

File E203960  
Project 09CA31824

January 21, 2010

REPORT

on

PROGRAMMABLE CONTROLLERS FOR USE IN HAZARDOUS LOCATIONS  
(NRAG, NRAG7)

Hirschmann Automation and Control GmbH  
Neckartenzlingen, Germany

Copyright © 2010 Underwriters Laboratories Inc.

Underwriters Laboratories Inc. authorizes the above named company to reproduce this Report provided it is reproduced in its entirety.

## DESCRIPTION

## PRODUCT COVERED:

USL, CNL - Open Type, Programmable Controller, Cat. Nos. RSR20- and RSR30-, followed by combination of 17 digits and letters, for use in Class I, Division 2, Groups A, B, C, and D Hazardous Locations when installed with Hirschmann Control Drawing No. 000144941DNR.

## GENERAL:

This device is an industrial Gigabit Ethernet Switch for DIN rail installation and for use in industrial automation applications. It is microcomputer-based and communicates via interfaces through wire or optical ports. It has nonincendive field wiring for relay outputs.

## ELECTRICAL RATINGS:

All Cat. Nos. RSR20 and RSR30 can be rated as follow:

			Power Supply Type C		Power Supply Type K	
MODEL	Ports designation		Supply Voltage	Input Current	Supply Voltage	Input Current
RSR20-	0900	xx	24-48Vdc	0.58-0.29A	110-230Vac 50-60Hz	0.13-0.06A
	0800	yy		0.50-0.25A		0.11-0.05A
	0800	T1		0.42-0.21A		0.09-0.04A
RSR30-	0603	xx		0.63-0.31A		0.14-0.07A
	0802	CC		0.67-0.33A		0.15-0.07A
	0802	O7		0.58-0.29A		0.13-0.06A
	0802	OO	0.58-0.29A	0.13-0.06A		
	0806	O6	0.50-0.25A	0.11-0.05A		
	0703	xx	n.a.			0.19-0.09A

x = any kind of character

y = any kind of character except T1

\*

**Outputs:**

Relay **Outputs(Fault Contact):**

Ethernet signals,

Vmax:30Vdc, Imax:0.09A, Ci:200 nF and  
Li:0.5 uH

Max. surrounding air temperature: 85°C

Temperature code: T4

## ENGINEERING CONSIDERATIONS (NOT FOR UL REPRESENTATIVE'S USE):

Note: CNL = Canadian National Standards - Listed.

USL = United States Standards - Listed.

Products designated USL have been investigated using:

ANSI/ISA 12.12.01-2007, Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Division 1 and 2 Hazardous (Classified) Locations, Approved 12 April 2007.

Products designated CNL have been investigated using:

CSA C22.2 No. 213-M1987, Non-incendive Control Equipment for Use in Class I, Division 2 Hazardous Locations.

Subject devices have been evaluated as Programmable Controllers (NRAQ, NRAQ7) to UL 508, Industrial Control Equipment. This evaluation is covered under the Applicant's ICE File E175531, Issue Date: 2009-11-25.

## CONSTRUCTION DETAILS:

General - The details of construction are covered in the following photographs and accompanying descriptive pages and illustrations.

Corrosion Protection - All metal parts are made of aluminum and are painted or plated as corrosion protection.

Limited Voltage/ Limited Current circuit - Since CPU and Ethernet boards are supplied by R/C (QQGQ2/8) power supply which fulfill requirements described in Par. 32.4 from UL 508 and is confirmed by appropriate test results the investigation has been conducted under consideration of the LV/LC requirements.

Any kind of Printed Wiring Board (ZPMV2/8) - suitable for direct support of live parts, rated min. 94 V-0, 125°C can be used.

Connectors - All used connectors are described in the Description area of the Report. Connectors not described are not to be used in the construction of the Models evaluated.

Make/Break Components - All make and break components are either in non-incendive circuits or are considered as nonarcing components as described.

Fuses - All fuses, with fuse holders are within the UL Recognized power supplies and are not accessible to the user. They are not subject to overloading.

Summary of Figures and Illustrations - The following figures and illustrations are included in this Report.

Fig. No.	Ill. No.	Mfct's Dwng. No.	Rev.	Date	Description
1 -5	-	-	-	-	Model RSR20
6,7,8	-	-	-	-	Model RSR30
9	-	-	-	-	CPU PCB Top Model 837-502-005
10	-	-	-	-	CPU PCB Btm Model 837-502-005
11	-	-	-	-	Ethernet Sw PCB Top 837-503-005
12	-	-	-	-	Ethernet Sw PCB Btm 837-503-005
13	-	-	-	-	Ethernet Sw PCB Top 837-504-205
14	-	-	-	-	Ethernet Sw PCB Btm 837-504-205
15	-	-	-	-	Ethernet Sw PCB Top 837-505-205
16	-	-	-	-	Ethernet Sw PCB Btm 837-505-205
17	-	-	-	-	Ethernet Sw PCB Top 837-506-205
18	-	-	-	-	Ethernet Sw PCB Btm 837-506-205
19	-	-	-	-	Ethernet Sw PCB Top 837-507-205
20	-	-	-	-	Ethernet Sw PCB Btm 837-507-205
21	-	-	-	-	SF Connector Details
-	1	952028-CP	1.13	2009-07-16	CPU electric diagram
-	2	837-502-005	-	2009-07-16	CPU PCB Layout
-	3	952028-SP.3 Combo	1.10	2009-07-25	Ethernet Switch 3 Combo electric diagram
-	4	837-503-005	-	2007-12-10	Ethernet Switch 3Combo PCB Layout
-	5	952028-SP.2 Combo	1.10	2009-07-25	Ethernet Switch 2 Combo electric diagram
-	6	837-504-999	-	2007-08-17	Ethernet Switch 2 Combo PCB Layout
-	7	952028-SP 10 X SFP	1.10	2009-07-25	Ethernet Switch 10 X SFP electric diagram
-	8	837-505-005	-	2007-12-10	Ethernet Switch 10 X SFP PCB Layout
-	9	952028-SP 3 X DSN	1.10	2009-07-25	Ethernet Switch 3 X DSN electric diagram
-	10	837-506-999	-	2007-12-10	Ethernet Switch 3 X DSN PCB Layout
-	11	952028-SP 3 X MTRJ	1.10	2009-07-25	Ethernet Switch 3 X MTRJ electric diagram
-	12	837-507-005	-	2007-12-10	Ethernet Switch 3 X MTRJ PCB Layout
-	13	000144941DNR	1.1	2010-01-13	Control Drawing

Marking - Markings may be provided in French or English for Canadian markets. Ink-stamped label permanently secured to the device, including Listee's name or File Number, device catalog number, the electrical ratings and max. surrounding temperature.

The following marking are also included in label:

Operating temperature code - T4

Hazardous location designation Class I, Division 2, Groups A, B, C, D.

Date code or serial number referencing date of manufacture, month and year minimum.

USB Port is marked with the Tri-ex (triangle with Exclamation point) symbol. Below is the triangle with exclamation point mark as noted in ISA 12.12.01-2007, Section 9.1.3.



Relay terminals are marked with the Tri-ex. The side of the Ethernet switch is marked with the triangle and "See Control Drawing 000144941DNR". Ill. 13 shows the Control Drawing.

Installation Instructions - Shall be provided and include a wiring diagram. In addition diagrams and instructions for installation shall be provided. Markings in the instruction manual:

- (i) Use 75°C copper wire only" for every model of this section.
- (ii) Tightening torque for field wiring terminals.
- (iii) "For Use in a pollution degree 2 environment" or equivalent.

\* "LAN ONLY" **for** Ethernet connections.

The following additional marking or equivalent must be provided in the instructions.

"SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D HAZARDOUS LOCATIONS, OR NONHAZARDOUS LOCATIONS ONLY."

"WARNING - EXPLOSION HAZARD - SUBSTITUTION OF ANY COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2."

"WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS."

"The USB connector is for temporary connection only. Do not use, connect, or disconnect unless area is known to be non-hazardous. Connection or disconnection in an explosive atmosphere could result in an explosion."

## NOMENCLATURE BREAKDOWN:

RCR30-	09	02	S2	M2	T1	U	C	C	H	P	H	H
I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII

## I: MODEL:

RSR20 Rail Switch Rugged Fast Ethernet

RSR30 Rail Switch Rugged Gigabit Ethernet uplink ports

## II: Ports Fast Ethernet:

06 - 6x100 Mbps Ethernet

08 - 8x100 Mbps Ethernet

07 - 7x100 Mbps Ethernet

09 - 9x100 Mbps Ethernet

## III: Ports Gigabit Ethernet:

00 - 0x1000 Mbps Ethernet

03 - 3x1000 Mbps Ethernet

02 - 2x100 Mbps Ethernet

## IV: Ports type 1. uplink:

CC - 2x Combo Port Gigabit Ethernet

07 - Combo Port Gigabit Ethernet

OO - 2x SFP Slot Gigabit Ethernet

06 - SFP Slot Gigabit Ethernet

TT - 2x Twisted Pair (Tx)/RJ45

T1 - Twisted Pair (Tx)/RJ45

MM - 2x Multimode FX SC

M2 - Multimode FX SC

JJ - 2x Multimode FX MTRJ

M3 - Multimode FX MTRJ

NN - 2x Multimode FX ST

M4 - Multimode FX ST

VV - 2x Singlemode FX SC

S2 - Singlemode FX SC

UU - 2x Singlemode FX ST

S4 - Singlemode FX ST

LL - 2x Singlemode Long Haul FX SC

L2 - Singlemode Long Haul FX SC

GG - 2x Singlemode Long Haul+ FX SC(200km)  
FX SC(200km)

G2 - Singlemode Long Haul+

ZZ - 2x SFP Slot (100Mbps)

Z6 - SFP Slot (100Mbps)

## V: Ports type 2. uplink:

ZZ - 2x SFP Slot (100 Mbps)

M4 - Multimode FX ST

07 - Compo port Gigabit Ethernet

S2 - Singlemode FX SC

06 - SFP Slot Gigabit Ethernet

S4 - Singlemode FX ST

T1 - Twisted Pair (Tx)/RJ45

L2 - Singlemode Long Haul FX SC

M2 - Multimode FX SC

G2 - Singlemode Long Haul+ FX SC(200km)

M3 - Multimode FX MTRJ

Z6 - SFP Slot (100Mbps)

## VI: Remaining ports:

T1 - Twisted Pair (Tx)/RJ45

Z6 - SFP Slot (100 Mbps)

## VII: Temperature range:

S - Standard 0 up to 60

U - Extended -40 up to 85

F - Extended -40 up to 85 inclusive conformal coating(coating is used to provide additional protection against dust only)

## VIII: Voltage range 1:

C - 24 - 48 V dc

K - 100 - 240 Vac

## IX: Voltage range 2:

9 - Not available

K - 100 - 240 Vac

C - 24 - 48 V dc

## X: Approvals:

H - UL508, GL, IEC61850, IEEE1613, EN50121

## XI: Software version:

P - Professional

## XII: Configuration:

H - Hirschmann

## XIII: OEM-Type:

H - Hirschmann

The following pages have been removed
---------------------------------------