# dBTechnologies Performer Line Uhf 16 Channels Wireless Microphone System User Manual



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Contents



## INTRODUCTION

The PU 900 is a family of frequency agile wireless microphones, operating in the UHF band, realized with state-of-the-art MICROCONTROLLER and PLL technology. The PU 900 series is part of the dB-technologies's Performer line, as can be seen from the devices dimension's and shapes, and include several innovative technical solutions. A unique, innovative, built-in **"Digital Code Squelch"** feature allow precise, reliable and noiseless operations even in strong interference conditions. Another innovative **"Battery Low"** function has been introduced to monitor the transmitter's battery status through a visual alert present in his companion receiver. Both the new features have been made possible by the **digital communication technique** adopted between transmitters and receivers.
The systems are available in several frequency ranges within the UHF band in order to meet the different country's regulations. Your local dB-technologies agent will have all the necessary details on the allowed legal frequencies for your area.
**PU 900** series' transmitters and receivers are 16-channel switchable. The frequency selection can be made by turning a suitable rotary switch or by acting on function's push-buttons, depending on the models.

### FAMILY DESCRIPTION

Each PU 900 system consist of a table top diversity receiver (integral or BNC antennas), a hand-held or pocket transmitter and come complete with all necessary accessories.

| **PU 900** systems are available in the following different sets: | |
|---|---|
| • **PU 900 M** | table top receiver **900 R** hand held transmitter **UH 900 M** with dynamic “cardioid” microphone capsule |
| • **PU 900 L** / ***GI*** **DHM** | table top receiver **900 R one** of:<br>• pocket transmitter **UH 900 L** with lavalier microphone<br>• pocket transmitter **UH 900 G** with instrument’s connection cable<br>• pocket transmitter **UH 900 DBM** with headset |
| • **PU910M** | table top receiver **910 R** with LCD display and BNC antenna connectors hand held transmitter **UH 910 ~f** with dynamic “cardioid” microphone capsule and metallic body |
| • **PU 910 L** / **G** / **DBM** | table top receiver **910 R** with LCD display and BNC antenna connectors **one of:**<br>• pocket transmitter **UH 900 L** with lavalier microphone<br>• pocket transmitter **UH 900 G** with instrument’s connection cable<br>• pocket transmitter **UH 900 DBM** with headset |
| All transmitters and receivers are also available separately. | |

**PRODUCT FEATURES**

The PU 900 series is the result of dB-technologies’ wireless and audio design know-how. The employment of ultra-miniature components in both transmitter’s and receiver’s electronics, the tremendous effort spent for design and optimization, the engineering care taken during the whole realization process have made possible the born of the world’s smallest “frequency agile” system present in the market Despite the use of PLL frequency synthesis in wireless microphones is known to have some significant limitations and shortcomings, and in some case can affect audio quality, battery life, size and weight quite significantly, the new PU 900 frequency agile series has been conceived to offer an affordable, high fidelity, compact, battery saving solution for best quality and no-compromise performances.

**DIGITAL CODE SQUELCH**

Wireless microphone receivers, by design, tend to generate high-level audio noise when no RF input signal is present. For this reason, in order to avoid annoying effects to the listeners and serious risks to amplifiers and speakers, the receiver must include some form of squelch circuitry to mute the audio output when no RF signal is present. In traditional systems, a circuit monitors the RF input signal to the receiver and mutes the audio output if the signal level drops below the selected threshold. Another serious cause of audio noise are interfering RF signals, that can trick the receiver out of the mute condition, especially when the wireless transmitter is turned off. In strong interference conditions, like when several wireless microphones are to be used simultaneously, the squelch threshold must be settled to the highest possible value, thus reducing the maximum range of the wireless distance. An innovative technique has been developed in dB-technologies’ laboratories to overcome this problem: the “Digital Code Squelch”. Digital Code Squelch is an improvement of already known squelch techniques like the so called “pilot tone”. A coded digital signal is transmitted in addition to the audio signal through the high frequency channel. Each transmitter’s frequency own a different coding, thus allowing any receiver to mute in case the proper code has not been received correctly. This prevents unwanted transmitters to unmute receivers tuned to other frequencies, as a consequence of strong interference and weak or absent wanted RF signal.

**Main Digital Code Squelch Benefits are:**

- User can switch OFF the transmitter without being afraid of other operating wireless transmitters or any other interference source in near distance because the receiver will stay reliably muted
- User can switch OFF and ON the transmitter without taking care of the annoying “pops” and “clicks” that can occur in the audio chain as a consequence of high amplification
- The MUTE switch on the transmitter is now unnecessary, given the above considerations. For this reasons the MUTE switch is no more present in the  PU 900 series wireless microphones. This greatly improves the system’s easyof- use.

#### BATTERY STATUS

Almost all wireless microphone transmitters include the battery low LED. This is intended to advice the performer when the battery must be replaced. Now, with the introduction of the PU 900 series, this same critical information has been made available in the companion receiver also. A “Battery Status “LED has been added in the receiver’s front panel to monitor their transmitter’s battery charge status. The sound engineer who is responsible of the overall sound system can be alerted in case of sudden transmitter’s battery drop, thus greatly improving the reliability and the degree of confidence of the user in the system.

#### VERY LONG BATTERY LIFE

Battery life is a common concern in considering the use of any transmitter for a particular application. It is a critical concern in many applications, especially when changing a battery could be not easy.  The PU 900 series has been designed with state-of-the art electronics. The broad use of today’s cellular phones technology, and the introduction of an innovative PLL design concept, have pushed the power consumption of the UH 900 and UH 910 transmitters to their lower limits thus giving an inexperienced very long operating time.

#### AUDIO INPUT LIMITER

The audio input limiter offer two basic advantages in wireless microphone design. First to avoid clipping and overload distortion if too much signal is delivered to the amplifiers. Secondly to meet the standard regulations for the restrictions imposed to the maximum RF deviation allowed. The limiter circuit present in the PU900 series transmitters can handle very high signal peaks, while keeping a clean limiting and very high signal to noise ratio.

#### LC DISPLAY OPERATIONS CONTROL (910 R only)

A very wide and well enlightened LCD is part of the 910 R receiver’s front panel. The LCD greatly improves the easy of use and give complete control of the system. Instantaneous RF signal strength indication, diversity operation, AF level monitoring, frequency and channel in use are only the main available facilities. As a complement of the LC Display, soft-buttons are available for powering the receiver and selecting and storing new settings like the operating frequency.

## PRODUCTS DESCRIPTION AND USE

#### 900 R / 910 R – DIVERSITY RECEIVERS

The 900 R is a 16 channels receiver. operating on the antenna diversity principle. The 900 R receiver is equipped as follows:
**FRONT:**

- two integral UHF antennas
- two green LEDs for monitoring of the diversity function (ChA, ChB)
- a red LED for monitoring of the transmitter’s battery status: the LED lights on when the companion transmitter’s

battery is low (Batt Low)

- a red LED for the Digital Code Squelch function ( the LED lights up when NO RIGHT CODE SQUELCH is received, and is unlight during normal operations) REAR:
- a control knob to adjust the SQUELCH level (max receiver's sensitivity is obtained by turning the knob clockwise)
- a CHANNEL SELECTOR for choosing one of the 16 available operating frequencies ( see the frequency table provided in the rear panel of the receiver for a direct reference between the channel number and the operating frequency)
- a control knob to adjust the audio output level (max audio level is obtained by turning the knob clockwise)
- an XLR socket for the BALANCED audio output
- a power 12V AC/DC socket for the supply (the AC-mains adapter is included in the packaging) The 910 R main differences, compared to the 900 R model, are:
- two BNC connectors in the front panel, for the external antennas or for cable connection to an antenna splitter a rugged metallic box especially suitable for rack mount an LC Display panel with channel selection facility, RF signal strength indication, incoming AF signal, instantaneous active antenna, squelch active status an ON/STAND-BY push-button a FUNCTION push-button for receiver's frequency programming and menu selection
- two push-buttons for UP and DOWN selection inside menus Setting up:
- Connect and lock the two supplied antennas into their BNC inputs ( 910 R only) and choose the desired angle. Make sure the supplied 12V-AC adapter and your local power mains voltage are compatible, and connect the plug into the 12V AC/DC socket on the back of the receiver. Lock the power supply cable in the apposite cable grip on the back of the receiver to avoid unwanted disconnection. When powered, the receiver's DIGITAL CODE SQUELCH LED light on. The LCD backlight turns on and the receiver perform the self test procedure (910 R only). Select one of the 16 available channels to work on in accordance with its companion transmitter. Turn the rotary switch on the rear of the receiver (900 R ) or follow the specific programming procedure for the 910 R.
- Check if the transmitter and the receiver are operating on the same channel: the DIGITAL CODE SQUELCH LED is unlight during normal operation to signal the right CODE reception from the companion transmitter, and one of the ChA or ChB antenna diversity LED light up. Adjusting the AF output level: Turn the OUTPUT LEVEL knob on the rear panel clockwise to increase the AF signal level. Adjustine the SQUELCH threshold level: In almost all operating conditions the Digital Code Squelch function prevents the receiver from being disturbed by unwanted interferences. Nevertheless, if needed, the receiver's RF sensitivity can be adjusted by turning the SQUELCH knob on the rear panel in order to avoid any sudden noise. The RF sensitivity decrease by turning the knob counterclockwise. 910 R proeramn1ing instructions:
- Frequency selection. To change the operating frequency, press one of the two buttons Up or Down; wait a few seconds and, when the message ·'STORE" appears press Function for a short while, until the displayed message change to "STORED". From now on the selected frequency will become the new operating frequency. The new selection is kept valid even at the power off by the receiver1s permanent internal memory.
- Channel indication. To change the display indication from "frequency" to ··channeJ" simply press the Function button for a short while.

### UH 900 MI UH 910 M – HAND HELD TRANSMITTERS

The **UH 900 M** and **UH 910 M** are 16 channels hand held transmitters, provided with an integral cardioid capsule.

The transmitters require two AAA type alkaline batteries, and are equipped as follows:

- an ON/OFF switch for operating the transmitter
- a green LED for monitoring of the transmitter's status. The LED is permanently lights on during normal operation, and flashes when the battery charge level start to be low (the battery must replaced).
  INSIDE THE BATTERY COMPARTMENT:
- a CHANNEL SELECTOR for choosing one of the 16 available operating frequencies ( see the frequency table provided for a direct reference between the channel number and the operating frequency)
  **Settin& up:**
- (!) Make sure the transmitter's ON/OFF switch is in the OFF position when you insert the batteries Access the battery compartment by unscrewing the cylindrical handle and insert the two AAA type alkaline batteries in accordance with the polarity marks ( +/-).
- Check the CHANNEL SELECT rotary switch, which is also accessible from the battery compartment, and eventually choose the wanted channel in accordance with the companion receiver.
- When you turn on the transmitter, the green LED must light up. The LED is permanently light when the battery charge level is high. – If the green LED flashes, the battery charge level is low and must be replaced.

**Adjusting the input sensitivity:**

- To adjust the AF input sensitivity use a screwdriver to turn the SENS trimmer located on the upper side of the transmitter.
- During normal use increase the transmitter input sensitivity so that the "PEAK" indicator LED is flashing at least occasionally, but it's not light up continuously.

## RECOMMENDATIONS AND TIPS

**Minimizing Interference problems:**

- Avoid basic problems:
- transmitters must be always located 5 to 6 meters away from ANY receive
- receiver's antennas must not be too close each other
- Make sure all transmitters have good batteries.
- Check the squelch level on the receivers (set the control to the lowest position that reliably mutes the interference).
- If you can1t avoid the interference you must change the operating frequency of the wireless system who is experiencing problems, searching for an interference free channel.
  **Simultaneous use:**

The PU900 series is suitable for the simultaneous use of several systems at the same time. Nevertheless, if you experience problems when more wireless microphones are working together, check the frequencies in use. In particular:

- Avoid frequency conflicts (Check the channel selector in the transmitters).
- As a rule of thumb: maintain a frequency spacing of 200KHz minimum, 1 MHz recommended.
- Try to determine where the interference is entering the audio system.

- Make certain that it really is a wireless system at fault. Try momentarily turning off the wireless receivers and disconnecting the audio cables.
- Turn off all wireless transmitters and make certain that all receiver “signal” indicators go out. This is to identify a possible external direct interference source.
- Turn ON one transmitter at a time, and identify the receiver’s indicator going in. If a receiver that is not tuned to the frequency of the transmitter exit from the “mute” state, the problem is intermodulation and the operating frequency must be changed.

## WIRELESS MICROPHONES LICENSING

dB-technologies’ products are fully compliant with the relevant Standard Regulations. In most countries, nevertheless, wireless systems must be approved for use by the Authorities and may be necessary to obtain a license to use it legally. Your local dealer will be able to give you details on wireless system regulations for your area.

## TECHNICAL SPECIFICATIONS

**TRANSMITTER UH 900 MI UH 910 M**

| | |
|---|---|
| Power supply | 3V (2x AAA alkaline |
| Frequency response | 35Hz to 16KHz ~ 3dB |
| Distortion | <1% |
| Power consumption | 70mA |
| Operating frequency | Multi channel, range: 770- 870 MHz |
| RF output power | < l0mWERP |

| | |
|---|---|
| Modulation | F3E Frequency Modulation |
| Deviation | 35 KHz nominal @ lKHz sinusoidal |
| Compander | Quadratic |
| Antenna | integral |
| Temperature range: | -10°C to +50″C |
| Frequency stability (-10° +50°C): | 3 KHz max |
| Input limiter | Yes |
| Peak (yes/no) | No |
| Channel selection | 16 positions rotary swith |
| Low battery warning | Yes |

| | |
|---|---|
| Battery life | > 10 hours |

**TRANSMITTER UH 900 UG/DHM**

| | |
|---|---|
| Power supply | lx 9V – alkaline |
| Audio input sensitivity | UH 900 L: adjustable from 50mV + SV RMS UH 900 G: adjust. from 1,5V + 15V |
| Frequency response | 35Hz to 16KHz ~ 3dB |
| Distortion | <1% |
| Power consumption | 40mA |
| Operating frequency | Multi channel, range: 770- 870 MHz |
| RF output power | < IOmWERP |
| Modulation | F3E Frequency Modulation |

| | |
|---|---|
| Deviation | 35 KHz nominal @ lKHz sinusoidal |
| Compander | Quadratic |
| Antenna | Integral, 1/1 wave lenght |
| Temperature range: | -lO”C to +50°C |
| Frequency stability (-10° +50°C): | 3 KHz max |
| Hard limiter | Yes |
| Peak (yes/no) | Yes |
| Channel selection | 16 positions rotary switch |
| Low battery warning | Yes |
| Battery life | > 12 hours |

**RECEIVER 900 R, 910 R**

| | |
|---|---|
| Receiver size | Half rack size |
| Power supply | 12 V -AC |
| Power consumption | 900R: 120mA<br>910R: 250mA |
| Audio output | 0 dB / 600 ohm balanced line, with regulator |
| Frequency response | 35Hz to 16KHz – 3dB |
| Distortion | <1% |
| Operating frequency | Multi channel, range: 770 870 J\,1Hz |

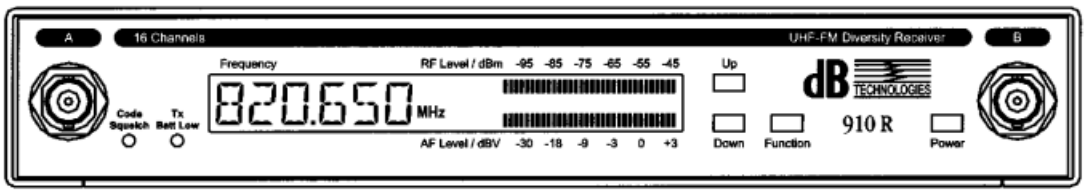
| | |
|---|---|
| Sensitivity | < 2uV for 20dB SINAD |
| Modulation | F3E Frequency Modulation |
| Deviation | 35 KHz nominal @ !KHz sinusoidal |
| Dynamic expander | Quadratic |
| Signal t-0 noise ratio | 115 dB typical |
| Antenna | 900R: integral, ‘/4 wave lenght 910R: detachable B NC |
| Temperature **range:** | -I0°C to +50°C |
| Diversity (yes/no) | Yes |

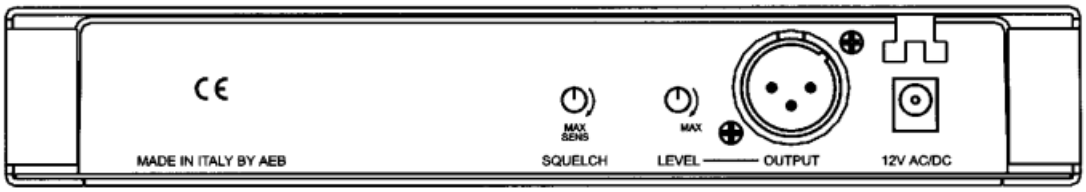
| | |
|---|---|
| Channel selection | **900R** : rotary switch<br>**910 R:** push buttons |

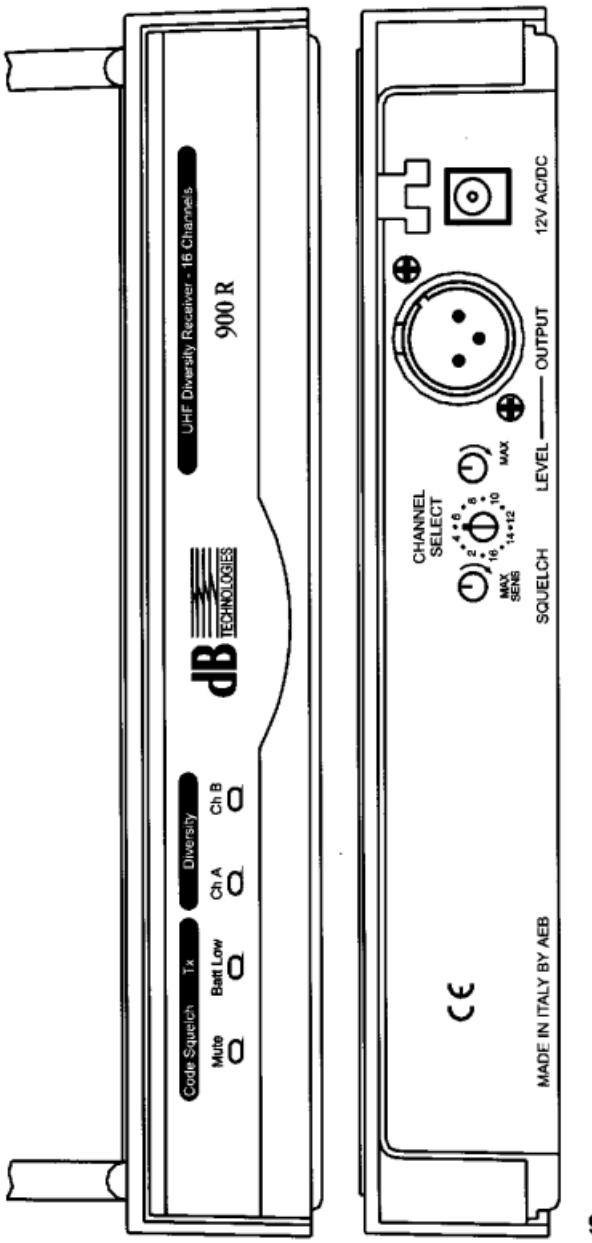
**SYSTEM PU 900/910 M / L / G / DHM**

| | |
|---|---|
| Intended use | Wireless microphone |
| Number of channels | 16 channels |
| Frequency response | 40Hz to 15KHz – 3dB |
| THD | <1% |
| Signal **to** noise | > l05 dB nominal |
| Operating frequency | Multi channel, range: 770- 870 l\1hz |

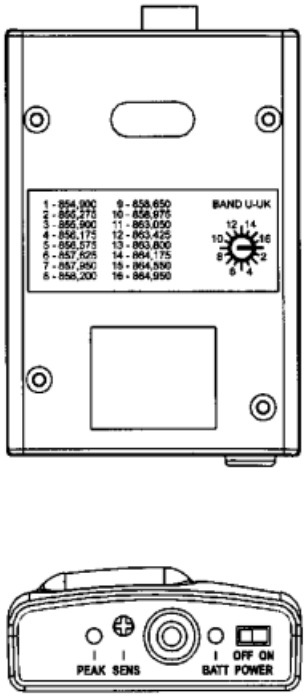
| | |
|---|---|
| Channel bandwidth | R (200 KHz) |
| Modulation | F3E Frequency Modulation |
| Category of the alignment range | AR2 |
| Deviation | 35 KHz nominal @ 1 KHz sinusoidal |
| Conformity t-0 1995/5/CE Directive | ETSI EN 300 422<br>ETSI EN 300 445 |



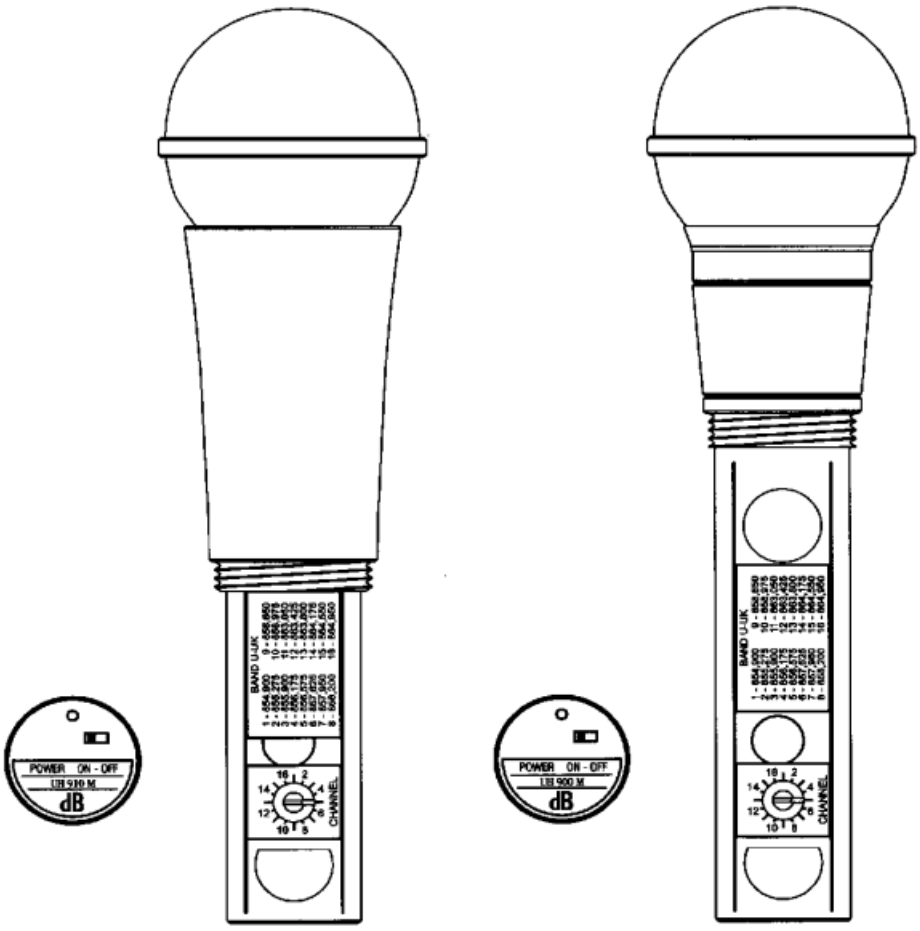






900 R




UH 900 L/G




910 M

900 M

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## Documents / Resources

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|---|---|
| dB TECHNOLOGIES<br>PERFORMER LINE<br>UHF 16 channels<br>Wireless Microphone System<br>*PU 900 - PU 910*<br>*M - L - G - DHM*<br>User manual | dBTechnologies Performer Line Uhf 16 Channels Wireless Microphone System [pdf] User Manual<br>PU 900, PU 910, MLG DHM, Performer Line Uhf 16 Channels Wireless Microphone System, Performer Line Uhf Wireless Microphone System, 16 Channels Wireless Microphone System, Wireless Microphone System, Wireless Microphone System, Microphone System |