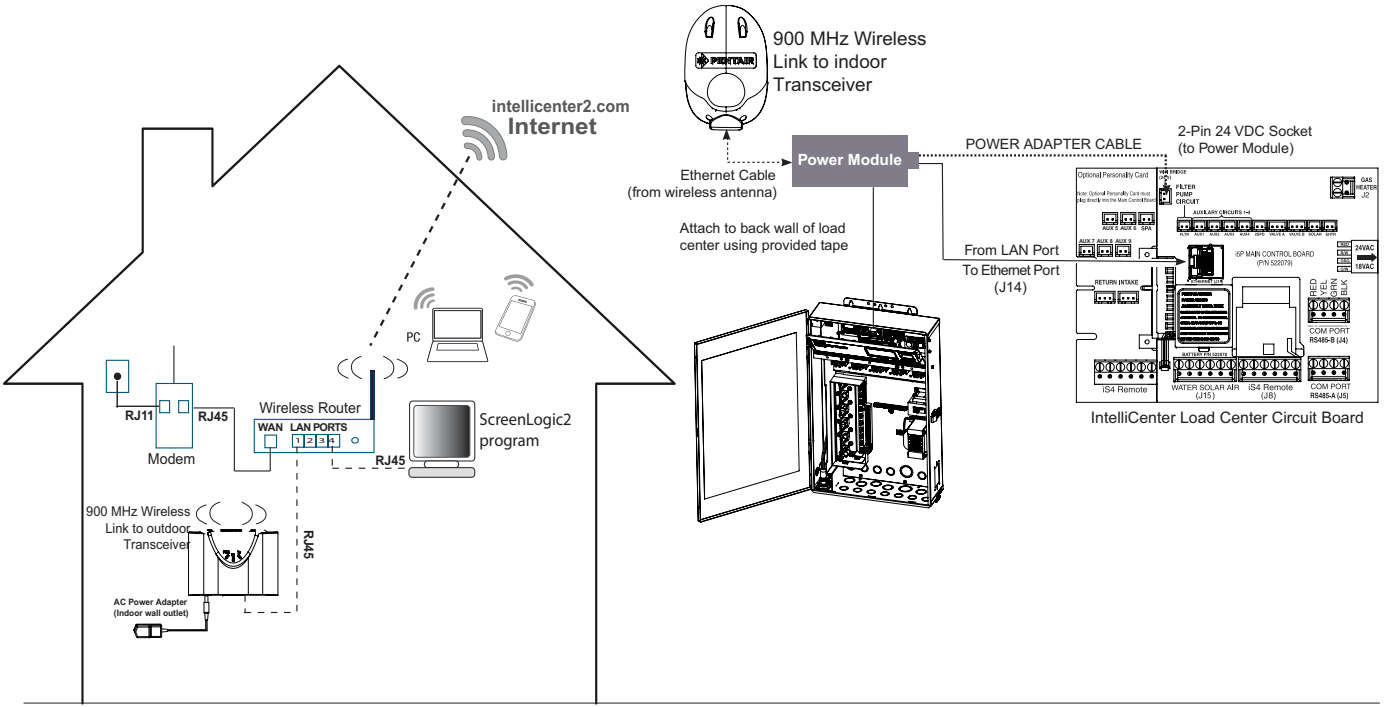


900 MHz Wireless Wiring Diagram
(for 900 MHz Wireless Installations Only)

Configurations and Models

PANEL:	TYPE:	CAPABILITY:
OCP0	i5P	i5P Capabilities: Single body of water (Pool or Spa) Filter pump relay + 4 AUX relays Valve A & B Heater control (Gas & Electric) Solar relay output 2-speed relay output Water, Air, Solar Sensor Two COM ports Ethernet port iS4 port
OCP0	i5PS	i5PS Capabilities: Shared equipment (Pool and Spa) Intake & Return valves
OCP0	i8P	i8P Capabilities: Single body of water (Pool or Spa) Filter pump relay + 7 AUX relays
OCP0	i8PS	i8PS Capabilities: Shared equipment (Pool and Spa) Filter pump relay+ 7 AUX relays Intake & Return valves
OCP0	i10P	i10P Capabilities: Single body of water (Pool or Spa) Filter pump relay+ 9 AUX relays
OCP0	i10PS	i10PS Capabilities: Shared equipment (Pool and Spa) Filter pump relay+ 9 AUX relays Intake and Return valves
OCP0	i10D	i10D Capabilities: Dual Bodies of water with separate Pumps, Filters and Heaters

1 OR 2 BODIES OF WATER:

OCP0:	**Main Circuit board - i5P capability**
EXP1:	Exp Motherboard - i5X or i10X
EXP2:	Exp Motherboard - i5X or i10X
EXP3:	Exp Motherboard - i5X or i10X

Error Messages and Codes (Standard Gas Heater)

Message	Note
5 Alarms in an hour	Indicates 5 faults have occurred in 1 hour. This fault will automatically reset in one hour or can be manually reset by pressing the ON/OFF button. Press the ON/OFF button to clear the alarm. Check heater over the next few minutes/hours to see if alarm appears again. This alarm most likely caused the five alarms in one hour.
Brownout	Check input voltage to the heater, supply voltage should be between 208 and 260 Volts or have technician inspect heater for bad transformer.
Communication Lost	This usually indicates that the communication cable between heater and the automation system has been disrupted in some manner. Check this wiring.
Defrost Temp Sensor Open	Call technician to verify condition and connection of defrost temp sensor and/or control board.
Defrost Temp Sensor Shorted	Call technician to verify condition and connection of defrost temp sensor and/or control board.
High Refrigerant	Check to be sure that water circulation pump is on. If pump is on, verify flow rate is adequate. If equipped with an external bypass plumbing loop, ensure that the bypass valve is closed allowing water to flow through the heater. If these troubleshooting steps do not resolve the problem, call technician.
High Water Temperature	Water temp is above 107°F [41.6°C]. Call technician to verify operation of thermistor and/or control board.
Low Ambient Temperature	Defrost cycle did not complete within allotted time or bad thermistor.
Low Refrigerant	Air and water temperatures may be too cold to operate the heater. Wait until temperatures warm up and check for proper operation. Also ensure the area around the heater is not blocking air flow to the air coil. Check fan for proper operation. If these troubleshooting steps do not resolve the problem, call technician.
Low Water Flow	Check to be sure that water circulation pump is on. If pump is on, verify flow rate is adequate. If equipped with an external bypass plumbing loop, ensure that the bypass valve is closed allowing water to flow through the heater. If these troubleshooting steps do not resolve the problem, call technician.
Low Water Temperature	Call technician to verify operation of thermistor and/or control board.
Pool and Spa remote inputs are both enabled	Pool and Spa remote inputs are simultaneously energized. Call technician to correct wiring error.
Water Temp Sensor Open	Verify connection to water temp sensor. Call technician to verify condition and connection of water temp sensor.
Water Temp Sensor Shorted	Verify connection to water temp sensor. Call technician to verify condition and connection of water temp sensor.

Error Messages and Codes (Solar Heater)

Message	Note
5 Alarms in an hour	Indicates 5 faults have occurred in 1 hour. This fault will automatically reset in one hour or can be manually reset by pressing the ON/OFF button. Press the ON/OFF button to clear the alarm. Check heater over the next few minutes/ hours to see if alarm appears again. This alarm most likely caused the five alarms in one hour.
Brownout	Check input voltage to the heater, supply voltage should be between 208 and 260 Volts or have technician inspect heater for bad transformer.
Communication Lost	This usually indicates that the communication cable between heater and the automation system has been disrupted in some manner. Check this wiring.
Defrost Temp Sensor Open	Call technician to verify condition and connection of defrost temp sensor and/ or control board.
Defrost Temp Sensor Shorted	Call technician to verify condition and connection of defrost temp sensor and/ or control board.
High Refrigerant	Check to be sure that water circulation pump is on. If pump is on, verify flow rate is adequate. If equipped with an external bypass plumbing loop, ensure that the bypass valve is closed allowing water to flow through the heater. If these troubleshooting steps do not resolve the problem, call technician.
High Water Temperature	Water temp is above 107°F [41.6°C]. Call technician to verify operation of thermistor and/or control board.
Low Ambient Temperature	Defrost cycle did not complete within allotted time or Bad thermistor.
Low Refrigerant	Air and water temperatures may be too cold to operate the heater. Wait until temperatures warm up and check for proper operation. Also ensure the area around the heater is not blocking air flow to the air coil. Check fan for proper operation. If these troubleshooting steps do not resolve the problem, call technician.
Low Water Flow	Check to be sure that water circulation pump is on. If pump is on, verify flow rate is adequate. If equipped with an external bypass plumbing loop, ensure that the bypass valve is closed allowing water to flow through the heater. If these troubleshooting steps do not resolve the problem, call technician.
Low Water Temperature	Call technician to verify operation of thermistor and/or control board.
Pool and Spa remote inputs are both enabled	Pool and Spa remote inputs are simultaneously energized. Call technician to correct wiring error.
Water Temp Sensor Open	Verify connection to water temp sensor. Call technician to verify condition and connection of water temp sensor.
Water Temp Sensor Shorted	Verify connection to water temp sensor. Call technician to verify condition and connection of water temp sensor.

Error Messages and Codes (Hybrid Heater)

Message	Note
5 Alarms in an hour	Indicates 5 faults have occurred in 1 hour. This fault will automatically reset in one hour or can be manually reset by pressing the ON/OFF button. Press the ON/OFF button to clear the alarm. Check Heater over the next few minutes/ hours to see if alarm appears again. This alarm most likely caused the five alarms in one hour.
Air Flow Switch	Call technician to troubleshoot heater. USE EXTREME CAUTION or call dealer or factory for advice before attempting to troubleshoot Electrical Box.
Automatic Gas Shut Off	Check to be sure that water circulation pump is on. If pump is on, verify flow rate is adequate. If these troubleshooting steps do not resolve the problem, call technician.
Brownout	Check input voltage to the heater, supply voltage should be between 208 and 260 Volts or have technician inspect heater for bad transformer.
Communication Lost	This usually indicates that the communication cable between heater and the automation system has been disrupted in some manner. Check this wiring.
Condensate Filter	Condensate neutralizer cartridge's effective lifetime has expired. Heater run time has met service interval for condensate neutralizer cartridge. Check pH of gas heater condensate. Replace as necessary and reset alarm/counter.
Condensate Float Switch	Condensate float switch detects water in exhaust stack. Verify proper hose routing from heater base. Ensure there are no loops, kinks or elevated portions between hose exit and heater base. Correct as necessary. If checking the hose routing does not solve problem, call technician to troubleshoot.
Freeze Warning	Ambient air temperature is too low for gas heater operation. Shut down and properly winterize heater. If ambient air temp is not low, call technician to troubleshoot.
High Limit Switch	Check to be sure that water circulation pump is on. If pump is on, verify flow rate is adequate. If these troubleshooting steps do not resolve the problem, call technician.
High Refrigerant	Check to be sure that water circulation pump is on. If pump is on, verify flow rate is adequate. If equipped with an external bypass plumbing loop, ensure that the bypass valve is closed allowing water to flow through the heater. Check fan for proper operation. If these troubleshooting steps do not resolve the problem, call technician.
High Water Temperature	Water temp is above 107°F [41.6°C]. Call technician to verify operation of thermistor and/or control board.
ICM Fault	Call technician to troubleshoot heater.
Low Ambient Temperature	Defrost cycle did not complete within allotted time or Bad thermistor.

Error Messages and Codes (Hybrid Heater) (cont.)

Message	Note
Low Refrigerant	Air and water temperatures may be too cold to operate the heater. Wait until temperatures warm up and check for proper operation. Also ensure the area around the heater is not blocking air flow to the air coil. Check fan for proper operation. If these troubleshooting steps do not resolve the problem, call technician.
Low Water Flow	Check to be sure that water circulation pump is on. If pump is on, verify flow rate is adequate. If these troubleshooting steps do not resolve the problem, call technician.
Low Water Temperature	Call technician to verify operation of thermistor and/or control board.
Stack Flue High Temp	Check exhaust vent for obstruction. Verify proper water flow to heater. If these troubleshooting steps do not resolve the problem, call technician.
Stack Flue Open/Short	Call technician to verify condition and connection of stack flue sensor and/or control board.
Suction Temperature Sensor Open/Short	Call technician to verify operation of defrost temp sensor and/or control board.
Thermal Fuse	Thermal fuse is open. Call technician to troubleshoot.
Water Temperature Sensor Open/Short	Call technician to verify operation of thermistor and/or control board.

Error Messages and Codes (MasterTemp and Max-E-Therm)

Message	Note
Water Pressure Switch	Insufficient water flow rate. Increase the water flow. Inspect the pump basket to remove debris. Eliminate other obstructions for water to flow.
High Limit Switch	Water outlet has exceed 135°F [57.2°C]. Verify water flow rate is above minimum. Service pump and filter to restore proper flow. Verify water inlet temperature is below 104°F [40°C]. Verify internal bypass valve, thermal governor and heat exchanger for blockage.
Air Flow Switch	Insufficient blower air flow. Verify blower operation. Check for any blockage in the blower intake, heat exchanger, and exhaust.
Auto Gas Shutoff Switch	Water outlet has exceed 135°F [57.2°C]. Verify water flow rate is above minimum. Service pump and filter to restore proper flow. Verify water inlet temperature is below 104°F [40°C]. Verify internal bypass valve, thermal governor and heat exchanger for blockage.
Ignition Control Error	Contact a service professional.
Stack Flu Sensor Error Alarm	Excessive stack flue temperature. Contact a service professional.
Stack Flu Sensor Open Alarm	Contact a service professional to verify condition of flue gas sensor.
Stack Flu Sensor Short Alarm	Contact a service professional to verify condition of flue gas sensor.
Water Sensor Open Alarm	Contact a service professional to verify condition of water sensor.
Water Sensor Short Alarm	Contact a service professional to verify condition of water sensor.
Air Flow Fault Alarm	Insufficient blower air flow. Verify blower operation. Check for any blockage in the blower intake, heat exchanger, and exhaust. Contact a service professional to verify condition of air flow switch.
Flame No Call For Heat Alarm	Contact a service professional.
Ignition Lockout Alarm	Contact a service professional.
Weak Flame Alarm	Flame strength is low. Contact a service professional.
Communication Lost	This usually indicates that the communication cable between heater and the automation system has been disrupted in some manner. Check this wiring.

Error Messages and Codes (IntelliChem)

Message	Note
Auto Calibration Failed	Calibration has failed. Ensure the circuit board is clean and dry.
Check ORP Container	ORP chemical tank is running low. It may be time to refill it.
Check pH Container	pH chemical tank is running low. It may be time to refill it.
Communication Lost	IntelliChem has lost communication with the outdoor control panel. Check that the filter pump relay is active and that the communication cable is wired properly.
Invalid Settings	Incompatible setting during pH setup
ORP Dose Limit	IntelliChem has several safeguards built into it to prevent too much chlorine from being dispensed into your pool. One of them is a daily maximum feed limit (usually in ounces). If this limit is reached, it will stop allowing chlorine from being dispensed. You may need to increase IntelliChem's daily ORP feed limit to prevent this alarm.
pH Dose Limit	IntelliChem has several safeguards built into it to prevent too much muriatic acid from being dispensed into your pool. One of them is a daily maximum feed limit (usually in ounces). If this limit is reached, it will stop allowing muriatic acid or CO_2 from being dispensed. You may need to increase IntelliChem's daily pH feed limit to prevent this alarm.
pH Lockout	IntelliChem is not able to keep your pH level at a low enough level (usually below 7.8) to not have a suppressive effect on your ORP level. To prevent IntelliChem from adding too much chlorine, IntelliChem has stopped adding chlorine until your pH level is decreased. This usually happens when the pH tank has run out of muriatic acid or the CO_2 tank is empty.
pH Low	IntelliChem pH reading is below 7.2 (typical good range is 7.2 to 7.6). It's rare for pools to stay below the 7.2 pH level. You may need to add a pH up chemical to your pool if the level doesn't rise over time. Consult your pool professional for a recommended action.
pH High	pH is above the 7.6 pH level (typical good range is 7.2 to 7.6). This could be temporary as IntelliChem signals your muriatic acid or CO_2 feeder to add more to your pool to lower the pH level. If the pH level doesn't lower, this usually means that your acid or CO_2 tank may be empty. Otherwise, you may need to increase IntelliChem dose amount, lower the mixing time, or change the sensitivity to High.
No Flow	Flow switch has indicated there is no flow to the flow cell where the pH and ORP probes are located. This can be caused by a dirty/clogged pool filter or IntelliChem prefilter or too slow of a pump speed.
ORP High	ORP reading is above 750. If pool consistently measures above 750 ORP and a manual chlorine reading is above 3 ppm, decrease ORP set point to get your chlorine PPM into the desired 1-3 ppm range.
ORP Low	IntelliChem will alert when the ORP level is below 650. If your pool consistently measures below 650 and a chlorine PPM reading is below 1 ppm, you may consider increasing your ORP set point to get your chlorine PPM into the recommended 1-3 ppm range. Also note that ORP probes take at least an hour before the reading stabilizes. It is perfectly normal to start the day at a very low 400-600 ORP reading. Similarly, the probe will read on the high side in the late afternoon and evening hours.
Weak Flame Alarm	Flame strength is low. Contact a service professional.
Communication Lost	This usually indicates that the communication cable between heater and the automation system has been disrupted in some manner. Check this wiring.

Error Messages and Codes (IntelliChlor)

Message	Note
Clean & Inspect Cell	The Salt Chlorine Generator (SCG) has sensed buildup on its chlorine generating cell blades which is hampering its ability to make chlorine. This is a normal occurrence that happens over time. This calcium buildup can be eliminated by turning off your filter pump, removing your salt cell from the plumbing, and spraying a garden hose on the jet setting to remove the excess calcium buildup inside the cell. You can also do an acid wash according to instructions given in the SCG manual.
Cold Water Cutoff	SCG won't produced chlorine in water temperatures below 52°F [11.1°C]. When the water is this cold, you should manually add chlorine to your pool, if needed.
Communication Lost	Usually indicates that the communication cable between the SCG and IntelliCenter has been disrupted in some manner. Check the Cable.
Low Salt	SCG salt level reading is low. Optimum salt level is 3600 ppm. Add salt to pool until salt level reaches 3600 ppm. Refer to the SCG manual for estimates of how much salt to add.
Very Low Salt	SCG salt level reading is very low. Optimum salt level is 3600 ppm. Add salt to pool until salt level reaches 3600 ppm. Refer to the SCG manual for estimates of how much salt to add.

Error Messages and Codes (Variable Flow Pump)

Message	Note
Communication Lost	IntelliCenter is not able to communicate with the pump. Verify proper connection at both ends of the RS-485 communication cable.
Drive Over Temperature	The pump has sensed that it is getting too hot. Ensure that the back of the pump is clear of debris and dirt. In very hot climates it may help to shield the pump from direct sunlight.
Over Current	The pump has sensed that it is receiving too much current. Contact a service professional.
Over Voltage	The pump has sensed that it is receiving too much voltage. Contact a service professional.
Power Outage	The pump has sensed that a power outage occurred.
Priming Alarm	The pump is having trouble priming. Ensure that the water level of the pool is high enough to fill the skimmer basket. Also check to make sure your skimmer baskets and pump basket are not clogged with leaves or debris. Make sure to bleed air out of the top of your filter as the pump is priming or when running. Always exercise caution when your are working in close proximity to working pool pumps and filters that are under pressure.

Error Messages and Codes (Variable Speed Pump)

Message	Note
Over Current	The pump has sensed that it is receiving too much current. Contact a service professional.
Over Voltage	The pump has sensed that it is receiving too much voltage. Contact a service professional.
Power Outage	The pump has sensed that a power outage occurred.
Priming Alarm	The pump is having trouble priming. Ensure the water level of the pool is high enough to fill the skimmer basket. Also check to make sure your skimmer baskets and pump basket are not clogged with leaves or debris. Make sure to bleed air out of the top of your filter as the pump is priming or when running. Always exercise caution when your are working in close proximity to working pool pumps and filters that are under pressure.
Drive Temperature	The pump has sensed that it is getting too hot. Ensure the back of the pump is clear of debris and dirt. In very hot climates it may help to shield the pump from direct sunlight.

Glossary

Access Point: An Access Point (AP) is stand-alone wireless hub that allows any computer that has a wireless network adapter to communicate with another computer and to connect to the Internet.

Expansion Kit: A kit that includes additional auxiliaries to an existing Personality Kit. Requires a Load Center for each Expansion Kit.

Feature Circuits: Programmable circuits that can control non-high voltage circuits, and valve actuators.

Freeze Protection: A circuit with freeze protection circulates water in order to protect plumbing or filtration equipment from freezing in low temperatures. When freeze protection mode is active, "Freeze Protect Active" will display.

High Voltage Compartment: Large lower right compartment of Load Center for all high voltage wiring including circuit breakers, relays, and GFCI.

Host Computer: The computer that is directly connected to the Internet using a modem or network adapter.

Indoor Control Panel: Color touch LCD screen is wired to the Personality board in the Power/Load Center. The control panel can be wall mounted inside a house.

iS4: Four function Spa-Side remote. Can be spa wall or deck mounted.

iS10/SpaCommand: Up to ten function spa-side remote with temperature changing capability. Can be spa wall or deck mounted.

Internet Protocol (IP) address: The address of a computer that is attached to a network. Part of the address designates which network the computer is on, and the other part represents the host identification.

Load Center: Metal enclosure with power relays, transformer, and circuit breakers. The Load Center is installed before to Personality Kit installation. Used for distributing power for controlling IntelliTouch® Control Systems. Also known as the "sub-panel."

Low Voltage Compartment: Top compartment of Load Center for all low voltage wiring.

Low Voltage Raceway: Vertical space in the left side of Power/Load Center for low voltage cabling.

Wireless Controller: Wireless controller for IntelliCenter® Control Systems with all the functionality of the Indoor Control Panel.

Outdoor Control Panel: LCD color touch control panel with flexible hinge is installed in upper portion of Power/Load Center and connected to the main circuit board (iS5).

Glossary (continued)

Personality Board: The circuit board mounted on top of the Outdoor Control Panel motherboard. The Personality board defines the system capabilities.

Personality Kit: Set of parts to define the capability of a system; may include: Outdoor Control Panel, temperature sensors, actuators, and additional relays.

Power Center: Same as Load Center with the exception of the circuit breaker base.

Relay Circuits: The circuits that control the relays on the Personality Board. Connectors on top edge of the circuit board.

RF: Radio Frequency.

Screw Terminal Connector: Removable connector that may attach to circuit board with multiple sockets (anywhere from 2 to 12) to receive wires from controllers and sensors; wires held by screw terminals; multiple wires of a small enough gauge (usually 22 AWG) may be coupled to a single socket of a terminal connector.

NOTES

PENTAIR POOL

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