

Remote Fire Control System

- Gen 2
- User Manual (rev. 1)



MANDATORY WARNINGS

- **ENSURE THAT ANY FIREARM IS UNLOADED BEFORE INSERTING OR REMOVING IT FROM THE TEST FIXTURE.**
- **IN THE EVENT OF A MISFIRE OR HANGFIRE, HAVE A QUALIFIED GUNSMITH CLEAR MALFUNCTION BEFORE REMOVING THE FIREARM FROM THE REST.**
- **USE ONLY AS PRESCRIBED IN THIS MANUAL**
- **ONLY FFL AND RESEARCH LABORATORY USE. NOT FOR ANY PRIVATE INDIVIDUAL USE.**
- **READ AND UNDERSTAND ALL INSTRUCTIONS BEFORE USE**

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Fire Control Unit Controls

Figure 1 identifies the primary controls, connections, and indicators located on the Fire Control System (FCS) control panel.

1. Emergency Stop (E-STOP)

- The Emergency Stop controls electrical power to the Fire Control System.
- Twist the E-STOP clockwise to energize the system.
Press the E-STOP firmly to immediately remove power from the system.
- Always press the E-STOP in the event of an emergency, malfunction, unintended actuation, or unsafe condition.

2. Pressure Relief Valve

- The pressure relief valve allows compressed air to be vented from the pneumatic system.
- Pull the relief valve to release excess pressure from the air system when reducing system pressure.
- Current system pressure is displayed on the Home Screen.

3. Fuse

- The Fire Control System is protected by a 1A fuse.
- Replace the fuse with an equivalent 1A fuse if it becomes damaged or blown.
If additional electrical issues persist after fuse replacement, contact Bighorn Kinetics for assistance.

4. Master Air Control Valve

- The Master Air Control Valve regulates airflow to the actuator system.
- Open the valve only when range conditions are safe and the firearm is ready for testing.
Close the valve to isolate and depressurize the pneumatic system.
- In the event of an emergency, closing the Master Air Control Valve will remove air pressure from the actuator system.



Figure 1. Fire Control Box Controls

Fire Control Unit Controls (cont.)

5. Battery Voltage Display

- The Fire Control System continuously monitors battery voltage.
- The system does not incorporate an auto-shutdown on low-voltage.
- If battery voltage falls below **9.5 V**, immediately recharge or replace the battery. Continued operation below 9.5 V may permanently damage the battery.

6. Air Outlet

- The Air Outlet connection supplies compressed air to the Solenoid Control Box and Modular Pneumatic Actuator.
- Connect the supplied ¼-inch pneumatic hose between this outlet and the input of the Solenoid Control Box.

7. Solenoid Control (12V Power Out)

- Provides 12V control signal to the Solenoid Control Box.
- Use the supplied BNC cable to connect the Fire Control System to the Solenoid Control Box.

8. Firing Sequence Active Output

- Outputs a 5V logic high signal whenever a programmed firing sequence is active.
- This output may be used to trigger external instrumentation or data acquisition equipment.

9. Burst Active Output

- Outputs a 5V logic high signal whenever a burst event is actively being executed.
- This output may be used to trigger external instrumentation or data acquisition equipment.

10. Solenoid Active Output

- Outputs a 5V logic high signal whenever the pneumatic actuator is energized and actively pulling the trigger.

11. Gunshot Detected Input

- Accepts external trigger inputs whenever a gunshot is detected. Must be 3.3V or 5V logic level input, typically used with out dedicated trigger generator.
- This input may be used for general debugging. For example, how many shots were commanded vs actually fired. The delay between energizing the solenoid and a shot being fired. Precise shot count when using a machine gun.

12. Programming Port

- The Programming Port is used to install software and firmware updates.
- Contact Bighorn Kinetics for information regarding software updates, firmware revisions, or programming support.

13. AUX Output

- Duplicates the 5 BNC ports onto a standard RJ-45 cable. Used when working at longer distances to conveniently only run one cable.

14. Rotary Encoder

- The Rotary Encoder allows the user to navigate touchscreen menus without direct contact with the display.
- This feature is particularly useful when wearing gloves or operating in adverse environmental conditions.

15. LOCK Button

- The LOCK button enables or disables the fire button. The system can not be fired while the lock button is active and illuminated.
- Only unlock the system when ready to fire.

Fire Control Unit Controls (cont.)

16. FIRE Button

- The FIRE button initiates actuator operation.
- The FIRE button is only active when:
- A valid firing program has been selected.
 - System pressure exceeds 20 PSI.
 - The system is unlocked.

17. Pressure Regulator

- The Pressure Regulator controls operating pressure supplied to the actuator.
- Turn clockwise to increase pressure.
Turn counterclockwise to decrease pressure.
- If pressure does not decrease immediately after adjustment, pull the Pressure Relief Valve to vent excess air from the system.

18. Touchscreen Interface

- The touchscreen serves as the primary user interface for the Fire Control System.
- The display provides:
 - System pressure readout
 - Fire mode selection
 - Firing schedule programming
 - System status information
- Refer to the **Programming the Fire Control System** section for additional information.

19. Air Inlet

- Connect the supplied ¼-inch pneumatic hose to the Air Inlet fitting first. The other side of the hose has a standard I/M style quick connect fitting.
- This connection supplies compressed air to the Fire Control System.
- The hose routing slot allows the air line to exit the enclosure.
- An optional fitting is included to allow operation from a 25 g compressed CO₂ cartridge.
- CO₂ cartridges are intended primarily for outdoor or remote testing where electrical power and compressed air are unavailable. For routine testing, Bighorn Kinetics recommends the use of a standard air compressor to provide reliable and consistent air supply.

20. Battery Compartment

- The Fire Control System is powered using a standard 12V DEWALT battery.
- Compatible battery capacities range from 2 Ah to 5 Ah.
- Monitor battery voltage during operation and recharge or replace the battery whenever voltage falls below 9.5 V.

Fire Control Unit Controls (cont.)

21. Solenoid Control Box

- The solenoid control box controls air pressure to the actuator via an electronic pneumatic solenoid. This box ensures proper timing for smooth function of the PGMS.

21a. AIR IN

- The AIR IN connection on the solenoid control box connects directly to the AIR OUT connection on the Fire Control Unit (see item 6).
- There is no air pressure routed to the solenoid control box until the master air control valve is opened.

21b. AIR OUT

- The AIR OUT connection on the solenoid control box connects directly to the pistol grip mounting system.

21c. 12V (Solenoid Control)

- This is the power connection to the solenoid control unit. This is connected directly to the 12V Power Out connection of the FCS (see item 7).

22. Modular Pneumatic Actuator

- The Modular Pneumatic Actuator provides reliable, remote actuation of firearm triggers for controlled testing environments



Pneumatic and Electrical Connections

Use the following procedure to properly connect the pneumatic and electrical systems prior to operating the Fire Control System.

Air Supply Connections

1. Connect the free end of the inlet hose to the **¼-inch Air In fitting** located on the underside of the Fire Control System main panel.
2. Connect the other end of the inlet hose with the I/M quick-connect fitting to a standard external air compressor or shop air.
3. Verify that the hose is routed through the **AIR IN** cable slot and is free from sharp bends, kinks, or obstructions.
4. Connect the longest supplied **¼-inch pneumatic hose** to the **AIR OUT** fitting on the Fire Control System.
5. Connect the opposite end of this hose to the **AIR IN** connection on the Solenoid Control Box.
6. Connect the shorter supplied **¼-inch pneumatic hose** to the **AIR OUT** connection on the Solenoid Control Box.
7. Connect the free end of this hose to the pneumatic fitting located on the Modular Pneumatic Actuator or Pistol Grip Mounting System (PGMS).

Electrical Connections

8. Verify that all pneumatic connections are secure before applying electrical power. The master air control valve should be closed.
9. Connect the supplied BNC power cable to the **12V Power Out** connection on the Fire Control System.
10. Connect the opposite end of the cable to the **12V Power In** connection on the Solenoid Control Box.
11. Verify that the cable is fully seated and secured at both ends.

Final Verification

Prior to operation, verify the following:

- All pneumatic hoses are fully inserted into their fittings. No hoses are kinked, pinched, or routed near moving components.
- The BNC power cable is securely connected.
- The firearm is properly mounted and pointed in a safe direction.
- The Emergency Stop is accessible and functioning properly.
- The Master Air Control Valve is closed until the range is safe and testing is ready to begin.
- Once all connections have been verified, the Fire Control System is ready for pressurization and operation.

Pneumatic and Electrical Connections (Cont.)

Connection Summary

1. Compressor → FCS AIR IN

Supplies compressed air to the Fire Control System.

2. FCS AIR OUT → Solenoid Control Box AIR IN

Supplies regulated air to the solenoid valve assembly.

3. Solenoid Control Box AIR OUT → PGMS Actuator

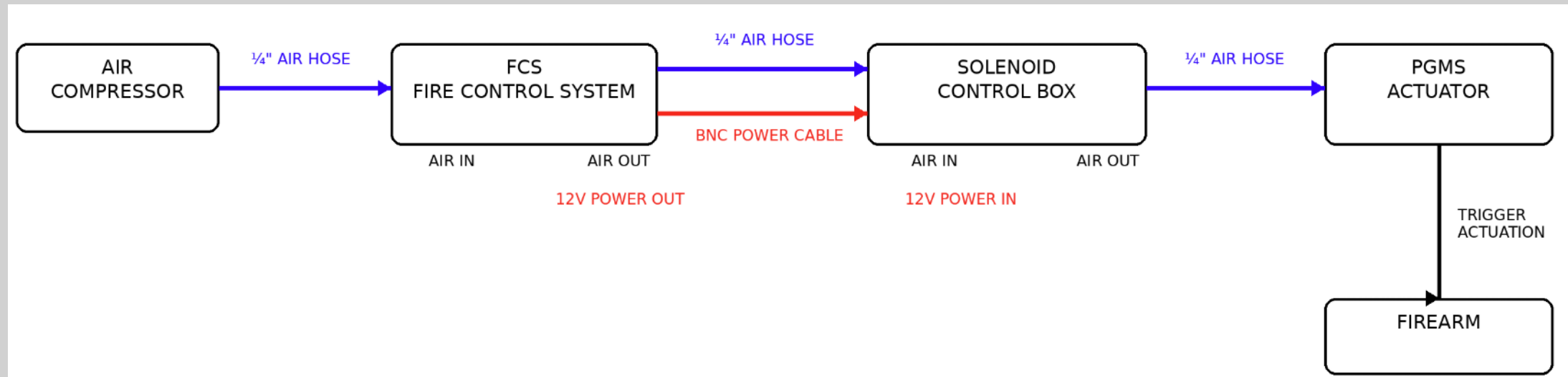
Supplies controlled pneumatic pressure to the actuator.

4. FCS 12V Power Out → Solenoid Control Box 12V In

Provides electrical power and control to the solenoid valve.

5. PGMS Actuator → Firearm

Provides trigger actuation during testing.



Connecting the Grip Mounting System

Pistol Grip Mounting System (PGMS) Installation

The Pistol Grip Mounting System (PGMS) is designed to mount the Modular Pneumatic Actuator to the right side (ejection port side) of most rifles equipped with a pistol grip. Proper installation is critical for reliable actuator operation and safe firearm testing.

Ensure the firearm is unloaded and pointed in a safe direction before installing the PGMS or any associated components.

The Master Air Control Valve should be closed.

Installation Procedure

- Loosen all wing nuts and actuator mounting knobs so that the mounting assembly can move freely.
- Remove the two black threaded knobs and the rear clamping plate containing the TPU grip pad.
- Position the PGMS on the rifle, ensuring that the trigger bar is properly located inside the trigger guard.
- Reinstall the rear clamping plate and black threaded knobs.
- Tighten the black threaded knobs until the mounting system securely grips the pistol grip in approximately the same location where a shooter would normally place their hand. See Figure 1 for proper alignment.
- Adjust the actuator position so that approximately **1–2 mm of clearance** exists between the trigger bar and a fully reset trigger.

- Verify that the actuator can move freely without contacting the trigger prior to actuation.
- Once proper alignment has been achieved, tighten all wing nuts and mounting knobs to fully secure the assembly.
- Confirm that the mounting system cannot rotate, shift, or move relative to the firearm.
- Connect the supplied **¼ inch pneumatic hose** between the actuator and the outlet port on the Fire Control System.
- The PGMS is now ready for operation.



Connecting the Grip Mounting System (cont.)

Trigger Bar Clearance

- Maintaining proper trigger bar clearance is critical for reliable operation.
- A clearance of approximately **1–2 mm** should be maintained between the trigger bar and a fully reset trigger. This spacing allows the actuator to accelerate before contacting the trigger, resulting in more consistent trigger pulls and improved reliability.
- Insufficient clearance may reduce actuator performance and can contribute to failures to fire or inconsistent trigger actuation.

Important Safety Information

- Failure to fully tighten all mounting hardware may allow the actuator assembly to shift during testing, potentially causing malfunctions, unintended firing behavior, or equipment damage.
- **Never stand in front of a firearm equipped with a PGMS that is connected to a pneumatic air supply, regardless of whether the firearm is believed to be loaded or unloaded.**
- Always follow established firearms safety procedures and maintain control of the test environment during installation, operation, and removal of the system.



Performing A Test

This section outlines the standard procedure for configuring and operating the Fire Control System. Prior to performing a test, ensure that all equipment has been installed and configured according to the procedures described in the previous sections of this manual.

Test Setup Procedure

1. Install a fully charged 12V battery in the Fire Control System.
2. Route and connect all pneumatic hoses and electrical cables as described in the **Pneumatic and Electrical Connections** section.
3. Install the Pistol Grip Mounting System (PGMS) and verify proper actuator alignment with the firearm trigger.
4. Confirm that the firearm is properly restrained and pointed in a safe direction.
5. Twist the Emergency Stop (E-STOP) clockwise to power on the Fire Control System.
6. Press the **Program Mode** button.
7. Select the desired firing program:
 - Direct Control
 - Semi-Automatic
 - Machine Gun
8. Configure the desired firing parameters (*See Programming the Fire Control System for details about programming a firing sequence*).
9. Press the **Home** button to return to the main screen.
10. Review the program summary displayed on the Home Screen and verify that all firing parameters are correct before proceeding.

Pressurizing the System

11. Open the lid covering the Master Air Control Valve.
12. Open the Master Air Control Valve by moving the lever to the ON position.

13. Observe the pressure readout displayed in the upper-right corner of the Home Screen.
14. Adjust system pressure using the Pressure Regulator.
 - Turn the regulator clockwise to increase pressure.
 - Turn the regulator counterclockwise to decrease pressure.
 - Pull the Pressure Relief Valve if pressure does not decrease immediately.
15. Set system pressure to a minimum of **20 PSI**.

Arming the System

16. Verify that:
 - The firearm is properly mounted.
 - The selected firing program is correct.
 - The range is clear.
 - All personnel are in safe locations.
17. Press the **LOCK** button to arm the Fire Control System.

The LOCK function serves as the primary software safety interlock. While the system is locked, firing functions remain disabled. Unlocking the system places the system into an armed state and enables actuator operation.

Note: The LOCK interlock will not release if system pressure is below 20 PSI. You must also be actively on the home screen.

Executing a Test

Once the range is clear and the system is armed, press the green **FIRE** button. The Fire Control System will energize the actuator according to the selected firing program and programmed firing parameters. Refer to the applicable Fire Mode section of this manual for additional details regarding program execution.

Performing A Test (Cont.)

Stopping a Test

A test may be terminated immediately at any time using any of the following methods:

Method 1: LOCK Button

Press the red **LOCK** button.

This immediately terminates the active firing sequence and returns the system to a safe state.

Method 2: Emergency Stop (E-STOP)

Press the Emergency Stop button.

This immediately removes electrical power from the Fire Control System and de-energizes the actuator.

Method 3: Master Air Control Valve

Close the Master Air Control Valve.

This removes pneumatic pressure from the actuator and immediately stops actuator operation.

Safety Requirements

Always remain in attendance while the Fire Control System is operating.

The operator shall continuously monitor the firearm, actuator, and test environment and be prepared to stop testing immediately in the event of a malfunction, unsafe condition, or unexpected firearm behavior.

Never approach a loaded firearm while the Fire Control System is armed or in standby mode.

At a minimum, the following conditions shall be met before handling a firearm, test fixture, or actuator:

- The Master Air Control Valve is closed.
- The LOCK button is engaged and indicates a safe state.
- The firearm is confirmed safe according to applicable range procedures.

Failure to follow these requirements may result in serious injury, death, or equipment damage.

Programming The Fire Control System

Fire Modes Overview

- The Fire Control System (FCS) includes three programmable fire modes designed to support a wide range of research and development testing requirements. Each mode provides a different method of actuator control and is intended for specific testing applications.

Direct Control Mode

- Direct Control Mode provides the user with immediate control of the actuator. Pressing and holding the **Fire** button energizes the actuator and applies force to the trigger. Releasing the button de-energizes the actuator and returns the system to its neutral state.
- This mode is commonly used for manual testing, setup verification, and applications where the operator requires complete control over the firing sequence.

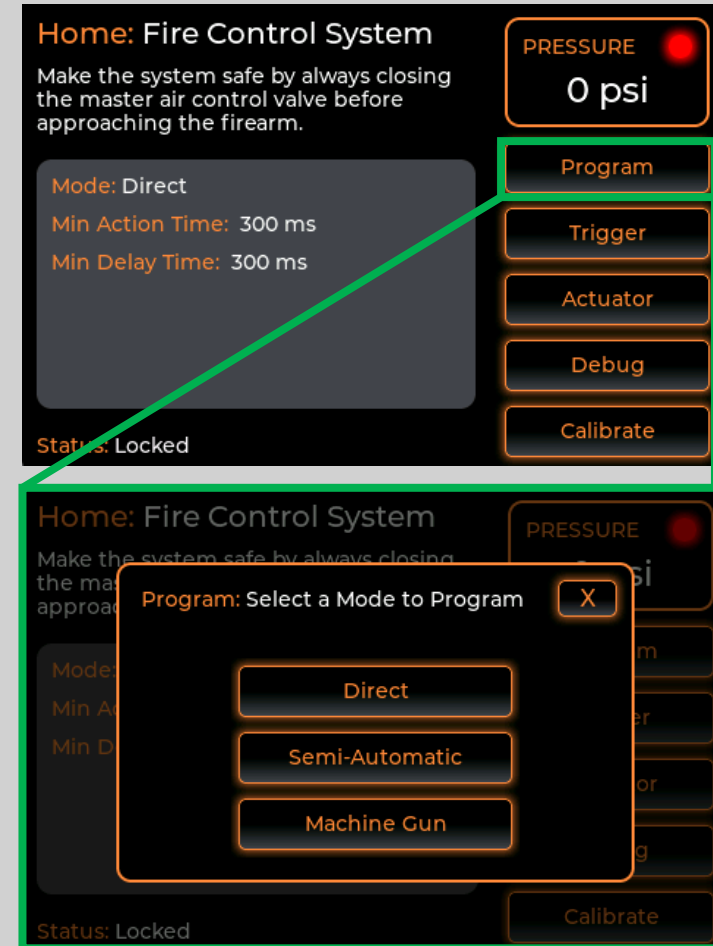
Semi-Automatic Mode

- Semi-Automatic Mode automates the firing of semi-automatic firearms by repeatedly energizing the actuator according to a user-defined firing schedule. The operator can program the number of shots and the time interval between shots to create repeatable test sequences.
- This mode is particularly useful for endurance testing, suppressor evaluation, thermal characterization, and other applications requiring consistent firing intervals.

Machine Gun Mode

- Machine Gun Mode is intended for select-fire and fully automatic weapon systems. Rather than cycling individual trigger pulls, the actuator remains energized for a user-defined duration, allowing the weapon to fire continuously for a specified burst length.
- This mode enables repeatable burst testing for machine guns and other automatic weapon systems while maintaining precise control over firing duration and test conditions.

Each fire mode is described in greater detail in the following sections of this manual.



Direct User Control Mode

Direct Control Mode provides immediate user control of the pneumatic actuator. This mode is intended for system setup, functional checks, manual firing operations, and applications where the operator requires direct control over each firing event.

When the **Fire** button is pressed, the actuator is energized for the programmed action time. Once the action is complete, the system will wait for the programmed delay time before accepting another firing command.

Minimum Action Time

- The **Minimum Action Time** defines the minimum duration that the actuator remains energized during a firing event.
- For most applications, an action time of **300 ms** is recommended. This value provides sufficient actuator travel and dwell time for reliable trigger actuation across a wide range of firearm platforms.

Delay Time

- The **Delay Time** defines the minimum time that must elapse before the user can initiate another firing event.
- This parameter prevents excessive cycling of the actuator and allows the firearm and pneumatic system to return to their normal operating state between shots.

Maximum Fire Rate

- The maximum fire rate is an additional check that does not allow the firearm to be fired faster than the set rate regardless of the action time, delay time, or physical user input.
- It is not adjustable.

Safety Timeout

- A built-in timeout function locks the system if there is no activity for greater than **6 seconds**.
- This setting is not adjustable.

Recommended Practices

- Use an action time sufficient to ensure reliable trigger actuation without excessive dwell time.
- Verify proper firearm function before increasing firing cadence.
- Adjust delay time to accommodate firearm cycling characteristics and test objectives.
- Do not rely on the timeout feature as a primary safety mechanism; always maintain safe firearm handling procedures.

The screenshot displays the 'Program Mode: Direct User Control' interface. At the top right is a 'Home' button. Below the title, there are four rows of settings, each with a label, a value, and a button: 'Min Action Time: 300 ms' with a 'Set' button, 'Min Delay Time: 300 ms' with a 'Set' button, 'Max Fire Rate: 60 rpm' with a 'Help' button, and 'Timeout: 6 s' with a 'Help' button. To the right of these rows are two buttons: 'Load' and 'Save'. Below the settings is a 'Program Description' section with text explaining the mode. At the bottom, there is a status bar with three sections: 'SHOT' (orange), 'HOLD' (orange), and 'RELEASE' (grey).

Program Mode: Direct User Control		Home
Min Action Time: 300 ms	Set	
Min Delay Time: 300 ms	Set	
Max Fire Rate: 60 rpm	Help	Load
Timeout: 6 s	Help	Save
Program Description: The user has direct control over the firing sequence. Press the fire button to energize the actuator and fire a shot. Release the fire button to de-energize the actuator.		
SHOT HOLD RELEASE		

Semi-Automatic Mode

Semi-Automatic Mode is used to fire a semi-automatic firearm through a programmed sequence of actuator cycles. This mode allows the user to define repeatable firing routines for research and development testing, including endurance testing, suppressor evaluation, thermal testing, and other controlled firing schedules.

Adjustable Parameters

Number of Bursts

- The **Number of Bursts** defines how many burst sequences will be executed during the programmed test routine.

Rounds per Burst

- The **Rounds per Burst** setting defines the number of actuator cycles within each burst. Each actuator cycle corresponds to one trigger actuation.

Burst Spacing

- The **Burst Spacing** setting defines the time between bursts and is measured in milliseconds. This value controls the pause between each programmed burst sequence.

Rate of Fire

- The **Rate of Fire** setting defines the spacing between shots within a burst. The user must select a rate of fire that is compatible with the firearm being tested.

Do not exceed the mechanical capabilities of the firearm. Excessive firing rates may cause hammer follow, cycling issues, failures to reset, or other malfunctions. For most semi-automatic test applications, a rate of fire below **600 rounds per minute** is recommended.

Safe Operation

- The user is responsible for maintaining a safe test environment during all semi-automatic test events. This includes properly restraining the test firearm, using appropriate ammunition, selecting a safe and reliable firing schedule, and ensuring that all equipment is properly maintained before testing.
- Only qualified personnel should configure, load, and operate the firearm during testing. In the event of a misfire, malfunction, or abnormal firing behavior, testing shall stop immediately.

Malfunctions and Misfires

If a misfire, failure to cycle, failure to reset, or other malfunction occurs during a semi-automatic test sequence, do not continue the test. The firearm shall remain pointed in a safe direction until the condition is resolved.

Only a competent gunsmith or qualified armorer should clear malfunctions during or following a semi-automatic test event. Do not attempt to resume testing until the firearm, actuator, and test setup have been inspected and confirmed safe for continued operation.

Program Mode: Semi-Automatic

Home

Number of Bursts: 1

Set

Rounds Per Burst: 3

Set

Burst Spacing: 1500 ms

Set

Load

Rate of Fire: 120 rpm

Set

Save

Program Description: Fire a semi-automatic weapon by repeatedly energizing the actuator for each shot.

BURST				SPACING	
SHOT		SHOT			
ACTION	DELAY	ACTION	DELAY	...	

Machine Gun Mode

Machine Gun Mode is intended for use with select-fire and fully automatic weapon systems. This mode holds the pneumatic actuator in the energized position for an extended duration, allowing the firearm to fire continuously for a user-defined burst length. Machine Gun Mode is intended for research and development applications only and should only be used with firearms that are legally configured and mechanically capable of fully automatic operation.

Adjustable Parameters

Number of Bursts

- The **Number of Bursts** setting defines the total number of burst events that will be executed during the test sequence.

Rounds per Burst

- The **Rounds per Burst** setting defines the desired burst length. The Fire Control System calculates the actuator hold time using the user-defined rate of fire. Because the system does not directly measure shots fired, it is the responsibility of the user to know the approximate cyclic rate of the firearm being tested and configure the burst length accordingly.

Rate of Fire

- The **Rate of Fire** setting is used to calculate the actuator hold time required to achieve the desired burst length. The user should enter the average cyclic rate of the firearm under test. Actual rounds fired may vary depending on firearm condition, ammunition, environmental conditions, and system configuration.

Burst Spacing

- The **Burst Spacing** setting defines the time between burst events and is measured in milliseconds. This parameter may be used to support scheduled firing protocols, suppressor testing, thermal characterization, barrel cooling studies, endurance testing, and other controlled firing schedules.

Safe Operation

- The user is responsible for ensuring the firearm is properly restrained and capable of safely operating at the selected firing schedule. Excessive burst lengths or insufficient cooling intervals may result in elevated firearm temperatures, accelerated component wear, or firearm damage.
- Prior to testing, verify that the selected burst length, cyclic rate, and burst spacing are appropriate for the firearm, ammunition, suppressor, and test objectives.

Malfunctions and Misfires

- In the event of a malfunction, runaway gun condition, failure to stop firing, or any abnormal firearm behavior, immediately disable the Fire Control System and follow established range safety procedures.
- Only qualified personnel should diagnose and clear malfunctions in automatic weapon systems. The firearm shall remain pointed in a safe direction until the condition has been resolved and the weapon has been verified safe for continued testing.

Program Mode: Machine Gun

Home

Number of Bursts: 1

Set

Rounds Per Burst: 3

Set

Burst Spacing: 1500 ms

Set

Load

Rate of Fire: 120 rpm

Set

Save

Program Description: Fire a machine gun by holding the actuator energized the duration of a burst.

BURST

SHOT

SHOT

•

•

•

SPACING

ACTION

Actuator Force Control

The Modular Pneumatic Actuator uses regulated pneumatic pressure to generate the force required to actuate the firearm trigger. Actuation force is controlled by adjusting the supplied air pressure. Proper pressure selection is important for reliable operation, repeatable firing schedules, and reduced wear on the actuator and firearm components.

For best performance, set the actuator pressure to provide at least twice the advertised trigger pull weight of the firearm being tested. For example, a trigger with a 5 lbf advertised pull weight should be operated with an actuator force setting of at least 10 lbf. This provides adequate margin for trigger variation, friction, actuator alignment, and dynamic effects during repeated firing cycles.

Pressure Adjustment

System pressure is adjusted using the regulator located on the main control panel.

- Turn the regulator knob clockwise to increase pressure.
- Turn the regulator knob counterclockwise to decrease pressure.
- The current system pressure is displayed in real time in the upper right corner of the home screen.
- After reducing the regulator setting, pull the pressure relief valve to vent excess air from the pneumatic lines and allow the system pressure to stabilize at the new setting.

Adjustment Procedure

1. Confirm the firearm is unloaded and pointed in a safe direction.
2. Determine the advertised trigger pull weight of the firearm.
3. Set the actuator force target to at least two times the advertised trigger pull weight.
4. Adjust the regulator to achieve the desired operating pressure.
5. Observe the live pressure reading on the home screen and verify that the pressure has stabilized.

Recommended Practices

Use the minimum pressure that satisfies the two-times trigger pull force recommendation while maintaining reliable actuation. Recheck actuator performance whenever changing firearms, trigger assemblies, air supplies, or actuator mounting positions. During extended firing schedules, periodically verify that the operating pressure remains stable and that actuator performance is consistent.

Maximum Operating Force

At maximum rated supply pressure, the Modular Pneumatic Actuator is capable of generating approximately 45 lbf of trigger pull force. Do not exceed the maximum operating pressure specified for the actuator system.

Troubleshooting

If the actuator does not reliably actuate the trigger, verify that the force setting is at least twice the advertised trigger pull weight. Confirm that the actuator is properly aligned with the trigger, that actuator travel is unobstructed, and that all pneumatic fittings and tubing are secure. Increase pressure only as needed and do not exceed the maximum operating pressure.

The screenshot displays the 'Home: Fire Control System' interface. On the left, a status box shows 'Mode: Machine Gun', 'Number of Bursts: 4', 'Rounds Per Burst: 1', 'Burst Spacing: 1500 ms', and 'Rate of Fire: 120 rpm'. Below this, the 'Status' is 'Locked'. On the right, a 'PRESSURE' section shows '0 psi' with a red indicator light. Below the pressure display are buttons for 'Program', 'Trigger', 'Actuator', 'Debug', and 'Calibrate'. A green box highlights the 'Actuator' button and a corresponding table of pressure and force values.

Pressure	Force
20 psi	4 lb
30 psi	8 lb
40 psi	12 lb
50 psi	16 lb
60 psi	20 lb
70 psi	24 lb
80 psi	28 lb

Calibration of Touch Screen

- The Fire Control System utilizes a touchscreen interface for user input. If touchscreen selections become inaccurate or do not correspond correctly with button locations, the screen should be recalibrated.
- **Performing a Screen Calibration**
 1. From the Home Screen, press the **Calibrate** button to enter the calibration utility.
 2. A series of green calibration targets will appear on the screen.
 3. Press each green target in the order displayed.
 4. Continue until all calibration points have been completed.
 5. Upon completion, the system will automatically update the touchscreen offsets and return to normal operation.



Warranty and Safety Information

SAFETY ADVISORY

Safety with firearms is the responsibility of the user
– exercise extreme caution while using this product.

Do not use the UMPIRE Remote Fire Control Unit for any purpose except as outlined in this manual.

We guarantee the exercise of reasonable care in manufacturing, but assume no further responsibility.

BIGHORN KINETICS WARRANTY

Bighorn Kinetics products are warranties against defective parts or defective craftsmanship for a period of one (1) year.

An RMA# (Return Merchandise Authorization) is required in order to send any products back for any reason. If you should have a problem with your unit, or any other products, please email BIGHORN KINETICS at info@bighornkinetics.com.



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