

# EM-1240 Series

*RISC-based ready-to-run embedded core module with 4 serial ports, dual LANs, SD,  $\mu$ Clinux*



- > MOXA ART ARM9 32-bit 192 MHz processor
- > 16 MB RAM, 8 MB flash on-board
- > 4 software-selectable RS-232/422/485 serial ports
- > Dual 10/100 Mbps Ethernet for network redundancy
- > RS-232 serial console port supporting PPP
- > Ready-to-run  $\mu$ Clinux Kernel 2.6 platform
- > SD signals supported for external SD socket connection
- > Built-in RTC, buzzer
- > 10 GPIOs reserved for system integration
- > Full-function development kit for quick evaluation and application development

The certification logos shown here apply to some or all of the products in this section. Please see the **Specifications** section or Moxa's website for details.



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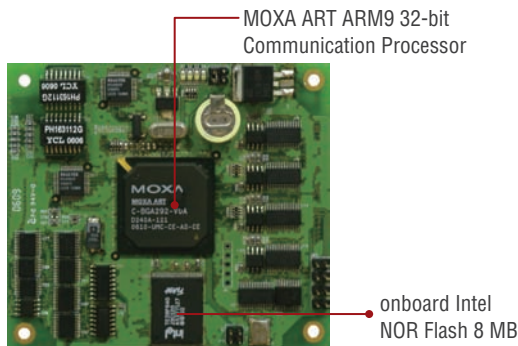
## Overview

The EM-1240 embedded module features 4 RS-232/422/485 serial ports, dual Ethernet ports and an SD socket for external storage expansion. The module has a compact design that can be easily integrated with related industrial applications, such as gas stations, vending machines, and ticketing machines, and offers a powerful serial

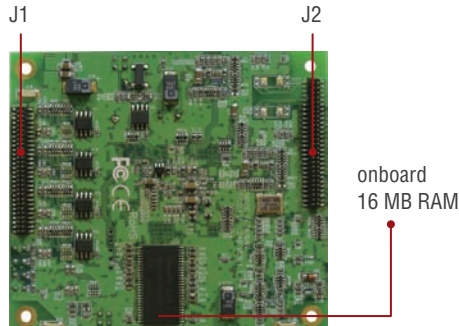
communication capability for better system integration. Programmers will find that the pre-installed, ready-to-run  $\mu$ Clinux platform and the full-function development kit make it easy to develop software and build a reliable communication base for industrial automation applications.

## Appearance

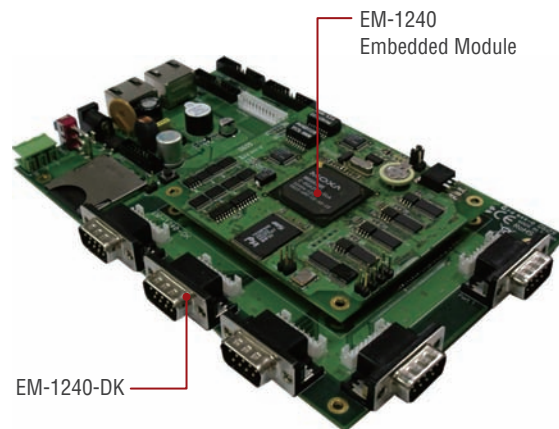
### Embedded Module—Top View



### Embedded Module—Bottom View



### Development Kit Appearance



## Hardware Specifications

### Computer

**CPU:** MOXA ART ARM9 32-bit 192 MHz processor  
**OS (pre-installed):** Embedded µLinux (kernel 2.6.19)  
**DRAM:** 16 MB onboard (32 MB for ODM)  
**Flash:** 8 MB onboard (16 MB for ODM)  
**Storage Expansion:** SD signals for external Secure Digital (SD) socket connection

### LAN Interface

**Ethernet:** Auto-sensing 10/100 Mbps x 2  
**Magnetic Isolation Protection:** 1.5 KV built-in

### Serial Interface

**Number of Ports:** 4  
**Serial Standards:** RS-232/422/485, software-selectable  
**ESD Protection:** 15 KV for all signals  
**Console Port:** RS-232, all signals, supports PPP

### Serial Communication Parameters

**Data Bits:** 5, 6, 7, 8  
**Stop Bits:** 1, 1.5, 2  
**Parity:** None, Even, Odd, Space, Mark  
**Flow Control:** RTS/CTS, XON/XOFF, ADDC™ (automatic data direction control) for RS-485  
**Baudrate:** 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

### Serial Signals

**RS-232:** TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND  
**RS-422:** TxD+, TxD-, RxD+, RxD-, GND  
**RS-485-4w:** TxD+, TxD-, RxD+, RxD-, GND  
**RS-485-2w:** Data+, Data-, GND

### LEDs

**System:** Ready x 1  
**LAN:** 10M/Link x 2, 100M/Link x 2  
**Serial:** TxD, RxD (4 of each)

### Physical Characteristics

**Weight:**  
 EM-1240 Module: 50 g  
 EM-1240 Development Kit: 200 g  
**Dimensions:**  
 EM-1240 Module: 90 x 80 mm (3.54 x 3.15 in)  
 EM-1240 Development Kit: 177 x 115 mm (6.97 x 4.53 in)  
**Module Interface:** Two 2 x 28 pin-headers (1.27 x 1.27 mm pitch)

### Environmental Limits

**Operating Temperature:**  
 Standard model: -10 to 60°C (14 to 140°F)  
 Wide temp. model: -40 to 75°C (-40 to 167°F)  
**Operating Humidity:** 5 to 95% RH  
**Storage Temperature:**  
 Standard model: -20 to 80°C (-4 to 176°F)  
 Wide temp. model: -40 to 85°C (-40 to 185°F)

### Power Requirements

**Input Voltage:** External 5 VDC through pin header

### Regulatory Approvals

**EMC:** CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

### Reliability

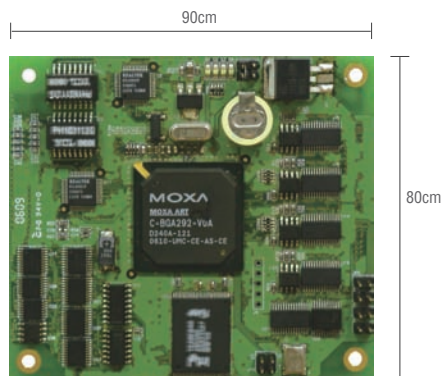
**Alert Tools:** Built-in buzzer and RTC (real-time clock)  
**Automatic Reboot Trigger:** Built-in WDT (watchdog timer)

### Warranty

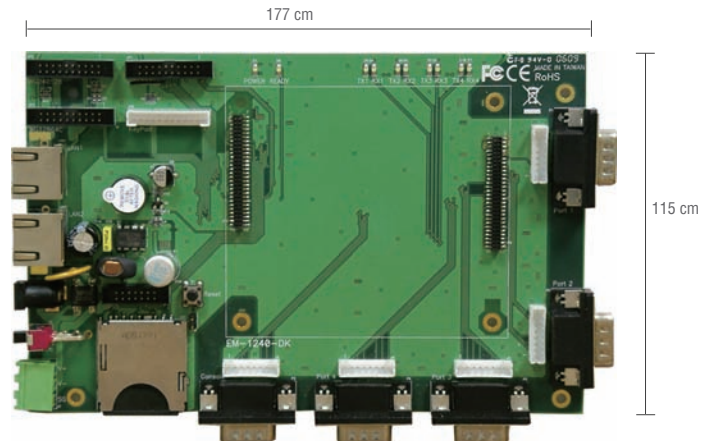
**Warranty Period:** 5 years  
**Details:** See [www.moxa.com/warranty](http://www.moxa.com/warranty)

## Dimensions

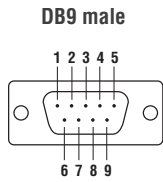
EM-1240 Embedded Module



EM-1240-DK

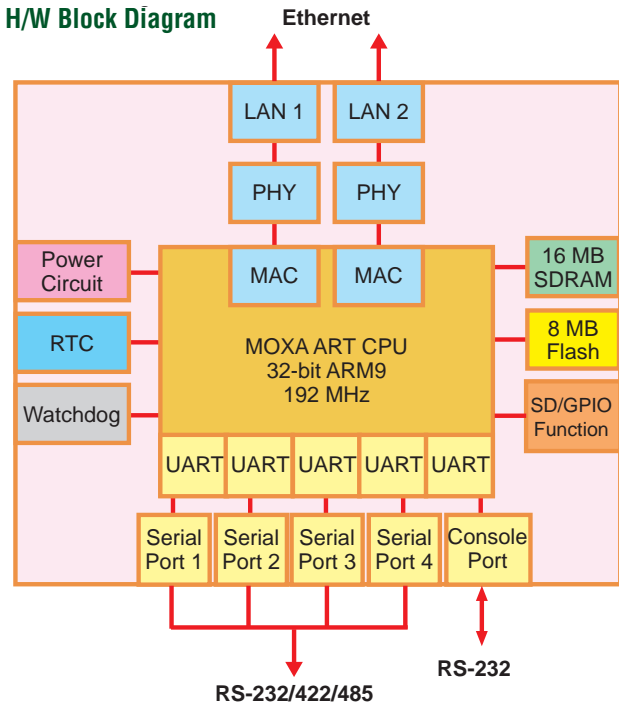


### Pin Assignment



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	-
2	RxD	TxD+(B)	-
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	-	-
7	RTS	-	-
8	CTS	-	-

### H/W Block Diagram



### Software Specifications

#### µClinux

**Kernel Version:** 2.6.19

**Protocol Stack:** ARP, ICMP, IPV4, TCP, UDP, FTP, Telnet, SNMP V1, HTTP, CHAP, PAP, DHCP, NTP, NFS V2, SMTP, Telnet, PPP, PPPoE

**File System:** JFFS2, root file system (read only), and user directory (read/write)

**Msh:** Minix shell command

**pppd:** Dial in/out over serial port daemon, including PPPoE (Point-to-Point over Ethernet)

**Snmpd:** SNMP V1 Agent daemon

**Busybox:** Linux normal command utility

**Tinylogin:** login and user manager utility

**Telnetd:** Telnet server daemon

**Telnet:** Telnet client daemon

**Inetd:** TCP server manager program

**ftpd:** FTP server program

**ftp:** FTP client program

**Boa:** Web server daemon

**ntpd:** Network Time Protocol client utility

#### Tool Chain:

Arm-elf-gcc: C/C++ PC Cross Compiler

µClibc: POSIX standard C library

### Ordering Information

#### Available Models

**EM-1240-LX:** RISC-based embedded core module with 4 serial ports, dual LANs, SD, µClinux OS (standard operating temperature: -10 to 60°C)

**EM-1240-T-LX:** RISC-based embedded core module with 4 serial ports, dual LANs, SD, µClinux (wide operating temperature: -40 to 75°C)

**EM-1240 Development Kit:** Includes the EM-1240-DK snap-on testing board with built-in RJ45 LAN ports and DB9 male serial ports

#### Package Checklist (module)

- EM-1240-LX or EM-1240-T-LX embedded module
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

#### Package Checklist (Development Kit)

- EM-1244 embedded module
- EM-1244-DK, the carrier board for the EM-1244 module
- Universal power adaptor set
- Cross-over Ethernet cable
- DB9 female to terminal block adaptor
- Terminal block (300V, 15A)
- Universal power adaptor set
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

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