

# **Stark Pool Controller**

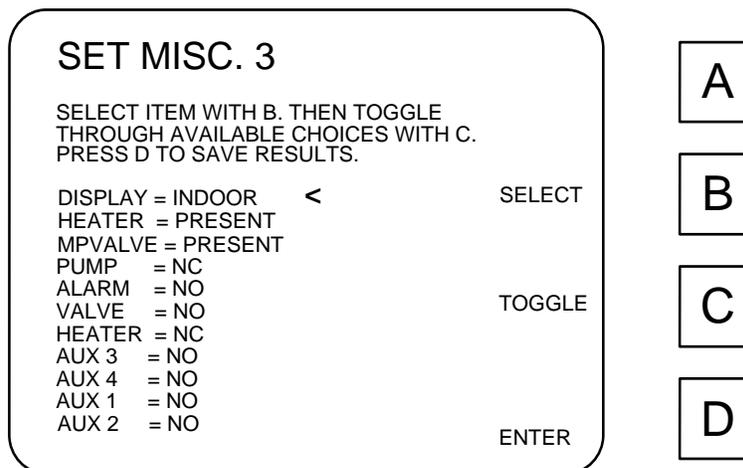
## **Installer's Guide**

Rev 2  
March 10, 1998

## Hidden Screens

The Stark Pool Controller software version 4.2 and newer, contains four "hidden" screens for special configuration and test. Access to three of these screens is gained by selecting "System Parameters", then "Backwash Parameters", then "Page 3". This is the screen normally used to select the number of filters in the system and pump suspend operation. From this screen, three number codes are entered to access the "hidden" screens as follows:

**Configure Hardware - Enter "123".**



**Figure 1, Set Misc. 3**

This screen allows you to configure the controller for the specific hardware that has been selected for this particular installation. Most controllers are shipped with a display that presents white letters on a blue background. This display uses a Cold Cathode Fluorescent backlight and a transmissive type of Liquid Crystal. These displays are very easy to read in normal indoor lighting conditions that would be found in a pump room. Unfortunately, the sun is much brighter than the backlight, so the characters wash out when viewed in direct sunlight. An alternate display is available that displays black characters on a pale green background. This display uses a Light Emitting Diode backlight and a transfective type of Liquid Crystal. This display presents poor contrast when used in normal pump room lighting but becomes easier and easier to read the brighter the ambient light becomes. The first item "DISPLAY" must be correctly configured as "INDOOR" if the blue CCF display is installed or "OUTDOOR" if the green LED display is installed in order to instruct the controller on which voltage to supply to the backlight. If going from an "OUTDOOR" configuration to an "INDOOR" configuration, the backlight of the indoor display will be off when the unit is powered up to change this configuration screen. If adequate ambient light is available, it is possible to see the displayed characters on the screen in order to accomplish this configuration change, although the characters will be very difficult to make out. After the "INDOOR" display has been selected, the next key press should turn on the backlight.

The next line allows you to select whether a heater is wired to the controller or not. If a heater is not present, the Solid State Relay output normally used to control a heater becomes AUX 5. This auxiliary output is energized “AUX 5 DELAY” seconds (as programmed from the Backwash Parameters 2 screen) before the start of a backwash cycle and remains energized for the entire cycle.

The next line allows you to indicate to the system whether a Multiport Valve is being used to switch filters, or whether discrete solenoids are used for each filter. If MPVALVE = ABSENT” is selected, Aux 1 is energized for filter 1 backwash, Aux 2 is energized for filter 2 backwash, Aux 3 is energized for filter 3 backwash, and Aux 4 is energized for filter 4 backwash. The Solid State Relay output normally used to step the Multiport Valve becomes the Master Relay in this configuration.

The remaining eight lines allow the installer to select either normally open or normally closed relays for use on any of the eight outputs. As shipped from the factory, the Pump and Heater outputs are configured to use with Normally Closed interface relays. All other outputs will be configured for Normally Open relays. With this configuration, the pump and heater will continue to operate if the Stark Controller dies or is turned off or removed for some reason. When the controller wants to turn off the pump or heater, it energizes its pump or heater output which then should be used to actuate a Normally Closed electromechanical relay to do the actual power switching. If for some reason Normally Open relays have been installed, these outputs can be toggled to “NO” with the “TOGGLE” key. If a Multiport Valve is being used, care must be taken not to switch this output to “NC” or the Multiport Valve will rotate continually when the controller is in filter mode and the controller will not be able to move the Multiport Valve to the desired positions for backwash operations. When leaving this screen, remember to press the “ENTER” key (“D”) to save the results to EEPROM. The controller must then be turned off and turned back on for these new parameters to take effect.

## Set Valve Shift - Enter "789"

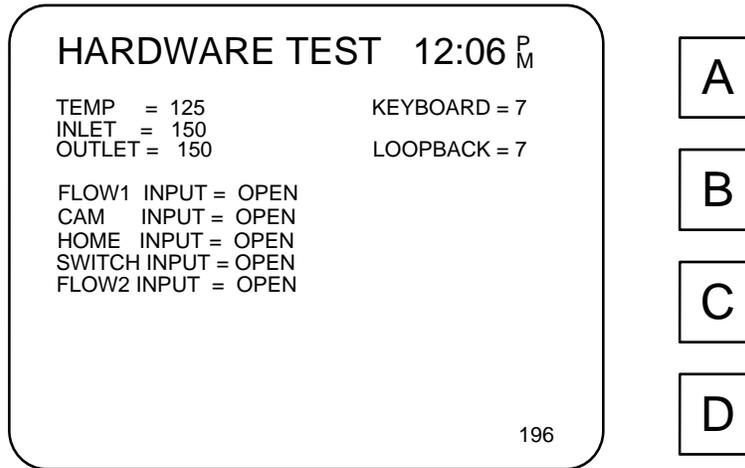


**Figure 2,** Set Valve Shift

"Valve Shift" is the amount of time that the system allows for the actuation of hydraulic valves that are connected to the multiport valve. This delay is useful in the pump suspend mode as it allows all valves to move into position before turning the pump on for backwash for pool operation when stepping to the interfilter delay position between filters. This can be set to any value between 1 and 9999 seconds. Factory default is 60 seconds, but this time is not long enough for large valves or systems with low water pressure.

To exit without changing this value, press "C" for Escape. To save this value in EEPROM, press "D" for Enter. In either case, you will exit back to the "Backwash Parameters" menu.

## Hardware Test - Enter "456"



**Figure 3**, Hardware Test

This screen is used in conjunction with the "Stark Test Set" at the factory to test the pool controller inputs and outputs. It is sometimes useful in the field to see what state the controller thinks various inputs are in or to force outputs to test wiring and fuses.

When in this screen, keys "1" through "8" turn on the Solid State Relays as follows:

key "1"	Pump
key "2"	Alarm
key "3"	Multiport Valve
key "4"	Heater
key "5"	Aux 3
key "6"	Aux 4
key "7"	Aux 1
key "8"	Aux 2

Press key "0" to turn all relays off.

One useful test is to energize the multiport valve by pressing key "3" and then watching the "CAM" and "HOME" inputs open and close as the multiport valve goes around. The "CAM" switch should close at each filter position and the "HOME" switch should close only once per revolution at the "0" filter position. If either of these inputs is not opening or closing correctly, the microswitch mounting plate on the multiport valve must be adjusted (or there is a wiring problem to the multiport valve) before the system can successfully position the multiport valve.

Care must be exercised when using this screen in the field on an installed controller as none of the safeties are present that would normally prevent you from turning off the pump while the heater is

on (causing the heater to overheat), short cycling the pump, or deadheading the pump into closed valves.

The "KEYBOARD" line indicates which key the controller thinks is being pressed. This indication is also sent out of the RS-232 port. The "LOOPBACK" line displays what character is being received into the RS-232 port. By connecting the TX and RX terminals on the terminal strip (terminals 23 and 24), the remote interface of the controller can be tested. For example, press the "HELP" key and notice the "KEYBOARD = H" message that is displayed in the upper right of the display. The "LOOPBACK = H" message below this indicates that the H key information was sent out of the "REMOTE" TX port and looped back into the "REMOTE" RX port and was received as a H.

Press keys 9, D, C, B, and A and notice the LEDs illuminating on the pool controller. This tests the display LEDs.

Throughout this test, the beeper will be beeping each time a key is pressed. This tests the beeper.

The number in the lower right of the screen is the total number of elapsed days that the unit has been in operation. This will be useful to track service life.

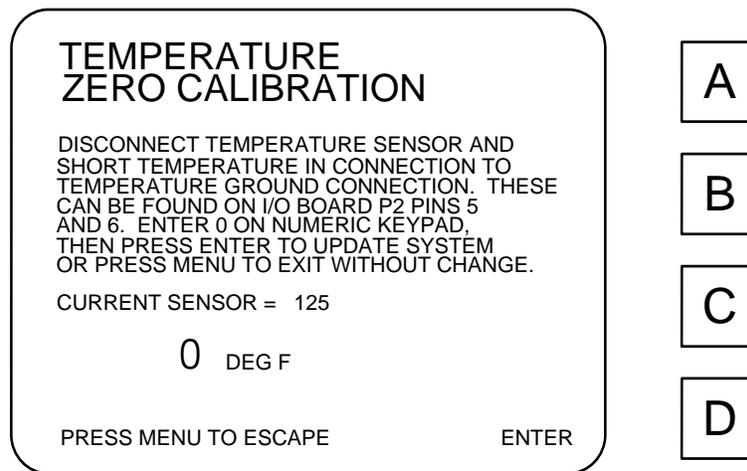
The only way to exit this screen is to turn off the power.

## System Calibration

Calibration of the analog inputs (pressure and temperature) of the Controller is accomplished in two stages, system hardware calibration and software calibration. The system hardware must be calibrated each time a pressure sensor is replaced. Since this sensor replacement involves complete disassembly of the controller, it is normally considered to be a “Return to Factory” repair. This hardware calibration should never need to be done in the field. Factory Test documentation gives detailed instructions of this hardware calibration procedure.

Software calibration can be accomplished in the field and may be required to bring the controller readings into agreement with other pressure or temperature indicating devices such as glass bulb thermometers or mechanical pressure gauges. Software calibration of the controller is described in the Operator’s Manual with the exception of calibration of the 0 degree point of the temperature inputs. To accomplish this calibration, a fourth “hidden screen” must be accessed.

From the “Temperature Calibration” screen, press “123”. The following “Temperature Zero Calibration” screen will be presented.



**Figure 4,** Temperature Zero Cal.

Follow directions on the screen. Note that P2 pins 5 and 6 are mentioned. These same points are more easily accessible on a installed controller as terminals 18 and 19 of the field wiring terminal block. The temperature probe, if present, should be temporarily disconnected from these terminals for this procedure to prevent shorting circuiting the probe.