

DECKEL

Windows 98

Hyper 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

made 14

course V.24

baud rate 4800

DIALOG 2

DIALOG 3

Serial Interface

for Data Input/Output

C O N T E N T S

1. V.24 interface

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- 4.4 Word structure

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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

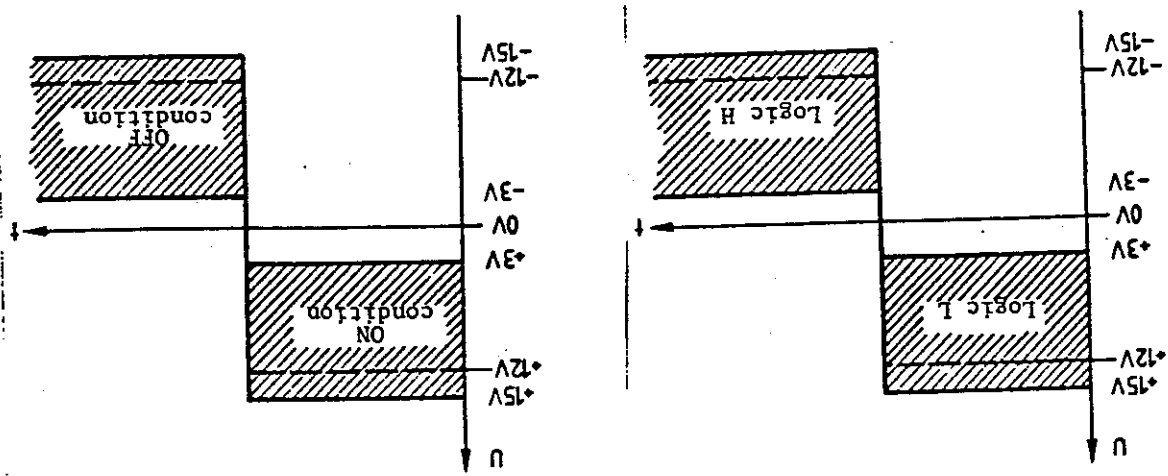
All interchange signals described below refer to the CNC DIALOG control which is defined as data terminal equipment (DTE).

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).

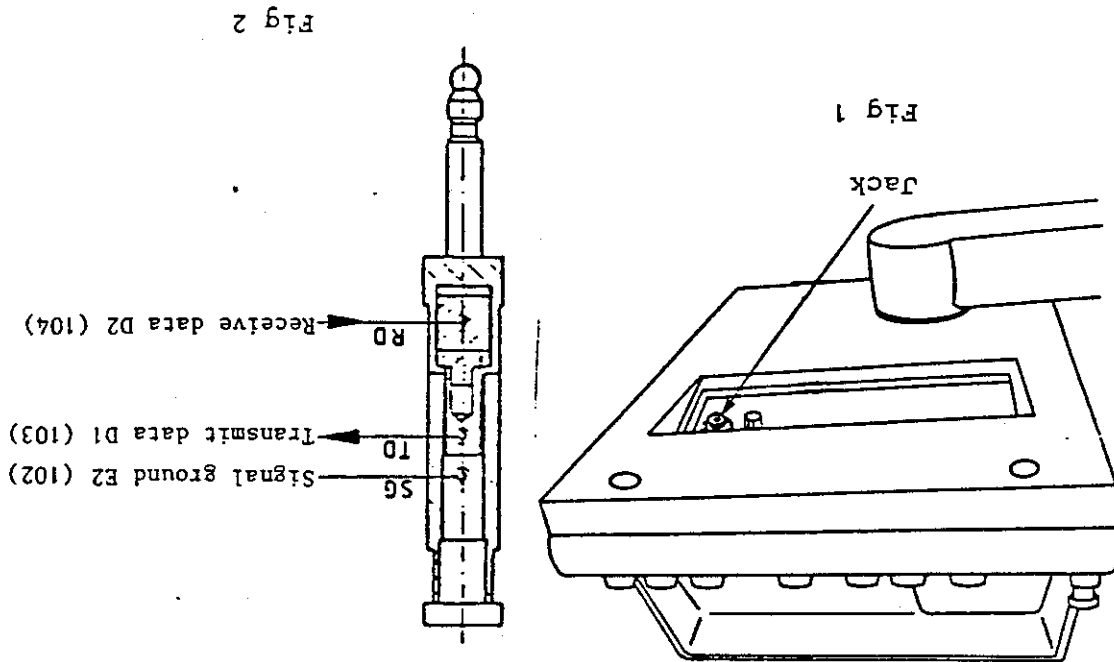
In the transition region (+3V to -3V), the signal status is not defined.

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

1.4.1 CNC DIALOG 1, 2, 3

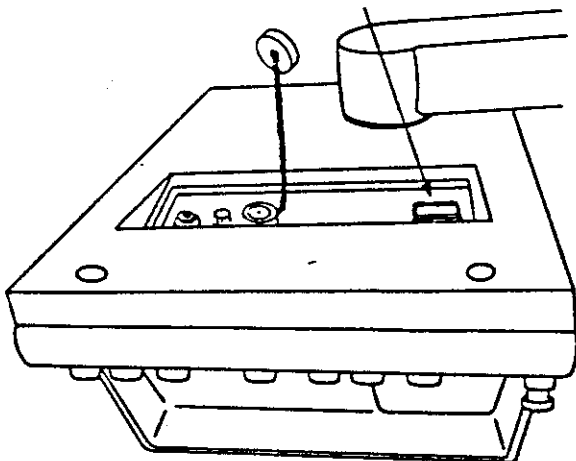
A 3-pole jack is provided on the bottom panel of the CNC DIALOG console (Fig 1) for interfacing.

Details will be seen from Fig 2 below.



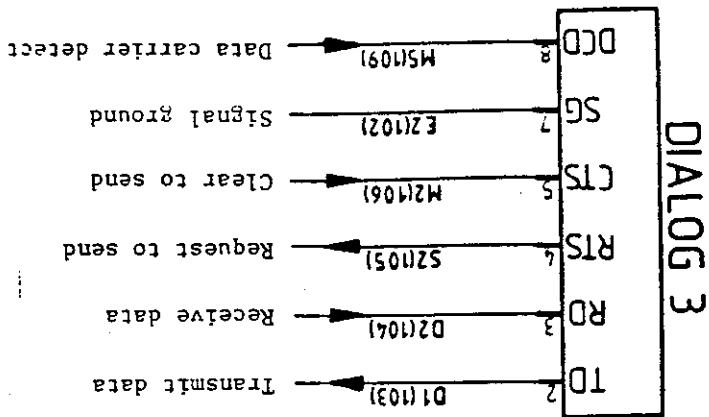
1.4.2 CNC DIALOG 3 only

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)

*Parallel printer
Serial printer*

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.

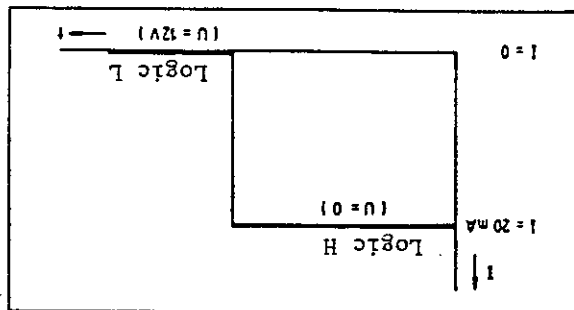
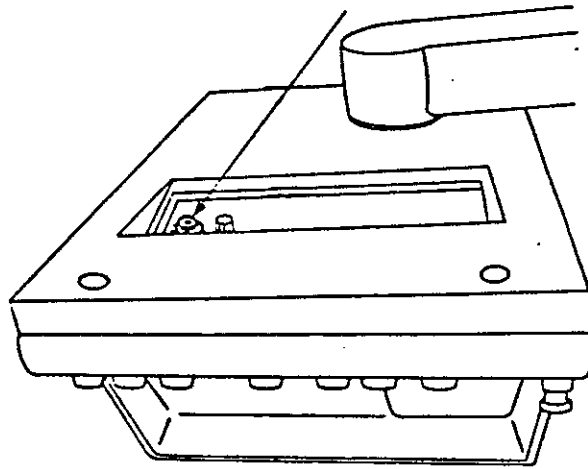


Fig 5

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.

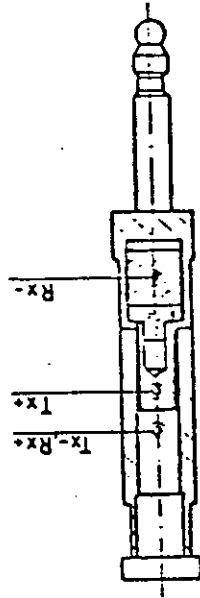
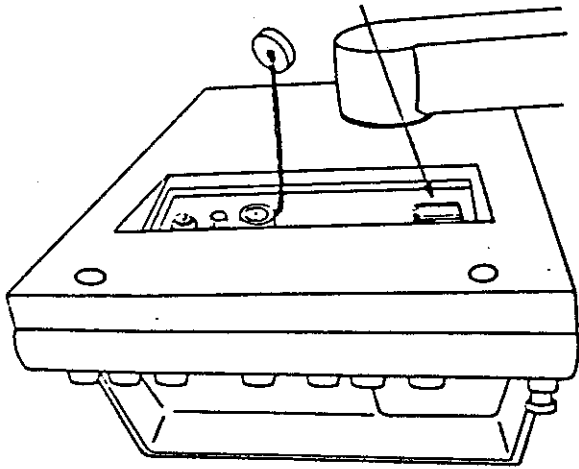


Fig 7

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.

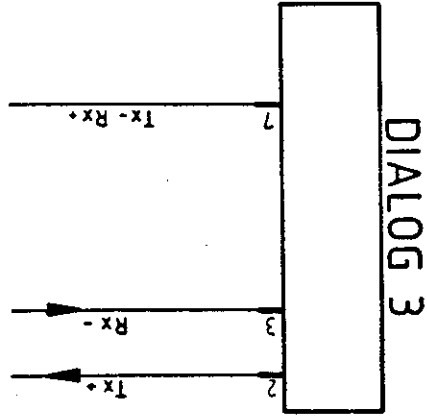


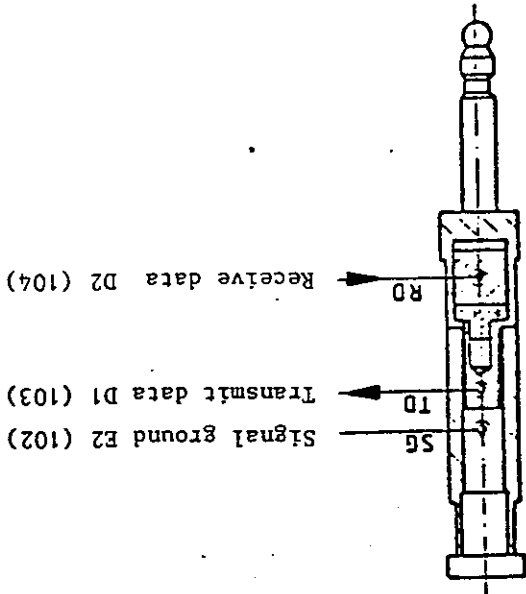
Fig 9

3. Quick-reference information on interfaces

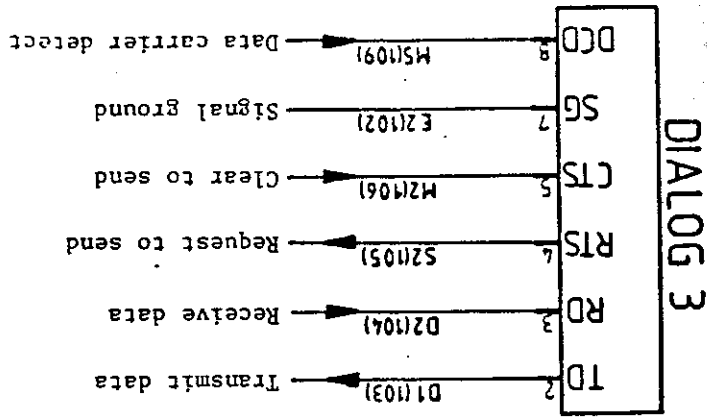
3.1 Pin assignment

3.1.1 V.24 Interface

(a) CNC DIALOG 1, 2, 3

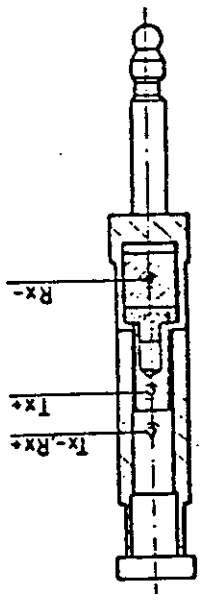


(b) CNC DIALOG 3 only

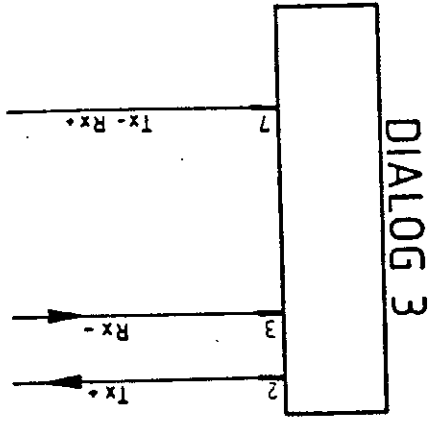


3.1.2 20 mA interface

a) CNC DIALOG 1, 2, 3



b) CNC DIALOG 3 only

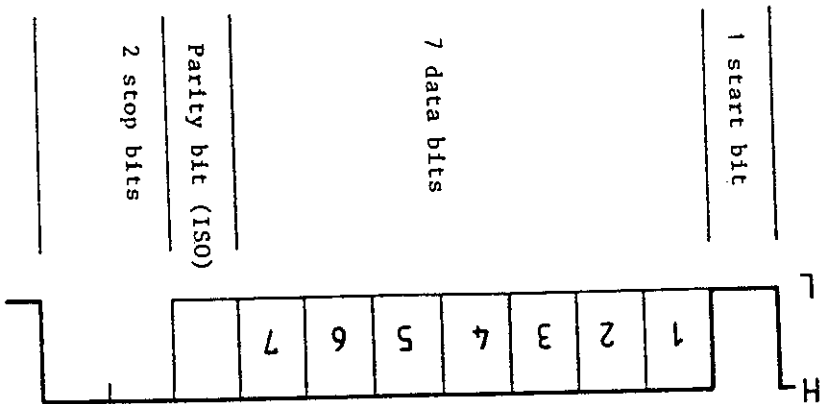


3.2 Signal identification

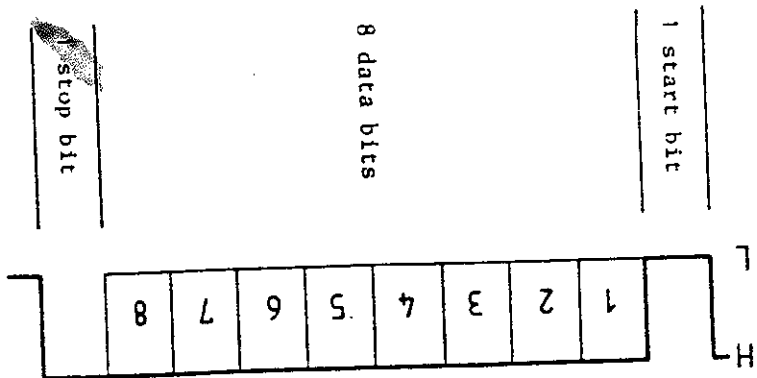
TD	Transmit data	V.24
RD	Receive data	V.24
RTS	Request to send	V.24
CTS	Clear to send	V.24
SG	Ground	V.24
DCD	Data carrier detect	V.24
TX+	Transmit data +	20mA
TX-	Transmit data -	20mA
RX+	Receive data +	20mA
RX-	Receive data -	20mA

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

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

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

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

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

4.2 Punched tape format

Typical program

```

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

CR LF NUL NUL	N0002	Line feed	2nd block number
SP	X-2000	Space	1st coordinate
SP	D+01	Space	Compensation
SP	Y+3500	Space	2nd coordinate
SP	D-01	Space	Compensation
SP	F 200	Space	Feed rate
SP	S + 1000	Space	Spindle speed
CR LF NUL NUL		Line feed	
CR LF NUL NUL		Line feed	
SP		Space	Last block number
SP	M02	Space	M function
CR LF NUL NUL		Line feed	
CR LF NUL NUL		Line feed	
CR LF NUL NUL	00001	Line feed	1st subroutine number
SP		Space	Milling cycle
SP	G71	Space	
SP		Space	
CR LF NUL NUL		Line feed	
CR LF NUL NUL		Line feed	
CR LF NUL NUL		Line feed	3rd subroutine number
SP	U0003	Space	M function
CR LF NUL NUL		Line feed	
CR LF NUL NUL		Line feed	End of program
CR LF NUL NUL		Line feed	Checksum (hex)
CR LF NUL NUL	5E3D	Line feed	
CR LF NUL NUL		Line feed	
CR LF NUL NUL		Line feed	Trailer (63)

EXPLANATORY NOTES

Leader

The leader comprises 50 ASCII codes 'NULL'.

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 's' stand for the

metric system and ASCII code '\$' for the inch

system.

Program number

The program number comprises a 'P' address and a

two-digit 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 num-

bered blocks.

End of program

ASCII code '?' identifies the end of a part

program.

Trailer

The trailer comprises 63 ASCII codes 'NULL'.

ASCII codes 'NULL', '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.

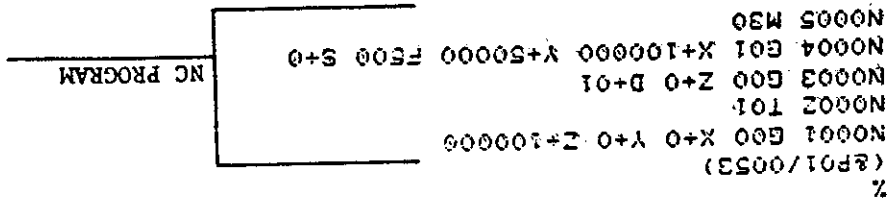
The cassette trailer has 50 ASCII codes 'U'.

4.3 Storage load and checksum

Typical program:

SP01
D01 +010000

COMPENSATION
VALUES



?
11E8

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

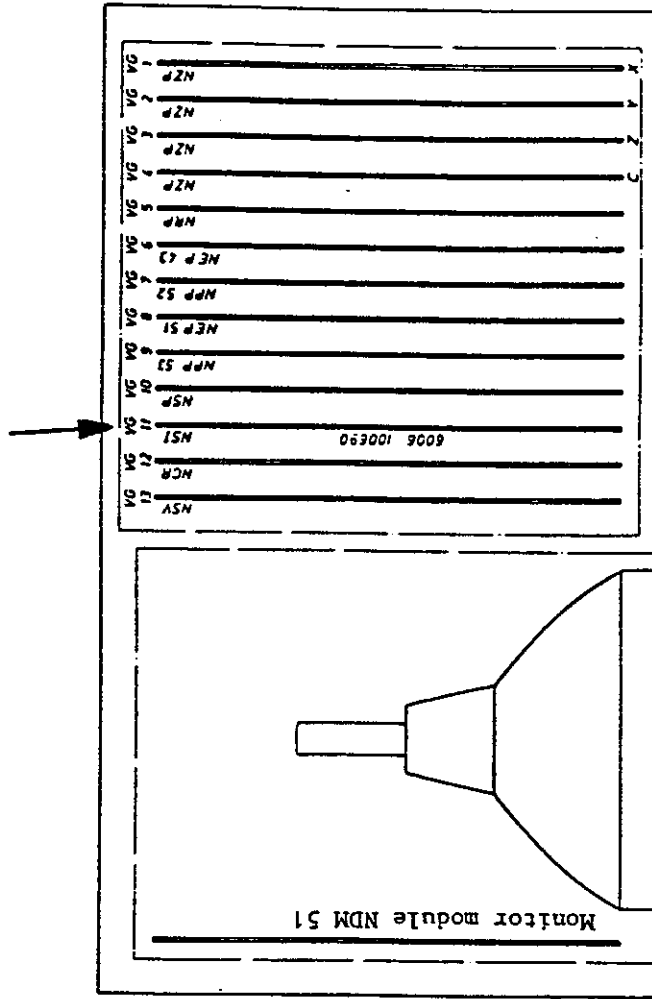
Explanatory notes

First letter	address				
Second letter	L				absolute/incremental
Second letter	D				incremental
Sign	+				absolute dimensions
First numeral	0				with positive or negative sign leading zeros may be omitted: variable word length
Second numeral	decades:				number of digits
Second and third numerals	decades:				number of digits be- fore 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	<u>OPEN</u>	Interface 20 mA	ON = <u>OPEN</u> OFF = <u>OPEN</u>
SG2	OPEN	Interface v.24	ON = <u>OPEN</u> OFF = <u>OPEN</u>
SG3	OPEN	Not assigned	
SG4	OPEN	Not assigned	
SH1	OPEN	300 bauds = reading speed 30 characters/sec	
SH2	OPEN		
SH3	<u>OPEN</u>		
SH4	OPEN		

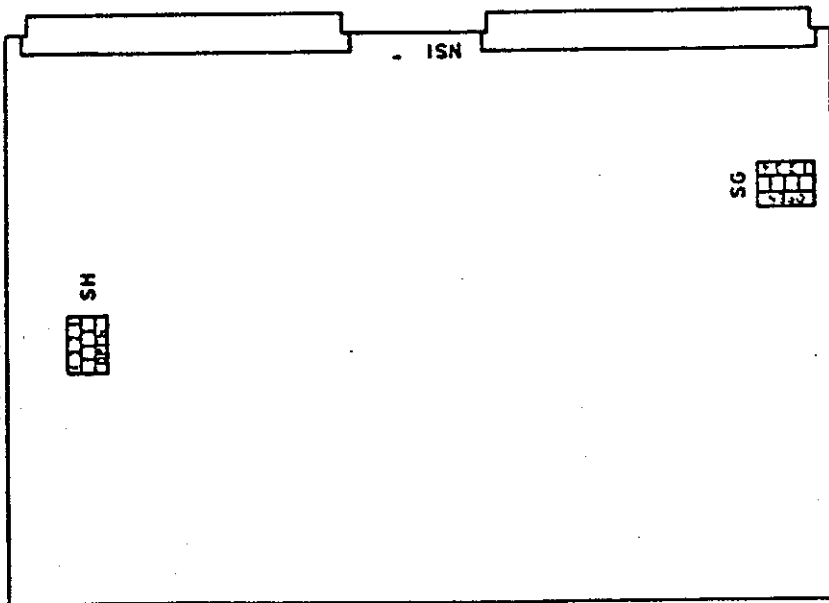
Table 1

Baud rate	SH1	SH2	SH3	SH4	SH5	SH6	SH7	SH8
2400	L	L	L	L	L	L	L	L
1200	H	L	H	L	H	L	H	L
600	L	L	L	L	L	L	L	L
300	H	L	H	L	H	L	H	L
150	L	L	L	L	L	L	L	L
110	H	L	H	L	H	L	H	L
75	L	L	L	L	L	L	L	L

Table 2

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).

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



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).