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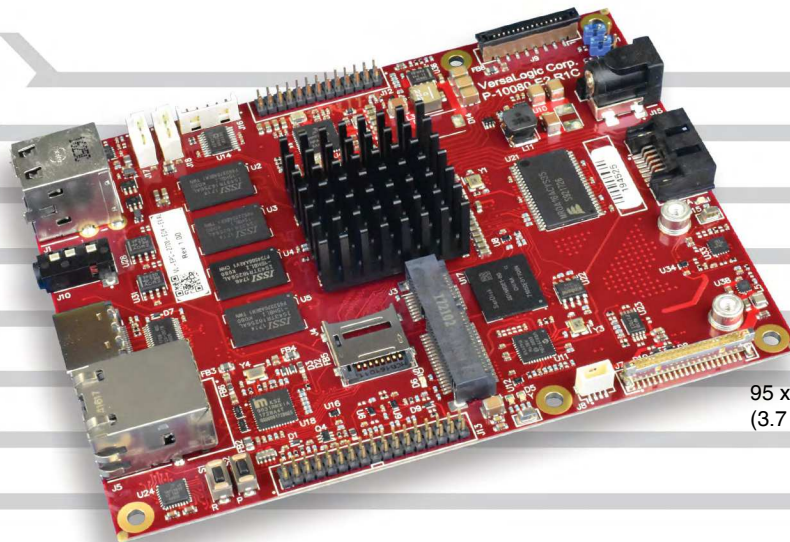
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# Tetra

## Arm-based Single Board Computer



95 x 125 mm  
(3.7 x 4.9")

### Overview

The Tetra is a power-efficient Arm-based quad-core embedded computer. It is ready for deployment into demanding industrial applications requiring rugged, long-life, power-efficient solutions. It features a full complement of on-board I/O.

VersaLogic's Tetra is rugged. It is engineered and validated to excel in unforgiving environments including high temperature, mechanical shock, and vibration. Each component has been carefully sourced to ensure reliable operation in the field.

This robust embedded computer provides connectivity via Gigabit Ethernet, USB, and CAN Bus interface, as well as HDMI and LVDS video support. It also includes a Mini PCIe socket for expandability, an I2C port, MIPI camera input, audio I/O, SPI, and a 6-axis accelerometer / magnetometer.

The available 10+ year product life support ensures long-term deployment in the field, free from expensive replacements that come from short, disposable lifecycles that are all too common.

### Highlights

- -40° to +85°C operating temperature
- Quad-core i.MX6 performance
- Shock and vibration per MIL-STD-202G
- 95 x 125 mm COM Basic size
- Low power draw
- Fanless operation
- Up to 4 GB soldered-on RAM\*
- Wide power input (8 to 17V)
- Gigabit Ethernet
- HDMI and LVDS video
- Mini PCIe\* / mSATA\* socket
- USB 2.0 ports
- Serial I/O (RS-232)
- SATA II port\*
- MicroSD card socket
- 128 KB Magnetic RAM\*
- Up to 32 GB eMMC Flash\*
- CAN Bus
- SPI
- I2C
- 6-axis, e-compass
- VersaAPI software support
- Linux and Android™ support

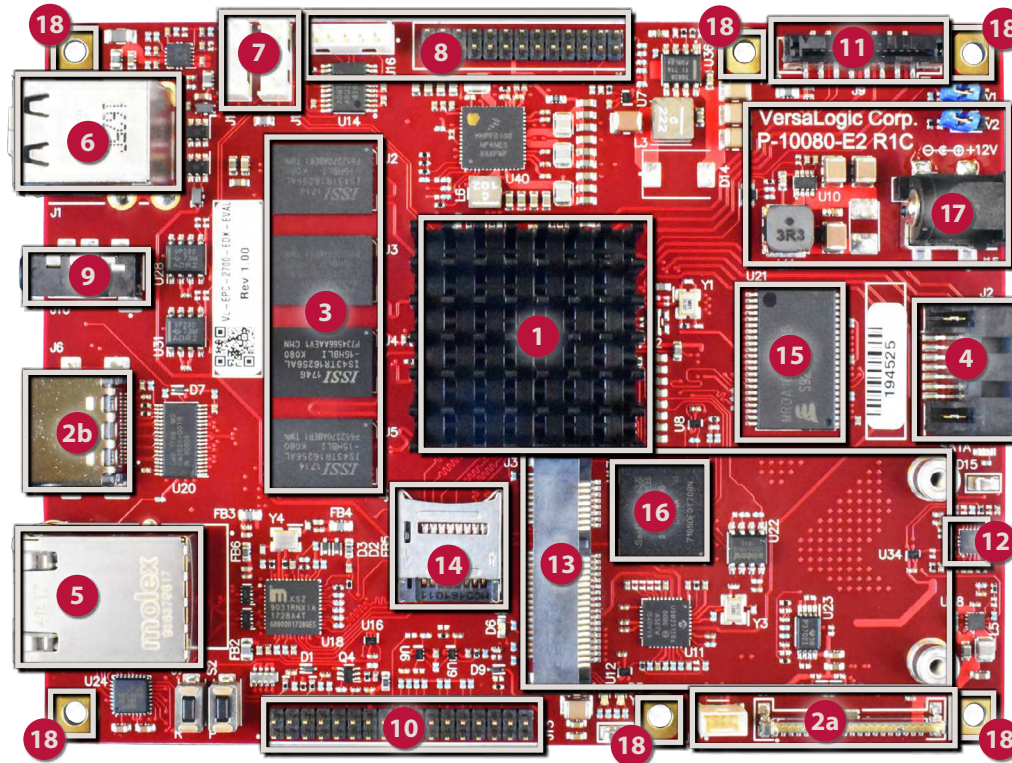
\* Optional. Not available on all models.

## Features

- 1 NXP i.MX6 Cortex®-A9 32-bit Processor**  
Quad-core Arm processor with integrated I/O and 2D/3D graphics engine
- 2 Video Outputs**  
LVDS (flat panel) video output with backlight support (2a), HDMI video output (2b).
- 3 RAM**  
Up to 4 GB soldered-on memory. 2 GB standard.
- 4 SATA\***  
One SATA II port supports high-capacity storage (solid-state drives or rotating media)
- 5 Network Support**  
Gigabit Ethernet interface with network boot capability
- 6 USB**  
Two USB 2.0 ports support keyboard, mouse, and other devices
- 7 CAN**  
Two CAN bus ports
- 8 Serial I/O**  
Two serial I/O ports (UART and Debug), I2C, and SPI
- 9 Audio**  
Audio I/O
- 10 GPIO and PWM**  
Eight 3.3V GPIO and three PWM outputs
- 11 Camera**  
MIPI camera input
- 12 Accelerometer**  
Integrated 6-axis e-compass (accelerometer/magnetometer)
- 13 Mini PCIe\*/mSATA\* Socket**  
Supports Wi-Fi modems, Ethernet, Analog I/O, Serial ports, GPS, MIL-STD-1553, Ethernet, solid-state mSATA drives, and other plug-in devices
- 14 MicroSD Socket**  
Supports removable microSD card solid-state drives
- 15 128 KB Magnetic RAM\***  
Fast memory that retains data during power-off
- 16 eMMC Flash\***  
Up to 32 GB
- 17 Input Power Conditioning**  
8 to 17V power input range (12V automotive compatible)
- 18 Standardized Mounting**  
COM Express Basic size mounting holes

- Industrial Temperature Operation**  
Full -40° to +85°C operation for harsh environments
- MIL-STD-202G**  
Qualified for high shock and vibration environments

- Software Support**  
Linux and Android operating system support.  
VersaAPI support software provided for onboard I/O devices.



## Modify Tetra to Your Exact Requirements

COTS modifications are available in quantities as low as 100 pieces.

- 4 GB RAM
- 128 KB Magnetic RAM
- 32 GB eMMC
- Standard Temperature Version
- Conformal Coating
- Connector & I/O Changes
- Custom Testing
- Custom Labeling
- BGA Underfill
- U-Boot Modification
- Software/Drivers
- Revision Locks
- Custom Screening
- Application-Specific Testing
- Etc.

## Specifications

General				
Board Size	95 x 125 x 21 mm (3.7 x 4.9 x .82")			
Weight	90 grams (3.2 oz.)			
Processor	NXP i.MX6			
Input Voltage	8 to 17VDC (compatible with 12V automotive systems)			
Power Requirements §	Model	Standby	Idle	Busy
	VL-EPC-2700-EDK-02x	0.98W	2.8W	4.8W
	VL-EPC-2700-EDK-EVAL	0.98W	2.8W	4.8W
System Reset and Hardware Monitors	Major voltage rails monitored. Watchdog timer with programmable timeout. CPU temperature monitoring. Push-button reset.			
Manufacturing Standards	IPC-A-610 Class 2			
Regulatory Compliance	RoHS (2011/65/EU), Conflict Mineral Free			

Environmental	
Operating Temperature ◊	-40° to +85°C
Storage Temperature	-40° to +85°C
Altitude	Operating* To 4,570 m (15,000 ft.)
	Storage To 12,000 m (40,000 ft.)
Airflow Requirements	0.5 Linear Meters per Second (100 Linear Feet per Minute)
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 ms duration per axis

Memory	
System RAM	Up to 4 GB DDR3L soldered-on memory. 2 GB standard*** 128 KB Magnetic RAM***

Video	
General	Integrated video controller. Supported video decoders: DivX 3/4/5/6, H.263, H.264, MJPEG, MPEG-1/2, MPEG-4, VC1. Video encoders: H.263, H.264, MJPEG, MPEG-4.
Desktop Display Interface ‡	HDMI V1.4 port
OEM Flat Panel Interface #	LVDS interface. 18- and 24-bit panels support up to 1366 x 768 resolution. Support for FPD power control.

‡ TVS protected port (enhanced ESD protection)

# Power pins are overcurrent protected

◊ Derate -1.1°C per 305 m (1,000 ft.) above 2,300 m (7,500 ft.)

\* For extended altitude information contact VersaLogic Sales.

§ Represents operation at +25°C and +12V running Yocto Linux 2.1 with HDMI display, SATA, and USB keyboard/mouse. Busy power measured with "/bmt" Himeno Max Power. The power consumed is a direct result of the peripherals plugged into the Zebra board.

□ MIL-STD-202G shock and vibration levels were used to illustrate the overall ruggedness of this product. Certification at higher levels or different types of shock or vibration methods per the specific requirements of the application is available. Contact VersaLogic Sales for further information.

\*\*\* Optional. Not available on all models—contact VersaLogic Sales.

Specifications are subject to change without notification. Arm and Cortex are trademarks of the Arm Ltd. Android is a trademark of Google Inc. All other trademarks are the property of their respective owners.

Mass Storage	
Rotating Drive / Flash / Solid-State Drives	Bootable SATA II port, latching connector*** mSATA socket, bootable*** MicroSD socket, bootable eMMC MLC Flash drive. 0 to 32 GB, bootable***

Network Interface	
Ethernet ‡	One autodetect 10BaseT/100BaseTX/1000BaseT port. Latching connector.
Network Boot	Supported

Device I/O	
USB# ‡	Two USB 2.0 host ports
Serial I/O	One UART (3.3V) port One RS232 debug port ‡
Audio	Microphone and headphones in/out on single 3.5 mm audio jack. Line inputs/outputs on 34-pin I/O header.
Digital I/O	Eight CMOS level TTL I/O lines (3.3V)
PWM	0 to 3 PWM outputs. Use of PWM outputs reduces GPIO pin count.
I2C	Two I2C interfaces
CAN Bus	Two channels (3.3V CAN signaling, 5V tolerant)
Camera Input	MIPI CSI – Low-cost camera port (CSI-2, 2-lane mode)
Accelerometer/ Magnetometer	6-axis sensor with integrated linear accelerometer and magnetometer.

Other I/O	
Mini PCIe Socket	Full-size Mini PCIe socket.*** Supports Wi-Fi modems, GPS receivers, and other plug-in modules.
SPI Interface	One channel with three device chip selects

Software	
VersaAPI	VersaLogic Application Programming Interface to support on-board I/O devices.
Sleep Modes	i.MX6 Power Modes: - Run - Wait - Stop - Dormant
Operating Systems	Compatible with most Arm operating systems including Linux and Android.

\*Feature optional or available on some models only

## Ordering Information

Call VersaLogic Sales at (503) 747-2261 for more information!

Model	CPU Model	Cores	Nominal CPU Speed	Memory	Mini PCIe Socket and SATA Port	mSATA Socket	Operating Temperature	MRAM	eMMC	Cooling
VL-EPC-2700-EDK-02A	i.MX6 Quad	Quad	800 MHz	2 GB	-	Yes	-40° to +85°C	-	-	Heat Sink
VL-EPC-2700-EDK-02B	i.MX6 Quad	Quad	800 MHz	2 GB	Yes	-	-40° to +85°C	-	-	Heat Sink
VL-EPC-2700-EDK-EVAL	i.MX6 Quad	Quad	800 MHz	2 GB	Yes	-	-40° to +85°C	128 KB	8 GB	Heat Sink

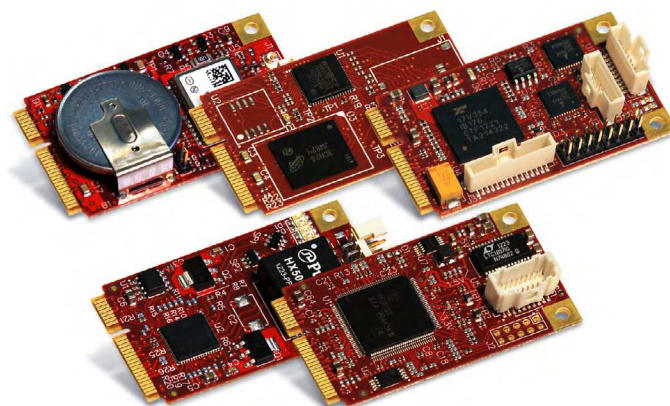
Other configurations are possible. Please contact VersaLogic Sales at (503) 747-2261 to discuss requirements.

## Accessories

Part Number	Description
<b>Cable Kit</b>	
VL-CKR-TETRA	Development Cable Kit for Tetra. Includes: VL-F41-8SBN-LINUX1, CBR-0504, 2603, 3407, PS-WALL12-24, HDW-108.
VL-F41-8SBN-LINUX1	Linux Operating System, 8 GB microSD card with bootable Linux, standard temperature
VL-CBR-0504	UART Cable, 2mm 5-pin to DB-9M, 0.3m
VL-CBR-2603	Serial I/O (I2C, UART, SPI). 26-pin 2 mm IDC to Ribbon Cable, 0.5m
VL-CBR-3407	Debug port cable (RS-232), 34-pin 2 mm IDC to Ribbon Cable, 0.5m
VL-PS-WALL12-24	Power Adapter, 90 ~ 264 VAC to 12VDC @ 2A, 2.1 mm ID Plug, International plug kit
VL-HDW-108	Mini PCIe/mSATA hold down screws, M2.5 x 6 mm Metric Nylon Screw kit (10ea) RoHS
<b>Cables</b>	
VL-CBR-0404	LED Back Light cable, 3-pin Pico-Clasp / 4-pin IDE Power to 6-pin 12V, 500mm
VL-CBR-0405	CAN bus cable, 2mm 4-pin to 2mm 4-pin MicroClasp, 1m
VL-CBR-0406	CAN bus cable, 2mm 4-pin MicroClasp to DB9 connector, 0.5m
VL-CBR-2014	LVDS to VGA adapter
VL-CBR-2015	LVDS cable, 24-bit 20-pin 1 mm Hirose to 1 mm Hirose, 20"
VL-CBR-2016	LVDS cable, 18-bit 20-pin 1 mm Hirose to 1.25 mm JAE, 20"
VL-CBR-2017	LVDS cable, 24-bit 20-pin 1 mm Hirose to 1.25 mm Hirose, 20"
<b>Solid-State Storage (flash memory)</b>	
VL-F41-xxxx	microSD card (SDIO), SLC, industrial temperature
<b>Hardware</b>	
VL-HDW-111	Half- to Full-Size Mini PCIe Adapter Kit. Metal adapter and screws (2)

## Expansion Modules

Part Number	Description	Expansion Interface
<b>Network</b>		
VL-MPEe-E3E	Gigabit Ethernet adapter	Mini PCIe
VL-MPEe-E4E	Gigabit Ethernet over Fiber adapter	Mini PCIe
VL-MPEe-FW1E	1394 FireWire Module	Mini PCIe
<b>Analog &amp; Digital I/O</b>		
VL-MPEu-A1E	Analog input (12-bit resolution)	Mini PCIe
VL-MPEu-A2E	Analog input (16-bit resolution)	Mini PCIe
<b>GPS</b>		
VL-MPEu-G2E	GPS receiver	Mini PCIe or mSATA
VL-MPEu-G3E	Advanced GPS receiver	Mini PCIe or mSATA
<b>Solid-State Storage (flash memory)</b>		
VL-MPEs-F1Exx	mSATA module (4/16/32 GB) (SATA)	mSATA
<b>Adapters</b>		
VL-MPEs-S3E	SATA adapter	mSATA



Mini PCIe Modules

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