DECKEL

Windows 98
Hype Terminal
Direct connect to Com 1
baud 4800
Data bits 7
Parity even
Stop bits 1
Flow Control Hardware
use "Transfer" - "capture text"
or "Transfer" - "read text"

DIALOG 1 Deckel
mode 14
choose V.24
baud rate 4800

DIALOG 2

DIALOG 3

Serial Interface for Data Input/Output

Edition 11.85-/511/874 E

C O N T E N T S

1. V.24 interface

1.1 General information

The V.24 interface of CNC DIALOG controls employs V.24 receivers and V.24 transmitters in conformity with DIN 66020.

The DIN 66020 specification defines the interface between data terminal equipment (DTE) and data communication equipment (DCE). It is based on recommendation V.24 and V.28 of CCITT (Comité Consultatif International Télégraphique et Téléphonique) which, in turn, is in conformity with EIA standard RS 232.

The interchange circuits used in CNC DIALOG represent a selection of the entire spectrum of circuits defined in the V.24 and RS 232 standards and thus meet their electrical characteristics.

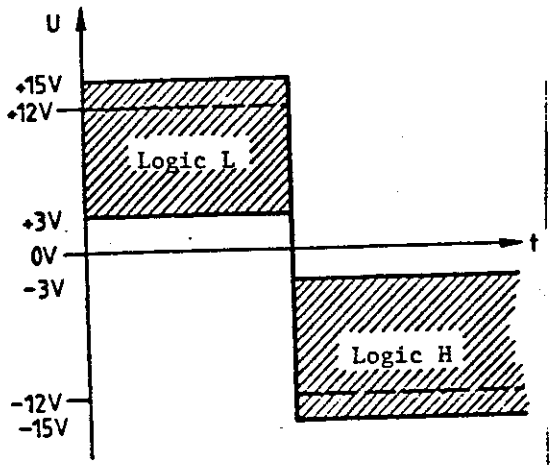
1.2 Interchange circuits

All interchange signals described below refer to the CNC DIALOG control which is defined as data terminal equipment (DTE).

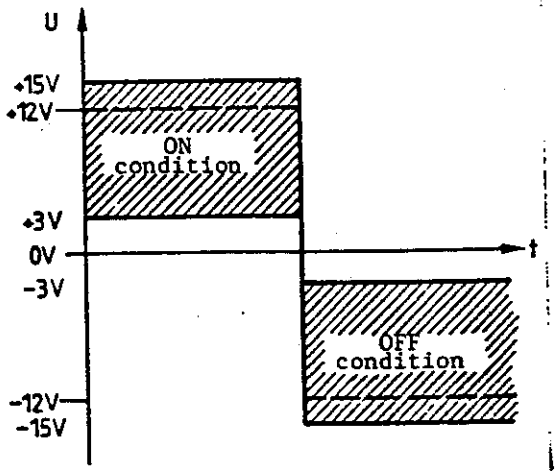
Ground circuits

E2: Signal Ground (192)
This is the common return for all interface signals.

1.3 Electrical signal characteristics



Data circuits



Control circuits

All signal levels refer to signal ground E2 (102).

In the transition region (+3V to -3V), the signal status is not defined.

1.4 Connection of data terminal equipment to CNC DIALOG via V.24 interface

1.4.1 CNC DIALOG 1, 2, 3

A 3-pole jack is provided on the bottom panel of the CNC DIALOG console (Fig 1) for intefacing.
Details will be seen from Fig 2 below.

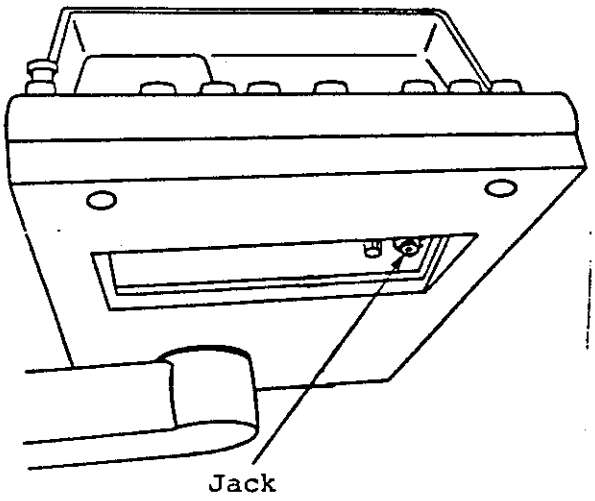


Fig 1

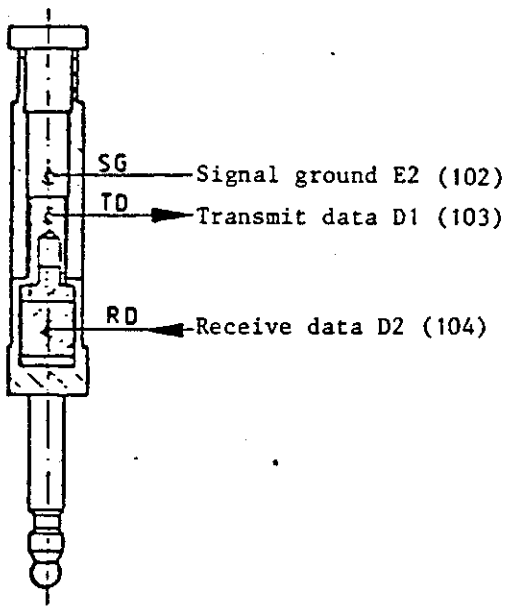
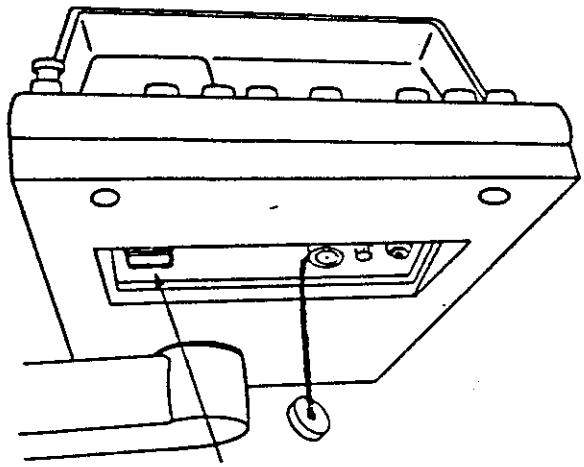


Fig 2

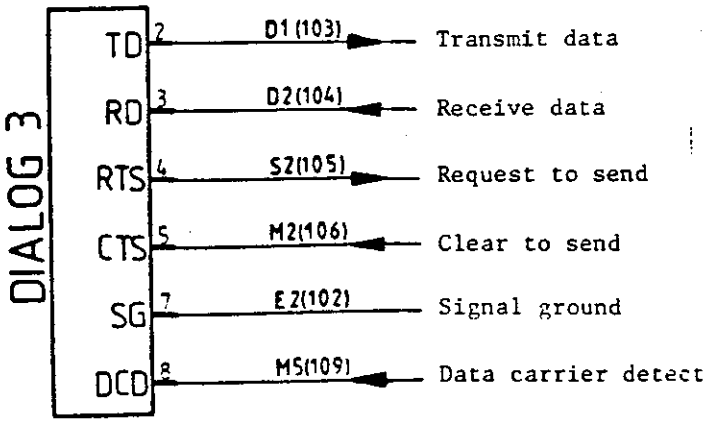
1.4.2 CNC DIALOG 3 only

The CNC DIALOG 3 console is additionally fitted with a 25-pin female connector (subminiature DB25S).



Connector (Fig 3)

Pin designation is in compliance with DIN 66020, the CNC DIALOG 3 being considered a data terminal unit.



V.24 Interchange circuits (Fig 4)

2. 20 mA interface

2.1 General information

The 20 mA current loop interchange is not a standard one by definition. It is, however, of such common use that it has practically become a standard by use (TTY = teletype interface).

2.2 Signal characteristics

It is the level of electric current, not the voltage level like in V.24 circuits, that determines the logic state in a 20 mA interchange.

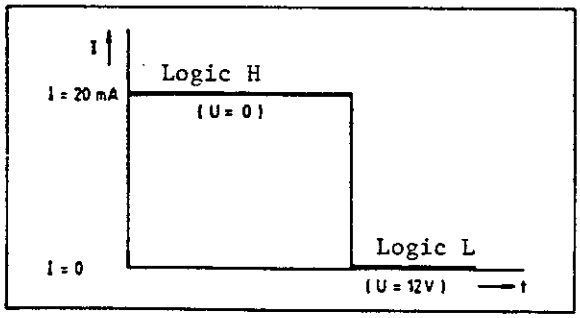
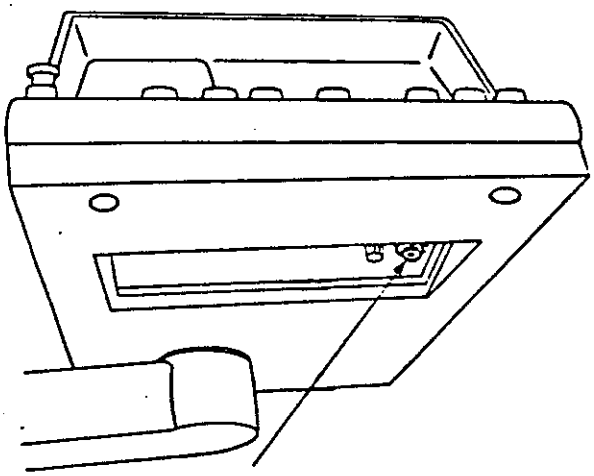


Fig 5

2.3 Connection of data terminal equipment to CNC DIALOG via 20 mA interface

2.3.1 CNC DIALOG 1, 2, 3

A 3-pole jack is provided on the bottom panel of the CNC DIALOG console for interfacing.



Connector

Fig 6

Details will be seen from Fig 7 below.

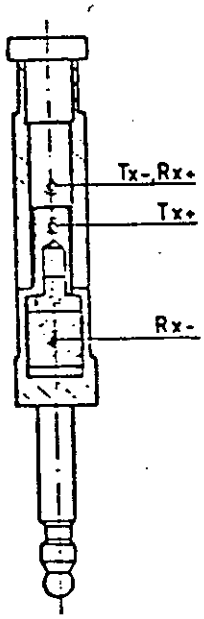
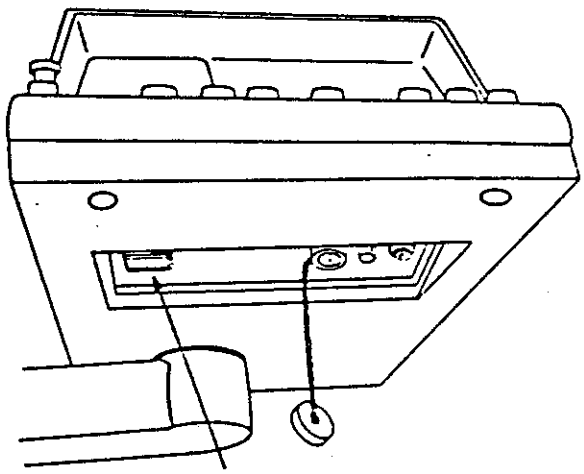


Fig 7

2.3.2 CNC DIALOG 3 only

The CNC DIALOG 3 console is additionally fitted with a 25-pin female connector (subminiature DB25S).



Connector (Fig 8)

Details of pin assignment will be seen from Fig 9 below.

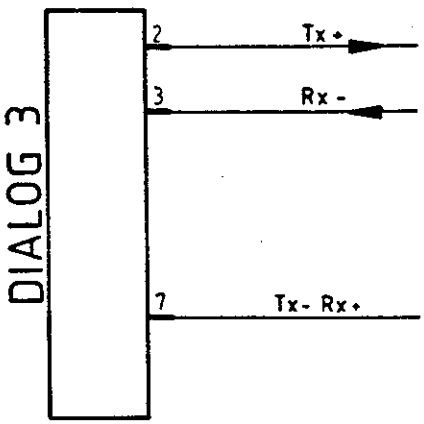


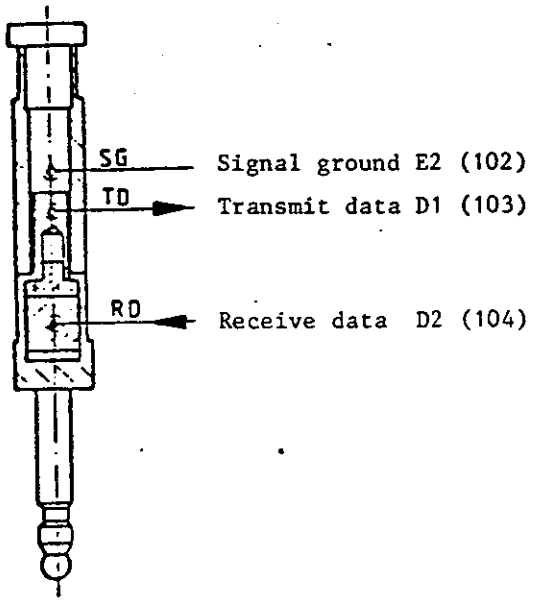
Fig 9

3. Quick-reference information on interfaces

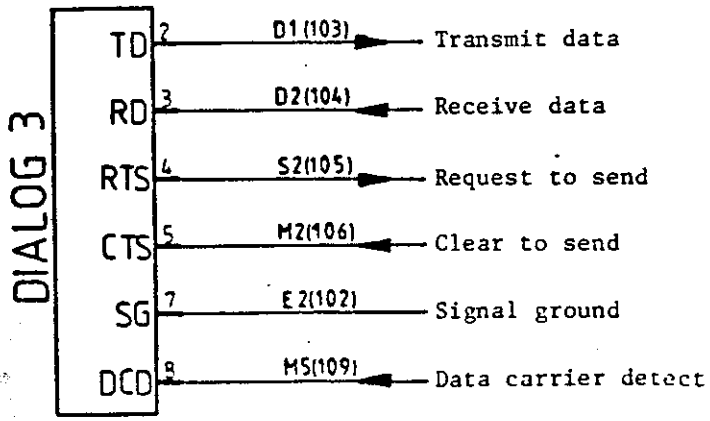
3.1 Pin assignment

3.1.1 V.24 Interface

(a) CNC DIALOG 1, 2, 3

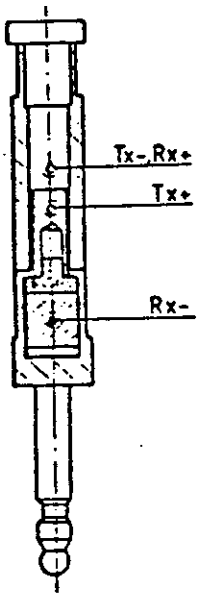


(b) CNC DIALOG 3 only

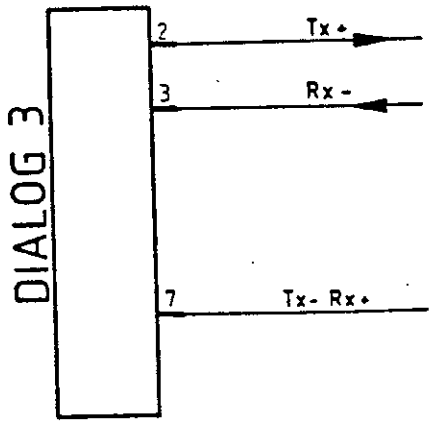


3.1.2 20 mA interface

a) CNC DIALOG 1, 2, 3



b) CNC DIALOG 3 only

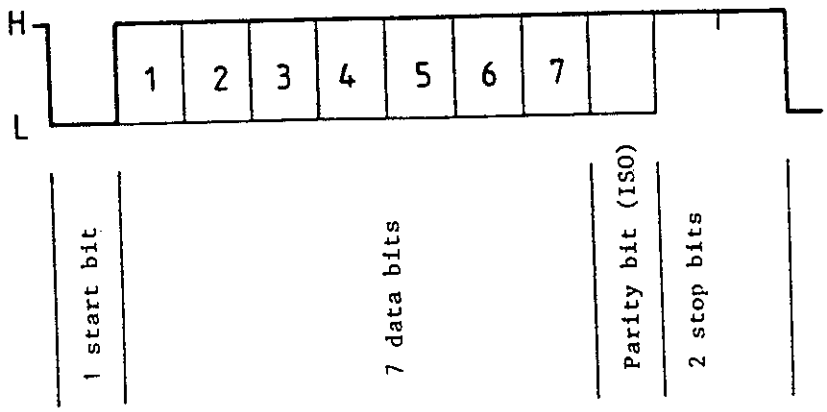


3.2 Signal identification

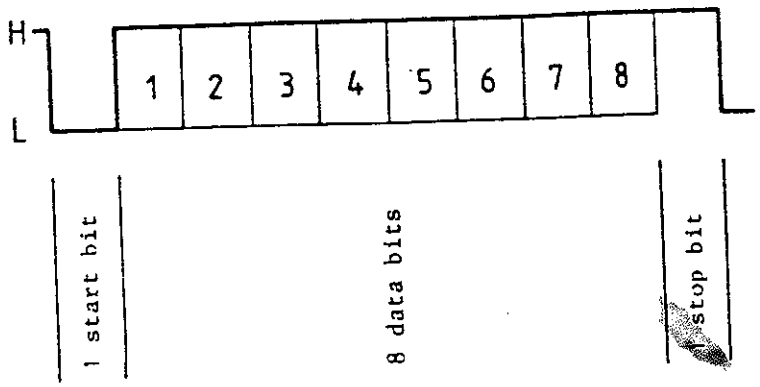
TD	Transmit data	V.24
RD	Receive data	V.24
RTS	Request to send	V.24
CTS	Clear to send	V.24
SG	Ground	V.24
DCD	Data carrier detect	V.24
Tx+	Transmit data +	20mA
Tx-	Transmit data -	20mA
Rx+	Receive data +	20mA
Rx-	Receive data -	20mA

3.3 Structural design of a serial binary signal

Transmit format



Receive format



4. Program format

4.1 Permissible ASCII codes

ASCII input	
HEX	CODE
+00	NUL
01	SOH
02	STX
03	ETX
04	EOT
05	ENQ
06	ACK
07	BEL
08	BS
09	HT
+0A	LF
0B	VT
0C	FF
+0D	CR
0E	SO
0F	SI
10	DLE
11	DC1
12	DC2
13	DC3
14	DC4
15	NAK
16	SYN
17	ETB
18	CAN
19	EM
1A	SUB
1B	ESC
1C	FS
1D	GS
1E	RS
1F	US

ASCII input	
HEX	CODE
+20	SP
21	!
22	"
23	#
x 24	$
x 25	%
x 26	&
27	'
x 28	(
x 29	)
2A	*
2B	+
2C	,
2D	-
2E	.
+2F	/
+30	0
+31	1
+32	2
+33	3
+34	4
+35	5
+36	6
+37	7
+38	8
+39	9
3A	:
3B	;
3C	<
3D	=
3E	>
x 3F	?

ASCII input	
HEX	CODE
40	@
+41	A
x 42	B
+43	C
+44	D
x 45	E
+46	F
+47	G
48	H
+49	I
+4A	J
+4B	K
+4C	L
+4D	M
+4E	N
4F	O
x 50	P
51	Q
+52	R
+53	S
+54	T
+55	U
+56	V
1) 57	W
+58	X
+59	Y
+5A	Z
5B	[
5C	\
5D	]
5E	^
5F	_

ASCII input	
HEX	CODE
60	`
61	a
62	b
63	c
64	d
65	e
66	f
67	g
68	h
69	i
6A	j
6B	k
6C	l
6D	m
6E	n
6F	o
70	p
71	q
72	r
73	s
74	t
75	u
76	v
77	w
78	x
79	y
7A	z
7B	{
7C	|
7D	}
7E	~
7F	DEL

\+ Permissible code
x Permissible in leader and trailer only
(1) Not permissible on CNC DIALOG 1

4.2 Punched tape format

Typical program

Leader (50)		NUL
Line feed (2)		CR LF NUL NUL
Identification (mm/inch)	&	or $
Program number	P07	
Line feed		CR LF NUL NUL
Compensation value address	D01	
Space (2)		SP
Compensation value	+123456	
Line feed		CR LF NUL NUL
Compensation value address	D04	
Space (2)		SP
Compensation value	-123456	
Line feed (2)		CR LF NUL NUL
Compensation value address	D72	
Space (2)		SP
Compensation value	+000500	
Line feed (2)		CR LF NUL NUL
Compensation value address	D99	
Space (2)		SP
Compensation value	+010000	
Line feed (3)		CR LF NUL NUL
Program start	%	
Line feed		CR LF NUL NUL
Comment (start)	(	
Identification (mm/inch)	&	or $
Program number	P07	
Divider	/	
Storage load (hex)	A1FC	
Comment (end)	)	
Line feed		CR LF NUL NUL
1st block number	N0001	
Space		SP
G function	G00	
Space		SP
1st coordinate	X+0	
Space		SP
2nd coordinate	Y+0	
Space		SP
3rd coordinate	Z+0	

Line feed		CR LF NUL NUL
2nd block number	N0002	
Space		SP
1st coordinate	X-2000	
Space		SP
Compensation	D+01	
Space		SP
2nd coordinate	Y+3500	
Space		SP
Compensation	D-01	
Space		SP
Feed rate	F 200	
Space		SP
Spindle speed	S + 1000	
.		
.		
.		
Line feed		CR LF NUL NUL
Last block number	N9999	
Space		SP
M function	M02	
Line feed		CR LF NUL NUL
Line feed		CR LF NUL NUL
1st subroutine number	U0001	
Space		SP
Milling cycle	G71	
Space		SP
.		
.		
.		
Line feed		CR LF NUL NUL
3rd subroutine number	U0003	
Space		SP
M function	M30	
Line feed		CR LF NUL NUL
End of program	?	
Line feed		CR LF NUL NUL
Checksum (hex)	5E3D	
Line feed		CR LF NUL NUL
Line feed		CR LF NUL NUL
Trailer (63)		NUL

EXPLANATORY NOTES

Leader

The leader comprises 50 ASCII codes 'NUL'.

Program start

ASCII code '%' identifies the start of a part program.

Comment (start)

ASCII code '(' identifies the beginning of control-specific input values.

Identification (mm/inch)

This shows the measuring system to be used for the part program: ASCII code '&' stand for the metric system and ASCII code '$' for the inch system.

Program number

The program number comprises a 'P' address and a two-digigt decimal number between 01 and 99.

Comment (end)

ASCII code ')' identifies the end of control-specific input values. This code is followed by the values for the workpiece programmed in numbered blocks.

End of program

ASCII code '?' identifies the end of a part program.

Trailer

The trailer comprises 63 ASCII codes 'NUL'.

ASCII codes 'NUL' 'CR' 'LF' 'SP' are merely used to facilitate reading of the printout and are ignored by the control.

The cassette format differs from this tape format only by using a different TRAILER.

The cassette trailer has 50 ASCII codes 'U'.

4.3 Storage load and checksum

Typical program:

```
&P01
D01  +010000
```

COMPENSATION VALUES

```
%
(&P01/0053)
N0001 G00 X+0 Y+0 Z+100000
N0002 T01
N0003 G00 Z+0 D+01
N0004 G01 X+100000 Y+50000 F500 S+0
N0005 M30

?
11E8
```

NC PROGRAM

Memory load: dec 83 (hex 0053)

Checksum: dec 4584 (hex 11E8)

Memory load

The memory load is a four-digit hexadecimal number indicating the total number of data value characters in an NC program, not counting blank spaces (SP), carriage returns (CR) and line feeds (LF). In the above example, the 83 characters of the NC program result in a memory load of hex 0053.

If string 0000 is entered for the memory load, the control will not check whether the length of the program exceeds the memory capacity of the control, before the program is read into the control.

Checksum

The checksum is a four-digit hexadecimal number showing the sum of the ASCII values of the characters contained in the NC program. As above, blank spaces (SP), carriage returns (CR) and line feeds (LF) are ignored.

When the program is read in, the control internally forms a checksum which will then be compared with the checksum entered. If the two fail to equivalent, an error readout will appear on the display screen.

If no checksum test is to be made, enter string 0000.

4.4 Word structure (metric)

N 4, U 4, G 2, XL+043, YL+043, ZL+043, CL+043,
D+2, ID043, JD043, KD043, F04, S+04, M2, T2,
V2, P2, L2

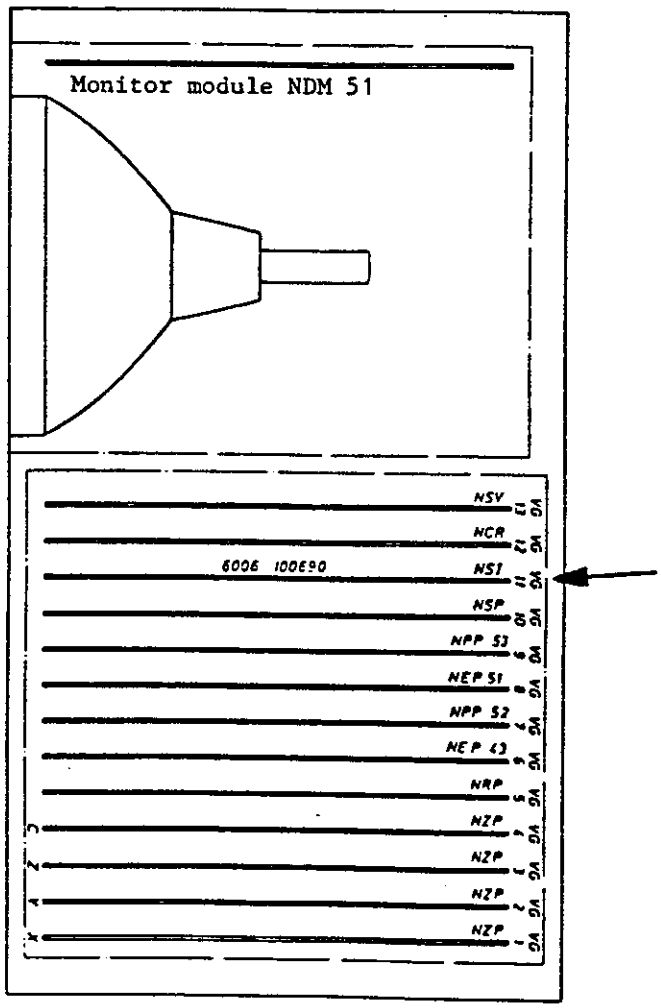
Explanatory notes

First letter	address	
Second letter	L	absolute/incremental
Second letter	D	incremental
Sign	+	absolute dimensions with positive or negative sign
First numeral	0	leading zeros may be omitted: variable word length
Second numeral	decades:	number of digits
Second and third numerals	decades:	number of digits before and after decimal point (coordinate values X, Y, Z, I, J, K in mm)

5. Selection of interface and baud rate

5.1 CNC DIALOG 1, CNC DIALOG 2

The interface (V.24/20 mA) and the baud rate are selected by means of coding switches on the interface card (NSI51 or NSI52).
This card will be found in position VG11 in the control console.



Coding switch SG serves to select the interface, coding switch SH to select the baud rate. The combinations obtainable will be seen from Table 2.

Setting the serial interface on the control

Switch	Switch position	Function	Function test
SG1	$\overline{\text{OPEN}}$	Interface 20 mA	ON = OPEN OFF = $\overline{\text{OPEN}}$
SG2	OPEN	Interface v.24	ON = OPEN OFF = $\overline{\text{OPEN}}$
SG3	OPEN	Not assigned	
SG4	OPEN	Not assigned	
SH1	OPEN	300 bauds = reading speed	
SH2	OPEN		
SH3	$\overline{\text{OPEN}}$	30 characters/sec	
SH4	OPEN	Not assigned	

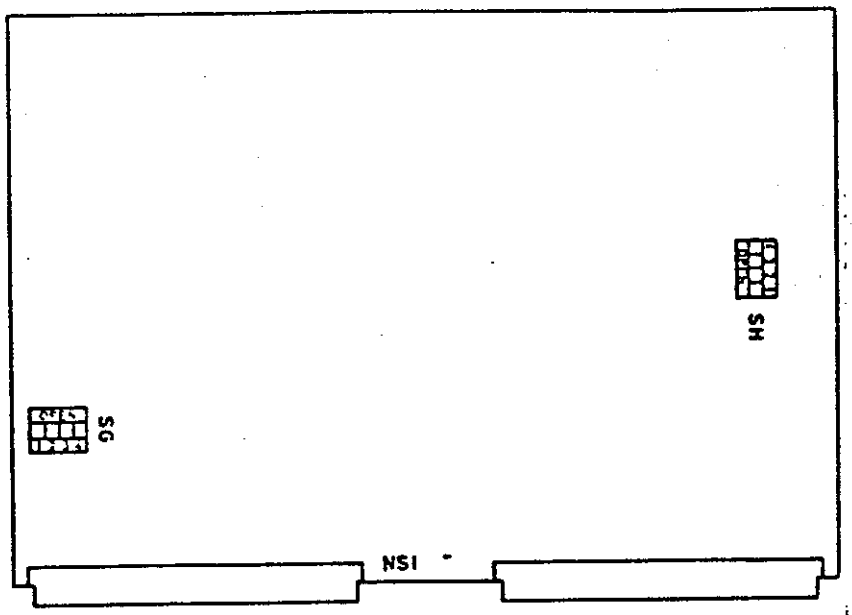
Table 1

Baud rate	75	110	150	300	600	1200	2400
SH1	L	H	L	H	L	H	L
SH2	L	L	H	H	L	L	H
SH3	L	L	L	L	H	H	H

OPEN = H

$\overline{\text{OPEN}}$ = L

Table 2



5.2 CNC DIALOG 3 (as from CNC software release 06)

This version gives you a menu on the display screen in modes 14 and 15, allowing you to select the desired interface and baud rate. The interface parameters will remain stored when the machine is switched off (see Operator's Manual).

Data circuits

D1: Transmitted Data (103)
This circuit carries data transferred from CNC DIALOG to peripheral equipment.

D2: Received Data (104)
This circuit carries data transferred from peripheral equipment to CNC DIALOG.

Control circuits to DTE

S2: Request to Send (105)
CNC DIALOG controls the data transmission of terminal end equipment (DTE).

Control circuits from DTE

M2: Clear to Send (106)
Data terminal equipment indicates that data may be transferred.

M5: Data Carrier Detect (109)
Data terminal equipment receives valid signals (adequate level).