



Application Note

Digi Connect Wi-SP Troubleshooting Guide

Digi Technical Support

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1 INTRODUCTION

1.1 Assumptions

This guide has been written for use by technically competent personnel with a good understanding of the communications technologies used in the product and of the requirements for their specific application. It also assumes a basic ability to access and navigate a Digi Connect Wi-SP and configure it.

This application note applies only to:

Model: Digi Connect Wi-SP

1.2 Corrections

Requests for corrections or amendments to this application note are welcome and should be addressed to: tech.support@digi.com

Requests for new application notes can be sent to the same address.

2 QUICK FACTS

2.1 Common Questions About the Connect Wi-SP

Q: What are the default username and password for the Connect Wi-SP?

- Username: **root**
- Password: **dbps**

Q: What wireless standards does the Connect Wi-SP support?

- It is an 802.11 b device.
- Operates at 2.4 GHz only.
- Has a maximum throughput of 11 Mbps.

Q: What authentication methods does the Connect Wi-SP support?

- Open, sharedkey, wep_authentication, wpa_psk, wpa2_psk, wpa_auth, leap, and eap-fast

Q: What encryption methods are supported by the Connect Wi-SP?

- Open, WEP, TKIP and CCMP

Q: Do I have to use the serial port to configure the device initially?

- Yes. It is not possible to use the Digi Device Discovery utility to locate the Connect Wi-Sp until it has been connected to a Wi-Fi network.

3 NECESSARY EQUIPMENT FOR CONFIGURATION

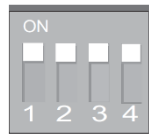
- A laptop with a DB9 serial port
- A crossover DB9-to-DB9 serial cable
 - A terminal program with COM port access, such as PuTTY. PuTTY can be downloaded from <http://www.putty.org/> at the time of this writing.

4 INITIAL CONNECT WI-SP CONFIGURATION

4.1 Setting the Serial Port for Command Line Interface (CLI) Mode

This section will cover the steps needed to initially configure the Connect Wi-SP via the CLI using the equipment described in the previous section:

1. Set the Digi Connect Wi-SP DIP switches in the On or up position. The figure below shows the DIP Switch settings for Command Line access for the Digi Connect Wi-SP. It is recommended to reboot the device after changing the DIP switch settings.



2. Next, a terminal session will need to be opened up at 9600 baud, 8,n,1 with no flow control. The device will prompt for a login into the Connect Wi-SP. Log in with the default username and password of 'root/dbps'. To view the options that are available to set at this time, type "set wlan ?" at the CLI, as shown in the screenshot below:

```
syntax: set wlan [options...]  
options:  
  
  ssid=(string) {empty strings uses any}  
  authentication=(open | sharedkey | wep_auth | wpa_psk | wpa_auth | leap  
    | leap-fast | any)  
  encryption=(open | wep | tkip | ccmp | any)  
  outer_eap=(peap | tls | ttls | any)  
  inner_eap=(gtc | md5 | mschapv2 | otp | tls | chap | mschap  
    | ttls_mschapv2 | pap | any | none)  
  options=(short_preamble | verify_cert)  
  username=(string) {used for wpa_auth and wep_auth}  
  password=(string) {used for wpa_auth and wep_auth}  
  psk=(passphrase string) {used for wpa_psk}  
  psk_hex=(hex string of 64 digits) {used for wpa_psk}  
  wepmode=(64bit | 128bit)  
  wepindex=(1 - 4)  
  wepkeyN=(hex string of 10 or 26 digits) {N = wepindex}  
  maxtxrate=(1 | 2 | 5.5 | 11) {Mbps}  
  txpower=(6 | 8 | 10 | 12 | 14 | 16) {dBm}  
  band=(b_only)
```

- The next step is to pick the Wi-Fi network parameters that will be needed to connect to the Access Point. For this example, the Connect Wi-SP will be using WPA2 authentication and AES encryption. The following command will configure these parameters:

```
set wlan authentication=wpa_psk encryption=ccmp ssid=ssid_of_ap psk=pre_shared_key
```

NOTE: Some Access Points require both CCMP and TKIP to be enabled simultaneously for connectivity when using AES encryption. It is possible to enable both simultaneously on the Connect Wi-SP if this is needed.

Once the above command has been issued, the status of the Wi-Fi connection can be obtained with the command “**display wlan**”. The following screenshot shows a Wi-SP that is *not* successfully connecting to the Wi-Fi network:

```
#> display wlan

Wireless LAN Status:

state           : scanning
channel         : 11
SSID            : DAP-GUEST
BSSID           : 18:8b:9d:24:0b:c2
tx rate        : 5.5 Mbps
rx signal strength : 61 % [-53 dBm]
authentication  : open system
encryption      : WEP

#>
```

The following screenshot shows a Wi-SP that is successfully connecting to the Wi-Fi network:

```
#> display wlan

Wireless LAN Status:

state           : authenticated
channel         : 1
SSID            : DAP-GUEST
BSSID           : 54:78:1a:33:7a:82
tx rate        : 5.5 Mbps
rx signal strength : 28 % [-73 dBm]
authentication  : WPA with pre-shared key (WPA-PSK)
encryption      : TKIP

#>
```

NOTE: You can now use the Digi WebUI to complete the device configuration at this time. The Digi Device Discovery Tool can be used to locate the Wi-SP via Wi-Fi.



Digi Connect Wi-SP 16M Python Configuration and Management

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Tutorial Not sure what to do next? This Tutorial can help.

[System Summary](#)

Model:	Digi Connect Wi-SP 16M Python
WiFi MAC Address:	00:40:9D:51:2C:7D
WiFi IP Address:	10.10.34.197
Link Local Address:	FE80::240:9DFF:FE51:2C7D
Description:	None
Contact:	None
Location:	None
Device ID:	00000000-00000000-00409DFF-FF512C7D

5 TROUBLESHOOTING TIPS

This section will provide additional troubleshooting tips to help when installing the Connect Wi-SP:

- **Connectivity Issues**
 - **What distance should the Wi-SP be from the Access Point during initial configuration?** When configuring the Digi Connect Wi-SP make sure it is 3 feet from the Access Point it will need to eventually connect to. This can prevent issues where noisy environments can make it difficult for the Wi-SP to locate the Access Point initially.
 - **Can the Wi-SP be discovered by the Digi Device Discovery Tool before connecting to an Access Point?** It is not possible to use the Digi Device Discovery utility until the Wi-SP has been connected to the Wi-Fi network.
 - **“When I type ‘display wlan’, I see the state of ‘scanning’. Why is this?”** This means that the Wi-Fi settings defined on the Wi-SP likely do not match the settings of the Wi-Fi network, and the Wi-SP is scanning for a network it can attach to. Common items to check in this situation are: SSID, channel, encryption & authentication types, or the passphrase/ password for the Wi-Fi network, making sure these all line up with the Access Point.

- **Everything has been checked but the Wi-Sp will still not connect to the Wi-Fi network. What next?** Digi Support will need to see the output of the command “**set wlan**” to help determine the issue. It is also best to capture a Wi-Fi trace from the Wi-SP. To take a trace, enter the CLI of the Wi-SP using the serial port (same process as the initial configuration), and issue the command:

```
set trace state=on mask=wlan:*,wpa:*
```

Use **Ctrl-C** to stop the trace and send this trace to Digi Support for further assistance.

- **What option on the Wi-SP should be used for WPA vs. WPA2?** The Digi Connect Wi-SP uses the “wpa_psk” options for both WPA and WPA2.
- **What options are used for AES Encryption?** When using AES encryption, the “wpa_psk” option is used for authentication, and CCMP and/or TKIP are used for the encryption method. Note that some access points will require both CCMP and TKIP to be enabled on the Wi-SP for connectivity.

- **General Troubleshooting Issues**

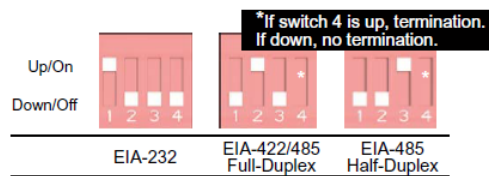
- **Has the latest firmware been installed?** Ensure that the latest firmware has been installed on the Wi-SP. The latest firmware typically has fixes to the device that may correct the issue being seen. The latest firmware can be downloaded from the <http://www.digi.com/>.
- **What do the LEDs mean on the Wi-SP?**
 - **RED LED** - indicates that the unit has power and will be solid red.
 - **GREEN LED** - is the network status. It is solid green when the unit is associated with the wi-fi network. If it is blinking quickly the device is scanning for a network.
 - **YELLOW LED** - indicates network activity. On solid the device did initialize. Off indicates device is ready. Blinking indicates network activity.
- **The serial port is not connecting to the end equipment. What next?** Ensure that the serial port has been switched back into a usable mode after the initial configuration through the serial port. The DIP switches will need to be set for RS232, RS422 or RS485 mode for proper operation. Make sure to power cycle the Wi-SP after changing the DIP switch settings.
- **Where is the Digi Device Discovery Tool located?** The tool can be found on the Digi Support website [here](#).

6 SERIAL PORT PINOUT & DIP SWITCHES

MEI 232/422/485 Switch Settings

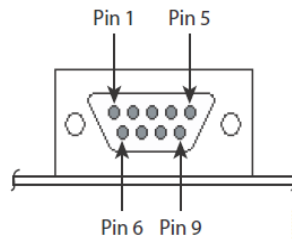
These switches set the MEI (multiple electrical interface) line protocol on the serial interface.

Function	Switch Setting			
	1	2	3	4
EIA-232	Up	Down	Down	Down
EIA-422/485 full-duplex	Down	Up	Down	- If up, termination.
EIA-485 half-duplex	Down	Down	Up	- If down, no termination



The figure and table provide information on DB-9 pin orientation and pin assignments.

DB-9 Pin Orientation



DB-9 Pin Assignments			
Pin	EIA-232	EIA-422/485 Full-Duplex	EIA-485 Half-Duplex
1	DCD	CTS-	Not used
2	RXD	RXD+	RXD+
3	TXD	TXD+	TXD+
4	DTR	RTS-	Not used
5	GND	GND	GND
6	DSR	RXD-	RXD-
7	RTS	RTS+	Not used
8	CTS	CTS+	Not used
9	NA	TXD-	TXD-