

SOLAR OPERATIONS

To adjust current Heating Temperature:

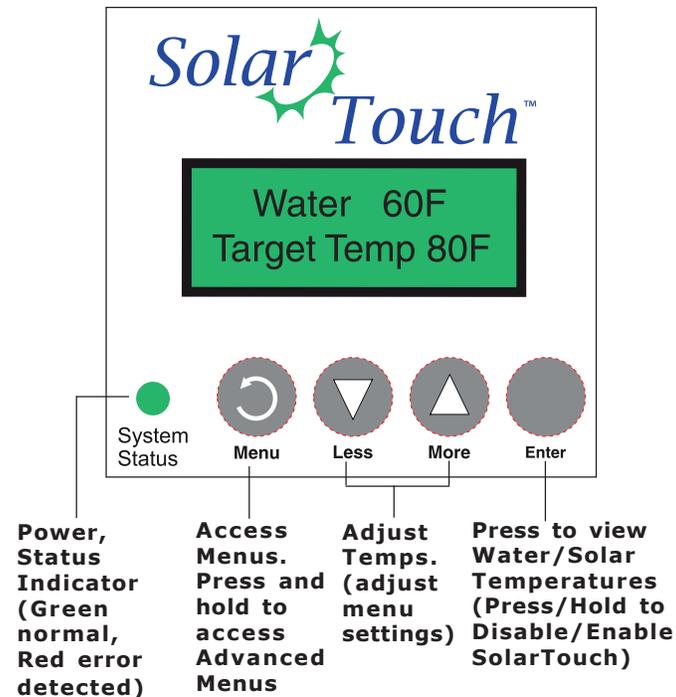
1. Press **Less or More** button to adjust to the desired temperature.
2. Press the **Enter** button to toggle between the Water/Solar temperatures.

Setting Water Temperature: To adjust the water target temperature, press the **Less (Down arrow) button or More (Up arrow) button** to lower or raise the set temperature to the desired level. The water temperature can be adjusted from 40° F to 104° F (4° C to 40° C). This allows the solar system to heat the water up to the target temperature.

Optimum Water Temperature: To achieve optimum water temperature, the solar roof sensor must be 6° higher than the water temperature. The pump must be ON for a few minutes for operation. When the roof sensor and the water temperature are within for example 2° (default), solar heat will switch off. This differential setting is adjustable in the "Diff to Stop" setting and is factory set at 2°, (see page 2). This setting sets how close to the temperature to switch off solar heat. Adjust the start and stop temperature differential settings to start and stop solar water heating. Adjusting the differential will effect the performance of your solar system. Refer to your solar service professional for the optimum setting.

Pool Pressure Cleaner Delay: Whenever the solar system is turned on, an electronic delay automatically turns off the pool pressure cleaner for five minutes. This protects the pump from damage caused by air in the solar panels at system start-up. The pressure cleaner is connected to "Cleaner Interrupt" terminal on the SolarTouch circuit board which will be always set to on.

Solar (Filter) Pump Timer: The solar (filter) pump timer must be set so that the filter pump operates during the time of the day when solar energy is available.



MAIN SCREEN DISPLAY

Main Screen: In normal operating mode the main screen displays the current WATER temperature and the HEATING or COOLING temperature. Press the **Enter** button to toggle between the current Water and Solar temperature.

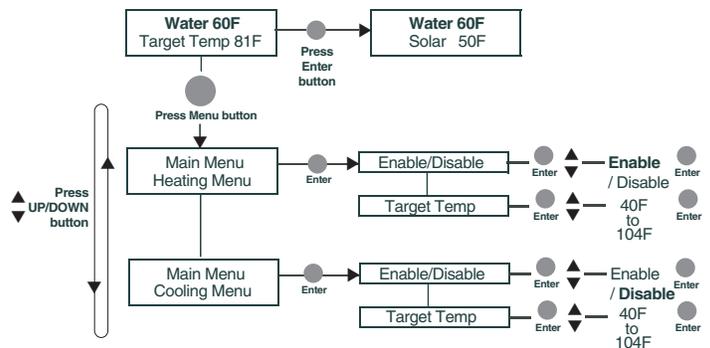
Freeze Protection: To display the air temperature, an optional air sensor is required. The air sensor is also used for freeze protection. The filter pump and optional relay must be connected to an external time clock for freeze protection to work.

Normal Operating Mode

In normal operating mode the main screen displays the current WATER temperature and the HEATING or COOLING target temperature. Press the Enter button to toggle between the current Water and Solar temperature. Degree units are displayed in either Fahrenheit or Celsius (see Advanced menu). Based on the current solar and water temperatures, SolarTouch operates automatically to control water through the solar collectors. "Target Temp" is displayed on the main screen indicating SolarTouch is in normal operating mode. This mode will automatically switch the system on whenever solar energy is available. SolarTouch will heat the pool or spa (rotate the valve to solar position and turn on a booster pump) when solar heat is available and the "Target Temp" is set higher than the water temperature. The solar roof sensor must be 6° higher than the water temperature. The pump must be ON for a few minutes for operation. When the roof sensor and the water temperature are within 2°, solar heat will switch off. The solar temperature start and stop differential settings are factory set at 6° and 2°. These differential settings are adjustable in the Advanced Menu settings. Refer to your solar service professional for the optimum setting.

CONTROL BUTTONS

Press **Menu** button to access the main menu.



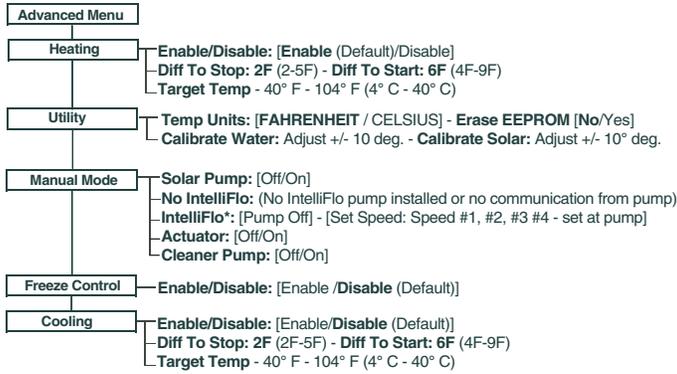
Main Menu

Press **Menu** button to access the Main menu.



Advanced Menu

Press and hold the **Menu button** to access the Advanced menu.



Note: (*) Only displays is IntelliFlo pump is connected and communicating with SolarTouch.

HEATING

The SolarTouch system can heat the pool/spa by circulating water through the solar panels. Heating must be enabled in the Heating Menu. The initial default setting is "Enabled." To start and stop solar water heating, adjust the start (default 6°) and stop (default 2°) temperature differential settings.

The Heating Menu settings are as follows:

Menu Item	Action
Enable/Disable	Enables or disables Heating.
Target Temp	The desired pool/spa temperature.
Diff To Start *	(4°F - 9°F) The minimum temperature difference to start Heating.
Diff To Stop *	(2°F - 5°F) The temperature difference at which Heating will stop.

(*) available in Advanced Menu

Heating will start when both the "Diff To Start" condition is met and the water temperature is below the Target Temp. Heating will continue until either the temperature difference reaches the "Diff To Stop" or the water temperature reaches .8°F above the Target Temp. You can adjust the start (default 6°) and stop (default 2°) temperature differential settings to adjust when to start and stop solar water heating.

When Heating is ON; the Solar Pump Relay and Valve Actuator are activated (ON). After five minutes the Cleaner Pump Relay will turn on.

IntelliFlo pump installed: If an IntelliFlo® pump is detected, it will be set to **Speed #2.** (1500 RPM default speed for all IntelliFlo and IntelliPro® pumps except for IntelliFlo VF (Press Manual button on pump to set RPM and GPM speeds. See the IntelliFlo VF manual (P/N 350075).

When Heating is OFF; the Solar Pump Relay and Valve Actuator are turned off. The Cleaner Relay remains on.

IntelliFlo pump installed: If an IntelliFlo pump is detected, it will go to stand-alone mode (may take up to two minutes). The pump is not being controlled by SolarTouch at this time.

Heat Start and Stop Temp Differentials: To start and stop solar water heating, adjust the start (default 6°) and stop (default 2°) temperature differential settings.

COOLING

The SolarTouch system can cool the pool/spa by circulating water through the solar panels when the solar controller is at a lower temperature than the pool/spa water (typically at night). Cooling must be enabled in the Cooling Menu. The default setting is "Disabled." To start and stop cooling, adjust the start (default 6°) and stop (default 2°) temperature differential settings. The Cooling Menu settings are as follows:

Menu Item	Action
Enable/Disable	Enables or disables Cooling.
Target Temp	The desired pool/spa temperature.
Diff To Start*	4°F - 9°F (-15°C to -13°C) is the minimum temperature difference to start Cooling.
Diff To Stop*	2°F - 5°F (-16°C to -15°C) is the temperature difference at which Cooling will stop.

(*) available in Advanced Menu

Cooling turns ON; when the water temperature is above the target temperature then cooling will be turned on and the Solar Pump Relay and Valve Actuator are activated (ON). After five minutes the Cleaner Pump Relay will turn on.

IntelliFlo pump installed: If an IntelliFlo® pump is detected, it will be set to **Speed #2.** (1500 RPM default speed for all IntelliFlo and IntelliPro pumps except for IntelliFlo VF (Press Manual button on pump to set RPM and GPM speeds. See the IntelliFlo VF manual (P/N 350075).

Cooling turns OFF; when the water temperature is below the target temperature the Solar Pump Relay and Valve Actuator are turned OFF. The Cleaner Relay remains on.

IntelliFlo pump installed: If an IntelliFlo pump is detected, it will go to stand-alone mode (may take up to two minutes). The pump is not being controlled by SolarTouch at this time.

Nocturnal Cooling: SolarTouch provides automatic nocturnal cooling for pools in hot climates that overheat. Water circulates through the system when the collector temperature and the pool temperature is hotter than the target temperature setting. Circulation will stop when the collector temperature is 2° (Default) less than the pool temperature or when the pool temperature is cooler than the target temperature setting.

FREEZE CONTROL

Please note that the initial "Freeze Protect" default setting is "Disabled". When the water or solar sensor temperature falls to 40°F (4°C) or below, the pool/spa water is automatically circulated through the system to prevent freezing. When the solar temperature sensor and the water sensor reaches 42°F (6°C) and above, freeze protection will stop. The Freeze Menu settings are as follows:

Menu Item	Action
Enable/Disable:	Freeze Protect will start when either the water or solar temperature reaches 40°F (4°C) or below. Freeze Protect will continue until both temperatures reach at least 42°F (6°C).
When Freeze Protect is turned ON;	the Solar Pump Relay and Valve Actuator are activated (ON). If an IntelliFlo pump is detected, it will be set to Speed #3. After five minutes the Cleaner Pump Relay is turned on.

When Freeze Protect is turned OFF; the Solar Pump Relay and Valve Actuator are turned off. If an IntelliFlo pump is detected, it will go to stand-alone mode (may take up to two minutes). The pump is not being controlled by SolarTouch at this time.

MANUAL MODE

The "MANUAL MODE" menu setting is accessed from the Advanced menu. Manual mode is useful for setup or service purposes. Manual mode menu settings will override existing SolarTouch system settings. After you exit the Manual mode menu all previous system settings will resume. **Note: While in the Manual mode menu, the system will stay in Manual Mode until you manually exit back to the Advanced Menu.** In Manual Mode the SolarTouch relays can be manually controlled. Manual Mode is only available in the Advanced Menu. Any changes made to settings while in Manual Mode will not affect previously save settings.

The Manual Mode Menu settings are as follows:

Menu Item	Action
Filter Pump	On / Off
Cleaner Pump	On / Off
Actuator	On / Off
IntelliFlo*	Pump Off / Speed #1 /Speed #2 / Speed #3 / Speed #4

(*) IntelliFlo will only be displayed if an IntelliFlo pump is detected)

Manual Mode

Any setting changed while in "Manual" mode do not affected previous settings. For example if "actuator" was set to "On" during Manual mode, after exiting from Manual mode, the previous actuator setting will be in effect.

Each relay remains in the state it was in when entering Manual Mode until it is manually changed. While in manual mode, each relay will stay in any state set by the user as long as they stay in Manual Mode.

Note: When exiting Manual Mode, all relays are **turned off**, and then set to the appropriate state depending on previously save settings.

Important! IntelliFlo Variable Speed pump running a schedule and SolarTouch in MANUAL MODE

If the IntelliFlo® Variable Speed pump is running a scheduled program (speed and time) and SolarTouch is put into **Manual Mode (Advanced menu)**, SolarTouch will interrupt the scheduled program. When SolarTouch is returned to normal operations, the IntelliFlo pump will resume the duration of the scheduled time at the **default speed for Speed button #1 (750 RPM)**. *So if the scheduled program is setup for a custom speed (1-8), you need to adjust the pump to the programed speed previously in use.*

Note: See back page for IntelliFlo pump set up.

RESET SYSTEM TO DEFAULT SETTINGS

Factory Default Settings (ERASE EEPROM)

The "Erase EEPROM" menu setting is accessed from the Advanced > Utility menu. Use this feature to reset SolarTouch to its default settings. The default settings are as follows:

Function	Setting
Heating	Enabled
Cooling	Disabled
Freeze	Disabled
Start Diff.	6°F (-14° C)
Stop Diff.	2°F (-16.6° C)
Target Heating	80°F (26° C)
Target Cooling	90°F (32° C)

DISABLE/ENABLE SYSTEM

Using the Enter Button to Disable/Enable SolarTouch System

For service purposes, the SolarTouch system can disable Heating, Cooling and Freeze Protect. Press and hold the Enter button to disable the system. The display shows "SolarTouch Disabled". Press and hold the **Enter button** again to enable the SolarTouch system.

GENERAL INFORMATION

Cooling/Cool Start and Stop Temp Differentials (see HEATING & COOLING (Advanced Menu): Enable cooling feature at night. Adjust the start (default 6°) and stop (default 2°) temperature differential settings to start and stop solar water heating. SolarTouch provides automatic solar heating control using a differential temperature control designed especially for solar-heated swimming pool, spas, and hot tubs. Also included is solar nocturnal cooling control for optimizing heat control at night. Whenever solar energy is available, SolarTouch will automatically activate a motorized three-port solar valve and/or the optional solar booster pump which controls the water flow direction, and pump pool water through the solar collectors. The filter pump timer can be set so the filter pump is operating during that time of the day when solar energy is available. If you are using a pool cleaner booster pump for your pool, SolarTouch will disable the pump for five minutes whenever the solar system turns on. This protects the pump from possible damage caused by residual air within the solar panels.

Solar Freeze protection: (Freeze Control - Advanced Menu) Enable freeze protection (**Freeze Control - Advanced Menu**) for the solar equipment.

Freeze Control (Advanced Menu) Enabled: The circuit will switch on if the air temperature drops to 40°F (4°C).

This feature is used to protect the system plumbing from being damaged during freezing conditions.

High voltage relay output, as a booster pump control:

The SolarTouch controller control panel can control a high voltage booster pump in addition to the normal low voltage solar valve. The high voltage relay contacts are isolated so that the booster pump can be run on a separate circuit.

High voltage relay output, as a time clock override: The SolarTouch controller can be used to override a filter pump timer. This feature is important if re-circulate freeze protection or nocturnal cooling functions are being used. Also, this function can be used on systems that should operate whenever solar heat is available, regardless of the timer settings.

Low voltage output: Solar Valve Connector: The SolarTouch can control a single solar valve, which diverts water depending on the temperature of the water and the settings. There are two three pin valve actuator connectors provided on the SolarTouch circuit board. Select either connector to be used for the desired direction of the valve (pool or spa).

Time clock pool daily filtering override: When using single or two speed pump, or an IntelliFlo or IntelliPro VS 3050 and 4x160 pump, for daily pool filtering schedules SolarTouch requires the pump to be connected to an external 24 hour time clock. In order to override the daily pool filtering schedules, a two-pole timer or two-pole relay for switching the pump on or off is required.

CAUTION! All of the electrical wiring methods and materials used to complete the electrical installation of the pool/spa system must be in accordance with the National Electrical Code or the Canadian Electric Code, as well as any local electrical codes in effect at the time of installation.

Using IntelliFlo or IntelliPro pumps for daily filtering:

When using an IntelliFlo or IntelliPro Variable Speed or IntelliFlo VF pump connected to SolarTouch, an external 24 hour time clock for daily pool filtering is not required. These pumps have built-in programs to schedule daily pool filtering.

Temperature Sensors: A three-position, 45° angled connector, is provided for the installation of the pool water and solar temperature sensors (center position on connector is common for both sensors). The water and solar sensors can be calibrated from the "Utility Menu" in the Advanced menu.

Note: If both sensors are open or shorted and Freeze Protect is enabled, Freeze Protect will be turned on.

Note: For SolarTouch ERROR conditions, see page 4.

INTELLIFLO/INTELLIPRO PUMP SETUP

Using IntelliFlo & IntelliPro Pumps with SolarTouch Solar Controller

The SolarTouch Controller communicates with the IntelliFlo pump via a two-conductor RS-485 communication cable (P/N 350122) which is connected to the COM port on the SolarTouch Controller circuit board (see wiring diagram on page 18). If an IntelliFlo or IntelliPro VS 3050 or 4x160 pump is being used as the main solar pump, an external automatic time clock is required to set the daily pool/spa filtering schedules. It is recommended to use a time clock that can be programmed in 15 minute increments for multiple ON/OFF times. However, it's not necessary to use a time clock when using an IntelliFlo or IntelliPro Variable Speed, IntelliFlo VF, or IntelliFlo or IntelliPro VS+SVRS pump. These pumps have built in scheduling features. For more information about IntelliFlo and IntelliPro pumps, visit www.pentairpool.com.

Adjusting IntelliFlo or IntelliPro Pump Preset Speeds

Be sure the pump is powered on and the green power LED is on. Note: SolarTouch supports one IntelliFlo or IntelliPro pump assigned to pump ADDRESS 1. Note: The IntelliFlo pump must be in "Running" mode to communicate with the SolarTouch controller.

To adjust one of the four preset (default) pump speeds:

The following describes how to adjust IntelliFlo and IntelliPro pump speeds.

The pump models include:

IntelliFlo & IntelliPro Variable Speed Programmable

IntelliFlo & IntelliPro VS 3050

IntelliFlo 4x160

IntelliFlo & IntelliPro VS+SVRS

IntelliFlo VF

1. Press the desired speed button (1- 4) to select the preset pump speed. When the selected speed button is pressed, the LED is on. The pump preset buttons and speeds are: Speed button #1, 750 RPM. #2, 1500 RPM. #3, 2350 RPM and #4, 3110 RPM.
2. Press the Start button. The pump will ramp to the selected preset speed.
3. Adjusting the pump speed while the pump is running, Press the Up/Down button to increase or decrease the pump speed. To save the adjusted speed, Press and hold down a Speed Button for three (3) seconds to save speed to the button or press the Enter button to save the speed.

TROUBLESHOOTING

Pool/Spa is not warm during sunny conditions:

- Check SolarTouch "Target temperature," it may be set too low?
- Check time clock settings are set to the best sunshine hours of the day.
- Solar Actuator Valve may be turned OFF?
- The pool filter may be dirty or clogged. Check the filter PSI and flow strength at pool outlets.
- Pump speed may need to be increased to pump water through system.
- Possible pool/spa water heat loss during nighttime. Might need a pool cover to prevent heat loss.
- Not enough solar collectors. Add an additional solar collector.

Bubbles in your pool/spa water: Clean filter: Check filter pressure with solar off then on. If the pressure is high (30 pounds or more) and does not increase with solar on, the filter needs cleaning.

- Check pool skimmer and pump basket for debris.

SolarTouch valve actuator is not switching positions or producing noise: Replace fuse 1A (1.5 AMP) on SolarTouch controller circuit board if necessary.

ERROR MESSAGES

When the control panel LED indicator is red, a sensor error has occurred. The control panel LCD will display the error message if either or both of the sensors are shorted or open. If the water or solar temperature sensor is shorted or open, heating and cooling will stop and not restart until the condition is corrected. Note: The control panel menus can be accessed but will not affect the error condition.

If one or both of the sensors is shorted or open and Freeze Protect is enabled, Freeze Protect will turn on.

If both sensors are open or shorted and Freeze Protect is enabled, Freeze Protect will be turned on.

IF FREEZE MODE IS DISABLED	 System Status	IF FREEZE MODE IS ENABLED
Water Sensor Shorted	← The water sensor reads over maximum temperature >390°F (199°C).	→ Water S Shorted Freeze Protect
Solar Sensor Shorted	← The solar sensor reads over maximum temperature >390°F (199°C).	→ Solar S Shorted Freeze Protect
Both Sensors Shorted	← Both temperature sensors read over maximum temperature >390°F (199°C).	→ Sensors Shorted Freeze Protect
Water Sensor Open	← The water temperature sensor circuit is open or disconnected.	→ Water S Open Freeze Protect
Solar Sensor Open	← The solar temperature sensor circuit is open or disconnected.	→ Solar S Open Freeze Protect
Both Sensors Open	← Both temperature sensor circuits are open or disconnected.	→ Sensors Open Freeze Protect

Note: For complete SolarTouch installation instructions please see the SolarTouch User's Guide (P/N 521591).

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