

Note that Input #4 is the most significant bit and Input #1 the least significant bit. Next construct a ladder diagram using the [LDHex] function as follow:



When Input #5 is ON, the Counter #1's present value will be loaded with the hexadecimal/BCD number formed by Inputs #4,3,2 & 1. Since Counter #1 is also Sequencer #1, its step number can be used as a decoded signal for decision making purposes.

5. Program Step Size Calculation

For E10+ PLCs, the step sizes occupied by the contacts, coils and special functions are different from that of the H-series. Most program elements occupy only one program step, with the following exceptions occupying two steps each.

	Symbol	Step Size
1	contacts for Sequencer#1 Step N	2
2	Coil for Timers & Counters	2
3	Interlock functions	2
4	Differentiation functions	2
5	"Load Seq1 with Hex number" function	2
6	ENDLOGIC - Always used at the end of each program	2

6. Host Link Commands

The new E10-Relay+ PLCs support a full set of point-to-point and multi-point host link commands for communication with a host computer. You normally DO NOT need to know them in order to program the PLC. Please refer to the "E10+ Host Link Command Reference Manual" ("HostlinkE10.pdf" on your WinTRILOGI CD-ROM or download from the following webpage: <http://www.tri-plc.com/HostlinkE10.pdf>).

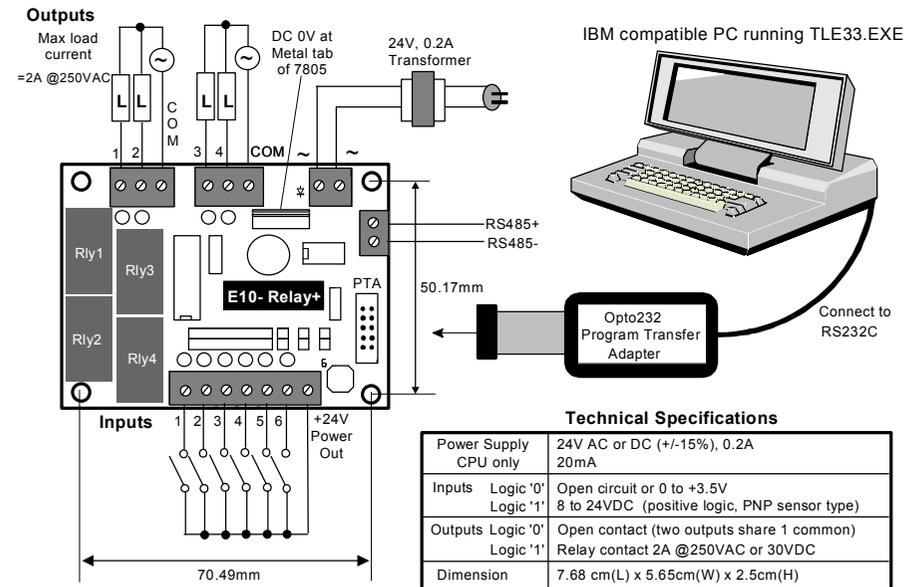
E10-Relay+ (with RS485) PLC Installation Guide

The new E10-Relay+ PLC is an enhanced version of the original E10-Relay. All timers and counters in the E10+ now support the full range of set values from 0-9999 instead of just 0-254, and the maximum program steps have been increased to 216 steps. More importantly, this E10+ PLCs can now be programmed by the new WinTRILOGI version 3.5 software which runs under Windows 95/98/ME/NT/2000 and XP. This new PLC also features a built-in **RS485 port** and supports a full set of host link commands similar to those on the H- and the M-series PLCs. These features allow it to be used as a slave or as an intelligent, distributed I/O board for a host PC or an M-series Super PLC. Aside from using the Opto232 programmer transfer adapter, this new PLC can also be remotely programmed via RS485 using an "Auto485" or equivalent RS232-to-RS485 converter.

Notes:

- 1) The E10+ PLC maintains backward compatibility with the original DOS TRILOGI so the old DOS TRILOGI can still be used to program the E10+ PLCs. The extra programming steps are supported by DOS TRILOGI 3.3E, but the timers/counters remain limited to 0-254 range when you use the DOS TRILOGI 3.3E to program it.
- 2) The RS485 port on the E10-Relay+ PLC is automatically enabled when the Opto232 adapter is unplugged from the 10-pin PTA box header.

1. E10-Relay+ Wiring Diagram



The E10-Relay+ PLC has a built-in power supply unit, hence requiring only a small 24V AC transformer to power it. The power supply also provides a 24V DC output for connection to sensors. Up to 0.1A current is available for sensors when using a 0.2A transformer.

DC ground (0V) may be tapped from the heatsink tab of the 7805 voltage regulator. The input is triggered by connecting a switch to the +24VDC output. PNP type sensor can be interfaced directly. With a pull up resistor NPN sensors may also be used, although the logic state for the input contact in the ladder program should be inverted

2. Programming E10-Relay+ using WinTRiLOGI 3.5

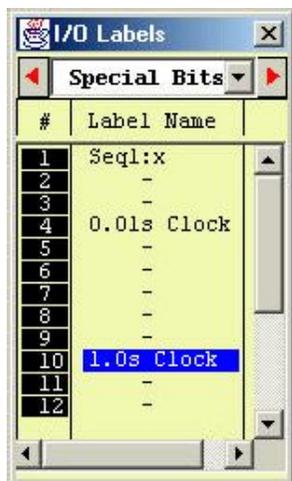
When the WinTRiLOGI program is first started, you will be prompted to select the PLC model type. Please select "E10+" and click the OK button to enter into E10+ mode. The E10+ PLCs are subject to the following I/O limitations:

Inputs	8
Outputs	6
Internal Relays	8
Timers	4
Counters	4
Sequencer	1
Maximum Program Steps	216

In addition, the E10+ PLCs supports only one sequencer, two clock pulses, and a limited number of special bits and special functions. To better differentiate program files created for the E10+ and the H-series, all files created in E10+ mode will be assigned the .PE3" as the default file extension, whereas files created in H-series mode will be assigned the default extension ".PC3". The WinTRiLOGI program will also automatically use the corresponding default extension for the selected PLC mode when you attempt to open a file or create a new file.

The next few sections describe the special bits and special functions supported by the E10+ PLCs.

3. Special Bits Menu

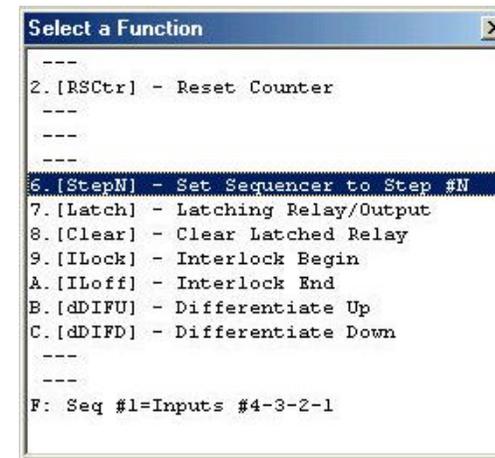


Unlike the H-series PLC which supports 8 sequencers, the E10+ PLC only supports 1 sequencer and two clock pulses.

When creating a contact and when you scroll to the special bits table, only the Seq1:X, the 0.01s clock pulse bit "Clk:01s" and the 1 second clock pulse bit "Clk:1.0s" are available for selection.

The unavailable items are marked as "-" to indicate that the menu item is only available to the H-series PLC but not to the E10+.

4. Special Functions Menu



The Special Function menu will only show those special functions which are available to E10+ PLC. Those functions that are unavailable are replaced by the "--" symbol.

Note that a unique Special Function: "[LDHex]" is visible only when you are in the E10+ mode. This function can be used to set the present value of the Sequencer #1 to that of the hexadecimal or BCD value formed by Inputs #4, 3, 2 & #1.

a. Using Sequencer #1

Since E10+ mode does not support [AVseq] & [Upctr] functions, you can use the normal down counter coil "-----[Ctr]" to decrement the value of Counter #1, which is also used as the step counter of Sequencer #1.

Define Counter #1 with the name "Seq1", and you can initiate it to any step number between 0 and 31 using the [StepN] function. When you create the [StepN] special function, it will ask you to select the sequencer (only Seq1 available here) as well as the step number N to set it to.

As the process progresses from one step to another, decrement the sequencer using the normal counter coil. As described in the TRiLOGI Programmer's Reference, each step of the sequencer such as "Seq1:5", "Seq1:29" can be used as a contact in the ladder diagram. When the sequencer reaches the final step (usually Step #0), use the [StepN] again to set it back to the initial value. A TRiLOGI sample program "Seqtest.PE3" which demonstrates the use of the sequencer can be found in your WinTRiLOGI installation folder.

b. [LDHex] Function

The [LDHex] function is an extremely convenient feature for applications that require external setting of timer/counter value using a thumbwheel switch. A thumbwheel switch typically has 10 or 16 positions and 4 binary outputs which are used to represent the position of the wheel. Connect the 4 outputs of the thumbwheel switch to the Inputs #4, #3, #2 and #1 of E10+ and the common output of the thumbwheel switch to (-) terminal of the E10+ power supply terminal, as shown in the following diagram: