LCR | EMBEDDED SYSTEMS, INC. ®

3-Slot SWaP-C-friendly VPX System for UAVs, Ground Mobile
The Perfect Rugged, Powerful, Customizable Solution Offers Superior Processing

LCR Embedded Systems' fully integrated, conduction-cooled, SWaP-C-friendly 3-Slot VPX System breaks new ground in addressing the concerns of application developers and allows for the massive expansion of payload performance and processing power for autonomous vehicles from small UAVs, to ground mobile and submersible vehicles.

The 3-Slot VPX System can feature a variety of processor and other blades (such as switch and GPU blades).

- 3-Slot VITA 48.2 VPX featuring superior cooling and processing
- Available in multiple configurations for demanding sensor management applications
- Supports high-speed signaling
- Optional MIL-STD-1553 XMC card for communication with avionics bus
- Slot for optional SSD hard drive
- Input power compliant to MIL-STD-704/MIL-STD-1275 (voltage spikes, cranking level 18V min.)

Features include data encryption, easily accessible/removable data storage, IP sealing, and lightweight materials for weight savings. The system is designed for mission management and sensor processing. Please contact us for more information about design possibilities. Various payloads are available but may require custom backplane designs to accomodate slot profiles.

Electrical

Input Power:
Nominal Input Voltage: +28 VDC
Input Transients: MIL-STD-704F
Max Power Consumption: 175W

Output Power:
Backplane: 12/5/3.3 V, ±12/3.3Vaux
Regulation: ANSI/VITA 62

Slots:
2 3U VPX, 1 3U VITA 62 power supply

Backplane:
ANSI/VITA 46.0, ANSI/VTA 65-2010

Physical

Dimensions:
3.70" (H) x 6.75" (W) x 8.84" (D)

Weight:
12lb fully populated including SSD

Mounting:
Provided to secure chassis to a flat metal surface

Sealing:
IP67

Cooling

Method:
Fanless conduction cooling through baseplate and natural convection

Dissipation:
Thermal loads up to 175W

Connectors & I/O

Available Connectors:
2 MIL-STD-38999 connectors
Options for Optical and RF

Environmental

Operating/Storage Temperature:
-40 to 70 C/-50 to 100 C
Designed to MIL-STD-810G Method 501.5, Procedure II

Thermal Shock:
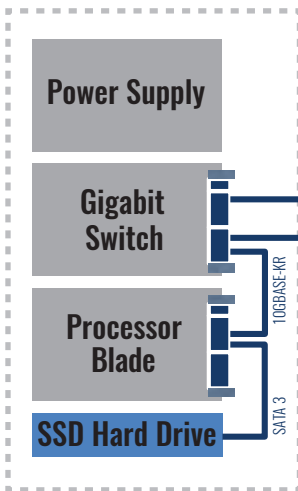Designed to MIL-STD-810G, Method 503.5, Procedure I

Shock/Vibration:
Designed to MIL-STD-810G, 40G

Humidity/Altitude:
0 to 95% noncondensing/60,000'

A Gateway to the Vehicle and Onboard Sensor Management

Power Supply

Gigabit Switch — 12x 1000BASE-T — 38999
10GBASE-KR — HF38999

Processor Blade — 10GBASE-KR
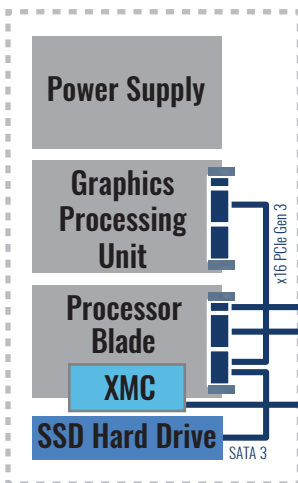
SSD Hard Drive — SATA 3

Modern autonomous vehicles can contain a multitude of sensors, including radar and multispectral video, in addition to GPS and satellite links -- all of which adds up to an enormous amount of data that cannot be communicated to the ground via a relatively low-bandwidth Tactical Radio link.

Pre-processing of this sensor and other data aboard the vehicle can often alleviate the amount of data that must be sent to the ground, with the vehicle effectively deciding which data is important enough to hand off.

Thanks to the processor card and Gigabit Ethernet switch of your choice, this system can not only connect the various sensors to one another and function as a switched fabric backbone for the entire vehicle payload, but it can also carry out vital data processing needed to make sure that the most important data gets to where it needs to be, including offload processing for other on-board systems and encryption of the data for off-board transmission.

The Power You Need for Multi/Hyperspectral Video/Imaging

Power Supply

Graphics Processing Unit — x16 PCIe Gen 3

Processor Blade — 10GBASE-KR — HF38999
Lo-speed I/O — 38999

XMC

SSD Hard Drive — SATA 3

One of the biggest challenges to carrying out high-performance, processing-intensive video surveillance is the sheer amount of data involved in multi and hyperspectral video gathering used in reconnaissance, surveillance, target acquisition, and damage assessment. Data may be gathered in various spectral bands, and given the low Tactical Radio bandwidth to the ground, it can be a challenge to communicate this data to those who need it.

A Graphics Processing Unit, when used in conjunction with the processor blade, can massively increase the data-processing capabilities of any vehicle, allowing far more sophisticated on-board algorithms, selecting only the most significant data -- speed, position, and location for example -- or communicating only the "delta" or difference between current images taken with previous satellite imagery to demonstrate how the landscape has changed.

From Ground Control to the Vehicle, A Total Solution

LCR Embedded Systems also designs and manufactures equipment for ground control stations, including high-performance AdvancedTCA enclosures currently in use all over the world. Such systems function as the central brain for ground control stations and carry out image processing and data processing both to communicate to the vehicle itself as well as downstream stations and personnel.

3U VPX System

Gigabit Ethernet LAN

Sensor **Sensor** **Sensor**

GPS **Radar**

Ground Control Station
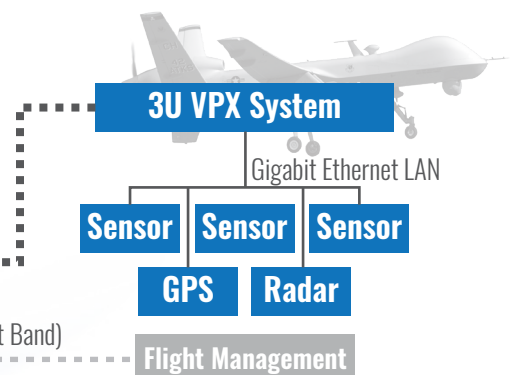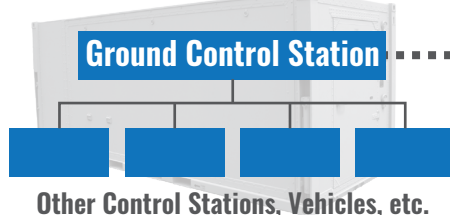
(Logically Separate DO-178/DO-254 Compliant Band)

Flight Management

Other Control Stations, Vehicles, etc.

Model Number	Product Description
LCRFW-3001-03	Conduction-cooled, Lightweight, 3-Slot Aluminum VPX Enclosure • 3U VPX Intel® Xeon® Processor Blade • 3U VPX GPU Blade • VITA 62 Power Supply • Removable SSD, 1 TB
LCRFW-3001-03CA	Cable Assembly, 28 VDC Input and AC Adapter (lab/development)

For other configurations, please contact LCR Embedded Systems at the phone number or e-mail address below.