



PLC-5 Programmable Controllers in Hazardous Environments

About This Publication

This publication lists the parameters required to use a PLC-5 programmable controller in a Class I Division 2 environment.

Application Notes

If you are using the serial port of your PLC-5 programmable controller in a Class I Division 2 application, you must satisfy the parameters in the Parameters for the Serial Port in Class I Division 2 Applications table.

Application Information

Per the Canadian Electrical Code, the circuit parameters of associated field-wired apparatus for use in hazardous locations shall be coordinated with the host product such that their combination remains nonincendive.

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The circuit parameters for the PLC-5 programmable controller serial port are given in the following table.

Parameters for the Serial Port in Class I Division 2 Applications

Parameter	Value	Definition
V _{max}	±15V dc min	Max applied voltage rating of each peripheral device. V _{max} of each serial peripheral shall be greater than or equal to V _{oc} . $V_{max}(\text{peripheral}) \geq V_{oc}$
I _{max}	0.5 A min	Max current to which each peripheral device can be subjected. I _{max} of each serial peripheral shall be greater than or equal to I _{sc} . $I_{max}(\text{peripheral}) \geq I_{sc}$
C _i	0.9 μF	Max allowed total capacitance of each separate peripheral device and its associated cable. C _i of each separate peripheral device and C _{cable} of its associated cable shall be less than or equal to C _a . $(C_i + C_{cable}) \leq C_a$
L _i	20 μH	Max allowed total inductance of each separate peripheral device and its associated cable. The sum of L _i of each peripheral device and L _{cable} of its associated cable shall be less than or equal to L _a as appropriate in Table 1. $(L_i + L_{cable}) \leq L_a$
V _{oc}	±15V dc	Open circuit voltage of serial port.
I _{sc}	0.5 A	Max output current of the serial port.
C _a	1 μF	Max total capacitance that can be connected to the serial port. Total capacitance of the peripheral and its cable must not exceed the indicated value.
L _a	28 μH	Max total inductance that can be connected to the serial port. Total inductance of the peripheral and its cable must not exceed the indicated value.

- The peripheral devices and their associated cabling shall have circuit parameters with the limits given in the table for them to remain nonincendive when used with the PLC-5 programmable controller serial port.
- For comparison of C_a and C_i, use the sum of the capacitance of all connected peripheral devices and their associated cables for C_i.

- For the comparison of L_a with L_i , use the inductance of each individual peripheral device and its associated cable for L_i .
- If cable capacitance and inductance are not known, the following values from UL 913 or CSA C22.2 No. 157 may be used:
 - $C_{\text{cable}} = 60 \text{ pF/ft}$ (197 pF/m)
 - $L_{\text{cable}} = 0.20 \text{ }\mu\text{H/ft}$ ($0.66 \text{ }\mu\text{H/m}$)

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