CEGELEC
INDUSTRIAL CONTROLS

Print Function

PRINT T38

DESCRIPTION

For a GEM80 controller with enhanced printing facilities the PRINT function enables user-definable messages to be output to a printer or equivalent serial device. The messages are selected by number from one list and are created and maintained by an editor resident in the controller. Each message may contain fixed text and format information (to enable numeric output of data table contents) in any combination. For full details refer to the user information leaflet for the host controller.

The execution of PRINT transfers data to the cyclic buffer store provide for the selected printer port. The printer port's buffer can store several messages, and automatically outputs them until the buffer is empty.

FEATURES

- On-line selection of printer port for output.
- Full ASCII/ISO-7 character set.
- Mixed text and data table output in one special function.
- Data table output can be with or without leading zeroes.

SPECIFICATION

Control language:-

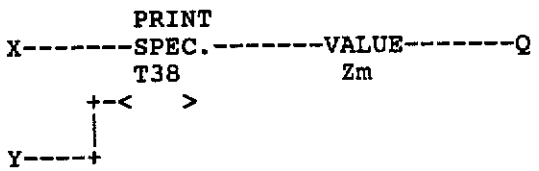


Table 1 Program Rung Data

Sym	Location	Use	Range
X	Rung input (upper branch)	Messages to be output	0 to 32767
Y	Rung input (lower branch)	Port to be used for output	0 to 4 0 = no operation
Q	Rung output	Fault indication	See Table 3
Zm	Value location	Start of data tables for numeric output	Any table usable by specials

Note: Zm must be present even if message X does not include format definitions. If data tables are to be output then the contents of Zm will be used in the first field, the contents of Zm + 1 in the second and so on.

OPERATION

For details of the operation of the printer port (padding characters, when transmission occurs etc.) refer to the user information leaflet for the host controller.

Two flags for each printer port are provided. One (called the empty flag) indicates when all characters have been transmitted and the buffer is empty. The other (called the filling flag) indicates when there is no longer room for one complete line of output. The table locations containing these flags are detailed in the user information leaflet for the host controller.

A typical message consists of fixed text delimited by quotes (") separated by commas (,) from format definitions which use a pictorial representation of ^ or 0 symbols for leading spaces or zeroes respectively and # symbols for significant digits. Scaling for numeric fields is entered separately. Each numeric output field of a message specifies 3 quantities;-

1) The total field width for that number.
2) The number of characters following and including the decimal point.
3) Scaling factor as an integer power of ten.

The data table contents will be displayed as follows:-

: Right justified in field width as specified

Either

: Leading zeroes suppressed

: Negative shown by minus symbol, positive implied (no plus symbol)

Or

: Leading zeroes displayed

: Value displayed is absolute value of data table contents, negative sign not displayed.

: Automatic rounding is format specifies fewer digits after decimal point than data table provides (0.5 rounds up)

: Numbers less than unity printed with zero before decimal point

If total characters to be printed exceed field width then the output will be modified to fit.

a) By truncating digits after decimal point
b) By omitting zero before decimal point of number less than unity

If modification as above cannot make number fit then default format is adopted. This format has a fixed field width of 6, no scaling, and the first character position contains P or N to indicate the sign. Leading zeros are not suppressed.

Table 2 Fault Conditions

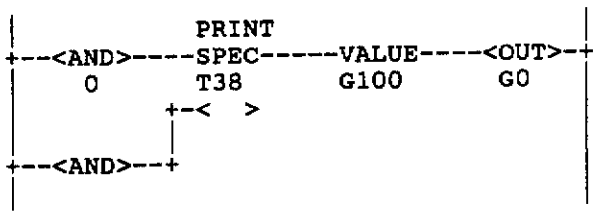
Condition	Rung Output Q		Filling Flag
	Numeric Value	States ON	
Successful execution resulting in room for > one line.	0	None	OFF
Successful execution resulting in room for < one line.	0	None	ON
Rung input (port number) outside valid range.	3	0 & 1	-
Programming error. Message number outside valid range.	5	0 & 2	-
Programming error. Inlaid value location. Message extends beyond end of data table area.	9	0 & 3	-
Programming error. Port not configured as a printer.	17	0 & 4	-
Programming error. Non-existent message requested.	33	0 & 5	-
Corrupted format definition, default format adopted.	65	0 & 6	-
Printer buffer overflow	129	0 & 7	ON
Corruption of port's output buffer.	257	0 & 8	OFF

APPLICATION NOTES

To output the contents of 2 data tables which specify gauge and motor current for a stand of a rolling mill. the gauge is to occupy a field width of 6 with 2 decimal places. Motor current has no decimal places and occupies a field width of 5. The scaling to be applied to the two quantities is : 1/100 and *10. suitable explanatory text is to be interspersed with the numeric values. For details of the entry of a message to define this output refer to the user information leaflet of the host controller, an example of this message is given below (defined as message 0).

MO = "Gauge",^ ^ ###,"mm Current",^ ^ ^ ##,"A"<
Scaling:-/100,*10<

If G100 contains 567 and represents the gauge and G101 contains 128 and represents motor current then the following rung would direct the output to port 3:



Displayed text would be:

Gauge 5.67mm Current 1280A.

To output the contents of 2 data tables which are used together to store a number larger than + or - 32767 the leading zero facility may be employed thus

MO= "Large number=",^ ^ ^ ^ ^ #,00# ##<
Scaling:-*1,/100<

If G101 is being used to store numbers up to 100 with 2 decimal places and G100 is storing the 100's of the dame number then the rung of note 1 above would produce the following outputs.

a) If G100 = 123 and G101 = 4567 representing 12345.68 then the output would be:-

Large number = 12345.67

b) If G100 = 123 and G101 = -768 representing - 12307.68 then the output would be:

large number = -12307.68.

CEGELEC
INDUSTRIAL CONTROLS

Kidsgrove, Stoke-on-Trent, ST7 1TW, England
Tel: (0782) 783511 Fax: (0782) 776329