1. CONTENTS

Congratulations on purchasing your new radio control system. We are delighted that you have selected the MULTIPLEX SMART SX M-LINK. You are now the owner of a superb system for the newcomer to the hobby of radio-controlled modelling. We hope you have many hours of fun and success with your new equipment.

2. QUICK-START

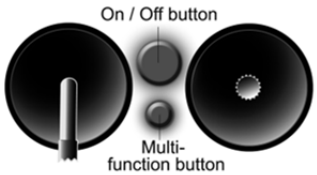
1. Unpack the transmitter and receiver
Store the documents safely.

2. Insert the batteries
It is essential to maintain correct polarity (see adjacent illustration). Reversed polarity may ruin the transmitter and / or the cells.

3. Binding

- Preparing the model
  When binding is complete, the receiving system immediately starts operating. Secure the model carefully so that no damage can result if the propeller should start turning.

- Prepare the transmitter
  Hold the multi-function button pressed in and switch the transmitter on, then release the button again. The LED flashes at a high rate.



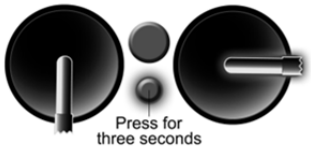
- Prepare the receiver
  Switch the receiver on with the SET button held pressed in; the receiver LED now flashes at a high rate.

If binding is successful, both LEDs revert to a slow flashing rate.

4. Check the directions of servo rotation

- Model with ID receiver
  The transmitter emits an audible signal when it detects the receiver. No further adjustments are required.

- Model with normal M-Link receiver (light or telemetry)
  All the control surfaces (servos) must respond to the sticks in the correct direction; check and reverse the servos if necessary: move the correct stick to one end-point and hold the multi-function button pressed in for three seconds: the servo now reverses, and moves to the opposite end-point.



5. Carry out a range check
It is important to check radio range before the first flight: hold the multi-function button pressed in for two seconds immediately after switching on, and the LED glows constantly. The transmitter now generates greatly reduced power, and emits an audible warning signal.

In this mode the control system must continue to function up to a distance of about fifty metres.

6. Flying the model
These few steps are all you need to do before the first flight. Be sure to keep to the correct sequence of switching on and off: always switch the transmitter on first, and only then the receiving system; reverse the sequence when switching off. Before you launch and fly your model please read through the manufacturer's notes; those concerning safety and other warnings are particularly important.

3. INTRODUCTION

These operating instructions are an integ-ral part of the product, and contain important information and safety notes. Please store them in a safe place, and be sure to pass them on to the new owner if you ever dispose of the equipment.

3.1 The SMART SX philosophy

The SMART SX M-LINK is a compact, intelligent six-channel beginners' radio control system with a

concept for the future!

The SMART SX intelligent beginners' radio control system is fully compatible with other MULTIPLEX systems, from the telemetry-capable COCKPIT SX right up to the high-end PROFI TX system. The same applies to the small ID receiver supplied in the set, which even works with the sophisticated PROFI TX transmitter.

However, MULTIPLEX offers much more than this: our range also includes a carefully considered, consistent series of models. Our complete RTF (Ready-to-Fly) packages contain the model, factory-assembled and almost ready for the air, the SMART SX transmitter, an RX-5 M-LINK ID receiver, dry cells, a rechargeable flight battery and a 230 V battery charger. Once you have unpacked the model, all you have to do is attach the wings, charge the flight pack and receiver battery (if used), and prepare the transmitter. When these few procedures are out of the way, there is nothing to stop you flying the model.

The presence of the M-LINK ID receiver enables the SMART SX to detect the specific model, and automatically activate the associated settings from its enormous reserve of model memories: fifty independent model memories are available. All compatible MULTIPLEX ELAPOR® models from RR+ to RTF are programmed in the transmitter as standard. Many models from other manufacturers can be fitted with an ID receiver, and this makes it very simple for the intelligent SMART SX transmitter to detect each ID receiver, and exploit its advantages. The overall concept of transmitter and model expands with the demands of the model pilot. MULTIPLEX offers a complete and consistent system whose components are all compatible.

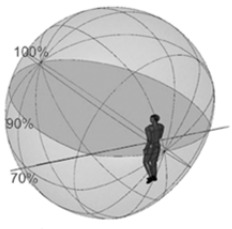
Once you have gained initial experience with an RTF model, and wish to own and fly another aircraft, we recommend that you move on to a MULTIPLEX RR+ model. Our RR+ packages are just as complete as the RTF models, with the exception of the SMART SX M-LINK transmitter and battery charger, as you already own these two components from your first RTF model. You can use them again, since the transmitter and charger are fully compatible with the RR+ models. The transmitter detects all compatible RR+ models which are currently available. When new models come onto the market, you can load their settings into your transmitter using the free MULTIPLEX Launcher software; this saves you the task of making the adjustments yourself.

When your requirements have expanded to the point where you are keen to invest even more time in the hobby of model flying, you can easily upgrade to an even more powerful MULTIPLEX transmitter, e.g. a COCKPIT SX system, since all the receivers are compatible. This represents long-term system compatibility, and saves you money.

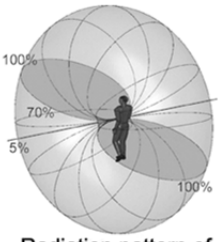
3.2 Features of the SMART SX

The SMART SX M-LINK is a compact, intelligent six-channel beginners' radio control system which includes groundbreaking features, some of them patented.

- The transmitter exploits its intelligent patented model identification system to assign a specific model (i.e. its receiver) to a pre-programmed model memory. All MULTIPLEX RR+ and RTF models are already programmed in separate model memories.
- The transmitter is fitted with an aerial incorporating the newly patented IOAT technology. The optimised directional characteristics significantly enhance security, and take effective range far beyond the limits of vision. The 2.4 GHz aerial integrated into the transmitter case is always directed at the optimum angle, and the radiated signal to the rear is minimal; all the radiated power is effectively concentrated in the flying sector.



IOAT radiation pattern



Radiation pattern of a conventional 2,4 GHz aerial

- The small, light transmitter is very easy to handle, and can be used for many types of model. Its ergonomically efficient case is very comfortable to hold.
- Five fully proportional channels are available: elevator, rudder and throttle plus two aileron channels. A

switched channel can also be used, controlled by the throttle function trim lever.
- All the primary control surface functions feature digital trims.
- A buzzer is used to provide audible feedback to the user, indicating the most important processes, such as: detecting the ID receiver, range-check, voltage monitor, trim function, Dual Rate setting, model select.
- The transmitter software is carefully structured with ultra-simple operation in mind. The simplicity of operating the transmitter makes it extremely easy to set it up to suit virtually any other model from a huge range of manufacturers. The transmitter even stores the final trim settings for each specific model.
- The pioneering, ultra-secure M-LINK transmission process with its intelligent channel management system creates the best possible pre-conditions for totally reliable operation. The M-LINK process makes it possible to operate up to 150 models simultaneously without mutual interference.
- With the three recommended AA-size dry cells the SMART SX transmitter operates for the enormously long time of up to 25 hours. The unit also includes an integral voltage monitor with a warning threshold set at a sensible level.
- It is possible to set up the transmitter to control almost any RC model currently available.
- The SMART SX transmitter is ideal for use as a Pupil transmitter in a Trainer system, providing the beginner with the perfect opportunity to learn the initial steps in the art of model flying quickly and safely. The wireless connection to the Teacher transmitter requires the M-LINK Trainer Stick - which can be used with any Trainer-capable MPX transmitter fitted with a multi-function socket - or a PROFI Tx using COPILOT.
- The transmitter software (= firmware) can be updated using the integral interface located in the battery compartment. This makes it possible to keep the transmitter completely up-to-date at all times. The same method can be used to transfer the settings for new RR+ models into the transmitter.

4. SAFETY NOTES, OTHER INFORMATION

Radio-controlled models and the associated RC systems are not playthings in the usual sense of the term. Building and operating them safely calls for a certain level of technical competence and manual skill, together with discipline and a responsible attitude at the flying field. Errors and negligence in building and flying the model can result in serious personal injury and damage to property. Since neither we, as manufacturer, nor the retailer have any control over the construction, maintenance and operation of our products, we are obliged to take this opportunity to point out these hazards and to emphasise your personal responsibility. We deny all liability.

It really is essential to observe the following safety notes, as you bear the responsibility for the safe operation of this product:
- Please read right through these instructions, and do not operate the system until you have studied the information and the following safety notes.
- It is never permissible to make technical modifications to the radio control system. Use genuine accessories and replacement parts exclusively; these include transmitter battery, receiver and servos.
- If you intend to operate the system in conjunction with products from other manufacturers, you must ensure that they are of good quality and work properly. Every new or changed combination of components must be checked exhaustively before use; the equipment must work correctly and at full range. Do not operate the RC system or the model if something is not in order. First seek out and eliminate the problem.
- A model flying out of control for whatever reason can certainly cause serious personal injury and property damage. For this reason it is the modeller's responsibility to take out third-party insurance for model aircraft, and heed the regulations. This really is mandatory.
- Always keep to the correct sequence when switching the system on and off, as this avoids the risk of the motor bursting into life unexpectedly:
  - When switching on
    Always switch the transmitter on before connecting the flight battery or switching the receiving system on.
  - When switching off
    Always disconnect the flight battery or switch the receiving system off before switching the transmitter off.
- Have your RC system - especially the transmitter and receiver - checked at regular intervals (every two or three years) by an authorised MULTIPLEX Service Centre.
- The transmitter must be operated exclusively within the stated temperature range. Please note that condensation may occur inside the transmitter if it is subjected to a major change in temperature. Damp can affect the operation of the transmitter and any other electronic equipment.
- If moisture affects any electrical unit, cease operations immediately, disconnect the power supply, and allow the device to dry out completely, preferably with the case open; this may take several days. After this carry out a careful check of its functions. If you are still unsure, take the affected equipment to an authorised MULTIPLEX Service Centre for checking.

In addition to these safety notes, please observe the following points.
- Build your model with great care; this applies in particular if you have to repair your model. The responsibility for completing the work competently rests with you.
- Install the servos and mechanical linkages in such a way that the control surfaces deflect freely, and are not

mechanically obstructed (stalled) at either end-point (maximum travel).
- Adjust the horns, output arms and linkages as accurately as possible, taking care to keep lost motion (slop) to an absolute minimum. This avoids overloading the servos, which are then able to exploit their full potential performance. These measures ensure that the servos have a long useful life, providing the highest possible margin of safety.
- Provide effective protection for the receiver, the batteries, the servos and the other RC components, and observe the notes in the operating instructions supplied with them. An important factor in this is the correct balancing of propellers and rotors. Any part of a power system which is damaged or runs out of true must be replaced at once.
- Do not place cables under strain, do not kink them, and do protect them from rotating parts.
- Avoid unnecessarily long or superfluous servo extension leads, and always use cable of adequate conductor cross-section (voltage loss). We recommend at least 0.24 mm^2 as a starting point.
- Take appropriate measures to avoid interference due to static charge, powerful electrical or electromagnetic fields (this includes the suppression of electric motors with suitable capacitors), and keep such sources well away from the RC system, the receiver aerial, wiring and batteries.
- Maintain adequate spacing between cables which carry high currents (e.g. electric power system leads) and the RC system. In particular the cables between brushless electric motors and their speed controllers must be kept short (max. 10 to 15 cm if possible).
- Check all functions carefully, and ensure that you are properly familiar with the method of operating your transmitter before using it to control a model.

You should also examine your model at regular intervals, checking the following points in particular:
- Check that control surfaces and linkages are free-moving and devoid of lost motion (slop);
- Check that pushrods, other linkage components, hinges, etc. are strong enough and in perfect condition;
- Look for fractures, cracks and distortions in the model, the RC components and the power system;
- All cables and connectors must be in good condition and make reliable contact;
- Check the condition of the power supply system and wiring, including the switch harness, and the external condition of the battery cells. This also includes the use of appropriate charging procedures to match the battery type, and regular maintenance of the batteries themselves.

Pay particular attention to the system's power supplies: both in the transmitter and in the model.
- Remove the dry cells from the transmitter if you know you will not be using it for a long period, as they could leak and cause damage.
- Always fit new dry cells after a protracted period of non-use.
- If you hear the voltage monitor warning sound, land your model (or otherwise cease operations) immediately. Change the dry cells for new ones of the correct type.
- Never attempt to recharge dry cells, as they could explode.
- At regular intervals check the state of the receiver battery or batteries, and the BEC system.
- Rechargeable batteries must be charged regularly; never wait until the servos' movements are perceptibly slower. Make it a rule to charge your batteries before every flying session.
- If you are using rechargeable cells, it is essential to observe the charging instructions provided by their manufacturer.

Before every flight carry out the following procedures and checks:
- Carefully charge up the transmitter, receiver and flight batteries, and check their state of charge regularly during the session and between flights.
- When you arrive at the launch point, register with the site warden or flight director, and do not switch ON until you have checked with the other pilots present that your channel is free.
- Check that all control functions and auxiliary functions are working correctly and in the correct "sense" (direction).

If you discover a problem, do not launch the model. First seek the fault, eliminate it, and check again.

When operating your model you should always observe the following points:
- If you have no experience in flying a model aeroplane, please ask a skilled pilot to help you initially. A Trainer system is a great help during the early stages.
- Only fly your model at a suitable site. Never operate a model in the vicinity of buildings or roads.
- Do not fly or steer your model over or towards spectators. Never place people or animals in danger.
- Do not carry out any high-risk flying or driving manoeuvres.
- In Germany and in many other countries it is a legal requirement to take out third-party insurance cover for the operation of model aircraft. Find out the exact legal requirements for your region, and observe them strictly.
- Be realistic when assessing your own skills and capabilities; don't over-estimate what you can do.
- If you notice any sign of a problem or interference, land your model immediately, or cease operations.
- **Static charge hazard!**
  In extremely dry air (in mountainous terrain and on steep slopes close to weather fronts) static charges may develop in the transmitter and / or the pilot. Such a charge may be dissipated by a static spark which could

damage the transmitter or cause interference, and might even endanger the pilot. The same effects may occur when an electrical storm is building up.

- **Counter-measures:**
  Cease operations as quickly as possible, walk a little way down the mountain in order to reach a less exposed point, and never fly in a thunderstorm or in the vicinity of such conditions.
- **Keep well clear of mobile telephones!**
  As a basic rule we recommend that you switch off mobile telephones and any other device which could affect the pilot's concentration.
- The SMART SX is protected against interference from electro-magnetic fields, such as those generated by mobile telephones. The system far exceeds the legal requirements regarding interference rejection. However, the rapid development in mobile radio, and the enormous range of devices now in use, do represent a residual risk which is difficult to assess. For safety's sake we therefore recommend that you always keep at least two metres away from any mobile telephone which is switched on.
- **Antenna Separating Distance**
  This product contains a radio transmitter with wireless technology which has been tested and found to be compliant with applicable regulations governing a radio transmitter in the 2.400GHz to 2.4835GHz frequency range.

  When operating your Smart SX transmitter, please be sure to maintain a separation distance of at least 5cm between your body (excluding fingers, hands, wrists, ankles and feet) and the antenna to meet RF exposure safety requirements as determined in the FCC regulations.

5. SET CONTENTS / ACCESSORIES

The SMART SX radio control set contains the components shown in the photo below:

- SMART SX M-LINK transmitter
- RX-5 light M-LINK ID 1 receiver
- Three AA-size dry cells
- Multi-lingual instructions

A set of optional aluminium stick tops can be fitted to the transmitter (see Chapter 7.19). They are in black (# 7 3305) and orange (# 7 3306) available.

If you have acquired the transmitter together with a MULTIPLEX RTF model aircraft, the set contents also include the aeroplane, a matching flight battery and a 230 V battery charger, as shown in the second photo.

The transmitter is available in two different stick modes (see Chapter 7.8):

- SMART SM M-LINK Mode 1 + 3 (# 1 5300)
- SMART SM M-LINK Mode 2 + 4 (# 1 5301)

The following additional items are available:

- RX-5 light M-LINK receiver
  If, for example, you wish to build and equip a MULTIPLEX RR model, a normal kit or another model, you will need an additional M-LINK receiver. In this case please note the ID number required to match the model concerned (see Chapter 7.15).

- USB PC lead (# 85149)
  You will need a USB adapter with Uni connector to load a firmware update via the port in the battery compartment, or to transfer new RR+ model settings into the transmitter (see Chapter 7.18).

6. SPECIFICATION

6.1 SMART SX transmitter

Frequency band:	2.4 GHz
Transmission type:	FHSS M-LINK
Aerial:	Integral IOAT aerial
Servo channels:	6
Model memories:	50
Servo signal format:	1.5 +/- 0.55 ms (at 100% travel)
Power supply:	3 AA-size cells
Current drain:	approx. 85 mA

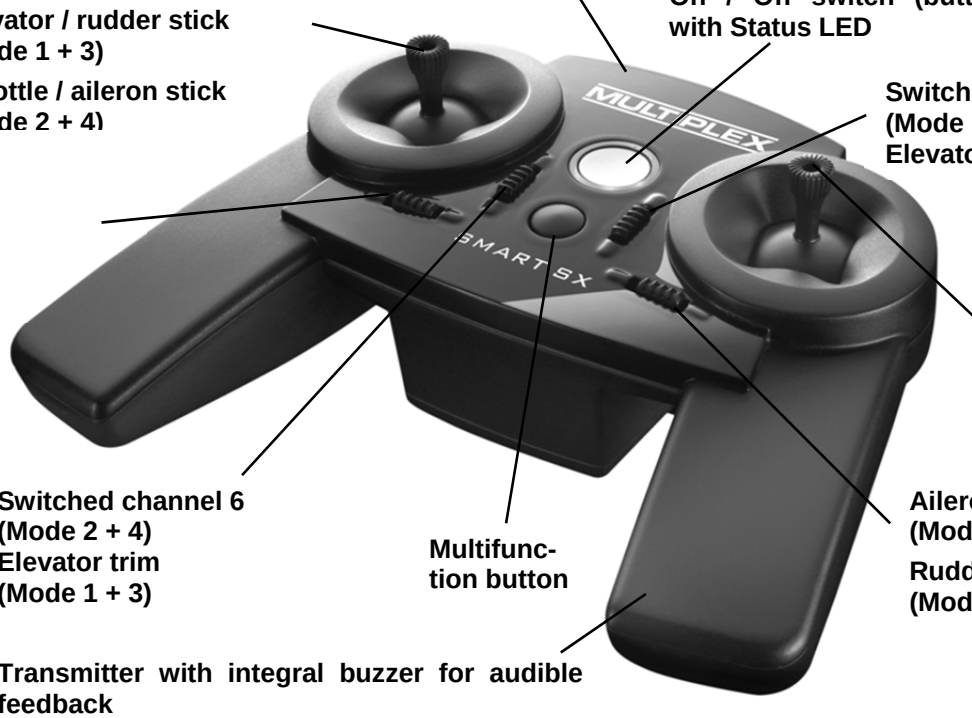
Weight:	approx. 355 g (incl. batteries)
Dimensions (L x W x H):	approx. 193 x 148 x 53 mm

6.2 RX-5 light M-LINK receiver

Servo channels:	5
Connector system:	UNI
Receive system:	2.4 GHz FHSS
Operating voltage:	3.5 V … 9.0 V
Power supply:	4 - 6 NiXX cells, 2S LiXX
Permissible operating temperature range:	- 20°C … + 55°C
Weight:	approx. 7 g
Dimensions (L x W x H):	approx. 34 x 19.5 x 11 mm

7. HANDLING

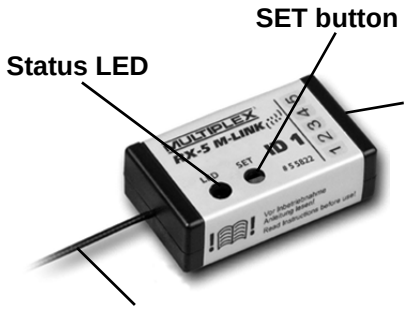
7.1 Transmitter controls



Battery compartment with cells fitted (always maintain correct cell polarity, as shown in this photo)

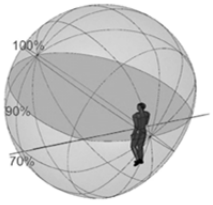
PC communication port with USB lead (# 85149).

7.2 Receiver controls

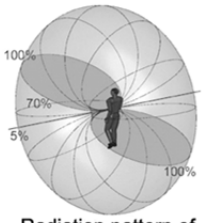


7.3 Transmitter aerial

The transmitter is fitted with an aerial exploiting the new, patented IOAT tech-nology. The integral aerial exhibits a radiation pattern which is ideal for the user, and completely new in the sphere of RC system transmitters: all the radiated power is effectively concentrated in the flight sector. The 2.4 GHz aerial integrated into the transmitter case is always oriented in the ideal direction, doubling the signal density over the radio link to the model. In conjunction with the optimised transmitting direction this aerial system provides a significant improvement in transmission security: effective range is far beyond the limits of vision.



IOAT radiation pattern



Radiation pattern of a conventional 2,4 GHz aerial

7.4 Inserting dry / rechargeable cells

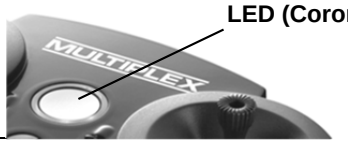
The SMART SX transmitter is powered by three AA-size dry cells; one set of cells is included in the set. Open the battery compartment on the back of the transmitter, and insert the dry cells as shown in the illustration on page 7. Close the battery compartment again. Remove the cells from the transmitter if you know you will not use it for a long period, e.g. during the Winter break.

Note:
It is essential to fit the batteries with correct polarity. The negative terminal of each cell must mate with the spring contact. Reversed polarity may ruin the transmitter and / or the cells.

It is also possible to use three rechargeable cells instead of the dry cells. However, these cells must always be recharged outside the transmitter, as no charge socket is present. Be sure to use a suitable battery charger.

7.5 Voltage monitor / operating times

The SMART SX transmitter features a permanent warning function which alerts the user to low battery voltage. When the dry or rechargeable cells are almost flat, you will hear an audible warning, and the LED will flash red instead of yellow. If this should happen, land the model or cease operations without delay, and fit new or fully charged cells.

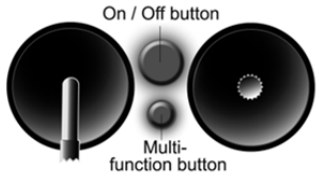


Thanks to the low energy requirement typical of 2.4 GHz equipment, the transmitter operates for the long period of up to 25 hours with three AA dry cells.

7.6 Binding

The first time you make the connection between transmitter and receiver the two components must be ‘bound’. For safety’s sake remove the propeller before doing this. When binding is complete, the receiving system immediately starts operating. First secure the model carefully so that no damage can result if the propeller should start turning. If you are unsure, for safety’s sake remove the propeller first.

- Prepare the transmitter for binding
  Switch the transmitter on with the multi-function button pressed in, and then release the button again. The Status LED flashes yellow at a high rate.



- Prepare the receiver for binding
  Switch the receiver on with the SET button pressed in. The LED on the receiver now also flashes yellow at a high rate.

Place the transmitter and receiver close to each other. Transmitter power is greatly reduced for the binding process; the distance between the two units may need to be 20 cm or less. As soon as the transmitter and receiver have “found” each other, the flashing rhythm on both components changes to a slow rate. Any servos connected to the receiver will now follow the movement of the corresponding sticks.

The binding information is stored permanently in the receiver, i.e. the binding procedure only needs to be carried out once.

If you are using an ID receiver, you will hear an audible signal when binding is complete, and the transmitter automatically loads the appropriate settings. This means that you do not need to adjust settings 7.7 to 7.11 every time.

7.7 Channel assignment

The channel assignment of the SMART SX transmitter is fixed; the sequence is as follows:

Channel 1:	Aileron 1
Channel 2:	Elevator
Channel 3:	Rudder
Channel 4:	Throttle
Channel 5:	Aileron 2

Channel 6: AUX auxiliary function (min. six-channel receiver required)

Connect the individual servos to the receiver in the sequence shown above.

7.8 Mode switching

Basically there are four methods of assigning the control functions aileron, elevator, rudder and throttle to the two dual-axis sticks of the SMART SX transmitter. Which of these options is used varies according to the personal preference and habits of the model pilot. The stick modes are defined as follows:

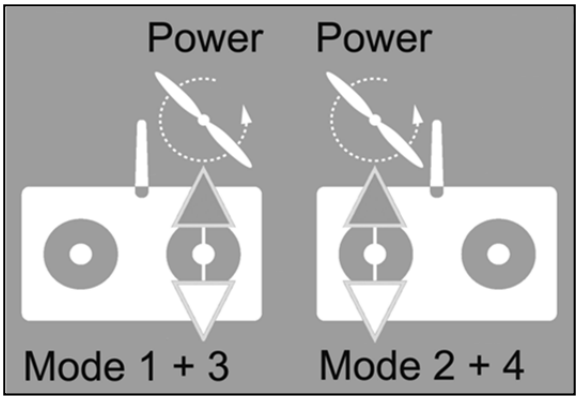
Mode 1:	Right stick	Throttle vertical Aileron horizontal
	Left stick	Elevator vertical Rudder horizontal
Mode 2:	Right stick	Elevator vertical Aileron horizontal
	Left stick	Throttle vertical Rudder horizontal
Mode 3:	Right stick	Throttle vertical Rudder horizontal
	Left stick	Elevator vertical Aileron horizontal
Mode 4:	Right stick	Elevator vertical Rudder horizontal
	Left stick	Throttle vertical Aileron horizontal

The SMART SX transmitter is available in two versions, each offering two stick modes. When you purchase your set you must decide on one of the combinations, which is determined by the non self-centring throttle function.

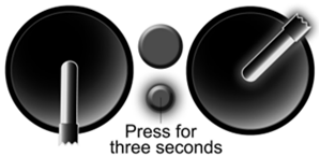
- SMART SX M-LINK Mode 1 + 3 (# 1 5300)
- SMART SX M-LINK Mode 2 + 4 (# 1 5301)

The stick mode can be changed within the selected combination. The first set (# 1 5300) can be switched between Mode 1 and 3. The second set (# 1 5301) can be switched between Mode 2 and 4.

If you wish to change the stick mode, please use this procedure:



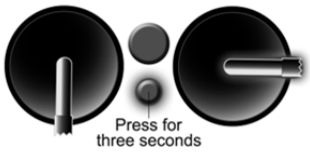
Locate the stick with two self-centring planes (no throttle function), and move it to the top right corner, then press the multi-function button for a period of three seconds: you will now hear an audible signal; the number of beeps indicates the new stick mode. It is only possible to swap rudder and aileron, as shown above, since the throttle function and the elevator are permanently assigned, depending on the set you have purchased. The setting is stored permanently for each model.



7.9 Servo reverse

The direction of servo rotation can be changed for the three control surface functions (= all except throttle). If any control surface operates in the wrong direction, it is a simple matter to reverse the direction of operation for that function.

Locate the stick for the control function you wish to reverse, move it to one end-point, and hold the multi-function button pressed in for a period of three seconds, i.e. until the servo switches to the opposite end-point. It will now respond in the desired direction. Servo reverse is not necessary for the throttle function, as the system always controls a speed controller the “right way round”. The setting is stored permanently for each model.



7.10 Activating / disabling the throttle function

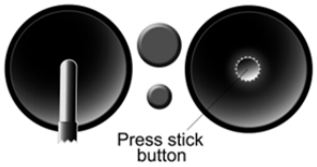
Regardless of the throttle stick position, the throttle channel is initially disabled when the transmitter is first switched on: your model’s motor remains off. To control the motor in your model you must first unlock and activate the throttle channel. You can also disable the throttle again after the landing.
To activate the throttle function you must press the throttle stick button once briefly, and move the throttle stick fully back to the “Off” position. You will a rising signal.
To disable the throttle function, press the throttle stick button again. You will hear a rising signal, and the motor is switched off until the throttle channel is re-activated.

7.11 Trims

The transmitter features digital trims for the three control surface functions. The trims are used to fine-tune the centre position of the servos. When you adjust the trims, you will hear a beep for every increment. For clarity you will hear different double-beeps at the centre position and both end-points. No trim is provided for the throttle function, as modern speed controllers for electric power systems adjust themselves automatically to the throttle stick's travel. The trim setting is stored permanently for each model.

7.12 Dual-Rate

In the case of model aircraft it can be useful to reduce the control surface travels when the sticks are at full deflection, e.g. when the model is flying at high speed. At other times - such as when flying aerobatics - full control surface travels are required. The Dual Rate function provides a means of switching between full and reduced control surface travels in flight (the throttle function is not affected by the Dual Rate setting). Press the stick which is assigned to the elevator function to switch Dual Rate on or off; elevator aileron and rudder are affected simultaneously.



An audible signal confirms the current status: a brief beep indicates reduced servo travel, a long beep indicates normal servo travel. The setting is stored permanently and separately for each model.

7.13 Fail-Safe

The receiver features a Fail-Safe function. If interference occurs, preventing the receiver picking up a valid M-LINK signal, the servos move to the previously programmed positions. In the case of a model aeroplane this usually means centred control surfaces, with the motor switched off. This significantly enhances safety when flying a model.

Move the transmitter controls to the point where the servos take up the desired fail-safe positions. When you are satisfied, press the SET button on the receiver: This action permanently stores the Fail-Safe positions in the receiver. However you can overwrite the settings at any time by setting new positions and pressing the button again.

7.14 Auxiliary (AUX) channel

The SMART SX features one switched channel (= servo channel 6). This option can be used when an M-LINK receiver with six or more channels is used.

The trim lever adjacent to the throttle stick controls the switched function.

Control for channel 6, Mode 1 and 3

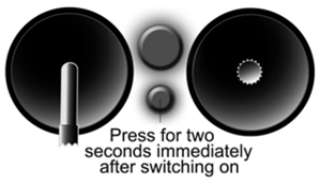
Control for channel 6, Mode 2 and 4

This function can be used to switch working systems on and off, such as a model's lighting system, retrac-table undercarriage, etc.

7.15 Range checking

Before launching a model you should always check the range of the radio control system. Regular range checks are very important - even when using a 2.4 GHz system - to ensure that the RC system continues to work properly, and to allow you to detect problems in good time.

To carry out a range check, switch the transmitter on, then immediately press the multi-function button for a period of two seconds, i.e. until the Status LED glows constantly. The transmitter now emits an audible warning signal every ten seconds to alert you to the fact that it is in range-check mode, and is only transmitting at low power.



In this state the model control system must continue to work up to a range of about fifty metres. If, and only if, this is the case, the system will operate at full range - beyond the limits of vision - when the transmitter is in normal operating mode. Switch the transmitter off to disable range check mode; when you switch on again, the system will be ready for normal use.

7.16 Model memory (ID)

The set is supplied complete with a compact 2.4 GHz M-LINK receiver with the UNI connector system, whose small case and in-line servo sockets make it ideal for use in relatively small models. However, the outstand-

ing feature of this intelligent receiver is its ID (model identification) capability.

This feature enables the SMART SX transmitter to recognise your model, and switch to the corresponding model memory. This eliminates the constant requirement to alter servo directions and adjust trim settings, which is typical of beginners' transmitters. If you possess several models fitted with ID receivers, and switch to a different model, you simply need to switch the transmitter off and then on again. As soon as you hear the audible ID detect signal, your model is ready to fly. The settings for compatible MULTIPLEX RTF and RR+ models are already programmed into the transmitter when you purchase it, i.e. you do not have to carry out any adjustments at all for these models.

However, it is also possible to overwrite or fine-tune the model data sets at the transmitter, which means that an ID receiver can be used in any model.

Other M-LINK receivers (light or telemetry) can also be operated in conjunction with the SMART SX transmitter. If you use a non-ID receiver, the SMART SX remains at the standard model memory "0" when it is switched on, and the audible ID detect signal is disabled. Here again all adjustment facilities are available, and the settings are stored automatically and permanently.

All compatible MULTIPLEX ELAPOR® RTF and RR+ models are programmed into the transmitter at the factory. The following receiver / IDs are available:

The receiver supplied in the set with the code 'ID 1' (# 5 5822) activates model memory 1 in the transmitter, to which no model is assigned. This ID code is free, i.e. any model can be operated with this receiver, and the user has to program model memory 1 in the transmitter and set it up himself.

RX-5 M-LINK ID 1 (# 5 5822)

No model assignment

The receiver with the code 'ID 2' (# 5 5823) activates model memory 2 in the transmitter, to which the model 'Easy Star II' is assigned.

RX-5 M-LINK ID 2 (# 5 5823)

Model: Easy Star II

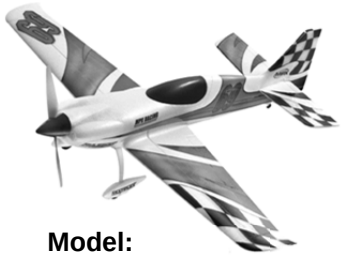
The receiver with the code 'ID 3' (# 5 5824) activates model memory 3 in the transmitter, to which the model 'Easy Glider' is assigned.

RX-5 M-LINK ID 3 (# 5 5824)

Model: Easy Glider

The receiver with the code 'ID 5' (# 5 5826) activates model memory 5 in the transmitter, to which the model 'Razzor' is assigned.

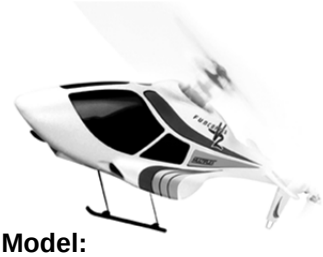
RX-5 M-LINK ID 5 (# 5 5826)



Model: Razzor

The receiver with the code 'ID 6' (# 5 5827) activates model memory 6 in the transmitter, to which the model 'FunCopter' is assigned.

RX-5 M-LINK ID 6 (# 5 5827)



Model: FunCopter

The receivers with the codes 'ID 21' (# 5 5828) and 'ID 22' (# 5 5829) activate model memories 21 and 22 in the transmitter respectively, to which no models are assigned; they are freely available, like the receiver with 'ID 1'.

RX-5 M-LINK ID 21 (# 5 5828)

RX-5 M-LINK ID 22 (# 5 5829)

7.17 Installing the receiver in the model

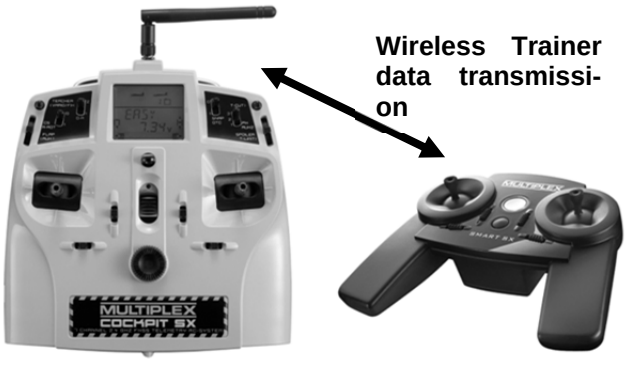
If you intend to fly a MULTIPLEX RTF or RR+ model, the receiver is installed in the correct manner as standard. If you wish to fly a different model, you must install an M-LINK receiver as described in the corresponding MULTIPLEX operating instructions. Please pay particular attention to the aerial deployment:

- Do not shorten or extend the aerial or its feed cable! If you need a longer or shorter aerial lead, please contact the MULTIPLEX Service Department, or a MULTIPLEX Service Centre.
- Install the receiver in the model in such a way that the aerial is as far away as possible from any conductive material.
- If your model's fuselage is made of electrically conductive material (e.g. carbon fibre), then the aerial must be installed in such a way that the active part (the final 30 mm) is located outside the model.
- Do not deploy the aerial parallel to servo leads, high-current cables or electrically conductive parts (e.g. pushrods).

All other information can be found in the instructions supplied with your receiver.

7.18 The SMART SX as Pupil transmitter

The SMART SX transmitter is prepared as standard for use in a wireless Trainer system; the Teacher transmitter can be any MULTIPLEX M-LINK transmitter fitted with a multi-function socket. The MULTIPLEX Trainer Stick can be plugged into this socket on the Teacher transmitter. A SMART SX transmitter will detect the presence of the stick, and switch automatically to Pupil mode. If you are using a PROFI TX transmitter with integral COPILOT, the same functions can be used just as conveniently. Once again, please refer to the instructions supplied with the systems mentioned above for more information.



Trainer mode operations in conjunction with a MULTIPLEX Cockpit SX transmitter.

Trainer mode operations in conjunction with a MULTIPLEX PROFI TX transmitter, with Trainer module.

7.19 Firmware Update / settings for future RR+ models

New firmware updates can be loaded into the memory of the SMART SX transmitter. This enables you at any time to bring the transmitter up to the latest technical standard. The settings for future RR+ models can also be loaded into the transmitter. You will need a USB adapter with Uni connector (see Chapter 5, Accessories) to connect the SMART SX transmitter to a PC (see Chapter 5).

The settings for future RR+ models or a firmware update is carried out under menu control with the help of the MPX-Launcher PC program. This software is available on our website (www.multiplexrc.de) as a free download. Take a look at the site, as you may already find that a new firmware update is available for the SMART SX transmitter.

7.20 Installing aluminium sticks

A set of optional aluminium stick tops can be fitted to the transmitter. These upgrade items are available in the following colours: black (# 7 3305) and orange (#7 3306). The following figure shows the transmitter with black aluminium sticks.

This is the procedure for fitting the new stick tops: the plastic stick top is a simple push-fit, and can easily be withdrawn; simultaneously twisting it eases the process. The aluminium stick top can now be slid into place, and retained by tightening the grubscrew on the side.

7.21 Speech output of telemetry data

You can still exploit the advantages of telemetry even if you use a SMART SX system. The basic requirement for this is the use of a telemetry-capable M-LINK 2.4 GHz receiver in the model, and - if desired - the corresponding MSB sensors. If you want the telemetry values to be generated as speech output, you need to use the special 'Souffleur' telemetry receiver (# 4 5185): this unit picks up the telemetry data from the model, completely independently of the transmitter, and generates the values in spoken form in real time, as well as vario tones and warning indicators. Please refer to the operating instructions supplied with the device for all further details.

8. Advice and Service

We have taken great trouble to formulate these operating instructions in such a way that you can quickly and easily find answers to any questions which might arise. However, if you still have a query regarding your SMART SX M-LINK, please contact your model shop in the first instance, where you will find practical advice freely given.

The addresses of our Service Centres can be found on our website:

www.multiplex-rc.de

under CONTACT / SERVICE

9. Care and Maintenance

The transmitter requires no special maintenance. We strongly recommend that you have your unit checked at regular intervals by an authorised MULTIPLEX Service Centre. This should occur every two or three years; more often if you use the system heavily. Regular checks of all working systems and radio range are mandatory in any case.

The best method of removing dust and dirt is to use a soft paintbrush. Stubborn soiling, such as grease and oil, can be removed with a moist cloth and - if necessary - a mild household cleaning agent. On no account use powerful cleaning agents such as white spirit or other solvents!

Avoid subjecting the transmitter to shock and pressure. The transmitter should always be stored and transported in a suitable protective container (transmitter case or bag).

10. CE Conformity Declaration

This device has been assessed in accordance with European harmonised directives. This means that you are the owner of a product whose design satisfies the protective requirements of the European Community for the safe operation of equipment.

You can view the full CE Conformity Declaration in the form of a PDF file on the Internet at www.multiplexrc.de in the DOWNLOADS area under PRODUCT INFO.

11. FFC Warning Statements

This device complies with part 15 of the FFC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
NOTE: The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user´s authority to operate the equipment.

12. IC Warning Statements

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

13. Guarantee / Liability Exclusion

The company MULTIPLEX Modellsport GmbH & Co. KG accepts no liability of any kind for loss, damage or costs which are due to the incorrect use and operation of this product, or which are connected with such operation in any way. Unless the law expressly states otherwise, the liability on the part of MULTIPLEX Modellsport GmbH & Co. KG to pay damages, regardless of the legal argument employed, is limited to the invoice value of those products supplied by MULTIPLEX Modellsport GmbH & Co. KG which were directly involved in the event in which the damage occurred. This does not apply if unlimited liability is incurred according to statutory law on account of intentional or gross negligence.

We guarantee our products in accordance with the currently valid statutory regulations. If you wish to make a claim under guarantee, your initial course of action should always be to contact the dealer from whom you purchased the equipment.

The guarantee does not cover faults and malfunctions which are caused by the following:

- Incorrect or incompetent use
- Maintenance carried out incorrectly, belatedly or not at all, or not carried out by an authorised Service Centre

- Incorrect connections
- The use of accessories other than genuine MULTIPLEX items
- Modifications or repairs which were not carried out by MULTIPLEX or by an authorised MULTIPLEX Service Centre
- Accidental or intentional damage
- Defects due to normal wear and tear
- Operation of the unit outside the limits stated in the specification, or in conjunction with equipment made by other manufacturers.

14. DISPOSAL

Electrical equipment marked with the cancelled waste bin symbol must not be discarded in the domestic waste; the owner should use the appropriate specialised disposal system.

In the countries of the EU (European Union) electrical apparatus must not be discarded via the normal domestic waste system (WEEE - Waste of Electrical and Electronic Equipment, Directive 2002/96/EU). You can take your unwanted equipment to your nearest public collection point or recycling centre, where the staff will dispose of it in the proper manner at no charge to you.

The same applies to the batteries you use, which must never be discarded in the domestic waste. Instead please take them to the appropriate collection point. By disposing of your old equipment in a responsible manner you can make an important contribution to safeguarding the environment.

15. FAULT FINDING

Although the system is simple to use and extremely secure and reliable, you may still encounter the occasional problem when using the SMART SX. The table below lists a few possible problems, together with their causes and remedies. Please check the table, as the cause of a problem is often a mistake in handling, and the table is designed to help you locate errors which are often extremely simple.

	Fault	Reason	Remedy
1	Transmitter cannot be switched on	Dry / rechargeable cells completely flat	Fit new dry cells, charge rechargeable cells, check cells are correctly inserted
2	Control surface travels too small	Dual Rates active	Check Dual Rate settings, see Chapter 7.11
3	The system fails to work over the distance specified for the range check	The receiver aerial may not be installed correctly	Try a different aerial position; see Chapter 7.16
4	Model cannot be controlled	Receiver not bound to transmitter Flat airborne battery	Carry out Binding procedure, Charge airborne battery
5	Binding cannot be carried out	Distance between transmitter and receiver too great	Reduce the distance to 20 cm or less

The MULTIPLEX team hopes you have many hours of pleasure with your SMART SX radio control system.

Errors and amendments reserved