PM8154 DIGITAL PLOTTER

IEEE 488
IEC 625 & V24

9499 430 10411

840301

1. PROGRAMMING

FUNCTION	ISO 7-BIT CODE	DESCRIPTION
PEN COMMANDS:		
PEN UP	H	Lifts pen, if down.
PEN DOWN	I	Lowers pen at current position.
SELECT PEN	F 1 ... 6	Returns pen in use and selects one of 6 pens.
DEPOSIT PEN	FØ	Returns pen in use to its alloted depot.
VECTOR COMMANDS:		
RECEIVE CO-ORDINATES	/	Instructs plotter to store numeric values as co-ordinates (abs. or relative) for further treatment. Syntax [X]/Y or X/[Y] alternatively.
MOVE ABSOLUTE	[H] K	Pen moves to point X/Y (absolute).
PLOT ABSOLUTE	[I] K	Pen plots to point X/Y (absolute).
MOVE RELATIVE	[H] J	Pen moves from the current position X/Y units (relative).
PLOT RELATIVE	[I] J	Pen plots from the current position X/Y units (relative).

[ ] can be optional

PHILIPS

FUNCTION	ISO 7-BIT CODE	DESCRIPTION
DEFINE LINE TYPE	L n l	Selects line type and shape, n = 0 solid line n = 1 dotted line n = 2 dashed line n = 3 dashed-dashed line n = 4 dashed-dotted line l = length (any valid no. to 255)

CHARACTER COMMANDS:

FUNCTION	ISO 7-BIT CODE	DESCRIPTION
DEFINE SIZE DIRECTION	Z h i w	Selects character height, inclination angle and width incl. spacing.
DEFINE CHARACTER SLANT	% n	Slants char. at 75° for n = 1 Normal 90° plotting for n = 0
DEFINE CHARACTER SET	# n	Selects character set: n = 0 standard ASCII n = 1 German n = 2 Spanish n = 3 Swedish, Finnish n = 4 Danish, Norwegian
CHARACTER PLOT ENABLE	B	Initiates character plotting Treats all character after B as data.
NEXT LINE	LF	Moves pen to the left margin (current position before B) and one line down.
HORIZONTALLY TABULATE	HT n	Character plotting starts on receipt of byte after the command string, n characters from left marging of text. (n can be either + or −).
VERTICALLY TABULATE	VT n	Character plotting starts on receipt of byte after this instruction, n lines from the upper margin, (n can be either − (tab. up) or + (tab. down).
CHARACTER PLOT DISABLE	CR	Stops character plotting. Following characters treated as instructions.
SPECIAL CHARACTER PLOT ENABLE	R	Plotting Greek characters.

FUNCTION	ISO 7-BIT CODE	DESCRIPTION
PLOT POINT MARK	M n	Drawns one of five special graphic characters with current pen position as centre. $n = 0 \diamond$ $n = 1 \triangle$ programmable for $n = 2 \times$ } height, width, $n = 3 +$ angle and slant. $n = 4 Y$
CIRCLE AND AXES COMMANDS:		
PLOT ARCS	[I] O r a b	For drawing arcs starting at current pen position. r = radius a = starting angle b = final angle
PLOT CIRCLES	[I] O r	For drawing circles of radius r starting at current pen position.
X-AXIS	X l d t_1 t_2	Lowers pen and draws X axis where: l = length, d = dist. between ticks t_1 = length of 1st. tick t_2 = length of 2nd. tick
Y-AXIS	Y l d t_1 t_2	Lowers pen and draws Y axis
DRAW CURVE	Q a b c_1 c_2	Draws a curve in a graph a = 0 X co-ordinates are defined by the latest Y-axis a = 1 Y co-ordinates are defined by the latest X-axis b number of co-ordinates $c_1 c_2$.. co-ordinates.
OFFSET	N x y	Origin is displaced by the point specified in X and Y
SCALE	G x y	Sets a new scale centre. The centre must be specified in x and y.
INCREMENT COMMAND:		
INCREMENT ENABLE	D	Initiates incremental mode, small sizes (Group 1).
	T	Initiates incremental mode, large sizes (Group 2). (byte string must be closed by <u>CR</u>)

FUNCTION	ISO 7-BIT CODE	DESCRIPTION

DIGITIZE COMMAND:

DIGITIZE IMMEDIATELY	!	For point digitizing

OPTION COMMAND:

CHART ADVANCE	U n	For paper advance by multiples of 1 cm (n = 1 ... 255)

SPECIAL COMMAND FOR V24 INTERFACE:

SET I/O PARAMETERS	&	ASCII characters for plotter input and output.

Parameter	Initial states	Meaning
BUFR	DC1	Request Buffer Status
TRIG	none	Output Trigger Character
TURN	10 ms	Turn Around Delay
OUTT2	LF	2nd Output Terminator
OUTT1	CR	1st Output Terminator
BS1E	DC1	Buffer Empty Status Char. (automatic)
BS1F	DC3	Buffer Full Status Char. (automatic)
BS2E	SOH	Buffer Empty Status Char. (on request)
BS2F	SUB	Buffer Full Status Char. (on request)

SPECIAL COMMAND FOR IEC-BUS INTERFACE:

SERVICE REQUEST MASK	S n	Sets mask for Service Request. Each bit set to "1" enables the corresponding status register bit to generate the interface message SRQ. (n = 0 .. 63)

bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
Not implemented	Format overflow	Buffer Empty	Buffer High	Data Available	Buffer Low	Not implemented

2. SETTINGS
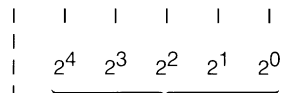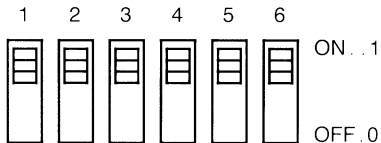
Settings V24 (RS232C) interface.

```
         1   2   3   4   5   6   7   8
        ┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐      ON...1
        │▤│ │▤│ │▤│ │▤│ │▤│ │▤│ │▤│ │▤│
        └─┘ └─┘ └─┘ └─┘ └─┘ └─┘ └─┘ └─┘      OFF...0
```
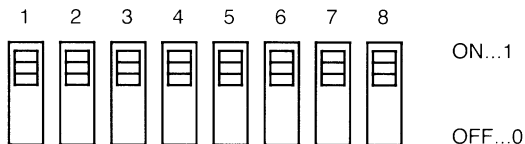
Automatic buffer	Enable. . . 1								
status message	Disable. . . 0				1	1	1	. . . 9600
					1	1	0	. . . 4800
Stop bits	2 bits. 1				1	0	1	. . . 2400
	1 bit. 0				1	0	0	. . . 1200	Baud rates
					0	1	1	. . . 600
Parity	Even. 1				0	1	0	. . . 300
	Odd. 0				0	0	1	 150
					0	0	0	 110
Parity	Enable. 1							
	Disable. 0	1	. . . . 8 bits	Word-length
		0	. . . . 7 bits	

Settings IEC/IEEE interface

```
         1   2   3   4   5   6
        ┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐      ON . . 1
        │▤│ │▤│ │▤│ │▤│ │▤│ │▤│
        └─┘ └─┘ └─┘ └─┘ └─┘ └─┘      OFF . 0
```

		2^4	2^3	2^2	2^1	2^0

Device address

Listen-only : 1
Addressable: 0

Setting examples:

Switch					Address
2^4	2^3	2^2	2^1	2^0	
0	1	0	1	1	11
1	0	0	2	0	18
0	0	1	1	1	7

Address 11111 is prohibited

3. OUTPUT DATA

Output data V24 (RS232C) interface

CO-ORDINATES AT DIGITISING

Char. no	1	2 3 4 5 6	7	8 9 10 11 12	13 14
Data	$\overline{SP}$	DIGITS	$\overline{SP}$	DIGITS	OUTT1 OUTT2

BUFFERSTATUS (on request)

Char. no	1	2	3
Data	Buffer Status	OUTT1	OUTT2

Note: Buffer status, OUTT1 and OUTT2 depends on I/O parameters.

Output data IEC/IEEE interface

CO-ORDINATES AT DIGITISING

Char. no	1	2 3 4 5 6	7	8 9 10 11 12	13	14 and EOI
Data	$\overline{SP}$	DIGITS	$\overline{SP}$	DIGITS	$\underline{CR}$	$\underline{LF} \wedge END$

DEVICE STATUS DATA

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
not used	RQS	FO	BE	BH	DA	BL	$\emptyset$

RQS = Request for service
FO = Format Overflow
BE = Buffer Empty
BH = Buffer High >1080bytes
DA = Data Available
BL = Buffer Low >100 bytes