

Product Brief:

SDC-MSD10AG 802.11a/g Miniature SDIO Module with Antenna Connectors

The SDC-MSD10AG miniature SDIO radio module from Summit Data Communications combines a high-performance 802.11a/g radio with customized software, both proven on 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 easy administration of the MSD10AG module.



Each MSD10AG module delivers:

- **Hardware:** Maximized radio range, minimized power consumption, and broad operating temperature range
- **Software:** Enterprise-level security, fast and reliable roaming, and easy administration
- **Certifications:** Regulatory certifications plus Wi-Fi Alliance® and CCX V4 certifications

The SDC-MSD10AG radio module is designed for use in business-critical mobile devices and the challenging RF environments in which they operate.

The MSD10AG 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 MSD10AG module is designed for use in business-critical mobile devices and the challenging radio environments in which they operate. Hardware innovations enable the MSD10AG module to provide far greater range than WLAN radio modules designed for office and consumer applications while minimizing power consumption and allowing for operation in extreme environments. Key hardware capabilities include:

- **802.11a and 802.11b/g:** By supporting both the IEEE 802.11a protocol and the IEEE 802.11g protocol, the MSD10AG module provides for a maximum data rate of 54 megabits per second (Mbps) in both the 5 GHz and 2.4 GHz portions of the radio frequency spectrum. Because 802.11g is a superset of the popular 802.11b standard, the MSD10AG module can be thought of as an 802.11a, 802.11b, and 802.11g module.

- **Smooth dual-band upgrade:** Because it has the same board connector and pin definitions as Summit's MSD10G module, the MSD10AG module provides device manufacturers with a smooth upgrade path from single-band to dual-band support.
- **Antenna connectors:** The MSD10AG module supports antennas of varying types and gains. With two Hirose U.FL antenna connectors, each for an antenna that supports both 2.4 GHz and 5 GHz, the module supports transmit and receive diversity in both frequency bands to maximize performance in high multipath environments.
- **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 MSD10AG module offers market-leading transmit power, receiver sensitivity, and delay spread. As a result, the MSD10AG 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.
- **Low power consumption:** With power consumption that's up to 40% lower than other 802.11a/g radio modules, the MSD10AG module maximizes device battery life to provide for full-shift operation.
- **Extended operating temperature:** To allow for device operation in extreme environments such as factories, warehouses, freezers, and the outdoors, the MSD10AG module provides an extended operating temperature range of -30° to +70° C, which far exceeds the capabilities of most other radio modules.

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 MSD10AG module includes a driver, an integrated supplicant, and a full-featured management and monitoring utility called the Summit Client Utility (SCU). Key capabilities of MSD10AG module software include:

- **Operating system support:** MSD10AG software operates on:
 - Windows Embedded CE 5.0 and 6.0 (all versions)
 - Windows Mobile 2003, 5.0, 6.0, 6.1, and 6.5
- **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 a broad range of EAP types including 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 MSD10AG 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 MSD10AG 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 MSD10AG 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 MSD10AG module on a broad range of devices. For device vendors that offer the MSD10AG 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 MSD10AG 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-MSD10AG Specifications

System Interface	32-bit SDIO with Molex 54722-0607 60-pin connector, which mates to Molex 55560-0607 60-pin connector
Antenna Interface	2 Hirose U.FL connectors with diplexer for dual-band antenna diversity
Chipset	Broadcom BCM4318E
Input Power Requirements	3.3 VDC +/- 10%
Typical Power Consumption (at maximum transmit power setting)	Transmit: 400 mA (1320 mW) Receive: 250 mA (825 mW) Standby: 10 mA (33 mW)
Operating Temperature	-25° to 75°C (-13° to 167°F)
Operating Humidity	10 to 90% (non-condensing)
Dimensions: L x W x H	35 mm (1.38") x 32 mm (1.26") x 4.5 mm (0.18")
Weight	9g (0.3 oz)
Mounting	60-pin connector 2 through holes (non-metallic screws 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
Data Rates Supported	802.11a and 802.11g (OFDM): 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b (DSSS): 1, 2, 5.5, 11 Mbps
Modulation	1, 6, 9 Mbps: BPSK 2, 12, 18 Mbps: QPSK 5.5, 11 Mbps: CCK 24, 36 Mbps: 16-QAM 48, 54 Mbps: 64-QAM
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 2.4-2.473 GHz	ETSI and KCC 2.4-2.483 GHz	TELEC 2.4-2.495 GHz
2.4 GHz Operating Channels	FCC 11 (3 non-overlapping)	ETSI and KCC 13 (3 non-overlapping)	TELEC 14 (3 non-overlapping)
5 GHz Frequency Bands	FCC and KCC 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 5.15-5.25 GHz
5 GHz Operating Channels	FCC and KCC 23 non-overlapping	ETSI 19 non-overlapping	TELEC 4 non-overlapping
Transmit Power Settings <i>Maximum transmit power will vary according to individual country regulations. All values nominal, +/-2 dBm</i>	802.11a 15 dBm (30 mW) 10 dBm (10 mW) 0 dBm (1 mW)	802.11b 18 dBm (63 mW) 17 dBm (50 mW) 15 dBm (30 mW) 10 dBm (10 mW) 0 dBm (1 mW)	802.11g 15 dBm (30 mW) 10 dBm (10 mW) 0 dBm (1 mW)
Typical Receiver Sensitivity (PER <= 10%)	802.11a 6 Mbps: -85 dBm 9 Mbps: -82 dBm 12 Mbps: -79 dBm 18 Mbps: -77 dBm 24 Mbps: -74 dBm 36 Mbps: -69 dBm 48 Mbps: -67 dBm 54 Mbps: -66 dBm	802.11b 1 Mbps: -96 dBm 2 Mbps: -93 dBm 5.5 Mbps: -92 dBm 11 Mbps: -90 dBm	802.11g 6 Mbps: -91 dBm 9 Mbps: -90 dBm 12 Mbps: -88 dBm 18 Mbps: -86 dBm 24 Mbps: -83 dBm 36 Mbps: -78 dBm 48 Mbps: -75 dBm 54 Mbps: -73 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 Mobile 6.5, 6.1, 6.0, 5.0, and (Pocket PC) 2003 Windows Embedded CE 6.0 R3, 6.0 R2, 6.0, and 5.0 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 15.207 Subpart E Industry Canada RSS-210 RSS-Gen Issue 2 TELECOM Regulatory Domain Article 2 Item 19, Category WW (2.4GHz 1-13 Channels) Article 2 Item 19-2, Category GZ (2.4GHz Channel 14)	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)
Certifications	Wi-Fi Alliance 802.11a, 802.11b, 802.11g WPA: Personal and Enterprise WPA2: Personal and Enterprise Cisco Compatible Extensions (CCX) Version 4  	
Warranty	<u>Limited Lifetime</u>	
<i>All specifications are subject to change without notice.</i>		

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>

Copyright © 2009, Summit Data Communications, Inc. Summit Data Communications, the Summit logo, the Summit symbol, and “Connected. No Matter What.” are trademarks of Summit Data Communications, Inc. All rights reserved. Wi-Fi®, Wi-Fi Alliance®, Wi-Fi Protected Access 2®, WPA2®, the Wi-Fi CERTIFIED logo, and the Wi-Fi logo are registered trademarks of the Wi-Fi Alliance; and the Wi-Fi Alliance logo and Wi-Fi CERTIFIED are trademarks of the Wi-Fi Alliance.

