

Errata

K. T. Erickson, *Programmable Logic Controllers: An Emphasis on Design and Application*, Fourth edition, March 2023.

- p. 64 Figure 2.42 caption, "GE" should be "Emerson/GE"
- p. 68 P2-3 statement, last line, "EX624" should be "EX632".
- p. 91 Multi-dimensional arrays are not available for the BOOL elementary data type. A BOOL array can only have one dimension.
- p. 111 To identify a bit in an Byte, Word, or DWord tag, use ".%X" between the tag name and the bit number, like "MyWord.%X2" identifies bit 2 in "MyWord" (MyWord is Word data type).
- p. 123 Figure 3.28 is missing the discrete module channels. A corrected figure is below.
- p. 123 Example 3.3 is missing the discrete module channels. A corrected example is below.
- p. 153 P3-7 (b), Tags PB6121 and PB6122 should be in slot 1
- p. 154 P3-8 (e), Tag LS10 should be in slot 15
- p. 218 Figure 5.15, In the CTU and CTD blocks, "Timer" should be "Counter". Starting with Studio 5000 V36, the MOV block should be a MOVE block.
- p. 236 For an S7-1500, if one wants to use the Q output of the CTU block, it is addressed as ".QU".
- p. 237 For an S7-1500, if one wants to use the Q output of the CTD block, it is addressed as ".QD".
- p. 267 Figure 5.77, tag above timer in network 3 should be "Pls_Tmr"
- p. 297 P5-20, paragraph that starts with "Any counter presets...": The first sentence should be deleted.
- p. 371 Figure 6.34, rung 15, the first unlatch coil should be "Step_12"
- p. 389 Figure P6.3 First part of caption should be "Screw cap on bottle machine:"
- p. 396 First line, "punch" should be "plunger"
- p. 460 Starting with Studio 5000 v36, the names of the comparison blocks have changed as follows:
- | V35 and older | V36 and newer |
|---------------|---------------|
| EQU | EQ |
| GEQ | GE |
| GRT | GT |
| LEQ | LE |
| LES | LT |
| NEQ | NE |
- p. 460 Figure 7.7 Starting with Studio 5000 v36, the "LES" block is changed to "LT" and the "GEQ" block is changed to "GE".
- p. 461 Figure 7.8 Starting with Studio 5000 v36, the "LIM" block is changed to "LIMIT".
- p. 462 Starting with Studio 5000 v36, the "SQR" block is changed to "SQRT".
- p. 463 Figure 7.10(d) Starting with Studio 5000 v36, the "SQR" block is changed to "SQRT".
- p. 463 Additional advanced math function block, ATAN2, a two-argument arctangent, calculates the angle, in radians between the positive x-axis and the line from the origin to the point (SourceX, SourceY).
- p. 463 Starting with Studio 5000 v36, the names of some of the calculation blocks have changed as follows:

- | | | |
|--|---------------|---------------|
| | V35 and older | V36 and newer |
| | ACS | ACOS |
| | ASN | ASIN |
| | ATN | ATAN |
| | SQR | SQRT |
| | XPY | EXP |
- p. 464 Starting with Studio 5000 v36, the names of some of the conversion blocks have changed as follows:
- | | | |
|--|---------------|---------------|
| | V35 and older | V36 and newer |
| | FRD | BCD_TO |
| | TOD | TO_BCD |
| | TRN | TRUNC |
- p. 465 Figure 7.12 Starting with Studio 5000 v36, the "FRD" block is changed to "BCD_TO". Figure 7.13 Starting with Studio 5000 v36, the "TOD" block is changed to "TO_BCD".
- p. 466 Figure 7.14 Starting with Studio 5000 v36, the "MOV" block is changed to "MOVE".
- p. 466 Starting with Studio 5000 v36, the name of one of the move blocks has changed as follows:
- | | | |
|--|---------------|---------------|
| | V35 and older | V36 and newer |
| | MOV | MOVE |
- p. 513 Figure 7.66 Starting with Studio 5000 v36, the "LES" block is changed to "LT" and the "LEQ" block is changed to "LE".
- p. 513 Figure 7.67 Starting with Studio 5000 v36, the "LES" block is changed to "LT" and the "LEQ" block is changed to "LE".
- p. 518 Figure 7.72 Starting with Studio 5000 v36, the "MOV" block is changed to "MOVE".
- p. 523 Comment for rung 8 should be "Acknowledge button transition"
- p. 531 Figure 7.79 Starting with Studio 5000 v36, the "GEQ" block is changed to "GE" and the "LES" block is changed to "LT".
- p. 532 Figure 7.80 Starting with Studio 5000 v36, the "MOV" block is changed to "MOVE".
- p. 547 P7-11. Note that the ladder logic is converting from a frequency (0-60 range) to the analog output channel value.
- p. 547 P7-12. Note that the ladder logic is converting from a frequency (10-120 range) to the analog output channel value.
- p. 547 P7-13. Note that the ladder logic is converting from a frequency (20-400 range) to the analog output channel value.
- p. 548 P7-14. Note that the ladder logic is converting from a flow rate (100-2400 range) to the analog output channel value.
- p. 548 P7-15. Note that the ladder logic is converting from a percent open (0-100 range) to the analog output channel value. Also note that the relationship between the position and channel value are reversed.
- p. 548 P7-16. Note that the ladder logic is converting from a percent open (0-100 range) to the analog output channel value.
- p. 548 P7-17. 6th line of first paragraph, "temperature in degrees Fahrenheit" should be "voltage in volts".
- p. 551 P7-18. 1st full paragraph, 1st line, "40" should be inserted before "degrees", so the line should read as, "Even if the temperature increases to **40** degrees or above while..."
- p. 575 P7-29. 3rd paragraph, 4th line, "Figure 2a" should be "Figure P7.29.2a"

- p. 629 Figure 8.6 Starting with Studio 5000 v36, the "MOV" block is changed to "MOVE".
- p. 631 Figure 8.8 Starting with Studio 5000 v36, the "MOV" block is changed to "MOVE".
- p. 636 Figure 8.14 Starting with Studio 5000 v36, the "MOV" block is changed to "MOVE".
- p. 712 Figure 8.87 Starting with Studio 5000 v36, the "NEQ" block is changed to "NE" and the "MOV" block is changed to "MOVE".
- p. 735 Figure 9.2 Starting with Studio 5000 v36, the "EQU" block is changed to "EQ" and the "MOV" block is changed to "MOVE".
- p. 739-44 Figure 9.6 Starting with Studio 5000 v36, the "EQU" block is changed to "EQ", the "MOV" block is changed to "MOVE", and the "LIM" block is changed to "LIMIT".
- p. 770 Figure 9.16, network 3, output of MOVE block should be "ISeq".Step_Num
- p. 783 Figure 9.20, network 1, data type for comparison contact should be Dint
- p. 809 P9-3, cap-striping machine control is problem P6-14
P9-4, capacitor testing station is problem P7-30
- p. 810 P9-10, cap-striping machine control is problem P6-14
P9-11, capacitor testing station is problem P7-30
P9-17, cap-striping machine control is problem P6-14
P9-18, capacitor testing station is problem P7-30
- p. 901 Figure 10.84, rung 62. Expression should be "(FT2503/100.0)*(8.0); Rung 65. Line before CPT block should be 0.1" lower. Starting with Studio 5000 v36, the "LES" block is changed to "LT", the "MOV" block is changed to "MOVE", and the "GRT" block is changed to "GT".
- p. 930 Figure 11.14 Starting with Studio 5000 v36, the "LES" block is changed to "LT" and the "GEQ" block is changed to "GE".
- p. 930 Starting with Studio 5000 v36, the names of the comparison blocks have changed as follows:
- | V35 and older | V36 and newer |
|---------------|---------------|
| EQU | EQ |
| GEQ | GE |
| GRT | GT |
| LEQ | LE |
| LES | LT |
| LIM | LIMIT |
| NEQ | NE |
- p. 931 Figure 11.15 Starting with Studio 5000 v36, the "LIM" block is changed to "LIMIT".
Figure 11.16 Starting with Studio 5000 v36, the "SQR" block is changed to "SQRT".
- p. 932 Starting with Studio 5000 v36, the names of some of the computation blocks have changed as follows:
- | V35 and older | V36 and newer |
|---------------|---------------|
| ACS | ACOS |
| ASN | ASIN |
| ATN | ATAN |
| SQR | SQRT |
| XPY | EXP |
- Starting with Studio 5000 v36, the names of some of the conversion blocks have changed as follows:
- | V35 and older | V36 and newer |
|---------------|---------------|
| FRD | BCD_TO |
| TOD | TO_BCD |
| TRN | TRUNC |
- p. 954 Figure 11.38, rung 4. Comment should state "10 seconds"

- p. 955 Figure 11.38, rung 8. The two coils can be in series.
- p. 957 Figure 11.40, network 4. This logic works because the timer Q output is used only once. See note at bottom of page 228.
- p. 975 Problem P11-1. Not necessary for Siemens S7-1200/1500. The TONR block implements a retentive timer function. The S7-300/400 processors do not have the TONR block.
- p. 986 Figure P11.15. The graph shows a soak value greater than the initial value, but the function block must also work when the soak value is less than the initial value.
- p. 1262 Figure 17.38, "DH+ network" in caption should be "subnet"
- p. 1265 Figure 17.40, the General tab should have an "External Access" field showing "Read/Write" above the "Style" field.
- p. 1265 Figure 17.41, the General tab should have an "External Access" field showing "Read/Write" above the "Style" field.
- p. 1268 Figure 17.43, network 3, comment should be "Connect command for TSEND_C"
- p. 1360 Title for Table 20.5 should be "Emerson PLC Families"
- p. 1384 Figure 21.13, the variable "EX100_START" is shown to the right of the Starter output. It does not use a coil.
- p. 1388 Figure 21.16 Starting with Studio 5000 v36, the "LIM" block is changed to "LIMIT".
- p. 1389-90 Figure 21.17 Starting with Studio 5000 v36, the "LIM" block is changed to "LIMIT" and the "MOV" block is changed to "MOVE".
- p. 1391 Figure 21.18, network 2. Last input connection should be "SC101"
- p. 1392 Figure 21.9, network 3. The tag above the last coil should be #Drive_Cmds.STW1.%X10
- p. 1393 Figure 21.19, network 10, top branch. This logic works because the timer Q output is used only once. See note at bottom of page 228.
- p. 1402 Figure 21.26, network 4. This logic works because the timer Q output is used only once. See note at bottom of page 228.
- p. 1404 Figure 21.27, the variable "XV102_SOLVlv" should be shown to the right of the Sol_Vlv output. It does not use a coil.
- p. 1412 Second full paragraph, line 4, "counter accumulator" should be "step number"
- p. 1413-90 Figure 21.38 Starting with Studio 5000 v36, the "EQU" block is changed to "EQ", the "MOV" block is changed to "MOVE", the "GEQ" block is changed to "GE", and the "NEQ" block is changed to "NE".
- p. 1423 Network 26. Tag beneath the P_TRIG block should be "XferS".EShutdown.Auto_Ons
- p. 1462 Problem P21-19. Instances of "plastic injection molder" should be replaced by "wood chip dumpstation"

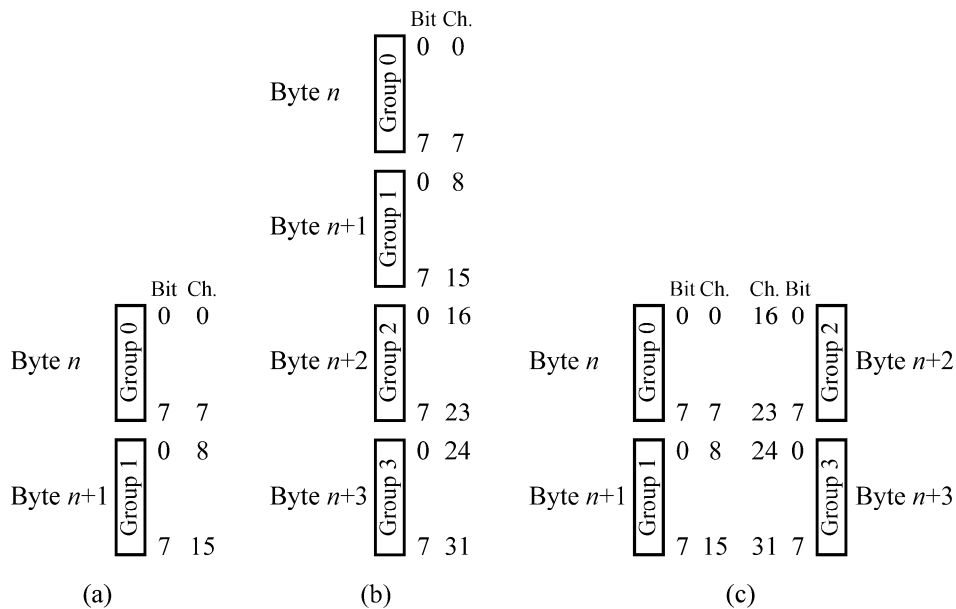


Figure 3.28. Discrete module bytes: (a) 16 channels; (b) S7-400 32 channels; (c) S7-300/1500 32 channels.

Example 3.3. Draw a S7 ladder diagram that will cause the output, pilot light PL2, to be **on** when selector switch SS1 is closed, push button switch PB5 is open, and limit switch LS7 is open. Show the I/O addresses in the logic. The input/output devices are wired to the following locations:

- PL2: Output module, processor rack slot 8, channel 15
module start address is 16
- SS1: Input module, remote rack slot 7, channel 5
module start address is 44
- PB5: Input module, remote rack slot 5, channel 9
module start address is 68
- LS7: Input module, processor rack slot 6, channel 8
module start address is 8

Solution. The addresses (with the Step7 Portal “%” prefix) are,

- PL2: %Q17.7 Group = $15/8 = 1$ Byte addr. = $16 + 1 = 17$ Bit = $15 - 8 \times 1 = 7$
- SS1: %I44.5 Group = $5/8 = 0$ Byte addr. = $44 + 0 = 44$ Bit = $5 - 8 \times 0 = 5$
- PB5: %I69.1 Group = $9/8 = 1$ Byte addr. = $68 + 1 = 69$ Bit = $9 - 8 \times 1 = 1$
- LS7: %I9.0 Group = $8/8 = 1$ Byte addr. = $8 + 1 = 9$ Bit = $8 - 8 \times 1 = 0$