WHITE RABBIT SWITCH V3.4.

The key element of the White Rabbit network

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.

- Deterministic time distribution with accuracy 1 ns.
- Long distances (hundreds of Kms).
- Many hops (14 tested keeping sub-nanosecond accuracy).
- Subnanosecond accurate event timestamps (ps for Ethernet traffic).
- Dependable: redundant network topologies.
- Future support of: switchover and holdover functionalities for next releases.
- High scalability.
- Heterogeneous timing interface (PTP, NMEA, etc).

Safran Electronics & Defense is with you every step of the way, building in the intelligence that gives you a critical advantage in observation, decision-making and guidance.

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Technical Specifications

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

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. We recommend 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 FGPA, USB Mini-B ARM
Input port	RS232

Certification	
Soldering	T 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

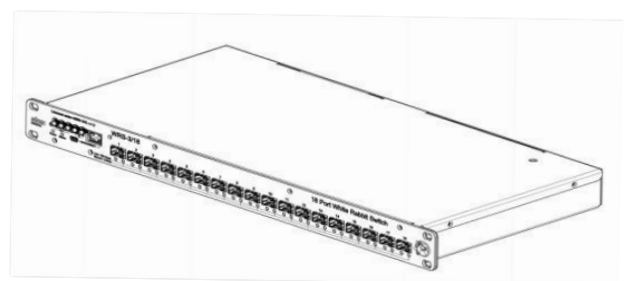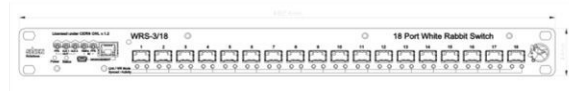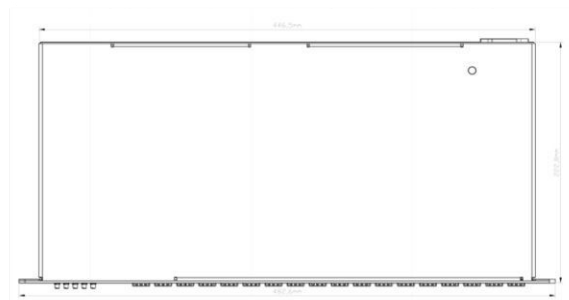| Environmental Conditions	
Temperature	-10ºC ~ +50ºC
Humidity	0% ~ 90% RH

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

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

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)

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