Data Sheet

Symphony Plus
S+ I/O: SD Series fiber optic repeater RFO810

Introduction

The RFO810 is the redundant optical communication repeater that allows S+ Control's SD Series controllers (HPC800 and SPC700) and HR Series controllers (BRC300/400/410) to transparently extend communication to I/O devices on HN800 bus up to 3 km for remote applications. The RFO810 can also be used to extend the CW800 bus, allowing peer-to-peer communication of SD Series controllers (HPC800) to extend up to 3 km.

The HN800 bus supports a 'Star Architecture' with RFO810s. With the controller located in the center of the 'Star', the local HN800 bus can support up to 4 RFO810 optical links. Each RFO810 remote link can be up to 3 km long and have up to 64 HN800 devices on each electrical HN800 bus.

The CW800 bus supports one RFO810 link per bus. This link can support multiple controllers on either side of the link and can be extended up to 3 km. Electrical CW800 bus on either side supports up to 30 single SD Series HPC800 controllers or 15 redundant pairs of SD Series HPC800 controllers.

SD Series fiber optic repeater RFO810

Design Standards

Table 1. RFO810 Design Standards

Category	Standard	Description
Safety	CSA C22.2 No. 142	Safety standards for process control equipment
	ANSI/ISA S82.01-1994	
	EN 61010-1	Safety standards for process control equipment
Environmental	EN 60068-2-1, EN 60068-2-2, EN 60068-2-14	Operating temperature
	EN 60068-2-78	Operating relative humidity
	MIL-STD-810G 501.5, 502.5	Storage/transportation temperature
	ISA S71.04 (level 1 liquids, solids, gases)	Air quality
Vibration	EN 60068-2-6	Operating vibration (sinusoidal)
	MIL-STD-810G 514.6	Storage/transportation vibration Category 1, basic transportation
	EN 60068-2-27	Shock
EMI, RFI, and electrical surge	EN 61000-4-2 (level 3)	ESD
	EN 61000-4-3 (level 3)	EMI susceptibility
	EN 61000-4-4 (level 3)	Electrical fast transient
	EN 61000-4-5 (level 3)	Electrical surges
	EN 61000-4-6 (level 3)	Conducted immunity
	EN 61000-4-8 (level 3)	Magnetic fields
	CISPR-16	Radiated emissions

Table 1. RFO810 Design Standards (continued)

Category	Standard	Description
Flammable atmospheres	CSA C22.2 No. 213	Nonincendive equipment
	ISA S12.12	Nonincendive equipment
	FM Class 3611	Division 2 equipment
Flammability of product components	IEEE 383	Intercabinet cables
	UL rating VW-1	Intracabinet cables
	UL 94 V-0, V-1, V-2, or V5	Flammability of plastic materials
Certifications	CE Mark (pending)	EMC directive 2004/108/EC Low voltage directive 2006/95/EC
	CSA (pending)	Certified for use as process control equipment in an ordinary (nonhazardous) location
	cCSAus (pending)	Approved for use in Class I; Division 2; Groups A, B, C, D: hazardous locations. Certified by CSA to Canadian and US standards: CAN/CSA C22.2 No. 1010.1-92 (R1999) CAN/CSA C22.2 No. 1010.1B-97 TIL No. I-29B CAN/CSA C22.2 No. 213 ANSI/ISA S82.02.01-1994 FM Class number 3611: Oct. 1999 Must be powered by an approved SELV source, in accordance with CSA C22.2 No. 1010.1, Annex H and mounted within an enclosure per ABB document WE-DOC-03604

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Specifications

Table 2. RFO810 Specifications

Property		Characteristic/Value[1]
Fiber optic repeater[2]	Power consumption	Support for redundant power inputs
	Voltage	21.6 VDC minimum
		24.0 VDC nominal
		28.0 VDC maximum
	Current	90 mA typical
		100 mA maximum
	Over voltage category[3]	Tested according to IEC/EN 61010-1 I for power
	Module redundancy	Yes
	Module dimensions	54 mm width, 119 mm height
Mounting bases	Mounting	Standard 35mm wide DIN-rail horizontally[4] Key positions to RMU810/RMU811 mounting base 1= F, 2=F
	RMU810 power rating[5]	
	Voltage	24.0 VDC nominal
	Current	2.0 A
	RMU811 power rating[5]	
	Voltage	24.0 VDC nominal
	Current	0.2 A
	Over voltage category[3]	Tested according to IEC/EN 61010-1 I for power
	Base dimensions	124 mm width, 186.5 mm height (holds two modules)

Table 2. RFO810 Specifications (continued)

Property		Characteristic/Value[1]
HN800	Communication rate	4 Mbaud
	Bus redundancy	Yes
	Architecture	Must be 'Star Architecture' with up to 4 RFO810 optical links
	Devices[6]	Up to 64 devices in total per electrical bus, up to 8 Bus Segments per electrical bus, up to 24 devices per Bus Segment. One RFO810, either single or redundant, is counted as 4 HN800 devices.
	Intracabinet distance[7]	30 m
	Intercabinet distance [8,9]	3,000 m
CW800	Communication rate	4 Mbaud
	Bus redundancy	Yes
	Architecture	One RFO810 optical link per bus
	Controller	Up to 30 single HPC800 controllers or 15 redundant pairs of HPC800 controllers on electrical CW800 bus on either side of the optical link
	Intracabinet distance[7]	30 m
	Intercabinet distance [8,9]	3,000 m
Fiber optic cable[10]	Fiber size	62.5/125 µm
	Fiber attenuation	-3.5 dB/km
	Index	Graded
	Wavelength	840nm
	Bandwidth	160 MHz/km
	Connector type[11]	ST style with right angle strain relief, 40 mm (1.5 in.) bend radius
	Transmission mode	Multimode

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NOTES:

1. All specification values are maximums unless stated otherwise.
2. Repeaters are required to connect HN800 between stand-alone enclosures even if the distance between enclosures is short. In the case of multibay enclosures, HN800 can extend to each bay without the use of repeaters as long as the 30 m (100 ft.) limit is not exceeded.
3. To be supplied by a Class 2 or Limited Energy Source in accordance with 61010-1 3rd edition. If the equipment is used in a manner not specified by the manufacturer, then the protection provided by the equipment can be impaired.
4. Only TRL810K02 fiber optic TU kit is authorized to mount on vertical DIN-rail.
5. The RMU810 and RMU811 mounting bases do not consume any power on their own. These ratings are based on the amount of power that passes through these bases to the RFO810 modules and to other adjacent bases and modules.
6. A Bus Segment is defined as the collection of HN800 devices physically connected between a pair of HBX01L & HBX01R Bus Extenders. The maximum 8 Bus Segments can only be achieved when all HBX01L & HBX01R on the bus is PR: C or later, and all TER800 on the bus is PR: F or later. When any Bus Extender or Bus Terminator with earlier product revision is used, the maximum number of Bus Segment per electrical HN800 bus is reduced to 3.
7. Intracabinet HN800/CW800 refers to HN800/CW800 enclosed within a stand-alone (or multibay) enclosure not leaving the protection of the enclosure. This distance includes the length of all interconnected bases and all connecting cables.
8. Special operation dip switches are required on the HPC800 and BRC300/400 controllers to achieve the maximum distance. HPC800, BRC and HN800 devices firmware must also be at a specific revision level (or later) to achieve the maximum distance. Refer to the HPC800 or BRC 300/400/410 user manual for details.
9. The absolute maximum difference in fiber optic cable length between HN800/CW800 Channel A and HN800/CW800 Channel B cables of a fiber optic HN800/CW800 segment is 20 meters (65.5 feet). The maximum length of a channel is 3,000 meters (9,842 feet).
10. Typical cable example: AMP Zip cord P/N 502983-1 (riser) or P/N 502986-1 (plenum).
11. Terminate the fiber optic cable with the appropriate ST connector according to the cable type (i.e.,jacket material, bend radius, pull strengths, etc.). ST connectors can be plastic, steel, or ceramic ferrules. Typical connector example: AMP ST style, Epoxyless, P/N 504034-1 with right angle strain relief P/N 502667-6 (black).

Environmental Specifications

Table 3. RFO810 Environmental Specifications

Environment	Operating	Storage and Transportation
Air quality	ISA S71.04 G1 ISA S71.04 G3 compliance version is also available	ISA S71.04 G1 ISA S71.04 G3 compliance version is also available
Altitude	Sea level to 3,048 m (10,000 ft)	Sea level to 12,192 m (40,000 ft.)
Relative humidity (noncondensing)	20% to 95% @ 40°C (104°F)	5% to 90%
Temperature	0° to 55°C (32° to 131°F) (internal enclosure)	-40° to 85°C (-40° to 185°F)
Vibration	10 to 60 Hz, 0.0375 mm (0.0015 in.) pp 60 to 150 Hz, 0.5 G sine	0.74 G_{RMS} longitudinal 0.20 G_{RMS} transverse 1.04 G_{RMS} vertical 10 to 500 Hz random
Shock	—	15 G, 11 msec

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