

HC900 Hybrid Controller

When you need more than just discrete control

Product Brief: Wireless Communications and HC900 Controllers

Background:

With the introduction of Honeywell’s One Wireless network for process applications, the ability to reliably communicate with remote devices without the need for expensive land-lines became a reality. Since the HC900 controller can operate stand-alone, independent from a server or network connection, creative users started asking the next logical question. Can the One Wireless network be used as a SCADA interface to supervise remotely located HC900 controllers performing localized process control? The initial response was: based on technical specifications, the applications should be OK. This stimulated additional questions that were a little more difficult to answer. What will the performance be? Can configuration changes be made over the wireless network? How about firmware upgrades? Others!

To be able to confidently answer these types of questions, validation testing was performed with the HC900 Hybrid Controller using the One-Wireless network. The results are noted below. In addition to validating wireless communication from a remote host to the HC900 controller, tests were also performed using the HC900 controller as a client on the One-wireless gateway and Ethernet Modbus TCP communications to bring wireless transmitter data into the HC900 controller database. Dedicated Gateway and transmitter function blocks provided in release 4.3 of the controller simplify the configuration task when using Honeywell transmitters. The results of these tests are also summarized below.

The following applications were tested:

	Question	Test Results	Detail
1	Host PC communications with H900 controllers via the One- Wireless network.	OK	See Figure 1 for architecture and details
2	HC900 controllers communicating with XYR6000 transmitters through a multi-node or Gateway via the wireless network.	OK	See Figure 2 Used transmitter function blocks in release 4.3
3	HC Designer software support for configuration downloading and monitoring via the One-wireless network?	OK – With limitations	See Figure 3. Download time is approximately 2X that of a wired connection. Wireless PC is not

			supported.
4	HC900's Modbus/TCP initiator function block used to communicate with a Modbus/TCP slave devices over the One-wireless network.	OK	See Figure 4
5	Host PC be used with the One-Wireless network to communicate with redundant HC900 controllers.	OK, using a single CPU Ethernet port on the Lead and Reserve CPU	See Figure 5 All equipment on the same sub-net. <u>Redundant networks on the same HC900 CPU with different subnets was not tested and is not recommended.</u>
6	HC900 controllers communicating with each other (peer to peer) over the one-wireless network.	OK	See Figure 6
7	Perform firmware upgrades on HC900 controllers via the One-Wireless network.	OK	HC Designer and PC are connected to a Gateway or Multi-node and the target HC900 is connected to its Multi-node. Download time is approximately 2X that of a wired connection.
8	HC900 Controller communicating with its remote I/O racks via the wireless network since this interface uses an Ethernet physical layer?	NO	The HC900 remote I/O interface does not use TCP, a requirement for a wireless router. (If more than one HC900 CPU had access to the wireless network, a CPU would have no way of distinguishing its remote I/O from another CPU's I/O.)

General note on performance: The 2X performance de-rating for downloads and software upgrades applies when only one wireless hop is needed between the PC and the controller. Each additional wireless hop between devices on the network will increase the execution time for communications because the effective bit rate is reduced by one half for each additional hop.

Architectures Tested:

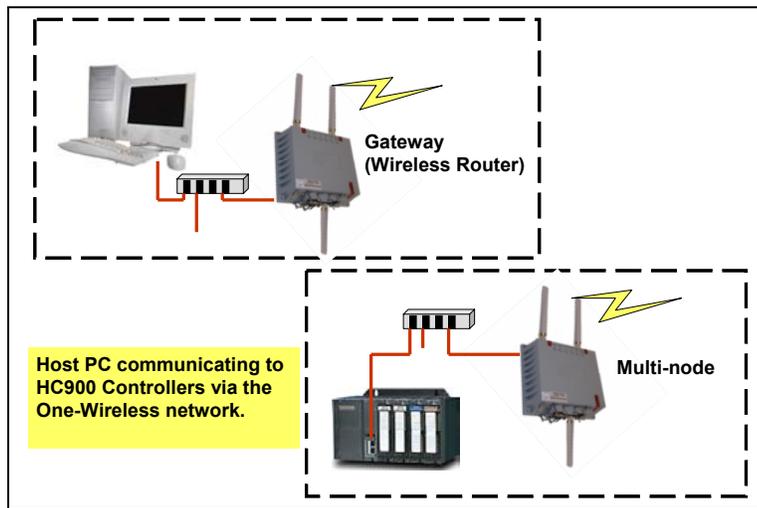


Figure 1

Note: The HC900 does not require registration in the One-Wireless gateway database. It functions outside the security boundaries typically applied to transmitter data. In its simplest form, the Gateway to Multi-node connection used to extend the distance for HC900 communications may be viewed as a replacement for a wired connection.

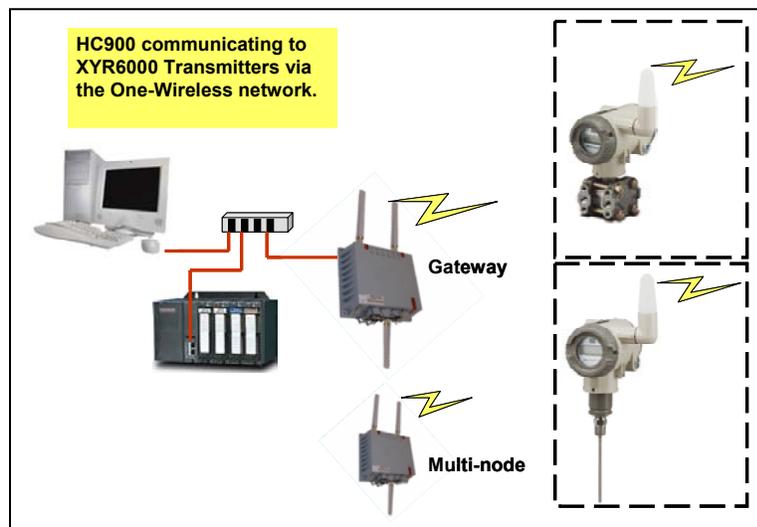


Figure 2

The HC900 communicates to XYR6000 Transmitters via Modbus TCP using an Ethernet connection to a Gateway or Multi-node. A PC is required to manage the One-Wireless

HC900 Controller is acting as a TCP initiator connected to a wireless Gateway or Multi-node communicating to other TCP slave devices. When interfacing with XYR6000 transmitters, a PC is required to manage access to the gateway database. All devices must be on the same subnet.

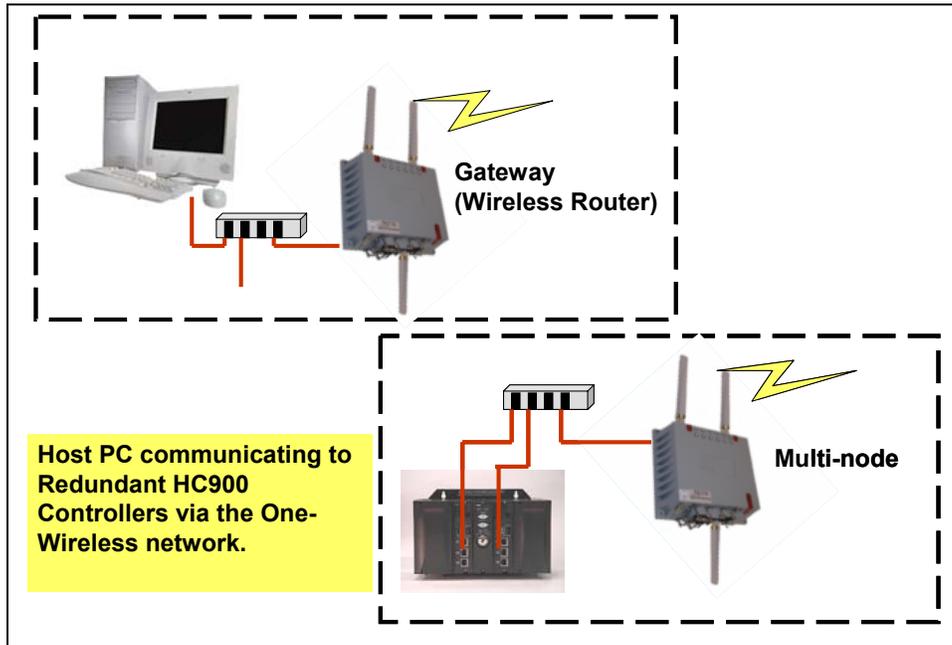


Figure 5

Using a field mounted Ethernet switch and all equipment on the same subnet, a PC may be used to communicate with remote mounted redundant HC900 CPUs. Since only one Ethernet port is active at any time, both CPUs will have the same IP address and the PC will communicate with the Lead CPU of the system.

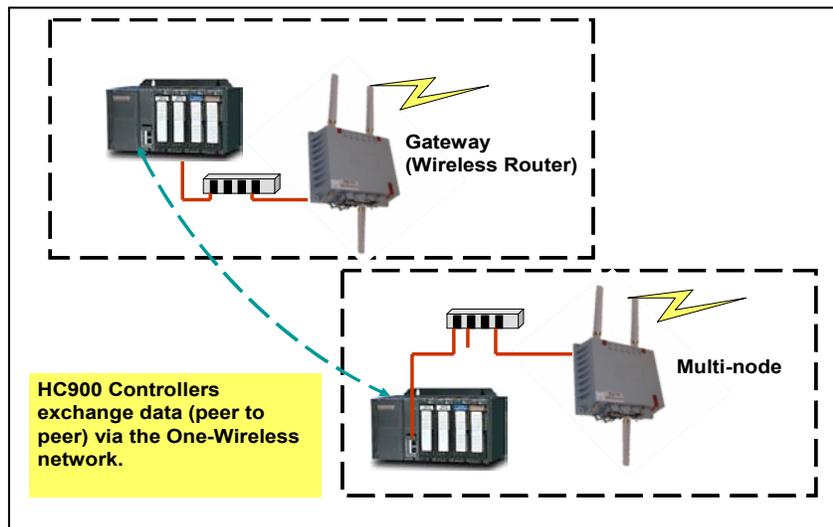


Figure 6

HC900 Controllers may communicate peer to peer over a One-wireless network using Peer function blocks. A Network PC is not required since the HC900 data exchanges are not included in the One-Wireless device database.

Note: Validation of the functions described above was performed in a laboratory environment under controlled conditions. The tests made no effort to quantify the impact of compromised wireless communications resulting from inappropriate installation practices or unreliable wireless interfaces.