

User Guide

COBRA 18R2

Wireless Firing System

TABLE OF CONTENTS

1. SYSTEM INTRO 3

2. POWER ON 4

3. REMOTE / FIRING MODULE SYNCHRONIZATION 9

4. MEASURING LINK QUALITY OF FIRING POSITIONS 10

5. INSERT AND TEST E-MATCHES / IGNITOR CLIPS 12

6. SET FIRING MODULE CHANNEL 15

7. ARM FIRING MODULES AND SET TO FIRE MODE..... 16

8. FIRING CUES..... 17

1. SYSTEM INTRO

The purpose of this document is to provide a detailed user guide to the COBRA 18R2 remote control and 18M firing module. If you have the COBRA 18R remote instead of the 18R2, please reference COBRA18RDetailedUserGuide.pdf.

The COBRA18 is a compact, yet rugged 18 cue wireless firing system great for small to medium sized shows or specialty firing applications that require quick setup and take down time. The system is easily expandable as it can control unlimited firing modules across 100 unique channels from a single remote.

Unlike traditional systems, the COBRA18 includes bi-directional communication between both the remote and the firing modules. This enables us to view information about the firing modules directly from the remote such as signal strength and cue continuity across all channels.

TECHNICAL SPECIFICATIONS

Firing Module (18M) Dimensions	8.24" x 6.47" x 1.64"
Remote (18R2) Dimensions	8.35" x 4.22" x 1.64"
18M Power	1 x 9v powers operations (5+ hours active operation, 24+ hours stand-by) 2 x 9v powers firing cues (fires 3,000+ e-matches / 500+ igniter clips)
18R2 Power	3 x AA (6+ hours active operation)
Base and Remote Keypads	Backlit silicon
Enclosure Material	Impact resistant and fire-retardant ABS
Frequency	2.4 GHz spread spectrum
System Range	300m+ direct line of site range w/ built-in link quality detection
Regulations Compliance	18M contains FCC (ID: W7Z-ICP0), CE, IC certified RF module 18R2 contains FCC (ID: U90-RF200), CE, IC certified RF module
Max # e-matches / igniters per cue	10-series e-matches or 4-parallel e-matches / igniters clips (18 Volts and 6 Amps per cue)
Firing Methods	Manual, step, fixed-delay manual sequence, and variable-delay auto sequence scripting via USB upload
Channels	100 channels across unlimited firing modules
Range	1,500+ ft. / 500+ m.

2. POWER ON

REMOTE

The remote uses three standard AA batteries and will operate actively for 4+ hours in day mode, 6+ hours in night mode (see [NIGHT AND DAY MODE](#)).

To power on the remote, insert the **Key** into the **Key Switch** clock-wise to the **ON** position.



Upon powering on the remote, the current software version is displayed. For example, 2.0.0. To learn more about software versions and how to upgrade your systems, see the [Software Versions](#) section of our website.

When powered on, the remote channel display shows current battery life as a range between P0 and P9 where P0 is **no power** and P9 is **full power**. If the battery life is below P2, “lo” will blink on the 3-digit display every 15 seconds.

FIRING MODULE

The firing module contains three standard or re-chargeable 9v batteries. One 9v battery (**1P**) powers the radio, channel display, LEDs and backlights. 1P will operate actively for 3+ hours in day mode, 5+ hours in night mode (see [NIGHT AND DAY MODE](#)), and 24+ hours in stand-by mode. Two additional 9v batteries (**2P**) power the firing cues only. 2P will last commonly for 50-100+ shows. The firing module supports both standard and re-chargeable batteries.



Important! COBRA recommends using higher quality battery brands such as Duracell or Energizer. If you plan to use re-chargeable batteries, we don't suggest using them for the 2P firing cue batteries, only the 1P battery. Make sure your battery is at least 500mAh in order to maintain the published battery life specifications noted above.

To power on the firing module, insert the **Key** into the **Key Switch** and rotate counter-clockwise to the **TEST** position. Upon powering on the firing module, the current software version is displayed. For example, "1.4.8".



When the firing module is powered on, the following information is displayed:

Software Version	The software version. For example, “2.0.0”. To learn more about software versions and how to upgrade your systems, see the Software Versions section of our website.
Module Address	<p>The 18M automatically assigned module address. For example, “A01”. When first syncing a module to the remote the address is automatically assigned. This address is stored permanently on the module until synced to a new remote whereby a new address is assigned. The module address is used to test continuity and signal strength across modules on the same channel (see TEST E-MATCHES / IGNITER CLIPS and MEASURING LINK QUALITY OF FIRING POSITIONS for more information).</p> <p>If your module addresses have gotten out of order and you wish to reset them to A00, A01, A02, etc... this can be accomplished by pressing and holding the SYNC button on the 18R2 for 15 seconds until the SYNC LED blinks. This un-syncs the 18R2 from the 18M modules and also resets the address counter. You can then re-sync your 18M modules and the address will begin at A00 and increase by one for each new module you sync.</p> <p>Note: Once the address is above A99, the A is no longer displayed and 100 is displayed followed by 101, 102, etc... until 999 is reached at which time the 18R2 remote will display error code 99 and require you to un-sync the remote from all modules (see UN-SYNC REMOTE for more information).</p>
Voltage Mode	The 18M voltage mode which is 9.0, 12.0, 14.8, 18, or 24V. To change the voltage mode, press TEST and CH+ or TEST and CH- to move the voltage up or down. This voltage mode is not currently used and will be functional with the release of the COBRA Power Adapter accessory to be released soon.
1P Battery Life	<p>The single 9v / PP3 1P battery life ranging from 1P0 (no battery) to 1P9 (full battery). For example, “1P9”. This battery is located towards the center of the module as printed on the battery door and powers the operations of the system including the RF module, LEDs and 7-segment displays and does not draw power from firing the cues.</p> <p>Note: If the battery life is 1P2 or less, “Lo” will blink on the channel display.</p>
2P Battery Life	The double 9v / PP3 1P battery life ranging from 2P0 (no battery) to 2P9 (full battery). For example, “2P9”. These batteries are located towards the outside of the module as printed on the battery door and are only used to fire cues and do

	<p>not draw power from the system operations.</p> <p>Note: If the battery life is 2P2 or less, “Lo” will blink on the channel display.</p>
Self-test	<p>“tSt” is displayed as the firing module performs the following tests:</p> <p>Cue responsiveness – Tests the responsiveness from each cue ensuring each firing MOSFET can be turned on and off. If any cue is unresponsive, the system will display Er1 or Er2 depending. If Er1 is displayed, make sure the battery orientation of the 2P batteries is correct.</p> <p>LED function – With the key in the TEST position only, the red and green LEDs will flash briefly.</p> <p>Shorted / stuck button – DO NOT press any buttons during the self-test as this will cause a false-positive to the shorted / stuck button test which displays error code Er3. If this error code is displayed, simply power the system off, then on and make sure no buttons are pressed and held during start-up.</p>

NIGHT AND DAY MODE

Both the remote and firing modules are equipped with back-lit silicon keypads for clear visibility in night conditions. When powered on, both the remote and firing module automatically enter night mode. To change to day mode (no back-lights, brighter displays), press and release the **LIGHT Button** on either the remote or firing module.



The 18M module will operate actively for 5+ hours in night mode and only 3+ hours in day mode.

The 18R2 hand-held remote will operate for 6+ hours in night mode and only 4+ hours in day mode.

To control the default backlight brightness, hold down the **Light Button**. Once held, the brightness will increase or decrease to 0 or 100%. Once fully dim or fully bright, release the button and press and hold again to change

brightness. Repeat until desired brightness is obtained. The default is remembered on both the remote and firing module upon power off and power on.

3. REMOTE / FIRING MODULE SYNCRONIZATION

In order for the remote to communicate with a firing module, they must be synced. Once synced, the firing module will ONLY respond to the remote to which it is synced. This is because each remote contains a unique, internationally-registered IEEE® MAC address that is saved into the firing module to which it is synced. The firing module will only respond to the remote with this address. You can change the remote to which a module is synced at any time, as many times as you like.

SYNC A FIRING MODULE TO A REMOTE

If running firmware version 3.0.1 or earlier, press and hold the SYNC button on both the remote and module. The SYNC LED will blink and the 18M will re-start. If you see Er3, you successfully synced the module, but held the SYNC button too long causing the stuck button error code to display. Re-start the 18M to confirm the 18M is in sync as the 18M SYNC LED will blink in response to the 18R2 SYNC LED.

If running firmware version 3.0.3 or greater, press and hold the **SYNC Button** on both the remote and firing module for three seconds. This will display “P” on both the 18R2 and 18M and cause the 18M to re-start. Once the 18M re-starts, release the SYNC button on both units. If you don’t release the SYNC button soon enough on the 18M, “P” will continue to display. If this happens, re-start both the 18R2 and 18M. Once powered on, if the SYNC LED on both the 18R2 and 18M are blinking, then you successfully synced the systems. Repeat this process for each module.

To batch sync multiple modules, we recommend the following, faster process:

- 1) Power on 182R
- 2) Once the 18R2 is fully powered on, press and hold SYNC until P is displayed. Release the SYNC button.
- 3) Power on each 18M while holding the SYNC button, P will display on the 18M. Release the SYNC button/
- 4) Press the SYNC button on both the 18R2 and 18M at the same time. After 1 second, the 18M will re-start.
- 5) Repeat for all modules. Once complete, re-start the 18R2 to confirm the SYNC LED is blinking on all 18M modules to confirm they are in sync.

UN-SYNC FIRING MODULE

To un-sync a firing module from any remote to which it is synced, hold down the **SYNC Button** for 15 seconds. The **SYNC LED** will blink 5 times when un-synced and the **SYNC LED** will no longer display orange. This will also reset the module addresses such that the next module you sync to the remote will inherit a module address of A00.

UN-SYNC REMOTE

To un-sync all firing modules from a remote, hold down the **SYNC Button** for 15 seconds. While holding SYNC, the letter “P” may appear. The **SYNC LED** will blink 5 times when un-synced and the **SYNC LED** will no longer display orange.

4. MEASURING LINK QUALITY OF FIRING POSITIONS

The remote and base firing modules are equipped with a link quality feature which enables you to measure the signal strength of each firing position. Different from a general “in range” feature which only measures whether receiving a signal is possible, the link quality feature measures true strength of signal.

To measure the link quality of each firing position, perform the following steps:

1. Power on the remote and any number of firing modules. The remote will only measure signal strength in **TEST** mode. By default, the remote is in **TEST** mode when first powered on.
2. Place the firing modules in their final desired shooting positions. Raising the modules off the ground a minimum of 30cm and extending the antennas straight up will maximize your signal strength. For close range firing (less than 100-150m) with direct line of sight, it is not required to raise the modules off the ground.
3. You can test signal strength from either the remote or the firing module (explained below). COBRA measures link quality between 0 and -100 where 0 is perfect signal strength and -100 is poor signal strength. If this value is between 0 and -75 then you will have no problem firing cues with a single button press. If the value is between -75 and -100 we recommend holding down the button when firing until you see the pyrotechnic fire. By holding down the button, a constant pulse of firing commands will be sent until the button is released.

To test signal strength from the remote: You can only test signal strength from the remote only in TEST mode. To begin, set the remote to the desired channel you wish to measure signal strength. For example, you may have several firing modules in the field and you wish to test the signal strength of each module on each channel. To display the signal strength, press and release the SYNC button to display a value between 0 and -100 (see above for an explanation of this value) followed by the module address for which the signal strength was measured.

If you have multiple modules on the same channel, you can repeatedly press the SYNC button to cycle through the signal strengths for each module. It is recommended to press the SYNC button repeatedly looking for any poor signal strengths (-75 to -100). By pressing the SYNC button repeatedly, you are cycling through modules on that channel. If poor signal strength is found, release the SYNC button to display the module address for that signal strength.

To test signal strength from the module: Press and release the SYNC button to display the signal strength value between 0 and -100 (see above for an explanation of this value).

Note: Make sure to obtain a few readings and use the average number for your reading. Alter the position

of the firing module to gain best results. Higher placement with the best direct line of site produces the best results. Once best results are achieved, turn off the firing module and leave it in its current position and orientation. Repeat for any additional firing modules until all firing positions are confirmed.

4. INSERT AND TEST E-MATCHES / IGNITOR CLIPS

The firing module is equipped with 18 separate firing cues that support up to 10 series-wired e-matches or 4 parallel-wired e-matches or igniter clips per cue.

Important! By default, the firing module is configured to fire e-matches with a 100ms pulse (1/10 of a second) for each cue. You can also configure the firing module to fire 2 seconds per cue.

E-match Mode - For 100ms pulses, press **SYNC** and **CH-** at the same time. **“0.1”** will display briefly on the channel display.

Igniter Clip Mode - For 2s pulses, press **SYNC** and **CH+** at the same time. **“2.0”** will display briefly on the channel display.

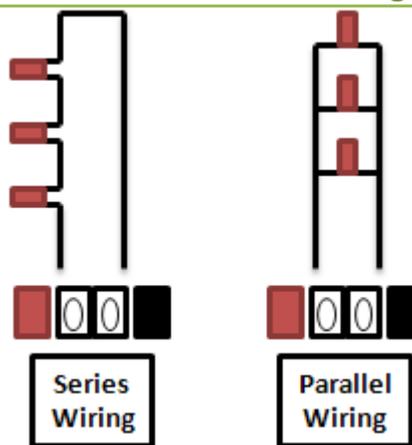
You can configure each module separately and can use them interchangeable in the show. For example, you can configure two modules for e-matches and 1 module for igniter clips.

Max per Cue E-Matches / Igniter Clips

# Feet Wire*	Max Series	Max Parallel
50	10	4
100	9	3
250	8	3
500	6	2

*assumes 22 gauge shooting wire

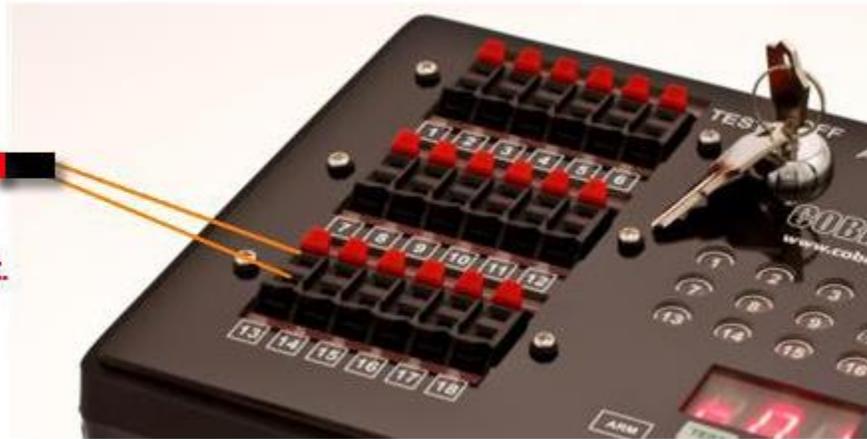
Series vs. Parallel Wiring



INSERT E-MATCHES / IGNITER CLIPS

Insert the e-matches or igniter clips by folding the end of the wire in half and inserting directly into the cues by pressing the red and black terminals. Tug lightly on the wire to ensure there is a firm grip. The wires can be placed interchangeably into the red or black terminals. **To avoid shorting of wires and to create a better connection, fold any long exposed leads in half before inserting.**

Insert e-match or clip wires into red and black spring contacts. We recommend folding the end of the wire when inserting for best contact.



TEST E-MATCHES / IGNITER CLIPS

The COBRA18 enables you to test firing module cues directly from the firing module or remote.

- **From the firing module** – To test the e-matches / igniter clips from the firing module, press and hold the **TEST Button** on the firing module. While pressed, the corresponding **Cue #'s LED** will display **GREEN** if the e-match or igniter clips are functional. If the corresponding **Cue # LED** does not display green, then the e-match or igniter clip is faulty and should be replaced.



Press and hold to test continuity and display module address

- **From the remote** – To test the e-matches / igniter clips from the remote, press and release the **TEST Button** on the remote. This places **ALL** synced firing modules into **TEST** mode. Since the remote can be synced to multiple firing modules on the same channel, the remote **Cue LEDs** represents the status for firing modules set to the selected remote channel. If there are multiple modules set to the same channel and partial continuity exists, the green LED will blink vs. display solid.

If there are multiple modules set to the same channel and partial continuity exists, the green LED will blink vs. display solid. To determine which module has bad continuity, you can repeatedly press the TEST button to cycle through the continuity for each module displaying the module address on the channel display at the same time. It is recommended to press the TEST button repeatedly looking for the module with bad continuity. Once found, you can note the module address and fix in the field accordingly.

Note: The 18R2 remote stores all module continuity in memory. This allows for instant continuity checks as the user cycles between channels. If a module's continuity changes, the new information is sent to the 18R2 remote at which time the green TEST LED blinks until the information is current and the green TEST LED displays solid. By viewing a solid green TEST LED on the remote you will always know that the continuity is current and up-to-date.

5. SET FIRING MODULE CHANNEL

You can set the firing module to any channel between 00 and 99. Using the remote, you can fire any firing modules set to the same channel on the remote. For example, to create a simple 36 cue system you can use one remote and two firing modules. Set the first firing module to channel 00 and the second firing module to channel 01 by pressing the **CH +** and **CH -** Buttons.

Note: The 18M has a bump protection in place on the CH+ and CH- buttons. This protection requires you hold down the CH+ and CH- buttons for about ½ second before the channel will change. This prevents a user from accidentally changing the channel in the field when operating the unit.



Press CH+ and CH- to change channel. Hold down to auto-scroll through channels.

To fire the first 18 cues (cues 1-18 on channel 00), set the remote channel to 00 and fire the cues using either the manual, step or sequence firing methods (see [FIRING CUES](#)). To fire the remaining 18 cues (cues 1-18 on channel 01), set the remote channel to 01 and fire the cues using one of the three available firing methods. You can also step-fire and auto-sequence fire between channels (see [FIRING CUES](#)).

To fire cues on multiple firing modules at the same time, you can set multiple firing modules to the same channel. For example, this may be used to fire two streaming comets from either end of a display, or to fire multiple identical cakes to create a duplicate show effect.

For example, consider the operator has 1 remote and 4 firing modules labeled A, B, C and D.

When the remote is set to channel 1, the operator controls firing module A.

When the remote is set to channel 2, the operator controls firing modules B and C.

When the remote is set to channel 3, the operator controls base unit D.

6. ARM FIRING MODULES



WARNING!

You are about to place your firing module into **FIRE** mode

This will create a **LIVE** firing system

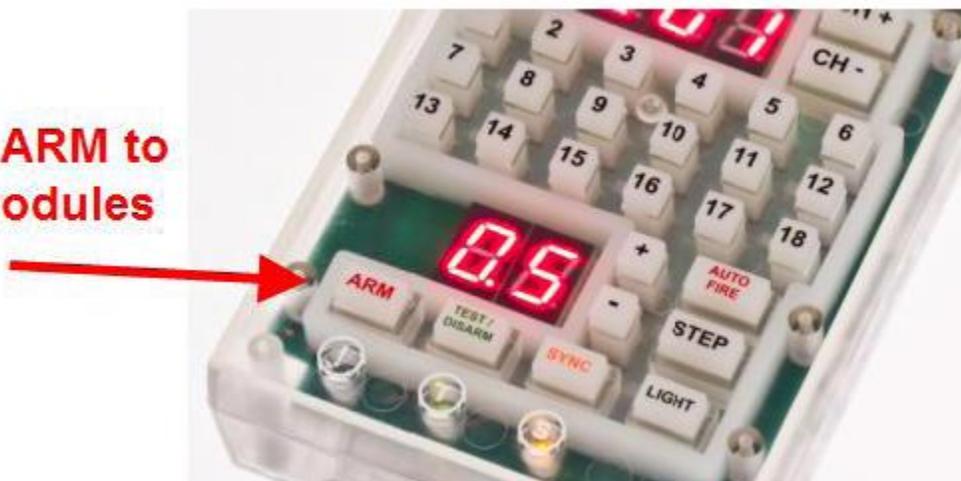
You are now ready to arm the firing modules and set each firing module to fire mode.

1. To arm the firing modules, rotate the **Key Switch** clock-wise to the far right **ARM** position.
2. To ARM all synced firing modules, press the **ARM/FIRE Button** on the remote.

Important! When arming the remote, the red LED will blink for a few seconds and will display the total number of firing modules armed and awake in the field. If the LED continues to blink and the number of firing modules is not displayed, one of your modules still has the key in the **TEST** position.

All firing modules are now armed and are ready to fire!

Press ARM to
arm modules



7. FIRING CUES

The remote has the following four firing options including **Manual**, **Step**, **Sequence**, and **Scripted**, explained below.

MANUAL FIRE

Fire individual cues by pressing individual 1-18 buttons. By pressing an individual button, the associated cue is fired on all firing modules set to the current selected remote channel. You can press buttons in any order desired.

Note: When firing any cue, the last cue that fired will always blink.

STEP FIRE

Step through cues 1-18 by pressing and releasing the STEP Button. By pressing STEP for the first time, cue #1 is fired. By pressing it again, cue #2 is fired, etc... until all 18 cues are fired. Once all 18 cues are fired, the channel ID will automatically increment by 1 reset back to cue #1. This allows you to step through continuous cues across multiple channels without delay. By turning the remote off and on, the STEP sequence is reset back to cue #1.

SEQUENCE FIRE

Automatically fire cues with a fixed time delay of 0.1 - 99 seconds. The automatic sequence can be for all 18 cues (1-18) or for a sub-set of cues such as cues 1-6 or 7-12, etc... You can also sequence in the reverse direction such as from cue 6 to 1. The ability to set a varied time delay is not currently supported.

Note: Depending on when your 18R was purchased, the SEQ button either displays **SEQ** or **AUTO-FIRE**. For the purposes of this user guide, we will refer to the button as the **AUTO-FIRE/SEQ Button**.

	<p>Watch this feature on YouTube!</p> <p>http://www.youtube.com/watch?v=9AbLcLKBwp8</p>
---	---

To set the time lapse on the remote, click the **+** and **- Buttons** to increase or decrease the time delay by 0.1 seconds. To quickly increase or decrease the time lapse, hold down the **+** or **- Buttons** for more than one second. Then, release when the desired time lapse is reached. The 2-digit display will display the current time lapse. For example, 0.1 = 0.1 seconds, 5.5 = 5.5 seconds, and 9.9 = 9.9 seconds.

To begin firing sequence, perform the following steps:

1. Press the **AUTO-FIRE/SEQ Button** at the bottom right-hand corner of the remote. "S" will display on the channel display requesting you enter the starting cue #.
2. Press the starting cue # (e.g. 1) and "S01" will display on the channel display showing the starting cue.

3. Press the ending cue # (e.g. 6) and “E06” displays on the channel display informing you that the sequence will end firing on cue 6.
4. Press the **AUTO-FIRE/SEQ Button** again to start the sequence. The sequence will automatically fire.

Note: At any time during steps 1-4, if you wish to go back to the main firing mode, simply press and release the FIRE button.

5. To automatically continue the sequence across channels, hold the **AUTO-FIRE/SEQ Button** throughout the entire sequence. If the button is still held after the last cue is fired, the channel will automatically increment or decrement depending on the direction of the sequence and the new sequence will begin.

Important! To force stop an automatic sequence, press and release the **AUTO-FIRE/SEQ Button** again while the sequence is running. This will stop the sequence on all firing modules set to the same channel and display “StP” on the remote channel display. You can also emergency stop a firing sequence by changing the remote to TEST mode. This will set all firing modules to TEST mode and will cease any firing.

SCRIPTED FIRE

The COBRA 18R2 supports full and semi- auto-firing functions by uploading up to 100 scripts directly to the 18R2. Each script can be assigned to a specific cue / channel combination While firing, the user can manually fire cues at the same time without interrupting the running script.

For more information on scripted firing, please go to www.cobrafiringsystems.com and click on [Support > User Guides](#).