It is the main element of the White Rabbit Technology. It distributes Time and Frequency within a sub-nanosecond accuracy to thousands of nodes through standard optical fiber.

The WRS provides deterministic delivery and a reliable communication using redundant network topology. In addition, the WR-Switch dynamically calibrates timing links. Currently, highly demanding industrial and scientific facilities in more than fourteen countries are already using the WR-Switch for time-critical applications.
## Technical Specifications

### FPGA

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

### On-Chip Clock Generation

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

### Front Panel

- Clocks I/O 5 SMC coaxial connectors:
  - 10 MHz reference clock input (GPS/Cesium)
  - 10MHz & 62.5 MHz output reference clock
  - 1xPPS Input & 1xPPS Output
- Ports 18 x SFP cages*
  - *SFP transceivers are not included in all packages. Seven Solutions recommends 1.25Gbps, 1490/1310 nm, Single Fiber Bi-directional SFP.
- Management 100Base-T Ethernet (Remote)
- USB Mini-B (Local)

### Back Panel

- Debug USB Mini-B FPGA
- USB Mini-B ARM
- Input port RS232

### Certification

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

### Power Supply

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

### Environmental Conditions

- Temperature -10°C ~ +50°C
- Humidity 0% ~ 90% RH

### CPU

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

### Software

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

### Physical Specification

- Dimension 447 mm x 44 mm x 223 mm
- Color White (Metallic)