IEEE 488

IEC 625 & V24

KS8237
MULTIPOINT
DATA RECORDER

9499 430 10811   840301

1. PROGRAMMING


```
INTERFACE MESSAGES
ESC n (V24)
ATN ∧ DAB (IEC)
```

```
PROGRAM DATA
(ESC)─(0)─DATA      RECORD
                    SEPARATOR
```

```
EXECUTE COMMANDS
(ESC)─ALPHABETIC
       CHARACTER
```

```
TEXT PRINTING
KS8237 IN
STANDBY MODE
```
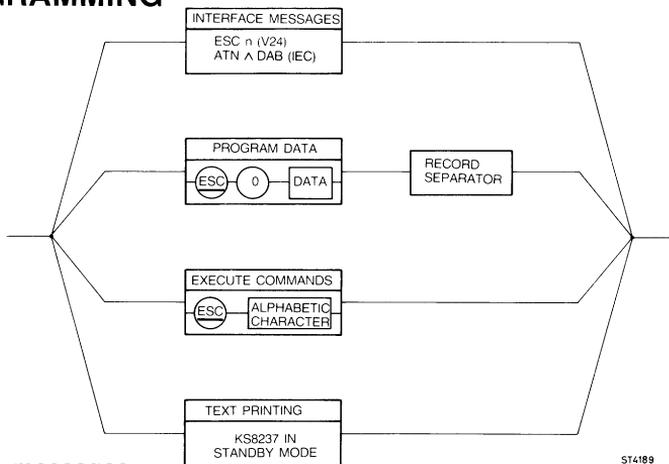
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1.1 Interface messages

IEC-625	V24	Description
GTL	ESC 1	Go to local state
listener address	ESC 2	Go to remote state
(REN)*	ESC 3*	Go to local state
SDC or DCL	ESC 4	Device clear
SPE/MTA/SPD	ESC 7	Poll (gives status byte)
GET	ESC 8	Device trigger

* ESC 3 for the serial interface, has the same result as making the REN line false for the IEC-bus interface

1.2 Program data (preceed by <u>ESC</u> 0)

FUNCTION	MESSAGE	DESCRIPTION
Channel select	CHnn	Select (existing) channel nn. Only possible in single channel measure, single channel display or program mode.
Set time	TM $\pm$ hhmm	Setting of the time in hours (hh) and minutes (mm). A + sign means that in the dot mode one numeral printout of the measuring results is given everytime the print interval time is up. A - sign means that there is no numeral printout in the dot mode.
Set date	DTddmmyy	Setting of date in days (dd), months (mm) and years (yy)
Chart drive	CD $\pm$ nn	Chartspeed (only in dot mode) $\quad$ + nn speed in mm/min $\quad$ – nn speed in mm/hour
	CDnn	nn is print interval time. In numeral mode: minutes $\qquad$ In dot mode: hours Determines also the time of output measurement data to the interface.
	CDnnnn	Divide factor for external clock pulses (only in dot mode and REMOTE ENABLE CLOCK NOT must be enabled) (see operating manual)
Service request	MS[R]n[n][n]	Setting of the service request mask. n[n] [n] is the decimal equivalent of the mask bit pattern. (service request enabled bit . . = 1)

bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
INITIALI-SATION	VALID DATA CAN NOT BE OUTPUT	OPERATING OR PRO-GRAMMING ERRORS	GENERAL INSTRU-MENT ERRORS	MEASURING ERROR	ALARM DETECTED	WAITING FOR AN EXECUTE COMMAND

FUNCTION	MESSAGE	DESCRIPTION
Separators (input/ output)	SP[R]nn[,nn]	Record-block separator(s). nn is the decimal equivalent of a character of column 0 or 1 of the ISO code table (decimal equivalent 27 (<u>ESC</u>) is not allowed) (initial state: 10)
	BS[P]nn	Block separator. nn is the decimal equivalent of a character of column 0 or 1 of the ISO code table. (decimal equivalent 27 (<u>ESC</u>) is not allowed) (initial state: 10)

NOTE: [ ] means optional

1.3. Execute commands

a) BASIC FUNCTIONS

FUNCTION	ISO 7-bit CODE	DESCRIPTION
Standby	ESC S	select the standby mode
Measure	ESC M	select the measure mode
Program	ESC P	select the program mode
Single channel measure	ESC A	single channel measure on
	ESC B	single channel measure off
Single channel display	ESC G	single channel display on
	ESC H	single channel display off
Numeral print	ESC N	select numeral print mode
Dot print	ESC Z	select dot print mode
Chart forward	ESC F	chart fast forward over 75 mm (1 fold)
Print program	ESC L	list program on paper (channel parameter settings)

### b) SCAN AND STEP FUNCTIONS (only selectable in measure mode)

FUNCTION	ISO 7-bit CODE	DESCRIPTION
Remote SCAN	ESC V	remote SCAN enable; remote STEP disabled
	ESC W	remote SCAN disable
Remote STEP	ESC X	remote STEP enable; remote SCAN disabled
	ESC Y	remote STEP disable

c) OUTPUT FUNCTIONS

FUNCTION	ISO 7-bit CODE	DESCRIPTION
Print program	ESC I	list program, via interface (channel parameter settings)
	ESC D	dump data (in hexcode) via interface for loading and reloading
Recorder status	ESC R	output recorder status to the interface (time, date, chart drive, print mode and service request mask)
Scaled measurement data	ESC T	the measurement data is scaled
	ESC U	the measurement data is unscaled (initial state) (see also output data)

2. OUTPUT DATA

2.1 Measuring data
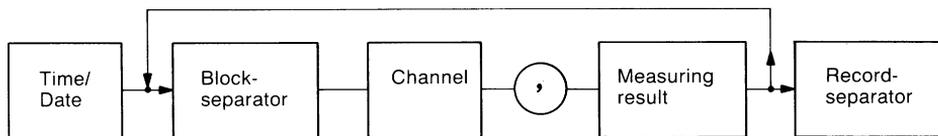
| TIME/DATE | TMhh.mm,DTyymmdd | hh; hours
mm; minutes | yy; years
mm; months
dd; days |

CHANNEL   CHnn   nn; channel number 01...24   (example: CH01)

MEASURING RESULT
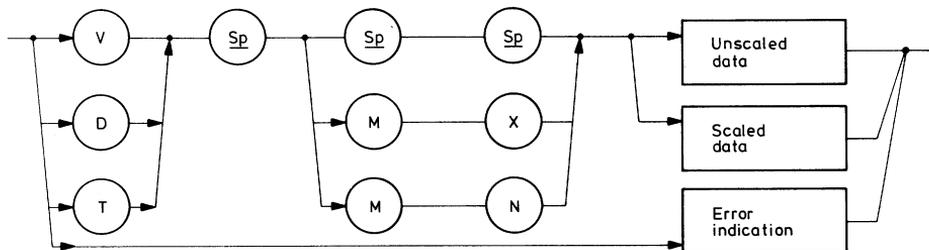
V Volt measurement
D Difference measurement
T Temperature measurement

MX Maximum alarm
MN Minimum alarm
Sp Space

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Output of UNSCALED DATA

1	2	3	4	5	6	7	8	9	10
+/−	d	d	.	d	d	E	+/−	e	e

Representation NR3 (technical notation)

+/− pos. /neg value   E exponent
dd.dd measurement value   ee value of the exponent

Output of SCALED DATA

A 4 digit number between 0000 and 1000
Output measure result is the input value in part per thousand of the programmed scale

Error indication
ERROR nn   nn = Decimal representation of the error code.

2.2 Recorder status (ESC R)

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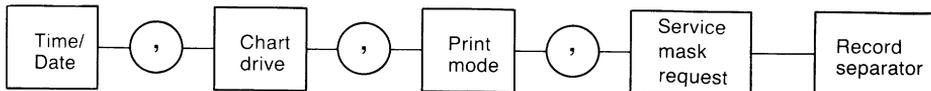| TIME/DATE | TM $\pm$ hh.mm,DTddmmyy | hh; hours 00-23 | dd; days |
		mm; minutes 00-59	mm; months
			yy; years
CHART DRIVE	CD $\pm$ nn	chart-speed in the dot mode	
	CD nn	print interval time in the numeral mode	
	CDnnnn	divide factor in the dot mode with extended chart control	
PRINT MODE	DM0	for numeral print mode	
	DM1	for dot mode	
SERVICE REQUEST MASK	MSnnn	nnn = Decimal equivalent of the bit pattern of the mask (3 digits)	

2.3 List program (ESC l)

```
MODODD......................................136characters..........................................................SR2
MODEVN......................................136characters..........................................................SR2
MEASFN......................................136characters..........................................................SR2
ZSCALE.......................................136characters..........................................................SR2
FSCALE.......................................136characters..........................................................SR2
MINALM......................................136characters..........................................................SR2
MAXALM.....................................136characters..........................................................SR2
RESODD......................................136characters..........................................................SR2
RESEVN......................................136characters..........................................................SR3
```
(total 142 characters per line)

2.4 Dump program (ESC D)
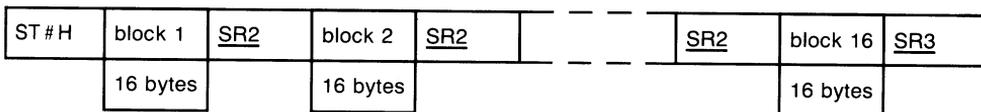
3. STATUS BYTE DECODING

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
EX	RQS	AB	BSY	EF3	EF2	EF1	EF0

If AB = 0 then the bits EF3 to EF0 indicate the function

EF3 = 1	Measure mode
EF3 = 0	Program or standby mode
EF2 = 1	Numeral print mode
EF2 = 0	Dot print mode
EF1 = 1	Alarm detected
EF1 = 0	(no alarm detected)
EF0 = 1	Initialisation passed
EF0 = 0	(Initialisation not passed)

If AB = 1 the bits EF3 to EF0 indicate the error status:

AB	EF3	EF2	EF1	EF0	DESCRIPTION
1	0	1	0	0	Measuring error
1	1	0	0	0	Valid data cannot be output

General instrument errors

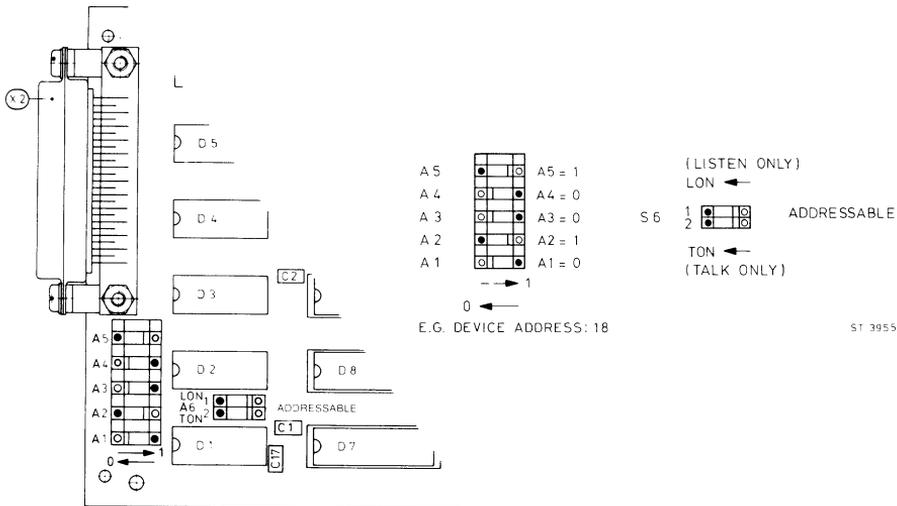| AB	EF3	EF2	EF1	EF0	DESCRIPTION
1	0	0	0	1	Instrument memory failure
1	0	0	1	0	All channels skipped or no correct programmed channel
1	0	0	1	1	Paper out indication

Operating and program errors

AB	EF3	EF2	EF1	EF0	DESCRIPTION
1	0	1	0	1	Selected channel is not in the range 1...24
1	0	1	1	0	Selected channel does not exist or is skipped
1	0	1	1	1	Selected channel contains invalid program data
1	1	1	0	0	Programmed data is invalid

4. SERVICE REQUEST

	EX	RQS	AB	BSY	EF3	EF2	EF1	EF0	
Initialisation	0	1	0	x	x	x	x	1	
Valid data cannot be output	0	1	1	x	1	0	0	0	
	0	1	1	x	0	1	0	1	Selected channel is not in the range (1 to 24)
Operating or program errors	0	1	1	x	0	1	1	0	Selected channel does not exist or is skipped
	0	1	1	x	0	1	1	1	Selected channel contains invalid program data
	0	1	1	x	1	1	0	0	Programmed data is invalid
	0	1	1	x	0	0	0	1	Memory failure
General instrument errors	0	1	1	x	0	0	1	0	All channels skipped or incorrectly programmed
	0	1	1	x	0	0	1	1	Paper-out indication
Measuring error	0	1	1	x	0	1	0	0	
Alarm detected in a channel	0	1	0	x	x	x	1	x	
Waiting for an execute command	0	1	0	0	x	x	0	0	

5. SWITCH SPECIFICATION

5.1 IEC-625/IEEE-488 interface

5.2 V24, 28 interface

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