

Model 2110R2 Barrier Device

Instruction Manual
EI# 29085



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GENERAL DESCRIPTION

The Model 2110R2 Barrier Unit is an intrinsically safe DIN Rail Mountable device that actively limits current and voltage to protect intrinsically safe equipment from power spikes and to maintain the intrinsic safety. The barrier provides intrinsically safe power and intrinsically safe communication or I/O lines for devices located in hazardous areas.

The 2110R2 is capable of delivering safe levels of supply power and 4-wire/2-wire RS485 digital signals or any other digital I/O lines. The device conforms to UL 913 Intrinsically Safe Apparatus and Associated Apparatus for use in Class I, Division 1 hazardous locations.

TECHNICAL DATA

Supply:

Voltage: 12VDC nom (10 to 15VDC max) with no reverse polarity protection

Maximum input current: 100 mA

Current consumption:

- No load
 - @ 15VDC 11mA
 - @ 12VDC 1.5mA
 - @ 10VDC 0.2mA
- With short circuit on the output
 - @ 15VDC 83 mA

Communication (I/O) lines input:

Voltage: 5 VDC nom / 7 VDC max

Maximum input current: 50 mA

Um: 250 Vrms

Environmental Conditions:

Operating: -40 to 60 °C

Storage: -40 to 85 °C

Approvals: UL 913, Standard for intrinsically Safe Apparatus and Associated Apparatus for Hazardous (Classified) Locations
UL 60079-11 (Intrinsic Safety "i" Zones 0 and 1)
CAN/CSA C22.2 No. 157 Intrinsically safe and non-incendive equipment for use in hazardous locations

Mounting: T35 DIN Rail

Weight: ~130 g

Connection: Ppolarized plug-in disconnect screw terminal blocks to accomodate terminations up to 2.5mm²

Location: Class I Div 1 Group D Temperature code T4

Protection class: IP20

Dimensions: Width=22.5mm/0.9", Depth= 99mm/3.9", Height=114.5mm/5.5"

TERMINAL BLOCK CONNECTION



HAZARDOUS AREA	SAFE AREA
9 → NOT CONNECTED	1 → TX/RX+
10 → NOT CONNECTED	2 → TX/RX-
11 → DC GND	3 → RX-
12 → VDC	4 → RX+
13 → TX/RX+	5 → NOT CONNECTED
14 → TX/RX-	6 → EARTH GND
15 → RX-	7 → DC GND
16 → RX+	8 → +VIN

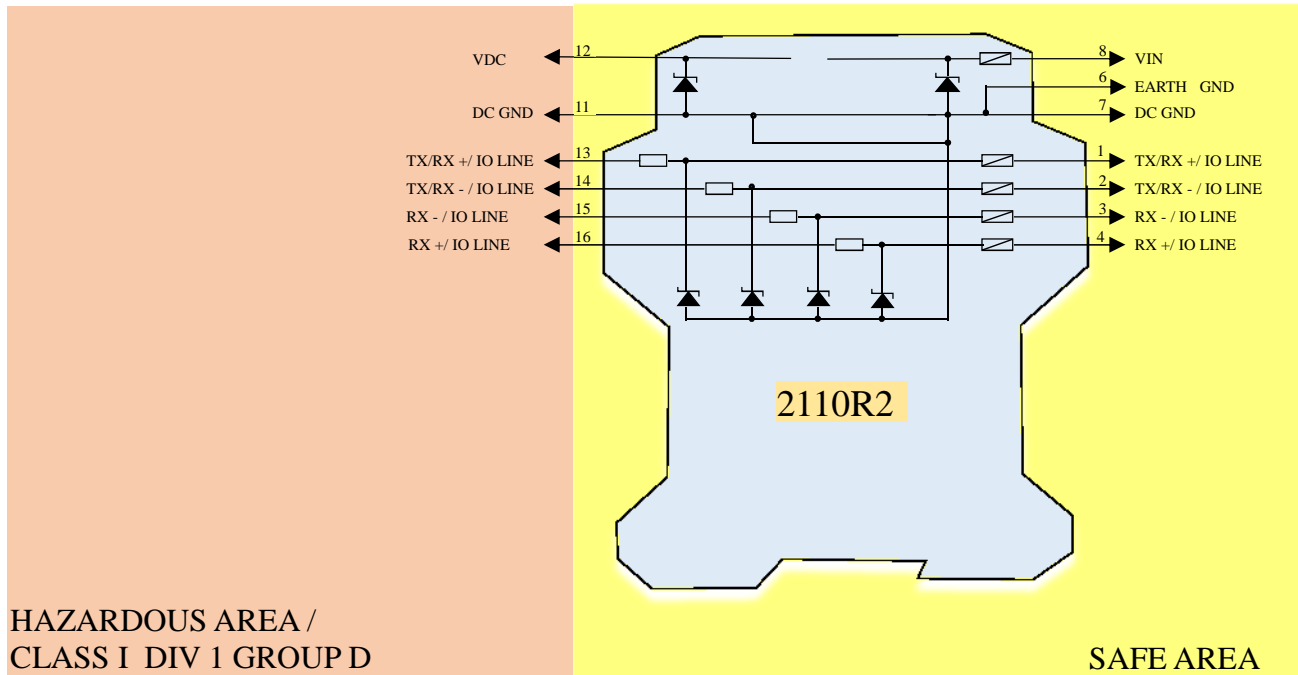
PARAMETERS TABLE

Terminals	2110R2 Associated Apparatus Parameter	Must be	Hazardous Area Device Parameters
12	$U_o/V_{oc} = 12.81 \text{ V}$	\leq	U_i/V_{max}
12+13+14+1 5+16	$I_o/I_{sc} = 217.4 \text{ mA}$	\leq	I_i/I_{max}
12+13+14+1 5+16	$P_o = 1.32 \text{ W}$	\leq	P_i / P_{max}
12+13+14+1 5+16	$C_o/C_a = 23.2 \mu\text{F}$	\geq	$C_i/C_i \text{ device} + C \text{ cable}$
12+13+14+1 5+16	$L_o/L_a = 5.9 \text{ mH}$	\geq	$L_i/L_i \text{ device} + L \text{ cable}$

For installation in which both C_i and L_i of the Intrinsically Safe Apparatus exceed 1% of the C_o and L_o parameters of the Associated Apparatus (excluding cable), then 50% of C_o and L_o parameters are applicable and shall not be exceeded.

If cable parameters are unknown, the following values may be used: Capacitance 60pF per foot (180pF per meter), inductance 0.20uH per foot (0.60uH per meter).

FUNCTION DIAGRAM



WARNINGS

- Not to be connected to control equipment that uses or generates more than 250Vrms or VDC with respect to earth ground.
- The 2110R2 must be installed, operated and maintained only by qualified personnel, in accordance to relevant national/international installation standards (National Electric Code (NFPA, Article 504) and ANSI/ISA – RP12.6).
- Particular care shall be given to segregation and clear identification of IS conductors and non IS conductors.
- De-energized power source (turn off power supply voltage) before plugging or unplugging the terminal blocks.
- **Warning: Substitution of components may impair Intrinsic Safety.**
- **Explosion Hazard: to prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.**
- The unit cannot be repaired by the end user and must be returned to the manufacturer for repair. Any unauthorized modification must be avoided.

Note: All inputs are not reverse polarity protected. If reverse polarity occurs the unit will fail safe by blowing the fuses. To avoid this situation special care is required during installation.

MARKINGS

Labels:

The Model 2110R2 IS barrier board parameters and instructions are clearly marked on the labels attached to the enclosure. There are three labels, one on each side and one on the front.

Serial Number:

For each unit, a unique serial number is generated after factory testing is complete. The serial number consists of five digits (e.g. SN: 00101) and is clearly printed with black permanent marker on a white rectangle located on the front side of the PCB.

INSTALLATION

- The unit is suitable for installation on T35 DIN Rail.
- The unit can be mounted with any orientation over the entire ambient temperature range.
- Electrical connection of conductors up to 2.5 mm² are accommodated by polarized plug-in removable screw terminal blocks which can be plugged in/out.
- Identify the function and location of each connection terminal using the wiring diagram.
- Intrinsically safe conductors must be identified and segregated from non intrinsically safe conductors and wired in accordance to relevant national/international standards (National Electric Code (NFPA, Article 504) and ANSI/ISA – RP12.6).
- The enclosure provides an IP20 minimum degree of mechanical protection for indoor installation. Outdoor installation requires an additional enclosure with a higher degree of protection consistent with the effective operating environment of the specific installation.
- The unit must be protected against dirt, dust, extreme mechanical and thermal stress, and casual contact.
- **Electrostatic Hazard: To avoid electrostatic hazard, enclosure must be cleaned only with a damp or antistatic cloth.** Any penetration of cleaning liquid must be avoided to prevent damage to the unit.
- Any unauthorized card modification must be avoided.
- Fuses are not field replaceable. The unit must be returned to Manufacturer for repair.

TECHNICAL SUPPORT

For more information or technical support:

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