2040 User Guide

CHAPTER 1

Introduction

The 2040 range has been designed as a result of extensive feedback from professional sound specialists and sets a new benchmark for radio microphone systems, with several unique features and offering benefits to appeal to sound mixers, directors, and artists.

DX2040

The DX2040 true diversity receiver in the RMS2040 range can be used with the TX2040 pocket transmitter and the HX2040 handheld transmitter. It is also fully compatible with the TX2020 and TX2000 UHF transmitters. All settings on the DX2040 receiver can be read or changed via infra-red using the Switch*iR* or Aud*iR©* for Palm™.

miniTX

The miniTX transmitter is the smallest transmitter in the Audio Ltd range. Designed as a rounded form to be very easily concealed. All settings can be set and changed via the infra-red port using the Switch*iR*™, and the miniTX can also be turned on and off through clothing using the Control-X. There are two versions of the transmitter available: one with a 4-pin Lemo connector and the other with a 3-pin Lemo connector.

TX2040

The TX2040 is a pocket transmitter that provides 32 pre-programmed frequencies with a switching bandwidth of up to 24MHz. The transmitter can be switched on and off, even when it is worn beneath clothing, using the unique Control-X handset. It is also compatible with the Switch*iR* infra-red controller, and Aud*iR*™ application Palm PDA.

HX2040

The HX2040 is a handheld transmitter designed in a classical conical shape, designed to accept any of 14 condenser capsules from the Schoeps™ Colette range.

The transmitter has 32 pre-programmed frequencies with up to 24MHz switching bandwidth, and it includes a unique infra-red remote control interface for reliable and accessible control over settings via the Switch*iR* or Aud*iR*™ application for Palm PDAs.

CHAPTER 1

Switch*iR*

The Switch*iR* is an infra-red remote control unit the size of a key fob, which can be used to access all the user-settable functions of the TX2040 and HX2040. Functions include transmitter frequency, audio level, battery status, serial number, and user identification.

Control-X

The Control-X uses electromagnetic induction to allow the miniTX or TX2040 transmitter to be controlled remotely, even through clothing.

At a distance of up to 20cm (8") the Control-X can switch on and off the transmitter, or check and display the selected frequency, and it also provides battery check features.

RK2040

The RK2040 is a compact 1U rack capable of accommodating up to four true diversity receivers. The RK2040 can be mains powered via an AC/DC adaptor, or can be powered from any 10-18V DC source. A built-in RS485 PC interface allows remote monitoring and control via Audio Ltd's PC-based monitoring application, Racktop.

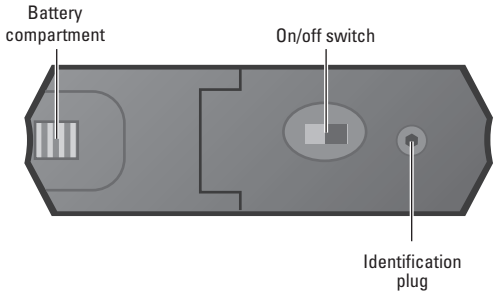
CHAPTER 2

DX2040 Receiver

The DX2040 true diversity receiver in the RMS2040 range can be used with the TX2040 pocket transmitter and the HX2040 handheld transmitter. It is also fully compatible with the TX2020 and TX2000 UHF transmitters. All settings on the DX2040 receiver can be read or changed via infra-red using the Switch*iR* or Aud*iR*© for Palm™.

Controls, display and connections

Bottom panel



Battery compartment

Holds two 1.5v AA (LR6) type cells.

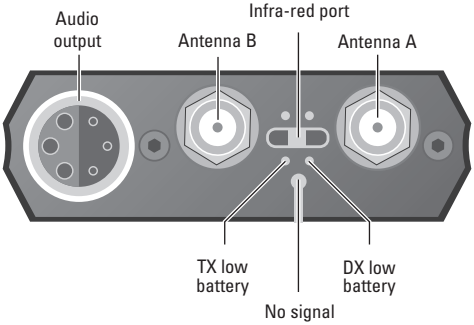
On/Off

Switches the power on or off. Additionally the output cable includes a link which disconnects power when the Lemo plug is removed, in which case the switch can be left on.

Identification plug

Can be fitted with one of the coloured rubber plugs supplied with the DX2040 to identify each unit.

Top panel



Audio output

Provides transformer balanced microphone level and adjustable headphone outputs.

Antenna A and Antenna B

SMA sockets to which the antennae are connected. Indicators next to each antenna indicate which of the unit's two built-in receivers is active at any time.

Infra-red port

Receives commands from and transmits status information back to the Switch*IR* infra-red controller.

TX/DX low battery indicators

Illuminate when the unit detects low battery power in either the TX2040 Pocket Transmitter or DX2040 Receiver. The units should not be used when a low battery power indicator is illuminated as poor operation may result.

Note: The low DX battery indicator does not function when the receiver is externally powered via Audio Ltd's cables. This is not a fault.

No-signal indicator

Illuminated when no carrier signal is being received, such as when the transmitter is switched off or set to an incorrect frequency.

Setting up the DX2040

To set up the DX2040 in conjunction with a TX2040 or HX2040:

- Fit the batteries.
- Connect the A and B antennae.
- Connect the audio output cable.
- Slide the On/Off switch to the On position.
- Select the operating frequency.
- Set the output level.
- Check that one of the A and B indicators is illuminated and that the red 'No signal' indicator is not illuminated.

These steps are explained below:

Fitting the batteries

To open the battery compartment, slide the release catch towards the centre of the DX2040 and flip open the cap.

Insert two 1.5 volt AA (LR6) type batteries, negative contact first as shown on the side of the unit, and close the cover. Do not use excessive force.

Connecting the antennae

Connect the antennae to the SMA connectors marked Antenna A and Antenna B. Connect the straight antenna to one socket and the right-angled antenna to the other socket.

Selecting the operating frequency

You can check or change the operating frequency of the DX2040 receiver via infra-red control using the Switch*iR*.

To check the DX2040 frequency:

- Press **MENU**.

The display shows:

- Align the front of the Switch*iR* with the infra-red port on the receiver and press **OK**.

Optimum operating range is between 5 and 15cm.

The Switch*iR* will display the receiver frequency; for example:

To change the DX2040 frequency:

- Press **OK** again.

The display will alternately flash between frequency and channel number.

For example:

- Press ∧ or ∨ to scroll through the 32 frequencies read from the receiver until the required channel or frequency is displayed.

For example:

- Align the front of the Switch*iR* with the infra-red port on the receiver and press **OK**.

If the command was received correctly the display will show the new frequency.

For example:

Otherwise the display will show:

- Repeat the above steps if an error message is displayed, moving the Switch*iR* closer to the infra-red port.

Setting the output level

The DX2040 output level is attenuated in 1dB steps over a 32dB range, allowing the receiver output to be matched to inputs which require a lower input level. The 0dB reference level is -25dBu.

To check the DX2040 output level:

- Press **MENU**.
- Press ∧ once until the display shows:

- Align the front of the Switch*iR* with the infra-red port on the receiver and press **OK.**

The display will show the current output level setting; for example:

To change the receiver output level:

- Press the **OK** button.

The AF level display will flash.

- Press the ∧ or ∨ button to step between the available output level settings until the required output level is displayed.

For example:

- Align the front of the Switch*iR* with the infra-red port on the receiver and press **OK**.

If the command was received correctly the new level will be displayed.

For example:

Otherwise the display will show:

- Repeat the above steps if an error message is displayed, moving the Switch*iR* closer to the infra-red port.

Checking the DC power status

To check the status of the receiver's DC power:

- Press **MENU**.
- Press ∧ three times until the display shows:

- Align the front of the Switch*iR* with the infra-red port on the receiver and press **OK.**

The display will show the DC voltage:

If the associated transmitter is on while the DC status is being checked the display will alternate between the receiver's DC status and the received transmitter DC status.

For example:

The transmitter status is shown as one of the following options:

Option	Description
H (high)	Indicates good.
L (low)	Indicates low. Replace as soon as possible.
F (failed)	Transmitter will not function correctly.

External powering

Audio Ltd has a large selection of cables available for a variety of different applications. If the DX2040 receiver is to be externally powered, ensure that the appropriate cable is used.

Technical specification

Frequency range	470MHz–1000MHz
Number of frequencies	32 pre-programmed
Switching bandwidth	Up to 24MHz
Sensitivity	-98dBm for 40dB SINAD
Balanced output level	-25dBu
Frequency response	50Hz to 18kHz ±1dB
THD	<0.2% typical
Batteries	2 x 1.5V AA (LR6) type
Battery life	> 4 hours on good alkaline batteries
Size	147 x 64 x 20mm
Weight	250g
Operating temperature range	-20°C to +55°C
Compliant to	ETS 300422 EN 300445(CE) FCC

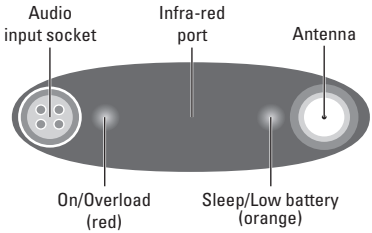
CHAPTER 3

miniTX

The miniTX transmitter is the smallest transmitter in the Audio Ltd range. Designed as a rounded form to be very easily concealed. All settings can be set and changed via the infra-red port using the Switch*iR*™, and the miniTX can also be turned on and off through clothing using the Control-X. There are two versions of the transmitter available: one with a 4-pin Lemo connector and the other with a 3-pin Lemo connector.

Controls, display and connections

Top panel



Infra-red port

Receives commands from and transmits status information back to the Switch*iR* infra-red controller, or Aud*iR* for Palm.

On/Overload indicator (red)

Flashes on momentarily to indicate an overload in the presence of a high-level audio signal. At this point, the low distortion limiter operates.

Sleep/Low battery indicator (orange)

Flashes every two seconds when the transmitter is in sleep mode. Remains on when the battery is low.

Battery compartment

Holds two AAA type 1.5V alkaline or lithium batteries.

Audio input

Allows a microphone or input cable to be connected via a 4-pin Lemo connector, or 3-pin Lemo connector on an optional variant.

SMA antenna connector

SMA socket to which the antenna is connected.

LF cut using Switch*iR*

Gives approximately 6dB LF cut at 50Hz, to assist in the reduction of wind noise.

Gain setting using the Switch*iR*

Provides eight gain options when used with standard microphones. Position 9 gives maximum gain and each position decreases the gain by approximately 3 to 4dB, giving a total of 30dB of adjustment.

Setting up the miniTX

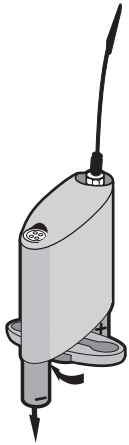
To set up the miniTX:

- Fit the batteries.
- Connect the antenna.
- Switch on by plugging in the microphone or input cable.
- Check or select the operating frequency.
- Check that the receiver's no signal indicator is not illuminated.
- Check or set the microphone gain.
- Check or set the low frequency cut filter.
- Check the battery status.

These steps are explained below:

Fitting the batteries

- Open the battery compartment by turning the battery compartment retaining nut in an anti-clockwise direction.
- Rotate the battery cover in either direction.



- Insert two AAA (LR03) type batteries as shown in the diagram on the miniTX cover.
- Close the battery compartment and tighten the battery compartment retaining nut in a clockwise direction. Take care not to over tighten.

An electronic resettable fuse protects the transmitter from reverse powering.

Low battery indication

When the battery is low the orange LED will remain on. The miniTX should not be used when the battery is low as poor operation may result. A low transmitter battery indicator is also provided on the DX2040 receiver and on the RK2040 rack.

Note: On the miniTX fitted with the 3-pin Lemo connector, the transmitter will switch on as soon as the batteries have been fitted to the transmitter. To maximize battery life the miniTX should be put into sleep mode by turning the miniTX off using the Switch*iR*.

Connecting the antenna

- Connect the flexible antenna to the SMA connector.

Switching on

- Insert the microphone plug.

The red LED illuminates momentarily under the top cover to indicate that the transmitter has been turned on.

Switching off

To turn the transmitter off remove the Lemo plug, or put the miniTX in sleep mode by switching it off using the Switch*iR*. Alternatively the miniTX can be turned off or on, even through clothing, using the Control-X.

In sleep mode the orange LED will flash every two seconds and the transmitter will draw very little current.

Connecting the audio input

- Connect the microphone or input cable to the four-pin Lemo socket.

A positive microphone bias voltage is provided, enabling the majority of modern lavalier microphones to be used with the miniTX.

Selecting the operating frequency

You can check or change the operating frequency of the miniTX via the infra-red control using the Switch*iR*.

To check the frequency:

- Press **MENU**.

The display shows:

- Align the front of the Switch*iR* with the infra-red port on the miniTX and press **OK**.

The display shows the current frequency; for example:

To change the frequency:

- Press **OK**.

The display will alternately flash between showing the frequency and channel number.

For example:

- Press ∧ or ∨ to scroll through the 32 frequencies read from the transmitter until the desired frequency or channel is displayed.

For example:

- Point the Switch*iR* at the infra-red port on the miniTX and press **OK**.

If the command was received successfully the display will show the new set frequency.

For example:

Otherwise it will show:

- Repeat the above steps if an error message is displayed, moving the Switch*iR* closer to the infra-red port.

Setting the gain

The steps between gain settings 2-9 are approximately 3 to 4dB. Set the gain position so that the Overload indicator does not flash on during normal operation.

To check the gain setting:

- Press **MENU** followed by ∧.

The display will indicate:

- Align the front of the Switch*iR* with the infra-red port of the miniTX and press **OK**.

The display will show the current transmitter gain setting:

To change the gain setting:

- Press **OK** again.

The display will flash the level setting.

- Press ∧ or ∨ to step between gain settings 2-9 until the required gain setting is displayed.

For example:

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

If the command was received correctly the display will show the new gain setting.

For example:

Otherwise the display shows:

- Repeat the previous steps if an error message is displayed, moving the Switch*iR* closer to the infra-red port.

Setting the low frequency cut filter

The LF cut filter gives an approximately 6dB cut at 50Hz to reduce handling and wind noise.

To check the status of the low frequency cut filter:

- Press **MENU**.
- Press ∧ twice until the display shows:

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

The current LF cut filter setting is displayed; for example:

To change the filter setting:

- Press **OK** again.

The current setting will flash.

- Press ∧ or ∨ to toggle between **ON** or **OFF** until the required setting is displayed.

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

If the command was received successfully the new setting will be displayed.

For example:

Otherwise the display will show:

- Repeat the previous steps if an error message is displayed, moving the Switch*iR* closer to the infra-red port.

Checking the battery status

- Press **MENU**.
- Press ∧ three times until the display shows:

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

The display will show the current battery status:

The battery level can also be checked from the receiver; see the appropriate instructions for the receiver.

Infra-red disable

You can protect the miniTX from an accidental change of settings, such as in a live performance, by disabling the infra-red port on the transmitter. This will prevent all communication with the transmitter until the the battery is disconnected and reconnected via the microphone plug.

Disabling the infra-red port

- Press **MENU**.
- Press ∨ twice.

The display will show:

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

If the command was received successfully the display will show:

Note: Once the infra-red port has been disabled, any subsequent interrogation of the transmitter will give an error display; this is not a fault.

Sleep mode

The miniTX can be put into sleep mode using the Switch*iR*. In sleep mode the orange LED will flash every two seconds. The miniTX uses very little current and the Switch*iR* can still be used to read all settings other than frequency.

When not in use the power should be switched off by removing the microphone plug or input cable.

Putting the miniTX into sleep mode

- Press **MENU** followed by ∨.

The display will indicate:

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

The display will show:

To switch the transmitter on again:

- Press **MENU**.

The display shows:

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

The display shows:

The red overload LED will flash on momentarily to indicate that the miniTX has woken from sleep mode.

- Press **MENU**.

The display shows:

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

The display shows the current frequency; for example:

Alternatively, you can use the Control-X to turn the miniTX on again.

Technical specification

Frequency range	470MHz–1000MHz
Number of frequencies	32 pre-programmed
Frequency stability	Better than ETS 300–422
Switching range	Up to 24MHz
Output power	25mW nominal
RF output connector	SMA 50Ω
Audio input connector	4 pin Lemo™ Other variant available: 3 pin Lemo™
System frequency response	50Hz to 18kHz ±1dB
System THD measured at 1kHz	<0.1% at working levels <0.3% at gain position 9 with -6dB input in overload
Gain control range	30dB in 8 steps
Maximum input level	0dB gain position 2
Indicators	Red LED to indicate overload Flashing orange LED to indicate standby mode Static orange LED for low battery
Batteries	2 x AAA (LR03) 1.5V type alkaline
Battery life	Typically 5 hours with alkaline type batteries, longer with lithium type
Other	miniTX can be switched ON/OFF through clothing via Control-X (available separately)
Size	16.5 x 82 x 48mm (DxHxW)
Weight	90g inc batteries
Operating temperature	-20°C to +55°C
Compliant to	R&TTE, FCC, EN 300-422 EN 300-445

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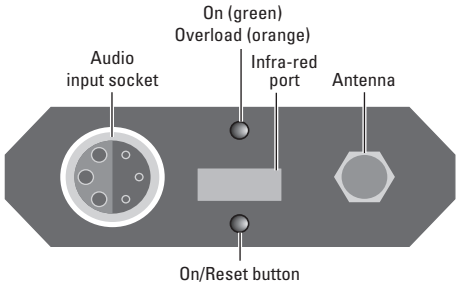
CHAPTER 4

TX2040 Pocket Transmitter

The TX2040 is a small, lightweight battery-powered pocket transmitter for use with a wide range of lapel microphones. All settings can be read and changed via the infra-red port using the Switch*iR*™.

Controls, display and connections

Top panel



Infra-red port

Receives commands from and transmits status information back to the Switch*iR* infra-red controller.

On/Overload indicator

The LED glows green while the TX2040 is switched on, but will flash orange to indicate an overload in the presence of a high-level audio signal. At this point the low distortion limiter operates.

Brown reset button

Resets the TX2040 and turns it on again from sleep mode. Please use the tip of the antenna to press the button.

Battery compartment

Holds a 6LR61 type 9V alkaline battery.

Audio input

Allows a microphone or input cable to be connected.

SMA antenna connector

SMA socket to which the antenna is connected.

LF cut using Switch*iR*

Gives approximately 6dB LF cut at 50Hz, to assist in the reduction of wind noise.

Gain setting using the Switch*iR*

Provides eight gain options when used with standard microphones. Position 9 gives maximum gain and each position decreases the gain by approximately 3 to 4dB, giving a total of 30dB of adjustment. Positions 1 and 0 provide line-level input.

The following table gives the equivalent settings for the TX2020:

TX2040	0	1	2	3	4	5	6	7	8	9
TX2020	8	9	0	1	2	3	4	5	6	7

Note: Positions 0 and 1 (8 and 9 on the TX2020) provide line-level input.

Setting up the TX2040

To set up the TX2040:

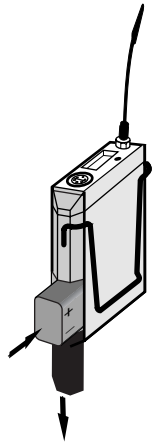
- Fit the battery.
- Connect the antenna.
- Switch on by plugging in the microphone or input cable.
- Check or select the operating frequency.
- Check that the receiver's no signal indicator is not illuminated.
- Check or set the microphone gain.
- Check or set the low frequency cut filter.
- Check the battery status.

These steps are explained below:

Fitting the battery

- Press and slide open the battery compartment door.
- Insert a 6LR61 type 9V alkaline battery with its contacts facing downwards observing the polarity as shown on the sleeve.
- Push the battery down against the spring-loaded contacts and slide the battery compartment door closed, pushing against the spring-loaded contacts.

Do not use excessive force:



An electronic resettable fuse protects the transmitter from reverse powering. A low transmitter battery indicator is provided on the DX2040 receiver and on the RK2040 rack in addition to the LED indicator on the TX2040 transmitter.

Connecting the antenna

- Connect the flexible antenna to the SMA connector.

Switching on

- Insert the microphone plug.

The LED illuminates green and the transmitter turns on. To turn the transmitter off remove the lemo plug. Alternatively the TX2040 can be turned off or on, even through clothing, using the Control-X.

The LED flashes green when the battery voltage falls below 6.5V. The unit should not be used when the battery is low as poor operation may result.

Connecting the audio input

- Connect the microphone or input cable to the six-pin Lemo socket.

Both positive and negative microphone bias voltages are provided, enabling the majority of Lavalier microphones to be used with the TX2040.

Selecting the operating frequency

You can check or change the operating frequency of the TX2040 via the infra-red control using the Switch*iR*.

To check the frequency:

- Press **MENU**.

The display shows:

- Align the front of the Switch*iR* with the infra-red port on the TX2040 and press **OK**.

The display shows the current frequency; for example:

To change the frequency:

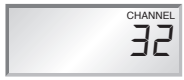
- Press **OK**.

The display will alternately flash between showing the frequency and channel number.

For example:

- Press ∧ or ∨ to scroll through the 32 frequencies read from the transmitter until the desired frequency or channel is displayed.

For example:



- Point the Switch*iR* at the infra-red port on the TX2040 and press **OK**.

If the command was received successfully the display will show the new set frequency.

For example:

Otherwise it will show:

- Repeat the above steps if an error message is displayed, moving the Switch*iR* closer to the infra-red port.

Setting the gain

The steps between gain settings 2-9 are approximately 3 to 4dB. Set the gain position so that the Overload indicator does not flash on during normal operation.

To check the gain setting:

- Press **MENU** followed by ∧.

The display will indicate:

- Align the front of the Switch*iR* with the infra-red port of the TX2040 and press **OK**.

The display will show the current transmitter gain setting:

To change the gain setting:

- Press **OK** again.

The display will flash the level setting.

- Press ∧ or ∨ to step between gain settings 2-9 until the required gain setting is displayed.

For example:

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

If the command was received correctly the display will show the new gain setting.

For example:

Otherwise the display shows:

- Repeat the previous steps if an error message is displayed, moving the Switch*iR* closer to the infra-red port.

Setting the low frequency cut filter

The LF cut filter gives an approximately 6dB cut at 50Hz to reduce handling and wind noise.

To check the status of the low frequency cut filter:

- Press **MENU**.
- Press ∧ twice until the display shows:

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

The current LF cut filter setting is displayed; for example:

To change the filter setting:

- Press **OK** again.

The current setting will flash.

- Press ∧ or ∨ to toggle between **ON** or **OFF** until the required setting is displayed.
- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

If the command was received successfully the new setting will be displayed.

For example:

Otherwise the display will show:

- Repeat the previous steps if an error message is displayed, moving the Switch*iR* closer to the infra-red port.

Checking the battery status

- Press **MENU**.
- Press ∧ three times until the display shows:

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

The display will show the current battery status:

The battery level can also be checked from the receiver; see the appropriate instructions for the receiver.

Infra-red disable

You can protect the TX2040 from an accidental change of settings, such as in a live performance, by disabling the infra-red port on the transmitter. This will prevent all communication with the transmitter until the brown reset button is pressed, or the battery is disconnected and reconnected via the microphone plug.

Disabling the infra-red port

- Press **MENU**.
- Press ∨ twice.

The display will show:

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

If the command was received successfully the display will show:

Note: Once the infra-red port has been disabled, any subsequent interrogation of the transmitter will give an error display; this is not a fault.

Sleep mode

The TX2040 can be put into sleep mode using the Switch*iR*. In the sleep mode the TX2040 uses very little current and the Switch*iR* can still be used to read all settings.

When not in use the power should be switched off by removing the microphone plug or input cable.

Putting the TX2040 into sleep mode

- Press **MENU** followed by ∨.

The display will indicate:

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

The display will show:

To switch the transmitter on again:

- Press **MENU**.

The display shows:

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

The display shows the current frequency; for example:

Alternatively, you can use the tip of the antenna to press the brown On/Reset button to turn the TX2040 on again.

Technical specification

Frequency range	470MHz–1000MHz
Frequency stability	Better than ETS 300–422
Number of frequencies	32 pre-programmed
Switching bandwidth	Up to 24MHz
Output power	50mW nominal
Gain control range	28dB in 8 steps, plus 2 steps for 600Ω line input
Maximum input level	+8dB gain position 0, 600Ω
Frequency response	50Hz to 18kHz ±1dB
THD	<0.1% at working levels <0.3% at gain position 7 with -6dB input in overload
Battery	9V (IEC 6LR61) Alkaline
Battery life	Typically 10 hours
Size	89 x 60 x 21mm
Weight	135g
Operating temperature range	-20°C to +55°C
Compliant to	R&TTE Directive FCC

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CHAPTER 5

HX2040 Hand-Held Transmitter

The HX2040 is a multi-frequency UHF hand-held transmitter for use with all the receivers from the RMS 2040, RMS 2020, and Envoy ranges. It is also compatible with the older RMS 2000 range. It provides 32 switchable frequencies, and is configured entirely by infra-red control using the supplied Switch*iR*. The HX2040 can be used with a range of microphone capsules from the Schoeps™ Colette series, and features a robust ergonomic design with a microphone suspension designed to minimise handling noise.

Controls, displays, and connections

Windshield

Can be unscrewed to access the microphone capsule.

Microphone capsule

Any capsule from the Schoeps™ Colette range can be used with the HX2040 transmitter. There are 18 different capsules available, ranging from a hyper-cardioid to an omni pattern. Many of the capsules are available from Audio Limited.

Identification ring and button

The HX2040 is supplied with six colour identifying rings and buttons to aid recognition in multi-channel use.

Anti-roll ring

An anti-roll ring is fitted to the windshield to prevent the HX2040 from rolling when placed on a flat surface, such as a table.

Infra-red port

Receives commands from and transmits status information back to the Switch*iR* infra-red controller.

On button

Switches the microphone on.

To prevent the microphone from accidentally being switched off during use the HX2040 can only be switched off by using the Switch*iR*, or by briefly disconnecting the battery.

On/Overload indicator

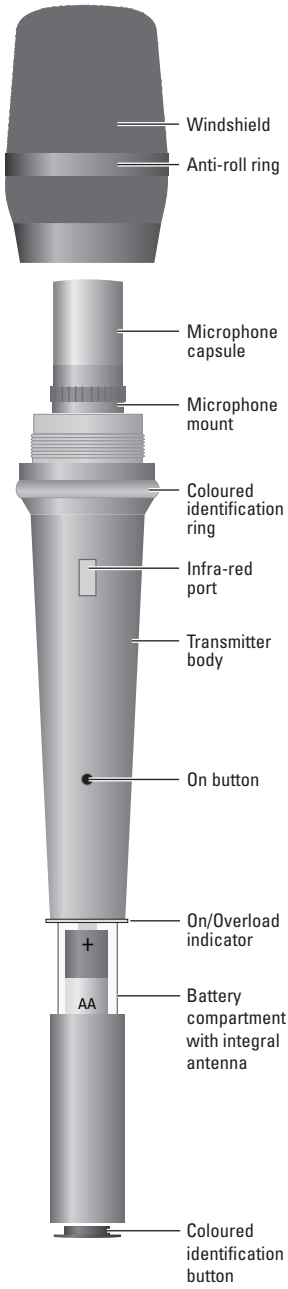
The ring above the battery compartment glows red while the HX2040 is switched on, but will flash off to indicate an overload if the microphone experiences a loud signal.

Battery compartment

Holds one AA 1.5V (LR6 type) alkaline battery.

Antenna

The transmitter antenna is integrated into the battery compartment and therefore no external antenna is required.



Setting up the HX2040

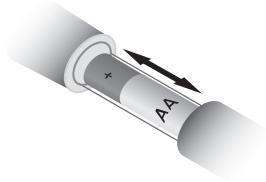
To set up the HX2040 :

- Fit the battery.
- Switch on by pressing and holding the grey On button below the infra-red port for one second.
- Check or select the operating frequency.
- Check or set the gain.
- Check or set the low frequency cut filter.
- Check the battery status.

These steps are explained below:

Fitting the battery

- Open the battery compartment by gripping the cover and sliding it gently away from the body of the HX2040.
- Fit the battery with the positive terminal uppermost and close the battery cover until it clicks shut.



Do not twist or turn the battery cover.

Removing the battery

The battery can easily be removed by pushing a small coin into the slot in the compartment beneath the battery.

Switching on

* Press and hold the grey On button below the infra-red port for one second until the ring above the battery compartment glows red.

When not in use the power should be switched off using the Switch*iR*, as described below. Alternatively the HX2040 can be switched off by opening the battery compartment and briefly disconnecting the battery.

Selecting the operating frequency

You can check or change the operating frequency of the HX2040 via infra-red control using the Switch*iR*.

To check the frequency:

- Press **MENU**.

The display shows:

- Align the front of the Switch*iR* with the infra-red port on the HX2040 and press **OK**.

The display shows the current frequency; for example:

To change the frequency:

- Press **OK**.

The display will alternately flash between showing the frequency and channel number.

For example:

- Press ∧ or ∨ to scroll through the 32 frequencies read from the transmitter until the desired frequency or channel is displayed.

For example:

- Point the Switch*iR* at the infra-red port on the HX2040 and press **OK**.

If the command was received successfully the display will show the new set frequency.

For example:

Otherwise it will show:

- Repeat the above steps if an error message is displayed, moving the Switch*iR* closer to the infra-red port.

Setting the gain

The steps between 0-9 gain settings are approximately 3 to 4dB. Set the gain position so that the Overload indicator does not flash off during normal operation. A typical setting is 6 or 7.

To check the gain setting:

- Press **MENU** followed by ∧.

The display will indicate:

- Align the front of the Switch*iR* with the infra-red port of the HX2040 and press **OK**.

The display will show the current transmitter gain setting:

To change the gain setting:

- Press **OK** again.

The display will flash the level setting.

- Press ∧ or ∨ to step between gain settings 0-9 until the required gain setting is displayed.

For example:

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

If the command was received correctly the display will show the new gain setting.

For example:

Otherwise the display shows:

- Repeat the previous steps if an error message is displayed, moving the Switch*iR* closer to the infra-red port.

Setting the low frequency cut filter

The LF cut filter gives an approximately 10dB cut at 50Hz to reduce handling and wind noise.

To check the status of the low frequency cut filter:

- Press **MENU**
- Press ∧ twice until the display shows:

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

The current LF cut filter setting is displayed; for example:

To change the filter setting:

- Press **OK** again.

The current setting will flash.

- Press ∧ or ∨ to toggle between **ON** or **OFF** until the required setting is displayed.
- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

If the command was received successfully the new setting will be displayed.

For example:

Otherwise the display will show:

- Repeat the previous steps if an error message is displayed, moving the Switch*iR* closer to the infra-red port.

Checking the battery status

- Press **MENU**.
- Press ∧ three times until the display shows:

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

The display will show the current battery status:

The battery level can also be checked from the receiver; see the appropriate instructions for the receiver.

Infra-red disable

You can protect the HX2040 from an accidental change of settings, such as in a live performance, by disabling the infra-red port on the transmitter. This will prevent all communication to the transmitter until the battery is disconnected and reconnected.

Disabling the infra-red port

- Press **MENU**.
- Press ∨ twice.

The display will show:

- Align the front of the Switch*iR* with the infra-red port on the transmitter and press **OK**.

If the command was received successfully the display will show:

Note: Once the infra-red port has been disabled, any subsequent interrogation of the transmitter will give an Error display; this is not a fault.

Fitting the microphone capsule

The HX2040 transmitter uses high quality interchangeable condensor capsules from the Schoeps™ Colette range. The HX2040 is compatible with the full range of capsules and accessories in this range.

The capsule mounting has a unique gel-based suspension to minimise handling noise.

To fit a capsule

- Unscrew the metal windscreen from the top of the transmitter.
- Screw the capsule into place taking care not to cross-thread the capsule or over-tighten it.
- Replace the windscreen.

Holding the HX2040

The HX2040 should be held above the illuminated On/Overload indicator ring. This will enable maximum power to be radiated from the integral antenna in the battery compartment. Holding the HX2040 over the battery compartment will impair the range of the transmitter and should be avoided.

The frequency, gain, and LF status setting will be retained even if the battery is removed from the transmitter.

An external foam windshield is available from Audio Limited.

Technical specification

Frequency range	470MHz–1000MHz
Number of frequencies	32 pre-programmed
Switching range	Up to 24MHz
Output power	10mW nominal
Gain control range	30dB in 10 steps
Frequency response	50Hz to 18kHz ±1dB excluding capsule
THD	<0.2% typical
Battery	1.5V AA cell (IEC LR6) Alkaline
Battery life	Typically 5 hours with an alkaline battery
Available capsules	A02S bright omni AC4 cardioid AC4A cardioid for vocal use and others from Schoeps™ Colette range
Indicators	Red LED for on; LED off indicates overload
Other	Specially designed suspension minimises handling noise
Length	260mm including windshield
Diameter	44/36mm reducing to 22mm at base
Weight	185g
Operating temperature	-20°C to +55°C range
Compliant to	R&TTE Directive FCC

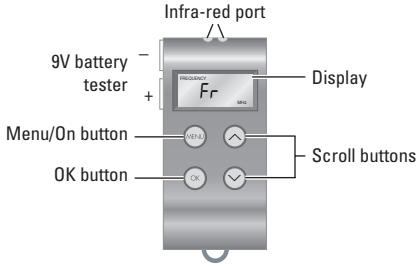
CE 0891

CHAPTER 6

Switch*iR* Infra-Red Controller

The Switch*iR* is a compact custom-designed infra-red controller for use with the 2040 Range. It provides functions to allow you to read the status of a device, or change its settings. In addition it includes a convenient built-in 9V battery tester:

Controls



Infra-red port

Point the infra-red port at the front of the Switch*iR* directly at the infra-red port of the transmitter or receiver, keeping the Switch*iR* within 30cm of the port.

Menu/On button

Turns on the Switch*iR*. The display will initially show the frequency screen:

∧/∨ Scroll buttons

Allow you to scroll through the menus, or the selections on the frequency, audio level, and LF cut screens.

OK button

Confirms the current selection.

Power saving feature

The Switch*iR* will switch off if no buttons are pressed within 30 seconds, to conserve battery life.

The Switch*iR* will also switch off automatically if the menu button is kept pressed for more than 50 seconds; for example while the Switch*iR* is in a pocket or bag.

Using Switch*iR*

Full instructions for using Switch*iR* with each of the products in the 2040 Range are given in the appropriate chapter of this guide.

The following table summarises the Switch*iR* functions, and describes the additional functions included in Switch*iR*.

Menu	Description
Fr	Press **OK** to read the transmitter or receiver frequency setting. Press **OK** again followed by ∧ or ∨ to select a new frequency, and press **OK** to transmit it to the unit.
AF	Press **OK** to read the receiver or transmitter audio level. Press **OK** again followed by ∧ or ∨ to select a new audio level and press **OK** to transmit it to the unit.
LF Cut	Press **OK** to read the transmitter's LF cut setting. Press **OK** again followed by ∧ or ∨ to switch the setting between on or off and press **OK** to transmit it to the unit.
Batt	Press **OK** to read the transmitter or receiver battery level. For receivers the receiver battery level alternates with a transmitter battery status indicator: H (high), L (low), or F (fail).
Int Batt	Displays the battery voltage of the Switch*iR* internal battery. If this falls below 5.00V the internal battery should be replaced.
9V Batt	Allows you to test a 9V 6LR61 type battery by holding it against the two metal terminals on the side of the Switch*iR*. A reverse polarity warning is displayed if the battery is connected the wrong way round.
Sn	Press **OK** to read the serial number of a receiver or transmitter and display it on the display. The serial number consists of a six-digit prefix followed by a two-digit suffix, and these are flashed alternately on the display.
User ID	Displays the unit's user ID. You can edit the user ID using the Aud*iR*™ application.
iR disable	Press **OK** to disable the infra-red port on a transmitter or receiver until power is disconnected and reapplied.
Off	Press **OK** to turn a transmitter off. Not available for receivers.

Technical specification

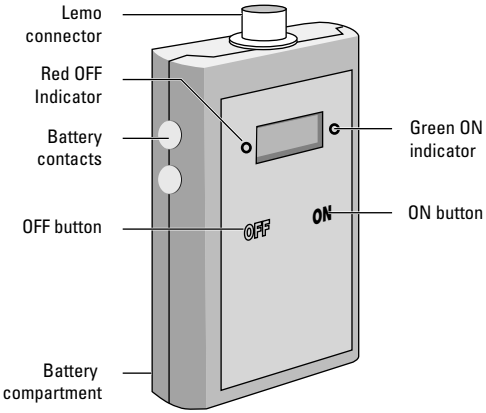
Size	65 x 30 x 11mm (17mm at battery end)
Weight	20g including battery
Battery type	6V PX28L Lithium or equivalent
CE	

CHAPTER 7

Control-X Transmitter Controller

The Control-X uses electromagnetic induction to switch on or off the miniTX or the TX2040 transmitter, or check its frequency, even when the transmitter is hidden beneath clothing. It has a built-in frequency counter and battery tester.

Controls, display, and connections



Lemo connector

Allows you to plug in a TX2040, TX2020, or DX2020 and measure its on-load internal battery voltage.

Battery contacts

Allow you to measure the voltage of a 9V 6LR61 type battery.

Red off indicator

Indicates no signal from the transmitter.

Green on indicator

Indicates a signal received from the transmitter.

Display

Shows the status of the Control-X, and displays frequency and voltage.

ON/OFF buttons

For turning the pocket transmitter on or off.

Battery compartment

Takes a 9V 6LR61 type battery.

Controlling a miniTX or TX2040

In the miniTX the receptor for the Control-X is located in the top part of the transmitter between the Lemo socket and the antenna socket.

In the TX2040 the receptor for the Control-X is located in the bottom part of the transmitter below the battery compartment.

Switching on

To switch the miniTX or TX2040 on, even through clothing:

- Hold the Control-X within 20cm (8") of the transmitter.
- Press and hold the **ON** button and slowly wave the Control-X in front of the transmitter.

The green indicator illuminates and the display shows:

- Release the **ON** button.

The green indicator stays illuminated if a signal is being received from the transmitter, and the display shows the frequency.

For example:

Switching off

- Hold the Control-X within 20cm (8") of the transmitter.
- Press and hold the **OFF** button and slowly wave the Control-X in fromt of the transmitter.

The red indicator illuminates and the display shows:

- Release the **OFF** button.

The red indicator stays illuminated and the display then shows:

This confirms that the transmitter has been switched off.

Checking whether the miniTX or TX2040 is switched on

You can use the Control-X to check the status of the transmitter, without switching it on or off, as follows:

- Hold the Control-X more than 20cm (8") away from the transmitter, and press and release the **ON** button.
- Move the Control-X within 20cm (8") of the transmitter.

If the transmitter is operating the green indicator will be illuminated and the display shows the frequency.

For example:

If the transmitter is not operating the red indicator will be illuminated.

The display shows:

Displaying the frequency of any transmitter

The Control-X can be used to display the frequency of any Audio Ltd or third-party transmitter.

Displaying transmitter frequency

- Bring the transmitter within 5cm (2") of the Control-X.
- Hold down the **ON** button.

The display shows the transmitter frequency; for example:

Checking battery voltages

Checking the Control-X battery

- Press the **ON** and **OFF** buttons simultaneously, and release them.

The display briefly shows the battery voltage of the Control-X; for example:

If this falls below 6V the battery should be replaced.

Note that the Control-X automatically switches itself off if no key has been pressed for approximately 12 seconds.

Checking the battery of other Audio Ltd RMS2020 or RMS2000 transmitters

- Plug the transmitter into the Lemo connector on the front of the Control-X without pressing either button.

The display shows the true on-load internal battery voltage of the unit.

For example:

Refer to the User Guide for the product for information about the minimum voltage requirement of the product.

Note: Although the Control-X display automatically turns off to conserve battery life, the transmitter will remain on while connected to the Control-X.

Measuring a battery

- Hold the 9V 6LR61 type battery against the two metal terminals on the side of the Control-X without pressing any buttons.

The green indicator will be illuminated and the battery voltage will be displayed.

For example:

If the battery is connected the wrong way round the indicator will be illuminated.

The display shows:

Technical specification

Size	100 x 63 x 24mm
Weight	150g including battery
Battery type	9V 6LR61
CE	

EC Declaration of Conformity

Déclaration de conformité pour la CEE
EG-Konformitäts-Erklärung
Certificato di conformitá comunitario
Declaración de Conformidad
EG-Conformiteitsverklaring

AUDIO LIMITED
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declare that these devices / déclarons que ces appareils / erklären, dass die Produkte / declaramos que estos aparatos / dichiaria che questi apparecchi / verklaren, dat deze toestelen

TX2040 Pocket Transmitter

HX2040 Handheld Transmitter

conform to the essential requirements of the R&TTE Directive 1999/5/EC. To demonstrate compliance with these requirements, the following standards were consulted:

sont conformes aux prescriptions fondamentales dan la Directive R&TTE 1999/5/EC. Pour mettre en pratique dans la règle de l'art les prescriptions,il a été tenu compte des normes suivantes:

den einschlägigen Anforderungen der R&TTE-Direktive 1999/5/EC entsprechen. Zur sachgemäßen Umsetzung der in den EG-Richtlinien genannten Anforderungen wurden folgende Norman herangezogen:

complen los requimientos básicos de la normativa de la normativa R&TTE 1999/5/EC. Con il fin de realizar de forma adecuada los requirimientos referidos en la normativa fueron consaltadas las siguientes normativas:

sono conformi alla normativa R&TTE 1999/5/EC. Per un'appropriato risconto nell'ambito della normativa CEE sono state consultate le seguenti normative:

evereenkomt met de basiseisen van de EG-Richtlijn 1999/5/EC. Om de eisen, die in de EG-Richtlijnen vermeld zijn, in juiste vorm om te zetten, zijn van volgende normen gebruik gemaakt:

Article 3.1a: EN 60065:2002 (Safety of Electrical Equipment)

Article 3.1b: EN 301 489-9:2002 (Electromagnetic Compatibility)

Article 3.2: EN 300 422-2:2000 (Radio Performance)

Conformity assessed via Annex IV using a Technical Construction. File examined by Notified Body 0891, TRL Compliance Services Ltd.

May 2004

Lee Stone
(Technical Director)