

Computer Gas Gun Controller

Congratulations on your purchase of a Cambridge Gas Gun. Cambridge's have been experts in the gas gun industry for many years. The Gas Gun Controller has been designed, to satisfy a wide variety of applications.

The unit has programmable options/features as follows:

- 1) 1 to 15 "blasts" per hour.
- 2) Single double or triple blasts.
- 3) Up to 3 start/stop cycles (active periods) with individually programmable start/stop times.
- 4) Reads out battery voltage on screen.
- 5) Ultra bright LED's for System OK and Battery Low indication.
- 6) A pre-warning of a blast by alternately flashing the System OK and Battery Low LED's for 10 seconds before gassing and firing.
- 7) Test mode for checking sparker and gas solenoid.
- 8) External trigger input, with active period programmable start/stop time.
- 9) Adjustable Real Time Clock with lithium battery back-up, so parameters and time are not lost when replacing system batteries. Note: Clock uses 24-hour format.
- 10) Built in time-delay (2 minutes) after turning gun "on" or displaying or changing a setting before the first blast is fired.

Heavy Duty batteries should be used in the Gas Gun, for longest life and reliability, Alkaline Batteries would give the longest operation. The batteries are placed in the battery holder ensuring both spring connectors are contacting the circuit board connectors.

When batteries are first installed into the unit, the Green System OK LED should begin flashing. This indicates that the controller is operating and the battery has sufficient capacity to operate. Pressing any key will activate the display, to allow the unit to be set up, or to view or alter settings.

The Various menu items are:

	<u>Display</u>	<u>Menu Item</u>	<u>Pressing + or - keys</u>
1)	Gun	Gun	Toggles gun ON or OFF.
2)	Cloc	Clock	Adjusts time of day (24 Hour format).
3)	St1	Start Time 1	Set cycle "1" start time.
4)	Ft1	Finish Time 1	Set cycle "1" finish time.
5)	St2	Start Time 2	Set cycle "2" start time.
6)	Ft2	Finish Time 2	Set cycle "2" finish time.
7)	St3	Start Time 3	Set cycle "3" start time.
8)	Ft3	Finish time 3	Set cycle "3" finish time.
9)	Str	Start Time remote	Set remote trigger start time.
10)	Ftr	Finish Time remote	Set remote trigger finish time.
11)	b/Hr	Bangs/Hour	Adjusts 1 – 15 Bangs (Shots) per hour.
12)	Shot	No of Shots	Set "shots" (bangs) to single double or triple shots.
13)	bAtt	Battery Volts	No effect, this item only allows the battery voltage to be viewed.
14)	test	Test Mode	<u>Warning:</u> Read Section "Test Mode" before using this function.

Basic Operations

The keypad has four keys for setting up the unit. The “Next” key takes you to the next menu item, the “Back” key goes back one item. Any menu-item setting may be changed by using the “+ or –“ keys. Pressing “+” increases the setting value, pressing “– “ decreases the value.

To view the current settings in the gun, simply pressing the “Next” key 14 times will take you through the 14 menu items. After each press of the “next” key wait for a few seconds and the display will toggle (alternate) between the menu item and the current setting for that menu item. **Note:** Any Menu item setting, (except for the battery voltage), can be altered by using the “+ or –“ keys. When changing or setting the clock time, or a start/finish time, holding the + or – key down will cause the displayed time-value to be rapidly changed.

When no key is pressed for more than 15 seconds, all settings are stored, and the display extinguishes to save battery power. Pressing any of the buttons after the display has turned itself “off”, will display the first item in the menu – “Gun” and toggle back and forth between “Gun” and its current state “On / Off.

All Menu items will toggle between the menu item and its current state. If a change to a setting is to be made, pressing the + or – key will freeze the display momentarily, showing the current setting value. If the + or – key is pressed again, the displayed setting value will increase by one for each press of the “+” key, or decrease by one for each press of the “–“ key. In the case of clock related settings, holding the + or – key pressed continuously will change the displayed time up or down, at a faster rate.

Setting up the unit

Units are shipped with the Gun turned off, the internal Real Time Clock is turned off and no active periods are pre-set. Fresh (Alkaline or Heavy-Duty) batteries need to be installed into the unit before programming or use.

First, set the clock time to the local time. **Note:** time is in 24Hr style, ie 2:00 pm is set as 14:00.

Then, set the start and finish times for the period that you want the gun to operate. Up to three active periods can be set. For instance the gun could be set to operate mornings and evenings for a set time.

If an active period(s) has been set, the unit will begin firing at the set start time, and continue firing until the finish time is reached. Note: a **remote active period** needs to be set for the remote trigger function before it can be used – refer to the remote trigger section.

If continuous operation is required (24 hours / day) set the start time the same as the finish time, the gun will then run continuously.

The number of blasts per hour can be set (from 1 – 15). – Local Council restrictions may apply in certain districts.

Next set the shots to single double or triple blasts. **Note** for multiple shots, all “bangs” are counted as separate blasts when determining the number of blasts per hour. This means if 6 blasts per hour are set but double shots are selected there will be 3 double shot firing events per hour (six bangs in total each hour).

Switch the unit off before disconnecting or connecting a Gas cylinder or transporting the Gun.

After the gun is placed in position for use, connect the Gas cylinder, turn on the gas supply and set the Gun to the “On” state. There will be a 2-minute delay before the first shot(s) is fired.

Test Mode

The “Test Mode” can be used to test the sparker-unit and Gas solenoid. **Warning:** It is recommended to disconnect the gas and remove the spark-plug before attempting these tests. The regulator line may still have some residual gas pressure in it so extreme caution must be used to avoid setting off the gun or igniting the gas. For these reasons the sparker unit is tested **Before** testing the Gas Solenoid. After running a test it is strongly advised not to re-run another test for a suitable time to allow any gas in the chamber to dissipate. If you wish to visually confirm the presence of a spark, first remove the sparkplug, reconnect the sparkplug cable to the sparkplug, and rest the sparkplug so the metal body of the sparkplug is touching the gun chassis

When the menu item “tESt” is selected, the setting displayed is “OFF”, pressing the “+” key will change the display to “On” and run the sparker for 5 seconds followed by alternately turning the gas solenoid off and on for 5 seconds, before returning to “Off”. Do not re-run the test until any gas in the chamber has dispersed, or a “bang” could result unexpectedly.

Disabling an active period

To disable any active period, a time setting of “----“ is set for the “start” and “finish” times. This setting is a special setting, found when adjusting the start or finish times, between 23:59 and 0:00

Remote Trigger Operation

The gas gun can operate in two ways for remote operation. The first way is using a remote hand held transmitter to remotely fire the gun on command. Please consult E H Cambridge if this option is required.

The second method for remote trigger operation uses a hard-wired trigger input. The gun can be triggered remotely, on command, by bridging the trigger-input terminals together. For certain applications it may be required that the gun triggers when an event occurs ie a door or gate is opened. Simply placing a switch that has normally open contacts in an appropriate position such that when the event occurs (ie door opened) will activate the switch (the contacts become closed) and the gun will fire. If the switch contacts remain closed (door open) the gun will keep firing until the switch contacts open again. (door closed).

Before the remote trigger function will work, a start and finish time must be set (“Str & Ftr”). This defines the active period that the remote function will operate. The first reasons for this is to conserve battery power by turning the receiver off, when not required ie night-time. The second reason is to allow the gun to be activated and deactivated at certain set periods. If the gun is used to scare off intruders by guarding a shed door for instance the active period could be set during the hours of darkness, but would de-activate at say 7:00 am so the gun will not fire when the building is entered by the owner.

If the gun is solely used with the remote trigger, the other 3 cycle start and stop times should be set to “----“ to avoid unexpected firing of the gun during a normal programmed time.

Note :

- 1) The gun must be set to “on” in the menu; or else the remote trigger function will not operate.

- 2) If multiple shots are programmed (ie triple shot), when triggered remotely, the gun will fire three times, even if the remote switch contacts again open after the first bang.

Cancelling an imminent blast:

If you are near the gun and the lights begin to flash alternately (warning of a blast in 10 seconds), or if the gas solenoid is heard to turn on, pressing any key on the unit will cancel the firing of the gun.

Note: The gun will be rearmed and an explosion will occur two minutes after the display extinguishes.

Operation Hints:

Assuming the display is off and you wish to check on the battery voltage condition, pressing the back key 3 times will take you to the battery voltage readout item. Pressing the next key twice would have taken you to the clock, where the current time of day is displayed. To go from battery voltage to clock in the menu, requires either 11 presses of the next key or 3 presses of the back key. So depending on where you are in the menu and where you want to be, the next or back key could be used effectively.

If a test-fire facility is required simply shorting the remote trigger terminals briefly will start a fire sequence. (The Gun must be set to “on” in the menu.)

Battery Replacement:

When the battery voltage falls to below 10 Volts the Green “System OK” LED, will flash almost invisibly and the Red “Battery Low” LED will begin flashing brightly. This warns that the batteries are approaching the end of their useful life and will soon need replacing. If the unit is left to continue running, when the battery voltage falls below 9 volts, the Red “Battery Low” LED will begin to flash briefly at a very slow rate and the unit will stop firing.

Flat batteries should never be left in the unit as they could leak and cause corrosion.

Providing that the batteries are not completely discharged, pressing any button whilst in this state, will cause the display to say FLAt, indicating that the batteries need to be replaced.

During battery replacement, all the user-programmed settings and current time of day are maintained by an internal Lithium battery. The Lithium batteries should last for 10 or more years before needing replacement.

Note :

If the gun was previously on, prior to replacing the batteries, the unit will be on after battery replacement. For this reason it would be wise to disconnect the circular connector plug from the controller during battery replacement, to avoid an unexpected blast occurring.

After the battery box has been re-installed into the unit and it is again ready for operation, reconnect the controller’s circular connector. If the gun is “on” and with-in a set active period, the first bang will occur after two minutes.

Storage for an extended period:

If the Gas Gun is to be stored for an extended period of time, it is recommended that the batteries be removed from the battery case to avoid corrosion from battery leakage. Before removing the main batteries select “Cloc” on the menu and set the time as “----“ this will turn

off the internal real-time clock. **Note:** The Real-time clock will need to be set again to local time, before the unit is next used.

Battery Life

It is recommended that new batteries be installed into the Gas-Gun at the beginning of each season. With fresh heavy-duty batteries installed, if the gun is set to 6 single bangs per hour, firing for 8 hours a day, the operating life-time for the batteries is expected to be 4 – 6 months. Obviously if longer operating times, and more shots per hour are required, or the remote radio receiver is fitted and used, the battery life would be reduced proportionally.

Spark-Plug Replacement

The Spark-Plug used in the Gas Gun should only be replaced with a “resistor” type spark-plug. These plug types help reduce electrical noise interference, which could induce problems in the computer controller. Suggested types are, NGK BPR-5ES, Bosch W8RDC or Champion N11RY

Problems:

Gun Controller appears to be dead.

- 1) Is the battery flat ?
- 2) Are the battery contacts or battery holder contacts corroded or dirty ?
- 3) Is the circular connector properly connected to the controller ?
- 4) Is the battery connector plug properly connected ?
- 5) Is the fuse blown or faulty ? (The fuse is located in the yellow rubber fuse-holder). The fuse should only be replaced with a 1Amp ceramic type fuse as glass fuses can break during installation /removal from the fuse holder.

Gun will not fire

- 1) Is the gun turned on in the menu ?
- 2) Is the Gas empty or turned off ?
- 3) Is the sparkplug connected properly and not dirty or fouled ?
- 4) Has the wrong type of plug been installed –**the spark plug must be a resistive type.**
- 5) Is the gun actually with-in a set active time period ?
- 6) Hint : Run a menu “test” and listen for spark / gas-solenoid operation. **Warning !** See page 2 “Test Mode” for cautions.

Disclaimer & Caution on use

This Gas Gun is not a toy ! It should be regarded in the same way as other farm machinery and equipment, and should be used with due caution and respect. Never look down the barrel or place an ear next to the barrel – **under any circumstances.**

It would be prudent to clear flammable material (Grass etc) within a 1 metre radius from the gun.

E H Cambridge can not accept any responsibility for misuse of the gun. It is the Gun Owner/Operators responsibility, at all times, to ensure safe operation and use for their intended application. Local Council restrictions or by-laws may be in effect in your area.