

File E203960  
Project 09CA02591

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REPORT

on

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

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## DESCRIPTION

## PRODUCT COVERED:

USL, CNL Programmable Logic Controllers Models OZD Profi 12M, may be followed by G11, G12, P11 or P12, may be followed by -1300, may be followed by EEC, followed by PRO for use in Class I, Division 2, Groups A, B, C, and D Hazardous Locations when installed per Hirschmann control drawing No. 0144944DNR

## GENERAL:

OZD Profi 12M ... PRO series devices are open-type fiber-optic repeaters designed for use in field bus networks. They permit conversions of electrical RS485 bus interface into optical bus interface and vice versa. The devices are intended to be supplied by a Class 2 source. As the relay contact outputs run through the classified locations the devices are determined to be non-incendive field wiring apparatus. The mechanical structure comprises a compact plastic housing with aluminum front, which can be mounted on a DIN rail.

## RATINGS:

## Electrical:

Main Supply Voltage: 18-32 Vdc, Class 2

Input Current: 0.2 A

## Non-incendive circuit parameters for relay contacts:

Vmax: 30 V, Imax: 90 mA, Ci: 20 pF, Li: 0.5  $\mu$ H

## Environmental:

Maximum Surrounding Air Temperature: All models 0°C to 60°C, except for the EEC series, which is -20°C to 60°C.

## TECHNICAL CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

Products designated USL have been investigated using requirements contained in:

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 2007-04-12.

Products designated CNL have been investigated using requirements contained in:

Canadian Standard CAN/CSA C22.2 No. 213-M1987 "Non-incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations" reaffirmed 1999.

Ordinary locations evaluation is done under in File E175531, Issued Date 2009-01-27.

## NOMENCLATURE:

OZD	Profi	12M	G	12	-1300	EEC	PRO
I	II	III	IV	V	VI	VII	VIII

I:	OZD	basic fiber optical repeater designation
II:	Profi	Profi Bus type
III:	12M	12 Mbit/s max.
IV:	G	glass fiber (860nm or 1300nm)
	P	plastic fiber (660nm)
V:	1	number of electrical ports
	2	number of optical ports
VI:	blank	wave length 860 nm (glass fiber) or 660nm (plastic fiber)
	-1300	wave length 1300 nm (glass fiber only)
VII:	blank	0...+60°C Surrounding air temperature range
	EEC	-20...+60°C Surrounding air temperature range incl. any coating of PCB's
VIII:	PRO	Module type in plastic housing

## CONSTRUCTION DETAILS:

Class 2 Circuit - The investigation has been conducted under consideration of the Class 2 requirements. Regarding to table 32.0 of UL 508 no requirements to spacings for this device.

General - Devices shall be constructed in accordance with the Section General and the following description.

Tolerances - Unless specified otherwise, all dimensions are nominal.

Connectors - The device does not contain connectors, unless described in the report.

Make/Break Components - There are no make and break components, unless described in the report. Examples of make/ break devices are switches, potentiometers and electro-mechanical relays.

Plug-In Components - The device does not contain plug-in components, unless described in the report.

Corrosion Protection - All parts are of corrosion resistant material or are plated or painted as corrosion protection.

Printed Wiring Boards - Any R/C (ZPMV2/8), rated at least V-2, 125°C whose solder time and temperature can be confirmed in the Recognized Component Directory.

Fuses - The device does not contain fuses, unless described in the report.

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

Fig. No.	Ill. No.	Manuf.'s Drawing No.	Rev.	Date	Description
1	-	-	-	-	Front of example module
2	-	-	-	-	Side of example module
3	-	-	-	-	Side of example module
4	-	-	-	-	Open example module
-	1	000144944DNR	1.1	2009-12-23	Control Drawing
-	2	0091909DNR	1.3	2008-05-30	Circuit Diagram
-	3	837-450-325	-	2006-11-09	Component Placement Drawing

## MARKINGS:

Markings may be provided in French or English for Canadian markets.  
Ink-stamped label permanently secured to the device.

1. Listee name, trademark or identifier or File Number
2. Electrical ratings as described under 'RATINGS'
3. Catalog or Model number
4. Operating temperature 100°C or operating temperature Class T5 (optional)
5. Maximum Surrounding Air Temperature 60 °C
6. Hazardous Locations as described under 'PRODUCT COVERED'
7. The month and year of manufacture or another suitable method, such as date coding or serial numbers.
8. "WARNING", "Do not disconnect while circuit is live unless area is known to be non-hazardous."
9. Reference to the control drawing of the device for relay terminal.
10. Relay terminals are marked "Nonincendive field wiring", or may have Tri-ex (triangle with Exclamation point) symbol, with explanation in installation instructions.



## INSTALLATION AND OPERATING INSTRUCTIONS:

An installation manual include a wiring diagram shall be provided with each unit to direct the user on proper installation and operation of the device. It must include following statements and marking or equivalent and information:

"Only for connection with a Class 2 power supply"

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

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

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

"Use 60/75°C or 90°C copper wire only" for every model of this section.

"Use in a pollution degree 2 environment."

"Use Class 1 wire only" or equivalent.

"For Use In Class 2 Circuits"

Tightening torque for field wiring terminals.

## MODEL OZD Profi 12M (G12) (P12) (-1300) (EEC) PRO - FIGS. 1 - 4

General - Fig. 1 shows the device front, Fig. 2 shows the side with two screw plugs and DIN rail mounting, Fig. 3 shows backside, Fig. 4 shows device open with PCB. Control Drawing is Ill. 1. The Figs. 1 - 4 represent all models covered in this report.

Due to the use of Class 2 Source, no evaluation of components was considered necessary except for the following:

1. Module Back - Plastic, Polyamide PA 6.6, approx. 130 mm by 111 mm by 32.5 mm.
2. Module Cover - Plastic, Polyamide PA 6.6, approx. 130 mm by 111 mm by 16 mm
3. Housing Front - Metal, approx. 126 mm by 32 mm by 1.4 mm
4. Printed Wiring Board - Approximate dimensions, 125 mm by 92 mm by 1.6 mm. Component placement and circuit diagram as described in Ills. 2 and Ill. 3. SW801, JP301, JP302 are not mounted.
5. Terminal Block (CO201) - R/C (XCFR2/8), types 312171xx, manufactured by RIA CONNECT INC. Plug secured to header by screws. Wires screw secured, 7 pole, rated 51 V, 1 A, 105°C, suitable for field wiring.
6. Terminal Block (CO101) - R/C (XCFR2/8), types 312361xx, 313791xx, 313921xx or 313931xx, manufactured RIA CONNECT INC. Plug secured to header by screws. Wires screw secured, 3 pole, min. rating 51 V, 1 A, 105°C, suitable for field wiring.
7. SUB-D Connector (JP701) - 9 pole, mechanically secured by 2 nuts for screw mounting of plug, for signaling use only.
8. Switch (SW301) - Located in a nonincendive circuit, 8 pole, rated 50V or higher, 0.3 A or higher. Type DA-08, manufactured by Deltron, or similar. Noted maximum voltage 5.2 V, calculated maximum current 138 mA. Operational in a non-incendive circuit. See Ill. 2 for schematic.
9. Fuse (F201) - Rated 3.5 A , 125\_V, soldered to board.
10. Potentiometers (RV50/RV401) - Rated 500 Ohms +/- 20%. Not operator accessible.

11. Relay (K201) - R/C (NRNT2/8) by manufacturer Panasonic Electric Works Co. Ltd. type TX2SS-3V-Z rated 2 A / 30 V DC or 0.5 A / 125 V AC. Max. allowed load 30 V DC / 42 V AC / 1 A / 30 W resistive as given in Ill. 4.

Alternate Relay (K201) - R/C (NRNT2/8) by manufacturer Tyco Electronics AXICOM type P2, V23079-G1008-B301 rated 2 A / 30 V DC or 0.5 A / 125 V AC. Max. allowed load 30 V DC / 42 V AC / 1 A / 30 W resistive as given in Ill. 4.

12. Converter DC-DC - R/C (QQGQ2/8), Manufactured by Cincon, Part No. EC3AB24HM-01. Rated Input: 36 V dc, 164 mA. Max. Output: 5.2 V dc, 300 mA.