BITSON Functions

BITSON S26

DESCRIPTION

The BITSON function treats a group of adjacent data table locations as a one dimensional array of bits. This block of tables is referred to as a GROUP. The elements within an Array are referenced by a bit number, commencing at bit 0.

The BITSON function counts the number of bits set ON (1) in either a Group or rung input.

FEATURES

- Dual mode of operation for Group or rung input.
- Input Group location specified by the user.
- User programmable Group length

SPECIFICATION

Control language:-

```
        BITSON
X-------SPEC------VALUE---------Q
          S26        Zm
```

Table 1 Program rung data

Sym	Location	Use	Range
X	Rung Input	If GL=0 then X is the value on which the count will be calculated. If GL <>0 then an internal GEM80 address of input Group	0 to @FFFF Address of data table location obtained by LOCATE
Zm	Value location	Start of parameter list (2 locations)	Any write-enabled table usable by special functions
Q	Rung output	Result of computation	Number of bits set to 1 in input

Table 2 **Value data**

Sym	Location	Use	Range
EC	Zm	Error code	See table 3
GL	Zm + 1	Group length	0 selects a rung input operation. 1 to 128 selects a Group operation

Table 3 **Fault conditions**

Condition	Result (Q)	Code in Zm	
		Numeric Value	States ON
Programming error Group length invalid	0	3	0 & 1
Programming error Invalid group address:- (a) Group not in table usable by special. (b) Input Group extends beyond end of data table area.	0	5	0 & 2

APPLICATION NOTES

```
              BITSON
+---<AND>----SPEC-----VALUE-----<OUT>---+
    G11        S26        G0         G10
```

1. Word mode

Initial values:- G1 = 0

If G11 = @A512 then after execution:-
G0 = 0, G10 = 6

2. Group mode

For a group defined by G100 to G102 the initial values could be:-

G1 = 3, G11 = address of G100 supplied by S20.
Contents of group:-
G100 = @0002, G101 = @0000, G102 = @5A00
After execution
G0 = 0, G10 = 5

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