

# Ladder Logic Instruction List

(μ sec)				
Class	Type	Inst.	Symbol	Speed (ON/OFF)
Discrete Instructions	Normally Open	NO		1.6/1.6
	Normally Closed	NC		1.6/1.6
	Positive Transition	PT		∅/3.0
	Negative Transition	NT		∅/3.0
	Output Coil	OUT		2.0/2.0
	Retention Coil	M		2.0/2.0
	Negated Coil	NEG		2.0/2.0
	Negated Retention Coil	NM		2.0/2.0
	Latch Coil	SET		2.0/0.2
	Latch Retention Coil	SM		2.0/0.2
	Unlatch Coil	RST		2.0/0.2
	Unlatch Retention Coil	RM		2.0/0.2
Bit Arithmetic Instructions	Logical Multiply	AND		3.2/0.2
	Logical Add	OR		13.2/9.0
	Exclusive Logical Add	XOR		3.2/0.2
	Bit Negation	NOT		2.0/0.2
	Movement Instructions	Move	MOV	
Block Move		BMOV		6.6/0.2
File Move		FMOV		4.0/0.2
Shift Instructions	Rotate Left	ROL		6.0/0.2
	Rotate Right	ROR		6.0/0.2
	Shift Left	SHL		5.6/0.2
	Shift Right	SHR		5.6/0.2

(μ sec)					
Class	Type	Inst.	Symbol	Speed (ON/OFF)	
Mathematical Instructions	Add	ADD		4.4/0.2	
	Subtract	SUB		4.4/0.2	
	Multiply	MUL		4.4/0.2	
	Divide	DIV		4.8/0.2	
	Residual Processing	MOD		6.0/0.2	
	Increment	INC		3.0/0.2	
	Decrement	DEC		3.0/0.2	
	Comparison Instructions	Equal To (=)	EQ		2.8/0.2
		Greater Than (>)	GT		2.8/0.2
		Less Than (<)	LT		2.8/0.2
Greater or Equal To (>=)		GE		2.8/0.2	
Less or Equal To (<=)		LE		2.8/0.2	
Timer/Counter Instructions	Not Equal (<>)	NE		2.8/0.2	
	Timer On-Delay	TON		10.4/17.2	
	Timer Off-Delay	TOF		20.4/14.0	
	Timer Pulse	TP		5.2/3.8	
	Counter Up	CTU		21.8/13.0	
	Counter Down	CTD		8.0/4.4	
	Counter Up Down	CTUD		15.6/12.0	

(μ sec)				
Class	Type	Inst.	Symbol	Speed (ON/OFF)
Conversion	BCD Conversion	BCD		23.0/2.6
	Binary Conversion	BIN		17.8/2.6
	Encode	ENCO		∅
	Decode	DECO		∅
Special Instructions	PID Instruction	PID		∅
Program Control	Jump	JMP	-->LabelName	∅
	Jump to Subroutine	JSR	-->SubroutineName<<	∅
	Return from Subroutine	RET	--<RETURN>--	∅
	Repeat	FOR NEXT		∅

\* All instruction speeds given here are for reference only. Instruction execution speed can vary slightly from the above value, depending on program and memory conditions.

\*\* Calculating instruction execution speed:

One scan is calculated from the results of 5,000 loops of the target instruction.

Discrete variables are allocated to bit operating instructions, and integer variables are allocated to all others. (Sequential or other variables would result in slower execution.)

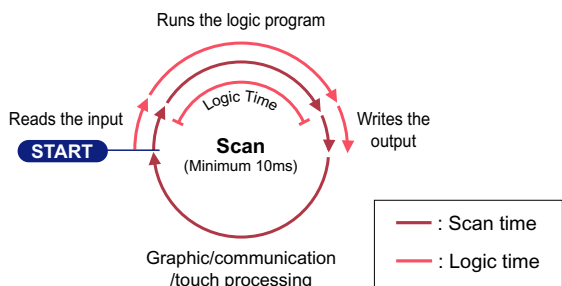
## Logic Execution Speed (for reference only)

Approx. 1K steps	Approx. 3K steps	Approx. 5K steps
4ms	12ms	20ms

As a guideline, the maximum program capacity is approximately 6K steps.

## LT Series Scan Time (Program Execution Cycle)

As shown in this diagram, the LT Series scan time consists of the time to execute the logic (ladder) program and the time for graphic/communication/touch processing. The time required to execute the logic program is called "logic time."



**Example** Scan time: 10ms  
 Logic time: 4ms (from the "Logic Execution Speed" reference above)  
 Graphic/communication/touch processing time: 10-4 = 6ms

- Read** Reads all input from the I/O driver.
- Run** Executes the logic program.
- Write** Writes all output to the I/O driver.
- Graphic Phase** Screen refresh, communication and touch processing (including SIO communication)

\*The scan time is set by the operator, but it is automatically adjusted every 64 scans and includes an error of approximately 0.02%.