

## **PS-1000 Wireless 802.11 Based Communications (WLAN)**

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The PS-1000-EXP-WLAN (WiFi) provides communications based on the IEEE 802.11 standard using a Roving Networks RN171 WiFly module. WiFi is a trademark of the Wi-Fi Alliance, which restricts the use of the term Wi-Fi Certified to products that successfully complete interoperability certification testing. See the Roving Networks RN-171 module data sheet for approvals if needed.

The PS-1000 uses WLAN to denote the WiFi communications.

During normal operation, there is no indication on the controller/monitor display regarding the status of the WLAN communications. To access this information as well as the WLAN setup parameters, press and hold **PB1 & PB3** (while viewing the main screen) to access the WLAN menu. When the WLAN menu is accessed, the top line of the LCD display shows the basic state of the module, see below for a list of messages.

|  |  |
|--|--|
| <b>WLAN DEACTIVATED</b>                    | The WLAN option is installed but deactivated via the CONNECT parameter under SETUP menu.             |
| <b>WLAN:CONN w/ TCP</b>                    | The WLAN is connected to the network and is communicating via the TCP port.                          |
| <b>WLAN:AUTH ERROR</b>                     | The WLAN password/pass-code is invalid, but the network has been found.                              |
| <b>WLAN:CONN NO TCP</b>                    | The WLAN is connected to the network, but the TCP port is not active.                                |
| <b>WLAN:NOT CONN</b>                       | The WLAN option is not connected to a network. There could be several reasons that are listed below. |
| <b>HARDWARE FAILURE<br/>NO WLAN MODULE</b> | The module was not detected by the LFC2000 CPU board.  |

Some reasons for not connecting to a network:

- In the case of the static IP mode: Wrong gateway setting, wrong subnet mask, or the IP is out of range for the network IP range.
- Invalid SSID
- Incorrect PASSWORD/passphrase.
- The signal strength is too low (check STATUS for a level).
- MAC address filtering (check under STATUS menu for the MAC address)

## WLAN MENU

The WLAN menu has two choices: STATUS (PB4) & SETUP (PB1). This menu will time-out and the controller returns to the main screen. Press PB2 or PB3 to return to the main screen earlier than the screen time-out.

## SETUP MENU

**WARNING: When the SETUP MENU is chosen, the WLAN communication is interrupted (IP & TCP port). The WLAN communications will resume when the user exits this menu. If the remote computer (e.g., SCADA) was connected, it must re-establish communications with the controller/monitor, which may require a restart of the remote communications software.**

**Parameter:** CONNECT

YES/NO Activates or deactivates the WLAN communications.

**Parameter:** IP MODE

Select one of two possible modes: STATIC and DHCP (Dynamic Host Configuration Protocol)

STATIC

The network IP address (IP), subnet mask (SM), and gateway (GW) are set manually.

DHCP (Dynamic Host Configuration Protocol)

The IP, SM, and GW are obtained from the router/switch. One can view these values under the WiFi STATUS menu.

*Note: It is recommended to set the network to DHCP, at first, to establish communications (retrieve the assigned IP, GW, & SM under the STATUS menu) and then switch over to STATIC. Most industrial applications will use STATIC IP addresses.*

**Parameter:** IP, Network address (Available when IP MODE = STATIC)

An Internet Protocol address (IP address) is a numerical label assigned to each device connected to a computer network that uses the Internet Protocol for communication. This parameter sets the STATIC internet address. The value is displayed in hexadecimal (the typical decimal dot notation cannot fit on the display).

*Note: The IP is set automatically in the DHCP mode (IP MODE=DHCP) and is not available under the SETUP menu. One can view the assigned IP address under the WLAN STATUS menu.*

## **ADJUSTING MULTI-BYTE PARAMETERS (IP, SM, and GW)**

- Press ADJ to set each individual byte of the IP address.
- The display shows both the hexadecimal and decimal value of each byte. Use UP and DWN (down) to slew in the correct value.
- Press SEL (select) to choose a specific byte (-A thru -D).
- Press ENT (enter) to return to the parameter select menu.

**Parameter:** SM, subnet mask (Available when IP MODE = STATIC)

Sets the SUBNET MASK value. It is entered the same way as the IP address.

A subnet mask is used to identify network address of an IP address by performing a bitwise AND operation on the netmask. A Subnet mask is a 32-bit number that masks an IP address, and divides the IP address into network address and host address. The lower byte of the IP address is the network address if the SM is 255.255.255.0 (FF.FF.FF.00).

*Note: The SM is set automatically in the DHCP mode (IP MODE=DHCP) and is not available under the SETUP menu. One can view the assigned SM value under the WLAN STATUS menu.*

**Parameter:** GW, gateway address (Available when IP MODE = STATIC)

Sets the GATEWAY address. It is entered the same way as the IP address.

The gateway address (or default gateway) is a router interface connected to the local network that sends packets out of the local network.

*Note: The GW is set automatically in the DHCP mode (IP MODE=DHCP) and is not available under the SETUP menu. One can view the assigned GW address under the WLAN STATUS menu.*

**Parameter:** TCP PORT

Sets the TCP (transfer control protocol) port number (0 to 60000). One uses this port number to communicate over the assigned IP address. The default value is 2000. One can use telnet to communicate with the LFC by entering the IP address and the TCP port address in the communications program.

**Parameter:** SSID (service set identifier)

Sets the primary name associated with an 802.11 wireless local area network (WLAN).

It is an alpha-numeric setting. The WLAN will not connect to the wireless network unless this parameter is set correctly.

**Parameter:** PASS (password/passphrase)

Sets the WLAN password. Most networks require a password. If the network is open, this parameter is ignored.

**Parameter:** DVID (DEVICE ID):

Sets the Device ID, which is a string of numbers and letters that can be used to identify, by name, a valve/controller.

### **Adjusting alpha-numeric string parameters.**

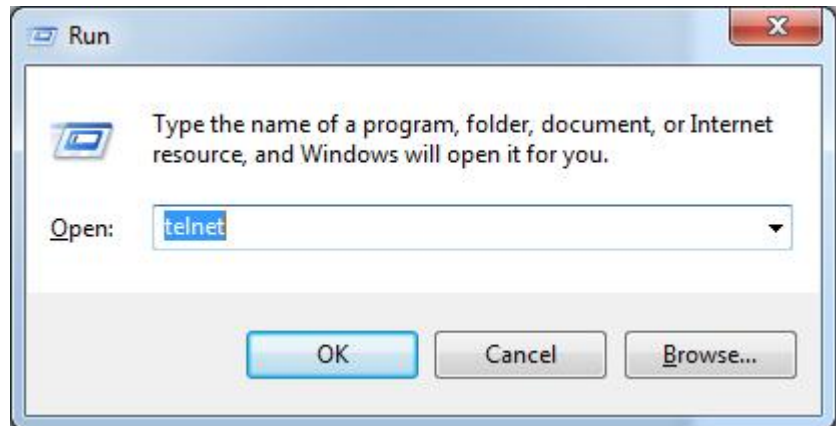
- Press ADJ (adjust) to make adjustments to the string.
- Press NXT (next) to select a character and use UP and DWN (down) to adjust the character.
- Make sure the last character is "end." Press and hold DWN until "end" is displayed.
- Press ENT (enter) to return to the parameter select menu.



## Using Windows Telnet

As a communications test, one can use the Microsoft Telnet Client to communicate with the controller/monitor.

Under the RUN item in Windows, type telnet and press ENTER.

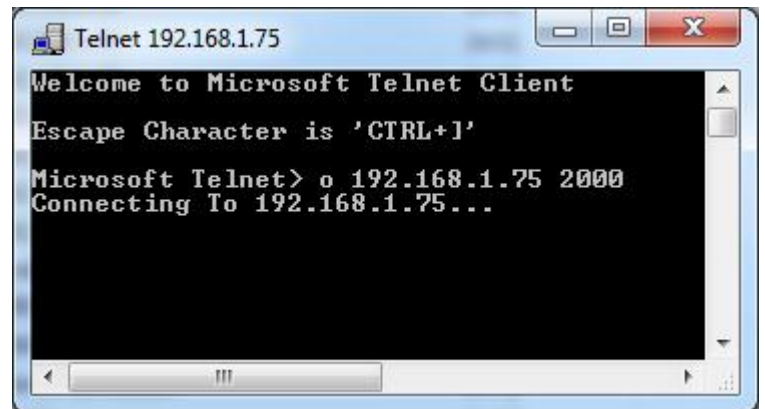


Controller/Monitor: Under the STATUS menu, find the IP address. It is displayed as a hexadecimal number. One will have to convert it to dot decimal notation.

Example (your IP will be different):  
C0.A8.01.4B converts to 192.168.1.75  
See the decimal/hexadecimal conversion chart...

The TCP port address can be read in the STATUS menu.

In this example, the TCP port is 2000. It is shown as a decimal number, which most programs expect.

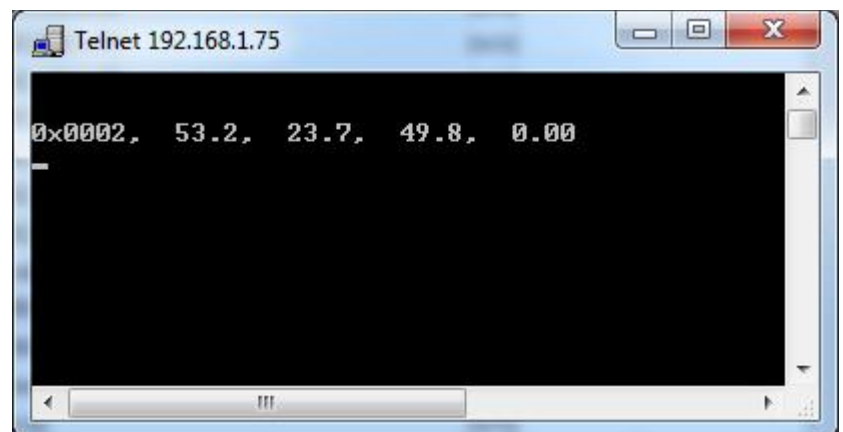


At the telnet prompt, type "o 192.168.1.75 2000" and press return.

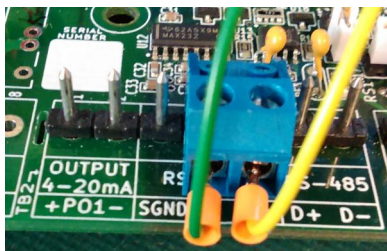
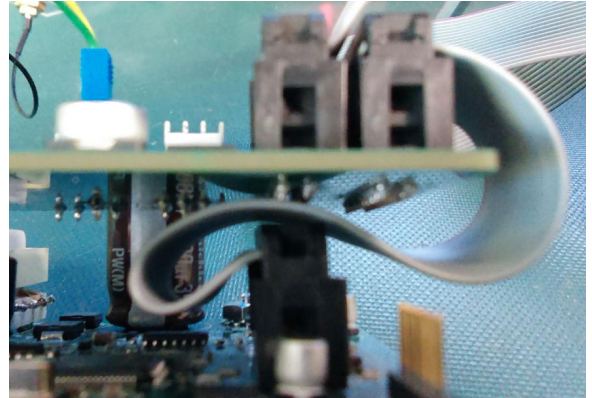
**NOTE: Again, your IP address will be different (in most cases).**

If the connection fails (after about a minute), check to be sure the IP and the TCP port are correct. Check the WLAN status (WLAN menu/PB2 & PB4). One should be able to find the address via the router interface (typically 192.168.1.1).

If the TCP port connection is made (check WLAN status), type MSV and press return...



Mount the PS-1000-EXP-WLAN board to the using one-inch stand-offs. 3/4 inch stand-offs can be used, but it's not recommended. The right image shows 3/4 inch stand-offs. The antenna must be connected to P1 (U.FL ). Do not power the controller with the WLAN option without a connected antenna, or damage to the WLAN module could occur.



The included connector with green and yellow wires must connect to TB2. Green connects to TB2-4 (Tx). Yellow connects to TB2-5 (Rx).



## PS-1000-EXP-WLAN BOARD OVERVIEW

### Upgrading the firmware:

The PS-1000 firmware can be updated without removing the WLAN board or disconnecting TB2. Set S1 to PROG (program) and connect the programmer (e.g., FWL1000) to P5 (PROG PORT). Be sure to set S1 back to WLAN after upgrading the firmware.

### WLAN MONITOR port P6:

The user can directly access the WLAN module via P6. This port is used by the factory for testing purposes.

### Normal operation:

Set S1 to WLAN. The WLAN communications will only function when S1 is set to WLAN.

