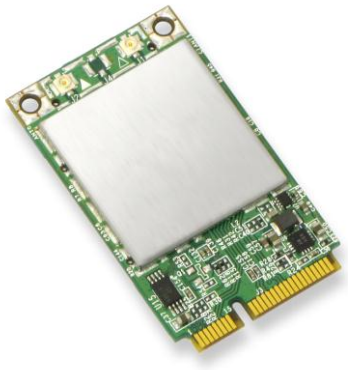
Product Brief:

SDC-PE15N 802.11n PCIe Module with Antenna Connectors

The SDC-PE15N PCI Express Mini Card (PCIe) radio module from Summit Data Communications combines a high-performance, dual-band 802.11n radio with software, both designed for mobile computers and other business-critical mobile devices that operate in harsh environments. No other Wi-Fi® radio module can match the range, robust security, seamless mobility, and manageability of the PE15N module.



The SDC-PE15N radio module is designed for use in business-critical mobile devices and the challenging RF environments in which they operate.

Each PE15N module delivers:

- Hardware: Maximized radio range, minimized power consumption, and broad operating temperature range
- Software: Robust security, fast and reliable roaming, and enterprise-class administration
- Certifications: Regulatory certifications plus Wi-Fi Alliance® and CCX V4 certifications[1]

The PE15N module is backed by a full set of support services including system integration support, regulatory process assistance, and technical support from product and wireless LAN (WLAN) experts.

Hardware Capabilities

The PE15N module is designed for use in business-critical mobile devices and the challenging radio environments in which they operate. Hardware innovations enable the PE15N module to provide greater range than consumer-grade WLAN radio modules while minimizing power consumption and allowing for operation in extreme environments. Key hardware capabilities include:

- **802.11n:** By supporting the ratified IEEE 802.11n protocol with two spatial streams, the PE15N module provides for a maximum data rate of 270 megabits per second (Mbps). Operating in both the 2.4 GHz and 5 GHz portions of the radio frequency spectrum, 802.11n is a superset of the popular 802.11b, 802.11g, and 802.11a standards, and the PE15N module can be thought of as an 802.11a, 802.11b, 802.11g, and 802.11n module.

[1] The PE15N module will earn Wi-Fi Alliance and CCX V4 certifications by April 2010.

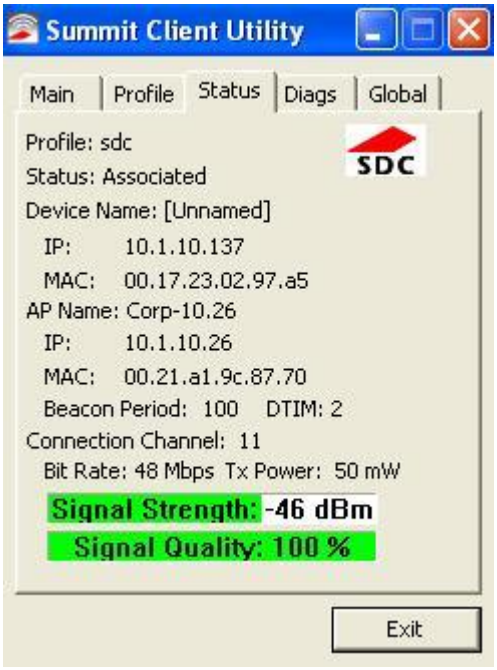
- **Antenna connectors:** The PE15N module supports dual-band antennas of varying types and gains. With two Hirose U.FL antenna connectors, the module supports two spatial streams for higher throughput in 802.11n mode or transmit and receive diversity to minimize dropped packets in pre-802.11n modes.
- **Range:** To maximize radio range – how far the module can be from a WLAN access point and still send data to that AP and receive data from it – the PE15N module offers enterprise-grade transmit power, receiver sensitivity, and delay spread. The module delivers reliable connectivity, even in environments with few APs, many substances that absorb or reflect radio waves, and many devices that compete for the airwaves.
- **Extended operating temperature:** To allow for device operation in extreme environments such as factories, warehouses, freezers, and the outdoors, the PE15N module provides an extended operating temperature range of -30° to +75° C, which far exceeds the capabilities of most other radio modules.
- **Power-saving options:** With configurable options for power savings, the PE15N module maximizes device battery life.

Software Capabilities

To operate effectively in a business-critical mobile device, a WLAN radio needs specialized software to deliver the security, trouble-free operations, and manageability that customers demand. Software for the PE15N module includes a driver, an integrated security supplicant, and a full-featured management and monitoring utility called the Summit Client Utility (SCU). Key capabilities of PE15N module software include:

- **Operating system support:** PE15N software operates on Windows XP Professional and Embedded.
- **Security:** Compliance with IEEE 802.11i, which is certified by the Wi-Fi Alliance through testing for the Enterprise version of Wi-Fi Protected Access 2® (WPA2®-Enterprise), provides for the highest level of interoperable WLAN security available. An integrated 802.1X supplicant supports authentication via pre-shared keys as well as six EAP types: EAP-TLS, PEAP-MSCHAPv2, PEAP-GTC, PEAP-TLS, EAP-TTLS, LEAP, and EAP-FAST. Data privacy is ensured via encryption and decryption using AES (WPA2), TKIP (WPA), or WEP.
- **Mobility:** A mobile device often roams from one AP to another. When scanning for a better AP or roaming to that AP, a device's radio cannot send or receive data. If roaming takes too long, a business-critical application that requires a constant connection can be disrupted. Summit radios support the fastest roaming in the industry and enable an administrator to tune roaming behavior to the needs of an application and its environment.

- **Administration:** SCU enables a user to view, and an administrator to configure, all radio operation and security settings. SCU also enables a user or administrator to view status and troubleshoot issues. All SCU functions are available to centralized management applications through the Summit software developer's kit (SDK).
- **Integration:** Summit provides device manufacturers with the Summit Manufacturing Utility, a tool that can be used to set regulatory parameters such as channel set and maximum transmit power to provide for worldwide compliance across multiple platforms.



SCU is a graphical utility for configuration, troubleshooting, and management

Certifications

The PE15N module is certified as compliant with all applicable regulations as set forth by agencies such as ETSI, the FCC, and TELEC. Thanks to software support for all Wi-Fi requirements and key Cisco innovations, the PE15N module is Wi-Fi CERTIFIED™ and certified for Cisco Compatible Extensions (CCX) Version 4 for application-specific devices.

Summit helps device manufacturers achieve regulatory, Wi-Fi, and CCX certifications for devices equipped with the PE15N module. By leveraging existing grants, test reports, and approvals, Summit customers incur minimal costs when attaining all required certifications.

Support Services

A business-critical mobile device depends on its WLAN radio for communication with the business network. **Summit understands that, if the radio doesn't work, the device doesn't work. If the device doesn't work, the end user can't do his or her job.**

Summit tests the PE15N module on a broad range of devices. For device vendors that offer the PE15N module as a device component or option, Summit provides consultation and documentation to aid in hardware and software integration. When devices experience issues with the PE15N module in the field, Summit's support team provides Level 2 technical support to device vendors. That team is well-versed in radio frequency characteristics, wired and wireless network architectures, and security protocols.

SDC-PE15N Specifications

System Interface	32-bit Peripheral Component Interconnect Express (PCIe) Mini Card with 52-pin edge connector
Antenna Interface	2 U.FL (Hirose) connectors for 2 x 2 MIMO support
Chipset	Broadcom BCM4322
Input Power Requirements	3.3 VDC +/- 10%
Typical Power Consumption (at maximum transmit power setting)	Transmit: 600 mA (1980 mW) Receive: 91 mA (300 mW) Standby: 3 mA (10 mW)
Operating Temperature	-30° to 75°C (-22° to 167°F)
Operating Humidity	10 to 90% (non-condensing)
Dimensions: L x W x H	51 mm (2.01”) x 30 mm (1.18”) x 3.3 mm (0.13”)
Weight	9g (0.3 oz)
Mounting	52-pin edge connector Two through-holes (non-metallic screw recommended)
Wireless Media	Direct Sequence-Spread Spectrum (DSSS) Orthogonal Frequency Divisional Multiplexing (OFDM)
Media Access Protocol	Carrier sense multiple access with collision avoidance (CSMA/CA)
Network Architecture Types	Infrastructure and ad hoc
Network Standards	IEEE 802.11a, 802.11b, 802.11d, 802.11g, 802.11h, 802.11i, 802.11n
Data Rates Supported (Mbps)	802.11a (OFDM): 6, 9, 12, 18, 24, 36, 48, 54 802.11b (DSSS): 1, 2, 5.5, 11 802.11g (OFDM): 6, 9, 12, 18, 24, 36, 48, 54 802.11n (OFDM, 20-MHz channels): 14, 29, 43, 58, 87, 116, 130, 144 802.11n (OFDM 40-MHz channels): 30, 60, 90, 120, 180, 240, 270, 300
Modulation	BPSK @ 1, 6, 9, 14, 30 Mbps QPSK @ 2, 12, 18, 29, 43, 60, 90 Mbps CCK @ 5.5,11 Mbps 16-QAM @ 24, 36, 58, 87, 120, 180 Mbps 64-QAM @ 48, 54, 116, 130, 144, 240, 270, 300 Mbps
Regulatory Domain Support	FCC (Americas and parts of Asia and the Middle East) ETSI (Europe, Middle East, Africa, and parts of Asia) TELEC (Japan) KCC (Korea)
2.4 GHz Frequency Bands	**FCC** 2.412-2.473 GHz **ETSI and KCC** 2.412-2.483 GHz **TELEC** 2.412-2.495 GHz
2.4 GHz Operating Channels	**FCC** 11 (3 non-overlapping) **ETSI and KCC** 13 (3 non-overlapping) **TELEC** 14 (4 non-overlapping)
5 GHz Frequency Bands	**FCC** 5.15-5.35 GHz, 5.47-5.725 GHz, 5.725-5.82 GHz **ETSI** 5.15-5.35 GHz, 5.47-5.725 GHz **TELEC** 5.15-5.35 GHz **KCC** 5.15-5.25 GHz, 5.725-5.82 GHz
5 GHz Operating	**FCC** **ETSI** **TELEC** **KCC**

Channels: 20-MHz Channels	23 non-overlapping	19 non-overlapping	TBD	8 non-overlapping
5 GHz Operating Channels: 40-MHz Channels	**FCC** 11 non-overlapping	**ETSI and TELEC** 9 non-overlapping	**TELEC** TBD	
Transmit Power Settings ***Maximum transmit power will vary according to individual country regulations. All values nominal, +/-2 dBm***	**A (802.11a)** 14 dBm (25 mW) **N: 2.4GHz, 40-MHz** 14 dBm (25 mW)	**B** 17 dBm (50 mW) **N: 5 GHz, 20-MHz** 15 dBm (30 mW)	**G** 17 dBm (50 mW) **N: 5GHz, 40-MHz** 14 dBm (25 mW)	**N: 2.4 GHz, 20 MHz** 15 dBm (30 mW)
Typical Receiver Sensitivity **(PER <= 10%)**	**A (802.11a)** 6 Mbps: -85 dBm 12 Mbps: -83 dBm 18 Mbps: -80 dBm 24 Mbps: -76 dBm 36 Mbps: -73 dBm 48 Mbps: -70 dBm 54 Mbps: -65 dBm **N: 20-MHz chs.** 13 Mbps TBD dBm 26 Mbps TBD dBm 39 Mbps TBD dBm 52 Mbps TBD dBm 78 Mbps TBD dBm 104 Mbps TBD dBm 117 Mbps TBD dBm 130 Mbps TBD dBm	**B** 1 Mbps: -96 dBm 2 Mbps: -95 dBm 5.5 Mbps: -94 dBm 11 Mbps: -90 dBm **N: 40-MHz chs.** 27 Mbps TBD dBm 54 Mbps TBD dBm 81 Mbps TBD dBm 108 Mbps TBD dBm 162 Mbps TBD dBm 216 Mbps TBD dBm 243 Mbps TBD dBm 270 Mbps TBD dBm	**G** 6 Mbps: -94 dBm 12 Mbps: -88 dBm 18 Mbps: -86 dBm 24 Mbps: -83 dBm 36 Mbps: -78 dBm 48 Mbps: -76 dBm 54 Mbps: -75 dBm	
Delay Spread	1 Mbps: 600 ns 2 Mbps: 500 ns 5.5 Mbps: 400 ns 6 Mbps: 400 ns 9 Mbps: 400 ns 11 Mbps: 200 ns	12 Mbps: 350 ns 18 Mbps: 350 ns 24 Mbps: 250 ns 36 Mbps: 250 ns 48 Mbps: 150 ns 54 Mbps: 150 ns		
Operating Systems Supported	Windows XP Professional and Embedded			
Security	**Standards** Wireless Equivalent Privacy (WEP) Wi-Fi Protected Access (WPA), Personal and Enterprise IEEE 802.11i, or WPA2, Personal and Enterprise **802.1X Extensible Authentication Protocol (EAP) Types** PEAP-MSCHAPv2, PEAP-GTC, PEAP-TLS, EAP-TLS, EAP-TTLS, EAP-FAST, LEAP **Encryption Protocols** Wireless Equivalent Privacy (WEP, RC4 Algorithm) Temporal Key Integrity Protocol (TKIP, RC4 Algorithm) Advanced Encryption Standard (AES, Rijndael Algorithm) **Encryption Key Provisioning (40-bit and 128-bit key lengths)** Static Pre-shared via WPA-PSK or WPA2-PSK			

	Dynamic via EAP authentication
Compliance	**FCC Regulatory Domain** FCC Part 15.247 Subpart C FCC Part 15.407 Subpart E **Industry Canada** RSS-210 RSS-Gen Issue 2 **ETSI Regulatory Domain** EN 300 328 EN 301 489-1 EN 301 489-17 EN 301 893 EN 60950-1 EU 2002/95/EC (RoHS) **TELEC Regulatory Domain** Article 2, Item 19, Category WW (2.4 GHz Channels 1-13) Article 2, Item 19-2, Category GZ (2.4 GHz Channel 14) Article 2, Item 19-3, Category XW (5150-5250 W52 and 5250-5350 W53) Article 2, Item 19-3-2, Category YW (5470-5725 W56)
Certifications	**Wi-Fi Alliance: Q1 2010** 802.11a, 802.11b, 802.11g, 802.11n WPA: Personal and Enterprise WPA2: Personal and Enterprise **Cisco Compatible Extensions (CCX): April 2010** Version 4
Warranty	**Limited Lifetime**
All specifications are subject to change without notice.	

Summit Data Communications, Inc. designs, manufactures, and supports WLAN radio modules for business-critical mobile devices such as mobile computers and medical devices. Summit delivers comprehensive solutions of hardware, software, certifications, and support services that ensure trouble-free integration and operation.

Summit Data Communications, Inc.
526 South Main Street, Suite 805
Akron, Ohio 44311 USA
+1 330-434-7929
http://www.summitdatacom.com