micro Sync

beat xtractor

input — Power
www.redSound.com

138.4
bpm

micro Sync

Red Sound
the colour of music

▶/II

tap
reset/
Stop

Pull   ok   Push
Sync

bPm
+/uP

Push

Pull

bPm
-/down

nudge

beat 1

midi clock

V2
BPM ENGINE

midi out

OWNERS MANUAL
Issue 3

CONTENTS

INTRODUCTION

Congratulations! By purchasing the MICRO SYNC you have joined an exclusive new club of re-mixers and Djs who have discovered the future of DJ'ing, mixing MIDI instruments with audio playback. Previously, to make MIDI happen in time with music was a matter of painstaking and time-consuming tweaking of MIDI tempos and sound source pitch controls to keep them even remotely synchronised.

The MICRO SYNC automatically synchronises audio and MIDI in a low-cost package with key features to further simplify and enhance performance. At the heart of the MICRO SYNC is Red Sound's highly acclaimed 'V2' BPM Analysis Engine (taken from the groundbreaking FEDERATION BPM FX module), which shoulders the responsibility of calculating the tempo of the music. This leaves you free to concentrate on mixing and adjusting the real-time controls on your MIDI sequencer/tone module.

With straight-forward connections and setup, a compact case and three mounting options, the MICRO SYNC will integrate perfectly into any DJ/studio setup.

Please read the following sections of this manual carefully to fully understand the operation of your new RED Sound MICRO SYNC Beat Xtractor.

OPERATING CRITERIA

This product has been designed to operate most effectively with dance music - i.e. music based on strong regular beats and patterns. However, as the range of pre-recorded dance material is virtually limitless (and the audio mix of individual tracks unknown) we cannot guarantee the performance of the MICRO SYNC with every dance track.

The MICRO SYNC may operate unsatisfactorily if the beat information is either unavailable or indefinable within the audio track. Please note this when selecting your audio material.

FRONT PANEL/CONNECTORS

FRONT PANEL CONTROLS AND CONNECTORS

Here's a quick guide to the controls and connectors on the MICRO SYNC.

1 AUDIO INPUT - Connector
Use the input cable (supplied) to connect this socket to the booth/record or master output on your mixing desk.

2 AUDIO INPUT LEVEL - Indicator
Use this bi-colour red/green LED to maintain the ideal input level. See 'Setting the correct Input Level 'on page 5.

3 POWER IN - Connector
Connect the output plug of the AC adaptor supplied with the MICRO SYNC to this socket.

4 BPM - Display
The four digit BPM reading of the audio signal will be displayed here.

5 RUN/PAUSE - Button
Press this button to run or pause the connected MIDI sequencer. (Also sets the BPM range)

6 TAP (RESET/STOP) - Button
Tap this button to manually enter a BPM. Press and hold the button to stop the MIDI clock and reset the BPM display.

7 SYNCHRONISATION - Display
This 3-way indicator shows any synchronisation adjustments.

8 NUDGE - 4 Buttons
Use this 4-way keypad to manually edit the BPM reading or adjust the audio/MIDI sync point - see page 8. (Also used for parameter editing)

9 MIDI CLOCK - Display
This 8 indicator display 'rotates' at the BPM rate when the MICRO SYNC's MIDI clock is running.

10 MIDI OUT - Connector
Use a suitable MIDI cable to connect this socket to the MIDI IN connector on your sequencer.
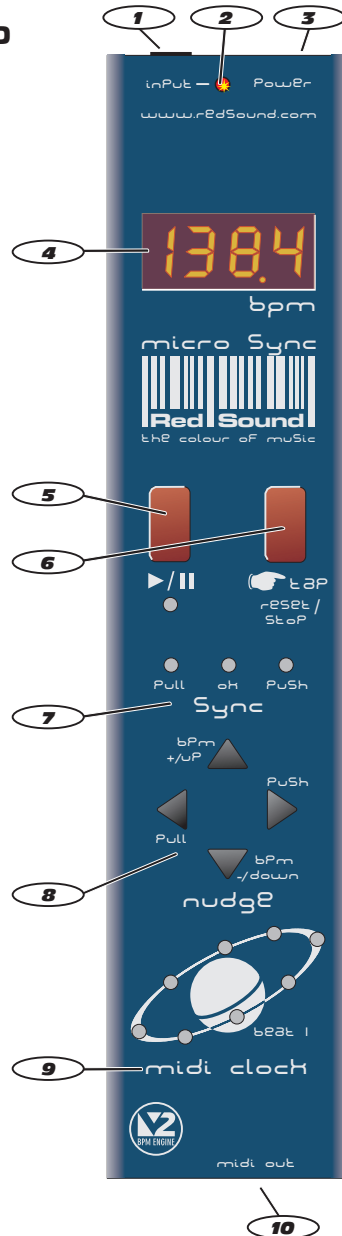
MOUNTING THE MICRO SYNC

You can choose one of three mounting options included with the MICRO SYNC.

1. **Rubber feet** - Stick one in each corner on the underside panel for free mounting.

2. **Double sided adhesive pads** - Stick one either side of the serial number label on the underside panel. Locate a flat, clean surface on your equipment/rig, peel-off film and press firmly into place for a permanent mounting.

3. **Brackets, for use with 19" rack mount holes on mixing desks** - The MICRO SYNC can be conveniently located on either side of a mixing desk for a semi-permanent mounting.
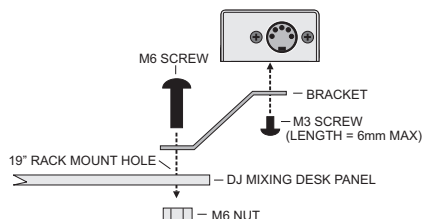
CONNECTING THE MICRO SYNC TO YOUR SYSTEM

When you have chosen the best mounting option for your system setup, connect the MICRO SYNC as follows:

1. Using the input cable supplied, connect the 3.5mm plug end to the MICRO SYNC socket marked 'INPUT' on the rear panel.

2. Connect the RCA phono plugs of the cable to a suitable line level output on your mixing desk. (Record, Booth etc.)

3. Connect the output plug of the AC power adaptor to the MICRO SYNC's power in socket on the rear panel.

4. Connect the MIDI OUT socket on the front panel of the MICRO SYNC to the MIDI IN socket of your sequencer, using a suitable MIDI cable.

M6 SCREW

— BRACKET

—M3 SCREW
(LENGTH = 6mm MAX)

19" RACK MOUNT HOLE

— DJ MIXING DESK PANEL

— M6 NUT

Rotate the chrome brackets to line-up with the 19" rack mounting holes on your mixing desk.

INPUT CABLE
(SUPPLIED)

TO AC ADAPTOR

R   L

RECORD/BOOTH
OR
MASTER OUTPUT

INPUT   POWER

BPM

RED
MICRO SYNC

19" RACK
Hole pitch range =
Min 90mm
Max 240mm

▶/❙❙

TAP
(RESET /STOP)

PULL   OK   PUSH
SYNC

BPM /UP

PULL   PUSH

BPM /DOWN

NUDGE

BEAT 1
MIDI CLOCK

MIDI OUT

MIXING DESK

SUITABLE
MIDI CABLE

AUDIO OUT   MIDI IN

TO SUB-MIXER: *DO NOT CONNECT MIDI AUDIO SIGNAL BACK INTO MAIN MIXER AS A FEED-BACK LOOP WILL OCCUR.*

303/505

MIDI SEQUENCER / TONE MODULE
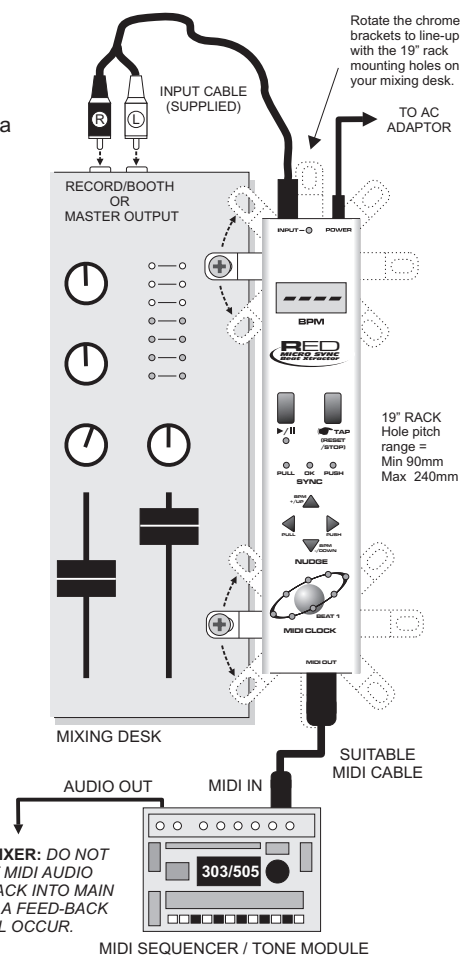
OPERATION

EXTERNAL MIDI SEQUENCER SETTINGS

Before the MICRO SYNC can operate correctly your MIDI sequencer must first be set to recognise e*xternal* MIDI Clock commands. Please consult the manufacturers operation manual to make the necessary settings. Here are some typical examples:

ROLAND MC-303/505
In System Settings, set the 'SYNCHRONIZATION SETTING' to 'Slave' mode.

E-MU Orbit / Planet Phatt etc.
In Master Menu, set 'GLOBAL TEMPO' down below 1 BPM to 'External' mode and set the 'BEATS MODE to 1, 2 or 3.

QUASIMIDI RAVE-O-LUTION 309
In the 'EDIT' page press F3 to select 'SYSTEM'. Select page 3 with the 'PAGE' dial. Use the 'EDIT VALUE' wheel to set MIDI SYNC to 'EXT'.

GETTING STARTED/POWERING UP

The MICRO SYNC has been designed to operate from the main output signal on a mixing desk or any line level audio source. When connecting to a mixing desk, this signal can usually be taken from a secondary parallel master output labelled 'RECORD' or 'BOOTH OUTPUT'. If your mixing desk does not feature this type of output, use two 'Y' type RCA phono splitter connectors on the master output terminals so that both the amplification system and MICRO SYNC receive the same signal. Alternatively you can connect to any 'EFFECT SEND'.

NOTE 1: When the MICRO SYNC is in use, avoid changing any volume or tone controls on the mixing desk as this could greatly affect the MICRO SYNC's synchronisation performance. (Example: a 'Bass' tone control turned right down would eliminate all the kick drum beat information from the track).

NOTE 2: A sub-mixer MUST be used to combine the MIDI driven audio and main audio output signals - see connection diagram. MIDI driven audio played back into the MICRO SYNC's input from the main mixer will create a feedback loop. This will result in the MICRO SYNC following it's own tempo rather than the master audio signal.

When power is first applied to the MICRO SYNC the software version fitted to your unit will be shown in the main display.

← Software version = 2.02 (i.e. 'V2' BPM engine)

Afterwards, the four centre bars will light to indicate the BPM engine is currently 'IDLE'.

Four static centre bars ← indicate 'IDLE' condition (no audio beat detected)

SETTING THE CORRECT INPUT LEVEL

The MICRO SYNC's input stage will work most effectively when the audio levels within your mixing desk are set to their nominal settings i.e. Individual channel Gain/level controls set to 0dB - Master output fader set to 0dB. The bi-colour 'INPUT' indicator at the top of the front panel can show four different input level conditions as follows:

OFF   - No audio signal present
DIM GREEN   - Audio signal present - Level too low
BRIGHT GREEN - Audio signal present - **Ideal working level**
RED   - Overloaded signal - Level too high

For satisfactory operation, this indicator should always be BRIGHT GREEN, occasionally flashing RED. If the indicator shows a different condition, check the channel/master settings on your mixing desk.

IMPORTANT NOTE: If the indicator is continuously DIM GREEN, the BPM engine may operate erratically. If the indicator is continuously RED the BPM engine may cease to function.

If the signal level is continuously too high, a secondary overload warning will be shown on the main display as follows:

← *4 rising centre bars indicate 'input overload' condition*
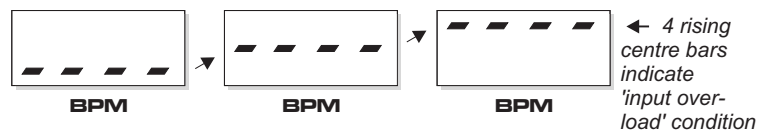
If the display shows the overload warning at any time, check and adjust back the gain settings on the mixing desk.

Play a track containing steady, definable beat information on any connected sound source, route it to the master output on your mixing desk and set the master level fader to it's normal operating position. If the MICRO SYNC is connected to the 'Booth' outputs on your mixing desk, turn up the Booth Output level control until the 'Input' indicator lights BRIGHT GREEN, occasionally flashing RED. If the MICRO SYNC is connected directly to the master outputs, turn up the Master fader until the Input indicator shows the same condition as above.

NOTE: Regularly check and adjust the input level setting to compensate for individual track level variations.

BPM DISPLAY

The main display should now show the BPM reading of the master audio signal as in the following example:

← *Example reading = 138.2 BPM*
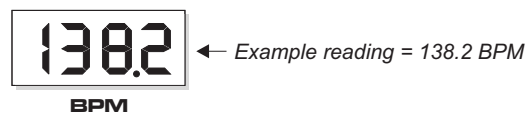
OPERATION

Also, the ▶/❙❙ indicator and 'Beat 1' indicator in the MIDI CLOCK display will flash at the detected BPM rate to show 'PAUSE' mode. The right-hand digit of the BPM display may fluctuate slightly as the BPM engine constantly analyses and updates the reading in real-time. Any progressive shift in tempo (slowly changing the playback speed using a CD/vinyl deck's pitch control) should be tracked and displayed by the MICRO SYNC.

IMPORTANT NOTE: If the BPM engine has picked up on the OFF-BEAT information in the track (LEDs flashing on the off-beats) from a prominent Hi-Hat etc., you can use the NUDGE control's Pull/Push feature to adjust the synchronisation to the on-beat position - see page 8.

RUN/PAUSE Button (▶/❙❙)

Select a suitable pattern on your MIDI sequencer (basic percussion parts are best when starting out).

RUN: To run the MIDI sequencer, press the 'RUN/PAUSE' button once.

NOTE: To set the initial alignment of the MIDI sequence and audio track, press this button accurately on the desired beat. Any misalignment error at this stage will be automatically corrected during the first few seconds of operation. This feature allows you to choose the exact start point of the MIDI pattern.

The RUN/PAUSE indicator will now stay on and the MIDI CLOCK display will 'rotate' in synchronisation with the audio BPM rate to indicate that the MIDI clock output is active. The selected pattern in your MIDI sequencer should now be playing in synchronisation with the audio track.

PAUSE: To pause the MIDI sequencer at any time, press the 'RUN/PAUSE' button again. The MIDI CLOCK display will stop rotating and the RUN/PAUSE / Beat 1 indicators will flash to indicate PAUSE mode. The MIDI sequencer's pattern or song will be held at the pause position and will only continue from that point when the RUN/PAUSE button is next pressed.

RESET: If you want to run the MIDI pattern from the start point again, in pause mode press the TAP button *once* before pressing the RUN/PAUSE button again. This resets the MIDI pattern or song to beat 1/bar1.

IMPORTANT NOTE: The MICRO SYNC will continue running the MIDI clock output indefinitely at the last detected BPM rate if the strong regular beats in the audio track become unavailable. This feature allows the connected MIDI sequencer to fill in parts during quite passages in the audio track without interruption or to continue playing after the track has finished.

If the strong regular beats in the audio track become unavailable at any time, the 3 remaining decimal point indicators in the main display will flash continuously as shown:

$$138.2$$

BPM

← *3 flashing decimal points indicate 'free-wheeling' condition*

This will occur approximately 3-4 seconds after the last valid BPM reading was taken to warn that the MICRO SYNC is now 'free-wheeling' and the BPM display is no longer being updated from the audio track. When the strong regular beats in the audio track return the MICRO SYNC will automatically detect the BPM information and make any necessary adjustments, at which time the flashing decimal point indicators will go out to indicate a 'locked-in' condition.

TAP (RESET/STOP) Button

This multi-function button allows you to manually enter a tempo (TAP), reset the MIDI pattern to beat1/bar1 (RESET) in pause mode, dis-engage the automatic beat synchronisation or stop the MIDI device (STOP).

TAP: The TAP feature can be used to set the MIDI Clock speed when there is no audio signal present or when the beat information becomes unavailable during a quite passage of the audio track (intro, middle eight etc.).

To enter a BPM rate from IDLE (no audio beat detected) use your finger to tap in a tempo on the TAP button. After 3-4 taps the tempo will be shown on the main BPM display. The RUN/PAUSE and Beat 1 indicators will flash at the BPM rate to show PAUSE mode.

The TAP feature can also be used to override the BPM engine whilst detecting a BPM or 'free-wheeling'. Use your finger to tap in the tempo. After 3-4 taps the new tempo will be shown on the main BPM display and the MIDI clock will immediately change to run at the new rate.

NOTE: Subsequent valid beat information detected by the BPM engine may override any manual changes made with the TAP function.

RESET TO BEAT 1/BAR 1: For details on the RESET function please see previous page.

DISENGAGE AUTO- SYNC: The TAP button can also be used to temporarily disengage the MICRO SYNC's automatic beat tracking whilst in RUN mode. This feature allows the MICRO SYNC to ignore sections of erratic, offbeat material present in certain sections of many audio tracks that can cause unnecessary adjustments and temporary disruption to the synchronisation. The MIDI device can then run- on, uninterrupted at the last detected synchronisation setting.

In RUN mode only, press the TAP button. The three indicators in the SYNC display (and the decimal points in the main display) will flash together at the BPM rate to indicate 'Sync Disengaged' mode. To reset the automatic tracking back ON, press the TAP button again. The indicators in the SYNC and MAIN displays will revert to their normal operation.

STOP: The STOP function is used to stop the MIDI Clock and clear BPM readings from the MICRO SYNC. Press and *hold down* the TAP(RESET/STOP) button for approximately 1 second. The BPM reading in the main display will be replaced by four centre bars and the MIDI CLOCK, RUN/PAUSE indicators will go out (and the connected MIDI device will stop).

OPERATION

SYNC Indicator

This 3-way indicator shows beat synchronisation adjustments between the audio track and the MIDI sequencer's beat position. The MICRO SYNC constantly analyses the accuracy of the relative beat positions and will either 'PULL' or 'PUSH' the MIDI clock output to maintain this synchronisation.

When the audio and MIDI are *synchronised* the green 'OK' indicator will light.

If the MIDI clock is *ahead* of the audio, the red 'PULL' indicator will light.

If the MIDI clock is *behind* the audio, the red 'PUSH' indicator will light.

NUDGE Control

The 4-button NUDGE control lets you make fine adjustments to the BPM rate and audio/MIDI synchronisation point.

BPM Adjustments (using BPM +/Up and BPM -/Down buttons): During normal operation, the BPM engine will automatically detect and adjust itself to the correct BPM value. However, if the MICRO SYNC's software is 'free-wheeling' or you wish to adjust a 'tapped in' tempo, you can use the North /South positions of the NUDGE control to increase or decrease the BPM value in 0.1 BPM steps.

To increase the BPM reading by 0.1 BPM, press the top button once, as in the following example:
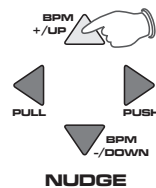
To decrease the BPM reading, press the lower button once (BPM -/DOWN). Press and hold down either button to scroll through the BPM values. Further 'valid' beat information detected by the BPM engine will override any manual changes made with these buttons.

Setting the default BPM - The BPM +/Up, -/Down buttons can be used to quickly enter a default BPM value. When the BPM engine is 'Idle' (four centre bars on), simply press either button to set the default reading of 120 BPM . The MICRO SYNC is now ready to run the connected MIDI sequencer at 120 BPM. You can adjust this setting with the TAP or NUDGE (-/BPM or +/BPM) buttons.

SYNC Adjustments (using PULL and PUSH buttons): Under normal circumstances the BPM engine will automatically detect and adjust the audio/MIDI trigger point to either the on-beat or off-beat position depending on whichever is more prominent in the audio track. You can use the PUSH/PULL feature to make fine adjustments to the synchronisation (if the MIDI sequencer sounds slightly ahead or behind the beat of the audio) or complete ½ beat steps (if the BPM engine has locked to the off-beat when you require synchronisation to be on the beat or vic-versa).

To check the current trigger synchronisation setting, press either the 'PULL' or PUSH' button once. The main BPM display and SYNC indicators will now show the current setting, as in the following example:

Example: Trigger point = 'Synchronised'

Flashing 'OK' indicator
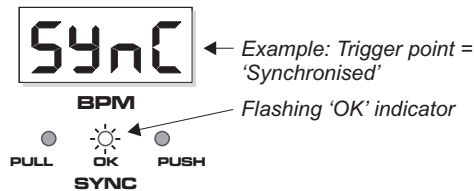
After 4 seconds the BPM display and SYNC indicators will revert to their normal operation.

To adjust the trigger synchronisation setting, again press one of the buttons marked 'PULL' or 'PUSH' and then, during the 4 second display period, press either button again to change the setting. Each half beat measure has 12 interim settings which allow very fine adjustments to be made to the synchronisation.

PULL THE SYNCHRONISATION: To 'Pull' the MIDI clock backwards, press the left button (PULL) during the 4 second display period.
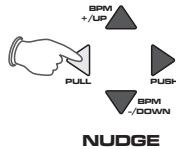
The display reading will change for each press as follows:

Etc. to -11
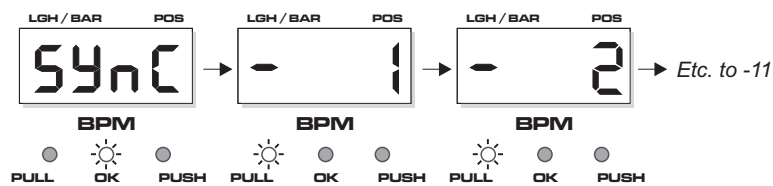
After the '-11' setting, the synchronisation will be pulled back exactly ½ beat, as indicated by the following display:

OPERATION

PULL ← *Display alternates between* → **HALF**

Further fine adjustments can be made beyond the 'PULL ½ beat' point (display reads from '-13' down to '-23') until the synchronisation is pulled back by one complete beat (maximum PULL adjustment). For this setting the display will show the following:


PULL ← *Display alternates between* → **ONE**
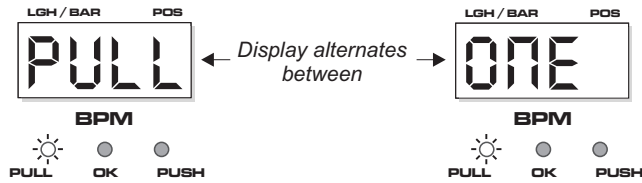
NOTE: You can adjust the PULL/PUSH setting in complete ½ beat steps by pressing and holding down either button for 1 second.

PUSH THE SYNCHRONISATION: To 'Push' the MIDI clock forwards, press the right button (PUSH) during the 4 second display period.
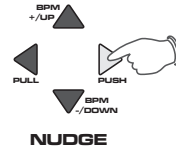
NUDGE

The display reading will change for each press as follows:

SYnC → **-⊦ 1** → **-⊦ 2** → *Etc. to +11*

After the '+11' setting, the synchronisation will be pushed forwards exactly ½ beat, as indicated by the following display:

PUSH ← *Display alternates between* → **HALF**
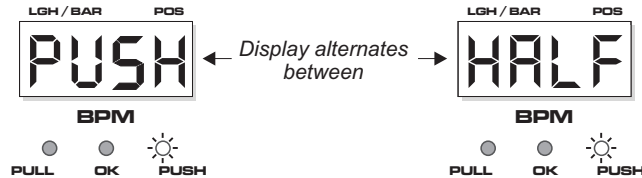
Further fine adjustments can be made beyond the 'PUSH ½ beat' point (display reads from '+13' up to '+23') until the synchronisation is pushed forwards by one complete beat (maximum PUSH adjustment). For this setting the display will show the following:

Display alternates between
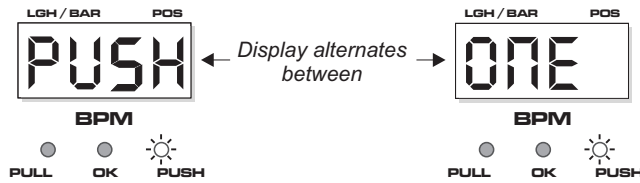
BPM RANGE

This is where you set the working range of the MICRO SYNC's BPM engine. There are three operating bands, each specifically designed to complement different styles of music from slow ballads to the fastest 'Speed Garage'. This setting can only be accessed when the BPM engine is in the 'Idle' condition (four centre bars). To check the setting in idle mode, press the ▶/❙❙ button once, the display will alternate between:

'r' = range →

Display alternates between

Default setting = MED(90-180 BPM)
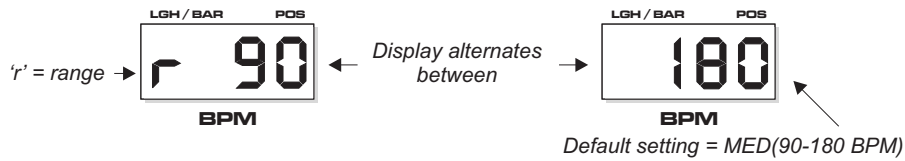
SETTING RANGE = LOW (60 to 120BPM), MED (90 to 180BPM), HIGH (115 to 230BPM)

To change the BPM range, use the NUDGE control 'BPM +/UP' or 'BPM -/DOWN' buttons, as in the following example:

NUDGE

New setting = HI (115-230 BPM)

Display alternates between
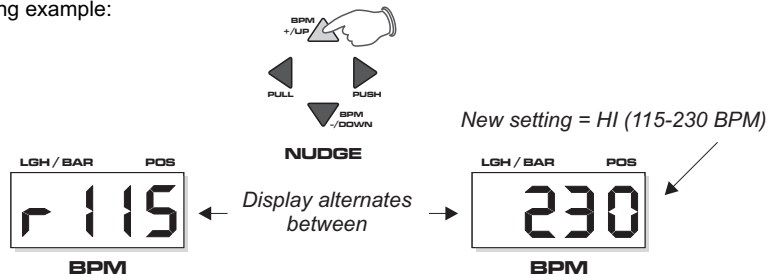
To exit 'BPM edit' mode, simply press the ▶/❙❙ button again. The MICRO SYNC will now return to 'Idle' mode.

NOTE 1: BPM's outside of the selected range limit cannot be analysed. Always check the general tempo of the music you are playing falls well within the selected BPM range. For most applications we recommend the MID BPM range of 90-180BPM.

NOTE 2: This setting is not memorised. Each time the MICRO SYNC's power is turned on, the default setting (90-180 BPM) will be restored.

HINTS&TIPS / SPECIFICATION

HINTS & TIPS

Tempo Changes:
1. Always make slow changes when adjusting the sound source pitch control. This will allow the MIDI clock to remain in synchronisation during tempo changes.

2. Never make tempo changes during quite passages (when beat information is unavailable) as the MICRO SYNC will lose synchronisation.

Synchronisation:
1. Use the NUDGE feature to manually adjust any synchronisation errors during quite passages (when beat information is unavailable).

2. Get to know a track before a performance to identify passages which upset the synchronisation. Then disengage the auto SYNC prior to breaks which contain the erratic beat information.

SPECIFICATION

	BPM Engine
BPM Range	3 x ranges: Low = 60 to 120 BPM, Med = 90 to 180 BPM, High = 115 to 230 BPM
Lock-in time	Typically 2 - 4 sec's (from introduction of readable beat information)
Accuracy	0.1 BPM
Input Level	Nominal line level (1V peak)

	Displays
BPM	1 x 4 character 7 Segment LED
Sync	3 x LED
Input	1 x Bi-colour green/red LED
MIDI clock	8 x red LED

	Accessories (included)
Input cable	1M (3.5mm mini-jack to RCA phono plugs),
Mounting kit	2 x chrome brackets / 2 x M6 screws / 2 x M6 nuts / 2 x M3 screws, 2 x double-sided adhesive pads, 4 x rubber feet

	MIDI Implementation
	System real time / Clock commands = transmitted

	Power Supply
	9vDC, 250mA (RED PSU - TYPE A)

	Dimensions/Weight
	42(W)x195(D)x22(H)mm, Less than 0.5 Kg

* Specification and /or appearance subject to change without prior notice due to product improvement.

Patent Pending

www.redsound.com

Red Sound
the colour of music

Bourne House, Cores End Road,
Bourne End, Bucks. SL8 5AR. England

Phone : +44 (0)1628 819191
Fax : +44 (0)1628 819111