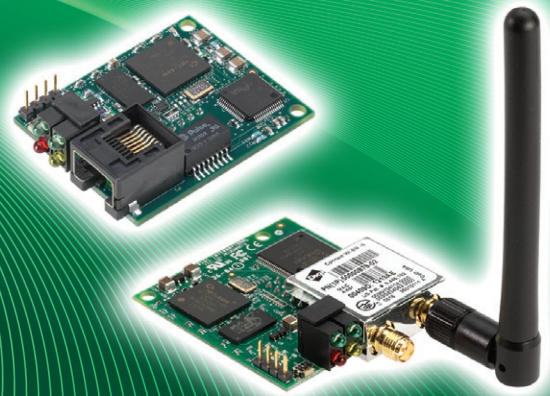# Digi Connect EM® Family

**Wired and Wireless Embedded Modules**

The industry's first interchangeable secure device server module, delivering wired and wireless Ethernet network connectivity that is cost-effective and easy to implement.

## Overview

Based on a common platform design approach, the Digi Connect EM and Digi Connect® Wi-EM offer complete drop-in integration combined with true long-term product availability. This allows you to build future-proof products based on single design by simply selecting between the 10/100 wired and 802.11b module. The Digi Connect EM family makes this possible without the traditional complexities of hardware and software integration work, and at a fraction of the time and cost required to create custom solutions.

Built on Digi's leading 32-bit NET+ARM processor technology, the Digi Connect EM family offers two-port serial-to-Ethernet functionality through Digi's plug-and-play firmware, and the freedom and flexibility of professional embedded software development provided by the easy-to-use, cost-effective and complete Digi JumpStart Kits® for NET+OS®.

### Platforms and Services

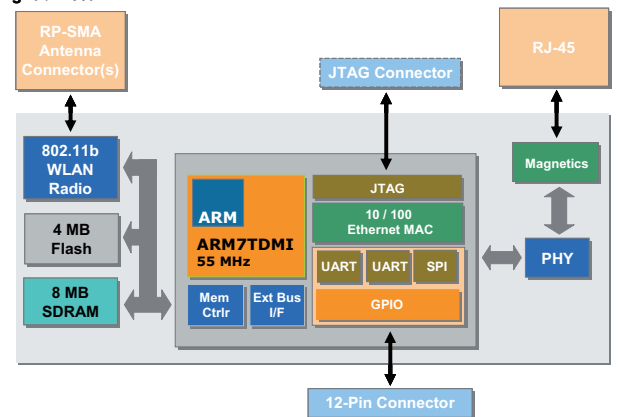

**Design Services**

**Accessory Kits**

**Support**

**NET+OS**

**PLUG -and- PLAY FIRMWARE**

**Supported Software Platforms**

### Block Diagram



Digi Connect Wi-EM

Digi Connect EM

RP-SMA Antenna Connector(s)

JTAG Connector

RJ-45

802.11b WLAN Radio

Magnetics

4 MB Flash

**ARM ARM7TDMI 55 MHz**

JTAG

10 / 100 Ethernet MAC

8 MB SDRAM

UART | UART | SPI

PHY

Mem Ctrlr

Ext Bus I/F

GPIO

12-Pin Connector

### Features/Benefits

- Compact and secure 32-bit device server modules
- Family of low-profile and pin-compatible modules
- 10/100 Ethernet interface or 802.11b WLAN interface
- 2 UART ports and integrated SPI option
- Strong WPA2/802.11i security (PSK and Enterprise)
- Proven low-emission design (FCC Class B)
- Extended/industrial operating temperature
- Digi processor and WLAN technology for true long-term availability
- Seamless migration path to NET+ARM chip design

**www.digi.com**

# Integration Kits / Development Kits

## Integration Kit and Digi JumpStart Kit®: Overview

| Plug-and-Play Integration Kit | Digi JumpStart Kit® for NET+OS® |
|---|---|
| Digi Integration Kits provide everything needed for evaluation, rapid prototyping and integration of Digi Connect device server modules using the feature-rich Digi plug-and-play device server firmware. They deliver fully transparent wired and wireless serial-to-network functionality and allow you to quickly network-enable your existing and new product designs. | This royalty-free turnkey solution for embedded software development is based on the ThreadX Real-Time Operating System (RTOS), one of the most reliable and field-proven RTOS solutions available. In addition to ThreadX, NET+OS provides the integrated building blocks needed to create product solutions with leading network security using Digi embedded modules and microprocessors. |

Digi plug-and-play firmware offers industry-leading features such as a robust IPv6-ready TCP/IP stack, fully-featured serial tunneling, Modbus/TCP, web user interface with private labeling/branding options, user management, file system, SSL/TLS, SSH, Modbus/TCP, intelligent device management via SNMP, configurable e-mail alarms, and patented RealPort® COM/TTY port redirection.

For professional NET+OS software development, the Microsoft Windows based Digi ESP™ Integrated Development Environment (IDE), with graphical user interface and a high-speed USB 2.0 hardware debugger, is provided out-of-the-box.

- Complete kit for product evaluation, rapid prototyping, and integration
- Digi plug-and-play firmware eliminates embedded software development
- Transparent wired and wireless device server functionality
- Full private-labeling/branding supported out-of-the-box

- Royalty-free turnkey solution for embedded software development
- Built on field-proven and compact ThreadX RTOS
- Fully integrated support for secure, IPv4/IPv6 networking applications
- Professional software development using Windows-based Digi ESP IDE

## Application Kit and Digi JumpStart Kit® Contents

| Software Platform | Plug-and-Play Firmware | NET+OS® |
|---|---|---|
| **Module** | Digi Connect EM or Digi Connect Wi-EM module w/ 4 MB Flash, 8 MB SDRAM, 2 dBi dipole antenna (Digi Connect Wi-EM) | |
| **Development Board** | 2 RS-232 serial ports, GPIO configuration/test switches (hi/lo), Screw terminal for GPIO signals, Status LEDs (serial, GPIO, power), Logic signal header, Test points, Reset button, 9-30VDC power supply w/Power-over-Ethernet support (mid-span), SPI header, JTAG header (JTAG modules) | |
| **CD/DVD** | Digi Connect Integration Kit CD: Device discovery tool w/source code, Device configuration wizard w/source code, RCI library, Device discovery (ADDP) library, Java applet sample source code, C/C++ sample source code (TCP, UDP, SSL) | Digi NET+OS CD: NET+OS 7, Digi ESP IDE, BSP source code, Sample code, Green Hills MULTI IDE support files, User documentation |
| **Documentation** | Getting started, Hardware reference manual, Development board schematics Digi Connect user's guide, Command line reference, RCI specification | Quick start guide, Getting started guide, Hardware reference manual, Development board schematics |
| **Power Supply** | External wall power supply (110/240VAC to 12VDC @ 850 mA) with interchangeable outlet adapters (North America, EU, UK, and Australia) | |
| **Accessories** | Crossover serial cable, Ethernet cable or 2 dBi dipole antenna | |
| **Other** | — | Digi JTAG link USB 2.0 hardware debugger |
| **Kit Part Numbers** | | |
| **Ethernet Only** | DC-EM-KT | DC-EM-NET |
| **802.11b WLAN + Ethernet** | DC-WEM-KT | DC-WEM-NET |

Please refer to the feature specs on our website for detailed information about the specific software platform capabilities.
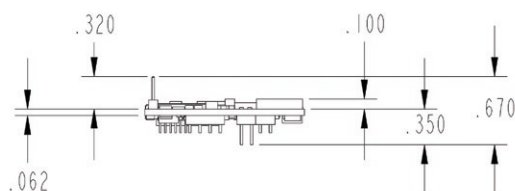
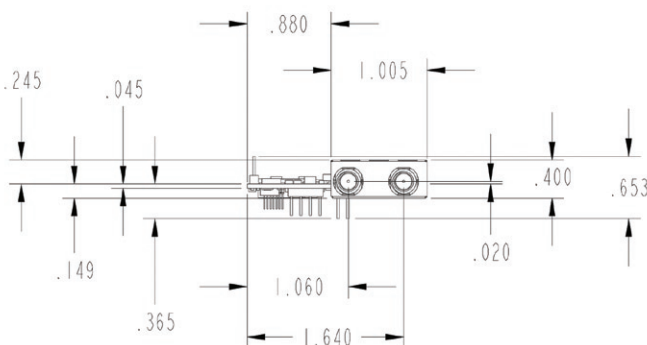| Platform | Digi Connect EM® | Digi Connect® Wi-EM |
|---|---|---|
| **Hardware** | | |
| **Processor Type** | 32-bit Digi NS7520 processor | |
| **ARM Core** | ARM7TDMI | |
| **Processor Speed** | 55 MHz | |
| **Memory Base Population** | 4 MB NOR flash | |
| | 8 MB SDRAM | |
| **Population Options** | LED array, LED pin header, Ethernet (RJ-45) connector, Ethernet pin header, Antenna connectors | |
| **Pins/Form Factor** | PCB-style module with 12-pin main pin header | |
| **High-Speed TTL Serial Interface** | 2 with up to 230 Kbps data rate<br><br>First port with full signal support for TXD, RXD, RTS, CTS, DTR, DSR and DCD, including hardware/software flow control<br>Second port RXD/TXD only | |
| **GPIO** | 9 shared | |
| **SPI** | Master mode<br>(Available through NET+OS development kit only) | |
| **On-Board Power Supervisor** | • | |
| **JTAG Interface** | NET+OS development modules only (P/N DC-EM-02T-JT, DC-WEM-02T-JT) | |
| **Dimensions (L x W x H)** | 1.935 in (49.149 mm) x 1.575 in (40.005 mm) x 0.670 in (17.018 mm)<br>Height and width (overhang) varies depending on connector population. See hardware reference manual for additional information. | 1.935 in (49.149 mm) x 1.855" (47.117 mm) x 0.0653" (16.586 mm)<br>Height and width (overhang) varies depending on connector population. See hardware reference manual for additional information. |
| **Network Interface - Wired** | | |
| **Standard** | IEEE 802.3 | – |
| **Physical Layer** | 10/100Base-T | – |
| **Data Rate** | 10/100 Mbps (auto-sensing) | – |
| **Mode** | Full- or half-duplex (auto-sensing) | – |
| **Connector** | RJ-45 or Pin Header | – |
| **Integrated Ethernet MAC/PHY** | • | – |
| **Network Interface – Wireless LAN** | | |
| **Standard** | – | IEEE 802.11b |
| **Frequency** | – | 2.4 GHz |
| **Data Rate** | – | Up to 11 Mbps with fallback |
| **Modulation** | – | DBPSK (1 Mbps), DQPSK (2 Mbps), CCK (11,5.5 Mbps) |
| **Typical Transmit Power** | – | 16 dBm |
| **Receive Sensitivity** | – | -82 dBm @ 11 Mbps |
| **Connector** | – | 1/2 x RP-SMA |
| **WLAN Security** | | |
| **WEP (Wired Equivalent Privacy)** | – | 64/128-bit encryption (RC4) |
| **WPA/WPA2/802.11i** | – | 128-bit TKIP/CCMP (AES) encryption<br><br>Enterprise mode (802.1X); LEAP (WEP only), PEAP, TTLS, TLS; GTC, MD5, OTP, PAP, CHAP, MSCHAP, MSCHAPv2,TTLS; MSCHAPv2 |

• Module Feature

| Platform | Digi Connect EM® | Digi Connect® Wi-EM |
|---|---|---|
| **Environmental** | | |
| **Operating Temperature** | -40° C to +85° C (-40° F to +185° F) | -30° C to +85° C (-22° F to +185° F) |
| **Storage Temperature** | -50° C to +125° C (-58° F to +257° F) | |
| **Relative Humidity** | 5% to 90% (non-condensing) | |
| **Altitude** | 12,000 feet (3,658 meters) | |
| **Power Requirements @3.3VDC** | | |
| **Maximum** | 270 mA (891 mW) | 400 mA (1.32 W) |
| **Regulatory Approvals** | | |
| **FCC Part 15 Class B, EN 55022 Class B** | | • |
| **EN 61000-3-2 and EN 61000-3-3** | | • |
| **ICES-003 Class B, VCCI Class II, AS 3548** | | • |
| **FCC Part 15 Sub C Section 15.247** | | • |
| **IC RSS-210 Issue 5 Section 6.2.2(o)** | | • |
| **EN 300 328, EN 301 489-17** | | • |
| **UL 60950-1, EN 60950 (EU)** | | • |
| **CSA C22.2, No. 60950** | | • |
| **EN 55024** | | • |

• Module Feature

### Digi Connect EM® - Front



### Digi Connect® Wi-EM - Front



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