

- Extremely small Mini PCIe module format
- Encrypted flash memory
- 256-bit AES Encryption
- Password attack protection
- 8 to 32 GB on-board capacity
- Industrial temp. (-40° to +85°C) operation
- MIL-STD-202G shock/vibe

## Highlights

### Mini PCIe Module Format

Small and flexible.

### AES Encryption

Hardware 256-bit AES encryption/decryption.

### Strong Data Protection

7 to 48 character password with attack protection.

### On-board Memory

Up to 32 GB Flash memory.

### Industrial Temperature Operation

-40° to +85°C operation for harsh environments.

### MIL-STD-202G

Qualified for high shock / vibration environments.

### Class 3 Manufacturing (optional)

IPC-A-610 Class 3 for applications requiring extreme reliability.

## Overview

The VL-MPEu-K1 is an extremely small and rugged encrypted memory module based on the industry-standard Mini PCIe module format. Unlike typical I/O expansion boards, Mini PCIe allows additional I/O functions to be added to a system with almost no increase in overall system/package size. Mini PCIe modules provide a simple, economical, and standardized way to add I/O functions to embedded computer products.

## Details

In a very small package, this encrypted memory board enables embedded systems to utilize hardware AES encryption/decryption to secure data. The integrated cryptographic engine offers 256-bit key AES encryption with a 7 to 48 character password size.

This encrypted memory module utilizes a high performance AES hardware engine to encrypt and decrypt data as it is transferred to and from the private flash drive. Because the encryption keys are only used within the AES hardware engine, they are never accessible to host software. Additionally, keys are never transferred off the board, protecting against hardware-based man-in-the-middle attacks.

The VL-MPEu-K1 utilizes an eMMC flash memory device with a managed interface that addresses error correction code (ECC), wear leveling, and bad block management technology. The on-board management interface takes the burden off the host controller and increases speed for higher system performance.

This board includes user-configurable areas of encrypted and non-encrypted memory. The non-encrypted memory block may be used as a system boot device if desired.

To defend against password attacks, the VL-MPEu-K1 can optionally limit the number of incorrect password attempts. After 10 incorrect password attempts, the private drive encryption key is destroyed permanently preventing access to the data stored on the private drive.

It also meets MIL-STD-202G specifications for shock and vibration, making it at home in harsh environments.

This encrypted memory board is compatible with a variety of popular x86 Windows operating systems.

The module utilizes USB signaling and can be used in any system that supports USB signaling at the Mini PCIe socket.

It is manufactured to IPC-A-610 Class 2 standards. Class 3 versions are available for extremely-high-reliability applications.

Product customization is available, even in low quantities. Options include conformal coating, application-specific testing, BOM revision locks, special labeling, etc.



### Ordering Information

Model	Function	Operating Temp.
VL-MPEu-K1E8	Encrypted memory. 8 GB eMMC flash storage.	-40° to +85°C
VL-MPEu-K1E32	Encrypted memory. 32 GB eMMC flash storage.	-40° to +85°C
VL-MPEu-K1E8C #	Encrypted memory. 8 GB eMMC flash storage. IPC-A-610 Class 3 manufacturing.	-40° to +85°C
VL-MPEu-K1E32C #	Encrypted memory. 32 GB eMMC flash storage. IPC-A-610 Class 3 manufacturing.	-40° to +85°C

# Special Order Product – Contact VersaLogic Sales for minimum order quantities and lead time.

### Accessories

Part Number	Description
<b>Hardware</b>	
VL-HDW-108	Mini PCIe module hold-down screws (10) for use with 2.5 mm standoffs
VL-HDW-110	Mini PCIe module hold-down screws (10) for use with 2.0 mm standoffs

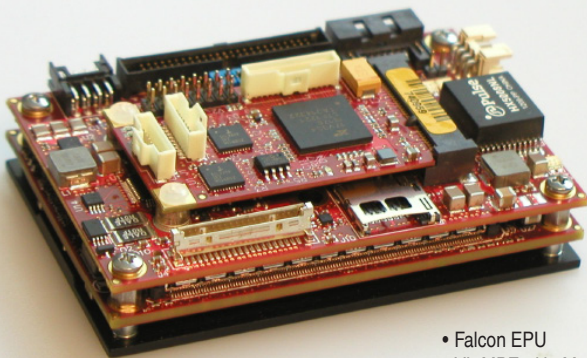
### Specifications

General	Board Size	Mini PCIe module (full size): 30 mm x 50.95 mm x 2.59 mm	
General	Power Requirements	3.3V @ 0.3W (supplied from the Mini PCIe socket)	
	Manufacturing Standards	Standard	IPC-A-610 Class 2 modified
		Optional	IPC-A-610 Class 3 modified
	Regulatory Compliance	RoHS	
Mini PCIe Signal Type	USB		
Environmental	Operating Temperature	-40° to +85°C	
	Storage Temperature	-40° to +85°C	
	Altitude	Operating *	To 15,000 ft. (4,570m)
		Storage	To 40,000 ft. (12,000m)
	Cooling	None (fanless)	
	Airflow Requirements	None (free air)	
	Thermal Shock	5°C/min. over operating temperature	
	Humidity	Less than 95%, noncondensing	
Vibration, Sinusoidal Sweep †	MIL-STD-202G, Method 204, Modified Condition A: 2g constant acceleration from 5 to 500 Hz, 20 min. per axis		
Vibration, Random †	MIL-STD-202G, Method 214A, Condition A: 5.35g rms, 5 min. per axis		
Mechanical Shock †	MIL-STD-202G, Method 213B, Condition G: 20g half-sine, 11 msec. duration per axis		
Memory	Flash Memory	Up to 32 GB. eMMC 4.4x compliant.	
	Hardware Encryption	AES 256-bit	
Software	Operating Systems	Compatible with Windows XP and XPe, Windows 7 and Windows Embedded 7.	

\* For extended altitude information contact VersaLogic Sales Dept.

† MIL-STD-202G shock and vibrate levels are used to illustrate the ruggedness of this product in general. Testing to higher levels and/or different types of shock or vibration methods can be accommodated per the specific requirements of the application. Contact a VersaLogic Sales Engineer for further information.

Specifications are subject to change without notification. PCI Express is a registered trademark of the PCI-SIG. All other trademarks are the property of their respective owners.



- Falcon EPU
- VL-MPEe-U2 Module

### Other VersaLogic Mini PCIe Modules

Model	Function	Signaling
VL-MPEe-A1E	Analog input (12-bit resolution)	PCIe
VL-MPEe-A2E	Analog input (16-bit resolution)	PCIe
VL-MPEe-E3E	Gigabit Ethernet adapter	PCIe
VL-MPEe-U2E	Quad serial plus twelve GPIOs	PCIe
VL-MPEe-W2E	Wi-Fi 802.11 a/b/g/n	PCIe
VL-MPEs-F1Exx	mSATA drive (4/16/32 GB)	SATA
VL-MPEs-S3E	SATA adapter	SATA
VL-MPEu-G2E	GPS receiver	USB