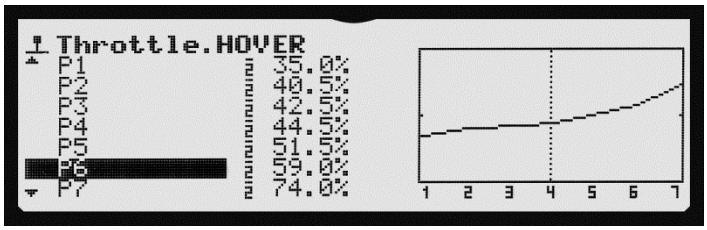
To assist configuration the current position of the collective pitch stick is displayed in the graph as a vertical dotted line.

Special case: auto-rotation

In the AUTOROT flight phase the throttle curve is switched off. All curve points have the same value: You can set the throttle position for auto-rotation at every curve point. The lower limit is switched off. For training with an internal-combustion engine, set a value at which the motor does not yet stop.



Example: throttle curve in the HOVER flight phase

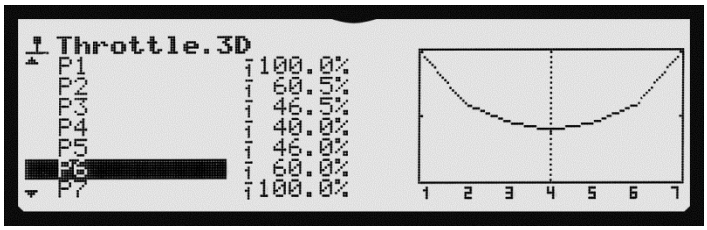


Simple throttle curve for hovering:

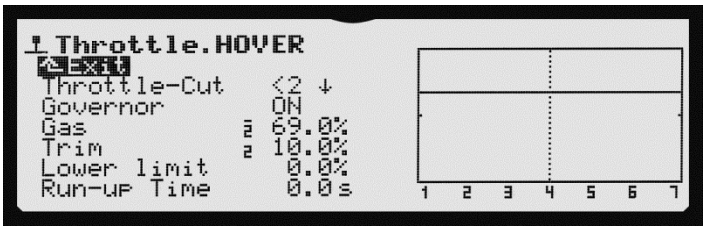
- For a negative collective pitch (= descending) the lowest motor power is required (in the example: P1 = 35%).
- A positive collective pitch (= climbing) requires the highest motor power (in the example: P7 = 85.5%).

Example: throttle curve in the 3D flight phase

Symmetrical V-shaped throttle curve for increased throttle when climbing in normal and inverted flight:



Governor ON for electric helicopters with brushless motors in Governor mode

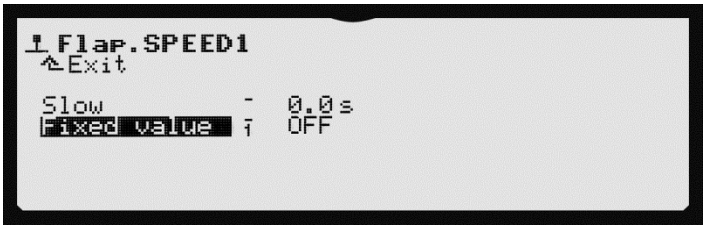


In Governor mode, the speed controller (governor) provides for a constant system speed. It merely requires a fixed value for the required system speed in the respective flight phase. The throttle curve can be switched off in the ControlFunctions > Throttle menu by choosing the setting Governor = ON.

5.4.4 Spoiler, Flap, Retract.Gear, Speed, Aux-1 to Aux-4

The following control functions operate identically:

- Spoiler, Flap, Retract.Gear, and Aux-1 to Aux-4 for fixed-wing models
- Spoiler, Speed, Retract.Gear, and Aux-1 to Aux-4 for helicopter models



Slow

Slow function: 0.0s to 6.0s

You can use this parameter to reduce the actuation time for the control function; i.e. the connected servos travel from one end to the other during this time.

Fixed value

Flight phase specific: -100%.. 0, OFF, 0.. +100%

Allows setting a control function to fixed positions that are dependent on the flight phase. If OFF is selected the function is controlled by the assigned control, provided an assignment exists. If this is not the case, refer to page 101.

Example of the Flap control function

Objective: Fixed, optimised flap position (camber) in specific flight phases.

You use 3 flight phases: SPEED1, NORMAL, THERMAL1.

Preparation: Use the GLIDER+ model template. A 3-position switch must be assigned to the phases 1-3 for switching between the flight phases (see page 104).

Open the Controls > Flap menu item. To begin with, set estimated values for the Fixed value of the flight phases SPEED1 and THERMAL1. Retain the value OFF for the NORMAL flight phase. Allocate a digi-adjuster (see page 164). The allocation applies to all flight phases.

Now, you can use the digi-adjuster to optimise the camber in flight from the status display. If OFF is selected, the digi-adjuster has no effect: The flaps are controlled by the assigned control. When the optimum camber has been identified allocation of the digi-adjuster can be erased (see page 166).

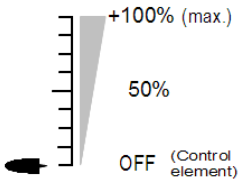
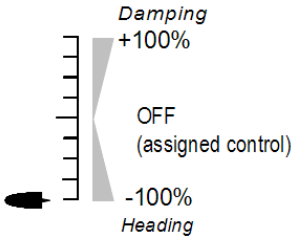
5.4.5 Gyro

This control function is used to control the sensitivity of a gyro. You can select a different sensitivity setting for each flight phase. Alternatively, you can control the sensitivity using a control (actuator). To this end, simply set the sensitivity to OFF and assign a control to the Gyro control function in the Setup > Assign.Controls menu.

Select the gyro model used in Type of Gyro. If your gyro is heading-hold capable, the gyro type Heading must be selected even if you only use the damping function.

The following table lists the characteristics and differences between the two gyro systems:

Damping gyro	**Heading-lock gyro**
This gyro type **dampens** the rotational movement of a model around the axis to which the stabilisation is applied. To maintain good control of this axis the damping effect should be reduced proportionally with stick travel. The reduction level is configured by selecting a setting between 0 and 200% for the Suppression parameter. The servo pulse of the gyro channel	This gyro type supports two operating modes: "Damping" and "Heading". You can switch between the modes by changing the prefix for the sensitivity setting. The gyro operates in Damping mode (as described in the opposite column) if the sensitivity setting is a positive value. In Heading-lock mode the control signal for the axis to be stabilised is used as

covers the entire setting range. The sensitivity setting ranges from 0% ... 100%: 	the setting for the rotational speed around this axis. In neutral position the rotational speed is maintained at zero: The model always points in the same direction. The sensitivity setting ranges from -100% ... +100%: 

Fixval.Sense

With this parameter, a fixed gyro sensitivity is set for each individual flight phase. Alternatively, a control can be used. If this is preferred, set the sensitivity to OFF and assign a control to the Gyro control function. Refer to page 101 for more details regarding controls assignment.

- The following applies to pure **Damping gyros**: Adjustment range: 0% to +100%
- The following applies to **Heading gyros**:

  Adjustment range for heading-hold: -100% to -1%
  Adjustment range for damping: 0% to +100%

Only the value of the activated flight phase can be displayed. When implementing changes make sure to activate the desired flight phase first.

The next line indicates if a heading gyro operates in Damping or Heading mode.

If the sensitivity parameter is set to OFF and a control is assigned to the "Gyro" control function, the value supplied by this control and the respective identifier (<E) are displayed next to it on the right. If no control is assigned, nothing is displayed and the sensitivity setting is zero.

Suppression

In Damping mode, the gyro also counteracts intentional control commands. For improved control, the gyro sensitivity can be suppressed proportionally to stick travel using this parameter. This function is already integrated in many gyros. In this case, retain the value OFF.

Adjustment range: OFF to 200%

The setting 200% reduces damping to 0% at half stick travel. If the gyro has its own suppression function, set the value to OFF.

Controlled axis

Here, you select the control function on which the gyro takes effect in the model.

- In Heading-hold mode, the trim for this control function is switched off. For helicopters, the static tail rotor compensation using the TAIL ROTOR mixer is also switched off.
- In Damping mode, the selected control function is used to reduce the level of damping (suppression).

If you are using a Heading-hold gyro, you must check whether the gyro operates in the displayed mode before operating the model. Make sure that the model motor cannot start up. Then, switch on the receive system and the gyro.

- Set the sensitivity to a mid-range negative value: "Heading" is now displayed for mode.
- Hold the rudder or tail rotor stick in an end position.

If the rudder or tail rotor moves to an end-point, the gyro operates correctly in Heading-hold mode.

If this is not the case, the gyro operates in Damping mode: The rotation direction of the Gyro servo channel must be reversed! The respective procedure is described on page 139.

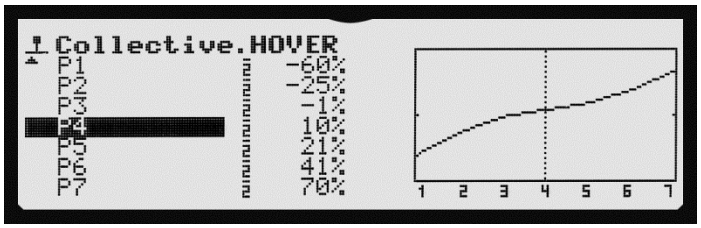
5.4.6 Collective (only helicopters)

The Collective control function is only available for helicopter models that are controlled using collective pitch. The curve for the "Collective" control function is set here.

A separate collective pitch curve with 7 curve points is provided for each flight phase.

Refer to section 8.2.9 "Setting the collective pitch curve" on page 206 for examples of collective pitch curves.

To assist configuration the current position of the collective pitch stick is displayed in the graph as a vertical dotted line.



P1 to P7

7-point curve, flight phase specific:
-100% - 0% - +100% for all curve points P1 to P7

Only the collective pitch curve of the activated flight phase can be displayed. When modifying collective pitch curves make sure that the desired flight phase is activated.

5.4.7 Thr.Limiter (only helicopters)

The Thr.Limiter control function is only available for helicopter models. To ensure a safe setup of the helicopter, you can use the throttle limiter to restrict the throttle towards full throttle.

You define the time needed for the throttle limiter to run up.

Adjustment range: 0.0s to 6.0s

5.5 Mixer main menu

You configure the mixers in this menu.

The menu is partially dynamic:

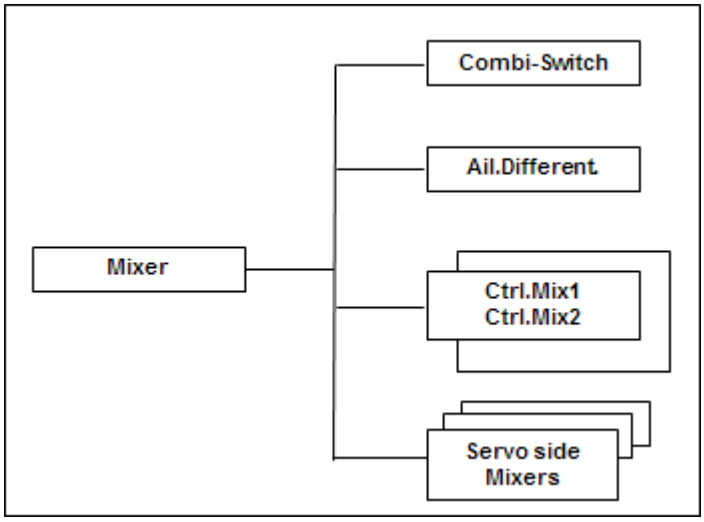
- The menu content differs for fixed-wing models and helicopter models.
- Mixers on the servo side are only listed if they are in use, i.e. they are assigned to a servo.
- Mixers on the control side are always listed, e.g. "Combi-Switch", "Differnt.Ail".

Opening the main menu

To open the main menu: button

5.5.1 Fixed-wing models

Overview



- The mixers `Combi-Switch`, `Differnt.Ail`, and `Ctrl.Mix` are always listed.
- Mixers on the servo side are only displayed if they are defined in the `Setup` > `Define mixer` menu.

5.5.1.1 Combi-Switch

The Combi-Switch couples aileron and rudder in a way that allows both of the control functions to be controlled by either of the functions. This makes it easier to fly accurate turns.

The Combi-Switch can be configured for specific flight phases. You define the associated switch in the Setup > Assign.Switches menu using the CS/DTC parameter (see section 5.3.6 "Assign.Switches" on page 102).

Ail > rudder or Ail < rudder

Percentage of the respective control function (%).

Increment: 2%

Adjustment range:

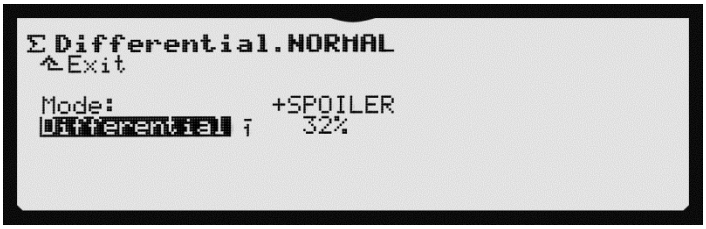
-200%	OFF	+200%
Ail < rudder	Default	Ail > rudder

Switch

The switch used and its respective switch position are displayed here.
(In the example: <2, on the left side of the transmitter, ↓ = switched on when back)

5.5.1.2 Differnt.Ail

You use the Differnt.Ail menu to configure the aileron differential. Refer to section 8.1.3.1 "Configuring aileron differential" on page 183 for differential information.



Mode

Possible values:

OFF	Differnt.Ail off
ON	Differnt.Ail on
+SPOILER	The +SPOILER mode should be selected if the ailerons are raised to use them as additional landing aid. This suppresses the differential when operating the landing aid (Spoiler control function). As a result, the aileron travels are not reduced in the downward direction, enhancing aileron response during landing.

Differnt.Ail

Flight phase specific setting for the differential level.
If the differential is incorrect (aileron travel is reduced in upward direction instead of downward), reverse the value (**REV/CLR** button).

5.5.1.3 Ctrl.Mix

Two control mixers are provided for fixed-wing models. They mix the signal of any second (Source) control function into any (Target) control function. The mixer takes effect on all servos that are connected to the target control function directly or via mixer.

Travel+ / Travel-

Mixing level.

Increment: 1%

Adjustment range: -100% - OFF - +100%

Source

Control function to be mixed in. The mixer is added without any control settings (Expo, D/R, Travel, Trim).

Target

Control function to be mixed into the Source.

Switch

Switch for deactivating the mixer. Without the switch the mixer is switched on.

All three components Source, Target, and Switch can be selected by operating a switch, using the central wheel or pressing the **+** or **-** button.

Press the **REV/CLR** button to erase Source and Target. The Switch is inverted when pressing the button the first time and erased when the button is pressed again. Pressing the button a third time restores the original setting.

Zero point

Possible values:

↕ –> ↕	Source with centred zero point, to Target with centred zero point. Each side can be configured separately using Travel+ and Travel–.
↕ –> ↓	Source with centred zero point, to Target with zero point located at one end of the associated control. The zero point was defined during controls assignment. Each side can be configured separately using Travel+ and Travel–.
↓ –> ↕	Source with zero point located at one end of the associated control. The zero point was defined during controls assignment. The Target has a centred zero point. The mixing level is configured using Travel+. Travel– has no effect.
↓ –> ↓	Source with zero point located at one end of the associated control to a Target of the same type. The zero points were defined during controls assignment. The mixing level is configured using Travel+. Travel– has no effect.

5.5.1.4 Mixers on the servo side

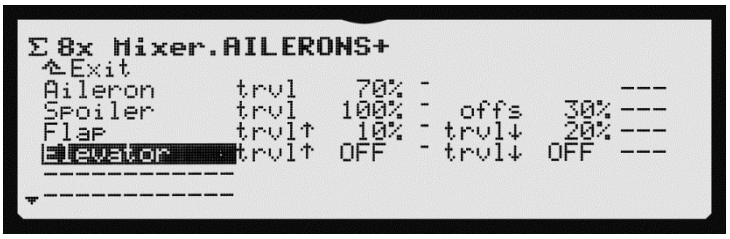
"Mixers on the servo side" combine up to 8 control functions in one common output signal. You can assign a unique name to each mixer. It is possible to assign the output signal to one or more servos using the name of the mixer.

For safety reasons, the mixers are defined and configured in separate main menus.

In this menu, only the travels and other parameters are configured. Only mixers are shown that are actually used, i.e. that are assigned to a servo.

The mixers are defined in the Setup > Define mixer menu (see section 5.3.7 "Define mixer" on page 105).

The following example of the AILERONS+ mixer, which is used in the GLIDER+ model template, illustrates how mixers on the servo side are configured.



Each line on the screen has 2 input and 2 display fields:

Aileron: The aileron travel in an upward direction is set here. The differential is set using A.-Differential. Observe the directions of stick and rudder: Reverse the travel using the REV/CLR button, if required. In addition, check the differential direction. Level and direction can be adapted for all aileron inputs using the A.-Differential mixer. If "Spoiler" is mixed in, you should switch the differential mode to +SPOILER.

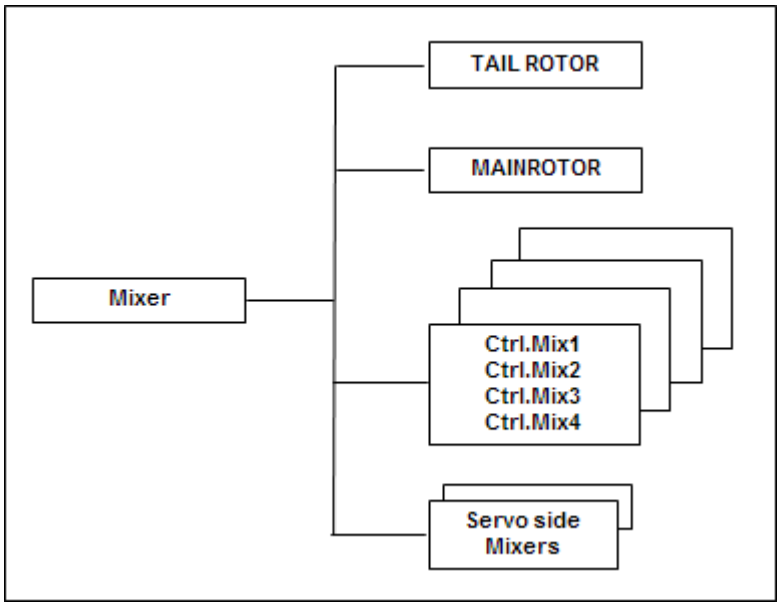
Spoiler: The end-travel of the spoiler on the aileron is configured in addition to full travel. The direction is determined by the prefix of the set value.
Apply an offset (offs) to shift the zero point of the output signal to make full use of the servo travel (always in opposite direction of the spoiler).

Flap: Configure the rudder travels separately for up and down using the two set values.

Elevator: The input is used untrimmed. Configure the rudder travels separately for up and down using the two set values. Usually, this mixer should be switchable. As we do not know the type and location of the switches installed in your transmitter it is not possible to assign switches in the templates. However, you can assign switches in the Setup > Define mixer menu (see section 5.3.7 "Define mixer" on page 105).

5.5.2 Helicopter models

Overview



- The 4 Ctrl.Mix mixers are always shown.
- The other mixers are only displayed if at least one servo is assigned.
- In the model templates HELImech., HELIccpm, and eHeli FBL, the TAIL ROTOR mixer is assigned to a rotor and is, therefore, shown here.
- Servos are assigned to the main rotor mixers in the HELIccpm template; as a result, MAINROTOR is displayed here.
- The MAINROTOR mixer is shown if it is assigned to one of the servos MAINROTOR-R., MAINROTOR-L., MAINROTOR-F, or MAINROTOR-B.
- If you remove the TAIL ROTOR and/or the MAINROTOR mixer from the servo assignment, the corresponding mixers also disappear from the menu.

5.5.2.1 TAIL ROTOR

Mixer for the tail rotor. Refer to section 8.2.6 "Checking and adjusting the tail rotor" on page 201 for information on how to check and adjust the tail rotor and for a detailed description of the workflow for the TAIL ROTOR mixer.

Preparations

- To display the TAIL ROTOR mixer in the Mixer menu the TAIL ROTOR must be assigned in the Servo > Assign menu (see section 5.6.2 "Assignment" on page 142).

- A 2-point calibration is sufficient for TAIL ROTOR. Take care that the servo is not stalled (mechanically obstructed) at its end-points (P1, P5)!

All settings for throttle and collective pitch must be completed before the TAIL ROTOR mixer is configured. Subsequent changes usually require a correction.

The TAIL ROTOR mixer is only activated in the Damping mode of the gyro. In Heading mode, it is switched off (see section 5.4.5 "Gyro" on page 122). If you do not use Damping mode, you can replace the mixer with the RUDDER control function (Servo > Assign main menu, see section 5.6.2 "Assignment" on page 142).

Coll.+ / Coll.-

Separate configuration of the collective pitch mixers for the tail rotor when climbing and descending:

- Coll.+: correction for climbing
- Coll.-: correction for descending

The exact values can only be established through a programme of flight testing, and vary according to many parameters.

Rudd.Diff.

Reduce tail rotor travel in one direction.

Offset

Pitch angle (offset) for the tail rotor to compensate for the torque at 0º collective pitch (main rotor).

Zero point

The origin for the static tail rotor compensation mixer.

Starting from this collective pitch setting angle in the direction of "climbing", the "Collective -> Tail rotor" mixer is added using the value set for Coll.+. The value set for Coll.- is applied in the other direction (descending).

5.5.2.2 MAINROTOR

You control the main rotor of your helicopter model with the MAINROTOR mixer. The PROFI TX features a universal swashplate mixer (CCPM) which can be used to control all types of swashplate fitted with three or four linkage points / servos.

Refer to section 8.2.5 "Checking and adjusting the main rotor" on page 197 for information on how to check and adjust the main rotor and for a detailed description of the workflow for the MAINROTOR mixer.

To ensure that the swashplate moves in the required manner, the swashplate servos must be connected to the receiver in the correct sequence. The channel assignment varies according to the selected servo assignment and can be viewed at any time in the Servo > Assign menu (see section 5.6.2 "Assignment" on page 142):

Servo	Description
MAINROTOR-FB	Front or back swashplate servo
MAINROTOR-L.	Left swashplate servo (as seen from the tail)
MAINROTOR-R.	Right swashplate servo (as seen from the tail)
MAINROTOR-4	Fourth swashplate servo, only useful when installed at 90°.

Geometry

Angle between the MAINROTOR-FB swashplate servo and the lateral MAINROTOR-L. / MAINROTOR-R. servos.

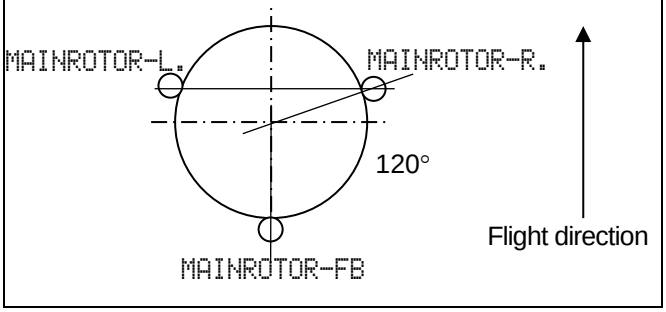
Adjustment range: 90 to 150º / -90 to -150º

Default: 120º

The angle must be entered with a negative prefix "-" if the MAINROTOR-FB servo is at the front when seen from the tail (see example 2).

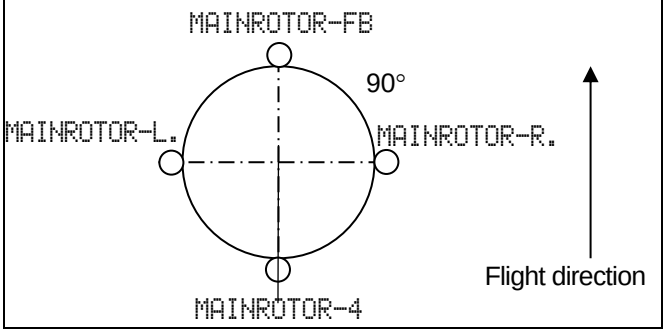
Example 1: 3-point 120º swashplate

Geometry	+120°
Rotation	+0°



Example 2: 4-point 90º swashplate

Geometry	-90°
Rotation	+0°

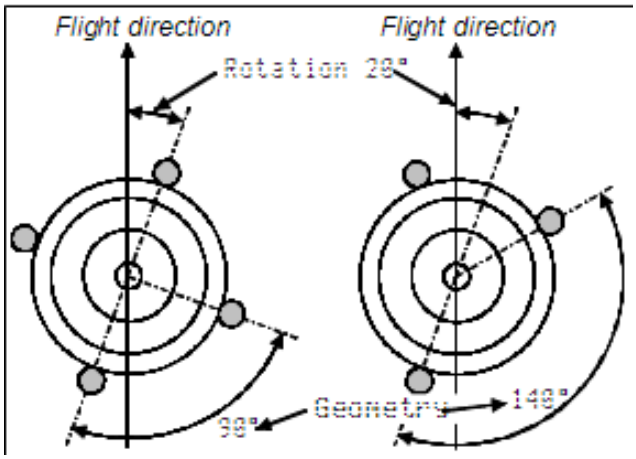


Rotation

Virtual swashplate rotation; the parameter is required in the following cases:

- The swashplate is physically installed in the model in such a way that the MAINROTOR-FB servo is not located on the centreline.
- The model rolls (aileron movement) when an elevator control command is given, and vice versa.

- If virtual rotation is required in the clockwise direction (when swashplate is viewed from above): negative values for rotation
- If virtual rotation is required in the anti-clockwise direction (when swashplate is viewed from above): positive values for rotation



Lever +/-

Only required for 3-point swashplates whose linkage points are not equi-distant from the rotor shaft centre for mechanical reasons.

The difference is set as a percentage (%) of the radial distance (from rotor shaft centre to the linkage point) between the MAINROTOR-FB and the lateral MAINROTOR-L. / MAINROTOR-R. servos. The lateral levers are set to 100%.

Adjustment range: -100% - 0° - 100%

Default: 0%

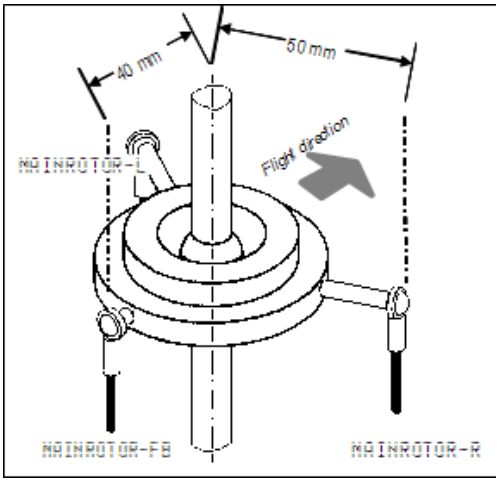
Example

Distance for MAINROTOR-FB: 40 mm

Distance for MAINROTOR-R. / MAINROTOR-L.: 50 mm (= 100%)

The lever for the fore-and-aft linkage (MAINROTOR-FB) is 20% shorter than the levers for the two side-mounted linkages.

So, you apply the following setting: Lever +/- -20%.



TIP

Once you have entered the mechanical values of the swashplate as parameters for the MAINROTOR mixer, the next step is to carry out a careful and thorough calibration of the head servos in the Servo > Calibrate menu (see section 5.6.1 "Calibrate" on page 139).

This step is essential to ensure accurate swashplate control. The direction of servo rotation can be checked using collective pitch control commands. If servos rotate in the wrong direction, you will need to reverse the rotation direction (**REV/CLR** button). It can be useful to disconnect the pushrods between the swashplate and the rotor head for the servo calibration process, as this makes it easier to calibrate the maximum travels (P1, P5).

The control travels for Aileron, Elevator, and Collective are then configured in the ControlFunctions menu (see section 5.4 "ControlFunctions" on page 112).

TIP: Helicopters with Heim mechanics

If you wish to fly a helicopter fitted with the HEIM mechanical system, proceed as follows:

1. Select the HELIccpm template for the new model.
2. Change the MAINROTOR-FB assignment to Elevator in the Servo > Assign menu. Now the front/back swashplate servo is controlled directly by the Elevator.

Set Geometry to 90° in the MAINROTOR mixer. This means that the MAINROTOR-L. / MAINROTOR-R. servos are only controlled by the Aileron and Collective functions.

5.5.2.3 Ctrl.Mix

These "mixers on the control side" mix the signal of any second (Source) control function into any (Target) control function. The mixer takes effect on all servos that are connected to the target control function either directly or via mixer. In helicopters, these mixers are typically used for throttle compensation. Four of these mixers are provided in the helicopter templates.

Refer to page 128 for a detailed description of the Ctrl.Mix mixers.

5.5.2.4 Mixers on the servo side

"Mixers on the servo side" are mixers that combine up to 8 control functions in one common output signal. Their output signals can be assigned to one or more servos. The mixers are defined in the Setup > Define mixer menu (see section 5.3.7 "Define mixer" on page 105).

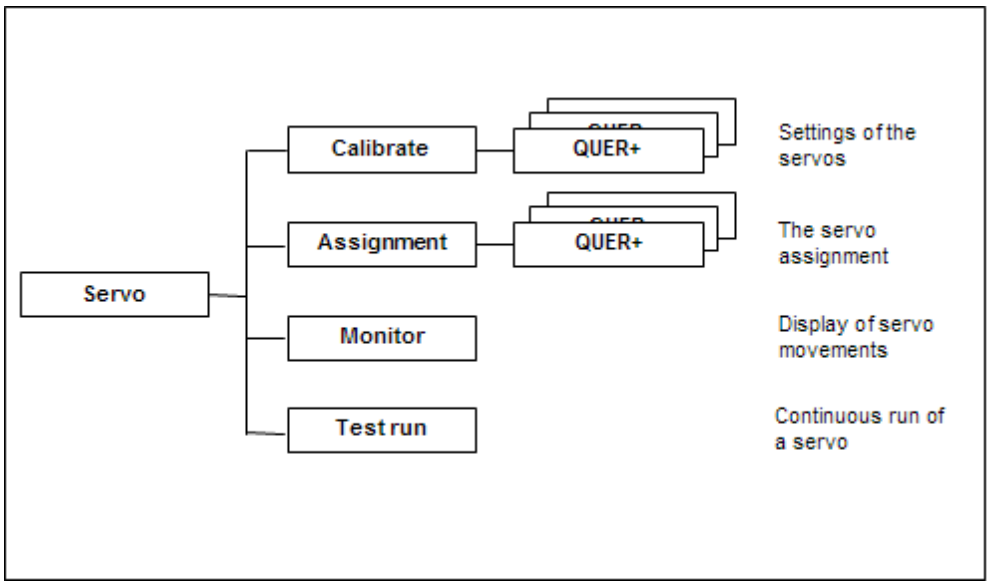
If they are assigned to a servo, these mixers can be configured in the Mixer menu according to the requirements of the particular model.

Refer to page 130 for instructions on how to configure mixers on the servo side.

5.6 Servo main menu

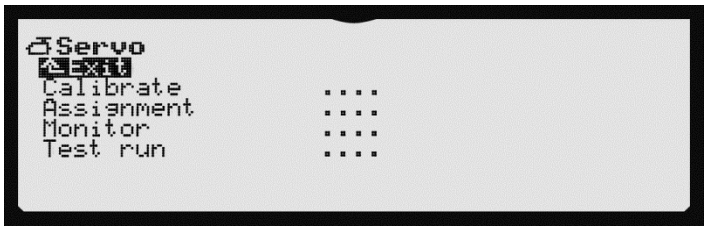
You can use this menu to configure, manage and monitor servos.

Overview



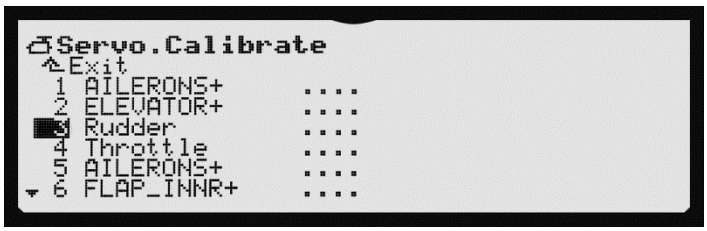
Opening the main menu

To open the main menu: button



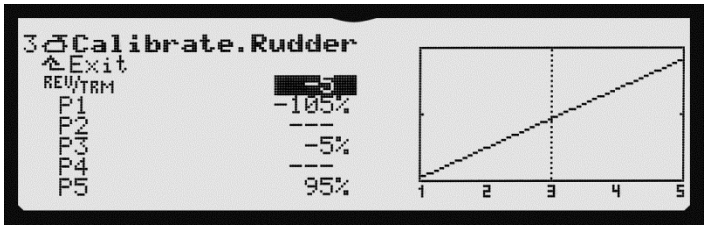
5.6.1 Calibrate

You can use the Calibrate menu to adjust the travels, centre and any intermediate points for all servos so that they move evenly and run to the end-points required.



The menu shows a list of all the servos which can be used with your transmitter type (9, 12, or 16 servos).

The sub-menu is identical for all servos.



Any parameter changes are immediately reflected in the graph. The channel number (receiver output) of the selected servo is shown above the graph.

REV/TRM

The REV/TRM parameter has two functions:

- Servo reverse (REV) changes the direction of servo rotation.
  To reverse the direction of servo rotation "open" the end-point and press the **REV/CLR** button: The entire curve is "reversed" and the prefixes of all curve points change.
- Servo trim (TRM) shifts all points on the servo curve in parallel. Use the wheel or the +/- buttons to adjust the trim.

The set trim value results in a parallel shift of the curve. The curve points are limited to +/- 110%. The shape of the curve remains unchanged until the limit is reached. The effect is the same as the standard trim procedure.

TRM must only be used for corrections during operation!

Use the TRM servo trim only to compensate for deviations from the neutral position of a servo that are identified during operation. When configuring a new model it is better to define the points separately.

P1 to P5

The number of configurable servo calibration points (min. 2, max. 5 points) varies according to the setting selected when initially assigning the servos (see section 5.6.2 "Assignment" on page 5.6.2).

You can resolve several issues by making adjustments to the servo calibration points (parameters P1 … P5):

- Establish the maximum working range of the servo:
  The servo travels set at this point are never exceeded by the transmitter (protection from mechanical servo stalling, limit).
- Compensate for mechanical differences in the rudder linkage:
  For example, adjust the flaps in a multi-flap wing so that they match.

NOTICE Servo calibration should only be used for fine-tuning. Careful and thorough mechanical adjustment is strongly recommended.

Never reduce the maximum servo travels (P1 and P5) by more than approx. 30%. Otherwise, available servo power is wasted, you will forfeit servo resolution and the play in the servo gearbox will be amplified unnecessarily.

Procedure

1. Adjust the direction of servo rotation.
   - Servos controlled by basic functions (e.g. Aileron, Elevator, Rudder, ...):

     First, check that the rotation direction of the controlled surface correlates to the control movement. If required, change the rotation direction in the REV/TRM parameter (**REV/CLR** button).

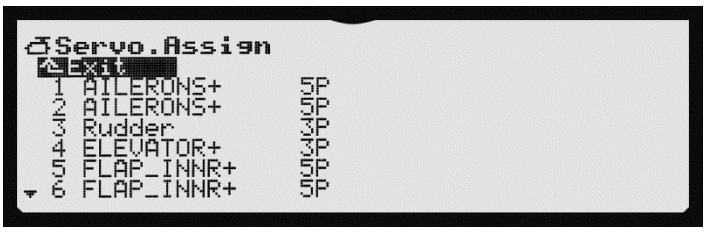
     If the rotation direction is changed later, you will need to re-calibrate it.
   - Servos controlled by mixers (e.g. AILERONS+, DELTA+, V-TAIL+, ...):
     In the case of servos to which a mixer has been assigned, the direction of servo rotation is initially irrelevant. The correct direction can be set later in the mixer. However, for paired control surfaces—e.g. ailerons with mixers—the ailerons must rotate in opposite directions. If this is not the case, one of the servos must be reversed.
2. Select a calibration point (P1 to P5) and open the input field.
3. Press the allocation button for the digi-adjusters.
   The servo—and all the other servos to which the same control function or mixer is assigned—automatically assume the position corresponding to the percentage figure at the selected calibration point.
   With one hand you can easily and conveniently measure and check the control surface travel (ruler, calliper), while the other hand remains free to change the value using the wheel.
4. If the travel is correct, press the allocation button F again.
   The servo(s) assume(s) the position corresponding to the position of the associated control.

Vertical line for orientation:

The vertical dotted line in the graph shows the current position of the associated control for easier orientation. If you activate a value using the allocation button F, the vertical line jumps to the corresponding point and remains there until you press the allocation button again or operate the associated control.

5.6.2 Assignment

You can use the Assignment menu to assign a control function or a mixer to your servos.



The menu shows a table of all the servos which can be used with your transmitter type (9, 12, or 16 servos). The following information is displayed for each servo:

Servo number

Number of the servo; identifies the servo in other menus.

Control function / mixer

Selection of the control function whose signal is to be fed to the servo. "--------" means that the receiver output is not in use. In this case a neutral pulse is present at the output.

nP

Number of servo calibration points available for selection in the Calibrate menu (see page 139).

2P 2 points (e.g. for Throttle, Towing dog, Retract.Gear)

3P 3 points (e.g. Elevator, Rudder)

5P 5 points (if several servos / control surfaces are to be trimmed for synchronised movement)

Assignment procedure

1. Select the servo.
2. Press the wheel or the **ENTER** button.
3. Select the function (control function or mixer).
4. Press the wheel or the **ENTER** button.
5. Select the number of calibration points.

6. Press the wheel or the **ENTER** button.
    - The input cursor returns to the servo number.
    - This completes the assignment procedure for one receiver output.

Procedure for erasing an assignment

1. Select the servo.
2. Press the wheel or the **ENTER** button.
3. Press the **REV/CLR** button. Pressing the button again restores the assignment.
4. Press the wheel or the **ENTER** button.

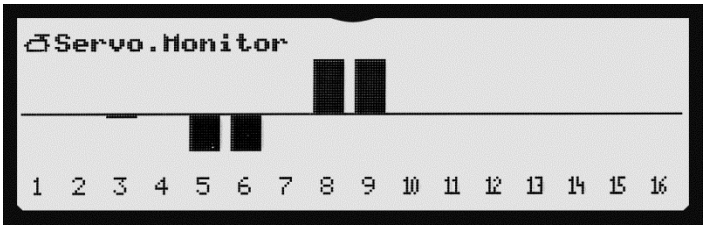
5.6.3 Monitor

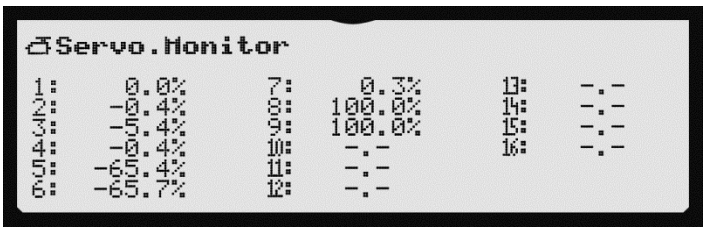
The servo monitor visualises the actuation movement of the servos. It enables you to detect errors and check the function / operation of cruise controls, gyro systems, speed controllers, etc.

Two screen types are available:

- graphic, with a display of output signals in bar-chart form
- numerical, with the values stated as percentages

Press the **+** / **–** buttons or use the central wheel to toggle between the two screen types. The figure shows the servo monitor for the PROFI TX16. The display varies according to the number of available servo channels.





5.6.4 Test run

This function triggers an automatic servo run that can be used for testing or demonstration purposes or as an aid in range checks.

While the test run is activated the selected control function cannot be controlled manually!

ControlFunction

Here, you select the control function intended for continuous operation. The test run is switched off when the name of the function is crossed out. Press the **+ / –** buttons or use the central wheel to select the control function. When the selection is changed, the test run is switched off so that critical functions such as motor or landing gear are not operated by scrolling.

Slow

Time required by the control function to move from one end position to the other.

Range: 0.1 to 6.0 seconds

OFF: Switched off, no movement

Starting a test run

Set the run time. Select the desired control function and then press the **REV/CLR** button. An even control movement is generated—moving from one end position of the control to the other. All the servos that are either directly controlled by this function or indirectly using mixers start to run.

Stopping the test run

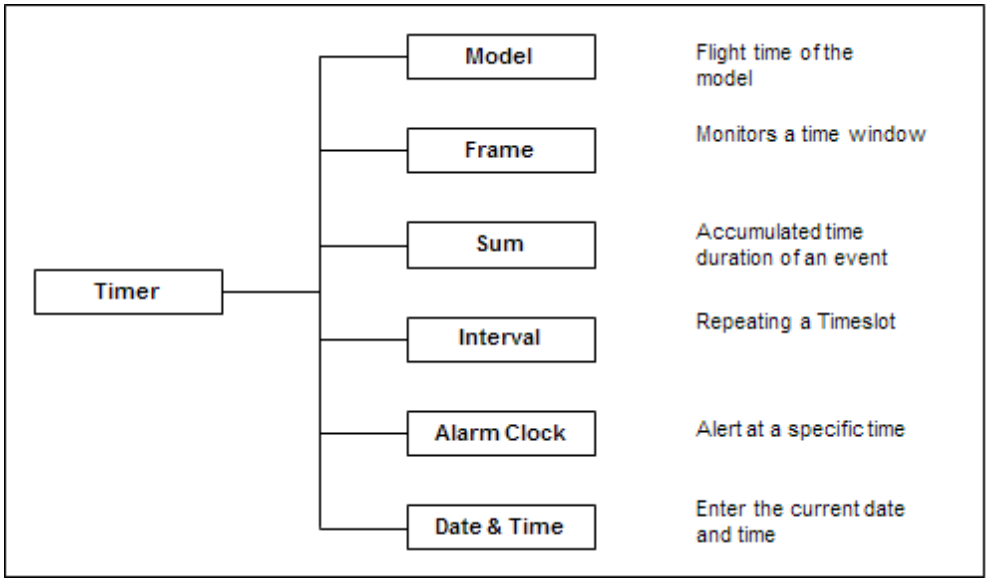
To stop the test run do one of the following:

- Open the ControlFunction selection and press the **REV/CLR** button.
  The control function is shown crossed out.
- Open the ControlFunction selection and select a different control function:
  The control function is shown crossed out.
- Open Slow and set it to OFF.

5.7 Timer main menu

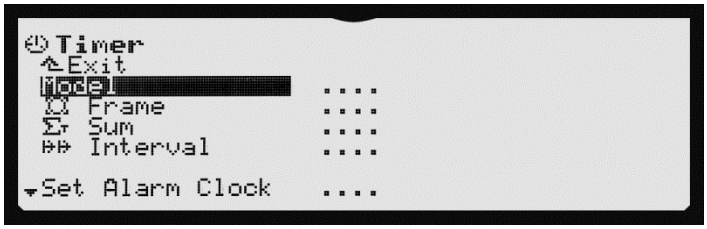
You can use this menu to set the current time and manage the PROFI TX timers.

Overview



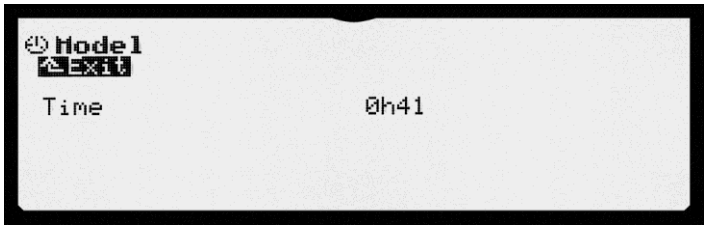
Opening the main menu

To open the main menu: button



5.7.1 Model uptime count

The Model timer is available for each model memory. It records the operating time (uptime count) for each model. The timer only runs when the transmitter emits RF signals.



Time

Displays the summed up operating time (uptime) in hours and minutes.

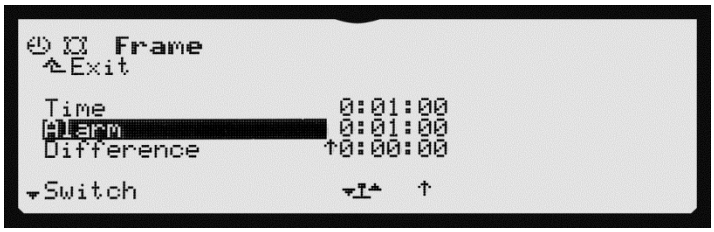
Range: 1000 h 00 m

Resetting the timer to 0h00

1. Press the wheel or the **ENTER** button to open the input field.
2. Press the **REV/CLR** button.
3. Press the wheel or the **ENTER** button to close the input field.

5.7.2 Frame

A frame is a time window (time limit) that can be monitored using this timer. Frame times are set in competitions, for example, where a certain flying task must be completed within a specified time.



This timer is triggered when the assigned switch is operated for the first time. It cannot be stopped using the switch until the set alarm time (frame time) has elapsed.

Frame time elapsed

Once started the timer runs until the frame time has elapsed, regardless of the position of the assigned switch. Only then, the switch becomes effective again.

Usage as a sum timer

If no alarm time is set (0:00:00), it works like a sum timer: It sums up the times during which the assigned switch is set to ON.

Alarm

The following alarms are issued:

- Starting 10 seconds before the alarm time elapses, one brief beep per second (🔈 , …)
- When the alarm time has elapsed, one long beep (🔈 ▭)

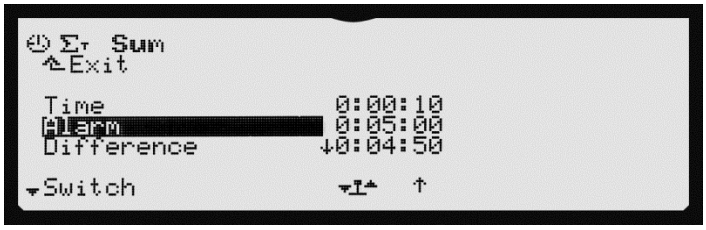
The single beep identifies the timer as the frame timer.

Refer to "Configuring timers" on page 149 for detailed configuration information.

5.7.3 Sum

This timer sums up times. It runs as long as the assigned switch is set to ON.

The timer starts at zero, counts up, sums up the times and is started and stopped using the assigned switch.



You can reset it to zero in this menu or in status display #3 using the **REV/CLR** button.

Alarm

The following alarms are issued:

- Starting 5 minutes before the alarm time elapses, one double beep per minute (🔈🔈)
- Starting 1 minute before the alarm time elapses, one double beep every 10 seconds (🔈🔈)

- Starting 10 seconds before the alarm time elapses, one double beep per second ( )
- When the alarm time has elapsed, one long double beep ( )

The double beep identifies the timer as the sum timer.

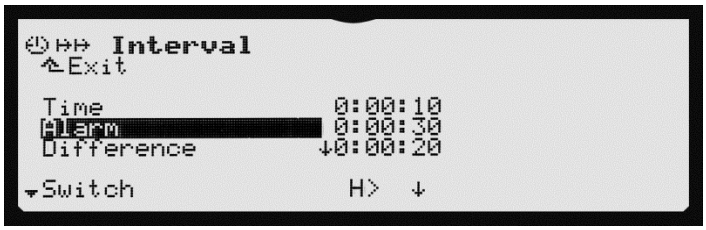
No alarm is issued when the alarm time is set to 0:00:00.

Refer to "Configuring timers" on page 149 for detailed configuration information.

5.7.4 Interval

The Interval timer is used to monitor a specified alarm time repeatedly or only once.

An alarm time must be set so that the Interval function can be activated. The timer



restarts from zero every time the assigned switch is switched on. It stops when the switch is set to OFF.

When the specified alarm time has elapsed an audible alarm is issued. The timer continues to run until it is switched off.

The following alarms are issued:

- 2 seconds before the alarm time elapses, one triple beep per second ( )
- When the alarm time has elapsed, one long triple beep ( )
- Then, for 5 seconds a hooter-like 3-tone signal.

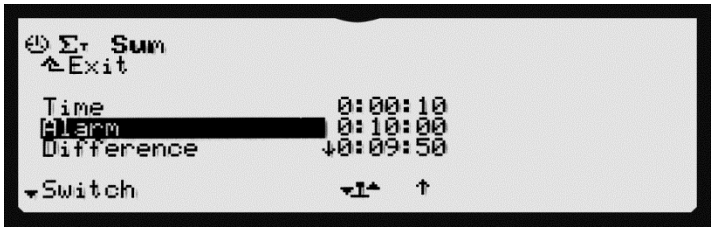
The triple beep identifies the timer as the sum timer.

Usage as a sum timer

If no alarm time is set (0:00:00), it works like a sum timer: It sums up the times during which the assigned switch is set to ON.

Refer to the next page for detailed configuration information.

5.7.5 Configuring timers



Time

This field indicates the time that has elapsed since timer start. After selecting this field you can reset the timer to zero by pressing the **REV/CLR** button. Further down in the menu, you see the Show difference field. When you set this field to OFF, this time is displayed in status display #3.

Alarm

Time at which an alarm should be issued.

Configurable alarm: 3:30:00 (3 h 30 min)

The frame timer cannot be stopped until the alarm time has elapsed.

Difference

Difference between time and alarm time. The arrow preceding the difference indicates the counting direction of the displayed time:

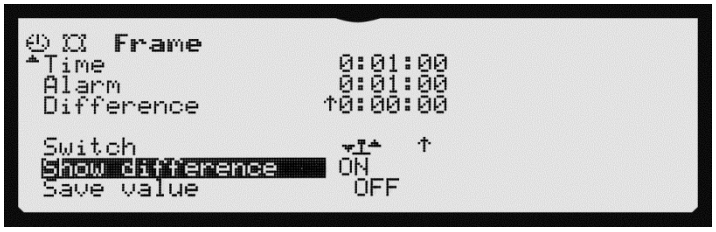
↑ Difference is counted up, time past alarm time.

↓ Difference is counted down, time before alarm time.

Further down in the menu, you see the Show difference field. When you set this field to ON, this time is displayed in status display #3. Otherwise, the time is displayed without preceding arrow.

Switch

Displays the switch used to control the timer and the respective switched state. If the switch is set to ON, i.e. the timer is running, an asterisk "*" is shown next to the arrow. Refer to page 104 for information on how to assign the switch.



Show difference

You select the information to be shown in status display #3:

ON The difference between timer time minus alarm time. Identified by the preceding up / down arrow. The displayed time is counted down to the alarm time and then counted up.

OFF The timer time (always counted up).

Save value

You select whether or not the timer time is stored in the model memory when the transmitter is switched off or the memory changes:

ON The timer time is stored in the model.

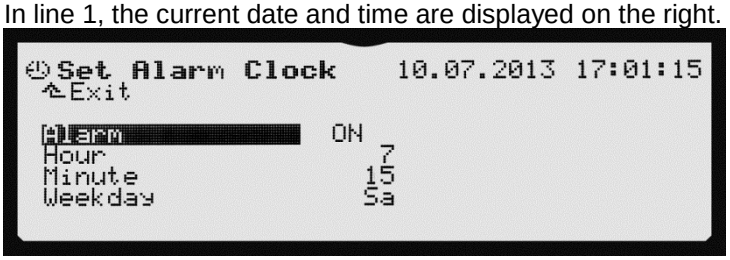
OFF The timer is reset to zero when the transmitter is switched on or a different memory is selected.

5.7.6 Alarm Clock

The clock in the PROFI TX (see section 5.7.7 "Date & Time" on page 151) has an alarm clock function. When the set alarm clock time is reached, the alarm clock rings in brief intervals for 10 minutes. During this time, a clock icon, the date, time and battery charge level are displayed on the screen.

To stop the alarm and close the display press the wheel.

In line 1, the current date and time are displayed on the right.



Hour

Hours of the alarm clock time in 24-hour format.

OFF switches the alarm clock off.

Minute:

Minutes of the alarm clock time.

Weekday

Day of the week on which the alarm clock should ring.

OFF: The alarm clock rings every day.

5.7.7 Date & Time

The PROFI TX features a clock with calendar that continues to run when the device is switched off. The clock (RTC) is used for the alarm clock function and for the file system on the SD card.

In line 1, the date and time are displayed on the right.

- Move the input cursor in turn to the menu items "Year", "Month", "Day", "Weekday", "Hour", and "Minute".
- Open the input field next to the menu item by pressing the wheel or the **ENTER** button.
- Set the date or time using the wheel or the + / - buttons.
- Finish entering by pressing the wheel or the **ENTER** button.

Year
Set the current year.

Month
Set the current month.

Weekday
Set the current weekday.

Hour
Set the hour of the current time in 24-hour format.

Minute:
Set the minute of the current time.

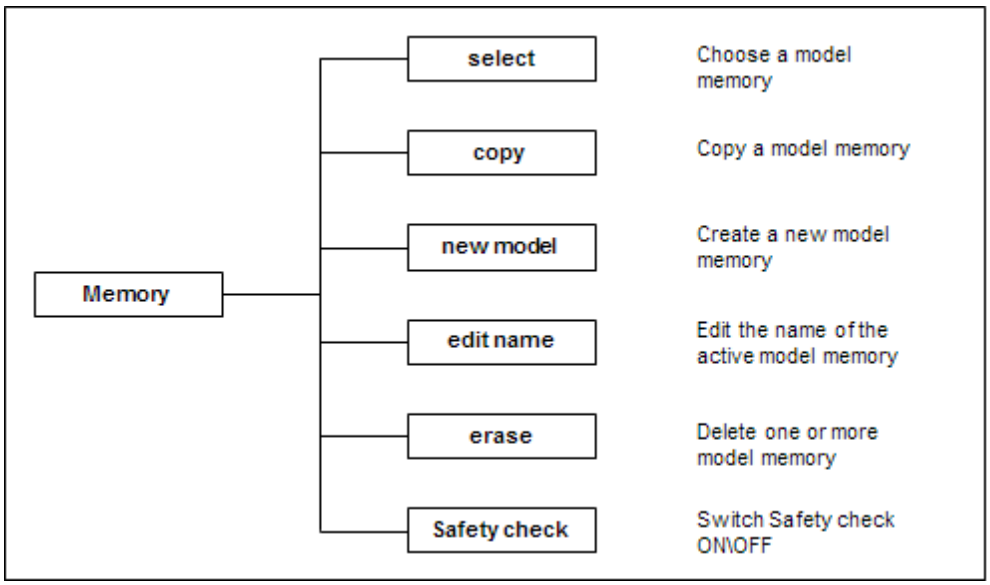
The seconds display remains zero with the Minute input field open, i.e. the clock is stopped while the input field is open.

For an accurate time setting, set the next minute and close the input field when the clock strikes the full minute.

5.8 Memory main menu

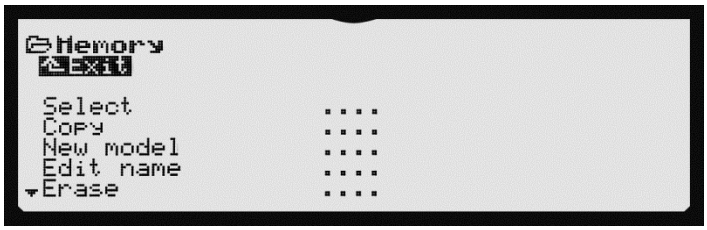
You can use this menu to manage the model memory in your PROFI TX.

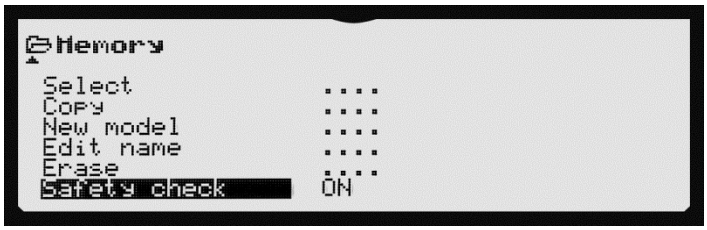
Overview



Opening the main menu

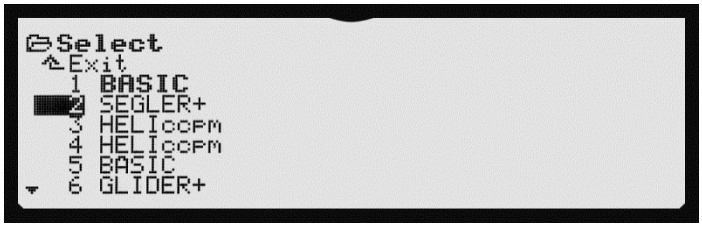
To open the main menu: button





5.8.1 Selecting the model memory

You can switch to a different model memory in this menu. The menu shows a list of all the available model memories. The name of the current model memory is bolded.



Move the input cursor to the desired model memory. The change takes effect when you press the wheel or the **ENTER** button.

The model memory currently in use is stored to the internal SD card and the newly selected model memory is loaded from the card.

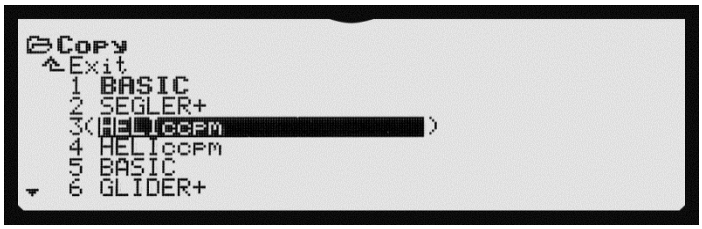
Then, the screen switches to status display #2.

If the safety check is switched on (Safety check menu, see page 159), the confirmation prompt is displayed when you change the model memory.

Press any transmitter button to exit the safety check.

5.8.2 Copying the model memory

You can copy the model memory to a different memory cell in this menu.



The menu shows a list of all the available model memories. The current memory is bolded.

1. Select a model memory.
2. Confirm your selection by pressing the wheel or the **ENTER** button.

The name of the transmitter you have selected for copying is shown inverted and in parentheses.

3. Move the memory to the target memory cell using the central wheel.
4. Copy is initiated by pressing the wheel or the ENTER button. Now, either of the following cases is possible:
    a. The target memory is empty: The model data is copied to the target memory. The model name is applied.
    b. The target memory is in use: You are prompted to confirm that you wish to overwrite the memory.

Pressing **REV/CLR**:
Overwrites the existing memory with the copy.

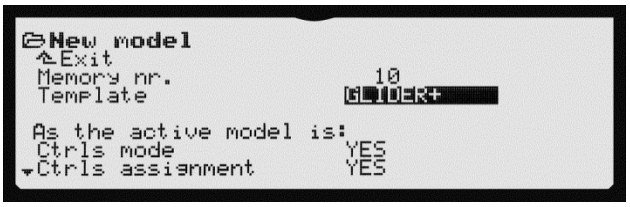
Pressing **ENTER** or wheel:
Cancels copying; the target memory remains unchanged.

5. Now, you can copy further memories or close the menu using Exit.

5.8.3 Creating new model memories

You can use the New model menu to create new model memories.

All the settings in this menu are retained, so, you do not have to re-enter the full set of information for every new model memory.



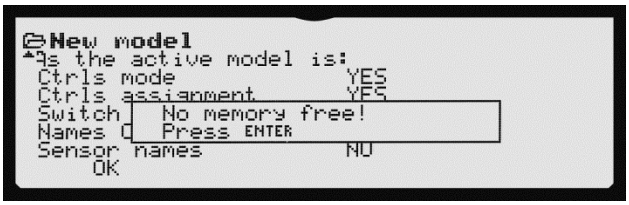
Memory No.

Data is automatically saved to the first empty memory cell in the transmitter.
It is not possible to choose at will. You can copy the model to a different memory cell later (see section 5.8.2 "Copying the model memory" on page 153).

If all the memories are in use, the following information is displayed on screen:

Memory No. -1

If you still try to create the new model by pressing OK, the following warning is displayed:

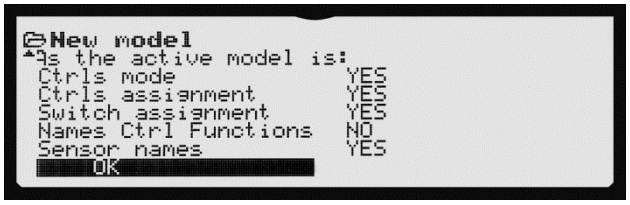


6. You cannot create new models until you have erased a model memory (see section 5.8.5 "Erasing model memories" on page 158).

Template

Template for the new model. The template provides the basic configuration for certain model types—fixed-wing models, vehicles, helicopters. The model type cannot be changed later.
The scrollable field shows a list of all the model templates available in the PROFI TX (see chapter 4 "Model templates" on page 53).

As the active model



Here you specify the setting areas to be inherited from the current model. If the current model and the template are incompatible, not all areas are inherited. All fixed-wing models are compatible with each other; the same applies to all helicopters. Vehicles, boats, and crawler-type vehicles (tanks) are not compatible with any other template.

Ctrl Mode

YES	NO
The stick assignment is inherited from the current model.	Mode 0 is used. This setting can be changed later.

Ctrls assignment

YES	NO
Only if compatible: The controls assignment is inherited from the current model.	Controls assignment as defined in the template.

Switch assignment

YES	NO
Only the assignment list defined in the Setup > Assign.Switches menu is inherited.	Switch assignment as defined in the template.

Names of Controls

YES	NO
Only if compatible: The names of the control functions are inherited from the current model.	Designations as defined by the template.

Sensor names

YES	NO
The names of the sensors are inherited from the current model.	Names as defined by the template.

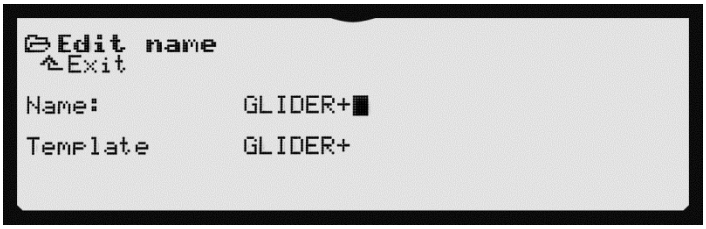
OK

When you have selected all options mentioned above move the input cursor to OK. You create a new model memory with the settings selected above by pressing the wheel or the **ENTER** button.
The device automatically switches to the new model memory and you can immediately start to configure further settings.

If you decide that you do not wish to create a model template, close the input screen using ⇧Exit.

5.8.4 Editing names

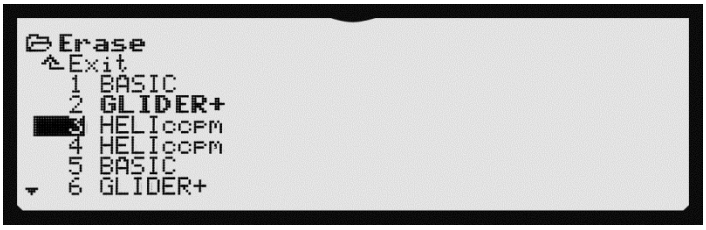
You can use the Edit name menu to change the name of the currently selected model. The name can have up to 18 characters.



7. The current name and the designation of the associated model template are displayed on screen. Refer to section 6.1.3 "Text input" on page 162 for details.

5.8.5 Erasing model memories

You can use the Erase menu to erase one or more model memories.



The menu shows a list of all the available model memories. The current model is bolded. The current model memory cannot be erased.

1. Select a model memory.
2. Press the wheel or the **ENTER** button.
3. To prevent inadvertent erasure of a memory, the following confirmation prompt is displayed:

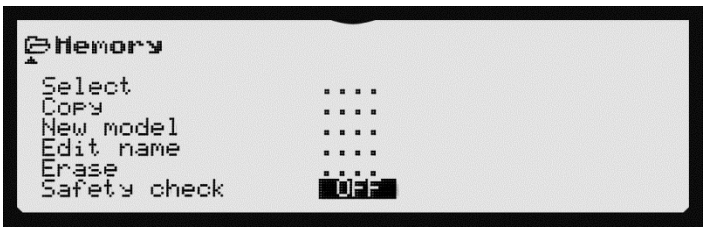
Pressing **REV/CLR**:
Erases the selected memory.

Pressing **ENTER** or wheel:
Erasing is cancelled.

4. Now, you can erase further memories or close the menu using Exit.

The current model (highlighted in bold) cannot be erased. First, select any other model (see section 5.8.1 "Selecting the model memory" on page 153) if you wish to erase the current model.

5.8.6 Safety check



The Safety check parameter switches the confirmation prompt on or off. This function is always activated for newly created model memories.

The safety check allows you to check the position of all the controls before establishing a wireless connection. Pay special attention to the controls for throttle and landing gear. Refer to page 45 for more details.

5.9 Error messages

The PROFI TX checks the content of the current memory when it is switched on or the model memory is switched. If it detects an error, the following error message appears:

If this error message is displayed, proceed as follows:

- Copy the memory to a different memory number.
- Change the name to "defective". For safety reasons, this memory must not be used again.
- Switch to the copy.
- Carefully check all the settings of the model memory.

Contact a Service Centre if the error occurs repeatedly.

6 Operating the transmitter

The PROFI TX is operated using the keypad and the central wheel.

6.1 Operation using the keypad

Fig. 17: Keypad

6.1.1 Direct access buttons for menus

The keypad is arranged in two rows. The upper rows has six buttons for accessing the main menus directly.

- Pressing one of the buttons in a status display or a different menu opens the menu associated with the button.
- If you press one of the buttons when the associated menu is displayed, the screen display switches back to the parent menu level until the current status display is shown again.

Button	Menu
	Setup
	ControlFunctions
	Mixer
	Servo
	Timer
	Memory

6.1.2 Buttons for special functions

The lower keypad row provides the following functions:

Button	Function
	• Allocation button: Activation button for the digi-adjusters (see section 6.3 "Digi-adjuster" on page 164). • In the menu: `Servo` > `Calibrate`: The servo—and all the other servos to which the same control function or mixer is assigned—automatically assume the position corresponding to the percentage figure at the selected calibration point (see section 5.6.1 "Calibrate" on page 139).
REV CLR	Erases and/or reverses (inverts) set values. Confirmation when erasing model memories or text. In case of bipolar set values, pressing the button three times restores the original value: Invert—Erase—Restore.
ENTER	Open / close input fields or trigger a function; pressing the button has the same effect as pressing the wheel.
	Down (minus) button; pressing the button has the same effect as turning the wheel in the anti-clockwise direction: • In the status displays: Every time you press the button the screen cycles back to the previous status display. • In the menus: Every time you press the button the cursor is moved to the previous menu item. • In a scrollable field: Every time you press the button the value or the content of the scrollable field is reduced.

	Up (plus) button; pressing the button has the same effect as turning the wheel in the clockwise direction: • In the status displays: Every time you press the button the screen cycles to the next status display. • In the menus: Every time you press the button the cursor is moved to the next menu item. • In a scrollable field: Every time you press the button the value or the content of the scrollable field is increased.

6.1.3 Text input

Use the buttons that are labelled with characters for text input (name of transmitter owner, model, mixers, etc.):

1. Open the input field by pressing the **ENTER** button or the wheel.

   The first character is highlighted to indicate the input position.
2. Change the input position as needed using the wheel.
3. Enter the text at the input position.

   The procedure for text input is identical to a simple mobile phone:
   - A list of 3 to 4 alphabetic characters (upper and lower case plus special characters) and one numeric character is assigned to each button.
   - The desired character is selected by repeatedly pressing the button.
   - The cursor moves to the next input position when you wait for 1.5 seconds or you use a different button.
4. Finish entering by pressing the **ENTER** button or the wheel.
5. If there are characters below or to the right of the input cursor, you are prompted to confirm that these characters, i.e. the rest of the text, should be deleted.

   Press the **REV/CLR** button for "Yes".
   Press the **ENTER** button for "No".

   The prompt is not displayed if the input cursor is positioned on the first character.

6.2 Operation using the wheel

You can use the central wheel to navigate through the menus and to edit set values. The wheel can be turned in increments to the left or to the right and it can be pressed.

Turning the wheel

- In the status displays:
  Every increment in the clockwise / anti-clockwise direction cycles to the next status display or back to the previous status display.
- In the menus:
  Every increment in the clockwise / anti-clockwise direction moves the cursor to the next / previous menu item.
- In a scrollable field:
  Every increment in the clockwise / anti-clockwise direction increases / reduces the value or the content of the scrollable field.

Pressing the wheel

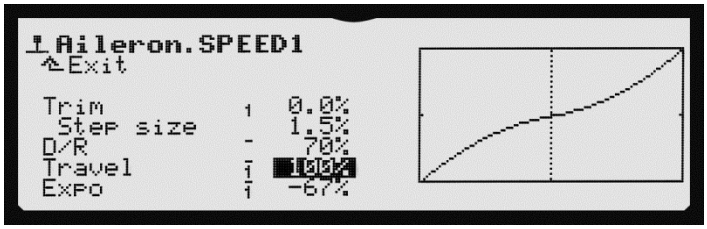
Press the wheel to open / close an input field or to trigger a function. Pressing the wheel has the same effect as pressing the **ENTER** button (see section 6.1.2 "Buttons for special functions" on page 161).

6.3 Digi-adjuster

A digi-adjuster can be installed in each of the two installation slots on the right and left side at the transmitter front (see section 3.3.4 "Installing additional controls" on page 37). A digi-adjuster of this type can be allocated to most of the set values. This allows you to change two set values directly. Digi-adjusters only function on the status display level.

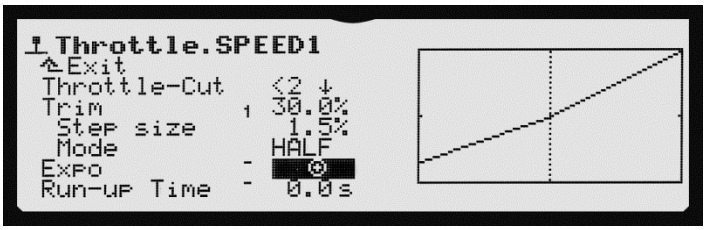
6.3.1 Allocating a set value

Values that can be allocated to a digi-adjuster are marked by a horizontal dash preceding the input field.



1. Open the desired input field.
2. Press the allocation button ◉.

   The allocation icon is displayed in the input field: ⟩⊕⟨



   The following icon appears for values that cannot be allocated: ▶⊗◀.

3. Turn the desired digi-adjuster.

   The ▶⊗◀ icon disappears.

If you change your mind and decide not to allocate a digi-adjuster, simply close the input field. The allocation icon disappears and the value is displayed again.

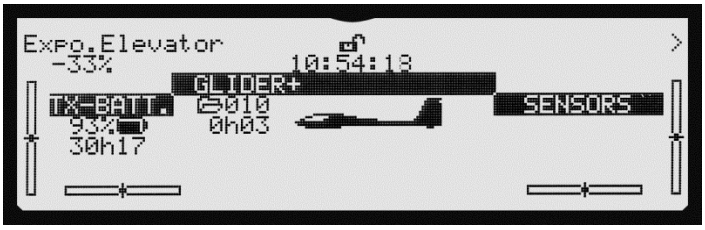
6.3.2 Setting a value

Initially, the digi-adjusters are locked after switching the device on. The padlock icon in the middle of the first line is closed.

1. Press the allocation button F to open the input.

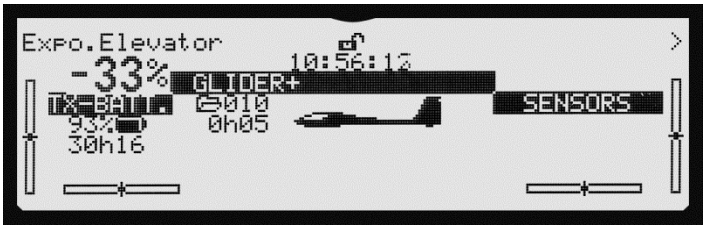
   In the status displays #2 to #8, the button activates / deactivates the optional digi-adjusters.

- The padlock icon changes from closed to open.



- If a value is allocated, the set value is displayed in the first line in the top left corner.

  Turn one of the digi-adjusters: The set value is temporarily displayed in double font size for easier reading.



6.3.3 Erasing the allocation

Allocations can only be erased in status display #2 (see page 87).

Press the allocation button to open the padlock icon.

Press and hold the **REV/CLR** button and turn the digi-adjuster for which you wish to erase the allocation.

6.4 Assigning controls to control functions

The assignment for controls and switches defines which functions in the transmitter or model are controlled by which control.

Controls, i.e. actuators, are:

- Sticks
- Slide potentiometers
- Rotary potentiometers
- Switches and their designated buttons

Controls can be assigned to control functions and/or switched functions. Multiple assignments are possible and quite useful, e.g. a stick can be assigned to the "Throttle" control function and also be used as a switch for one or more timers.

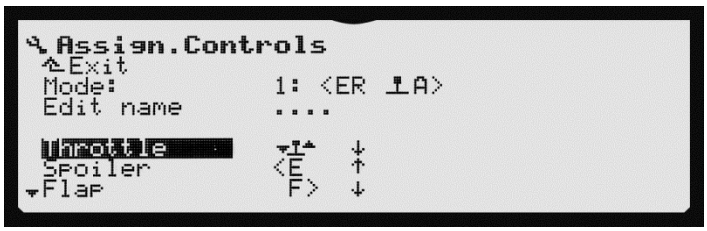
Examples of control functions: "Aileron", "Throttle", "Retract.Gear", "Spoiler", "Flap".

Examples of switched functions: Timer ON/OFF, dual rate, throttle-cut, variometer tone ON/OFF.

6.4.1 Assigning controls

Controls are assigned in the Setup > Assign.Controls menu. The menu shows a list of all the controls provided in the software (see section 5.3.5 "Assign.Controls" on page 101).

The basic functions ("Aileron" / "Elevator" / "Rudder" for fixed-wing models and helicopters plus "Collective" for helicopters only) are always assigned to the sticks. They are not assigned using the list, but by configuring the controls mode (see page 169). One vertical axis always remains unassigned and can be assigned using the list (⊥ icon). This is typically used for "Throttle" or "Spoiler" in glider-type models.



You can use this menu to customise the controls assignment according to your needs.

Controls mode

Ailerons, elevators and rudders are controlled by the stick units. The stick units are assigned to the individual axes using the standardised controls mode (1 to 4).

You configure the controls mode in the Setup > Assign.Controls > Ctrl Mode menu (see section 5.3.5 "Assign.Controls" on page 101). One vertical axis always remains unassigned (icon) and can be assigned using the assignment list. In power models, is typically used for "Throttle", in glider-type models for "Spoiler".

The controls modes:

Mode	left vertical	left horizontal	right vertical	right horizontal
1	Elevator	Rudder		Aileron
2		Rudder	Elevator	Aileron
3	Elevator	Aileron		Rudder
4		Aileron	Elevator	Rudder

Assignment list

To assign a control function proceed as follows:

1. Move the input cursor to the control function you wish to assign a control to.
2. Open the input field.
3. Assign a control by pressing the **+** / **–** buttons, by using the central wheel or by operating the control.
4. To set the actuation direction keep the control in the desired zero position and close the input field. Alternatively, you can invert, erase or reset the control by pressing the **REV/CLR** button, if required.

You can freely assign 21 physical and 6 logical controls to the following 12 control functions:

Icon	**Control**
	Free stick that is not assigned to aileron, rudder or elevator.
E, F	E = left slider, F = right slider
G, H	G = slider on the far left, H = slider on the far right
<1,<2,<3,<4,<5,<6,<7	Installation slots on the front left side for switches, buttons, and rotary potentiometers
1>,2>,3>,4>,5>,6>,7>	Installation slots on the front right side for switches, buttons, and rotary potentiometers
	Left stick button/switch
	Right stick button/switch
MS1, MS2	MagicSwitches (logical controls)
Fp1, Fp2, Fp3, Fp4	Flight phases (logical controls)

Control functions of the model templates

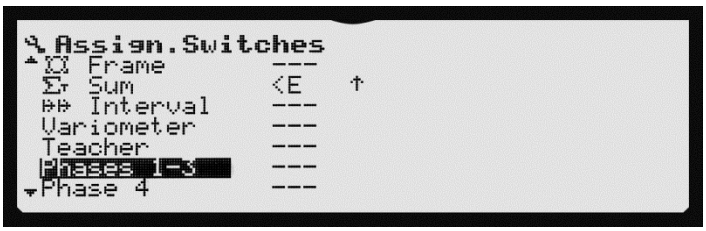
The following control functions are defined in the PROFI TX model templates. The control functions 1 to 3 are assigned using the controls mode.

	Fixed-wing models	Vehicles	Ships / boats	Tanks	Helicopters
1	*Aileron*	*Gimbal h*	*Gimbal h*	*Turret turn*	*Aileron*
2	*Elevator*	*Gimbal v*	*Gimbal v*	*Gun up/down*	*Elevator*
3	*Rudder*	*Steering*	*Steering*	*Steering*	*Rudder*
4	Throttle	Throttle	Throttle	Throttle	Throttle
5	Spoiler	Horn	Aux-1	Weapon sel.	Aux-1
6	Flap	Gear	Aux-2	Gear	Aux-2
7	Retract.Gear	Light	Aux-23	Aux-21	Retract.Gear
8	Towing dog	Full beam	Light	Light	Light
9	Wheel Brake	Sound	Headlight	Headlight	Switching channel -1
10	Gyro	Support Legs	ESP	Gyro	Gyro
11	Mixture		Horn	Horn	Switching channel -2
12	Aux-1	Aux-1	Aux-4	Aux-2	Aux-3
13	Aux-2	Aux-2	Aux-5	Aux-3	Aux-4
14	Aux-3	Aux-3	Aux-6	Aux-4	Collective
15	Aux-4	Aux-4	Aux-7	Aux-5	Thr.Limiter

6.4.2 Assigning switches

Switches are controls that toggle functions or switch functions on/off.

Switches are assigned in the Setup > Assign.Switches menu (see section 5.3.6 "Assign.Switches" on page 102). This menu includes a list of the switchable functions provided in the software.



You can use this menu to customise the switches assignment according to your needs.

To assign a switch proceed as follows:

1. Move the input cursor to the control function you wish to assign a switch to.
2. Open the desired input field.
3. Assign the desired switch by operating it.
4. Set the switch to the ON position or select it using the **REV/CLR** button.
5. Close the input field.

List of switched functions

Switch	**Description**
DR aileron	Dual rate (switching between travels) for the aileron signal
DR elevator	Dual rate (switching between travels) for the elevator signal
DR rudder	Dual rate (switching between travels) for the rudder signal
CS/DTC	• Combi-Switch (fixed-wing models) • Direct Throttle Control (helicopters)
Throttle-Cut	For switching the motor off.

Switch	Description
Frame	Frame timer
Sum	Sum timer
Interval	Interval timer
Variometer	Tone of the variometer
Teacher	For transferring control functions to the student
Phase 4	Switches from every flight phase to phase 4
Phases 1-3	For switching between the flight phases.
Sensor Alarm	For clearing the warning bar and for switching the sensor alarm tone off. Use a 3-position switch. In end position ON (*) the warning bar and the vibration alarm are cleared. In the other end position, the alarm tone of the sensors is switched off (useful if one sensor repeatedly triggers alarms).

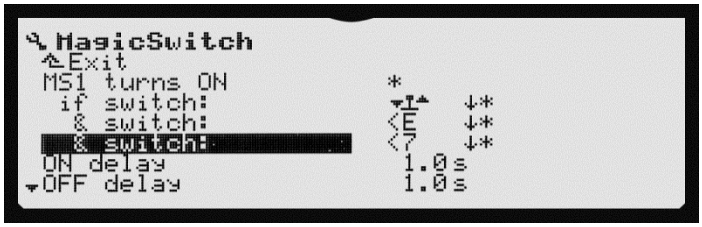
MagicSwitch

The PROFI TX features 2 MagicSwitches.

A MagicSwitch is a logical switch which can be assigned and inverted like a real control. It combines up to three switches (including the second MagicSwitch and flight phases) in an AND function. Unused inputs are considered switched on. The MagicSwitch is switched on when all switches that are assigned to it are switched on.

MagicSwitch output switches with a configurable delay. OFF and ON delays can be configured separately.

Switches are assigned in the Setup > Assign.Switches > MagicSwitch menu (see page 104).



To assign a MagicSwitch proceed as follows:

1. Move the input cursor to a switch.
2. Open the desired input field next to it.
3. Assign the desired switch using the central wheel or by operating the switch. The switches MS1, MS2 (MagicSwitch) and FP1 to FP4 (flight phases) cannot be assigned by operating a switch.
4. Set the switch to the ON position or select the ON position using the **REV/CLR** button.
5. Close the input field.

7 Operating the transmitter using the PC

You can use the supplied USB cable to connect the PROFI TX to any PC or tablet featuring an operating system that supports USB mass storage and an USB port that is compliant with the USB standard (4.5-5.5V / 500mA). Some laptops and tablets are not compliant with this standard.

The following functions are available when the transmitter is switched off (charging mode):

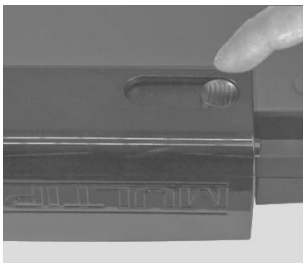
- Charging the battery; *refer to section 3.4.1 "Charging the battery" on page 41 for detailed information*
- Accessing the model memory on the SD card in the transmitter
- Updating the PROFI TX software
- Switching the transmitter on

The following functions are available when the transmitter is switched on (normal mode):

- Charging the battery
- Controlling a model flying simulator
- Switching the transmitter off

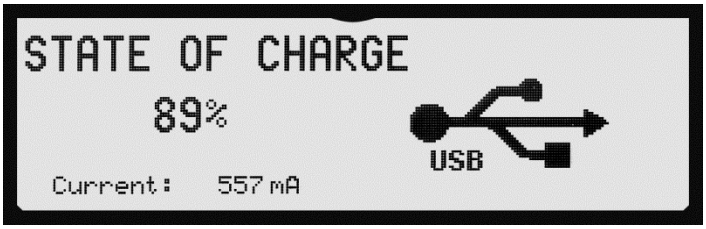
7.1 Connecting the transmitter

To connect the transmitter proceed as follows:

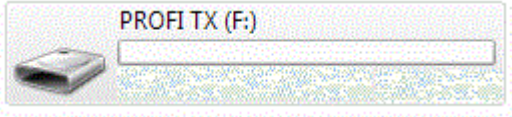


1. Lift the device (the recessed control for the sliding latch is located on the underside of the case).
2. Slide the latch to the left.
3. Connect the supplied USB cable to the mini USB socket on the PROFI TX and to the USB socket on the PC.

Die PROFI TX switches on automatically when it is supplied with charging voltage. The USB icon is shown on the right side of the screen and the state of charge and the charging current are displayed on the left.



The PROFI TX logs into the PC as mass storage (drive) with the name "PROFI TX".



Open this "drive". It contains the following folders:

- DATA; contains the model memories, see section 7.2 "Editing ".
- AUDIO; this folder is empty in the current software version.
- UPDATE; see section 7.3 "Software update" below.

7.2 Editing model memories

The "DATA" folder on the PC contains the entire model memory of your PROFI TX. Files with the extension "MDL" contain one model data set each.

You can delete the model data sets on the PC or edit the numbers to reorganise the memory.

Do not change the file name format. The PROFI TX only recognises file names in this format: PTXxxx.MDL (where "xxx" represents the memory number with leading zeros)

7.3 Software update

The "Update" folder on the PC is used for updating the software on your PROFI TX and for changing the language pair.

1. Connect the transmitter to the PC.
2. Open the "PROFI TX" mass storage.
3. Place the update file in the "UPDATE" folder.
4. Switch on the transmitter.

   The update process starts automatically when an update file is found in the "Update" folder. The file name of the update is displayed on the transmitter screen. The annular light "rotates" until the update is completed.

   Upon completion of the update process, the transmitter starts as usual.

7.4 Switching to normal mode

In charging mode, the PROFI TX logs into the PC as mass storage with the name "PROFI TX".

Press and hold the power button until the annular ring is fully lit to switch to normal mode: The PROFI TX logs off from the PC as USB mass storage and logs in again as a game controller.

Now, you can access the status displays and menus as usual and program the transmitter.

7.5 Model flying simulator

You can use the PROFI TX to control a model flying simulator in two ways:

- Via USB cable
- Via M-LINK in conjunction with the MULTIFlight stick

In both cases, you have the following options:

- Would you like to work in simulator mode without configuring "Travel", "Expo" and "Trim"?
  Switch ON "Training" in the Setup > Training menu (see page 96).
  Select the Student mode. In this case, only unprocessed stick signals are used for controlling. It is not relevant which model memory is used. Only the stick assignment must match (see "Ctrl Mode" on page 101).
- Would you like to use "Trim", "D/R", "Expo", "Combi-Switch" and "Ctrl.Mix"?
  Create a new model using the BASIC template (page 155) and change the model name (page 157), e.g. to Simulator. Safety check can be switched off.
  From now on, use this model memory for simulator mode.
- Would you like to use "Expo", "D/R", "Trim", and "Combi-Switch" for the simulator?
  Create a new model memory based on the BASIC template (page 155).
  Change the model name (page 157), e.g. to Simulator.
  Alternatively, you can copy the memory of a suitable model. Change the model name to avoid mix-ups. Do not use the memory of a real-world model: Settings that you configure for the simulator mode will not automatically suit your real-world model.

In simulator mode, all the functions on the servo side (mixers, curves, reverse) are switched off.

7.5.1 Via USB cable

If the PROFI TX transmitter is operating in normal mode and is connected to the PC via USB cable, it logs into the PC as a game controller. Upon first time use, Windows automatically installs the required drivers. This may take several minutes.

Neither the transmitter nor the PC must be switched off while the driver installation is in progress.

Once the installation is completed, the "Devices and Printers" menu contains the following additional entry:

If you are using our MULTIFlight simulator, no further steps are required. Calibration and assignment of the control channels match automatically.

For other simulators, you may have to perform a calibration and assign the control functions.

7.5.2 Using the MULTIFlight stick

Insert the MULTIFlight stick in a free USB socket on your PC. Wait until the driver installation process, which starts automatically, is completed.

Now, you have to bind stick and transmitter. Press and hold the MULTIFlight stick button until the yellow LED starts to flash. Switch on the transmitter. Open the `Setup > M-LINK` menu. Activate the `binding` as described on page 93.

The binding procedure has completed successfully when the LED on the MULTIFlight stick flashes slowly in regular intervals.

If you are using our MULTIFlight simulator, no further steps are required. Calibration and assignment of the control channels match automatically.
The binding procedure can also be activated from the MULTIFlight simulator.

For other simulators, you may have to perform a calibration and assign the control functions.

7.5.3 MULTIFlight simulator

The simulator is available as freeware download on our website: www.multiplex-rc.de

Two options are available for configuring the PROFI TX transmitter for simulator mode:

- Would you like to use "Trim", "D/R", "Expo", "Combi-Switch" and "Ctrl.Mix"?
  Create a new model using the BASIC template (page 155) and change the model name (page 157), e.g. to Simulator. Safety check can be switched off.
  From now on, use this model memory for simulator mode.
- Would you like to use only the stick signals, like a game controller?
  Open the Setup > Training menu item. Leave Training switched off and set Mode to Student.

The MULTIFlight simulator automatically recognises the MULTIFlight stick and PROFI TX.

If you have questions regarding the use of PROFI TX with third-party simulators, please contact the simulator manufacturer.

8 Creating and customising models

The following chapters contain detailed descriptions of the menus and how the transmitter is operated using the keypad or central wheel:

- "Menus", see page 86
- "Operating the transmitter", see page 160

8.1 Fixed-wing models

8.1.1 The procedure in principle

A model memory for a glider is created in this example. The procedure for power models is identical. The only difference for power models is that Throttle and Spoiler are interchanged.

The following steps are required to ensure correct operation of the basic model functions:

1. Setting basic functions, see page 181
2. Setting rotation direction and maximum travels for the servos, see page 183

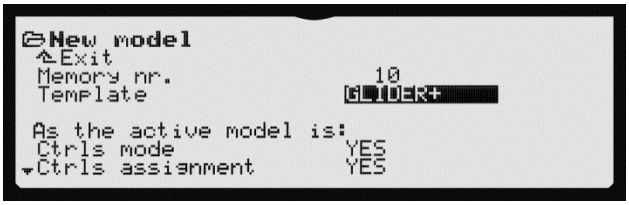
The basic functions of the model can be controlled once these steps are completed.

The basic functions can be extended and fine-tuned as follows:

3. Using ailerons as spoilers, see page 187
4. Using camber-changing flaps as spoilers, see page 188
5. Using further optimisation options, see page 188

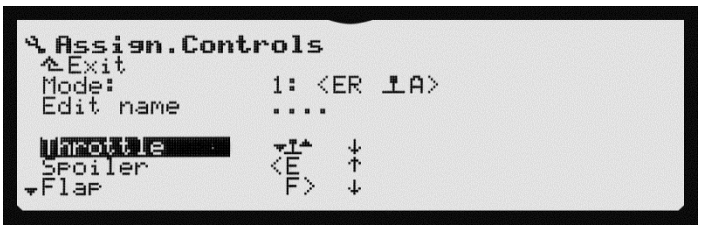
8.1.2 Basic settings

1. Switch on the transmitter.
2. Open the Memory main menu.
3. Open the New model menu.



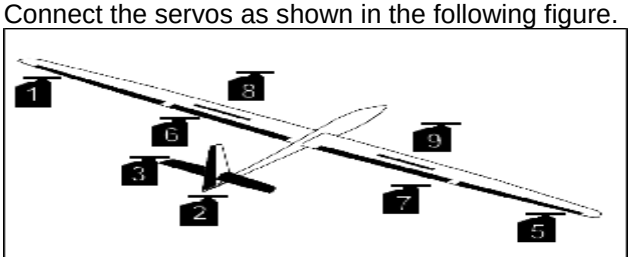
4. Select the GLIDER+ model template as Template.

5. Open the Memory > Edit name main menu and enter a unique and descriptive name for the model (see section 5.8.4 "Editing names" on page 157).
6. Assign the desired controls (actuators) to the control functions in the Setup > Assign.Controls menu (see section 5.3.5 "Assign.Controls" on page 101).



Pay attention to the zero positions (↑ / ↓) of the controls for Throttle and Spoiler!

7. Connect the servos as shown in the following figure.



Do not connect the electric motors yet!

- Perform the binding procedure (see section "Binding" on page 48.

8.1.3 Adjusting rotation direction and maximum travels for the servos / control surfaces

NOTICE Use electronic means as little as possible to reduce the servo travels. Otherwise, you will forfeit servo resolution!

If possible, implement major changes using control surface linkages.

8.1.3.1 Configuring aileron differential

1. Open the Mixer > Differnt.Ail menu.
2. Set Mode to ON and Differnt.Ail to 100%.

3. Set aileron travel to the left.

   In case of stick travel to the left, the left control surface should move.

   If the right control surface moves, reverse the differential using the **REV/CLR** button (-100%).
4. Now, reset Differnt.Ail to 50% (+ or -). The suitable value is determined later in flight.

8.1.3.2 Setting control surface travel and maximum servo travel

If the definition is unchanged, the AILERONS+ mixer is defined as follows:

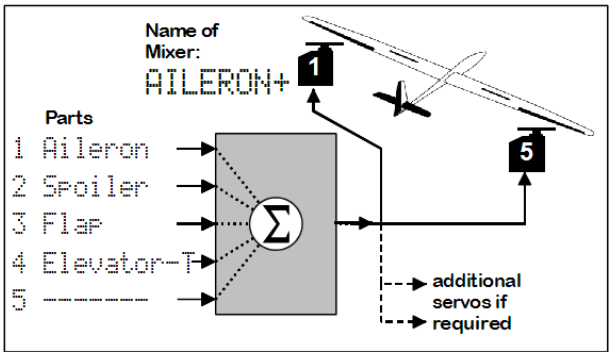
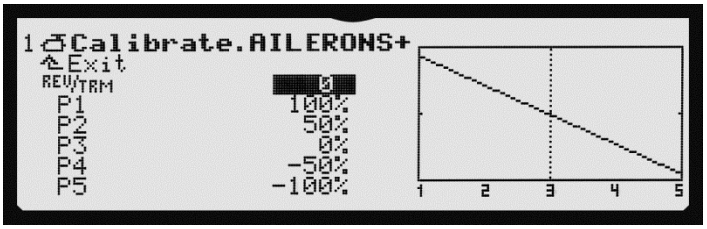


Fig. 18: Principle of the AILERONS+ mixer

1. Open the Servo > Calibrate > 1: AILERONS+ menu.



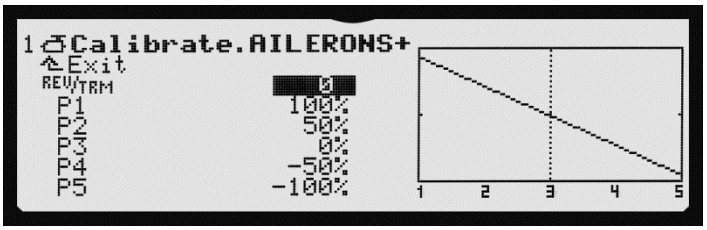
2. Open the REV/TRM parameter and set aileron travel to the left.

   If the left aileron does not move up, reverse the servo using the **REV/CLR** button.

3. Move the aileron stick to the centre position. Move the control surface to the neutral position using the central wheel or the **+** / **–** buttons.

   The setting range is +/-10%. Offsets exceeding 5% should be corrected mechanically.

4. Open the input field P1.



5. Press the button: .

   Both ailerons move to maximum.

6. Choose a P1 setting so that the left aileron (servo 1) stops a little way from the mechanical stop.

7. Now open P5.

8. Press the F button.

   Both ailerons move to the opposite maximum.

9. Set the positive travel on the left aileron (servo 1) to a safe value.

10. You can use the points P2 and P4 to linearise the control curve, if required. P3 shifts the neutral position without changing the other points.

11. Open the Servo > Calibrate > 5: AILERONS+ menu.

12. Open the REV/TRM parameter and set aileron travel to the right.

    If the right aileron does not move up, reverse the servo using the **REV/CLR** button.

13. Move the aileron stick to the centre position. Move the control surface to the neutral position using the central wheel or the **+** / **–** buttons.

    The setting range is +/-10%. Offsets exceeding 5% should be corrected mechanically.

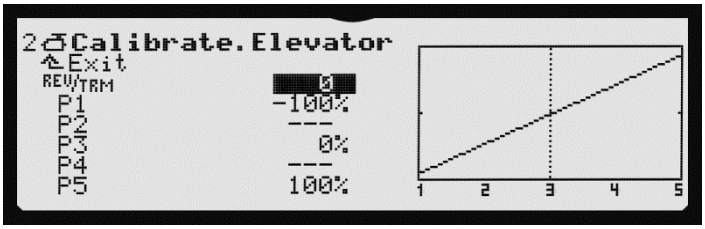
14. Choose a P1 and P5 setting so that control surface travels on the right aileron are identical to those on the left aileron:
    - Open the input field P1.
    - Press the F button.

    Both ailerons move to the negative maximum.
    - Use P1 to align the negative travel of the right aileron with that of the left aileron.
    - Open the input field P5.
    - Press the F button.

    Both ailerons move to the positive maximum.
    - Use P5 to align the positive travel of the right aileron with that of the left aileron.
    - Repeat these steps for the points P2 and P4. P3 shifts the neutral position without changing the other points.

8.1.3.3 Adjusting elevators

1. Open the Servo > Calibrate > 2: ELEVATOR+ menu.



2. Open the REV/TRM parameter and apply up-elevator.

   If the elevator moves down, reverse the servo using the **REV/CLR** button.

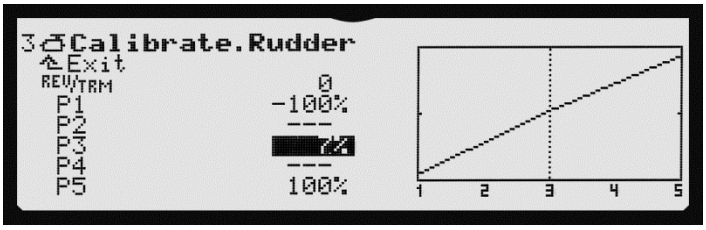
3. Move the control surface to the neutral position using the central wheel or the **+** / **–** buttons.

   The setting range is +/-10%. Offsets exceeding 5% should be corrected mechanically.

4. Correct the maximum servo travels using P1 and P5 (see section 8.1.3.2 "Setting control surface travel and maximum servo travel" on page 183).

8.1.3.4 Adjusting rudders

1. Open the Servo > Calibrate > 2: Rudder menu.



2. Open the REV/TRM parameter and set rudder travel to the left.

   If the rudder does not move to the left, reverse the servo using the **REV/CLR** button.

3. Move the control surface to the neutral position using the central wheel or the **+** / **–** buttons.

   The setting range is +/-10%. Offsets exceeding 5% should be corrected mechanically.

4. Correct the maximum servo travels using P1 and P5 so that no mechanical stop is reached (see section 8.1.3.2 "Setting control surface travel and maximum servo travel" on page 183).

8.1.3.5 Adjusting flaps

1. If your model has inboard flaps perform step 1 to 4 in section 8.1.3.1 "Configuring aileron differential" on page 183 for the inboard flaps.
2. If your model features mechanical airbrakes, extend them using the assigned controls. Check and correct the actuation direction in the Servo > Calibrate menu for servos 8 and 9.

8.1.3.6 Adjusting the power system

1. If your model has a power system, check the actuation direction of the throttle channel.
2. To switch the throttle channel, reverse the servo using the **REV/CLR** button.

After these steps, the main setup is completed:

- The control surfaces move in the correct direction.
- Maximum travels and neutral positions are adjusted.
- The ailerons move synchronously.

8.1.4 Using ailerons as spoilers

To use the ailerons as airbrakes (spoilers) proceed as follows:

1. Open the Mixer > AILERONS+ menu.
2. Set the value for the Spoiler > Travel parameter to 100%.
3. Move the control for the Spoiler control function to maximum.

   If both ailerons do not move up, reverse the travel using the **REV/CLR** button.
4. Reduce the value for the Aileron > Travel parameter to a value significantly below the spoiler travel. Use the manufacturer specifications for your model as a guideline.
5. Configure the differential in the Mixer > Differnt.Ail menu (see section 8.1.3.1 "Configuring aileron differential" on page 183).

8.1.5 Using camber-changing flaps as spoilers

If your model has inboard flaps, you should use the camber-changing flaps also as airbrakes (spoilers):

1. Open the Mixer > FLAPS+ menu.
2. Set the value for the Spoiler > Travel parameter to 100%.
3. Move the control for the Spoiler control function to maximum.

   If both flaps do not move down, reverse the travel using the **REV/CLR** button.
4. Reduce both travel distances, up and down, of the aileron.

   In this mixer, you can adjust the travel distances of the ailerons separately. The flaps should have the travel recommended by the manufacturer of your model.
5. Configure the differential in the Mixer > Differnt.Ail menu (see section 8.1.3.1 "Configuring aileron differential" on page 183).

8.1.6 Optimisation

Your model is now configured and ready for flying. The following optimisation options are available:

- Camber-changing flaps:

  Increase the travels for Flap in the mixers AILERONS+ and FLAPS+ (see section 5.5.2.4 "Mixers on the servo side" on page 137).
- Snap flap:

  Increase the travels for Elevator in the mixers AILERONS+ and FLAPS+.

  You can configure the mixer input as switchable by assigning a switch to the Elevator mixer input in the SETUP > Define mixer > AILERONS+ menu and the SETUP > Define mixer > FLAPS+ menu (see section 5.3.7 "Define mixer" on page 105).
- Elevator compensation:

  You can mix Spoiler, Flap and Throttle into the elevator using the Mixer > ELEVATOR+ menu (see section 5.5.2.4 "Mixers on the servo side" on page 137).
- Combi-Switch:

  Define a switch in the Setup > Assign.Switches menu and assign it in the Mixer > Combi-Switch menu (see section 5.5.1.1 "Combi-Switch" on page 127).

- Other control functions:

  If required, assign other control functions to unused servo channels in the Servo > Assignment menu (see section 5.6.2 "Assignment" on page 142).

- V-TAIL+:

  In the Servo > Assignment menu, reassign servo channels 2 and 3 from ELEVATOR+ / Rudder to V-TAIL+.

  Then, adjust the rotation direction and travels in the Mixer > V-TAIL+ menu (see section 5.5.2.4 "Mixers on the servo side" on page 137).

- Flight phases:

  Assign a switch to flight phases 1 to 3 in the Setup > Assign.Switches menu.
  The 4th phase is activated by a assigning a switch to Phase 4.

  Choose a suitable name for each flight phase in the Setup > Flight phases menu. Set the transition time to the next phase using the Slow parameter (see section 5.3.2 "Flight phases" on page 94).

- Flight phases as virtual switches:

  You can also assign flight phases as virtual switches, e.g. if you prefer to use different mixers in some flight phases.

- Control functions:

  Further options—many of which are flight phase specific—are available in the ControlFunctions menu (see section 5.4 "ControlFunction" on page 112).

8.2 Helicopter models

8.2.1 The procedure in principle

A model memory for a helicopter with 120° CCPM rotor head and electric power system is created in this example.

The following steps are required to ensure correct operation of the basic model functions:

1. Creating a new model in the transmitter, see page 190
2. Preparing controls and switches, see page 191
3. Checking and changing servo assignment, see page 194
4. Checking and adjusting the main rotor, see page 195
5. Checking and adjusting the tail rotor, see page 201

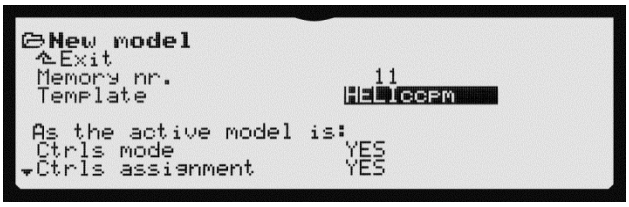
The basic functions of the model, i.e. Aileron, Elevator, Rudder, and Throttle / Collective, can be controlled once these steps are completed.

The basic functions can be extended and fine-tuned as follows:

6. Working with flight phases, see page 207

8.2.2 Creating a new model in the transmitter

1. Open the `Memory` main menu.
2. Switch to a similar model in the `select` menu. If no model is available yet or if the current model is quite similar to the new model, simply proceed with the next step.
3. Open the `new model` menu in the `Memory` main menu.



Selecting a template

Thanks to pre-defined model templates (see page 53) new models can be created more easily and quickly since the basic configuration is more or less completed by selecting the template.

You can use the Memory > Edit name menu to find out which template was used for model creation.

4. Select the HELIccpm model template for the Template parameter.

Inheriting parameters from the active model

5. Select the data to be inherited from the currently active model.
   a. Ctrl Mode: Usually, the basic control functions will always remain on the same stick axes. So, keep the switch setting "ON".
   b. Ctrls assignment: When you select "ON", the assignments of controls to control functions are inherited from the current model. When set to "OFF", they are inherited from the template.
   c. Switch assignment: When you select "ON", the assignments of switches to switched functions are inherited from the current model. When set to "OFF", they are inherited from the template.
   d. Names of Controls: When you select "ON", the names of the control functions are inherited from the current model. When set to "OFF", they are inherited from the template. If you changed the names in the current model and you would like to inherit these names, "ON" should be selected. Otherwise, setting the switch to "OFF" is preferable.
   e. Sensor names: When you select "ON", the names of the sensors are inherited from the current model. When set to "OFF", they are inherited from the template. If you changed the names in the current model and you would like to inherit them, "ON" should be selected. Otherwise, setting the switch to "OFF" is preferable.

   The device stores your selection. In most cases, you just have to check the selection switches.

Confirming settings

6. Confirm the setting with OK: The model memory is created and immediately activated. The display automatically switches to safety check and status display.

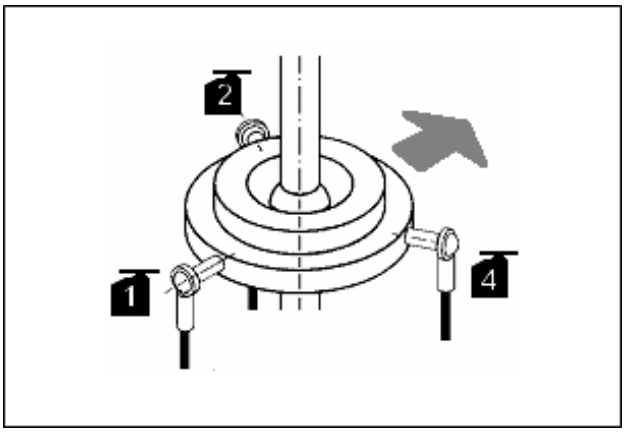
Editing the model name

The new model that is created has the same name as the template used: HELIccpm. For easier reference, you should change the name to the actual model name:

7. Open the Memory > Edit name menu.
8. Enter a name (max. 16 characters) that clearly identifies the model. Refer to page 157 for details.

The creation of a new model in the memory is now completed. These settings determine the following in the model memory:

Receiver output sequence



- Servo 1 to 6 are pre-defined
- The servo assignments can be changed and amended as required (Servo > Assignment menu).

Controls assignment from the template

Controls are assigned to control functions in the Setup > Assign.Controls menu:

Function Control	
Throttle ▼I* ↓*	Collective is assigned to the same control as Throttle
Gyro <E ↓*	Left-hand slider for gyro sensitivity
Thr.Limiter F> ↓*	Right-hand slider for Thr.Limiter

Switch assignment

The Setup > Assign.Switches menu contains:

Function Switch	
CS/DTC	You can use this switch to alternate from the throttle curve to direct throttle control using the throttle limiter. Useful for configuring I.C. engines.
Throttle-cut	Do not use any button here!
Σ Sum F ↑	Switch for the sum timer, controlled by control F> (throttle limiter). The sum timer records the motor run time.
Phase 4	Switch for the main flight phase = AUTOROT
Phases 1-3	Flight phases switch

Unused switches are marked with ⎍ --- -" and are not listed here.

9. Assign a switch to all the switched functions that you intend to use.

You can now perform the first functional test with the servo monitor. The model is not required for this test (see section 5.6.4 "Test run" on page 144).

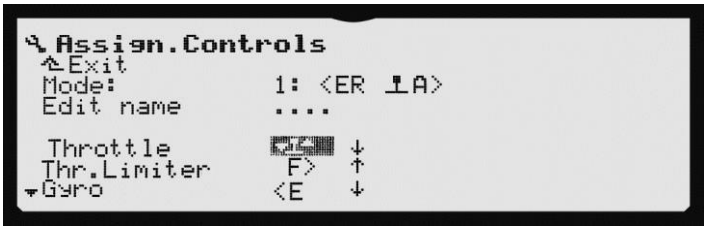
8.2.3 Preparing controls and switches

Checking / changing the minimum control positions for idle / collective pitch and throttle limiter

In the templates for helicopters, minimum idle / collective pitch is set to "back" (↓ arrow next to the identifier). The minimum position for the throttle limiter is also set to "back".

To change the setting to "front" proceed as follows:

1. Open the Setup main menu.
2. Open the Assign.Controls menu.
3. Select the control function, e.g. Throttle.



4. Operate the throttle stick vigorously. Leave it in idle position.
   The direction arrow points to the current position of the stick.

WARNING Never change the assignments and/or rotation direction of controls and switches when the model is switched on. Power systems and servos may start up unexpectedly and cause damage.

5. Confirm the change by pressing ENTER.

Proceed as described above to change the minimum position for the throttle limiter.

Changing switch position for ON and/or assignment

The "ON" position can be changed for all the switches.

8.2.4 Checking and changing servo assignment

The servo assignment defines:

- The receiver output controlling the servo
- The number of curve points (2, 3, or 5) used for adjusting the servo travel

Defaults

The rotor head servos and the servo gyro have 3 curve points (the centre can also be set). Throttle and tail rotor have 2 curve points for a linear characteristic (only end-points must be set).

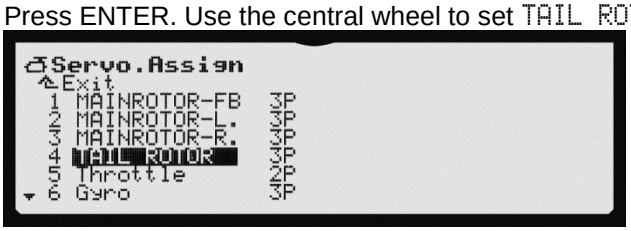
Procedure

1. Open the Servo main menu.
2. Open the Assignment menu.

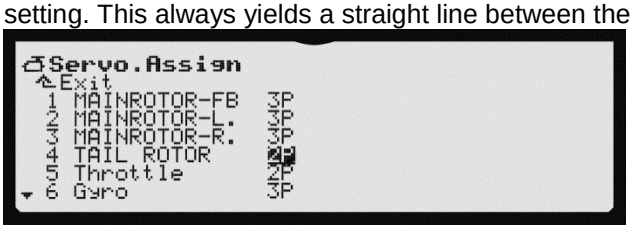
   In this menu, the assignments for all the receiver outputs can be changed as required.

   In the following example, servos 3 and 4 are swapped so that all the head servos are in sequence.
3. Select servo 3 TAIL ROTOR.

4. Press ENTER. Use the central wheel to set MAINROTOR-R.
5. Press ENTER. Set the number of curve points to 3P.
6. Press ENTER. Select servo 4.
7. Press ENTER. Use the central wheel to set TAIL ROTOR.



8. Set the number of curve points to 2P. Only the end positions then require setting. This always yields a straight line between the points.



9. Confirm the change by pressing ENTER.

Servo 3 and servo 4 are now swapped. All the head servos are in sequence.

8.2.5 Checking and adjusting the main rotor

CAUTION Secure the model when you set the rotation direction, centre, and travels for the servos to prevent danger or damage due to unexpected reactions.

8.2.5.1 Checking / changing direction of servo rotation on the rotor head

The directions of travel for the servos must be checked and changed (if required) before centre and travel are set.

- For electric helicopters: disconnect the motor!
- Move the collective pitch stick approximately to the centre position.
- Then, switch the receive system ON.

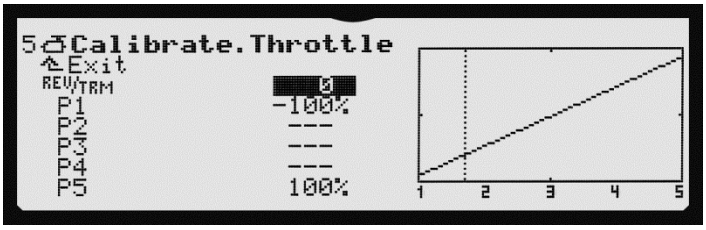
Start with the Collective function!

If swashplate responds correctly when you move the collective pitch stick and if the head servos are connected correctly, the directions of travel for aileron and elevator must also be correct.

To perform the check move the collective pitch stick in the direction of maximum collective pitch (climbing) and observe if the swashplate moves up and remains horizontal.

Changing the rotation direction

1. Open the Servo main menu.
2. Open the Calibrate menu.
3. Select a servo.
4. Select REV/TRM and open the parameter.



5. Adjust the direction of servo rotation using the **REV/CLR** button. The effect of the change is immediately visible in the graph (the curve reverses).

If you move the collective pitch stick slightly from the neutral position before pressing the **REV/CLR** button, the servo will jump to the new position when you reverse it. This is an easy way to check that you have selected the "correct" servo.

6. If the rotation direction is correct, confirm the change and exit the menu.
7. Select the next servo that you want to edit.

Make sure that the rotation direction for all the servos is correct before you start to set travel and centre. If the rotation direction is changed later, you will need to re-calibrate it.

8.2.5.2 Calibrating servos: setting centre and maximum travel

Use the Servo > Calibrate menu (see page 139) to adjust the travels (P1 and P5) and the centres (P3) for all the servos so that the servos take up the correct idle position, move evenly across their range of travel, and reach the appropriate end-points.

If you wish your models to fly accurately, precise servo calibration is a fundamental requirement!

The travel you set at this point cannot be exceeded (travel limit).

Always set the largest travel which the servo will be required to carry out.

Setting the centre

1. Open the Servo main menu.
2. Open the Calibrate menu.
3. Select a servo.
4. Select the P3 menu item and open the parameter.

First, perform a hardware calibration:

Press the F button. This generates the "true" centre, without the influence of the trim or mixer inputs on the servo.

If the servo is not in the desired centre position at this stage, it is essential to correct the control surface position mechanically (by re-positioning the output arm on the servo, or otherwise adjusting the linkage).

Wherever possible, the fine-tuning for point P3 for the servo calibration should not exceed ±15%.

5. Press the F button to allocate the centre. This passes the Centre value, 0%, to all the servos with the same basic function. This enables you to set the centre for the current servo regardless of the stick position.

   Moving the stick, or pressing the F button erases the allocation!

Note regarding "allocation"

Allocating in this way saves you the bother of holding the stick at one end-point, and enables you to use both hands in order to measure the control surface travel on the model. If required, you can make corrections using the central wheel.

Calibrating multiple servos with the same function:

Example:

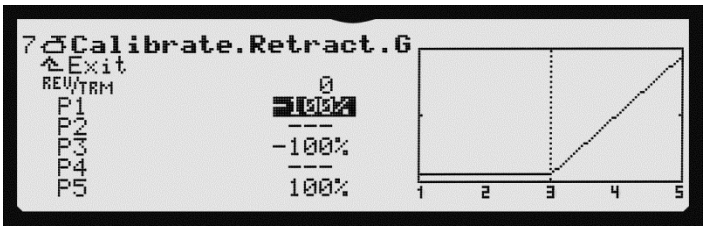
Servos 1, 2, and 4 are assigned as MAINROTOR-X (mixed function). Point P3 is opened in the Calibrate menu for servo 1. When you now allocate the centre using the F button, all the swashplate servos will immediately move to the centre. At this point, you can use the central wheel to adjust the current servo to match the other two.

6. Use the wheel to set the servo to the desired centre. Any changes you make are immediately visible on the model itself.
7. If the centre is correct, confirm the change and exit the menu.
8. Select the next servo that you want to edit.

Setting the maximum servo travel (control surface travel)

At this point, set the maximum required value for blade deflection; this is generally the auto-rotation value. The smaller values required for normal flying can be set for the individual flight phases in the ControlFunctions menu under Collective.

1. Open the Servo main menu.
2. Open the Calibrate menu.
3. Select a servo.
4. Select the P1 menu item and open the parameter.



5. Press the F button. All the swashplate servos now assume this position.
   This enables you to set the servo travel regardless of control position and trim.
   Pressing the F button again unlocks the servos.

Maximum servo travel = 110%

If required, servo travel can be increased to up to 110% on both sides.

6. Conclude the calibration for P1.
7. Repeat the procedure for point P5, starting from step 4.
8. Exit the menu and set up the other servos accordingly.

8.2.6 Checking and adjusting the tail rotor

8.2.6.1 Checking / changing the direction of servo rotation for the tail rotor

The direction of servo travel must be checked and changed (if required) before centre and travel are set.

When entering the basic settings do not connect the tail rotor servo via the gyro, but directly to the respective receiver output. This ensures that the gyro has no effect on your settings.

Move the rudder stick to the left, and observe the response of the tail rotor. Does the pitch angle of the blades change in the correct direction? Otherwise, reverse the tail rotor servo as described on page 141.

8.2.6.2 TAIL ROTOR mixer

The TAIL ROTOR mixer of the PROFI TX conceals the function "static tail rotor compensation", which is also sometimes known as REVO-MIX (revolution mixer). The TAIL ROTOR mixer is always displayed in the Mixer main menu when you set up a model based on the model templates HELImech. or HELIccpm.

When a helicopter makes the transition from the hover into a climb or descent, the torque which the tail rotor has to compensate becomes larger or smaller, with the result that the model yaws in one direction. Once set up correctly, the TAIL ROTOR mixer compensates for these torque fluctuations, and prevents the model yawing. It also eases the task of the gyro system, so that you can set a high sensitivity value and thereby obtain very good tail rotor stabilisation.

For this, the following parameters are required in the TAIL ROTOR menu:

Offset

To compensate for the torque at 0° collective pitch (main rotor), a small tail rotor pitch angle (= Offset) is required. The value can be set separately in each flight phase. This will be necessary if you use different system speeds in the various flight phases.

In the flight phase AUTOROT (auto-rotation) the Offset parameter can be changed so that no tail rotor pitch is present at all. This is particularly important if your model helicopter features a driven tail rotor.

Coll.+ / Coll.- (REVO-MIX)

You can use the Coll.+ / Coll.- parameters to set the collective pitch mixers for the tail rotor separately for climb and descent, and for each flight phase:

- Coll.+: correction for climbing
- Coll.-: correction for descending

The exact values can only be established through a programme of flight testing, and vary according to many parameters.

Zero point

The origin for the static tail rotor compensation mixer is set under Zero point. Starting from this collective pitch setting angle in the direction of "climbing", the "Collective -> Tail rotor" mixer is added using the value set for Coll.+. The value set for Coll.- is applied in the other direction (descending).

1. Move the collective pitch stick to the position corresponding to 0° collective pitch (use a rotor blade gauge if available).

The setup of the collective pitch curve must be completed, first.

The value for Collective (last line) cannot be changed. It shows the current position of the collective pitch stick, and serves as an aid during setup. Use the throttle / collective pitch stick to set the main rotor blades to a pitch angle of zero. Apply this value to the Zero point parameter.

Configuring rudder differential

The purpose of the Rudd.Diff. parameter is to reduce the tail rotor travel in one direction. This is necessary if the model behaves differently when yawing (rudder commands) to left and right (angular velocity). Since the tail rotor has to counteract the torque generated by the main rotor, "Rudder" is usually weaker when the model is required to turn against the rotation direction of the main rotor.

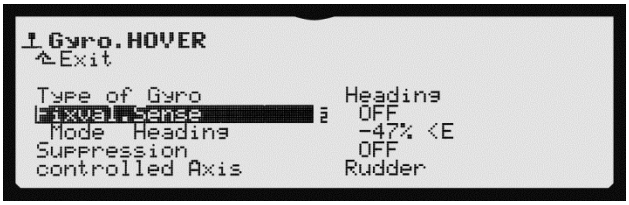
A separate value can be set for each flight phase.

8.2.7 Gyro

The Gyro control function is intended for gyro systems which allow radio-controlled configuration of the sensitivity via a servo channel.

If Gyro is not assigned to a servo channel, this function is not available in the Controls menu.

1. Open the Controls main menu.
2. Open the Gyro menu.



The gyro type Heading is selected by default in the model templates. The fixed value for sensitivity setting is switched off (OFF). Gyro sensitivity is controlled using the assigned control. In the helicopter templates, this control is always the left-hand slider (<E). The next line shows the operating mode (Mode), the value provided by the control in %, and the identifier for the control (<E). Rudder is set as Controlled axis.

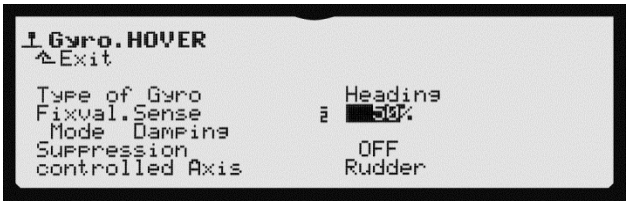
In Heading mode, rudder trim and tail rotor mixer (TAIL ROTOR) are switched off.

The gyro is assigned to servo channel 6 in all the helicopter templates.

Refer to section 5.4.5 "Gyro" on page 122 for more information.

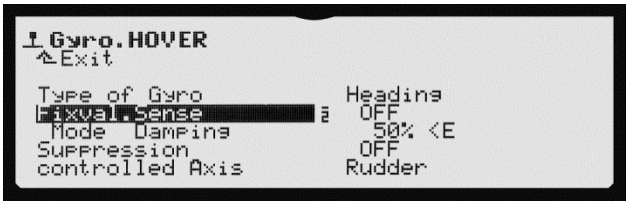
- Damping mode

  The gyro operates in Damping mode if you set the sensitivity to a value between 0% and +100%:



- The gyro operates in Heading-hold mode if you set the sensitivity to a negative value.
- Controls mode

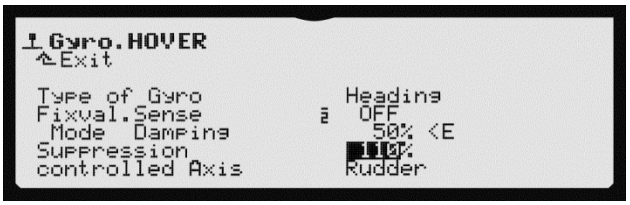
In controls mode, gyro sensitivity can only be set manually using the Gyro control function (factory setting: slider E). To this end, Fixval.Sense must be set to OFF. The next line now shows the position (50%) and control (<E):



8.2.7.1 Setting gyro suppression

Many gyros reduce their effect (sensitivity) when the pilot gives a deliberate command. Without this suppression, the gyro would also damp out intentional control commands. If you are using a gyro without its own automatic suppression (read the appropriate notes in the gyro system operating instructions!), then you should activate this function.

In helicopter models, the gyro effect is suppressed in proportion to the travel of the control that was set in addition to the Controlled axis. In case of helicopters, this control is always Rudder.



- If Suppression = 100%, the gyro effect (Fixval.Sense) is reduced to zero (= gyro OFF) at full travel of the Rudder control.
- If Suppression = 200%, gyro sensitivity is reduced to zero (= gyro OFF) at half travel of the control.
- If Suppression = 50%, gyro sensitivity at full travel is 50% of the original value setting.

Suppression is only effective in the Damping gyro mode, regardless of the flight phase.

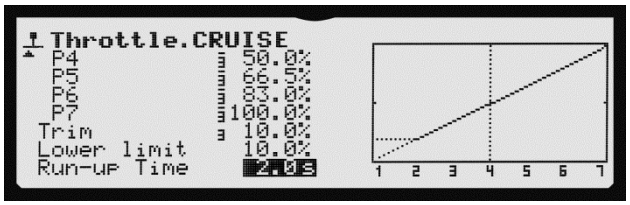
NOTICE Before flying a model, make sure that the gyro counteracts the rotational movement of the model in Damping mode. If set incorrectly, the gyro will amplify any unwanted yawing motion of the helicopter model, rendering it uncontrollable.

Please observe the notes in the operating instructions supplied with the gyro system!

8.2.8 Throttle

Does not apply to the FUNCOPTER template! For throttle-controlled helicopters, the simple throttle setting of fixed-wing models is used. See chapter 5.4.2 on page 117.

The Throttle control function can be adjusted using 7 curve points or using a fixed value when the electric power system operates in Governor mode.



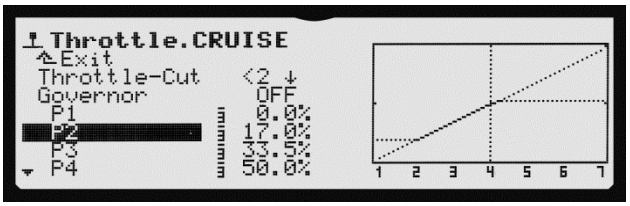
Each flight phase has a specific curve. Only in the AUTOROT flight phase, all the curve points have the same value (yielding a straight line).

To assist model adjustment when the motor is running Throttle can be limited towards full throttle using a limiter. In all the helicopter templates, the right-hand slider F> is used for this function (changing; see page 101). During adjustment, reduce the limiter to a value that prevents the model from taking off.

- The purpose of the throttle cut switch is to turn off the power system quickly in case of an emergency.

NOTICE No Throttle-Cut switch is assigned in the templates. You must assign a switch before you start operating your model (see page 104). **Always use a dip-switch. If a button were used, electric motors would start up again when the button was released!**

- The limiter (upper dashed horizontal line) limits the throttle upwards to allow the model to be adjusted (slider at the top = no limit). The sum of lower



limit + trim^{FPH} restricts Throttle downwards as the idle limit for I.C. engines (upper dashed horizontal line).

- The idle limit is switched off in the AUTOROT flight phase, even if flight phase specific trim was or is set to 0.0%.

Sometimes, it can be useful to operate the throttle directly without any restrictions. To do so, assign a switch to the CS/DTC switched function as described on page 104. When this switch is in ON position, the limiter controls the throttle directly.

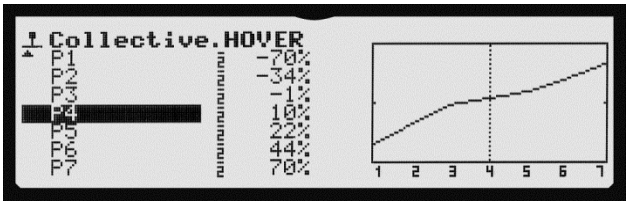
8.2.9 Setting the collective pitch curve

Does not apply to the FUNCOPTER template! Throttle-controlled helicopters do not feature collective pitch control.

For helicopter models, the collective pitch curve is set in the ControlFunctions menu under Collective. For each of the flight phases a separate collective pitch curve can be configured to achieve optimum adaptation to the respective flight phase:

Each curve point can be allocated using the central wheel to allow in-flight configuration (see section 5.4.6 "Collective (only helicopters)" on page 125).

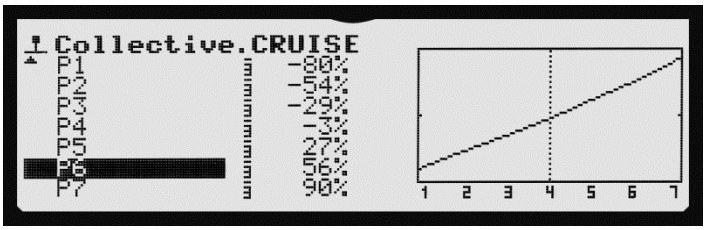
Example 1: collective pitch curve in the HOVER flight phase



A "flatter" collective pitch curve from hover collective pitch (stick centre) to collective pitch minimum (descent) helps to provide fine control during the hover and promote accurate landing of the model.

In the "climb" area (stick centre to collective pitch maximum) only 70% of possible collective pitch travel is used. This also contributes to fine control during the hover.

Example 2: collective pitch curve in the CRUISE flight phase



Linear, symmetrical collective pitch curve for the same collective pitch control when climbing and descending; overall higher maximum collective pitch values since a higher system speed is typically set (throttle curve) allowing higher climbing performance:

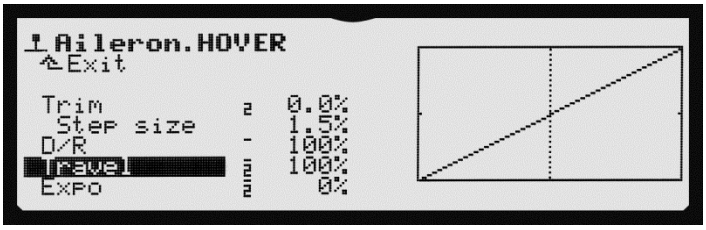
8.2.10 Working with flight phases

Requirement

To allow working with flight phases, at least one switch must be assigned in the Setup > Assign.Switches menu (either for Phase 4 or Phases 1-3). Otherwise, the transmitter always operates in Phase 1.

For each flight phase, you can customise the control characteristics on the transmitter according to the requirements of the model (e.g. reduced control travels for HOVER, maximum control travels for collective pitch for AUTOROT, V-shaped throttle curve for 3D flying). In the control function menus, all settings that can differ between flight phases are accompanied by the respective identifying number for the flight phase.

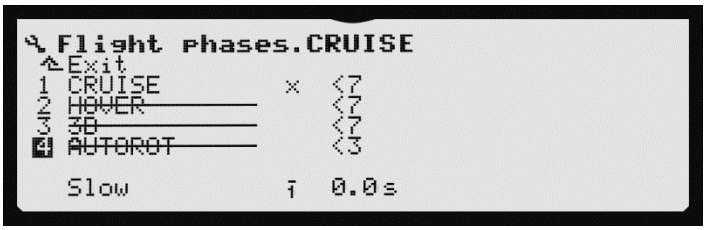
Example: Aileron



Flight phase specific settings can only be configured for control functions and control mixers. The servo settings are identical in all the flight phases.

8.2.10.1 Defaults in the Flight phases menu

1. Open the Setup main menu.
2. Open the Flight phases menu.



Flight phases 2, 3, and 4 are locked (the name is crossed out).

Three dashes "---" next to the flight phases indicate that no switch has been assigned for switching between flight phases. In this case, flight phase 1 HOVER is automatically selected and marked as the active flight phase (x).

Names are pre-assigned to all four possible flight phases. However, those can be edited using the **+** / **–** button or the central wheel.

8.2.10.2 Assigning switches for flight phases

At least one of the two switches must be assigned before you can use different control settings in the flight phases:

1. Open the Setup main menu.
2. Open the Assign.Switches menu.
3. Select Phases 1-3 and open the parameter.
4. Move switch I to the ON position (* must be visible).

To use all four flight phases a switch must also be assigned to Phase 4.

Phase 4 switch (assign a 2-position switch)

If this switch is in ON position (marked with * during assignment), flight phase 4 is activated. In this case, the position of the second switch does not have any influence.

If no switch is assigned to Phases 1-3, you can only switch between phase 1 and 4 by operating the Phase 4 switch.

Phase 1-3 switch (assign a 3-position switch)

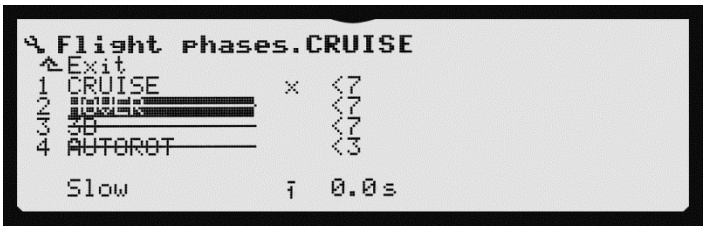
You can use this switch to activate Phase 1, 2 or 3, provided that the Phase 4 switch is in OFF position.

8.2.10.3 Locking / unlocking flight phases

You can lock flight phases that have not yet been set. Locked phases cannot be activated even if a switch is assigned to them. If the switch is moved to a position for a locked flight phase, an acoustic warning sounds (a beep approx. every 0.5 seconds) for as long as the switch remains in this position.

The active flight phase—marked with an x—cannot be locked.

1. Open the Setup main menu.
2. Open the Flight phases menu.



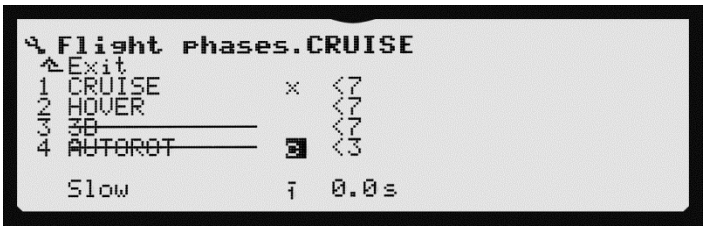
3. Select the respective flight phase in the menu.
4. Every time you press the **REV/CLR** button, the flight phase toggles between locked and unlocked.
5. Confirm the change.

8.2.10.4 Copying flight phases

Once you have established the correct settings in one flight phase, you can copy the values into another flight phase and then modify them. This avoids the need to re-enter all the settings from the start.

Only the active flight phase can be copied.

1. Open the Setup main menu.
2. Open the Flight phases menu.
3. Select the active flight phase (with the X) and press the **ENTER** button twice: A C is now shown above the X.
4. Select the copy target by moving the C to the respective line. Press the **ENTER** button.



The cursor returns to the number of the active flight phase. Except for the run times, all the flight phase specific settings are now identical to those of the active flight phase.

8.2.10.5 Changing flight phase names

You can select any of the 13 pre-set names for the flight phases:

1	NORMAL	6	SPEED1	11	HOVER
2	START1	7	SPEED2	12	3D
3	START2	8	CRUISE	13	ACRO
4	THERMAL1	9	LANDING		
5	THERMAL2	10	AUTOROT		

After activating the input field for the name, select a suitable name by pressing the **+** / **–** buttons or by using the central wheel.

Two exceptions apply to the AUTOROT name: There is no transition delay when switching to this flight phase and the lower throttle limit is cancelled.

8.2.10.6 Setting the transition time

You can either immediately switch between flight phases or apply a selectable delay time of 0.1 to 6.0 seconds.

1. Open the Setup main menu.
2. Open the Flight phases menu.
3. Select the Slow menu item.
4. Switch to the desired flight phase.
5. Press the **+** / **–** buttons or use the central wheel to select the delay time.
6. Confirm your settings.

9 Maintenance and care

The transmitter does not require any special maintenance or care.

However, we strongly recommend that you have the transmitter checked by an authorised MULTIPLEX Service Centre at regular intervals (every two or three years), depending on the intensity of use. Regular functional and range checks are mandatory (see section 3.6 "Range check" on page 47).

NOTICE Never use abrasive cleaning agents such as spirit or solvents!

- Remove dust and dirt preferably with a soft bristle brush.
- Remove persistent dirt, in particular grease and oil, with a moist cloth and, if required, with a mild household cleaning agent.
- Protect the transmitter against mechanical impact and shock.
  The transmitter should be stored and transported in a suitable container (bag or carrying case).
- At regular intervals, check that the transmitter case, mechanical parts and especially the wiring and contacts are in good condition.

10 Appendix

10.1 Specifications

	PROFI TX 9	PROFI TX 12	PROFI TX 16
Channels	9	12	16
Model memories	50	100	200
Transmission type	M-LINK 2.4GHz spread spectrum + frequency hopping		
Servo pulse width at +/- 100% servo travel	UNI 1.5 ± 0.55ms		
Power supply	3.3V LiFePO4 4000mAh		
Current consumption	approx. 150mA		
Charging via USB socket	• 500mA on the PC • Up to 1.5A using a special charger		
Permissible temperatures for	• operation: -15°C to +55°C • storage: -20°C to +60°C • charging: 0°C to +40°C		
Weight with battery	approx. 1800 g		
Dimensions without stick units	L x H X W: 235 x 250 x 71 mm		

10.2 Accessories

2-position ON/OFF switch, long
Item No.: 75750

2-position ON/OFF switch, long
Item No.: 75751

3-position ON/OFF/ON switch, short
Item No.: 75752

3-position ON/OFF/ON switch, short
Item No.: 75753

COPILOT
Item No.: 45184

Digi-adjuster
Item No.: 75755

Rotary knob
Item No.: 75756

PROFI TX hand-rest
Item No.: 85701

Aluminium stick unit, long, with 2-position switch
Item No.: 85940

Aluminium stick unit, long, with 3-position switch
Item No.: 85941

Aluminium stick unit, long, with push-button
Item No.: 85942

Transmitter case
Item No.: 763323

Lanyard transmitter neckstrap
Item No.: 85710

Standard transmitter neckstrap
Item No.: 85711

Push-button
Item No.: 75754

USB plug-in charger 100-240V
Item No.: 145534

USB car plug-in charger 12V DC
Item No.: 145533

Glossary of technical terms

Allocation

Permanently assigning a set value to a digi-adjuster.

Assignment

Defines which functions in the transmitter or model are controlled by which control.

Battery management

Determines the remaining operating time (time to empty), the capacity and other battery data from the current and voltage characteristics. Optimises the charge / discharge limits for a long battery life.

Binding

Required to ensure that the receiver exclusively responds to signals from "its" specific (bound) transmitter. The binding procedure must be performed during initial setup.

Re-binding is required if the transmitter mode is changed (e.g. response is changed from "Fast" to "Normal", frequency range is changed from "Normal" to "France").

Centre trim

Trim corrections do not change the end-points.

Combi-Switch

Couples aileron and rudder in a way that allows both of the control functions to be controlled by either of the functions. This makes it easier to fly accurate turns.

Control

Any transmitter control which can be assigned to a control function or switched function:

- Sticks
- Slide potentiometers
- Rotary potentiometers
- Switches and their designated buttons

Differential

Indicates the percentage by which the travel distance of the control surface down is reduced relative to the travel distance up; if the differential is set to 50%, the travel distance down is half as great as the travel distance up. The higher the % value, the shorter the travel distance of the control surface down. Differential is required because the downward control surface generates greater drag than the upward control surface. This results in a negative turning moment (known as adverse yaw) which tends to push the model out of the turn.

Digital trim

The physical position of a conventional trim with trim slider corresponds to the actual trim value, while digital trim buttons do not. The digital trim position is displayed on the screen, and the trim values are stored in the model memory. If you switch model memories, there is no need to move the trim sliders to the correct position to suit the model. The correct trims are immediately available. If the PROFI TX is used with a model for which you have set up multiple flight phases, each flight phase has its own trim memory, i.e. it is simple to trim each flight phase accurately, and independently of the trims in the other phases.

DTC

Direct Throttle Control

If DTC is switched on, the throttle channel (regardless of whether it acts upon a carburettor or a speed controller) is controlled directly by the transmitter control assigned to throttle limiter, and is independent of the position of the collective pitch stick.

Dual rate (D/R)

Alters the sensitivity of particular transmitter controls. If the D/R parameter for a control function (e.g. Aileron) is set to 50% you can use the assigned switch to reduce the control surface travels on the model by half for finer control. The control curve in the graph changes accordingly when you operate the switch assigned to dual rate.

Expo

Generates a non-linear control function.

- For Expo = 0%, the control works in a linear fashion.
- The effect of negative values is that smaller control surface travels are generated around the centre position with the same stick travel, thus providing finer control.
- The effect of positive Expo values is that control surface travels are increased around the centre position.

The end-points remain unchanged.

Failsafe

If the receiver does not receive any signal, the servos stop at their most recent positions (Hold function). If Failsafe positions were stored in the receiver, the servos return to these positions after 0.75 seconds.

FastResponse

Reduces the transmission cycle from 21ms to 14ms reducing the response time for control commands. Only 12 servos can be controlled with FastResponse.

Flight phases

Settings / data sets for a model which can be called up by operating a switch. The data sets are optimised for particular flight tasks.

Lower throttle limit and throttle trim (idle)

You use the lower throttle limit to restrict the throttle channel to the idle speed of the power system.
If you set the throttle limiter to minimum, the idle characteristics of an I.C. engine can be fine-tuned using the trim in order to suit the operating conditions (temperature, humidity). Trimming is carried out using the trim button adjacent to the stick which you have selected (via "Mode") to control throttle and collective pitch.

MagicSwitch

Logical switch, which can be assigned like a normal control; it combines up to three switches in an AND function. Unused inputs are considered switched on. In addition, switching can be delayed.

Mixer

Combination of control functions (e.g. elevator, aileron, etc.) in various percentages; 14 free mixers are available in PROFI TX. Five of these mixers are pre-defined and ready for immediate use. All the mixers (even the pre-defined ones) can be changed as required.

Mode

Defines the assignment of the main control functions Aileron, Elevator, and Rudder to the stick units.

Model template

Template for creating new models; thanks to model templates, new models can be created more easily and quickly since the basic configuration is more or less completed by selecting the template. Model templates also contain the basic configuration for mixers, controls, servos and flight phases.

Range check

Is used to check the proper operation of the radio link. The transmitter power is reduced to approx. 1% so that the check can be performed at a shorter distance.

Ratchet

Ratchet system in which a mechanism assumes and holds a specific position.

Servo

Positioning device; converts a default setting that is provided as an electrical signal into a physical position.

Servo calibration

Servo curve

Used to define the maximum control surface travels, set the neutral position, and set the control surface travels of servos with the same function to the same value. Also for trimming servos on control surface pairs to synchronous operation.

Snap flap

Switchable elevator mixer to the camber-changing flaps (flaps) or the ailerons.

Spoiler

Used for glide path control or for "braking" the model.

Standard trim

Shifts the entire setting range of the stick in parallel up and down (by the trim value). To allow this shift without limiting the control signal, the control signal must be reduced by the maximum trim value possible. Thus, unlike centre trim, the servo travel cannot be fully used.

Switch

Controls that switch functions on or off or toggle between functions; multiple menus are available for assigning switches to functions. Standard functions (D/R, Timer, etc.) are compiled in a list.

Throttle curve

Only used for helicopters. The throttle curve of the PROFI TX has 7 points and determines how much throttle is assigned to the various individual positions of the collective pitch stick. The aim is a constant speed, i.e. the higher the collective pitch, the more the throttle is advanced.

Throttle limiter

Only used for helicopters. Restricts (limits) the maximum possible throttle value. This allows safer model setups. For normal flying, the limiter is set to maximum. After start-up of the power system, the throttle limiter can be used to slowly increase the speed of the main rotor.

Throttle-cut

While this switch is switched on, the throttle channel is maintained in the position which you earlier selected during travel adjustment as point P1 for the throttle servo. This enables you to "switch off" an I.C. engine, assuming that the carburettor barrel is fully closed at this position.

Trainer mode

Safest method for beginners to get started in model sport; two transmitters are inter-connected using a second M-Link radio link. An experienced modeller has control over the model, and is able to transfer control functions to the student by operating the trainer button ("TEACHER" button). Initially these will be individual control functions, and later all the main control functions when the "student" has gained sufficient skill. If individual control functions are transferred, the teacher retains control over the remaining control functions. If he releases the TEACHER button, the teacher resumes full control of the model—typically if a dangerous situation develops. The teacher transmitter carries out all the data processing. This means that the student transmitter simply needs to be switched to "Student" mode. No further configuration or programming is required. All the teacher transmitter needs from the student transmitter are the pure stick signals.

Trimming

Adjustment of the model aircraft to fly straight and level when you leave the sticks exactly at centre.

Variometer

Device in the model aircraft that indicates the climbing and descending rate through audible signals.

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