

# R A P T O R<sup>®</sup>

## iMX950

Intelligent Cyber Secure Platform



## Product Overview

iMX950 is an Intelligent Cyber Secure Platform running the iBiome<sup>®</sup> OS. The iBiome is an all-encompassing operating system that supports switching and routing on a single platform. The iMX950 has been designed for future scalability. Its modular system of field replaceable modules, hot-swappable power supplies, and its ability to run third party software applications makes it a very flexible platform for today and the future.

The RAPTOR iMX950 has been specifically designed to protect and secure critical infrastructures in the harsh environments found in utility and substation applications. It meets or exceeds the standards set out in IEC 61850-3 and IEEE 1613 for utility communication equipment in substation environments.

In addition to the switching and routing software capabilities found in the iMX350, the iMX950 supports a stateful firewall, NAT and IPSec capabilities.

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# Features and Benefits

Table 1. Common Specification

DESCRIPTION	
NUMBER OF SLOTS	Up to 4 slots
PORTS	
ETHERNET NETWORK PORTS	Slot #1- 3—supports up to 8 x 10/100/1000 RJ45s, or 8 x 100/1000 SFPs, up to 24-ports may be configured to support PoE, see below for details. Slot #4—supports up to 4 x 10GB Base-X or 4x1GB Base-X Uplinks .
SERIAL CONSOLE PORT	RS-232 in RJ-45 connector with console cable. 115200bps, 8, N, 1.
SERIAL COMMUNICATIONS PORTS	Slot #1- 4—supports 4x DB9 serial interfaces or 8x RJ45 serial interfaces RS232/422/485. Maximum 3 serial modules per switch.
HSR/PRP MODULE	Slot #1-4 – max one module, 2 RedBoxes or 1 QuadBox supported.
USB PORT / SD CARD	USB 2.0 for software and configuration update.
OTHER HARDWARE FEATURES	Modular chassis with hot-swappable modules. Redundant hot-swappable power supplies.
ALARM	Fault Contact: Relay output carries up to 1A at 24VDC and 200mA at 125VDC.

## PRODUCT SPECIFICATIONS

TECHNOLOGY	
MAC TABLE	16K
PRIORITY QUEUES	8
PROCESSING	Store-and-Forward
SWITCH PROPERTIES	Switching latency : 7 $\mu$ s Switching bandwidth: 128 Gbps
JUMBO FRAME	Up to 9216 bytes
IEEE 1588 PTP	IEEE 1588 precision timing protocol v2 with Power Profile, in transparent clock mode. Supported in slots 1, 2, and 3 for Ethernet Line Modules Supported in all slots for HSR/PRP line modules
PHYSICAL CHARACTERISTICS	
ENCLOSURE	IP40 Satin Coat Steel
DIMENSIONS	486.15 (W) x 446.65 (D) x 44.36(H) mm (19.14 x 17.58 x 1.75 inches)
WEIGHT	9.8 kg (21.6 lbs.)
POWER	
REDUNDANT INPUT POWER	Dual Power Supplies available in any combination of 24VDC (Nom.), 48VDC (Nom.), and 100-240VAC/VDC (Nom.)
POWER CONSUMPTION	60 Watts
OVERLOAD CURRENT PROTECTION	Fast Acting Fuse 3.15A (can only be replaced in the factory)
POWER OVER ETHERNET (AVAILABLE ON PoE CONFIGURED iMX950)	
MAX PoE POWER FROM iMX350 SWITCH	720 Watts
MAXIMUM PoE POWER FROM 8GRJ45P LINE MODULE	240 Watts
POWER LEVELS AVAILABLE PER PORT	Default up to 30 Watts per port Two adjacent RJ45 ports may draw up to 60 Watts. For 60 Watt PoE, disable PoE on the neighboring port
SLOTS WHERE PoE IS SUPPORTED	Slots 1, 2, and 3
NOTES	Power over Ethernet is a factory configured option on the iMX950 It requires an external power supply to supply the power to PoE ports
WARRANTY	
WARRANTY	5 years, (extendable option with additional terms)

# Product Specifications

Table 2. RAPTOR® iBiome®

DESCRIPTION	SPECIFICATION
<b>MANAGEMENT FEATURES</b>	SNMP (v1, v2c, and v3) agent and MIB support SNMP Proxy CLI (Console, Telnet, and SSH) SSH v2.0 support TLS 1.2 and 1.3 support WebUI (HTTP and HTTPS / SSL) Configuration Save and Restore in the form of MIB OIDs Configuration Save and Restore in the form of text file Software and configuration upgrade through TFTP or SFTP Debug Logging Ability, Backup/Restore configuration SNTP Syslog Port Mirroring System Resource Monitoring Multiple Level User Management Syslog Server/Client MIB support RMONv1 Power Supply Alarms, on redundant power supply failure.
<b>L2 - FEATURES</b>	TCP/IP stack for IPv4 Proxy ARP DHCP (Client, Server & Relay) for IPv4 DHCP—Support for Option 82 SSH v2.0 support on 128-bit Jumbo Frame support VLAN-aware bridging RSTP (IEEE 802.1D, 2004) /MSTP/PVRST+ RSTP: BPDU load/attack prevention mechanism IGMP v1, v2, v3 snooping Link Aggregation with LACP Link Layer Discovery Protocol (LLDP) QoS <ul style="list-style-type: none"> <li>• Traffic Shaping</li> <li>• Scheduling</li> <li>• Queueing</li> <li>• Classification based on ACL and Priority Map Table</li> <li>• pre-Marking Support for IP</li> <li>• DSCP</li> <li>• Egress Port Scheduler and Shaper</li> </ul> Rate Limiting and Storm Control, Flow Control MAC Learning Limit per port & per VLAN
<b>L3 - FEATURES</b>	Unicast Routing <ul style="list-style-type: none"> <li>• Static</li> <li>• RIPv1/2</li> <li>• OSPF</li> <li>• BGP</li> <li>• route redistribution between protocols</li> </ul>
<b>OTHER PROTOCOLS</b>	Multicast <ul style="list-style-type: none"> <li>• IGMP (v1/v2/v3)</li> <li>• IPv4 multicast - PIM-SM</li> </ul> Serial <ul style="list-style-type: none"> <li>• Modbus Server/Client</li> <li>• Raw Socket</li> </ul> Media Redundancy Protocol (MRP) HSR/PRP Power over Ethernet, factory configurable option
<b>SECURITY FEATURES</b>	RADIUS Authentication TACACS+ Authentication SSH v2.0 support on 128-bit 802.1x authentication (Port Based Authentication) ACLs (Access Control Lists) for Traffic Filtering – L2ACL, L3ACL Stateful Firewall NAT GRE over IPSec IPSec, site-to-site implementations

# Product Specifications

Table 3. Compliance Specification

DESCRIPTION	SPECIFICATION	LEVEL
<b>PRODUCT SAFETY TESTS</b>		
IP RATING	IEC 61850-3 clause 6.6.2 IEC 60529 clause 6.11 ISO 20653:2013	IP40
CLEARANCE AND CREEPAGE	IEC 61850-3 clause 6.6.1 IEC 62368-1, clause 5.4.2 & 5.4.3	Overvoltage Category II, Pollution Degree II
IMPULSE VOLTAGE	IEC 61850-3 clause 6.6.3 IEEE 1613 clause 5.3	5kV on auxilliary power supply and digital inputs 1kV on station bus ports
DIELECTRIC VOLTAGE	IEC 61850-3 clause 6.6.4 IEEE 1613 clause 5.2	2.8kV DC on auxilliary power supply and digital inputs 0.5kV AC on station bus ports
INSULATION RESISTANCE	IEC 61850-3, clause 6.9.2.2	≥550 MΩ at 500 Vdc
PROTECTIVE BONDING	IEC 61850-3 clause 6.6.5	less than 0.1Ω
FLAMMABILITY	IEC 61850-3 clause 6.6.6, IEC 60255-27, subclause 10.6.5.2	V-1
SINGLE FAULT CONDITION	IEC 61850-3 clause 6.6.7	12VDC
PRODUCT SAFETY STANDARDS	IEC 62368-1	Product Safety Standard for Europe and North America
<b>ELECTROMAGNETIC COMPATIBILITY (EMC) TESTS</b>		
<b>EMISSIONS AND IMMUNITY COMPLIANCE</b>		
EUROPE	EN 55032:2012, CISPR 32:2012, Multimedia	Class A Equipment
	EN 55024:2010, CISPR 24:2010 , Multimedia	
NORTH AMERICA	FCC Part 15 Subpart B:2017, Multimedia	Class A Equipment
	ICES-003:2017, Multimedia	
<b>IMMUNITY</b>		
1 MHZ DAMPED OSCILLATORY WAVE	IEC 61850-3 clause 6.7.3 IEC 61000-4-18 IEEE 1613 clause 6 IEEE 1613.1 clause 5	2.5 kV CM, 1.0kV DM HV/Telec. 2.5 kV CM, 2.5kV DM Zone A
ELECTROSTATIC DISCHARGES	IEC 61850-3 clause 6.7.3 IEC 61000-4-2 IEEE 1613 clause 8 IEEE 1613.1 clause 8	8kV contact, 15kV air
RADIATED RADIO FREQUENCY MAGNETIC FIELD	IEC 61850-3 clause 6.7.3 IEC 61000-4-3 IEEE 1613 clause 7 IEEE 1613.1 clause 7	20 V/m
FAST TRANSIENT/BURST	IEC 61850-3 clause 6.7.3 IEC 61000-4-4 IEEE 1613 clause 6 IEEE 1613.1 clause 5	4kV
SURGE	IEC 61850-3 clause 6.7.3 IEC 61000-4-5 IEC 1613.1 clause 6	Signal Ports ± 4kV LE ± 1kV LE (PoE)
		D.C Power Ports ± 4kV LE ± 2kV LL ± 2kV LE (PoE 56VDC) ± 1kV LL (PoE 56VDC)
		A.C Power Ports ± 4kV LE ± 2kV LL
CONDUCTED DISTURBANCE INDUCED BY RF FIELDS	IEC 61850-3 clause 6.7.3 IEC 61000-4-6 IEEE 1613.1 clause 9	0.15-80MHz at 10V 27, 68 MHz at 10V

# Product Specifications

DESCRIPTION	SPECIFICATION	LEVEL
MAIN FREQUENCY VOLTAGE, COMMON-MODE DISTURBANCES	IEC 61850-3 clause 6.7.3 IEC 61000-4-16 IEEE 1613.1 clause 12	30V; 60s. 300V; 1s
POWER FREQUENCY MAGNETIC FIELD	IEC 61850-3 clause 6.7.3 IEC 61000-4-8 IEEE 1613.1 clause 10	100 A/m cont.; 1000 A/m 1s
D.C. VOLTAGE DIPS	IEC 61850-3 clause 6.7.3 IEC 61000-4-29	60%; 0.1s 30%; 0.1s
A.C. VOLTAGE DIPS	IEC 61850-3 clause 6.7.3 IEC 61000-4-11	60%; 50 c 30%; 1c
D.C. VOLTAGE INTERRUPTIONS	IEC 61850-3 clause 6.7.3 IEC 61000-4-29	100%; 0.05s
A.C. VOLTAGE INTERRUPTIONS	IEC 61850-3 clause 6.7.3 IEC 61000-4-11	100%; 5/50c
D.C. RIPPLE	IEC 61850-3 clause 6.7.3 IEC 61000-4-17 IEEE 1613 clause 4.2	10% Ur_dc 5% content (different calculation method)
DAMPED OSCILLATORY MAGNETIC FIELD	IEEE 1613.1 clause 11 IEC 61000-4-10	100 A/m (peak)
BURDEN FOR DC POWER SUPPLY	IEC 61850-3, clause 6.8.2	60W
INRUSH CURRENT	IEC 61850-3, clause 6.8.1.2/6.8.2.2	100VAC peak 15.4A ≤5ms 240VAC peak 32.4A ≤5ms 100VDC peak 19.4A ≤1ms 240VDC peak 52.8A ≤1ms 24VDC peak 131A ≤1ms 48VDC peak 262A ≤1ms
<b>CLIMATIC ENVIRONMENTAL TESTS</b>		
DRY HEAT OPERATIONAL	IEC 61850-3 clause 6.9.3.1 IEC 60068-2-2, test Be	+85°C; 16 hours
	IEEE 1613 clause 3.1.1	+85°C
COLD OPERATIONAL	IEC 61850-3 clause 6.9.3.2 IEC 60068-2-1, test Ad	-40°C; 16 hours
	IEEE 1613 clause 3.1.1	-40°C
DRY HEAT STORAGE	IEC 61850-3 clause 6.9.3.3 IEC 60068-2-2, test Bb	+85°C; 16 hours
	IEEE 1613 clause 3.1.2	+85°C
COLD STORAGE	IEC 61850-3 clause 6.9.3.4 IEC 60068-2-1, test Ab	-40°C; 16 hours
	IEEE 1613 clause 3.1.2	-40°C
CHANGE OF TEMPERATURE	IEC 61850-3 clause 6.9.3.5 IEC 60068-2-14 test Nb	-40°C; +85°C 3 hours; 5 cycles
DAMP HEAT, STEADY STATE	IEC 61850-3 clause 6.9.3.6 IEC 60068-2-78 test Cab	+40°C; 93%, 10 days
DAMP HEAT, CYCLIC	IEC 61850-3 clause 6.9.3.7 IEC 60068-2-30 test Db IEEE 1613 clause 3.1.3	+25°C; 55°C 97%; 93% 6 cycles + 55°C
<b>MECHANICAL ENVIRONMENTAL TESTS</b>		
VIBRATION RESPONSE	IEC 61850-3 clause 6.10.1 IEC 60255-21-1	0.5g, 1 sweep cycle/axis, 3 axis, freq range 10-150Hz
VIBRATION ENDURANCE	IEC 61850-3 clause 6.10.1 IEC 60255-21-1	1g, 20 sweep cycles/axis, 3 axis, freq range 10-150Hz
SHOCK RESPONSE	IEC 61850-3 clause 6.10.2 IEC 60255-21-2	5g, 11ms duration/pulse, 6 pulses/axis, 3 axis.
SHOCK WITHSTAND	IEC 61850-3 clause 6.10.2 IEC 60255-21-2	15g, 11ms duration/pulse, 6 pulses/axis, 3 axis.

# Product Specifications

DESCRIPTION	SPECIFICATION	LEVEL
BUMP	IEC 61850-3 clause 6.10.2 IEC 60255-21-2	10g, 16ms duration/pulse, 2000 pulses/axis, 3 axis.
SEISMIC (SINGLE AXIS SWEEP)	IEC 61850-3 clause 6.10.3 IEC 60255-21-3	Freq Range: 1-35Hz, Cross-over frequency 8-9Hz, Displacement 3.5mm [x], 1.5mm [y], Acceleration: 1.0g [x], 0.5g [y], Number of sweep cycles per axis 1, number of axis 3
VIBRATION	IEEE 1613 clause 9	V.S.3
SHOCK	IEEE 1613 clause 9	100 mm
<b>ALTITUDE</b>		
ALTITUDE	IEC 61850-3 section 4, table 1	less than or equal to 2000m
	IEC 61850-3 section 7.2, table 25	86 kPa to 106 kPa

Table 4. Standards and Management

DESCRIPTION	SPECIFICATION		
IEEE STANDARDS	IEEE 802.3 for 10Base-T		
	IEEE 802.3u for 100Base-TX and 100Base-FX		
	IEEE 802.3ab for 1000Base-T		
	IEEE 802.3z for 1000Base-X		
	IEEE 802.3ae for 10Gigabit Ethernet		
	IEEE 802.3x for Flow control		
	IEEE 802.3ad for LACP (Link Aggregation Control Protocol)		
	IEEE 802.1Q – 2014 Bridged Networks		
	IEEE 802.1-2010 Port Based Network Access Control		
	IEEE 802.1AB – 2016 Station and Media Access Connectivity discovery (LLDP)		
	IEEE 802.1AX Link Aggregation		
	IEEE 1588 v2 PTP, Transparent Clock Operation with Power Profile		
	IEEE 802.3af PoE Support - 15.4 Watts		
IEEE 802.3at PoE+ Support - 30 Watts			
IEEE 802.3bt PoE++ Support - 60 Watts			
RFC COMPLIANCE	RFC 768: UDP	RFC 1166: IP Addresses	RFC 2474: DiffServ Precedence
	RFC 783: TFTP	RFC 1643: Ethernet Interface MIB	RFC 2571: SNMP Management
	RFC 791: IPv4 protocol	RFC 1757: RMON	RFC 3164: Syslog
	RFC 792: ICMP	RFC 1901,1902-1907 SNMPv2	RFC 3376: IGMP v3
	RFC 793: TCP	RFC 2068: HTTP	RFC 3580: 802.1x RADIUS
	RFC 826: ARP	RFC 2131, 2132: DHCP	RFC 4250-4252 SSH Protocol
	RFC 854: Telnet	RFC 2236: IGMP v2	RFC 5424-5425: Syslog
	RFC 1157: SNMPv1	RFC 2273-2275: SNMPv3	

# Front/Back Panel Elements

## FRONT VIEW



1. SD CARD
2. Management Port  
(Factory Disabled)
3. RJ-45 Serial Console Port
4. USB Port
5. Power Status LED
6. Power Supply 2 (PS2)
7. Power Supply 1 (PS1)

SD Cover is not shown

## BACK VIEW



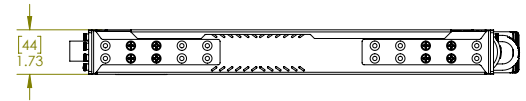
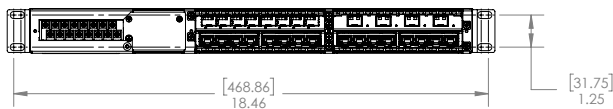
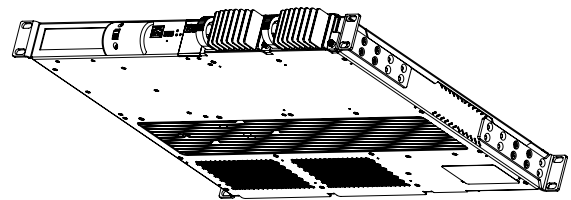
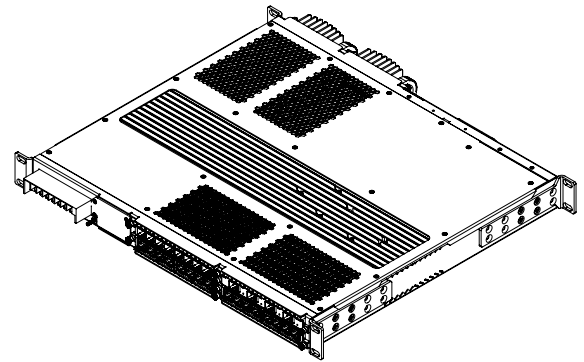
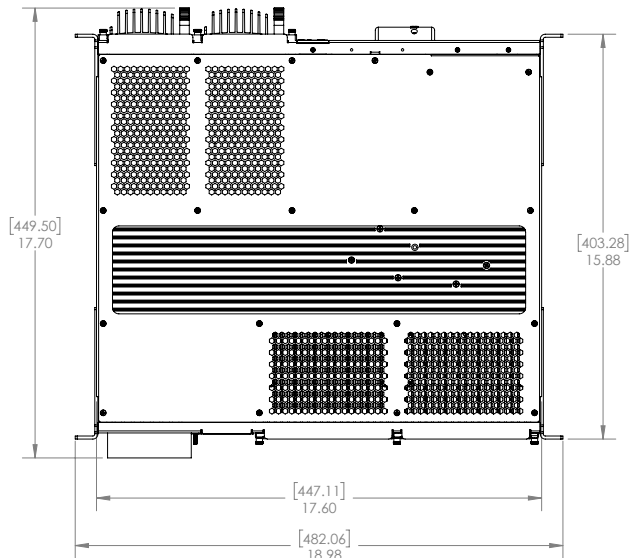
- Terminal Block
- Line Module 1
- Line Module 2
- Line Module 4

Line Module 3 is located underneath line module 4 and is not shown



# Dimensions

All dimensions are shown in inches [millimeters].



## SUPPORTED SFPs FOR THE iMX950

ORDER CODE	DESCRIPTION	WORKS WITH		
		iRM-2RBX	iRM-8GSFP/ iRM-4RJ4SFP	iRM-4TGSFP
SFP-SGMII-TX	100/1000Mbps TX RJ45 Transceiver 100m, -40°C to +85°C		•	•
SFP100-MM-2	SFP 100Mbps Multimode LC Transceiver 2km, 1310nm, -40°C to +85°C	•	•	
SFP1000-MM-550	SFP 1Gbps Multimode LC Transceiver 550m, 850nm, -40°C to +85°C	•	•	•
SFP1000-MM-2	SFP 1Gbps Multimode LC Transceiver 2km, 1310nm, -40°C to +85°C	•	•	•
SFP1000-SM-10	SFP 1Gbps Singlemode LC Transceiver 10km, 1310nm, -40°C to +85°C	•	•	•
SFP10G-MM-300	SFP 10Gbps Multimode LC Transceiver 300m, 850nm, -40°C to +85°C			•
SFP10G-SM-10	SFP 10Gbps Singlemode LC Transceiver 10km, 1310nm, -40°C to +85°C			•
SFP1000BIDI1-SM-10	SFP 1Gbps Bi-Directional Singlemode LC Transceiver 10km, TX1310nm, RX1550nm, -40°C to +85°C	•	•	•
SFP1000BIDI2-SM-10	SFP 1Gbps Bi-Directional Singlemode LC Transceiver 10km, TX1550nm, RX1310nm, -40°C to +85°C	•	•	•

# Ordering Information

## iMX950 SYSTEM

MODEL	POWER SUPPLY 1	POWER SUPPLY 2	PoE SUPPORT	FUTURE USE	SLOT 1	SLOT 2	SLOT 3	SLOT 4	DESCRIPTION
iMX950									RAPTOR L2/L3 Switch
	HV2	HV2							High Voltage, HV2, Power Supply Nominal: 100-240VAC/VDC Operational: 85-264VAC or 88-300VDC
	MV2	MV2							Medium Voltage, MV2, Power Supply Nominal: 48VDC Operational: 36-72VDC
	LV2	LV2							Low Voltage, LV2, Power Supply Nominal: 24VDC Operational: 10-36VDC
		XX							Blank Power Supply Module
			XX						None
			P						PoE Capable chassis, Factory Configured
				XX					None
					8GRJ45	8GRJ45	8GRJ45		8-port 10/100/1000BaseTX, RJ45 Connector
					8GRJ45P*	8GRJ45P*	8GRJ45P*		8-port 10/100/1000BaseTX, RJ45 Connector, PoE Capable
					8GSFP	8GSFP	8GSFP		8-port 100/1000BaseX SFP blank slots, Transceivers not included
					4RJ4SFP	4RJ4SFP	4RJ4SFP		4-port 10/100/1000BaseTX, RJ45 Connector plus 4-port 100/1000BaseX SFP blank slots, Transceivers not included
					iROC**	iROC**	iROC**	iROC**	iROC industrial Computing Module (see system order codes)
					8SRJ45†	8SRJ45†	8SRJ45†	8SRJ45†	8x Serial RJ45 Interfaces, RS232/422/485
					4DB09†	4DB09†	4DB09†	4DB09†	4x Serial DB9 Interfaces, RS232/422/485
					2RBX††	2RBX††	2RBX††	2RBX††	HSR/PRP with support for 2 RedBoxes
					BLK	BLK	BLK	BLK	Blank Module
								4TGSFP	4-port 1G/10G BaseX SFP blank slots, Transceivers not included

\* 8GRJ45P Option has a maximum operating temperature of +75°C.

\*\* Maximum 3 (three) iROCs may be installed per iMX950, the iROC has a maximum operating temperature of +70°C.

† Maximum 3 serial modules per RAPTOR.

†† Maximum one HSR/PRP module is supported per RAPTOR.

**Please Note: All RAPTORs must be equipped with at least one Ethernet line module.**

### iMX950 Sample Order Code

iMX950-HV2-XX-XX-XX-8GRJ45-BLK-8GSFP-4TGSFP

Description: RAPTOR iMX950 Switch, equipped with a single high voltage (HV2) power supply, an 8-port 10/100/1000BaseTX RJ45 module, a blank line module, an 8-port 100/1000BaseX SFP module with no transceivers, and a 4-port 1G/10G Base-X SFP module with no transceivers.

The same unit, may be ordered with conformal coating by appending '-C1' to the order code, for example:

iMX950-HV2-XX-XX-XX-8GRJ45-BLK-8GSFP-4TGSFP-C1

Description: RAPTOR iMX950 Switch, equipped with a single high voltage (HV2) power supply, an 8-port 10/100/1000BaseTX RJ45 module, a blank line module, an 8-port 100/1000BaseX SFP module with no transceivers, and a 4-port 1G/10G Base-X SFP module with no transceivers. This system will be conformal coated.

### iMX950 Sample Order Code - PoE Example

iMX950-HV2-XX-P-XX-8GRJ45P-8GRJ45P-8GRJ45P-4TGSFP

Description: RAPTOR iMX950 Switch with PoE Support, equipped with a single high voltage (HV2) power supply, three 8-port 10/100/1000BaseTX RJ45 PoE Capable modules, and a 4-port 1G/10G Base-X SFP module with no transceivers. This switch will need external power supplies to supply power to the PoE line modules.

## iROC SYSTEM ORDER CODE

The iROC computing module is a hot-swappable industrial computing module that will operate in slots 1 through 4 of the RAPTOR. For the full module specifications and standalone order codes please review its datasheet. The order codes below are used for ordering an iROC factory installed in a RAPTOR system.

MODEL	CPU	OS	STORAGE	SOFTWARE PACKAGE	DESCRIPTION
iRC					iROC Computing Module, HDMI port, USB 2.0, USB 3.0, Console port, 10/100/1000TX RJ45
	1				E3940 Intel Atom, with 8GB of memory
		W1			Windows® 10 Pro Operating System
		C8			Centos Operating System version 8.2
		C7			CentOS Operating System version 7 (2009)
			2A		256GB Industrial SSD Storage
			5A		512GB Industrial SSD Storage
			1T		1TB Industrial SSD Storage
			2T		2TB Industrial SSD Storage
				XX	None

To order software applications for iROC, please refer to the specific datasheet. Example: Fortinet/FortiGate datasheet.

### iMX950 Sample Order Code – iROC Example

iMX950-HV2-XX-XX-XX-8GRJ45-iRC1C85AXX-8GSFP-4TGSFP

Description: RAPTOR iMX950 Switch, equipped with a single high voltage (HV2) power supply, an 8-port 10/100/1000BaseTX RJ45 module, an iROC computing module running Centos 8.2 with 512GB storage, an 8-port 100/1000BaseX SFP module with no transceivers, and a 4-port 1G/10G Base-X SFP module with no transceivers.

## INDIVIDUAL MODULES

PART #	SLOTS 1 - 3 MODULES DESCRIPTION
iRM-8GRJ45	MODULE - 8 X 10/100/1000Base-T(X) RJ45
iRM-8GRJ45P	MODULE - 8 X 10/100/1000Base-T(X) RJ45, Supports PoE
iRM-8GSFP	MODULE - 8 X 100/1000Base-X SFP (Blank slots, Transceivers not included)
iRM-4RJ4SFP	MODULE - 4 X 10/100/1000Base-T(X) RJ45, plus 4 X 100/1000Base-X SFP (Blank slots, Transceivers not included)
PART #	SLOTS 1 - 4 MODULES DESCRIPTION
iRM-BLK	Blank Module
iRM-8SRJ45	8x Serial RJ45 Interfaces, RS232/422/485
iRM-4DB09	4x Serial DB9 Interfaces, RS232/422/485
iRM-2RBX	HSR/PRP support for two RedBoxes
PART #	SLOT 4 MODULES DESCRIPTION
iRM-4TGSFP	MODULE - 4 X 1000Base-X SFP/10G-X SFP (Blank slots, Transceivers not included)

## INDIVIDUAL MODULES FOR POWER SUPPLIES

PART #	POWER SUPPLY MODULES DESCRIPTION
iRM-PS-HV2	MODULE – High Voltage, HV2, Power Supply Nominal Range: 100-240 VAC at 50/60 Hz / 100-240 VDC Operating Range: 85-264 VAC, 88-300VDC
iRM-PS-MV2	MODULE – Medium Voltage, MV2, Power Supply Nominal Range: 48 VDC Operating Range: 36-72 VDC
iRM-PS-LV2	MODULE – Low Voltage, LV2, Power Supply Nominal Range: 24 VDC Operating Range: 10-36 VDC
iRM-PS-BLK	MODULE – Blank Power Supply This is a filler module, used to prevent damage to an otherwise unpopulated power module slot

## PoE EXTERNAL POWER SUPPLIES

PART #	MAX POWER	NOMINAL INPUT VOLTAGE	OUTPUT VOLTAGE	EXTERNAL PoE POWER SUPPLIES DESCRIPTION
1900-0015	240W	24VDC	56VDC	DIN Mount Power Supply
1900-0016	240W	48VDC	56VDC	DIN Mount Power Supply
1900-0017	240W	100-240 VAC 110-250 VDC	56VDC	DIN Mount Power Supply
1900-0018	480W	100-240 VAC 110-250 VDC	56VDC	DIN Mount Power Supply

Notes: PoE External Power Supplies support operating temperatures of -25°C to +70°C. Derating begins above +60°C. Power supplies may be wired in parallel to supply additional power to the PoE line modules.

## ACCESSORIES

PART #	DESCRIPTION
1900-0032	Panel Mount Bracket Kit for the iMX350/iMX950



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