

1. Description

The FIX function provides a BCD output of a floating point input. This output can then be used for display or further numerical data processing within the user software.

2. Features

- INTEGER and EXPONENT modes user programmable
- User programmable output group length

3. Specification

Control Language:

```

      FIX
X-----SPEC-----VALUE-----Q
      S79           Zm

```

Table 1 Program Rung Data

Sym	Location	Use	Range
X	Rung Input	Floating point input value	Up to ±the maximum representable number. See Note.
Zm	Value Location	Start of parameter list (3 locations)	Any write-enabled table by special function
Q	Rung output	Fault code	See Table 3

Note...The number range is -3.4 E38 to -1.2 E-38, 0, 1.2 E-38 to 3.4 E38 as input from Q-table direct. If passed from other floating point instructions can become -1.1 E4932 to -3.4 E-4932, 0, 3.4 E-4932 to 1.1 E4932.

Table 2 Value Data

Sym	Location	Use	Range
M	Zm	Mode control	1 - INTEGER 2 - EXPONENT See 'Application Notes'
DA	Zm + 1	Internal GEM 80 address of output group Dm	Up to 5 locations
GL	Zm + 2	Output group length	0 < GL < 6

Table 3 Fault Conditions

Condition	Rung Output Q	
	Numeric Value	States ON
PROGRAMMING ERRORS		
Invalid array address; output array extends beyond end of data table area	3	0 & 1
Invalid array address; output array not in write-enabled table usable by Special Function	5	0 & 2
Output array length invalid	9	0 & 3
STATUS		
Input value too large for INTEGER mode	17	0 & 4
Exponent value out of range	33	0 & 5
Input value invalid for EXPONENT mode	65	0 & 6

4. Application Notes

Note...In some applications, rounding off the last digit may occur.

MODE 1 - INTEGER

1234	5678	9012	3456
Dm	Dm + 1	^	Dm + n

The number is read from lower data table locations to higher ones, where the lowest data table contains the most significant part of the integer.

Note... 1 < = n < = 4

Example

```

--<AND>-----<OUT>--
  1                                     G0

      LOCATE
--<AND>--SPEC--VALUE-----<OUT>--
  0      S20    G10          G1

--<AND>-----<OUT>--
  4                                     G2

      PI    MULT  MULT    FIX
--<AND>--SPEC--SPEC--SPEC--SPEC--VALUE-----<OUT>--
  0      S77    T10   T10   S79    G0          G5
           +< >   +< >
           |       |
--<AND>-----+
10000

--<AND>-----+
10000

```

G10	G11	G12	G13
@0	@3	@1415	@9265

read as : 314, 159, 265

General Note

Under some circumstances it is possible for the last digit to be rounded.

@ - Hexadecimal number

MODE 2 - EXPONENT

1234	5678	9012	3456	0012
Dm	Dm + 1	^	Dm + n	Exponent
				[Dm + (n + 1)]

The number is read from lower data table locations to higher ones. The last word is an exponent in 2's complement format. The decimal point is assumed to be after the first digit of the first table location (Dm).

Note... $2 \leq n \leq 5$

Example

```

--<AND>-----<OUT>--
  2                                           G0

      LOCATE
--<AND>--SPEC--VALUE-----<OUT>--
  0      S20    G10           G1

--<AND>-----<OUT>--
  5                                           G2

      PI  MULT  MULT  FIX
--<AND>--SPEC--SPEC--SPEC--SPEC--VALUE-----<OUT>--
  0      S77   T10   T10   S79    G0           G5
               +< >  +< >
               |      |
--<AND>-----+
10000
               |
--<AND>-----+
10000

```

G10	G11	G12	G13	G14
@3141	@5926	@5358	@9753	@8
				Exponent

read as : 3.141592653589753 10⁸



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