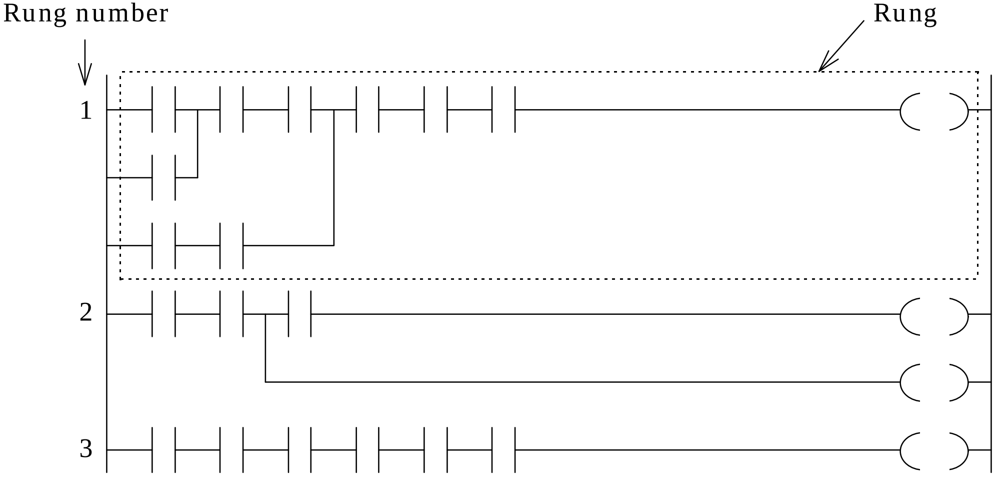
What is Ladder Logic Programming?

The programming language of the T1 is ‘ladder diagram’.
Ladder diagram is a language which composes program using relay symbols as a base in an image similar to a hard-wired relay sequence. In the T1, in order to achieve an efficient data-processing program, ladder diagram which are combinations of relay symbols and function blocks are used.

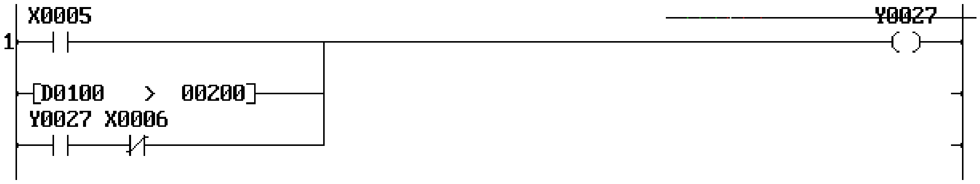
The ladder diagram program is constructed by units called ‘rung’. A rung is defined as one network which is connected each other.



The rung numbers are a series of numbers (decimal number) starting from 1, and cannot be skipped. There is no limit to the number of rungs.

The size of any one rung is limited to 11 lines × 12 columns.

A example of a ladder diagram program is shown below.



When X005 is ON or the data of D0100 is greater than 200, Y027 comes ON.
Y027 stays ON even if X005 is OFF and the data of D0100 is 200 or less.
Y027 will come OFF when X006 comes ON.

Program execution sequence

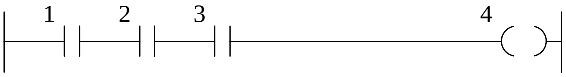
The instructions execution sequence is shown below.

(1) They are executed in the sequence from block 1 through the final block which contains the END instruction (or IRET in an interrupt program).

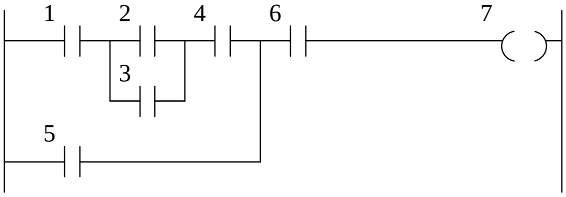
(2) They are executed in the sequence from rung 1 through the final rung in a block (or the END instruction).

(3) They are executed according to the following rules in any one rung.

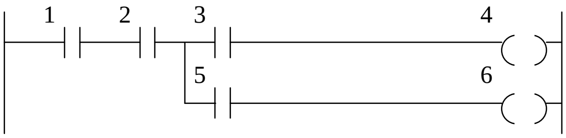
① When there is no vertical connection, they are executed from left to right.



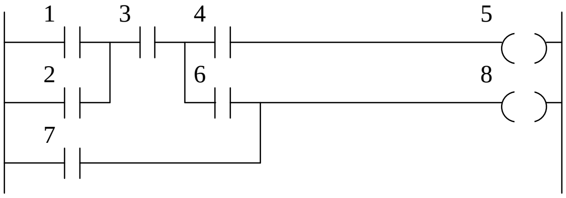
② When there is an OR connection, the OR logic portion is executed first.



③ When there is a branch, they are executed in the order from the upper line to the lower line.



④ A combination of ② and ③ above.



The instructions execution sequence in which function instructions are included also follows the above rules. However, for program execution control instructions, such as jumps (JCS), loops (FOR-NEXT), subroutines (CALL-SUBR-RET), it will depend the specifications of each instruction.