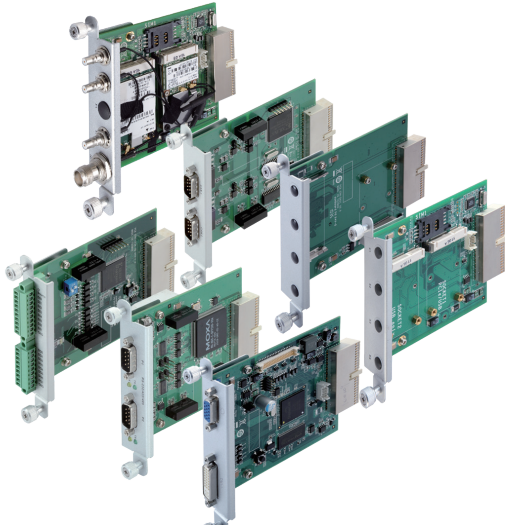


# V2400 Series Expansion Modules

*Expansion peripheral modules (EPM) for the V2400 series*



- > EPM-3032: 2 isolated RS-232/422/485 ports with DB9 connectors
- > EPM-3112: 2 isolated CAN ports with DB9 connectors
- > EPM-3338: GPS, Cellular, 802.11a/b/g/n WLAN
- > EPM-3438: 8+8 DI/DO with 3 kV digital isolation protection, 2 KHz counter
- > EPM-3552: VGA or DVI-I display module
- > EPM-DK01: mini PCI and mini PCIe expansion modules
- > EPM-DK02: 2 mini PCIe slots
- > EPM-DK03: GPS receiver, 2 mini PCIe slots



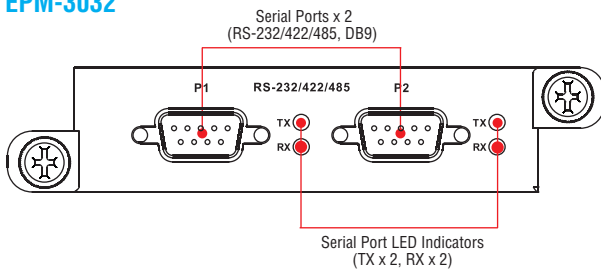
## Introduction

Moxa's V2400 series expansion modules, which come with serial ports, CAN ports, wireless and GPS cards, digital input/output channel cards, mini PCI and PCIe modules, a 2-slot mini-PCIe module, and

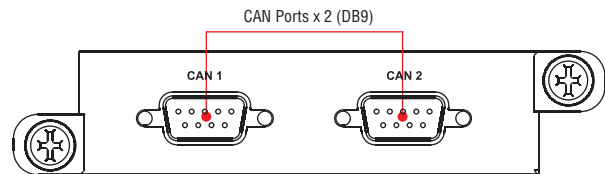
VGA or DVI-I display connectors, can be used with Moxa's V2422 and V2426 embedded computers, and give end-users the best flexibility for setting up and expanding a variety of industrial applications.

## Appearance

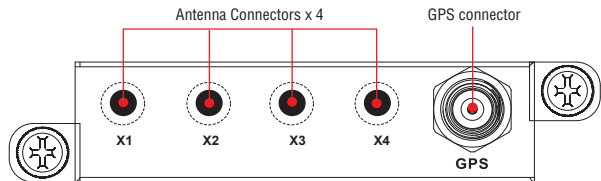
### EPM-3032



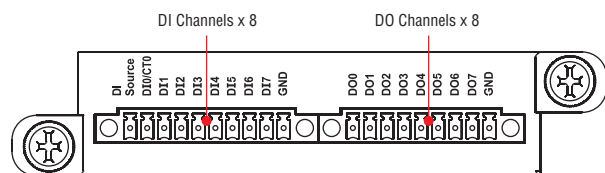
### EPM-3112



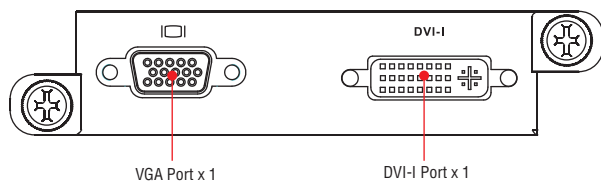
### EPM-3338



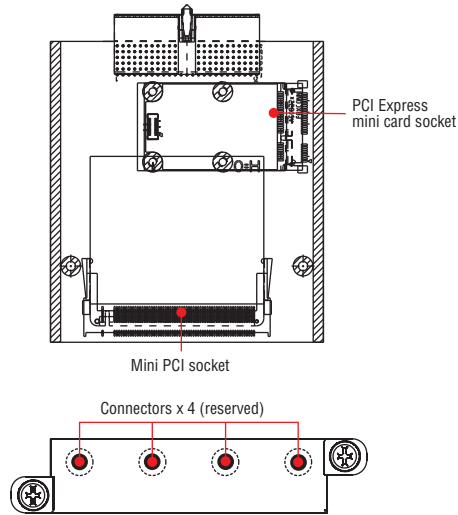
### EPM-3438



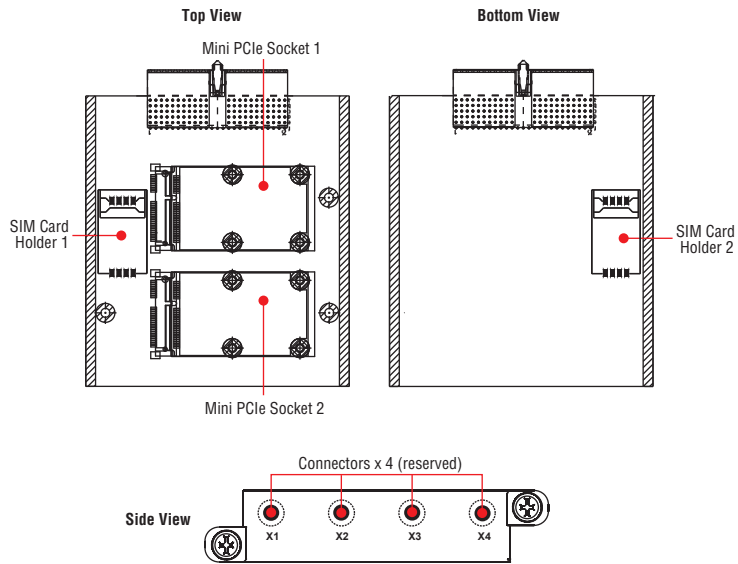
### EPM-3552



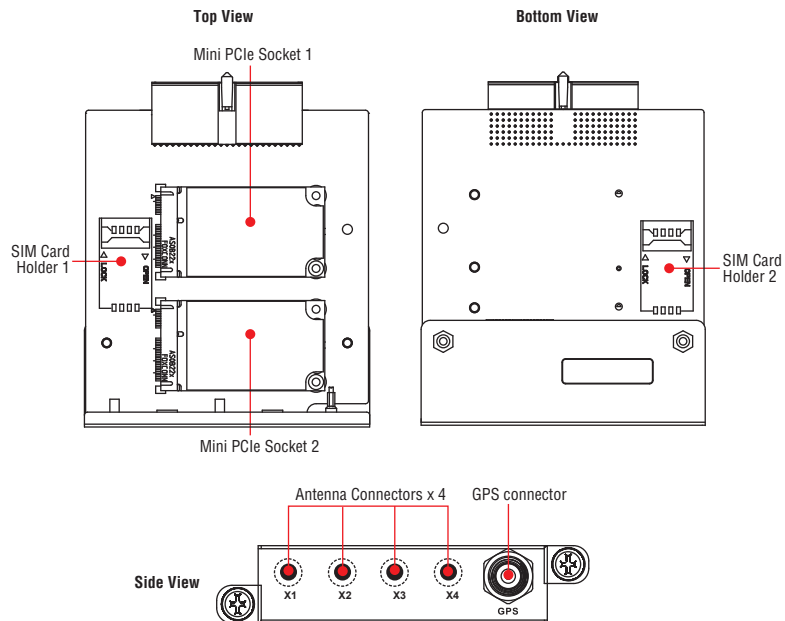
**EPM-DK01**



**EPM-DK02**



**EPM-DK03**



## EPM-3032 Specifications

### Serial Interface

**Serial Standards:** 2 RS-232/422/485 ports, software-selectable (DB9 male)

**Isolation:** 2 kV digital isolation

### 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

### Physical Characteristics

**Weight:** 137 g

**Dimensions:** 104 x 121 x 34 mm (4.09 x 4.76 x 1.34 in)

### Environmental Limits

**Operating Temperature:** -40 to 70°C (-40 to 158°F), EN 50155 Class TX

## EPM-3112 Specifications

### CANbus Communication

**Interface:** 2 optically isolated CAN2.0A/2.0B compliant ports

**CAN Controller:** Phillips SJA1000T

**Signals:** CAN-H, CAN-L

**Isolation:** 2 kV digital isolation

**Speed:** 1 Mbps

**Connector Type:** DB9 male

### Physical Characteristics

**Weight:** 127 g

**Dimensions:** 104 x 121 x 34 mm (4.09 x 4.76 x 1.34 in)

### Environmental Limits

**Operating Temperature:** -25 to 55°C (-13 to 131°F), EN 50155 Class T1

## EPM-3338 Specifications

### EPM-DK03 Mini PCI Express Interface

**Interface:**

- Slot 1: PCI-Express V1.0 (one lane) / USB 2.0

- Slot 2: USB 2.0

**USB 2.0 Bus SIM Card Holder:** Reserved for cellular applications

### Physical Characteristics

**Weight:** 220 g

**Dimensions:** 104 x 121 x 34 mm (4.09 x 4.76 x 1.34 in)

### Environmental Limits

**Operating Temperature:** -25 to 55°C (-13 to 131°F), EN 50155 Class T1

### GPS Interface

**Receiver Types:**

- 50-channel u-blox 6 LEA-6 engine

- GPS L1 C/A code

- GALILEO L1 open service (with upgrade)

- SBAS: WAAS, EGNOS, MSAS, GAGAN

**Acquisition:**

- Cold starts: 28s

- Warm starts: 28s

- Aided starts: 1s

- Hot starts: 1s

**Sensitivity:**

- Tracking: -160 dBm

- Reacquisition: -160 dBm

- Cold starts: -147 dBm

**Timing accuracy:**

- RMS: 30 ns

- 99%: <60 ns

- Granularity: 21 ns

**Accuracy:**

- Position: 2.5m CEP

- SBAS: 2.0m CEP

**Protocols:** NMEA, UBX binary, max. update rate: 5Hz (ROM version)

**Time Pulse:** 0.25Hz to 1KHz

**Velocity Accuracy:** 0.1 m/s

**Heading Accuracy:** 0.5 degrees

**A-GPS:** Supports AssistNow Online and AssistNow Offline, OMA SUPL compliant

**Operational Limits:** Velocity: 500m/s (972 knots)

### Wi-Fi Module

*This Wi-Fi module must be installed by the purchaser*

**Standards Compatibility:**

IEEE 802.11a/b/g/n

**Chipset:** Mac/BB/RF Atheros AR9382

**Host Interface:** Half Mini PCI Express

**Radio Antenna :** 2 x U.FL connectors, 2T2R

**Operating Frequencies:**

- 802.11b/g/n ISM Band: 2.412 ~ 2.4835 GHz

- 802.11a ISM Band: 5.15 ~ 5.85 GHz

**Modulation :**

- 802.11a: OFDM (BPSK, QPSK, 16-QAM, 64-QAM)

- 802.11b: DSSS (DBPSK, DQPSK, CCK)

- 802.11g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM)

- 802.11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM)

**Transmission Power (2T) :**

- 802.11a: 12dBm ± 1.5dBm

- 802.11b: 17dBm ± 1.5dBm

- 802.11g: 16dBm ± 1.5dBm

- 802.11gn HT20: 17dBm ± 1.5dBm@MCS15

- 802.11gn HT40: 16dBm ± 1.5dBm@MCS15

- 802.11an HT20: 13dBm ± 1.5dBm@MCS15

- 802.11an HT40: 12dBm ± 1.5dBm@MCS15

**Receive Sensitivity (2R) :**

- 802.11a: -76dBm ±2dBm@54Mbps

- 802.11b: -85dBm ±2dBm@11Mbps

- 802.11g: -76dBm ±2dBm@54Mbps

- 802.11gn HT20: -75dBm ±2dBm@MCS7

- 802.11gn HT40: -71dBm ±2dBm@MCS7

- 802.11an HT20: -71dBm ±2dBm@MCS7

- 802.11an HT40: -71dBm ±2dBm@MCS7

### HSPA Cellular Module

*This cellular module must be installed by the purchaser*

**Frequency Bands:**

- UMTS/HSDPA: Triple band, 850/1900/1900/2100 MHz

- GSM/GPRS/EDGE: Quad band, 850/900/1800/1900 MHz

- Dual-band EV-DO/CDMA: 800/1900 MHz

- Prepared for UMTS - AWS and EV-DO/CDMA: 2100 MHz

**Advanced RF Technologies:**

- Receive Diversity on all HSPA/UMTS/EV-DO/CDMA bands
- Receive equalization
- Standalone GPS and gpsOneXTRA™

**Data Speeds:**

- HSDPA/HSUPA DL/UL: 14.4 Mbps/5.76 Mbps
- WCDMA DL/UL: 384 kbps/384 kbps
- GSM DL/UL: 14.4 kbps/14.4 kbps
- GPRS DL/UL: 85.6 kbps/42.8 kbps
- EDGE DL/UL: 236.8 kbps/118.4 kbps
- EV-DO FL/RL: 3.1 Mbps/1.8 Mbps
- CDMA 1xRTT FL/RL: 153 kbps/153 kbps

**Power Class:**

- HSPA/WCDMA 800/850/900/1900/2100 Mhz: Power Class 3
- GSM/GPRS 850/900 Mhz: Power Class 4
- GSM/GPRS 1800/1900 Mhz: Power Class 1
- EDGE 850/900/1800/1900 Mhz: Power Class E2

**EPM-3438 Specifications**

**Digital Input**

**Input Channels:** 8, source type

**Input Voltage:** 0 to 30 VDC at 25 Hz

**Digital Input Levels for Dry Contacts:**

- Logic level 0: Close to GND
- Logic level 1: Open

**Digital Input Levels for Wet Contacts:**

- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (Source to DI)

**Counter Frequency:** 2 KHz (DI0 only)

**Connector Type:** 10-pin screw terminal block (8 DI points, DI Source, GND)

**Isolation:** 3 kV optical isolation

**Digital Output**

**Output Channels:** 8, sink type, 0 to 30 VDC

**Output Current:** Max. 200 mA per channel

**On-state Voltage:** 24 VDC nominal, open collector to 30 VDC

**Connector Type:** 9-pin screw terminal block (8 DO points, GND)

**Isolation:** 3 kV optical isolation

**Physical Characteristics**

**Weight:** 120 g

**Dimensions:** 104 x 121 x 34 mm (4.09 x 4.76 x 1.34 in)

**Environmental Limits**

**Operating Temperature:** -40 to 70°C (-40 to 158°F), EN 50155 Class TX

**EPM-3552 Specifications**

**Display**

**Graphics Controller:** DisplayLink DL-195

**VGA Interface:** 15-pin D-sub connector (female)

**DVI Interface:** 24-pin DVI-I connector (female)

**Resolution:** Up to 1920 x 1600 (2048 x 1152 for wide screen) resolution

**Physical Characteristics**

**Weight:** 130 g

**Dimensions:** 104 x 121 x 34 mm (4.09 x 4.76 x 1.34 in)

**Environmental Limits**

**Operating Temperature:** -25 to 55°C (-13 to 131°F), EN 50155 Class T1

**EPM-DK01 Specifications**

**PCI Express Mini Slot**

**Interface:** PCI-Express V1.0 (one lane)

**USB 2.0 Bus SIM Card Holder:** Reserved for Cellular applications

**Mini PCI Slot**

**Interface:** PCI

**Bus Frequency:** 32-bit, 33 MHz PCI

**Physical Characteristics**

**Weight:** 117 g

**Environmental Limits**

**Operating Temperature:** -40 to 70°C (-40 to 158°F), EN 50155 Class TX

**EPM-DK02 Specifications**

**PCI Express Mini Slot**

**Interface:**

- Slot 1: PCI-Express V1.0 (one lane) / USB 2.0
- Slot 2: USB 2.0

**USB 2.0 Bus SIM Card Holder:** Reserved for cellular applications

**Physical Characteristics**

**Weight:** 125 g

**Environmental Limits**

**Operating Temperature:** -40 to 70°C (-40 to 158°F), EN 50155 Class TX

## EPM-DK03 Specifications

### PCI Express Mini Slot

#### Interface:

- Slot 1: PCI-Express V1.0 (one lane) / USB 2.0
- Slot 2: USB 2.0

**USB 2.0 Bus SIM Card Holder:** Reserved for cellular applications

### Physical Characteristics

**Weight:** 220 g

**Dimensions:** 104 x 121 x 34 mm (4.09 x 4.76 x 1.34 in)

### Environmental Limits

**Operating Temperature:** -25 to 55°C (-13 to 131°F), EN 50155 Class T1

### GPS Interface

#### Receiver Types:

- 50-channel u-blox 6 LEA-6 receiver
- GPS L1 C/A code
- GALILEO L1 open service (with upgrade)
- SBAS: WAAS, EGNOS, MSAS, GAGAN

#### Acquisition:

- Cold starts: 28s
- Warm starts: 28s
- Aided starts: 1s
- Hot starts: 1s

#### Sensitivity:

- Tracking: -160 dBm
- Reacquisition: -160 dBm
- Cold starts: -147 dBm

#### Timing accuracy:

- RMS: 30 ns
- 99%: <60 ns
- Granularity: 21 ns

#### Accuracy:

- Position: 2.5m CEP
- SBAS: 2.0m CEP

**Protocols:** NMEA, UBX binary, max. update rate: 5Hz (ROM version )

**Time Pulse:** 0.25Hz to 1KHz

**Velocity Accuracy:** 0.1 m/s

**Heading Accuracy:** 0.5 degrees

**A-GPS:** Supports AssistNow Online and AssistNow Offline, OMA SUPL compliant

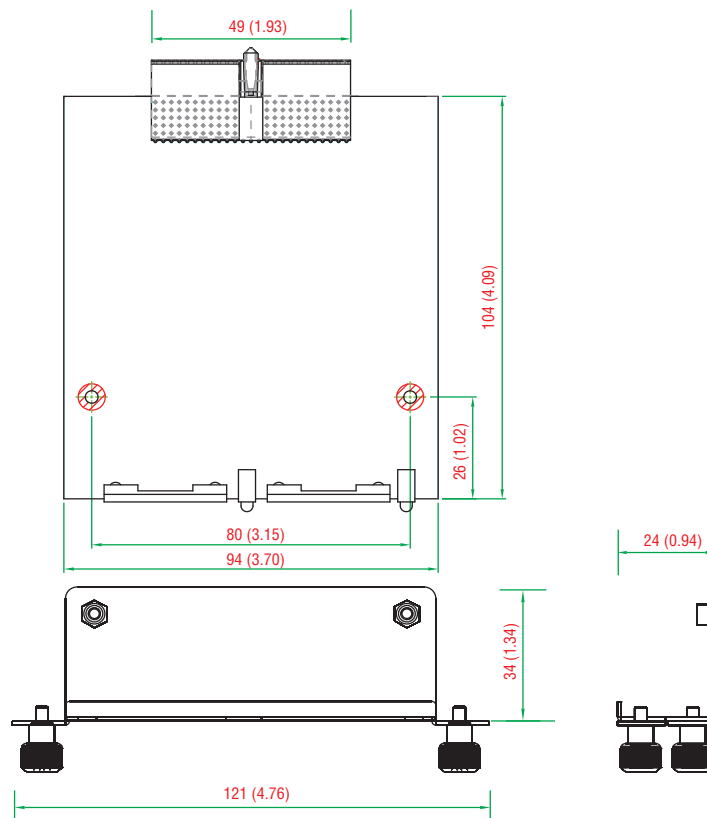
**Operational Limits:** Velocity:500m/s (972 knots)

### EPM-3338 Package List

- 1 EPM-DK03 Expansion Module
- 1 V2400 WiFi Accessory Package
- 1 V2400 HSPA Cellular Accessory Package
- 1 Quick Installation Guide (printed)
- 1 Software Installation DVD

## Dimensions

Unit: mm (inch)



## Ordering Information

### Available Models

**EPM-DK01:** 1 mini PCI and 1 mini PCIe slot, -40 to 70°C operating temperature

**EPM-DK02:** 2 mini PCIe slots, -25 to 55°C operating temperature

**EPM-DK03:** GPS receiver, 2 mini PCIe slots, -25 to 55°C operating temperature

**EPM-3032:** 2 isolated RS-232/422/485 ports with DB9 connectors, -40 to 70°C operating temperature




**EPM-3112:** 2 isolated CAN ports with DB9 connectors, -25 to 55°C operating temperature

**EPM-3338:** GPS receiver, cellular module, 802.11a/b/g/n WLAN card, -25 to 55°C operating temperature




**EPM-3438:** 8+8 DI/DO with 3 kV digital isolation protection, 2 KHz counter, -40 to 70°C operating temperature

**EPM-3552:** VGA or DVI-I display module, -25 to 55°C operating temperature

## EPM-3338 Accessory Package Options

Wi-Fi	Item	Type	Model Name	Description
	1	Cable	A-CRF-RFQMAM-R2-50	QMA (male) to SMA (male) adaptor with 50cm cable
	2	Antenna	ANT-WDB-ARM-02	Omni 1 dBi rubber SMA antenna
Cellular				
	1	Cable	A-CRF-QMAMSF-R2-50	QMA (male) to SMA (female) adaptor with 50cm cable
	2	Antenna	ANT-WCDMA-ASM-1.5	Omni 1 dBi rubber SMA antenna
GPS				
	1	Cable	A-CRF-CTPSF-R2-50	TNC to SMA (female) adaptor with 50 cm cable
	2	Antenna	ANT-GPS-OSM-05-3M	26 dBi, 1572 MHz, L1 band SMA antenna

## EPM-DK03 Accessory Package Options

Wi-Fi	Item	Type	Model Name	Description
	1	Cable	A-CRF-RFQMAM-R2-50	QMA (male) to SMA (male) adaptor with 50cm cable
	2	Antenna	ANT-WDB-ARM-02	Omni 1 dBi rubber SMA antenna
	3	Digital Interface	V2400 WiFi Accessory Package	802.11n mini PCIe Wi-Fi module
Cellular				
	1	Cable	A-CRF-QMAMSF-R2-50	QMA (male) to SMA (female) adaptor with 50cm cable
	2	Antenna	ANT-WCDMA-ASM-1.5	Omni 1 dBi rubber SMA antenna
	3	Digital Interface	V2400 HSPA Cellular Module Package	3G mini PCIe cellular module
GPS				
	1	Cable	A-CRF-CTPSF-R2-50	TNC to SMA (female) adaptor with 50 cm cable
	2	Antenna	ANT-GPS-OSM-05-3M	26 dBi, 1572 MHz, L1 band SMA antenna