

3. PROGRAMLAMA

3.1. Komut Kelimeleri

3.1.1. Temel Komutlar

Symbol	Name	Function
LOD	Load	Reads out the I/O status after storing an intermediate result.
AND	AND	Logical AND
O R	OR	Logical OR
OUT	Output	Output
MCS	Master Control Set	Starts a master control.
MCR	Master Control Reset	Ends a master control.
SOT	Singlt Output	Leading-edge differentiation
TIM	Timer	Timer
CNT	Counter	Counter
SFR	Shift Register	Shift register
END	End	Ends a program.
SET	Set	Sets an output, internal relay or shift register.
RST	Reset	Resets an output, internal relay or shift register.
JMP	Jump	Jumps a designated program area.
JEND	Jump End	Ends a jump program.
NOT	NOT	Inversion
FUN	Function	Sets function and computing instructions.

3.1.2. Fonksiyon Komutları

FUN No.	Contents of Instructions
FUN100 to FUN146	Coincidence comparison instructions for the counter's counted values
FUN200 to FUN246	Larger/smaller comparison instructions for the counter's counted values
FUN147	Computing instruction
FUN247	Computing instruction
FUN300	Addressed jump instruction
TIM FUN	External display instruction for the timer's counted values
CNT FUN	External display instruction for the counter's counted values

3.1.3. Hesaplama Komutları

<div style="border: 1px solid black; padding: 2px; display: inline-block;">FUN147</div> (a) (a)	Type
1	BCD→BIN conversion
2	BIN→BCD conversion
3	4-digit comparison
4	Addition (+)
5	Subtraction (-)
6	Multiplication (×)
7	Division (÷)
8	Data register data shift
9	BCD digit left shift
10	Data load (16-bit)
11	Data load (8-bit)
12	Data load (indirect)
13	Data load (16-bit)
14	Data load (8-bit)
18	Data increment
19	Data decrement
20	Data store (16-bit)
21	Data store (8-bit)
22	Data store (indirect)
23	Data store (16-bit)
24	Data store (8-bit)
25	Data display (dynamic)

3.2. Komut Biçimi

Address	Instruction	First Address	Second Address
One-address Instructions	LOD AND OR OUT SET RST SOT	Instruction word and number	
	AND·LOD OR·LOD MCS MCR JMP JEND END	Instruction word	
Two-address Instructions	SFR SFR NOT	Instruction word and initial number	No. of bits for shift register
	TIM CNT FUN100-146 FUN200-246	Instruction word and timer/counter numbers	Preset value or comparison data
	TIM FUN CNT·FUN	Instruction word and timer/counter numbers	Output initial No.
	FUN147	Instruction word	Operation instruction code
	FUN300	Instruction word	Address No. for jump destination

3.3. Birimlerin Ayrılmış Numaraları

FA-1J Serisi Ayrılmış Bütün Numaralar

Name	Allocation No.	No. of Points
Input	0-7, 10-17, 20-27, 30-37, 40-47, 50-57, 60-67, 70-77	64
Output	200-207, 210-217, 220-227, 230-237, 240-247, 250-257, 260-267, 270-277	64
Internal Relay	400-407, 410-417, 420-427, 430-437, 440-447, 450-457, 460-467, 470-477, 480-487, 490-497, 500-507, 510-517, 520-527, 530-537, 540-547, 550-557, 560-567, 570-577, 580-587, 590-597, 600-607, 610-617, 620-627, 630-637, 640-647, 650-657, 660-667, 670-677, 680-687, 690-697	240
Special Internal Relay	700-707, 710-717	16
Timer	0-79 (When using arithmetic operand: 100-1079)	80
Counter	0-44 (When using arithmetic operand: 900-944)	45
Reversible Counter	45 (dual pulse), 46 (up/down selection) (When using arithmetic operand: 945 & 946)	1 each
Shift Register	0-127 (bidirectional)	128
Single Output	0-95	96
Data Register	800-899 (DRO-99)	100

FA-1J Serisi Giriş/Çıkışın Ayrılmış Numaraları

For I/O numbers, the input has fixed numbers from 0 to 77 and the output has fixed numbers from 200 to 277. The I/O numbers of each expansion unit are allocated automatically in sequence from the nearest to the CPU unit.

(Ex. 1) 72 I/Os

CPU	0-7	20-27	40-47
	10-17	30-37	
	16-input	16-input	8-input
	Relay output	16-Tr. output	8-Tr. output
	200-207	220-227	230-237

(Ex. 4) 32 I/Os

CPU	0-7	10-17	20-27
	AC 8-input	AC 8-input	AC 8-input
	Relay output	Dummy	Dummy
	200-207		

(Ex. 2) 40 I/Os

CPU	0-7		
	10-17	Dummy	Dummy
	16-input		
	Relay output	Relay output	Relay output
	200-207	210-217	220-227

(Ex. 5) 32 I/Os

CPU	0-7	20-27
	AC 8-input	AC 8-input
	AC 8-input	Relay output
	10-17	200-207

(Ex. 3) 40 I/Os

CPU	0-7	210-217
	10-17	Relay output
	16-input	
	Relay output	Relay output
	200-207	220-227

FA-1J Serisi Özel Rölelerin Ayrılmış Numaraları

No.	Function	
700	Unused	
701	Start control	
702	Start control	
703	All output OFF	
704	Initialize pulse (Turns ON for 1 scan when starting)	
705	Unused	
706	Numerical value error	
707	(CY) Carry & Borrow	
710	Greater than (>) comparison operation	
711	Equal to (=) comparison operation	
712	Smaller than (<) comparison operation	
713	1-sec timer reset	
714	1-sec clock (duty 1:1)	For readout only
715	100-msec clock (duty 1:1)	"
716	Timer/counter preset value changed	"
717	In-operation output	"

FA-1J Serisi Özel Rölelerin Fonksiyonları**701 & 702** Start control

When start input of Input No. 0 is turned ON, or when automatic start is designated by setting 500 via FUN61, the FA-1J starts upon turning on special internal relay 701, and then 702. It stops when these relays are turned OFF.

703 All outputs OFF

When No. 703 is turned ON, all outputs (Nos. 200 to 277) go OFF. The self-holding circuits using outputs (Nos. 200 to 277) also go OFF, and do not reset even when No. 703 is turned OFF. Internal relays and shift registers remain unchanged.

704 Initialize pulse

When the FA-1J starts operation, No. 704 goes ON only for one scan.

**706** Numerical value error

No. 706 is turned ON when operation by a computing instruction results in a data error.

707 (CY) Carry & Borrow

Sets carry and borrow of operation result via computing instruction.

710, 711 & 712 Comparison operation

Compares designated data with those of data register via computing instruction.

No. 710 turns on when:

Register data > Operand data

No. 711 turns on when:

Register data = Operand data

No. 712 turns on when:

Register data < Operand data

713 1-sec clock reset

While No. 713 is ON, No. 714 (1-sec clock) is always placed in the reset mode.

714 1-sec clock

While No. 713 is OFF, No. 714 generates clock pulses oscillating at 500msec ON and 500msec OFF (duty ratio 1:1).

715 100-msec clock

No. 715 always generates clock pulses oscillating at 50msec ON and 50msec OFF.

716 Timer/counter preset value modified

When the program loader is used to modify timer/counter preset values for the FA-1J CPU unit, No. 716 goes ON. No. 716 is cleared when a program is written into the memory pack by pressing TRS, ENTR and ENTR keys or the memory pack is replaced.

717 In-operation output

No. 717 is always ON during FA-1J operation.