ThingMagic® M6e UHF RAIN RFID Series Comparison
Performance, Efficiency and Flexibility

As companies start to build RFID solutions into a variety of different applications, they often discover that building a customized reader is the best way to fulfill their specific use case. And the best way to build a reader is by using RFID modules. While companies may be tempted to start at the chip level, using a module can offer benefits such as lower costs due to less development time, fast integration into a solution resulting in quicker time-to-market and complete certification for global use. Additionally, the use of modules can offer predictable and stable performance to ensure a successful RFID deployment.

ThingMagic, a JADAK brand, offers a series of embedded UHF RFID modules to drive innovation and increase productivity for a variety of applications. Hundreds of companies have designed ThingMagic embedded RFID modules into their solutions. A wide range of performance and form factors allows companies to meet their individual needs. By using ThingMagic modules, organizations benefit from the expertise of the engineers who have designed modules for years. In addition, ThingMagic's modules use a universal API that allows customers to write the software once and use it for multiple applications with different modules within the family.

It's this flexible solution – a universal API coupled with reliable, accurate modules – that makes ThingMagic the perfect solution for developing RFID applications for any use case, in any industry.

M6e Series High Performance Multi-Protocol Embedded UHF RFID Modules

ThingMagic M6e

The 4-port M6e will meet or exceed the performance requirements of the most demanding fixed position multi-antenna reader applications, delivering the highest read rate and RF power. The M6e will transmit up to +31.5 dBm and can read more than 750 tags/second. This performance makes M6e the ideal RFID engine for challenging applications like race timing, portals with long cable runs and conveyors requiring multiple antennas. The M6e has both serial and USB interfaces to support both board-to-board and board-to-host connectivity.

ThingMagic Micro and Micro-LTE

The 2-port Micro and Micro-LTE deliver the form factor, efficiency, RF power and flexibility needed to embed UHF RFID in your best-in-class portable and handheld applications. The Micro reads 750 tags/second and the Micro-LTE is optimized for applications with small populations and reads 50 tags/second. The low power consumption of both modules fits battery operated applications and wider RF output range (-5 dBm to +30 dBm) is a key requirement for RFID enabled printers, tag commissioning stations and point of sales readers. Edge connections allow the Micro and Micro-LTE to be soldered directly to a motherboard as a standard component. The on-board connectors allow the module to be mated to a motherboard.

ThingMagic Nano

ThingMagic Nano delivers the smallest form factor for a Mercury Series embedded UHF RFID module with very low power consumption and is ideal for battery operated, low cost, small form-factor portable readers. The Nano's wide RF output range (0 dBm to +27 dBm) is important for the read/write requirements for RFID-enabled printers and tag commissioning stations. It features a surface mount package designed for the efficiency of SMT manufacturing, driving down the total cost for embedding RFID in volume applications, including consumables authentication and device configuration.

ThingMagic M6e Series Comparison

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TECHNICAL SPECIFICATIONS

FEATURES SUMMARY	M6E SERIES		
	M6e	Micro & Micro-LTE	ThingMagic Nano
Dimensions	69 mm L x 43 mm W x 7.5 mm H (2.7 in L by 1.7 in W by 0.3 in H)	46 mm L x 26 mm W x 4.0 mm H (1.8 in L x 1.0 in W x 0.16 in H)	22 mm L x 26 mm W x 3.0 mm H (0.866 in L x 1.024 in W x 0.118 in H)
RFID Protocol Support	EPCglobal Gen 2 (ISO 18000-6C) with DRM; ISO 18000-6B and IP-X optional; EPCglobal G2V2 (ISO 18000-63) pending market availability		EPCglobal Gen 2 (ISO 18000-6C); EPCglobal G2V2 (ISO 18000-63) pending market availability
Antenna Connector	Four 50 Ohm MMCX connectors supporting four monostatic antennas	Two 50 Ohm connections (board-edge or U.FL) supporting two monostatic antennas	Single 50 Ohm connection (board-edge) supporting a monostatic antenna
RF Power Output	Separate read and write levels, command adjustable from +5 dBm to +31.5 dBm (1.4W) with +/-0.5 dBm accuracy above +15 dBm[1]	Separate read and write levels, commanded adjustable from -5 dBm to +30 dBm (1W) in 0.5 dB steps, accurate to +/- 1 dBm[2]	Separate read and write levels, command adjustable from 0 dBm to +27 dBm (500mW) in 0.01 dB steps
Regulatory	Pre-configured and screened for the following regions: FCC (NA, SA), ETSI (EU), TRAI (India), KCC (Korea), ACMA (Australia), SRRC-MII (P.R.China), 'Open' (Customizable) 865-869 MHz and 902-928 MHz	Pre-configured for the following regions: FCC (NA, SA), ETSI (EU), TRAI (India), KCC (Korea), ACMA (Australia), SRRC-MII (P.R. China), MIC (Japan), 'Open' (Customizable) 865-868 MHz and 902-928 MHz	Pre-configured for the following regions: FCC (NA, SA), ETSI (EU), TRAI (India), KCC (Korea) MHz, ACMA (Australia) MHz, SRRC-MII (P.R.China), MIC (Japan), 'Open' (Customizable) 865-870 MHz and 915-928 MHz
Physical	15-pin low-profile connector providing DC power, communication, control and GPIO signals	28 board-edge connections or 20-pin Molex low profile connector (53748-0208) providing access to RF, DC power, communication, control and GPIO signals	41 board-edge connections providing access to RF, DC power, communication, control and GPIO signals
Data Interfaces	UART with 3.3/5V logic levels from 9.6 to 921.6 kbps; USB 2.0 full speed device port (up to 12 Mbps)	UART with 3.3/5V logic levels from 9.6 to 921.6 kbps; USB 2.0 full speed device port (up to 12 Mbps)	UART; 3.3V logic levels; 9.6 to 921.6 kbps
Control Interfaces	Shutdown Control and Reset Indicator		Shutdown Control
GPIO Sensors and Indicators	Four 3.3V bidirectional ports configurable as input (sensor) ports or output (indicator) ports	Two 3.3V bidirectional ports configurable as input (sensor) ports or output (indicator) ports	Four 3.3V bidirectional ports configurable as input (sensor) ports or output (indicator) ports
API Support	C#/.NET, Java, C	C#/.NET, Java, C	C#/.NET, Java, C
DC Power Required	DC Voltage: 5.0 V +/- 5% DC power consumption when reading: 6.7 W @ +31.5 dBm 4.2 W @ power levels under +17 dBm	DC Voltage: 3.5 to 5.25 V[3] DC power consumption when reading: 5.5 W @ +30 dBm 3.5 W @ +27 dBm 2.5 W @ +23 dBm 2.0 W @ 0 dBm	DC Voltage: 3.3 to 5.25 V for +25 dBm out 3.7 to 5.25 V for +27 dBm out DC power consumption when reading: 3.7 W @ 5 VDC for +27 dBm out 3.2 W @ 5 VDC for +25 dBm out 1.6 W @ 5 VDC for 0 dBm out

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FEATURES SUMMARY	M6E SERIES		
	M6e	Micro & Micro-LTE	ThingMagic Nano
Idle Power Consumption:	0.25 W	0.32 W	0.84 W
	Power Saving Options:	Power Saving Options:	Power Saving Options:
Standby: Sleep: Shutdown:	0.12 W 0.005 W 0.00025 W	0.06 W 0.008 W 0.00025 W	0.04 W 0.02 W 0.00025 W
Certification	FCC 47 CFR Ch. 1 Part 15 Industrie Canada RSS-21 0 ETSI EN 302 208 v1.4.1		
Operating Temp (case temperature)	-40C to +60C	-20C to +60C	-20C to +70C
Storage Temp.	-40C to +85C	-40C to +85C	-40C to +85C
Shock and Vibration	Designed to be installed in host devices which are required to survive 5-foot drops to concrete	Survives 1 meter drop during handling	Survives 1 meter drop during handling
Max Read Rate	Up to 750 tags/second using high-performance settings	Micro: Up to 750 tags/second using high-performance settings Micro-LTE : 50 tags/second	Up to 200 tags/second
Max Tag Read Distance	Over 30 feet (9 m) with 6 dBiL antenna (36 dBm EIRP)	Over 30 feet (9 m) with 6 dBiL antenna (36 dBm EIRP)	Over 10 feet (3 m) with 6 dBiL antenna (33 dBm EIRP)

[1]Maximum power may have to be reduced to meet regulatory limits, which specify the combined effect of the module, antenna, cable, and enclosure shielding of the integrated product. Adequate heat sinking required to run continuously at maximum power. [2]Duty cycle restrictions, based on temperature, apply at power levels above +23 dBm. [3]Will operate below +3.5 V with reduced input line noise immunity. Specifications subject to change without notice.

ORDERING INFORMATION

M6e Series Embedded RFID Readers	SKU
M6e - Embedded (+30 dBm in North America, +31.5 dBm in Europe)	M6E
M6e-A - Embedded (+31.5 dBm in all regions, requires contract)	M6E-A
M6e-PRC - Embedded (PRC high and low bands)	M6E-PRC
Micro (M6E-M) - North/South America, EU, IN, KR, PRC	M6E-M
Micro-LTE (M6E-MICRO) - North/South America, EU, IN, KR, PRC	M6E-MICRO
M6e license for optional IPX and ISO 18K-6B protocols (Gen2 standard)	M6E-LIC-2F
Micro (M6E-M) license for optional IPX and ISO 18K-6B protocols (Gen2 standard)	M6E-M-LIC-2F
Micro-LTE (M6E-MICRO) license for optional IPX and ISO 18k-6B protocols (Gen2 standard)	M6E-MICRO-LIC-2F
ThingMagic Nano - North/South America, EU, IN, KR, PRC	M6E-NANO
M6e Series Embedded RFID Reader Development Kits	**SKU**
M6e Development Kit (North/South America, EU, IN, KR)	M6E-DEVKIT
Micro (M6E-M) - Development Kit (North/South America, EU, IN, KR, PRC)	M6E-M-DEVKIT
Micro-LTE (M6E-MICRO) - Development Kit (North/South America, EU, IN, KR, PRC)	M6E-MICRO-DEVKIT
ThingMagic Nano Development Kit (North/South America, EU, IN, KR, PRC)	M6E-NANO-DEVKIT

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Developers Kit

Everything needed to read and write RFID tags and begin developing RFID-enabled applications:

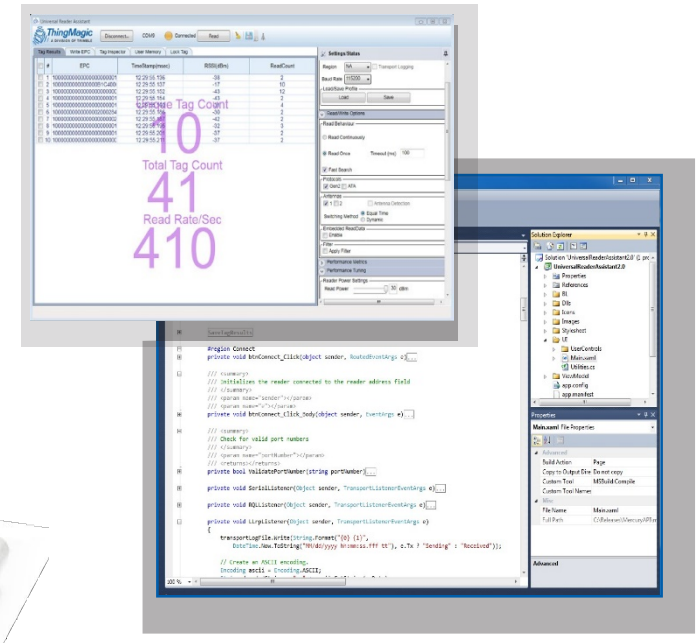
- Test chassis
- Cables
- Antenna
- Sample Tags
- Full schematics to help you design your own complementarycomponents

Mercury API

A common development platform, supporting an extensive variety of hardware to connect, configure and control ThingMagic readers.

Universal Reader Assistant

A utility for advanced demo, testing and tuning of all ThingMagic readers. Reduces complexity for novice users while permitting low-level control for advanced developers.



Mercury xPRESS Sensor Hub

An extensible, compliance-ready solution development platform that enables companies to rapidly create cost-effective finished reader devices.

ABOUT JADAK:

JADAK, a business unit of Novanta, is a market leader in machine vision, RFID, barcode, printing, and color and light measurement products and services for original equipment manufacturers. The business designs and manufactures custom embedded detection and analysis solutions that help customers solve unique inspection, tracking, scanning and documenting challenges. JADAK is based in Syracuse, New York, with sales and technical locations across the globe. For more information, visit www.jadaktech.com.

ThingMagic is JADAK's RFID line of products.

Novanta is a trusted technology partner to OEMs in the medical and advanced industrial technology markets, with deep proprietary expertise in photonics, vision and precision motion technologies. For more information, visit www.novanta.com.

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