# TM400

**TECHNICAL DATA**

## Test and Measurement Wireless System

- **Converts any measurement microphone to wireless operation**
- **Selectable 5, 15 and 48 volt phantom power**
- **24-bit, 88.2 kHz digital audio stream for compandor-free audio**
- **256 selectable UHF frequencies**
- **SmartTuning™ to quickly find a clear channel**
- **100 mW RF output power**


**Microphone not included with system.*

**Digital Hybrid Wireless™**
*(US Patent Pending)*

### Wireless Freedom for Acoustic Analysis

The TM400 wireless system eliminates the cable between the microphone and computer/analyzer allowing more samples to be made in less time. The extended operating range enables measurements across a much broader range than cable allows. The result is accurate and thorough samples of any acoustic space from smaller theaters to large outdoor arenas.

Digital Hybrid Wireless™ technology combines digital audio with analog RF to eliminate a compandor and its artifacts in the audio path and preserve the proven RF performance of the finest analog wireless system. With 24-bit sampling at 88.2 kHz, the digital audio stream offers an excellent signal to noise ratio and broad, flat frequency response needed for critical measurements. The RF link is an aggressively optimized FM system with DSP and microprocessor controlled algorithms to minimize dropouts and noise.

### The R400A Receiver

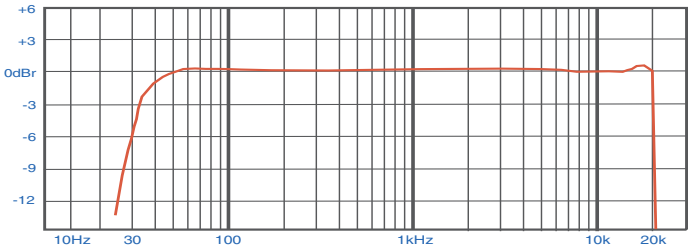
The overall system design provides 256 frequencies so a clear operating channel can be found in any location. As a convenience, the SmartTune™ utility in the firmware performs an RF site scan and automatically sets the receiver to a clear channel in a matter of seconds. The LCD then shows the switch settings for the transmitter to match the newly found channel. Setup is fast and easy. The receiver can be powered from an AC outlet or from external DC sources such as vehicles or batteries.

### The UH400TM Transmitter

Any measurement microphone can be converted to wireless operation. Phantom power (5, 15 or 48 volt) is selected on the transmitter control panel allowing the transmitter to be used with any microphone, including high current condenser types. The unit is powered by a single 9 volt battery, with a full 100 mW RF output over the life of the battery, extending the operating range for large outdoor areas.

The XLR input coupler is an ingenious design, spring loaded to maintain a secure, noise-free connection to the microphone. The antenna is formed between the microphone body and the housing of the transmitter. An insulator just below the input coupler separates the two antenna “halves” creating a highly efficient dipole design.

**Overall System Frequency Response**

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## Receiver Rear Panel Features

Standard XLR and 1/4 inch outputs are provided. The XLR output is balanced but not floating, so an unbalanced signal is available using pin 1 as ground and pin 2 as signal, leaving pin 3 open. The 1/4 inch jack is an unbalanced output. The levels can be adjusted independently with the front panel LCD.

Also featured are a locking power input jack that can accept 8-18 VDC (center pin positive). The power input is diode protected against reverse polarity.


*The rear panel of the receiver includes a locking power supply input jack, balanced and unbalanced outputs and two standard 50 ohm BNC antenna jacks.*

## UH400TM Transmitter

| | |
|---|---|
| Frequency selection: | 256 frequencies in 100 kHz steps |
| RF Power output: | 100 mW (nominal) |
| Pilot tone: | 25 to 32 kHz; 5 kHz deviation (in the 400 Series operating mode) |
| Frequency stability: | ± 0.002% |
| Deviation: | ± 75 kHz (max) |
| Spurious radiation: | 60 dB below carrier |
| Equivalent input noise: | –118 dBV (A-weighted) |
| Input level: | Nominal 2 mV to 300 mV, before limiting. Greater than 1V maximum, with limiting. |
| Input impedance: | 1k Ohm |
| Gain control range: | 43 dB; semi-log rotary control |
| Modulation indicators: | Dual bi-color LEDs indicate modulation of -20, -10, 0, +10dB referenced to full modulation |
| Controls: | • Power/Phantom "ON-OFF" switch<br>• Phantom voltage selector switch<br>• Audio input gain knob<br>• Two 16-position rotary switches adjust transmitter frequency |
| Audio Input Jack: | Standard 3-pin XLR (female) |
| Phantom Power Selector: | 5V @ 18 mA max., 18V @ 15 mA max. and 48 V @ 15 mA max., plus "OFF" |
| Antenna: | Housing and attached microphone form the antenna |
| Battery: | Precision compartment auto-adjusts to accept any known alkaline 9 Volt battery. (We've tried 243 different ones.) |
| Battery Life: | 4.5 hours (alkaline); 12 hours (lithium); 5 hours (approx.) with NiMH rechargeable (battery life varies with the phantom power selection) |
| Weight: | 6.6 ozs. - 187 grams (including lithium 9V battery) |
| Dimensions: | 4.18 x 1.65 x 1.58 inches |

*Specifications subject to change without notice*

## R400A Receiver

Operating Frequencies (MHz):

| | | | |
|---|---|---|---|
| Block 21: | 537.600 - 563.100 | Block 25: | 640.000 - 665.500 |
| Block 22: | 563.200 - 588.700 | Block 26: | 665.600 - 691.100 |
| Block 23: | 588.800 - 607.900 | Block 27: | 691.200 - 716.700 |
| | 614.100 - 614.300 | Block 28: | 716.800 - 742.300 |
| Block 24: | 614.400 - 639.900 | Block 29: | 742.400 - 767.900 |

| | |
|---|---|
| Frequency Adjustment Range: | 25.5 MHz in 100 kHz steps |
| Channel Separation: | 100 kHz |
| Receiver Type: | Triple conversion, superheterodyne, 244 MHz , 10.7 MHz and 300 kHz |
| Frequency Stability: | ±0.001 % |
| Front end bandwidth: | 30 MHz @ -3 dB |
| Sensitivity:<br>20 dB Sinad:<br>60 dB Quieting: | <br>1 uV (-107 dBm), A weighted<br>1.5 uV (-104 dBm), A weighted |
| Squelch quieting: | Greater than 100dB |
| AM rejection: | Greater than 60 dB, 2 uV to 1 Volt (Undetectable after processing) |
| Modulation acceptance: | 85 kHz |
| Image and spurious rejection: | 85dB |
| Third order intercept: | 0 dBm |
| Diversity method: | Phased antenna combining - SmartDiversity™ |
| FM Detector: | Digital Pulse Counting Detector operating at 300 kHz |
| Antenna inputs: | Dual BNC female, 50 Ohm impedance |
| Audio outputs: | • Rear Panel XLR; -50dBu to +5dBu in 1dB steps.<br>• Rear Panel 1/4 inch; -55 dBu to +0 dBu in 1dB steps. |
| Scanning mode: | Coarse and fine modes for RF spectrum site scanning. |
| Audio test tone: | 1 kHz, -50 dBu to +5 dBu, < 1% THD (XLR output);<br>1 kHz, -55 dBu to 0 dBu, < 1% THD (1/4" output) |
| Transmitter battery type selection: | 9V alkaline, 9V lithium, AA alkaline, AA lithium, TIMER |
| Smart NR (noise reduction): | OFF, NORMAL, FULL modes (Hybrid mode only) |
| Power, Ext DC: | Min 8 V, Max 18 V DC; 1.6 W, 200 mA max. |
| Weight: | 13 oz. |
| Dimensions: | 5.50" (14 cm) wide, 1.75" (4.5 cm) high, 6.25" (16 cm) deep |

## Audio Performance (overall system):

| | |
|---|---|
| Frequency Response: | 40 Hz to 20 kHz (+/- 1 dB); -3 dB at 35 Hz |
| THD: | 0.2% (typical) |
| SNR at receiver output (dB): | 107 dB (SmartNR set at NORMAL) |

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21 March, 2007