



# Modem Evaluation Platform ZMP-001

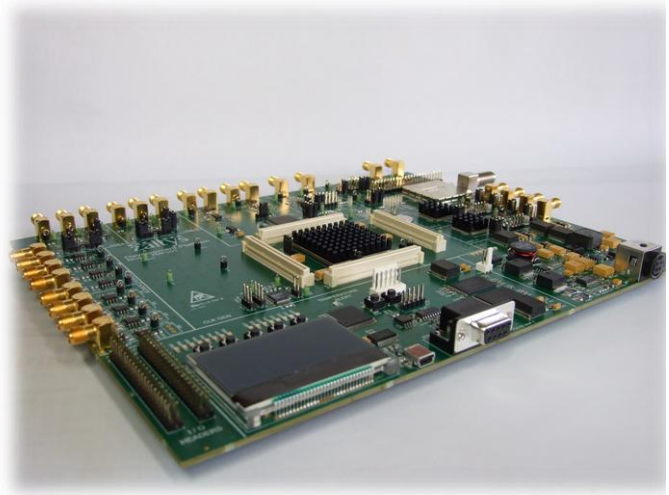
Product Overview

## Features

- Xilinx Virtex-4 FPGA engine
  - LX100-12 (others on request)
- Integrated L-band DVB-S2 tuner
  - 1 x Intel WGCE5038
- Dual variable-gain amplifiers (VGAs)
  - 2 x Analog Devices AD8367
- Dual 12-bit 170Ms/s ADCs (200Ms/s on request)
  - 2 x Analog Devices AD9430-170
  - Differential or single-ended inputs
- Dual 12-bit 125Ms/s DACs
  - 1 x Analog Devices AD9765-125
- Dual 16-bit 500Ms/s oversampling DACs
  - 1 x Texas Instruments DAC5687
  - Differential or single-ended outputs
- Quad 12-bit auxiliary serial ADCs
  - 1 x Texas Instruments ADS7841
- Quad 12-bit auxiliary serial DACs
  - 4 x Texas Instruments DAC7571
- Flexible clocking subsystem
  - Two low-noise onboard clocks
    - 100MHz & 125MHz (others on request)
  - 100MHz dithered clock generator
  - External clock input
  - Dual clock-conditioning DACs
- USB & RS232 ZEDwire™ interfaces
  - Connects to ZEDwire Communicator™ GUI software
- On-board FPGA FLASH
- On-board power supply conditioning & AC adapter
- Baseband expansion port
  - Allows customer to add custom baseband functions
  - General purpose baseband boards also available

## Introduction

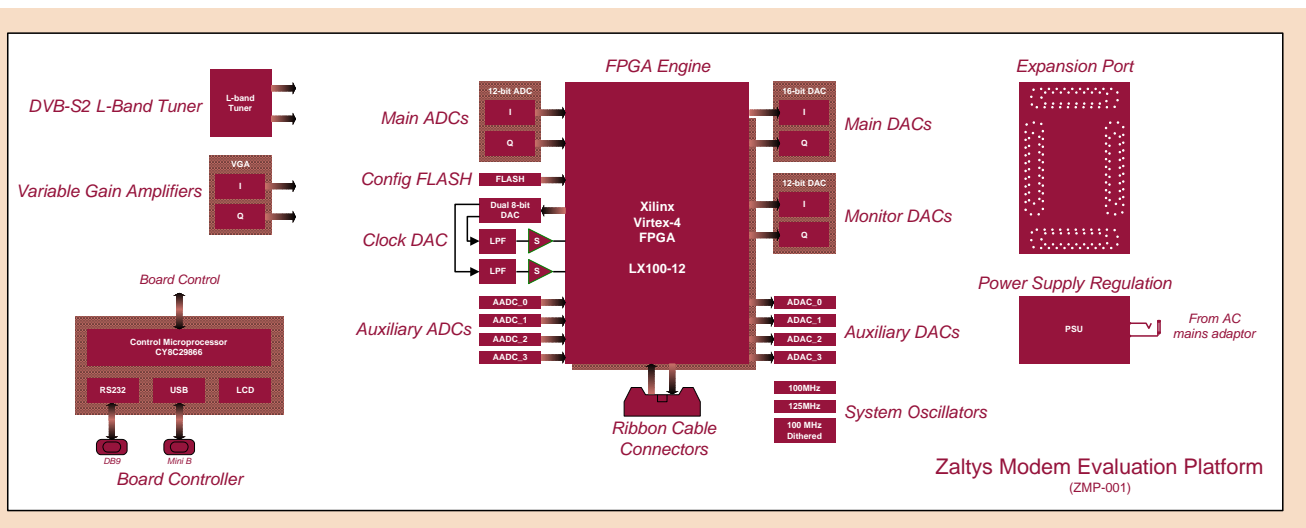
The Zaltys™ Modem Evaluation Platform (ZMP-001) is designed to demonstrate Zaltys modem products at rates of up to 65Mbaud. The platform uses Xilinx Virtex-4 technology, and can be fitted with custom expansion boards to extend its functionality. It connects to a PC via a USB or serial port, allowing easy connection with the ZEDwire Communicator software.



## Technical Overview

### Interfaces

The board is designed to interface seamlessly to a range of diverse modem receive and/or transmit evaluation scenarios.



# Modem Evaluation Platform ZMP-001

Product Overview

## Technical Overview continued

On the **receive** side, the board can accept either an L-band input or baseband real & imaginary (IQ) analogue signals.

On the **transmit** side, the board produces baseband real & imaginary (IQ) analogue signals.

It is also possible to receive or transmit signals containing a residual low-frequency IF carrier.

### Receive Channel

The on-board DVB-S2 tuner converts an L-band input signal to an IQ signal with a residual low-frequency IF carrier. This is then digitised by the main ADCs before being passed to the FPGA for demodulation or other digital processing. The main ADCs can also accept analogue IQ inputs either directly from an external source, or indirectly via the Variable Gain Amplifiers (VGA). Flexible gain control of both the L-band tuner and the VGAs can be provided either externally, or can be digitally controlled directly from the FPGA. The auxiliary DACs and ADCs can be used for a variety of functions such as front-end RF AGC control, RSSI measurements, or slow constellation monitoring.

### Transmit Channel

IQ digital data from the FPGA can be converted by either of the two main DACs to give IQ analogue outputs. In addition, the 16-bit oversampling DAC can be configured to digitally generate IQ analogue signals containing a low-frequency IF carrier.

### Customer Baseband Expansion Port

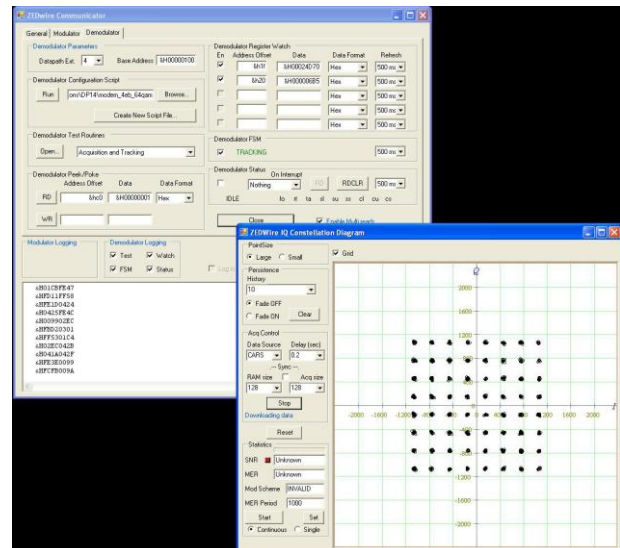
The board is supplied with a baseband expansion port that allows customers to add their own additional customised functionality to the board.

### Zaltys Modem Core Evaluation

The board is supplied with the encryption keys required to evaluate many Zaltys Modem cores. These keys are pre-programmed into the hardware, and are retained by an on-board battery. Evaluation bit streams can be downloaded from the Silicon Infusion website, and these can be loaded onto the board by using the standard Xilinx JTAG cable and software (not supplied).

### Zaltys ZMP-001 GUI Software (ZEDwire Communicator)

ZEDwire Communicator is a software GUI which runs under Microsoft Windows®. It interacts with the ZMP-001 board, allowing rapid evaluation of Zaltys Modem cores. The board connects directly to the software via the ZEDwire interface, and allows the user to directly control and interact with the core under evaluation. Hardware registers can be read, written and monitored, and register configurations can be scripted and automatically loaded. Receive IQ constellations can be viewed, and approximations of SNR can be evaluated. If the particular Zaltys Modem core includes statistics gathering functionality, then this information can be downloaded and saved to files for further offline processing (e.g. using Excel® or a MATLAB® model).



## Deliverables

The board is delivered fully configured and ready for use. If it is intended to use the board to evaluate a Zaltys Modem core, then this can be supplied already pre-loaded.

| Deliverables              |  |
|---------------------------|--|
| Documentation             | Hardware Guide   |
| Hardware                  | Hardware Evaluation Board<br>AC Mains Adaptor (115-250V 50/60Hz) |
| Support                   |  |
| 3 Months Support Included |  |

## Additional Products

### Related Cores

The Zaltys **High Data Rate Demodulator (HDRM-D)** IP core forms the digital baseband section of a high performance modem receive path, including quasi-zero IF to baseband conversion, sample decimation, symbol timing recovery, and carrier recovery. The core can demodulate BPSK, QPSK, offset-QPSK (OQPSK), 8PSK and 16QAM, all at high symbol rates.

The Zaltys **High Data Rate Enhanced Demodulator (HDRM-D2)** IP core adds support for 8QAM (3 shapes), 64QAM, 16APSK and 32APSK, and comes with an integral blind adaptive equaliser. It also supports an increase in datapath resolution up to 14-bits, which allows it to cope with higher levels of adjacent channel interference.

The Zaltys **High Data Rate Modulator (HDRM-M)** core forms the digital baseband section of a high performance modem transmit path, including symbol-mapping, matched-filtering, interpolation, and DAC interfacing.

Silicon Infusion also supplies many other related cores to help complete your design, such as DVB and Intelsat related framing and FEC solutions. Please contact Silicon Infusion with your enquiry.