PM3305C(D)

PROGRAMMING THE PM3305C(D)

ADDRESS SETTING

	16	8	4	2	1	
						1
						0
	5	4	3	2	1	
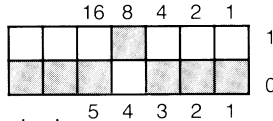
At delivery:
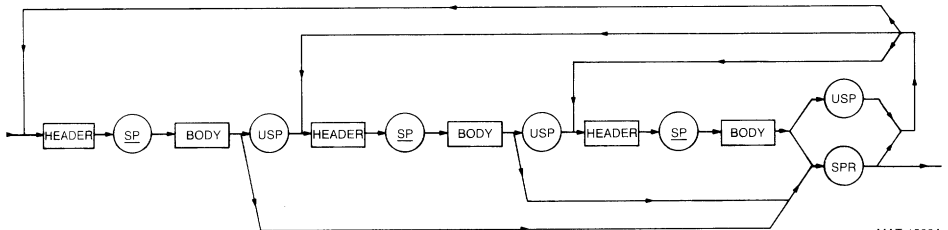device address 8

0:TALK ONLY
0:LISTEN ONLY

RECORD FORMAT

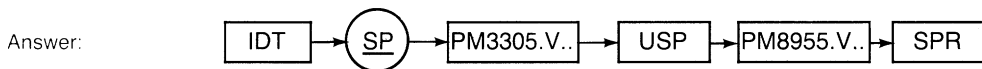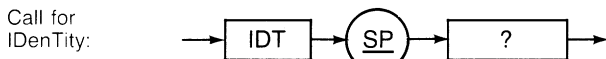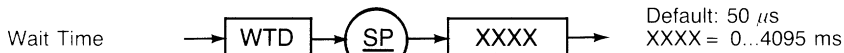SUPER FUNCTION   MAIN FUNCTION   SPECIFIC FUNCTION

MAT 1508A

SYSTEM FUNCTIONS

Program:

Unit SeParator →　| USP | → (SP) → | ISO char. | →   Default: comma ($2C_H$)

Record SeParator →　| SPR | → (SP) → | ISO char. | →   Default: New Line ($\emptyset A_H$)

Wait Time →　| WTD | → (SP) → | XXXX | →   Default: 50 μs
                                              XXXX = 0...4095 ms

Call for IDenTity →　| IDT | → (SP) → | ? | →

Answer: | IDT | → (SP) → | PM3305.V.. | → | USP | → | PM8955.V.. | → | SPR |
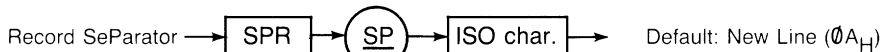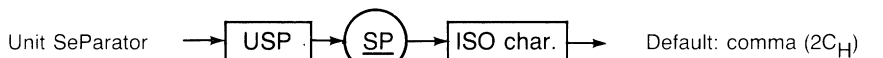
Example: PM3305.V03/PM8955.V02

SUPER FUNCTIONS

Header:	Body:	Function:
FRO	?	Request for front panel selection
FRO	$\emptyset$	Select front panel
FRO	OFF	Select register
REG	?	Request for register selection
REG	$\emptyset$	Select register
REG	OFF	Select front panel

MAIN FUNCTIONS

Header:	Body:	Function:
VER	?	Request for vertical front panel settings
VER	A	Selection of vertical channel A
VER	B	Selection of vertical channel B
HOR	?	Request for horizontal front panel settings
HOR	MTB	Selection of the Main Time-Base
MSC	?	Request for miscellaneous front panel settings
MSC	AUX	Selection of miscellaneous functions
DAT	?	Request for the register data part from the oscilloscope
DAT	ALL	Selection of the compete data register contents.
DAT	A	Selection of only the channel A register data points.
DAT	B	Selection of only the channel B register data points.
DAT	C	Selection of only the channel C register data points.
DAT	D	Selection of only the channel D register data points.

SPECIFIC FUNCTIONS

TABLE I: (VER)

Header:	Body:	Function:
FCN	?	Request for function
FCN	ON	Selected channel → active state*
FCN	OFF	Selected channel → inactive state*
CHP	?	Request for chopper state
CHP	ON	Selects chopped display of the vertical channels A and B*
CHP	OFF	Selects one channel display and switches off the ABCD CHOP function*
CHP	ALL	Chopped display of ALL selected vertical channels A, B, C and D. This is the selection of the function ABCD CHOP

* These functions are <u>not</u> programmable in FRO Ø but have to be set manually on the front panel of the oscilloscope. They are only programmable in REG Ø.

TABLE II: (HOR)

Reading the Time base:

Header:	Body:	Function:		
TIM	?	.1E-06	0,1 μs/div.	
		.2E-06	0,2 μs/div.	
		.5E-06	0,5 μs/div.	
		1E-06	1 μs/div.	
		2E-06	2 μs/div.	Sampling - mode*
		5E-06	5 μs/div.	
		10E-06	10 μs/div.	
		20E-06	20 μs/div.	
		50E-06	50 μs/div.	
		.1E-03	100 μs/div.	
		.2E-03	0,2 ms/div.	
		.5E-03	0,5 ms/div.	
		1E-03	1 ms/div.	
		2E-03	2 ms/div.	
		5E-03	5 ms/div.	
		10E-03	10 ms/div.	
		20E-03	20 ms/div.	Direct - mode
		50E-03	50 ms/div.	
		.1E-00	0,1 s/div.	
		.2E-00	0,2 s/div.	
		.5E-00	0,5 s/div.	
		1E-00	1 s/div.	
		2E-00	2 s/div.	
		5E-00	5 s/div.	

Programming the Time base:

Header:	Body:	Function:	
TIM	XXE-∅Y	Time-base setting	Example: 50E-03 = 50 ms/div

* TIME/DIV switch positions 100 μs/div. ... 0,1 μs/div. (sampling mode)
and XDEFL can not be programmed in FRO ∅ but only in REG ∅.
These positions except XDEFL can only be read by the controller.

NOTE: The actual TIME/DIV position will be selected if one of the TIME/DIV settings between
100 μs/div. and 0,1 μs/div. is programmed.

Header:	Body:	Function:
DUA	?	Request for dual trigger state
DUA	ON	Dual triggering $\rightarrow$ active state
DUA	OFF	Dual triggering $\rightarrow$ inactive state
RDY	?	Request for ready state. Answer is RDY YES when oscilloscope is triggered (or loaded for a single shot) otherwise RDY NO.
MOD	?	Request for the selected time-base mode.
MOD	SNG	Single shot mode reset. Of the SINGLE mode is selected, the oscillscope will start the measurement after a Group Execute Trigger command has been given. Between the resetting and this GET command, a waiting time might be required, depending on the time-base setting. *NOTE: The first time that the SINGLE mode is programmed, the oscilloscope will measure directly after the receipt of the first trigger pulse (so without the need for a GROUP EXECUTE TRIGGER command).*
MOD	REC	Recurrent mode
TRD	?	Request for PRE TRIG state.
TRD	XX	Trigger delay in divisions. This is the PRE TRIG function. PRE TRIG 0 $\rightarrow$ TRD 0 PRE TRIG 1/4 $\rightarrow$ TRD -2.5 PRE TRIG 1/2 $\rightarrow$ TRD -5 PRE TRIG 3/4 $\rightarrow$ TRD -7.5 PRE TRIG 1 $\rightarrow$ TRD -10
CLK	?	Request for active external clock.

POSSIBLE HEADER-BODY COMBINATIONS

HEADER \ BODY	~	∅	ON	OFF	ALL	A	B	C	D	MTB	AUX	SNG	REC	EVN	ODD	CMP	LIV	YES	NO	V1	V2	V3	V4	
FRO	•	•		•																				SUPER FUNCTIONS
REG	•	•		•																				
VER	•					•	•																	MAIN FUNCTIONS
HOR	•									•														
MSC	•										•													
DAT	R				R	R	R	R	R															
FCN	•		X	X																				
CHP	•		X	X	•																			
TIM	•																				•			SPECIFIC FUNCTIONS
DUA	•		•	•																				
RDY	•																	X	X					
MOD	•													•	•									
TRD	•			•																		•		
CLK	•																	X	X					
CLR	•		•	•																				
WRT	•		•	•																				
LCK	•		•	•																				
MQU	•			•																		•		
CMP	•			•												•	•							
MNM	•		•	•																				
YVT	•		•	•																				
YVX	•		•	•																				
DOT	•		•	•																				
DAT	R																							
PRT	R				R											R	R							
BGN	R																						R	
END	R																						R	
CNT	R																						R	

Header groupings (left side):
- FRO, REG → (Super Functions)
- FRO*/ or REG*/ : VER, HOR, MSC → Main Functions
- REG*/ : DAT
- VER*/ : FCN, CHP
- HOR*/ : TIM, DUA, RDY, MOD, TRD, CLK
- MSC*/ : CLR, WRT, LCK, MQU, CMP, MNM, YVT, YVX, DOT
- DAT*/ : DAT, PRT, BGN, END, CNT

* One of the possible bodies must be added, before entering the next header-body combination

V1 = XXE - ∅Y
  (XX = .1, .2, .5, 1, 2, 5, 1∅, 2∅, or 5∅; Y = ∅, 3 or 6)
V2 = ∅ (OFF), − 2.5, − 5, − 7.5 or − 1∅

V3 = ∅ (OFF)...7
V4 = ∅...4∅95
X = In FRO ∅ : read only
  In REG ∅ : programmable
R = Only active in REG ∅

TABLE III: (MSC)

Header:	Body:	Function:
CLR	?	Request for CLEAR state
CLR	ON	Clear the digital memory until message "CLR OFF" is programmed
CLR	OFF	Stop clearing the digital memory
WRT	?	Request for WRITE state
WRT	ON	The digital memory contents can be refreshed
WRT	OFF	The digital memory is locked
LCK	?	Request for LOCK state
LCK	ON	The digital memory is locked
LCK	OFF	The digital memory contents can be refreshed
MQU	?	Request for actual selected memory quarter
MQU	X	Display selected memory quarter X. X = $\emptyset$ (OFF) ... 7
CMP	?	Request for COMPARE state
CMP	OFF	Switch off compare mode
CMP	EVN	Compare odd (living) with even (dead) addresses*
CMP	ODD	Compare even (living) with odd (dead) addresses*
MNM	?	Request for MIN/MAX state
MNM	ON	MIN/MAX mode selected
MNM	OFF	MIN/MAX mode switched off
YVT	?	Request for X = t state
YVT	ON	Display of vertical channel versus time axes
YVT	OFF	Display of vertical channel versus vertical channel (X = A / Y = B)**
YVT	?	Request for X = A / Y = B state
YVT	ON	Display of vertical channel versus vertical channel (X = A / Y = B)**
YVT	OFF	Display of vertical channel versus time axes
DOT	?	Request for SMOOTH state
DOT	ON	Display of only dots
DOT	OFF	Display of dotjoin

* CMP ODD or EVN mode is not allowed to be programmed when also MNM ON is programmed. The LEDbar will blink as fault indication.

** Only possible to program if ALT or CHOP of the vertical channel selection switch S1 is depressed. If this switch is not depressed the LED bar will blink as fault indication.

TABLE IV: (DAT)

| Header:	Body:	Function:
PRT	?	Request for selected part
PRT	CMP	Select the stored points of the memory
PRT	LIV	Select the living points of the memory
PRT	ALL	Select all points of the memory
DAT	?	Request for the register data part from the oscilloscope which is selected by main function DAT ALL/A/B/C or D
BGN	?	Request for start address of data transfer
BGN	XX	The start address of the transfer of data (this is only possible after the programming of the DAT function) XX = integer 0 - 4095 (decimal)
END	?	Request for end address of data transfer.
END	XX	The end address of the transfer of data (this is only possible after the programming of the DAT function) XX = integer 0 - 4095 (decimal)
		NOTE: the last value 4095 (decimal) is not displayed!
CNT	?	Request for count factor
CNT	X	This is the so-called resolution factor $X = 0$: is not allowed $X = 1$: all points selected $X = 2$: every two points selected Etc. The following data of the selected channel is meant: BGN, BGN + X, BGN + 2X, BGN + 3X etc. (this is only possible after the programming of the DAT function)

REGISTER data transfer

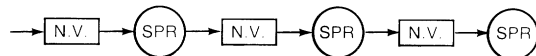Register contents VS display:

Vertical:
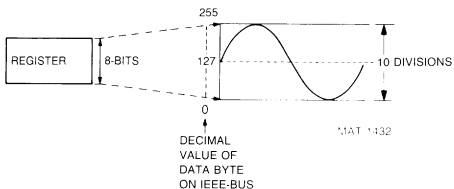
Horizontal:
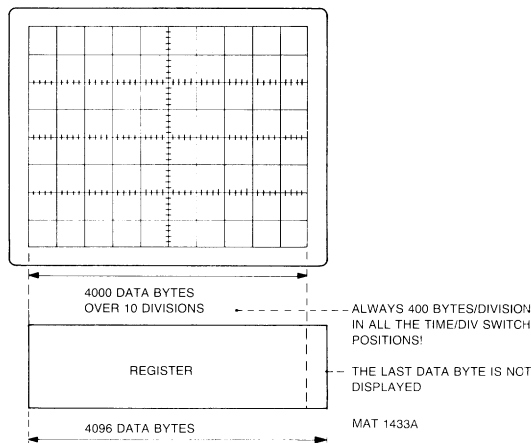
progamming example:

```
100 FOR I = B TO (E - C) / X - 1 STEP C
110 ___  ⎫
120 ___  ⎪
130 ___  ⎬ program
140 ___  ⎪
150 NEXT I
```

format output data:

N.V. = Numerical value of 0...255
The number of the N.V. blocks depends on the actual mode and BGN, END and CNT settings

B = BGN: the numerical representation of the programmed BGN
E = END: the numerical representation of the programmed END
C = CNT: the numerical representation of the programmed CNT
    X   : 1 for VER A FNC ON or VER B FNC ON
           2 for CHP ON or VER A FNC ON CMP EVN(ODD) or VER B FNC ON CMP EVN(ODD)
           4 for CHP ON CMP EVN(ODD) or CHP ALL
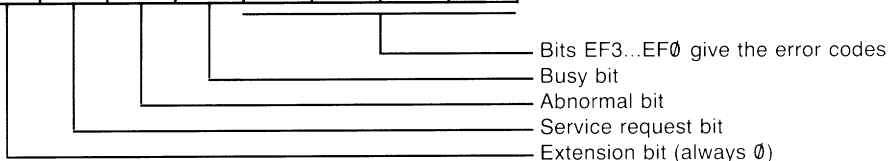   8 for CHP ALL CMP EVN(ODD)

NOTE: X = 1 if DAT ALL is selected.

NOTE: Measuring data is send in decimals from 0 up to 255 (The leading zero's are blanked and the values are separated by record separators).

SERVICE REQUEST + STATUS WORD

128	64	32	16	8	4	2	1
DIO8	DIO7	DIO6	DIO5	DIO4	DIO3	DIO2	DIO1
EXT	RQS	AB	BS	EF3	EF2	EF1	EF0

- Bits EF3...EF0 give the error codes
- Busy bit
- Abnormal bit
- Service request bit
- Extension bit (always 0)

Possible values of the status word and remarks:

16: After a Group Execute Trigger command (Oscilloscope busy)
64: After a Group Execute Trigger command (Oscilloscope ready)
97: Programming failure
100: Data ready to be transferred
104: Input buffer of oscilloscope full (Only in case that no seperator is received)

POSSIBLE MULTI LINE MESSAGES AND DEFAULT SETTINGS

Go To Local, Group Execute Trigger, Selective Device Clear and Device Clear.

Default settings after SDC or DCL:

VER A FCN ON or FCN OFF	YVT ON
VER B FCN ON or FCN OFF	DOT ON
CHP ON or CHP OFF	TIM .2E-03
CLR OFF	DUA OFF
WRT ON	RDY YES
MQU OFF	MOD REC
CMP OFF	TRD OFF
MNM OFF	CLK NO