User Guide
COBRA18
Wireless Firing System

Firework & Pyrotechnic Ignition Equipment
easypyro

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1. SYSTEM INTRO

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

18R Remote   18M Firing Module

Firing Module (18M) Dimensions	8.24" x 6.47" x 1.64"
Remote (18R) 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)
18R Power	3 x AA (15+ hours active operation, 72+ hours stand-by)
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	Contains FCC (ID: W7Z-ICP0), 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 and sequence (0.1-9.9s)
Channels	100 channels across unlimited firing modules

2. POWER ON

REMOTE

The remote uses three standard AA batteries and will operate actively for 7+ hours in day mode, 15+ hours in night mode (see NIGHT AND DAY MODE), and 72+ hours in stand-by mode.

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

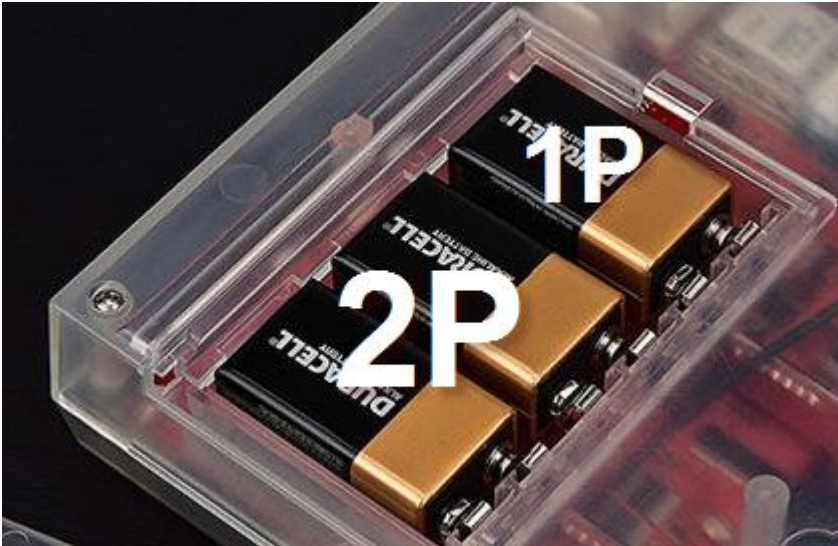Upon powering on the remote, the current software version is displayed. For example, 1.4.4.

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.

If the remote is inactive for more than 60 seconds (e.g. no buttons are pressed), the remote will automatically enter a power conserving stand-by mode whereby a dash (-) will blink every 3 seconds on the channel display. To awaken the remote from stand-by mode, press and hold the **SYNC Button** until awake.

Note: The remote will never enter stand-by mode when in FIRE mode to allow for quick response when firing (see INSERT AND TEST E-MATCHES / IGNITOR CLIPS and ARM FIRING MODULES AND SET TO FIRE MODE for more information about test and fire mode).

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 5-10+ shows. The firing module supports both standard and re-chargeable batteries.

Important! COBRA recommends using higher quality battery brands such as Duracell or Energizer. It is recommended that the battery is rated over 500mAh. Lithium ion re-chargeable batteries will provide the longest life and best performance.

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, "1.4.4".

To power on module, insert key and rotate counter clock-wise to TEST

When the firing module is powered on, the channel display shows the **1P** and **2P** battery life separately as a range between 1P0 and 1P9 where 1P0 is **no power** and 1P9 is **full power**. If the battery life on either the 1P or 2P batteries is below 2, 1LO or 2LO will blink on the 3-digit display every 15 seconds.

Note: After the 1P and 2P battery life is displayed, the term **tSt** is displayed briefly on the channel display. At this time the firing module is performing a self-test ensure each firing driver is operating properly. If you see an "Er1" or "Er2" displayed on the channel display, please email info@cobrafiringsystems.com for support. This is a safety test to ensure no MOSFET drivers are shorted and are functioning properly.

If the remote to which the module is synced is in stand-by mode, the firing module will also enter a power conserving stand-by mode after 60 seconds of no operation (e.g. no buttons pressed). When in stand-by mode, three dashes (---) will blink every 3 seconds on the channel display.

To awaken the firing module, you have two options: 1) Press any firing module button until awake, or 2) Awaken the remote to which the firing module is in sync. If the remote is in TEST mode, the firing module will only awaken if set to the same channel as the remote.

Note: The firing module will never enter stand-by mode when in FIRE mode to allow for quick response when firing (see INSERT AND TEST E-MATCHES / IGNITOR CLIPS and ARM FIRING MODULES AND SET TO FIRE MODE for more information about test and fire mode).

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 firing module will operate actively for 5+ hours in night mode and only 3+ hours in day mode. Note that the battery life is only for 1P which powers the system operations and lighting.

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

To sync a firing module and remote, press and hold the **SYNC Button** on both the remote and the base for three seconds.

Hold down SYNC buttons together for 3 seconds until they blink

The orange **SYNC LED** will blink on both the remote and firing module. Once synced, the orange SYNC LED will blink quickly three times. You can now release the SYNC buttons and the SYNC LEDs will blink about once every second. When the module SYNC LED blinks, it is responding to the remote SYNC LED blinking. This indicates the two units are in constant communication.

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.

UN-SYNC REMOTE

To un-sync all firing modules from a remote, 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.

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 -70 then you will have no problem firing cues with a single button press. If the value is between -70 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 in TEST position. To begin, set the remote to the desired channel you wish to measure since displayed signal strength is only for modules set to the same channel. Press and release the SYNC button to display the signal strength value between 0 and -100 (see above for an explanation of this value). The signal strength of any module(s) set to this channel will display. This allows you to toggle between channels and view the signal strength of each position. If multiple modules are set to the same channel, it is recommended to test signal strength from the modules themselves since the remote only displays the last command received (randomly rotates between the modules on the same channel).

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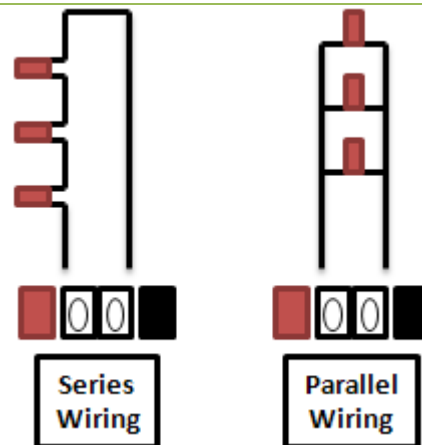
You can configure each module separately and can use them interchangeable in the show. For example, you can configure two modules for e-matches and 1 module for igniter clips.

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

Series Wiring   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 igniter clip into cue by pressing and holding red and black clamps. Release for firm grip. We recommend folding end of wire before inserting for best results.

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 down for 1 second and release to test continuity on the module

- **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.

Press and release TEST button to enable TEST mode. Once in TEST mode, continuity on the selected channel always displays in real-time.

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.

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 AND SET TO FIRE MODE

<div style="border:2px solid red">

WARNING!

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

This will create a **LIVE** firing system

</div>

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 set all synced firing modules to **FIRE** mode, press the **FIRE Button** on the remote.

   All synced firing modules are now armed and in **FIRE** mode and are ready to fire!

Press FIRE to arm remote and firing modules

7. FIRING CUES

The remote has the following three firing options including **Manual**, **Step** and **Sequence** (explained below). When firing cues using any of these methods, the **Cue** will display red once fired.

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.

STEP FIRE

Step though 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.

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

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 **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 "E" will display on the channel display requesting you enter the ending 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 **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 **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 **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.

8. VERSIONS

Upon powering up your COBRA 18R or COBRA18M, the current version will display. To upgrade to the latest firmware, please contact us at sales@easypyro.com.

v1.4.5, March 2011

Sub-sequence support	The remote now supports the ability to perform a sub-sequence, which is an automatically sequence between a starting cue and an ending cue. For example, you can sequence between cues 1 and 6, or cues 7 and 12, or cues 1 and 18. You can also sequence backwards from cues 6 to 1. To perform the sub-sequence, simply press SEQ, press the starting cue, then ending cue, then press SEQ again. By holding the SEQ button down, the channel will either auto-increment up or auto-increment down depending on the direction of the sequence. You can continue to hold the SEQ button across multiple channels if desired.

v1.4.4, March 2011

Mode to toggle between e-match and consumer igniter clips per module	The firing module now has a setting to toggle between e-match and consumer igniter clip mode. In e-match mode, 100ms of current is provided to each cue. In consumer igniter mode, 2s of current is provided to each cue. The reason for these modes is to avoid a shorted cue to draw current from an active cue. Therefore, when using e-matches, we recommend using the e-match mode vs. consumer igniter clip mode.

To toggle to e-match mode, press and hold **SYNC** and **CH-**. 0.1 is displayed on the channel display.

To toggle to consumer igniter clip mode, press and hold **SYNC** and **CH+**. 2.0 is displayed on the channel display. |

v1.4.3, February 2011

Hold firing buttons send continual firing commands	The remote now sends the firing command continually when holding any of the firing buttons including the individual 1-18 cue buttons, STEP, and SEQ buttons. Previously, the firing command was sent for 480ms and then stopped. Now, the firing command will be sent until the bottom is released. This will support firing at extreme ranges up to 4,000m beyond the advertised 500m range.
Sleep mode displays "---" vs. "-"	When in sleep mode, the firing mode and remote now displays "---" vs. "-". This makes sleep mode more obvious to the user vs. thinking the unit is turned off.
Quicker response when testing cues from firing module	Pressing TEST on the firing module now displays cue continuity faster, commonly under 0.5 seconds. Previously the system would wait up to 1 second before continuity was displayed.
Holding down CH+/- and SEQ +/- buttons auto-increment improvements	The CH+, CH-, SEQ+, and SEQ- buttons auto increment by 5 when held for more than 2 seconds. This allows users to go quickly from Channel 1 to Channel 99, or from 0.1s to 99 seconds.

Firing module signal strength	By pressing SYNC on the firing module, the signal strength from only the remote is displayed. Previously, the firing module would display signal strength of any other units including other firing modules. This allows you to test signal strength from firing modules without having to turn off other firing modules.
Remote signal strength	By pressing SYNC on the remote, the signal strength from the firing module(s) only on the selected channel is displayed. This allows you to check signal strength for individual channels. If multiple modules are on the same channel, a random signal strength is displayed. The functionality does not yet support toggling between individual modules on the same channel.
Auto sequence between channels	You can now perform automatic sequences from across multiple channels. For example, you can execute a 0.1s sequence from channel 1 to channel 3 by holding down the SEQ button while executing the sequence. Once cue #18 is reached, the channel is automatically incremented and a new sequence begins on channel 2. You can perform this function across as many channels as desired.
SEQ stop controls	By pressing SEQ after starting an auto-sequence, the remote sends a SEQ stop command to stop any currently running sequence for safety purposes. When pressing the SEQ button to stop, "StP" displays on the remote and the 18-cue LEDs stop sequencing and turn off. By re-pressing SEQ the sequence will start again at 1.
Software version displayed when system is powered-on	When powering on either the remote or firing module, the software version is displayed. For example, 1.4.0. COBRA will offer a re-programming unit to customers to upgrade their own software. This will allow the user to know what current version they are running and what features exist for that version.
Wake up on any button press	The remote and firing module will wake up on any button press. Previously this was only when pressing the SYNC button.
Time to sleep extended to 60 seconds	The remote and firing module will fall asleep after 60 seconds of inactivity in TEST mode only. They will continue to never fall asleep in FIRE mode. Previously the firing module fell asleep after 5 seconds and the remote after 15 seconds.