

## C700 – VSD2 Module Vector Signal Demodulator

400 MHz to 6 GHz Quadrature Demodulator  
Integrated with a Programmable FPGA Core

- Direct FPGA access - Custom User Code
- Supports **Altera**<sup>®i</sup> & **Xilinx**<sup>®ii</sup> FPGAs & tools
- Coherent Multi Channel & MIMO Ready
- Superior Phase Noise & SFDR performance
- Integrates with your design environment of choice: MATLAB<sup>®iii</sup>, LabVIEW<sup>®iv</sup>, .NET & more...

The Vector Signal Demodulator module is the flagship signal reception module for the SpectraTronix C700 Platform. The RF Module integrates an FPGA of choice with top performance RF chips while the C700 Platform takes care of Synchronization, LO Control, data communication and all other ancillary functions.



The C700 is a Modular Development & Verification platform designed specifically to bring about speed and flexibility to FPGA & System Designers. Allowing you to test your RF design without draining your time & resources integrating and troubleshooting RF boards.

Works out of the box. No time wasted on Setup Integration, testbed creation or code re-design

- Frequency range: 400 MHz to 6 GHz
- Wide IQ Bandwidth up to 40 MHz
- Digital I & Q with 16-bit resolution
- Analog, Digital and Arbitrary demodulation
- Phase Noise -107 dBc/Hz @ 10 KHz
- SFDR > 70 dB
- Image Rejection > 40 dB
- Switching time < 10  $\mu$ s
- Cutting-edge baseband reception with Modular architecture to meet various applications

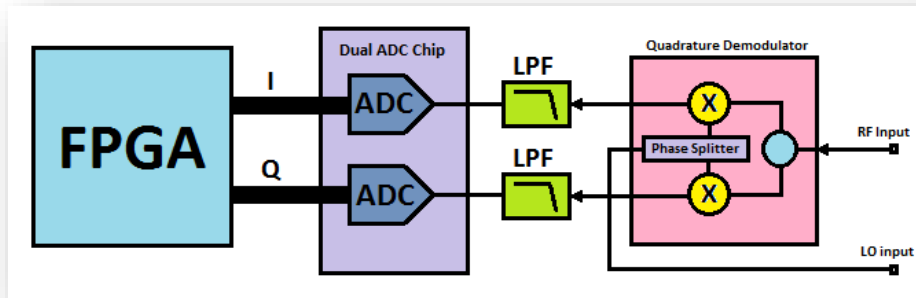


Ideal Solution for Cognitive Radio, DSP, Wireless Communications & Massive MIMO Applications

Module firmware natively supports programming the FPGA with custom HDL code through direct JTAG access, this allows developers to use separate design environments for HDL development and for system level testing

## Design from your Comfort Zone

C700 goes all the way to help you focus on your job. The system can be fully programmed & controlled right from your design tool or system level simulation environment of choice (MATLAB®, LabView®, ... etc.) in addition to a multitude of programming languages (VHDL, C and many others). This allows reusing the same test bed during



simultaneously and independently.

SpectraTronix C700 VSD module gives developers the ability to receive, demodulate then analyze complex baseband I/Q signals through VHDL programming of its fully configurable FPGA blocks. The High-End Vector Demodulator guarantees the best RF performance required by HDL Developers to implement complex RF functions inside the FPGA and also use the connected PC for post processing

the design and prototyping phases completely eliminating inconsistency and guaranteeing a streamlined testing procedure through the project lifecycle. No more you will need to create new complex and expensive test bed for your prototype, now design engineers can easily move back and forth testing the code AND the actual prototype side by side greatly accelerating debugging and design iteration.

## Vector Signal Analyzer

The C700 structure is highly modular and configurable to adapt to almost every design need. Modules or even entire units can be stacked and aggregated for large scale designs (massive MIMO, cognitive radio networks...etc.) and easily connected to your PC for control, data I/O or as hardware in the loop for simulation.

The RF characteristics of the C700 outperforms traditional Test & Measurement Equipment of its class, enabling the use of the C700 as a general-purpose test bench or a fully optimized automated test station. The C700 VSD Can function as a traditional standalone Vector Signal Analyzer for a very wide range of Applications.

## Specifications

<b>General Specifications</b>	
Frequency	0.4 GHz to 6 GHz
IQ Bandwidth	40 MHz @ 16-bit resolution
Sampling Rate	50 MSps
IQ Resolution	16 bits
Switching Speed	< 10 $\mu$ s (Within $\pm$ 160 MHz from LO frequency)
LO Input level	-6 dBm to 6 dBm
Maximum Input Level	12 dBm
SFDR	>70 dB (Typical 80 dB)
Level Accuracy	<0.5 dB (Typical 0.2 dB)
Image Rejection	> 40dB (optional 80 dB, refer to UDC module datasheet)
Sensitivity	<-90 dBm @ BW=10 KHz (Optional Low Noise Amplifiers available)
Power Consumption	< 5 Watt
<b>FPGA</b>	
FPGA Configuration	Downloadable via JTAG port
Standard FPGA Chips	Cyclone III                      Cyclone IV
Part Number	EP3C10E144I7                      EP4CE55F23I7
Memory Size	414 Kbits                              2,340 Kbits
Logic Elements	10,320                                  55,856
No of Multipliers (18x18)	23    154
No of PLLs	2    4
Available FPGA Resources	50 % Memory                      90 % Memory 80 % Logic                              95 % Logic
<b>Physical Characteristics</b>	
Connector Type	SMA female
External Dimensions	L95 x W80 x D15 mm (Including connectors)
Weight	< 100 gm.
Operating Temperature	-10 to +50 C
Operating Humidity	<95 % rel. humidity

## Ordering information

VSD1	Vector signal receiver/demodulator and digitizer, 0.4 to 2.7 GHz, 40 MHz BW @ 16-bit resolution. Cyclone III FPGA including LO cable
VSD2	Vector signal receiver/demodulator and digitizer, 0.4 to 6 GHz, 40 MHz BW @ 16-bit resolution. Cyclone III FPGA including LO cable
VSD2e	Vector signal receiver/demodulator and digitizer, 0.4 to 6 GHz, 40 MHz BW @ 16-bit resolution. Cyclone IV FPGA including LO cable

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<sup>i</sup> Altera® is a trademark and registered in U.S.

<sup>ii</sup> Xilinx® is a trademark and registered in U.S.

<sup>iii</sup> MATLAB® is a registered trademark of MathWorks.

<sup>iv</sup> LabVIEW® is a trademark of National Instruments.