

Ruby3



Managed Redbox (Redundancy Box) or 10 Port PRP/HSR Switches

- Reliable industrial networking realizing zero packet loss and zero recovery time
- Compliant implementation of both PRP (IEC62439-3-4) and HSR (IEC62439-3-5)
- Full FPGA hardware solution with low switching latency
- PRP/HSR selection is configurable in software only with the same hardware platform
- Precision time synchronization in accordance with IEEE 1588v2 is supported
- Provides pure 3 port Redbox and also 10 port PRP/HSR switches including 2 Gigabit combo PRP/HSR ports and up to 8 Ethernet ports including Gigabit SFP ports and 100 Mbit fiber/copper ports
- Exceeds IEC61850-3 and IEEE1613



Overview

The new Ruby3 series switches from Kyland are specially designed for reliable industrial networking realizing both PRP (Parallel Redundancy Protocol) and HSR (High-availability Seamless Redundancy) which are defined in IEC62439-3. The Ruby3 provides the ultimate in network reliability and zero failover time from network faults. Full FPGA hardware solution enables Kyland Ruby3 low switching latency and PRP/HSR is selectable via software with the same hardware platform. Precision time synchronization in accordance with IEEE 1588v2 is supported on Kyland Ruby3. Ruby3 series not only provide 3 port pure Redbox but also 10 port PRP/HSR switches including 2 Gigabit combo PRP/HSR ports and up to 8 Ethernet ports including Gigabit SFP ports and 100 Mbit fiber/copper ports.

***Product Status:**

RFD (Ready for delivery) since April 1st, 2014

Technical Specifications

Standard

IEEE802.3i, IEEE802.3u, IEEE802.3ab, IEEE802.3ac, IEEE802.3ad, IEEE 802.3z
 IEEE 802.3x, IEEE 802.1p, IEEE 802.1Q, IEEE 802.1s, IEEE802.1X, IEEE1588-2008
 IEC62439-3

Protocols

PRP, HSR
 DT-Ring,DT-Ring+,DT-VLAN,MSTP,DRP;
 IGMPsnooping,GMRP;VLAN,GVRP,PVLAN;
 Telnet,HTTP,HTTPS,SNMPv1/v2/v3,RMON,LLDP,Bootp,DHCP
 server/relay/client,DHCP Option 82;

SNTP,PTP,RTC;
 SSH,SSL,TACACS+,RADIUS,ACL;
 FTP,TFTP,Syslog;
 ARP,Modbus TCP,QoS,LACP

Switch Properties

(Following switching properties are for switch part of Ruby3 only)
 Priority Queues: 4
 Number of VLANs: 256
 VLAN ID: 1-4094
 Number of Multicast Groups: 256
 MAC Table: 8K
 Packet Buffer: 1Mbit
 Packet Forwarding Rate: 5.5Mpps
 Table size: Standard, 512; Professional, 8K
 Ring Node: Standard, 30; Professional, 200
 Switching Delay: <3µs

Interface

Port A: Gigabit combo port
 Port B: Gigabit combo port
 Gigabit Ethernet port: 1 Gigabit combo port, or 2 Gigabit SFP ports
 Fast Ethernet fiber ports: Optional 2 100Base-FX multi mode or single mode fiber ports in SC/ST connector
 Fast Ethernet RJ45 Ports: 6 10/100Base-TX RJ45 ports
 Console Port: RS232 (RJ45 connector)
 Alarm Contact: 3-pin 5.08mm-spacing plug-in terminal block, 250VAC/220VDC Max, 2A Max, 60W Max

LED

LEDs on Front Panel:
 Running LED: Run
 Alarm LED: Alarm

Power LED: PWR1, PWR2
 Redundancy LED: PRP/HSR
 Interface LED: Link/ACT, Speed (RJ45 port)

Transmission Distance

Twisted Pair: 100m (Standard CAT5, CAT5e network cable)
 Multi Mode Fiber: 1310nm, 5km (100M); 850nm, 550m (1000M)
 Single Mode Fiber:
 1310nm, 40km/60km (100M); 1550nm, 60km/80km (100M)
 1310nm, 10km/40km (1000M); 1550nm, 60km/80km (1000M)

Power Requirements

Power Input: 24DCW (18-72VDC), 220AC/DCW(85-264VAC/77-300VDC)
 Power Terminal: 5-pin 5.08mm-spacing plug-in terminal block
 Power Consumption: <5W (Ruby3-3G only), <8W (Others)
 Overload Protection: Support
 Reverse Connection Protection: Support
 Redundancy Protection: Support (24DCW version only)

Physical Characteristics

Housing: Metal, fanless
 Protection Class: IP40
 Dimensions (W×H×D): 66×135×107.5mm (2.60×5.31×4.23 in.)
 Weight: 0.76kg (1.676 pound)
 Mounting: DIN-Rail

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F)
 Storage Temperature: -40 to 85°C (-40 to 185°F)
 Ambient Relative Humidity: 5 to 95% (non-condensing)

MTBF

345,000 hrs

Warranty

5 years

Approvals

CE, FCC, UL508 Class1 Div2 (Pending)

Industrial Standard

EMI:
 FCC CFR47 Part 15, EN55022/CISPR22, Class A

EMS:

IEC61000-4-2 (ESD): ±8kV (contact), ±15kV (air)
 IEC61000-4-3 (RS): 10V/m (80MHz-2GHz)
 IEC61000-4-4 (EFT): Power Port: ±4kV; Data Port: ±2kV
 IEC61000-4-5 (Surge): Power Port: ±2kV/DM, ±4kV/CM; Data Port: ±2kV
 IEC61000-4-6 (CS): 3V (10kHz-150kHz); 10V (150kHz-80MHz)
 IEC61000-4-16 (Common mode conduction): 30V (cont.), 300V (1s)

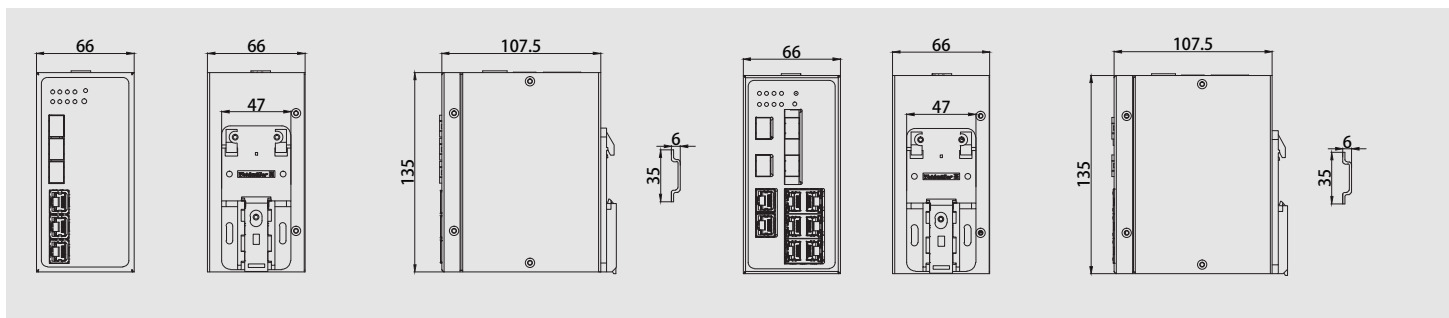
Machinery:

IEC60068-2-6 (Vibration)
 IEC60068-2-27 (Shock)
 IEC60068-2-32 (Free Fall)

Industry: IEC61000-6-2

Power: IEC61850-3, IEE1613

» Mechanical Drawing



» Ordering Information

Ruby3 - _____ - _____ - _____
 Ports Distance & Connector PS

Ports

3G = 2 Gigabit combo ports as Port-A and Port-B for PRP/HSR, 1 Gigabit combo port as Local port
 2G2GX6T = 2 Gigabit combo ports as Port-A and Port-B for PRP/HSR, 2 Gigabit SFP ports and 6 10/100Base-TX RJ45 ports
 2G2S6T = 2 Gigabit combo ports as Port-A and Port-B for PRP/HSR, 2 100Base-FX single mode port, 6 10/100Base-TX RJ45 ports
 2G2M6T = 2 Gigabit combo ports as Port-A and Port-B for PRP/HSR, 2 100Base-FX multi mode port, 6 10/100Base-TX RJ45 ports

Distance & Connector

SC = Multi mode fiber: 1310nm 5km in SC connector; Single mode fiber: 1310nm 40km in SC connector
 ST = Multi mode fiber: 1310nm 5km in SC connector; Single mode fiber:

1310nm 40km in SC connector
 SC60 = Single mode fiber, 1310nm 60km in SC connector
 SC80 = Single mode fiber, 1550nm 80km in SC connector

PS: Power Supply

L1 = 24DCW(18-72VDC), dual redundant power inputs
 H1 = 220AC/DCW(85-264VAC/77-300VDC), single power input

Example Order Codes

Ruby3-3G-H1
 Redbox with 3 Gigabit combo ports, 220AC/DCW(85-264VAC/77-300VDC), single power input

Ruby3-2G2S6T-SC-L1
 PRP/HSR switch with 2 PRP/HSR Gigabit combo ports, 2 single mode fiber ports, 1310nm 40km in SC connector, 24DCW (18-72VDC) dual redundant power inputs