MTB40S User Manual

Wideband Plug-on Transmitter

SN: _____

Rev.02 (rif. FW 1.25.0H)

Date: 19 November 2014

INTRODUCTION

MTB40S is an extremely small and light plug-on transmitter designed for professional audio applications.

Very easy and quick to use thanks to OLED display, MTB40S benefit also of the latest Wisycom RF technology along with an enhanced robustness against noise and inter-modulation.

FEATURES

- Up to 232 MHz bandwidth in 470/798 MHz range
- Enhanced robustness against self-interferences and antenna performances thru a proprietary "intermodulation cancellation" circuit
- Miniature design with flexible pcb (no connectors) for extended reliability
- User selectable compander systems: - ENR designed for maximum noise reduction
  - ENC designed for maximum audio fidelity
- *Input dynamic extension with an integrated HW limiter (30 dB above peak)*
- P48 phantom power for condenser microphones
- *New white OLED display (128 x 32 pixels)*
- *New XLR-3F connector with locking collar to ensuring an extremely tight noiseless fit!*
- Infrared interface for management and firmware update
- Audio input circuitry with high linearity audio transformer
- Battery: 2 AA Alkaline or rechargeable NiMH

SAFETY INSTRUCTION

- Read this safety instruction and the manual first
- Follow all instructions and information.
- Do not lose this manual.
- Do not use this apparatus under the rain or near the water.
- Do not install the apparatus near heaters or in hot environments, do not use outside the operating temperature range.
- Do not open the apparatus, only qualified service technician are enabled to operate on it. The apparatus needs servicing when it is not properly working or is damaged by liquids, moisture or other objects are fallen in the apparatus.
- Use only accessories or replacement parts authorized or specified by the manufacturer.
- Clean the apparatus only with dry cloths, do not use liquids.
- Report the serial number and the purchasing date in front of the manual. It is needed to have proper replacement parts or accessories from the manufacturer.
- When replacement parts are needed, use only replacement parts authorized from the manufacturer. Substitution with not authorized parts could result in electric shock, hazards or fire.
- Keep attention on all the labels with warnings or hazards on the apparatus.
- Wisycom declines all responsibility for damages to things or people caused by not following the instructions contained in this document.

LED INDICATION

The front led is a RGB indicator (red, green, blue) which shows the following status of the transmitter:

- Wireless transmission status: **green** when RF transmission power is on.
- Battery status: **green** steady, slowly blinking (< 25%), quickly blinking (<12%).
- Modulation peek (if activated): **red**.
- Limiter in action (if activated): **blue**.

BATTERIES

MTB40S is working with 2 AA alkaline or NiMH batteries (select correct type on setup controls). Battery status can be checked on internal OLED display or looking to LED status on front.

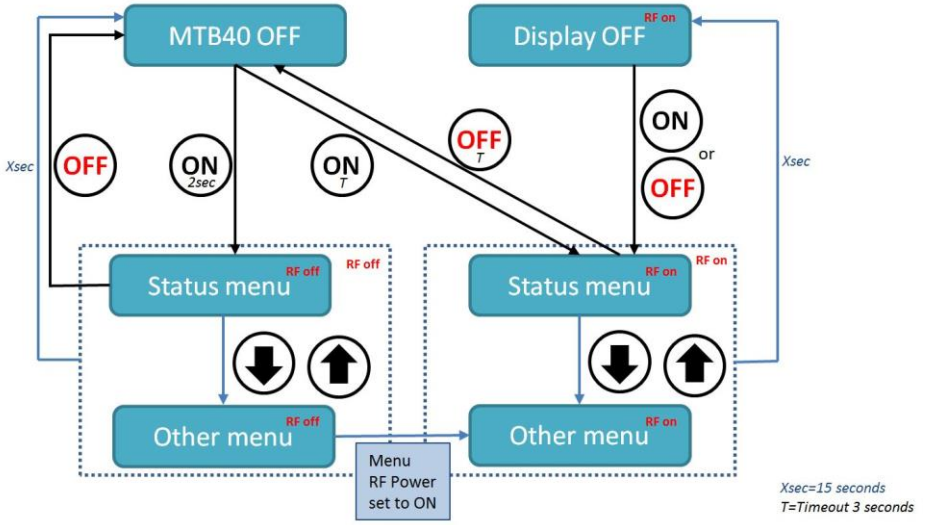
BATTERY SUBSTITUTION

- Open transmitter cover and insert batteries.
  Attention: always replace both the batteries

OPERATING CONTROL

1. Shotgun Microphone input, XLR-3F socket (balanced)
2. OLED display
3. OFF button
4. ON/SEL button
5. DOWN button
6. UP button
7. LED indicator
8. CH/GAIN button
9. Battery compartment cover

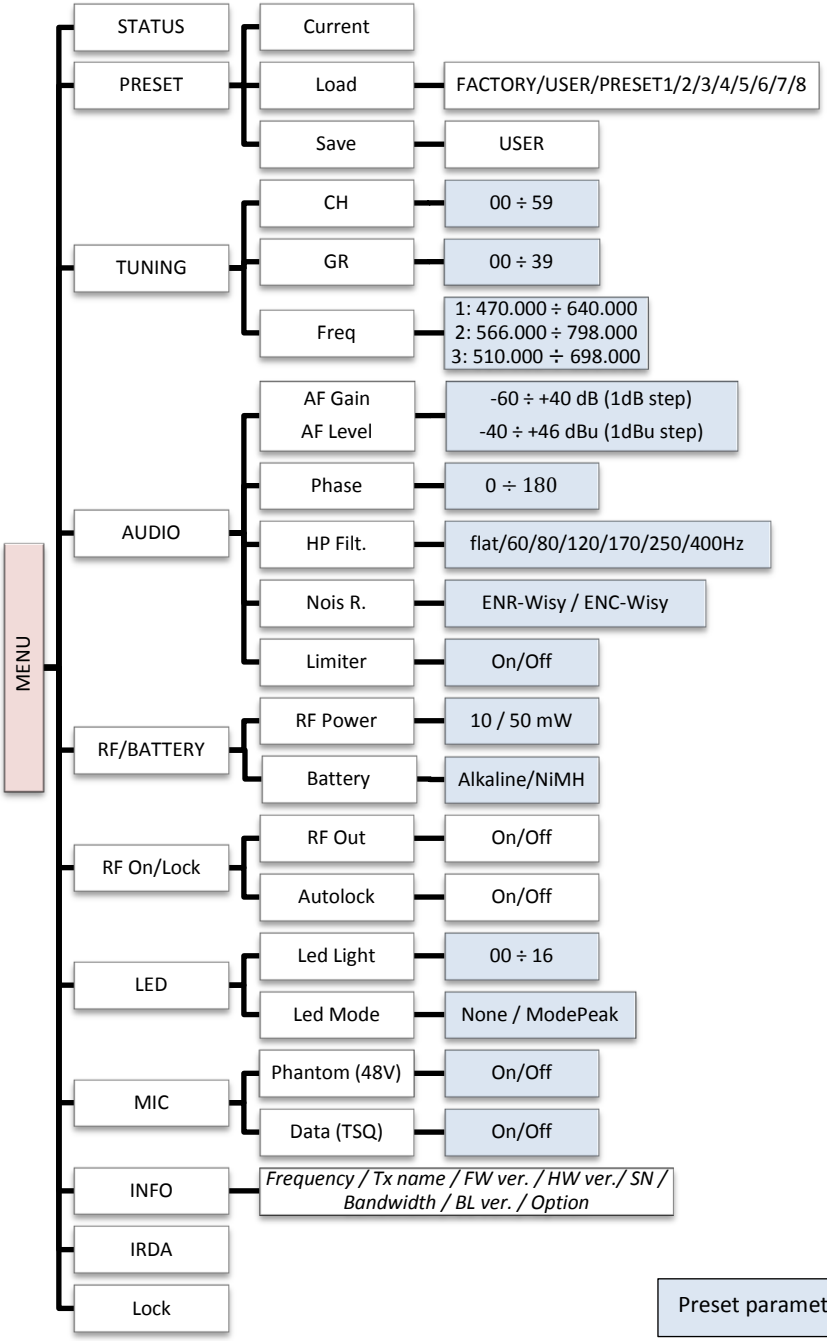
POWER UP/DOWN



Buttons	Mode	To…
OFF	Status display	- power off the device - power off the RF transmission - exit from the operating menu
	Operating menu	Cancel the entry and return to the standard display
	Setting mode	
ON/SEL	Device off	- power on the device - power on the RF transmission
	Status display	- enter on the operating menu
	Setting mode	- store the setting a parameter in the menu

DISPLAY MENU

Setup menu are accessed in sequence:



Using <↓↑> selector all menus can be accessed in sequence, push <ON/SEL> to enter edit mode: - <↓↑> to setup field

- <ON/SEL> again to confirm changes and exit.

Exit without confirmation if:

-no button is pressed after a few seconds (4sec) time out or

-OFF button is pressed

<START UP> menu

These menu are displayed during power up for few seconds.

This menu gives indication on product:

- product id (MTB40S),
- a number which identify the working band

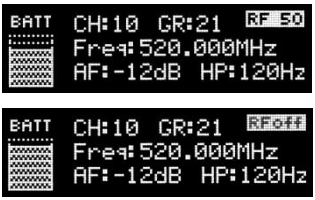
1	470-640
2	566-798
3	510-698

- a number which identify the hardware version,
- the firmware release (i.e. *125.0F*),
- the band in extended format and
- the serial number.

Keep selector pushed to hold this menu!

<STATUS> menu

This is the first menu displayed after power up.

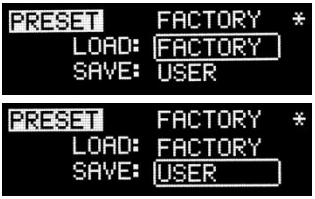


Major info are displayed:

- Current channel/group or the receiver name if the MTB40S is already synchronized with a receiver
- Current frequency (*i.e. 520.000 MHz*)
- Gain (*i.e. AF: -12 dB*) and high pass filter (*i.e. HP: 120 Hz*)
- "RF 10", "RF 50" or "RF off" on top right if RF transmission is ON ("RF 10" if the RF power is set to 10mW or "RF 50" if the RF power is set to 50mW) or OFF
- Batteries charger (a bar with 7 level)

<PRESET> menu

This menu can be entered by pushing ↓.

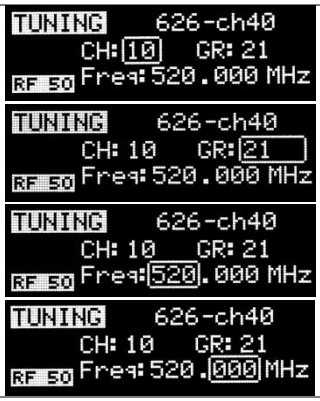


MTB40S can recall configuration presets. "FACTORY" recall the Wisycom factory configuration. "USER" recall the user configuration (the transmitter configuration is copied into the USER using the "save to" submenu). All the parameters of "USER" menus are not locked by default, thus this is quick way to unlock features! If the parameter of a preset is changed, an asterisk appears in the upper right of the display near the name of the preset.

The other 8 configuration presets are user programmable thru the infrared and the PC interface (using the programmer UPK 300 or the receiver MRK950/MRK960 thru USB connection). All parameters can be "left unchanged", "changed" or "changed and lock", allowing a very flexible way to pre-program MTB40S configuration.

<TUNING> menu

This menu can be entered by pushing ↓.



In this menu channel/group and frequencies can be setup.
The name of the group is shown on the top right of the display.
SYNC group is a quick self-settable channel synchronized by receiver (with SYNC group, on the top right of the display is shown the name of the synchronized receiver).
Use the selector (↓↑) to change values and <**SEL**> to confirm.

<AUDIO> menu

This menu can be entered by pushing ↓.

In the AUDIO menu are shown all the audio parameters:

- The sensitivity of the audio input is settable between "**AF Gain**" (measured in dB) or "**AF Level**" (measured in dBu). *To help proper audio gain setting, an audio bar is supplied (with maximum peak indicator) indicating the headroom to audio peak (0 dB , nominal deviation 40KHz). Set the gain, with the maximum input signal, avoiding the peak on the audio bar.*
- Phase: the audio phase can be **0**/**180** deg.
- "**HP Filt.**" applies different audio High Pass filter: Flat / 60Hz / 120Hz / 170Hz / 250Hz / 400Hz.
- MTB40S supports 2 different type of "Companding systems":
  ENR-Wisy: designed for maximum noise reduction;
  ENC-Wisy: designed for maximum audio fidelity (use this in case of special vocal application or to remote instruments).
- Limiter: if is set "On", an input audio signal above the peak threshold (*up to 30 dB above peak*) is not cut but attenuate, without lost quality. The limiter acts as a variable attenuator (thanks to the feedback system), maintaining a distortion <3%. When the limiter intervenes, the front led turns blue. If this parameter is set "Off", the limiter is disable.

Use the selector (↓↑) to change values and <**SEL**> to confirm.

<RF/BATTERY> menu

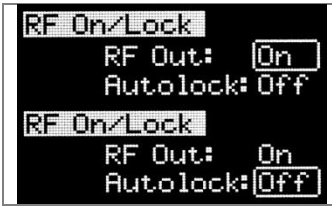
This menu can be entered by pushing ⬇.

Her it's possible to setup:
- "**RF Power**", that can be 10 mW or 50 mW
- **Battery** type can be setup in Alkaline or NiMH.

Use the selector (⬇⬆) to change values and <**SEL**> to confirm.

<RF On/Lock> menu

This menu can be entered by pushing ⬇.



- **RF Out**: setup to On/Off to activate or not the radio transmission.
- **Autolock**: select ON for lock the transmitter after the auto turn off of the display

Use the selector (⬇⬆) to change values and <**SEL**> to confirm.

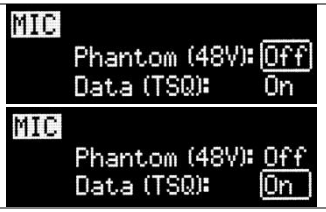
<LED> menu

This menu can be entered by pushing ⬇.

In "**Led Light**" the brightness of the front led ❼ can be set from 0 to 16 level.
It's also possible to change the mode of function of the LED (in "**LED Mode**") selecting *ModPeak* (become RED when audio get close to saturation) or *None* (never become RED).
Use the selector (⬇⬆) to change values and <**SEL**> to confirm.

<MIC> menu

This menu can be entered by pushing ⬇.



In "MIC" menu is possible to activate or not the **Phantom (48V)** supply and activate or not the Data (TSQ) (tone squelch).
Use the selector (⬇⬆) to change values and <**SEL**> to confirm.

<INFO> menu

This menu can be entered by pushing ⬇.

In the info menu it's possible to see all the information about the device: Frequency, Name of the device, Firmware version, Hardware version, Serial Number, Bandwidth, Bootloader version and Options.

<IRDA> menu

This menu can be entered by pushing ↓.

	Thanks this menu the transmitter can be connected to IRDA for setup or firmware upgrades. NOTE: while in this menu display is not automatically turned off.

<LOCK> menu

This menu can be entered by pushing ↓.

	Long pressing (2 sec.) selector button (**SEL**) it locks MTB40S in transmission mode. To unlock, long pressing (2 sec.) selector button again.

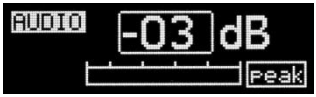
<BOOTLOAD> menu

This menu can be entered pushing **at the same time** both up and down selector and then pushing the ON button (↓ + ↑ & **ON**).

	Device is forced in bootloader mode to allow **FIRMWARE UPDATE**.

<CH/GAIN> Quick menu

Push CH/GAIN button (❽) to change quickly the values of CH or GAIN. Use the selector (↓↑) to change the values of CH or GAIN and <**SEL**> to confirm. These menus display larger characters to easily operate channel/gain settings.

	Use this menu to change the value of "AF Gain" or "AF Level" parameter in AUDIO menu. To help proper audio gain setting, there is also the audio bar of AUDIO menu.
	These quick menu allow to change only the channel of transmission (not the group or the frequency value).

WISYCOM IR PROGRAMMER (VER. 1.4.0.6 AND ABOVE)

Wisycom IR Programmer allows reading, modifying and updating the MTB40S device configuration.

It is necessary to:

- install Wisycom IR Programmer (version 1.4.0.3 or above)
  WARNING: If it is the first installation and Wisycom USB driver has not already installed in the PC, install the USB driver (run *C:\Program Files (x86)\Wisycom\MTP&MTH Infrared Programmer (TX)\Drivers\ DriverInstaller.exe*)
- connected the programmer UPK300 or the receiver MRK950/MRK960 to the PC thru **USB connection**
- run the program
- enable the IRDA communication on the transmitter
  NOTE: Wisycom IR Programmer does not work whit MRK950/MRK960 if it is connected to the PC using an Ethernet cable.

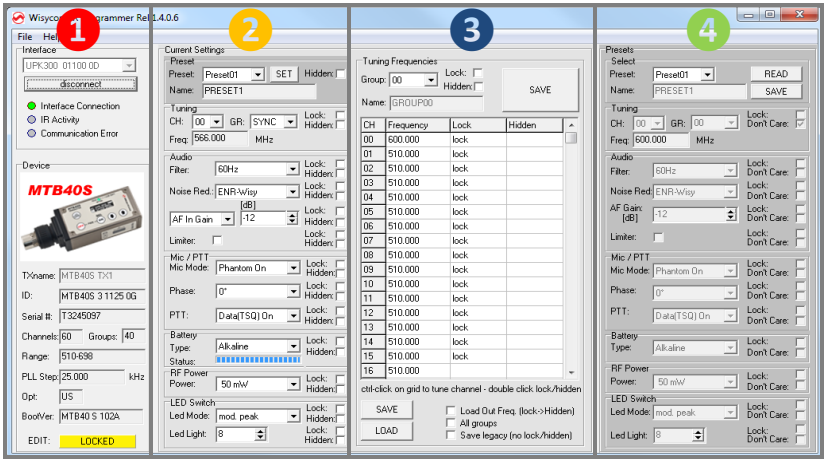
The Wisycom IR Programmer's window is divided in 4 parts (see Fig. 5):

1 **Interface** and **Device** panel contains all the major information of the connected device

2 **Current Settings** panel shows the current configuration. Thanks the PRESET panel, a previous saved configuration can be chosen and loaded like current setting.

3 **Tuning Frequencies** panel allows handling Groups, Channels and Frequencies

4 **Presets** panel allows reading, changing and saving different configurations



10 different configurations are available:

- FACTORY configuration is a locked configuration: no parameter can be changed.
- USER configuration is the only configuration that can be saved using the OLED display (see <PRESET> menu). Note: It is not possible to change the name of this configuration.
- Other 8 configurations where the user can change both the name and the values of all parameters.

INTERFACE AND DEVICE PANEL

At the beginning, the program detects active IR devices and shows them on the **Interface** panel.

The user has to select the device and push <connect> button in order to open the communication with the IR device. A picture on the top in the Interface panel help the user in this selection showing the type of devices detected. During this process the "IR activity" led blinks to indicate that the program wait connection's answer from the IR device.

A successful connection is signaled with the "interface connection" green led, while a failed connection is signaled with the "communication error" led.

Once a supported device is found, the software automatically reads all the data related to the remote configuration, as well as the frequencies that are pre-programmed.

Firstly, in order to avoid unwanted operation, no parameters can be changes and the EDIT button, presents on the bottom of **Device** panel, is yellow and set to LOCKED state. Pushing the EDIT button, it becomes grey and sets to UNLOCKED state to indicate that the configurations can be modified.

CURRENT SETTINGS PANEL

In the Current Settings panel the user can

- **with Preset panel** → load one of the 10 available configurations
- **with other panels** → modify all the configuration's parameters (the same that are changeable in the OLED display). Each parameter can be locked clicking the related lock button, so the set value cannot be changed next using the OLED display. In the audio panel it's also possible to change the unit of measurements of the gain choosing between dB (gain in dB of MTB40S amplifiers) or in dBµ peak.

ATTENTION: All the modifies applied to the Current Settings panel are instantaneous: they are applied directly to the device and save in its memory but no saved in the preset configuration.

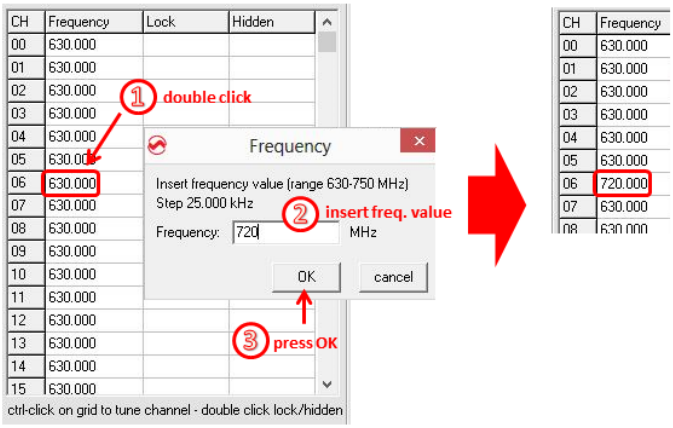
TUNING FREQUENCIES PANEL

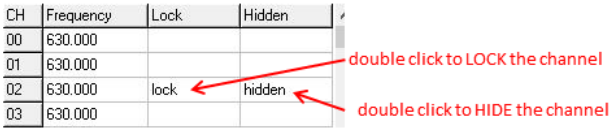
In Tuning Frequencies panel, the user can select a frequencies group (0÷39) and for each one execute the following operations:

- modify the Group's Name
- lock and/or hidden the group
- for each channel (0 ÷59) of the selected group: change the frequency value and the related status (locked/hidden) (in the center grid frequency)

The SAVE button, at the top of the panel, save the changes of the group selected (name group, lock/hidden group).

To change a frequency value for a specific channel: double click on the grid frequency panel (row=channel's number), insert the new frequency value and press OK button.

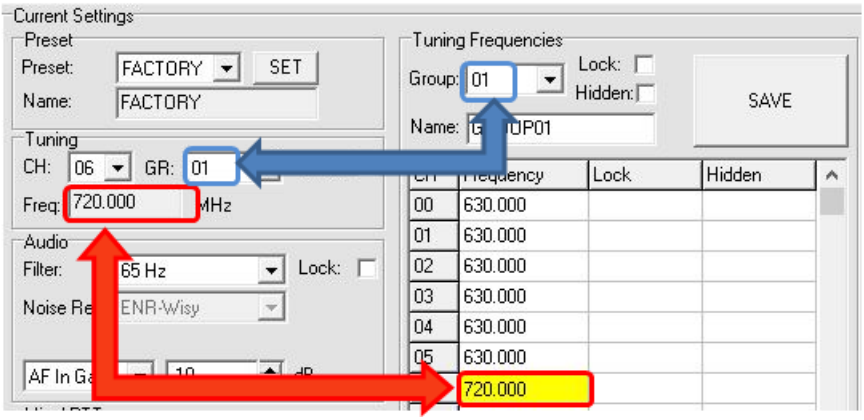




To lock/hide a specific channel, double click on the grid frequency panel.

NOTE: keeping pressed the CTRL button on the keyboard and clicking the wanted channel/group shown on the frequencies grid, the tuning process is executed. It is equivalent to configure the Tuning in the Current Settings panel but it is easier. The device is re-tuned immediately, so be sure that the RF power is turned off while changing frequencies with other RF systems in use around you!

If the currently tuned channel is on the same group that is listed on the grid, the background color of the related cell (channel) on the grid becomes yellow.



Using the LOAD/SAVE button, at the bottom of the panel, it is possible to **load/save** the frequencies for the selected group from/to a .wdf file. To save the frequencies of all the groups click to the related button above. The legacy option save the channels without the hidden/lock info.

PRESETS PANEL

The Preset panel allows to manage all the 10s available configurations.
For each configuration, it is possible to set the name and all the parameters value except for FACTORY and USER configurations (see table below).

PRESETS:	NAME*	LOCK/DON'T CARE	PARAMETERS VALUE
FACTORY			
USER			√
OTHERS	√	√	√

√=change is allowed

* Be careful to write a meaningful name for the preset because the name will appear on the settings list of the device menu! Please, avoid empty names.

If a parameter is "locked", it cannot be modified by device menu (using OLED display), while if "don't care" propriety is active, when the user load the configuration, the parameter's value does not changed.

ATTENTION: Changes are applied only after a "save" action.
NOTE: *"a trick"* In case of the user have a locked parameter and he is in great need for modify it, he can save the configuration to USER configuration by OLED (see PRESET menu) and then load the USER configuration (in this way all the parameters have the lock propriety disable and the user can modify all the parameters).

FILE MENU

Using a file menu at the top left of the panel it is possible to **load/save all the configuration** values of the device to/from a .wcf file (Wisycom Configuration File).

Save a .wcf file

With an infrared device correctly connected, select File->Save User Configuration and select the destination file.

Load a .wcf file

To load a user configuration select File->Load User Configuration and select a previously saved data file; a form will be shown, where it is possible to select which data has to be restored and which skipped. This allow the user to load a particular configuration while keeping other data.

TECHNICAL SPECIFICATIONS

Switchable channels	2400 allocated by 40 groups of 60 channels (in specific frequency range), quickly selectable with dedicated buttons
Switching window	Up to 232 MHz, depending on band (see below code table)
Frequencies	Quartz PLL frequency synthesizer circuit (25 kHz step)
Frequency stability	▪ ± 2,5 ppm (in the rated temperature range)
Temp. range	-10 ÷ +55 °C
Max RF power	▪ 100 mW (ERP) for USX option ▪ 50 mW (ERP)
Spurious emissions	< 2 nW
Modulation	wideband FM, with 50 µs pre-emphasis
Nominal deviation	±40 kHz (Peak deviation = ±56 kHz)
Telemetry feature	MTB40S transmits also a digitally modulated sub-carrier, suitable for: ▪*tone-squelch operating* ▪ *remote battery monitoring* ▪ *optional PTT (Push to talk) operation*
AF input connector	XLR-3F (transformer isolated) with locking collar and 48V phantom power
AF input level	80 dB adjustable range from -60 dBu (775 uV) to 26 dBu (15.5 V) at peak deviation (1 kHz), adjustable in 1 dB steps
Max. input level	+26 dBu (15.5 V) at clipping, +20 dBu (7.75 V) at nominal level
Noise-Reduction	ENR (Wisycom Extended-NR), with independent Attack- and Recovery-time, noise optimized ENC (Wisycom Extended-NC), with independent Attack- and Recovery-time, voice optimized & with reduced pre-emphasis
AF bandwidth	▪ 45 Hz ÷ 21 KHz (3dB) ▪ 55 Hz ÷ 20 KHz (1dB)
Distortion	< 0.3 % (0.15 % typ.)
Signal-to-noise ratio	▪ typ. 115 dB $(A)_{rms}$ with 40 kHz deviation ▪ typ. 121 dB $(A)_{rms}$ with 56 kHz deviation
Display	High contrast OLED (Organic light-emitting diode) white display (128 x 32 pixels) 8 step battery lifetime indication: 7 bars (100%-87%-75%-63-50%-38%-25%) and "empty bar" quickly blinking (12% remaining)
Led	RGB Led indication (red, green and blue): ▪ Wireless transmission status - Green when RF transmission power is on, - Red when RF transmission power is off. - Blue when the input signal is above the peak threshold ▪ Modulation peak (if activated & limiter disabled): *RED* ▪ Battery lifetime status: *GREEN* - steady (> 25%) - slowly blinking (< 25%) - quickly blinking (<12%)
Power supply	2 AA size batteries (Alkaline, rechargeable NiMH) - Phantom power to Shotgun Microphone (max 4mA)
Dimension	124 x 40 x 34 mm (Height-Width-Depth)
Weight	Approx. 210 g. without batteries (250g with batt)

OPTION CODE MTB40S -PX :

▪ FREQUENCY RANGE (-X)

1 470-640 MHz

2 566-798 MHz

3 510-698 MHz

DECLARATION OF CONFORMITY

DICHIARAZIONE DI CONFORMITA'
DECLARATION OF CONFORMITY

Il sottoscritto, rappresentante il seguente costruttore
The undersigned, representative of the following manufacturer

WISYCOM S.r.l.
via Spin, 156 - 36060 Romano d'Ezzelino (VI) - Italy

DICHIARA che l'apparecchiatura descritta in appresso:
DECLARES that the product:

Descrizione *Description*	Plug on transmitter
Modello *Model*	Mtb40s

è conforme alle disposizioni legislative che traspongono le seguenti direttive:
- **direttiva 2004/108 CE (Direttiva EMC)**
- **direttiva 2006/95 CE (Direttiva Bassa Tensione)**
- **direttiva 99/5 CEE (Direttiva Apparecchiature Radio)**

is in accordance with the following Directives:
- *2004/108 EC Directive (EMC Directive)*
- *2006/95 EC Directive (Low Voltage Directive)*
- *99/5 EEC (Radio Equipment Directive)*

e che sono state applicate tutte le norme e/o specifiche tecniche di seguito indicate
and that all the following standards have been applied

EN 60065:2002 + A1:2006 + A11:2008 + A2:2010 + A12:2011

EN 301 489-1 V1.9.2

EN 301 489-9 V1.4.1

EN 300 422-2 V1.3.1

Luogo *Place*	Romano D'Ezzelino
Data *Date*	6 August 2014
Firma *Sign* (nome e funzione) *(name and title)*	Franco Maestrelli WISYCOM s.r.l. Franco Maestrelli Amministratore Unico

mtb40s-ec declaration.doc 1/1

MANUFACTURER DECLARATIONS

In compliance with the following requirements

- RoHS Directive (2002/95/EC)

- WEEE Directive (2002/96/EC)

Please dispose of the diversity transmitter at the end of its operational lifetime by taking it to your local collection point or recycling center for such equipment

- Battery Directive (2006/66/EC)

The supplier batteries or rechargeable batteries can be recycled. Please dispose of them as special waste or return them to your specialist dealer. In order to protect the environment, only dispose of exhausted batteries.

ENVIRONMENTAL INFORMATION

Applicable in the European Union and other European countries with separate collection systems

Disposal of Old Electrical & Electronic Equipment (2002/96/EC)

This symbol indicates that this product shall not be treated as household waste. Instead, it shall be handed over to the appropriate collection point for the recycling of electrical and electronic equipment. The recycling of material will help to conserve natural resources.

Disposal of waste batteries (2006/66/EC)

This product may contain batteries. If so, this symbol on the batteries means that they shall not be disposed with other household waste. Instead, it shall be handed over to the appropriate collection point for the recycling of batteries.

ITALY ONLY

Obblighi di informazione agli utilizzatori

ai sensi dell'art. 13 del Decreto Legislativo 25 luglio 2005, n. 151 "Attuazione delle Direttive 2002/95/CE, 2002/96/CE e 2003/108/CE, relative alla riduzione dell'uso di sostanze pericolose nelle apparecchiature elettriche ed elettroniche, nonché allo smaltimento dei rifiuti"

Smaltimento di apparecchiature elettriche ed elettroniche di tipo professionale

Il simbolo del cassonetto barrato riportato sull'apparecchiatura o sulla sua confezione indica che il prodotto alla fine della propria vita utile deve essere raccolto separatamente dagli altri rifiuti.

La raccolta differenziata della presente apparecchiatura giunta a fine vita è organizzata e gestita dal produttore. L'utente che vorrà disfarsi della presente apparecchiatura dovrà quindi contattare il produttore e seguire il sistema che questo ha adottato per consentire la raccolta separata dell'apparecchiatura giunta a fine vita.

L'adeguata raccolta differenziata per l'avvio successivo dell'apparecchiatura dismessa al riciclaggio, al trattamento e allo smaltimento ambientale compatibile contribuisce ad evitare possibili effetti negativi sull'ambiente e sulla salute e favorisce il reimpiego e/o riciclo dei materiali di cui è composta l'apparecchiatura.

Lo smaltimento abusivo del prodotto da parte del detentore comporta l'applicazione delle sanzioni amministrative previste dalla normativa vigente.

Smaltimento batterie usate

Questo prodotto può contenere batterie. Questo simbolo apposto sulle batterie significa che non possono essere smaltite insieme a normali rifiuti domestici, bensì devono essere depositate negli appositi punti di raccolta delle batterie.

Iscrizione al Registro A.E.E. n. IT09100000006319

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WiSyCOM®

Wireless System Communications

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