mx-12 Graupner HoTT Computersystem 2.4GHz

Order No. 4754   € 229,-*

The mx-12 gives ambitious RC model builders low-cost access to computer-controlled remote-control technology.

The transmitter has 10-model memory, programming through simplified programming technology with toggle and cutoff switches. Great functional safety through the use of Graupner HoTT 2.4 GHz technology. Bidirectional communication between transmitter and receiver with the ability to connect a telemetry box to the transmitter.

- **Microcomputer remote control system** in state-of-the-art 2.4 GHz Graupner HoTT technology
- **Bidirectional communication** between transmitter and receiver
- **Modes 1 to 4 are freely selectable**
- **Extensive programmes** for fixed-wing and helicopter models
- **Short aerial, foldable**
- **10-model memory** accomodates all important program parameters and settings
- **Contrast-rich, 4-line multi-data display**
- **MONIT** Servo channel monitor for 6 servos
- **MODEL NAME** and model number seprately programmable
- **DSC socket** for connection of a flight simulator
- **Alarm system** for transmitter and back-up lithium battery

The set includes:
Graupner HoTT mx-12 microcomputer transmitter with built-in NiMH transmitter battery, Graupner HoTT GR-16 receiver, switch cable.

HoTT-features:
- Simple, extremely fast binding
- Range test and warning function
- Low-voltage warning
- Extremely broad receiver operating voltage range from 3.6 V to 8.4 V (functional to 2.5V)
- Failsafe, free channel allocation (channel mapping); mixing functions and all servo settings can be programmed simply with the HoTT-Smartbox
- Binding of any number of receivers for channel expansion (maximum of 32 channels)
- Up to 4 servos can be controlled simultaneously as a block with a signal repetition time of 10 ms (only digital servos!)
- Maximum immunity to interference through optimized frequency hopping and broad channel spread
- Intelligent data transmission with correction function
- Extremely fast rebinding, even at maximum distance
- Telemetry analysis in real time
- Over 200 systems can be used simultaneously
- Future-proof through update capability via USB interface

STICK MODE 1-4

`[STICK MODE]`
`#4 TAXI II`
`▶ MODE 1`
`  THRO REVERSE`
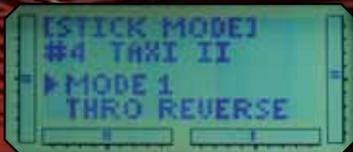
Control arrangement for stick functions, selection of the sequence of control functions (MODES 1-4), gas left/right adjusted to the requirements of the respective pilot.

LIST-MODE Einstellmenü

`INFO   TRA ADJ`
`▶D/R EX  E→F MX`
`REV SW  A→R MX`
`S.TRIM  TH CUT`

This menu lets you select and set model and pilot-specific parameters, e.g. dual rate, travel adjust, servo reverse, sub-trim, mixer and monitor program.

SWITCH SEL

`[SWITCH SEL]`
`▶D/R  INDIVID`
`GEAR  RIGHT SW`
`FL-M  RIGHT SW`

Selection menu for switch definition for the position and assignment of controls for dual rate, gear, mix and flap systems.

D/R & EXP

`[D/R&EXP]`
`AILE POS0`
`▶EXP + 70%`
`D/R  95%`

Dual rate and exponential settings programs with separate setting options for dual rate and exponential function for ailerons, elevator, and rudder, dual rate 0 to 125%, EXPO -100% to +100%.

SUB TRIM

`[SUB TRIM]`
`TH H 12▶AIR   4`
`ELD   8  RUL 15`
`GE+ 14  FLU  5`

Servo center trim for 6 servos ± 125 step can be set and stored separately for each specific model for throttle, aileron, elevator, rudder, gear and pitch function.

WING TYPE

`[WING TYPE]`
`▶FLAPERON OFF`
`ELEVON   OFF`
`V-TAIL   OFF`

Selection menu airfoil type FLAPE-RON (2 rudders), ELEVON (Delta system), and V-TAIL (V-tailplane). The required mix and servo functions are assigned automatically after selection of the desired airfoil type.
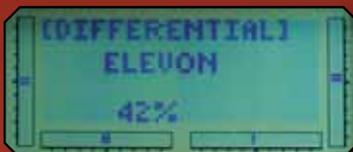
DIFFERENTIAL ELEVON (Delta)

`[DIFFERENTIAL]`
`ELEVON`

`42%`

Differentiation in Delta models with differential mix. 0 - 100% (split) adjustable to the desired characteristics of the respective model.

TRAVEL ADJ

`[TRAVEL ADJ]`
`ELEV     RUDD`
`D 95%   L100%`
`U100%  ▶R113%`

Desired travel setting left and right 0 - 150% for throttle, aileron, elevators, rudder, landing gear, and pitch function.

REVERSING SW

`[REVERSING SW]`
`THR:N   AIL:N`
`ELE: R ▶RUD: R`
`GEA: R  PIT:N`

Servo reverse switching for throttle, aileron, elevators, rudder, landing gear, and flap servos can be selected and stored separately for each specific model.
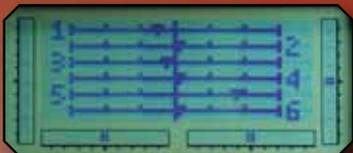
MONIT Servoweg-Monitor

The graphical servo travel monitor permits simultaneous checking of all servo functions for servo center and servo travels.

MODEL SEL

`[MODEL SEL]`
`▶#4 PLANE`
`   TAXI II`
`TOTAL T 1:05:44`

The Model Select menu enables you to store 10 models separately and call them up as needed. The memories contain the model type, model memory no. 1 - 10, model name, and model operating time.

120° CCPM

`[120° CCPM]  REV`
`AILE ▶  60%   N`
`ELEV    60%   R`
`PIT     60%   N`

Setting menu for fine adjustment of the swashplate system to trim out system imprecisions.

THRO CURVES

`[THRO]`
`▶NORM`
`I  50`
`O  52`

A 5-point throttle curve system permits perfect adjustment of motor characteristics to the requirements of the helicopter.

REVO MIX

`[REVO MIX]`
`▶NORMAL`

`UP R 28%`
`DNL 28%`
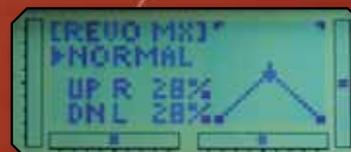
Universally programmable mixers permit programming of extreme special functions, such as revolution mixing in the helicopter area.

PITCH CURVES

`[PITCH]`
`▶HOLD`
`I  50`
`O  52`

A 5-point pitch curve system permits perfect adjustment of pitch-hovering position. Full-show position, ¼ position, center position, ¾ position, and full-high position can be set independently.

SWASH TYPE
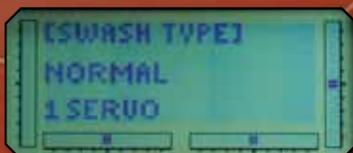
`[SWASH TYPE]`
`NORMAL`
`1 SERVO`

Swashplate type 1 servo. Standard mechanical mixing. This type uses separate servos for roll, pitch axis, and pitch functions.

SWASH TYPE

`[SWASH TYPE]`
`180° CCPM`
`2 SERVOS`

Swashplate type 2 servos. Mixing with 3 roll/pitch servos; the pitch axis function is mixed in mechanically.

SWASH TYPE

`[SWASH TYPE]`
`120° CCPM`
`3 SERVOS`

Swashplate type 3 servos. Symmetrical 3-point linkage; all 3 servos are used together for all 3 functions: roll, pitch axis, and pitch.

mx-16 Graupner HoTT Computersystem 2.4GHz

Order No. 4755   € 329,-*

With 8 control functions, the mx-16 enables the advanced RC model builder to control nearly any model.

The use of Graupner HoTT 2.4-GHz transmission technology ensures great functional safety through bidirectional communication between transmitter and receiver, with the the ability to connect a telemetry box to the transmitter. The transmitter has 12-model memory. Programming through simplified programming technology with toggle and cutoff switches. A contrast-rich, 5-line graphic display ensures perfect display of all settings and parameters.

- **Microcomputer remote control system** in state-of-the-art 2.4 GHz Graupner HoTT technology
- **Bidirectional communication** between transmitter and receiver
- **Short aerial, foldable**
- **Operation and programming** based on the proven concepts of the mc-19 to mc-24
- **A contrast-rich, 4-line multi-data display** ensures perfect control of settings and parameters such as model type, model memory, clocks, and operating voltage
- **8 control functions**
- **Free assignment of all switches**
- **12-model memory**
- **4 switches**, including a 3-stage-switch, 1 switch, 1 analog switch, 2 digital switches already built in
- **Modes 1 to 4 are freely selectable**
- **Extensive programmes** for fixed-wing and helicopter models
- **Servo path adjustment** for all servo channels and for each final value can be adjusted separately
- **Sub-trim** to set the neutral position of all servos
- **2-stage expo-/dual-rate system**, individually adjustable, can be switched during flight
- **Mixer functions** programmable failsafe function »Hold« or »Advance to pre-set positions« adjustable separately for each individual servo channel
- **Stop watches / countdown timer** with alarm function
- **Model copy function** for model memories

The set includes:
Graupner HoTT mx-16 microcomputer transmitter with built-in RTU NiMH-transmitter battery, Graupner HoTT GR-16 receiver, switch cable.

HoTT-features:
- Simple, extremely fast binding
- Range test and warning function
- Low-voltage warning
- Extremely broad receiver operating voltage range from 3.6 V to 8.4 V (functional to 2.5V)
- Failsafe, free channel allocation (channel mapping); mixer functions and all servo settings can be programmed simply with the HoTT-Smartbox.
- Binding of any number of receivers for channel expansion (maximum of 32 channels)
- Up to 4 servos can be controlled simultaneously as a block with a signal repetition time of 10 ms (only digital servos!)
- Maximum immunity to interference through optimized frequency hopping and broad channel spread
- Intelligent Data transmission with correction function
- Extremely fast rebinding, even at maximum distance
- Telemetry analysis in real time
- Over 200 systems can be used simultaneously
- Future-proof through update capability via USB interface

Function Selection Menu
All setting options are clearly arranged depending on the model type selected.

Model Memory Selection Menu
Up to 12 models can be clearly identified and administered by name and symbol.

Copy Model
The copy menu makes it possible to copy proven model configurations to additional models as basic settings.

Basic Settings for Model (fixed-wing model) - Part 2 -
Tailplane type, number of ailerons/cambered flaps, clocks, Phase 2.

Basic Settings for Model (fixed-wing model) - Part 3 -
Phase 3, teacher/pupil, change receiver output.

Servo Display
Simultaneous graphical and numeric display of all servo positions in real time permits immediate visual monitoring of the programming done.

Servo Settings Menu
All servo settings for the 8 servos, such as servo travel direction, center position, and servo travels, can be set in just one menu.

Transmitter Settings Menu
The control elements available but not needed in the basic transmitter, such as switch and proportional transmitter, can be programmed simply as transmitter elements.

Dual-Rate & Exponential
Dual rate and exponential settings programs with separate setting options for dual rate and exponential function for ailerons, elevator, and rudder. Dual rate 0 to 125%, Expo -100% to +100%.

Flight Phase Trim
For each activated flight phase it is possible to set the trim precisely.

Surface Mixer Menu
Depending on the model type selected and the servo configurations set, the available predefined mixing programs are activated and can be set individually.

Programmable Curve Mixer
3 adjustable curve support points make it possible to set nearly any control characteristic.

Free Mixer
The three universally programmable mixers make it possible to program various special functions.

Basic Settings for Model (helicopter model) - Part 2 -
Rotor turning direction, pitch minimum, clocks, Phase 2.

Basic Settings for Model (helicopter model) - Part 3 -
Autorotation, teacher/pupil, change receiver output.

Helicopter Mixer
Flight-phase-independent settings for gas, pitch, and rear rotor, as well as gyro sensitivity.

Swashplate Mixer
Precise setting options for pitch, roll, and pitch axis mixers.

Dual-Rate & Exponential (helicopter model)
Dual rate and exponential settings programs with separate setting options for roll, pitch axis, and rear rotor. Dual rate 0 to 125%, Expo -100% to +100%.

Receiver GR-16 Graupner HoTT

Order No. 33508   **€ 74,80***

The GR-16 receiver can control up to 8 servos

With the GRAUPNER HoTT 2.4 GHz technology, the receiver has a new hopping telemetry transmission high-frequency unit with state-of-the-art components and the latest software. A hardware antenna diversity system always switches to the better antenna signal and for transmission always uses the antenna that was last used for receiving. This ensures that the back channel data are always sent via the better-positioned antenna. Without additional sensor systems, the parameters receiver voltage and temperature, as well as signal strength are transmitted.

- The use of up to 75 channels ensures extreme operating reliability and immunity to external interference.
- The broad reception voltage range of 3.6 V - 8.4 V (functional to 2.5 V) ensures full functionality even when voltage fluctuates.
- Two LEDs signal operating status.
- The sizes and weights have been reduced.
- Receiver input sensitivity and thus the range have been increased further.
- Servo connections in the front panel.

Specification

Dimensions (LxWxH)	46 x 21 x 14 mm
Operating voltage	(2,5) 3,6 ... 8,4 V
Frequency	2400 ... 2483.5 MHz
All-up weight, approx.	12 g
Modulation	2.4GHz FHSS
Range approx.	4000 m
Charging rate	70 mA
Temperature range	- 15...+70 °C
Aerial length	2 x wire 145 (aerial 30) mm

Servo connections in front panel

Size comparison with familiar 35 Mhz receiver SMC 16 scan

Example of use
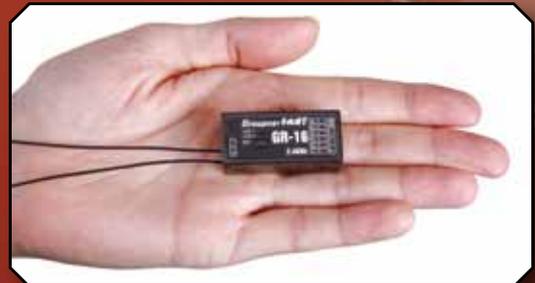
SMART-BOX HoTT

Order No. 33700   € 41,95*

For the Graupner HoTT 2.4-GHz transmission system, the SMART-BOX is display and programming device in one. Whether telemetry data are displayed in real time or settings have to be made in your HoTT system, the generous display with 8 x 20 characters facilitates easy handling. Four switches are available for operation. An integrated buzzer to sound acoustic signals and warning tones makes the BOX even more convenient to use. The attached installation set makes it possible to attach the device to the handle of the hand transmitter, so that it is optimally positioned for reading telemetry data in real time while you are controlling your model. Since the SMART-BOX can be updated via the USB connection, you always have the latest software and can utilize future functions.

Telemetry data display
● Signal quality
● Range test
● Receiver voltage with adjustable warning threshold
● Transmitter voltage display with adjustable warning threshold
● Receiver temperature with adjustable warning threshold

Programming data display
● Country settings
● Servo direction reversal
● Servo neutral position
● Servo path
● Servo cycle time
● Free channel assignment (channel mapping)
● Failsafe settings
● Mixer settings
● Servo test

Computersystem not included in delivery

Specification

|	
Dimensions (LxWxH)	76 x 72 x 17 mm
All-up weight, approx.	67 g
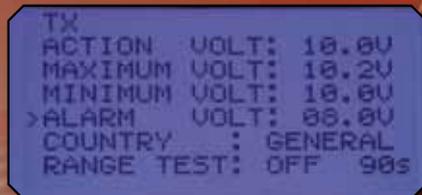
Transmitter module settings menu: alarm threshold for module voltage, country programming: GENERAL/FRANCE, range test function.

Telemetry data for receiver: signal strength TX, max. time w/o reception, receiver voltage, lowest receiver voltage, receiver temperature.
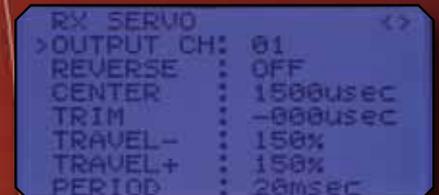
Receiver setting: servo reverse and servo travel limit, as well as servo cycle time 10ms/20ms.
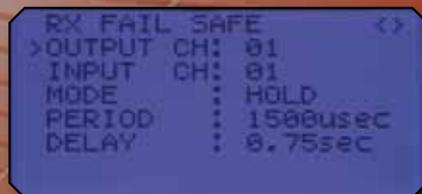
Receiver setting: channel mapping and failsafe setting.
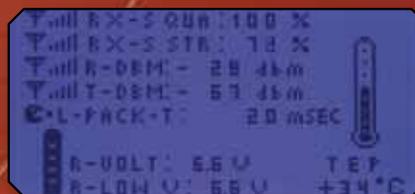
Telemetry data for receiver: (graphic display): signal strength TX/RX, max. time w/o reception, receiver voltage, lowest receiver voltage, receiver temperature.

Telemetry data: (graphic display): GENERAL-AIR module #33611.
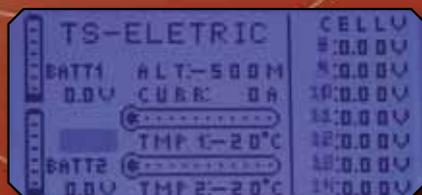
Telemetry data: (graphic display): ELECTRIC AIR module #36620.

Telemetry data: (graphic display): Vario #33601.

Telemetry data: (graphic display): GPS #33600.

PRODUCT OVERVIEW ⟨HoTT⟩

	Order No.	€*	Description	Delivery time
	4754	229,00	mx-12 Graupner HoTT Computersystem 2.4GHz	immediately
	4755	329,00	mx-16 Graupner HoTT Computersystem 2.4 GHz	immediately
	33505	59,50	Receiver GR-12S HoTT	December 2010
	33506	59,50	Receiver GR-12 HoTT	December 2010
	33508	74,80	Receiver GR-16 HoTT	December 2010
	33512	98,90	Receiver GR-24 HoTT	January 2011
	33600 33601	84,95 38,95	Graupner HoTT GPS with Vario Graupner HoTT Vario Modul	January 2011 January 2011
	33611	68,95	General Air Module Graupner HoTT Vario, rpm, fuel, 2x temperature, 2 x voltage, current to 40A, Capacity, Individual cell voltage 2 - 6 S	January 2011
	33612	13,95	Temperature 120°C, Voltage Sensor Graupner HoTT	January 2011
	33613	13,95	Temperature 200°C, Voltage Sensor Graupner HoTT	January 2011
	33615	13,95	Graupner HoTT RPM Optical Sensor	January 2011
	33700	41,95	HoTT SMART-BOX	December 2010

A complete product overview of the GRAUPNER HoTT system can be found at www.graupner.com

*recommended sales prices