

physical made digital



## SkyeModule M9



900MHz UHF RFID Reader/Writer

### BENEFITS:

- » Meets strict regulatory requirements for worldwide operation
- » Superior embeddability for fast integration and time-to-market
- » Variety of tag vendor choices to comply with Wal-Mart, DoD, ATA
- » Low power consumption
- » Cost-effective and highly scalable
- » Common Blade technology: common hardware and software interface with the SkyeModule M2 HF reader for maximum design and solution flexibility

### FEATURES:

- » 862-955 MHz
- » Tiny footprint - 49% smaller than a business card
- » Extensive tag compatibility and optimization with Tagnostic® and TagIQ™
- » Minimal power consumption for maximum read range
- » Configurable output power
- » Simple firmware upgrades
- » Variety of host interfaces: TTL, USB, SPI & PC
- » Simple and intuitive API
- » Secure memory support

### Product Overview

The SkyeModule™ M9 is the world's smallest, globally compliant UHF module. Its one-of-a-kind combination of high performance, security, and cost/space/power efficiency makes it the industry's price per performance leader, delivering the following benefits:

**Ease of integration** by using the SkyeAPI, a single library that abstracts, simplifies, and automates tag and protocol-specific functions from the host system.

**Investment protection** through SkyeTek's Advanced Universal Reader Architecture (AURA) permitting upgrading of modules in the field to grow with the evolution and cost savings in tag and reader technologies.

**Tagnostic®** support for more EPC Class 1 Gen 1/2 and ISO 18000-6B tags than any other comparable reader allowing customers to fully optimize their application.

**TagIQ™** that recognizes the unique characteristics of each tag so that read/write performance is maximized for each individual tag type.

**Global SKU** that provides regulatory pre-scan certification for major markets including FCC, ETSI (302 208), Korea, Taiwan, Australia/New Zealand, Singapore & Hong Kong.

**Unparalleled size** that is half the size of a typical business card.

**Performance optimization** achieved through best-in-class power control (10 – 27dBm), noise reduction technology, and power management – essential for embedded applications.

**Industry's first standards-based UHF security.** Industry-leading privacy protection and anti-counterfeiting/anti-tampering available on any C1G2 tag with user memory.

**Enhanced reliability** through anti-collision and dense reader mode capability.

**Unprecedented price-performance and TCO,** best exemplified by ReaderWare and ReaderDNA licensing which allows customers to manufacture modules at cost.

### Applications

The SkyeModule M9 has been created specifically for several applications that share common requirements for tag support, protocol, performance, and security. The M9 is an ideal solution for:

- Product Authentication and Anti-counterfeiting
- Handheld Reading/Encoding
- Inventory Management
- Printing and Encoding
- Patron Management
- Access Control
- Asset Management



**About SkyeTek:**

SkyeTek, Inc., maker of SkyeWare™, is the leading supplier of RFID reader software and reference designs that enable the pervasive adoption of RFID technology. SkyeTek's Tagnostic® reader technology works with most industry standard tags and smart labels, its low power requirements and small form factor make it the optimal choice for embedding into new or existing products. SkyeTek's RFID reader technology is available in several formats including reader modules, hardware reference designs, and the SkyeWare software suite. SkyeTek markets to OEM customers in targeted vertical markets with several high-volume licensing options available.

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**Software and Security**

**Software**

SkyeAPI C/.NET API  
 SkyeTek Protocol v3  
 SkyeWare 4 developer interface  
 Demonstration applications

**SkyeOS™ Embedded**

TagIQ™  
 Fast Inventory with anti-collision  
 Field upgradeable firmware bootloader

**SkyeSecurity<sup>1</sup>**

Clone and tamper protection  
 Encryption (AES, TDEA)  
 Key Derivation Function (KDF)  
 Pseudo-Random Number Generator (PRNG)  
 Secure key store

**Tag Support<sup>2</sup>**

Protocol	Verified Manufacturers
EPC C1G1	Alien, STMicro
ISO18000-6B	Fujitsu, NXP
EPC C1G2/ISO 18000-6C	Alien, Impinj, NXP, EM Microelectronics, Intellexflex
IP-X, EM4122, EM4444	EM Microelectronics

**Specifications**

**Frequency**

862-955 MHz

Physical	CF <sup>3</sup>	MH <sup>3</sup>
Length:	66 mm	70 mm
Width:	36 mm	53 mm
Height:	5 mm	9 mm
Weight:	10.7 g	12.5 g

**Environment**

Storage Temperature: -30°C to 85°C  
 Operating Temperature: -20°C to 70°C

**Host Communication Interfaces/ Data Rates**

UART (TTL): 9.6-115.2 kbps  
 SPI Mode 1: up to 10MHz  
 USB 2.0 Full Speed: 12 Mb/s  
 I<sup>2</sup>C: 100/400 KHz

**Peripheral I/O Connection**

7 programmable GPIO pins CF  
 4 programmable GPIO pins MH

**Compliance<sup>4</sup>**

FCC 15.247 EN 302-208  
 EN 301-489 EN 61000-4-3  
 AS/NZS 4268:2003 DGT LP002  
 HKTA 1049 IDA TS SRD  
 MIC 2005-50 RoHS

**Transponder Communication Rate**

EPC C1G1: slow & fast modes  
 EPC C1G2 / ISO 18000-6C: 40, 80 kbps  
 ISO 18000-6B: 40 kbps

**Air-interface Protocols**

EPC C1G1  
 EPC C1G2 / ISO 18000-6C  
 ISO 18000-6B  
 ISO 18000-6A<sup>5</sup>

**Antenna Connection**

50 Ω port with MMCX (female)  
 VSWR 1.5:1 or lower for best performance

**Current Consumption**

Sleep Mode: 5 mA  
 Idle Mode: 170 mA  
 Scan Mode: 800mA @ 27 dBm  
 650mA @ 24 dBm  
 500mA @ 21 dBm

**Supply Voltage**

4.5-5.5 V

**Output Power**

Adjustable 10-27 dBm @ 0.1 dB steps  
 Power Accuracy: ±1 dBm

**Singulation Performance**

Up to 50 tags/second (25-35 typical)

**Read Range**

Approx. 3.5m with 6 dBi linearly polarized antenna

*Performance dependent on tag type, configuration, and other environmental conditions*

**DKM9 - SkyeModule M9 Developer Kit**

The developer kit for the SkyeModule M9 includes all hardware and software components required to integrate UHF RFID technology quickly and easily into any application:

**Hardware**

- 1 M9 SkyeModule
- 1 Host Interface Board
- 1 860-960MHz External Antenna
- 1 9V Power Supply
- 1 RS-232 Cable
- 1 USB Cable

- SkyeTek sample tag kit
  - EPC Class1 Gen1, EPC Class1 Gen2, and ISO18000-6B label tags
  - Variety of labels and form factors

**Software**

- SkyeWare 4 Dev/Demo Software
- Software Libraries (API): C, .NET
- Protocol Command Builder
- Command Line Interface
- Windows DLL

**Service**

- Technical Support

Notes: <sup>1</sup>Available via firmware upgrade, <sup>2</sup>See Tag Support Matrix for complete details, <sup>3</sup>CF = CompactFlash-style form-factor; MH = Mounting Hole format, <sup>4</sup>Pre-scan compliant. Fit-for-use products require additional certification. <sup>5</sup>Future firmware release.



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**SkyeTek Reader Technology** SkyeTek provides a variety of reader technology at both 13.56 MHz (HF) and 860- 960 MHz (UHF). ReaderDNA, a comprehensive reference design, is available for component level integration of the technology including complete design files, BOM, and test fixture. All SkyeTek readers leverage powerful firmware that drastically reduce hardware costs and are delivered in conjunction with ReaderDNA. SkyeModules are controlled via the SkyeTek Protocol, a powerful but simple communication protocol that grants the user access to all features of an RFID transponder. Further, they have been designed with flexible and modular embedded software that allows one to select only the features desired.



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