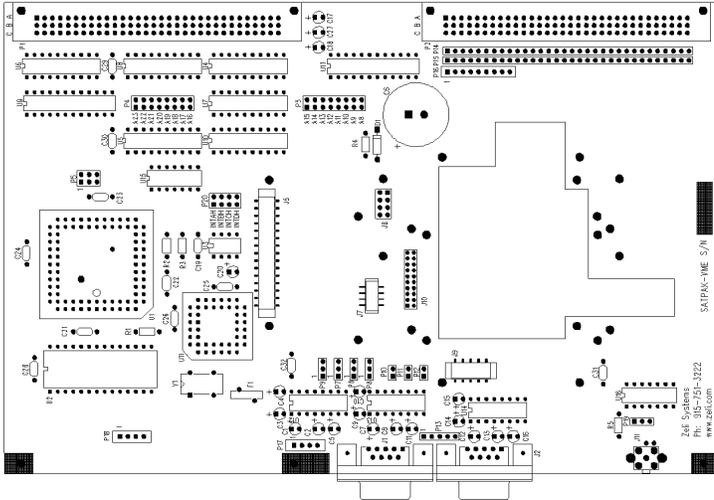


# Zeli Systems SATPAK-VME



## The "No Hassle" GPS solution for the VME Bus

### Features:

- The SATPAK-VME is a 6U carrier board that provides modular GPS receiver technology to the VME Bus.
- The SATPAK-VME can be configured to mate with either the Trimble SK2/SK8 (Lassen), Trimble ACEII/ACEIII, Navman Jupiter, Motorola M12/VP/GT/UT Oncore, Ashtech G12, Ashtech G8, Thales DG14/DG16, or Canadian Marconi SuperstarII GPS receiver.
- Optional front panel 9-digit LED Display for time and position. Digits are 0.3" tall.
- Fused +5V to GPS receiver.
- Employs a PC16552 Dual Universal Asynchronous Receiver Transmitter (DUART) to communicate with the GPS receiver.
- DUART can be bypassed to provide RS-232 signal levels at front panel for both communication channels of GPS receiver via DB9S connectors J1 and J2.
- Meets VME A24:D08(O) requirements to access on-board DUART (PC16552), and interrupt control/vector registers.
- VME ROAK interrupter can handle four interrupt sources. Typically only three are used by the SATPAK-VME (GPS CHA, GPS CHB, and 1PPS).
- Uses a 1 Farad capacitor to retain almanac, ephemeris, and real-time clock of the selected GPS receiver.
- Single-ended or open collector (jumper selectable) Time Pulse output (1PPS) provided on bracket mount DB9S connector.
- 1PPS interrupt to the VME bus for NTP or timing applications.

**SATPAK-VME Function:** The SATPAK-VME provides an inexpensive method to interface a modular GPS receiver to the VME Bus. The SATPAK-VME can be configured to mate with either a Trimble SK2/SK8 (Lassen), Trimble ACEII/ACEIII, Navman Jupiter, Motorola M12/VP/GT/UT Oncore, Ashtech G12, Ashtech G8, Thales DG14/DG16, or Canadian Marconi SuperstarII GPS receiver. The TTL communication signals of the selected GPS receiver are transmitted and received over the VME Bus using a dual universal asynchronous receiver transmitter (DUART). For users that employ external serial ports, the DUART can be bypassed to provide RS232 signal levels to two

(one for each GPS I/O channel) DB9S connectors on the front panel. A keep-alive voltage is generated by using a large value (1 Farad) capacitor to maintain the almanac, ephemeris, and real-time clock of the selected receiver. Differential GPS (DGPS) corrections can be received at the J2 front panel DB9S connector or can be transmitted over the VME Bus through the second DUART channel. Each DB9S connector also provides the 1PPS timing pulse generated by the GPS receiver. A 1PPS interrupt capability allows the SATPAK-VME to generate a VME-Bus interrupt from the Time Pulse (1PPS) signal generated by the GPS receiver. The VME P2 connector can be configured to provide RX/TX signals for each GPS I/O channel, the 1PPS Time Mark signal, and other selected signals.

**Power:** The SATPAK-VME operates from single +5 VDC power. The GPS receiver +5 volt power is fused using a resettable fuse that is thermally activated. Once the fault condition has been removed, the fuse will automatically reset after cooling.

**VME Interface:** Communication with the GPS receiver is performed using the PC16552 DUART over the VME-Bus. The DUART is initialized and accessed via VME A24:D08(O) data transfers. An on-board ROAK interrupter is implemented in an Altera 8282 device to handle serial DUART and 1PPS interrupts to the host. Four interrupt sources can be programmed for interrupt level and priority via an interrupt control register for each source. A separate interrupt vector register allows programmable 8-bit vectors. Push-on jumpers allow selection of the SATPAK-VME base address. The SATPAK-VME supports address modifiers 39, 3D, 29 and 2D as per the VME-Bus specification.

**Front Panel Display Option:** An optional 9-digit red character LED display can be supplied with the SATPAK-VME. The 9-digit display employs 0.3" high characters and mounts on the front panel. The display utilizes an on-board 87C751 microcontroller to decode NMEA messages from the GPS receiver to display time and position.

**RF Input and 1PPS Output:** An RG174 antenna adapter cable is used between the GPS receiver and the front panel. SMA connectors are standard for these two connections.

## SATPAK-VME SPECIFICATIONS (Block Diagram not shown in “.pdf” version of datasheet)

### Mechanical, Environmental, Power:

Physical Dimensions:	160mm X 233mm (VME 6U)
Operating Temp:	-10°C to 70° C
Humidity:	0 to 99% (non-condensing)
Power:	+5V +/- 5%, 0.3 A
Fabrication:	1.68mm ± 0.2mm, FR4

### Connectors:

GPS TX/RCV (CHA):	J1
Conn:	Primary GPS TX/RCV
Type:	DB9S
GPS TX/RCV (CHB):	J2
Conn:	Secondary GPS TX/RCV (RTCM)
Type:	DB9S

### Note: J1 AND J2 only used when on-board DUART is bypassed

GPS Antenna: J3	
Conn:	SMA (BNC optional)
Type:	Bulkhead Female
1PPS Output: J4	
Conn:	SMA (BNC optional)
Type:	Right-Angle PCB mount

### VME-Bus Interface:

Data Type:	D08(O) slave
Addressing Type:	A24 (standard supervisory, standard non-privileged address)
Addressing Base:	A8 to A24 configurable by push-on jumpers

Offset 1	DUART CH2 Base Add	(R/W)
Offset 3	DUART CH2 Int Enable	(R/W)
Offset 5	DUART CH2 Int Ident	(R)
Offset 5	DUART CH2 FIFO Cntr	(W)
Offset 7	DUART CH2 Line Cntr	(R/W)
Offset 9	DUART CH2 Modem Cntr	(R/W)
Offset B	DUART CH2 Line Status	(R/W)
Offset D	DUART CH2 Modem Stat	(R/W)
Offset F	DUART CH2 Scratch Reg	(R/W)
Offset 11	DUART CH1 Base Add	(R/W)
Offset 13	DUART CH1 Int Enable	(R/W)
Offset 15	DUART CH1 Int Ident	(R)
Offset 15	DUART CH1 FIFO Cntr	(W)
Offset 17	DUART CH1 Line Cntr	(R/W)

Offset 19	DUART CH1 Modem Cntr	(R/W)
Offset 1B	DUART CH1 Line Status	(R/W)
Offset 1D	DUART CH1 Modem Stat	(R/W)
Offset 1F	DUART Scratch Reg	(R/W)
Offset 21	VME Interrupt Cntr Reg A	(W)
Offset 23	VME Interrupt Cntr Reg B	(W)
Offset 25	VME Interrupt Cntr Reg C	(W)
Offset 27	VME Interrupt Cntr Reg D	(W)
Offset 29	VME Interrupt Vec Reg	(R/W)

**VME-Bus Interrupt Enable, Level, and Vector:** The user programs the on-board interrupt control register to enable/disable interrupts for the associated interrupt source. One of IRQ1\* to IRQ7\* must be programmed into the interrupt control register. VME-Bus interrupt levels IRQ1\* to IRQ7\* are driven using LS641 open collector drivers. The on-board vector register is programmed with the desired base vector.

### Ordering and Quantity Price Information:

Use the part numbers below to accommodate the specified GPS receiver. Please note that the SATPAK-VME is delivered with SMA front-panel connectors as standard. An optional 9-digit LED display to display time and position can be provided. Please append the following part numbers with the “-SMA”, “-BNC”, and “-LED”, to specify these connector and display options.

SATPAK-VME-T	Trimble ACEII or ACEIII
SATPAK-VME-L	Trimble Lassen SK2 or SK8
SATPAK-VME-R	Navman Jupiter
SATPAK-VME-M	Motorola M12/VP/GT/UT Oncore
SATPAK-VME-A12	Ashtech G12 or Thales DG14/DG16
SATPAK-VME-A8	Ashtech G8
SATPAK-VME-C	Cnadian Marconi SuperstarII

Example: To order the SATPAK-VME configured for the Trimble ACEIII, with SMA front-panel connectors, and the 9-digit LED display, use the following part number:  
SATPAK-VME-T-SMA-LED