



## WHITE RABBIT SWITCH

### WRS

WRSはホワイトラビットテクノロジーの主要な要素です。標準の光ファイバーを通して、サブナノ秒の精度で時刻と周波数を数千のノードに分配します。

冗長化されたネットワークトポロジを使用して確定的な配信と信頼性の高い通信を提供します。

さらに、WR-Switchは、タイミングリンクを動的に調整します。現在、14か国以上の非常に要求の厳しい産業施設および科学施設が、タイムクリティカルなアプリケーションにWR-Switchをすでに使用しています。



# Technical Specifications / WRS

## FPGA

<b>Type</b>	Xilinx Virtex-6 (LX240T)
<b>Package</b>	1156-pin BGA
<b>Slices</b>	37,680 (4 LUTs and 8 flip-flops)
<b>Memories</b>	416x36 Kb Block RAM
<b>Softcore</b>	LatticeMico32 (LM32)
<b>I/O</b>	20 GTX transceivers for SFP links 40 GPIO for generic purpose (LEDs, SFP detection, ...)
<b>Monitoring</b>	Monitoring power supply Temperature sensor control

## On-Chip Clock Generation

<b>PLL</b>	AD9516 (14-Output Clock Generator with Integrated 1.6 GHz VCO)
<b>Synthesizer</b>	TI CDCM61002RHBT (28-683MHz)
<b>DAC</b>	2xAD5662BRJ (16bit; 2.7-5.54V)

## Front Panel

<b>Clocks I/O</b>	5 SMC coaxial connectors: <ul style="list-style-type: none"> <li>10 MHz reference clock input (GPS/Cesium)</li> <li>10MHz &amp; 62.5 MHz output reference clock</li> <li>1xPPS Input &amp; 1xPPS Output</li> </ul>
<b>Ports</b>	18 x SFP cages* <i>*SFP transceivers are not included in all packages. Seven Solutions recommends 1.25Gbps, 1490/1310 nm, Single Fiber Bi-directional SFP.</i>
<b>Management</b>	100Base-T Ethernet (Remote) USB Mini-B (Local)

## Back Panel

<b>Debug</b>	USB Mini-B FPGA USB Mini-B ARM
<b>Input port</b>	RS232

## Certification

<b>Soldering</b>	IPC-A-610 Rev E Class 2
<b>Others</b>	ISO-9001, ISO-14001, CE, RoHS,FCC,SE

## Power Supply

<b>Input</b>	100-240VAC, 2.0A 50-60 Hz
<b>Output</b>	12V DC, 6.66A – 80W max

## Environmental Conditions

<b>Temperature</b>	-10°C ~ +50°C
<b>Humidity</b>	0% ~ 90% RH

## HIGHLIGHTS

- ✓ Sub-nanosecond time accuracy
- ✓ Thousands of nodes
- ✓ 18 SFP 1GbE ports
- ✓ Time and frequency distribution
- ✓ Remote monitoring
- ✓ Dynamic calibration
- ✓ Open hardware

## CPU

<b>Type</b>	ARM Atmel AT91 SAM9G45
<b>Core</b>	400MHz (ARM926E)
<b>Memories</b>	64MB DDR2 (16-bit bus chip) 256MB NAND flash chip
<b>I/O</b>	32bit Async Bridge with FPGA 100Base-T Ethernet

## Software

<b>OS</b>	Linux (Kernel v2.6.39)
<b>Timing</b>	White Rabbit
<b>Switching</b>	IEEE802.1x protocols (multicasting, spanning tree, GMRP/-GARP) VLAN Tagging SNMP switch management
<b>Protocols</b>	TCP/IP, SSH, SNMP, NTP, TFTP, DHCP, ARP, DNS

## Physical Specification

<b>Dimension</b>	447 mm x 44 mm x 223 mm
<b>Color</b>	White (Metallic)

