ALEX-TRONIX

A DIVISION OF GNA INDUSTRIES, INC.

SMART-ALEX®

and

SMART ONE®

Battery Powered Valve Box Controller

M A N U A L

Patents #5,914,847 and #6,335,855

02/03

FCC STATEMENT

The User is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If This equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

*Reorient or relocate the receiving antenna.

*Increase the separation between the equipment and receiver.

*Connect the equipment into an outlet on a circuit different from that to which the Receiver is connected.

*Consult the dealer or an experienced radio/TV technician for help.

This equipment has been certified to comply with the limits for a class B computing device, pursuant to FCC Rules. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

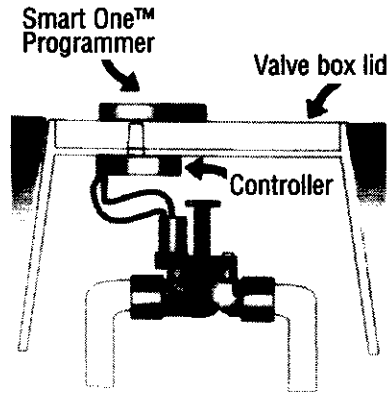
SMART-ALEX® BASICS

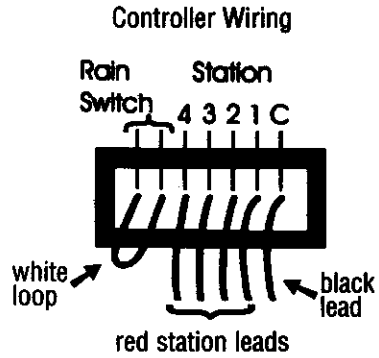
The Smart-Alex consists of a hand-held programmer (The Smart One®) and Smart Controller (SC) recognized by the U.S. Dept. of Energy for energy efficiency. The 1, 2 or 4 station SC controller is mounted under the lid of a plastic or concrete valve box with a bolt. A metal valve box cannot be used as it will block the radio signal. The controller is programmed by placing the programmer over the mounting bolt and downloading for about 5 seconds. There is no need to open the valve box nor is there anything to plug in.

Packaged with each programmer is a separate patented Mini-Smart activator for initiating a valve test cycle or shutting down an active irrigation cycle without the use of the programmer. Valves up to 200 feet away can be activated with the controller. The Smart Alex is compatible with nearly all valves. Consult the valve compatibility chart for adapters required with certain valves. Battery life is guaranteed for two years, with 5 years or more possible.

INSTALLATION

To install the controller, remove the valve box cover. Visually place the controller under the lid such that it does not extend past the cover edge. Mark the mounting post spot and drill a 5/16 inch diameter hole in the plastic lid between the plastic ribs. If a concrete valve box is used, drill a 5/8 diameter to within 1/4 inch of going through the lid. Now drill 5/16 inch hole inside the 5/8 diameter hole and drill through the rest of the concrete lid. Do not use a metallic washer to hold the controller in position as it may block the radio signal. Use either the 3/4 or 1 inch supplied bolt to secure the controller under the lid as follows:





Use gel packed wire nuts (not supplied) to attach the latching solenoid wires to the controller wires. Connect the black (common) controller wire to the solenoid black lead(s), and each red controller wire to each station. Consult the valve compatibility chart to determine what adapters (if any) may be required with the various valve models. If the rain or moisture switch is used, cut the looped white wire from the controller at its center and strip the ends. Connect the common and normally closed leads of the rain switch to the two ends of the white wire. With the rain switch open the controller can still close valves if they are open but cannot open them until the rain switch dries and closes again. CAUTION: Do not connect the rain switch in the common line as is normally done with AC controllers. If the rain switch is activated while the valve is running, the valve may not close even when the rain switch dries out!

PROGRAMMING

Only one Smart One programmer is required to program all Smart-Alex valve box controllers. For convenience, the programmer can hold up to four irrigation schedules in memory, plus one working schedule. An irrigation schedule is programmed as follows:

1. Press any button to power up the display. The display will shut off to conserve power if no button has been pushed for at least one minute. Within 15 minutes of the last button being pushed, pushing a button will return the screen to the last function displayed. After 15 minutes, it will revert to the Time of Day (TOD) function.
2. Use the FUNCTIONS up and down ↑ ↓ buttons to scroll to the desired function listed on the front panel..
3. In the Time of Day (TOD) function, the programmer time of day is displayed on the top line and the last controller fetched TOD is displayed on the second line as follows:

To change or adjust the current time of day, press SELECT and the programmer TOD alone appears with a flashing cursor at the day of the week position. To adjust the day, use the + and – ADJUST buttons. Once the correct day is displayed, use SELECT again to advance the cursor to the hour of the day and adjust it as desired. Holding down either ADJUST button will rapid advance the flashing display. Going through noon or midnight will automatically adjust the am or pm setting. Press SELECT again to adjust the minutes. When completed, press ENTER and the cursor will stop flashing and the display will be returned to the programmer and controller TOD screen. **CAUTION: The ENTER button must be pressed after each function is adjusted to enter the data to the programmer, or display will revert back to its previous screen without accepting new information.** The

programmer and controller time of day may not match. The controller time of day is updated whenever the current time of day is downloaded (stored) into the controller as described under the Store function.

4. To Assign Stations to program A or B, go to the Assign Stns function by pressing the FUNCTION button until ASSIGN STATION comes up on the screen first line. On the second line, programs A and B will each have four positions corresponding to stations 1–4 for each program. Press SELECT to the station position desired and use the ADJUST + button to enable that stations, or the – button to remove it. A – in that station position indicates that station is not assigned to that program. In the following display, stations 1, 3, and 4 are assigned to program A and all four stations are assigned to program B. Note that any station can be assigned to either program, both, or neither.

5. To enter the Program A Start Times, go to the Prog A Starts function. The display will say PROGRAM A STARTS on the top line and WAIT on the second line for about 2 seconds. Then the four program A start times will be displayed. Press SELECT to advance to the first starting time and adjust the hour of the day desired. The hours scroll through noon and midnight and change the am and pm indications automatically. Going through midnight, the display will show-------, meaning no start time in that position. An hour of starting time must be selected before the minutes can be adjusted. Proceed to program up to four start times in a similar way. Start times need not be in any specific order. Once the display shows all desired start times for program A, press ENTER. The display will appear as follows:

Program the program B start times similarly.

6. To enter the Program A Watering Days, go to the Prog A Days function. PROGRAM A DAYS will be on the first line and the seven days of the week starting with Sunday will be on the second line. Press SELECT and the Sunday position will flash. If that is a watering day, press the + ADJUST button. An upper case day is a watering day, and a lower case day is a non-watering day. Similarly program each watering day for the B program. The display will appear as follows:

If a watering day interval is desired, use the SELECT button to advance to the "I" (Interval) at the end of the line following Saturday. By pressing ENTER while the "I" is flashing, the display will change to look like this:

Now the interval of days can be set from 1 to 99. If interval is selected, the current day is the first day of the interval, and the controller will irrigate starting on the current day, and then every 3rd day thereafter if an interval of 3 days is programmed. Each program can be set to either days of the week or interval of days independently. Once again press ENTER to record programming. Entering an interval of watering days cancels any days of the week programming for that program. Program the B watering days similarly.

7. To program Station Watering Times, go to the Stn 1 & 2 Times or Stn 3 & 4 times. STNS 1 & 2 TIMES (or 3 & 4) will show up on the first line and the second line will have the station time setting. Pressing SELECT will go to the first station hour selection. If only minutes are to be set, press SELECT again to advance to the minutes settings. press SELECT again to advance to the hours of the next station and finally to the minutes. After each station is programmed as desired, press ENTER to save. This completes the standard programming functions.

8. Rain Delay, Manual, Semi-Auto, Fetch, Store, and Controller On/Off are separate Immediate Command Functions and are independently programmed into the Controller from the Programmer directly from their individual functions.
   a. Rain Delay: To suspend irrigation for a number of days press FUNCTION up or FUNCTION down until RAIN DELAY is displayed on the top line of the display and the number of days is displayed on the second line. Press SELECT to activate the cursor. Use ADJUST + or ADJUST – to adjust Rain Delay from 0 to 99 days. Set programmer on top of the valve box centering the recessed area on the bottom of the programmer over the bolt on the valve box cover. Press ENTER. After 1 to 2 seconds the programmer will say R DELAY ACCEPTED. (If the program says NOT TRANSFERRED try again after removing programmer about 6 inches away for 2 seconds. If the problem persists contact the factory.) The Rain Delay counts down one day at midnight until it reaches 0. The next scheduled start after the rain delay reaches 0 will resume normal automatic irrigation.
   b. Manual: To initiate a Manual station operation press FUNCTION up or FUNCTION down until MANUAL and the duration time displayed on the top line of the display and

the station number is displayed on the second line. Press SELECT to activate the cursor and select station time on the top line or station number on the second line. Use ADJUST + or ADJUST – to adjust the Manual station time from zero to 23 hours and 59 minutes on the top line and SELECT or to adjust from station 1 to station 4 or OFF on the second line. While the cursor is flashing and the desired data is displayed, set the programmer on top of the valve box over the bolt on the valve box cover. Press ENTER. The programmer will display DATA TRANSFER and in 1 to 2 seconds display DONE. (If the programmer displays NOT TRANSFERRED try again. If the problem persists contact the factory.) Five seconds later the selected valve will come one.

To turn the valve off without waiting the required station time press SELECT to activate the cursor and select station number on the second line of the display. Use ADJUST up or ADJUST down to display OFF on the second line of the display. While the cursor is still flashing and OFF is displayed set the programmer on top of the valve box and press ENTER. The programmer will display DATA TRANSFER and in 1 to 2 seconds display DONE. Five seconds later the valve will turn off.

Only one station at a time can be Manually operated. The programmer must be removed for at least 2 seconds from the valve box cover before another operation can be performed.

   c. Semi-Auto: To start a Semi-Auto cycle press FUNCTION up or FUNCTION down until SEMI-AUTO is displayed on the top line of the display and A B is displayed on the second line. Press SELECT to activate the cursor and select A or B on the second line. While the cursor is still flashing and the desired data is displayed set the programmer on the top of the valve box centering the programmer over the bolt on the valve box cover. Press ENTER. The programmer will display DATA TRANSFER and in 1 to 2 seconds display DONE. (If the programmer displays NOT TRANSFERRED try again. If the problem persists contact the factory.) Five seconds later the first valve assigned to the selected program will come on and remain on for its programmed time. Each station assigned to the selected program will come on in sequence for its programmed time for one cycle and shut off. Only one program at a time can be initiated by the Semi-Auto start. To turn the Semi-Auto cycle off go to the CONTROLLER ON/OFF Function and download that command as described below. (Remember to turn the controller back ON after turning off the Semi-Auto since the controller has actually been turned off by using the controller OFF function.) The Semi-Auto cycle may also be terminated by either placing a Mini-Smart or the programmer on the mounting bolt for 30 seconds. This last method does not turn the controller OFF, it just terminates any active program.
   d. Fetch: The Fetch Function is used for one of two reasons. The first reason is to retrieve and determine the program that is currently stored in a controller. The second reason is to retrieve a program stored into one of the four schedules in the programmer.

To fetch from a controller press FUNCTION up or FUNCTION down until FETCH FROM is displayed on the top line of the display and CNTLR SCHEDS is displayed on the second line. Press SELECT to activate the cursor and select CNTLR on the second line. While the cursor is still flashing on CNTLR set the programmer on top of the valve box over the bolt on the valve box cover. Press ENTER. The programmer will display DATA TRANSFER and in 2 to 3 seconds display either SC1, SC2, or SC4 and whether the controller is ON or OFF. (If the programmer displays NOT TRANSFERRED try again. If the problem persists contact the factory.) The program that was fetched from the controller can now be reviewed in the programmer. If no programmer button is pressed, the display will automatically change back to the function display after 15 seconds.

To fetch a schedule (program) from a schedule within the programmer press - FUNCTION up or FUNCTION down until FETCH FROM is displayed on the top line of the display and CNTRL SCHEDS is displayed on the second line. Press SELECT to activate the cursor and select SCHEDS on the second line. While the cursor is still flashing on SCHEDS press ENTER. The programmer will display FETCH FROM on the top line of the display and SCHEDULE with the cursor blinking over the number "1" on the second line of the display. Use ADJUST + or ADJUST – to adjust the number from 1 to 4. When desired schedule 1, 2, 3, or 4 is selected press ENTER. The selected schedule can now be reviewed by scrolling through the various programmer functions.

The schedules can be used in various ways. For example, one irrigation schedule can be pre-programmed for each of four controllers in separate valve boxes. Another option is to program a schedule for each season.

e. Store: As with the Fetch Function the Store Function is used for one of two reasons. The first reason is to store the program displayed on the programmer display in the controller. The second reason is to store the program displayed on the programmer display to one of the schedules within the programmer.

To store to a controller press FUNCTION up or FUNCTION down until STORE TO is displayed on the top line of the display and CNTLR SCHEDS is displayed on the second line. Press SELECT to activate the cursor and select CNTLR on the second line. While the cursor is still flashing on CNTLR set the programmer on top of the valve box over the bolt on the valve box cover. Press ENTER. The programmer will display DATA TRANSFER and in 2 to 3 seconds display either DONE or CONTROLLER OFF on the top line and PRESS ANY BUTTON on the bottom line of the display. (If the programmer displays NOT TRANSFERRED try again. If problem persists contact the factory.) DONE indicates the controller has accepted and read back the program properly. CONTROLLER OFF indicates the controller has accepted and read back the program

properly but the controller is in the OFF condition. If no programmer button is pressed the display will automatically change back to the function display after 15 seconds.

To store a schedule (program) in the programmer display to a schedule within the programmer press FUNCTION up or FUNCTION down until STORE TO is displayed on the top line of the display and CNTRL SCHEDS is displayed on the second line. Press SELECT to activate the cursor and select SCHEDS on the second line. While the cursor is still flashing on SCHEDS press ENTER. The programmer will display STORE TO on the top line of the display and SCHEDULE with the cursor blinking over the number "1" on the second line of the display. Use ADJUST + or ADJUST – to adjust the number from 1 to 4. When the desired schedule 1, 2, 3, or 4 is selected press ENTER. DONE will be displayed on the second line of the programmer display momentarily and the schedule viewed on the programmer display will be stored to the selected programmer irrigation schedule.

f. Controller ON/OFF: To turn the controller ON or OFF, press FUNCTION up or FUNCTION down until CONTROLLER is displayed on the top line of the display and ON/OFF is displayed on the second line. Press SELECT to activate the cursor and select either ON or OFF on the second line. While the cursor is still flashing and the desired data is displayed set the programmer on top of the valve box over the bolt on the valve box cover. Press ENTER. The programmer will display DATA TRANSFER and in 1 to 2 seconds display DONE if the controller was turned ON or CONTROLLER OFF if the controller was turned OFF. When the controller is turned OFF no automatic, semi-automatic and manual starts are possible. Rain Delay, Fetch, Store and Mini-Smart test cycles are the only actions possible with the controller OFF. If the controller is in an automatic, semi-automatic or manual cycle when the controller is turned OFF all stations till shut down and no further cycles will start. Upon fetching a program from a controller that is turned OFF the programmer display will indicate the controller is OFF.

9. Operational Considerations

a. Manual and Semi-Automatic Starts: Starting a Manual or a Semi-Automatic cycle will terminate any other cycle in progress and perform the Manual or Semi-Automatic cycle.

b. Help/Info Function: The Help/Info Function provides a variety of helpful information. Pressing SELECT provides the toll free customer service number, a count of the number of valve actuations of the last fetched Controller, the Programmer and Controller firmware versions, and the ability to clear all Programmer memory including all stored irrigation schedules.

c. Battery Check: The Battery Check function indicates the status of the programmer battery and the last fetched controller batteries. Normally the programmer and controller 3.6VDC batteries need not be replaced. The controller 9VDC lithium battery may

require replacing once every several years. The need to replace any battery will be displayed automatically by the programmer upon fetching from the controller. To change the 9VDC controller battery, remove the valve box cover and turn it over. Use a #2 Phillips screwdriver to remove the four screws holding the controller lid in place and remove cover. Snap out the 9VDC battery and replace it with the recommended lithium battery available from your local turf distributor. In an emergency, an alkaline battery may be used, but will provide shorter battery life.

10. Mini-Smart Operation

a. Valve Cycle Test: To observe valve and sprinkler operation without a programmer, place the Mini-Smart activator or the programmer recessed area directly on top of the controller mounting bolt. After 30 seconds each valve will activate for 1 minute in sequence for 1 cycle and stop as long as the Mini-Smart or programmer remains in place. Removing Mini-Smart or programmer during the test cycle will shut off the valve in 5 seconds and end the test. To repeat the test, remove the Mini-Smart or programmer for at least 2 seconds and again position it over the mounting bolt. After another 30 seconds, another test cycle will start.

b. Turning off An Irrigation Cycle: To shut off an active valve and end a cycle, place the Mini-Smart activator or the programmer recessed area directly on top of the controller mounting bolt. After 30 seconds, the currently active irrigation cycle will end. This Mini-Smart feature can be used to allow maintenance of valves and sprinklers without having a programmer. Remove the Mini-Smart or programmer to allow future automatic cycles.

CAUTIONS

1. Do not drop programmer or controller. Physical damage will void warranty.
2. Place programmer centered directly over controller mounting screw head. Programmer will not operate properly unless programmer is resting on top of the valve box with the mounting screw in the recessed area.
3. Leaving programmer on top of the valve box for over 30 seconds without uploading or downloading will initiate a test cycle. It is therefore strongly recommended that all programming functions be completed prior to placing the programmer on top of the valve box to eliminate the accidental starting of a test cycle.
4. After programming any function, press ENTER to record selections. If not entered, program will revert to previous display.
5. DO NOT PLACE MINI-SMART DISC OR PROGRAMMER NEAR CREDIT CARDS OR OTHER MAGNETICALLY SENSITIVE DEVICES. CREDIT CARDS MAY BE PERMANENTLY ERASED.
6. While the controller may be submerged, DO NOT SUBMERGE THE PROGRAMMER or leave it in the rain or directly under the hot sun for prolonged periods of time.
7. The Smart One programmer will operate first generation Smart Alex controllers, but cannot read their battery voltages.
8. The Smart Alex programmer with rotary function switches will not operate the new Smart Alex controllers. Consult factory for instructions.
9. **Do not forget the Mini Smart activator on the valve box. Passing a lawn mower over a valve box could damage the mower and cause a safety hazard.**
10. When changing the controller 9 V Battery, do not allow water or dirt to fall on the circuit board.

WARRANTY

Upon purchase, users of this product agree to the following terms, conditions and limitations of warranty and liability coverage:

Alex-Tronix warrants the Smart-Alex® to be free from original defects for two years from the date of original sale. The manufacturer shall replace, free of charge any part found defective under normal use and service within the guarantee period, provided the product is installed, used, and maintained in accordance with any applicable instructions or limitations issued by Alex-Tronix. Components supplied as replacement parts are warranted for 90 days from the date of shipment. The manufacturer assumes no liability for incidental or consequential damage sustained in the adoption or use of our engineering data, service, or products. Liability is therefore limited to the repair of the product manufactured by Alex-Tronix. No agent or representative of Alex-Tronix or GNA Industries, Incorporated has the authority to waive or add to this agreement. Altered products, damage due to boxes left open or unlocked, or use of products in a manner not intended shall void this warranty. For warranty service, ship unit pre-paid to the address below. Controllers damaged in transit due to improper packaging are not covered by warranty.

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