

# DECKEL

## **DIALOG 4.**

Serial Interface  
for Data Input/Output

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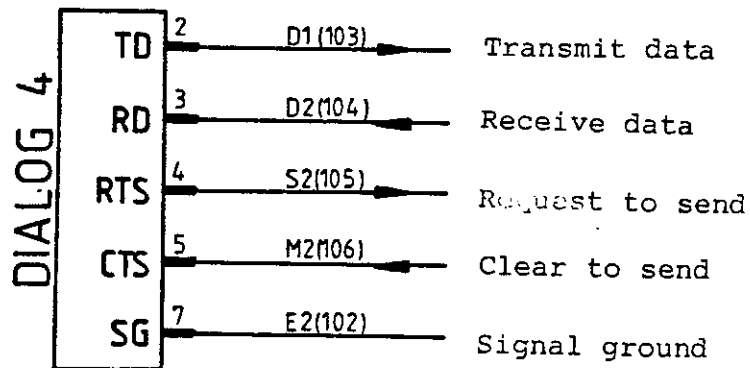
### 3. Cassette recorder interface

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Pin assignment complies with the DIN 66020 standard, with the CNC DIALOG control designated as a data terminal unit.



V.24 interchange circuits (Fig. 2)

Which of the available control and status signal circuits are used depends on the peripheral equipment.

If the status signal circuit (CTS) is not connected, it will be switched to "ON" by internal pull-up resistors.

5. Quick-reference information on interfaces

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## 1. V.24 interface

### 1.1 General information

The V.24 interface of the CNC DIALOG control employs V.24 receivers and V.24 transmitters which comply with the DIN 66020 standard.

The DIN 66020 specification defines the interface connecting data terminal equipment (DTE) with data communications equipment (DCE). It is based on recommendations V.24 and V.28 issued by the CCITT (Comite Consultativ International Telegraphique et Telephonique), which, in turn, are derived from the U.S. EIA RS232 standard.

The interface employed in the CNC DIALOG control represents a combination of all standard V.24 and/or RS232 signals and thus complies with their electrical characteristics.

### 1.2 Interchange circuits

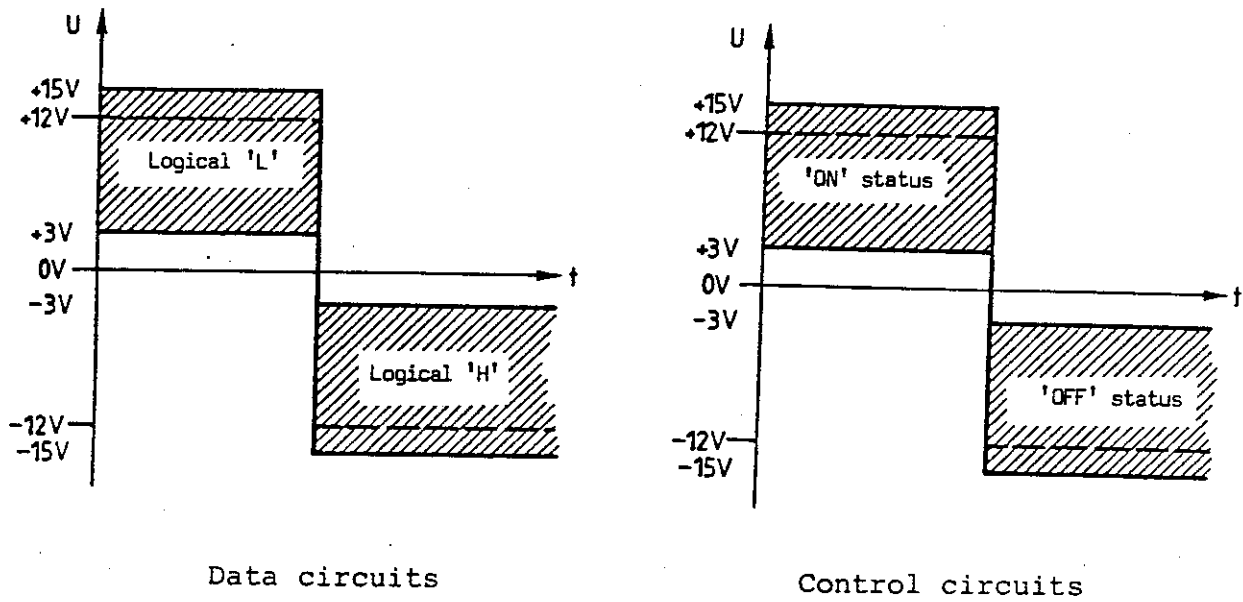
All of the interface signals described in the following refer to the CNC DIALOG control system, which is defined as data terminal equipment (DTE).

#### Ground circuits:

E2: Signal ground (102)

This is the common return for all interchange circuits.

### 1.3 Polarity and signal level allocation



All signal levels are based on signal ground E2 (102).

The signal level is not defined in the transition region (+3V to -3V).

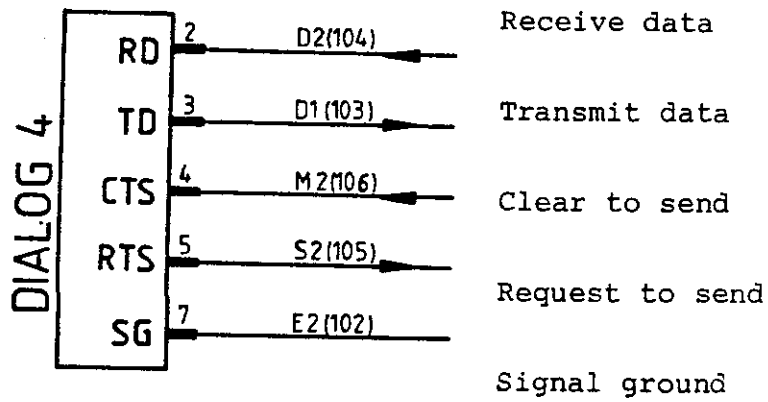


Fig. 4

Which of the available control and status signal circuits are used depends on the peripheral equipment.

If the status signal circuit (CTS) is not connected, it will be switched to "ON" by internal pull-up resistors.

## 2. 20 mA interface

### 2.1 General information

This interface is not standardized. Due to its widespread use, however, it has become virtually a working standard (TTY = TeleType interface). On the CNC DIALOG 4, it is available only on the universal interface I.

### 2.2 Interchange circuits

All of the interface signals described below refer to the CNC DIALOG control system. The 20 mA interface on the CNC DIALOG 4 is active, i.e. it supplies the 20 mA current loop.

#### **Data circuits:**

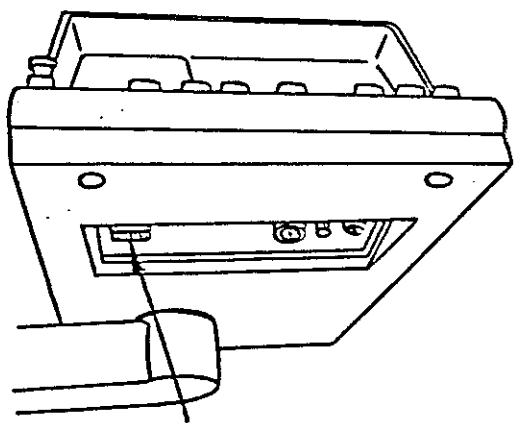
Tx+ : Transmitted data +

Tx- : Transmitted data -

The current loop of the transmitted signal is carried through these two circuits.

2.4 Connection of peripheral equipment to CNC DIALOG control via 20 mA interface

A 25-pin female connector (subminiature DB25S) is located on the bottom panel of the CNC Dialog 4 control unit.



Connector

Fig. 5

The connector pin assignment is shown in Fig. 6.

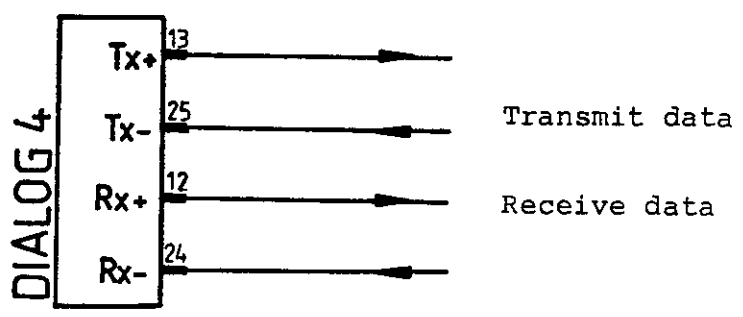


Fig. 6

### 3. Cassette recorder interface

#### 3.1 General information

The cassette recorder interface operates in accordance with the so-called "Kansas City" standard, in which the transmitted signal is modulated and/or the received signal demodulated.

#### 3.2 Interchange circuits

Ground circuits:

SG: Signal ground

This circuit is the common return for send and receive signal.

Data circuits:

Tx: Transmitted data

Modulated data are carried from the CNC DIALOG control to the cassette recorder through this circuit.

Rx: Received data

Modulated data are transferred from the cassette recorder to the CNC DIALOG control through this circuit.

3.4 Connection of peripheral equipment to CNC DIALOG control via cassette recorder interface

A 3-conductor jack is provided for this interface on the bottom panel of the CNC DIALOG 4 control system.

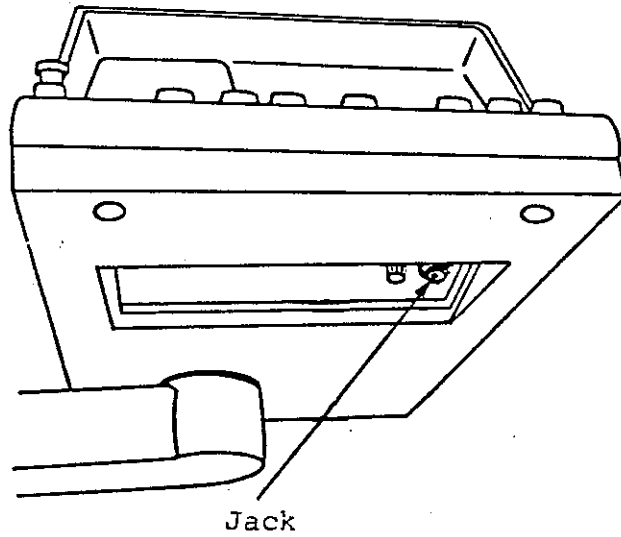


Fig. 7

#### 4. RS485 interface

##### 4.1 General information

This interface of the CNC DIALOG control system employs a driver and receiver module whose electrical characteristics conform to the U.S. EIA standard.

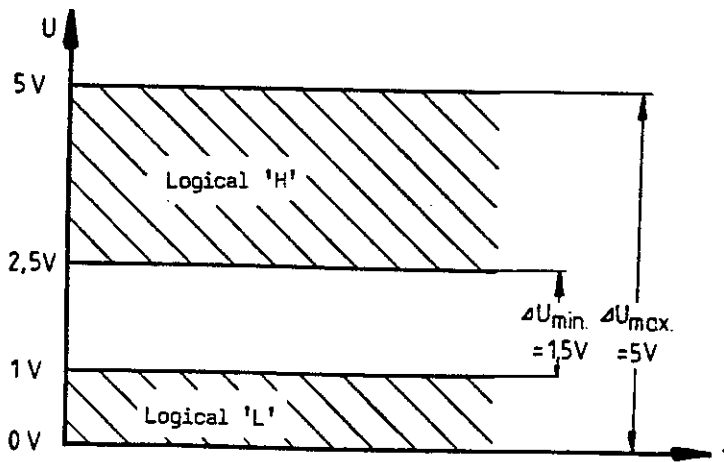
These drivers permit the development of a linear data network (bus system) with up to 32 devices. Symmetrical transfer provides for increased reliability of data links.

##### 4.2 Interchange circuits

Data circuits:

A, B: The send and receive signal is carried via this paired circuit in the form of differential voltage.

##### 4.3 Signal level



Signal level allocation

#### 4.4 Connection to CNC DIALOG control via RS485 interface

Connection to the CNC DIALOG 4 is made via the universal interface I (optional). This additional jack connector (subminiature DB25S) is located on the bottom panel.

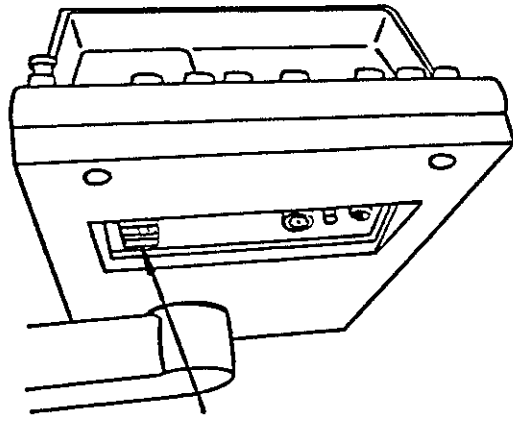


Fig. 9

Connector  
Universal interface II

Pin assignment is shown in Fig. 10.

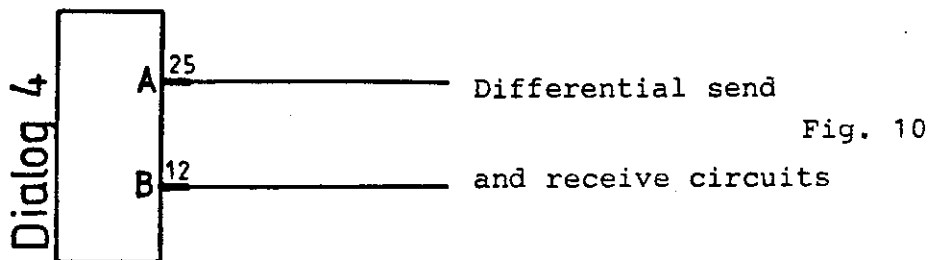


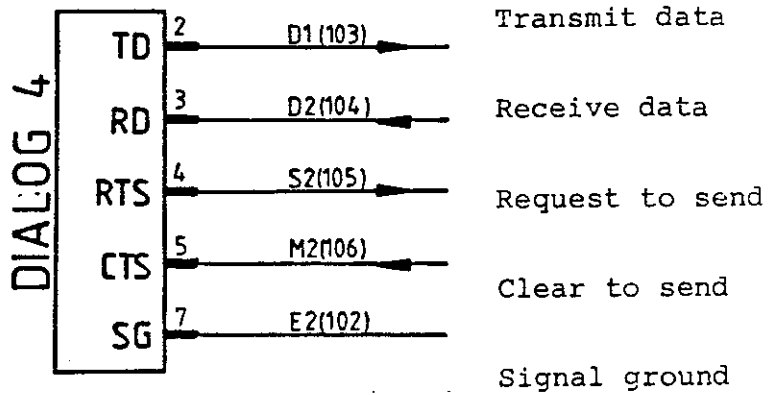
Fig. 10

5. Quick-reference information on interfaces

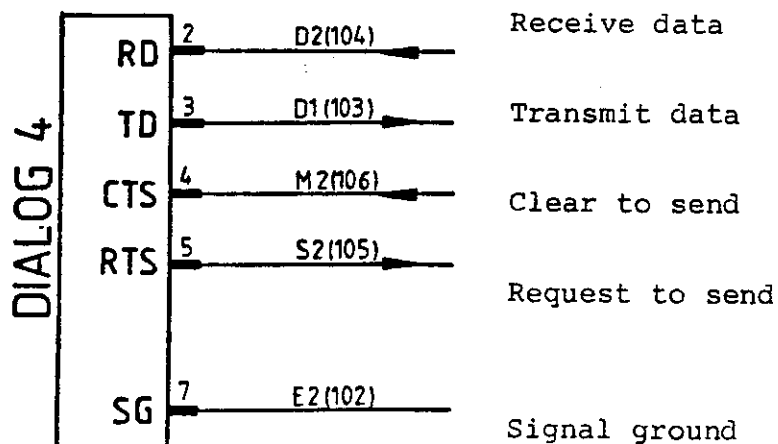
5.1 Pin assignment for serial interfaces

5.1.1 V.24 interface

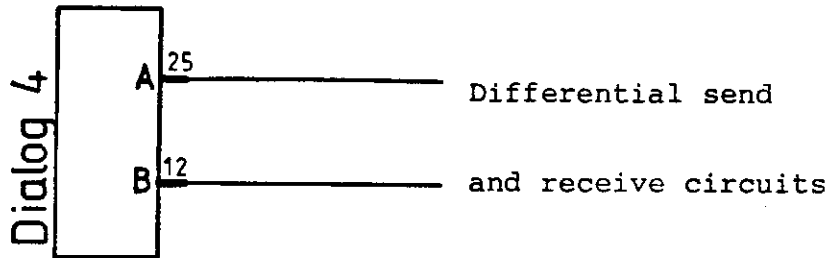
a) Universal interface I (DTE assignment)



b) Universal interface II (DCE assignment)



5.1.4 RS485 interface  
(universal interface II only)

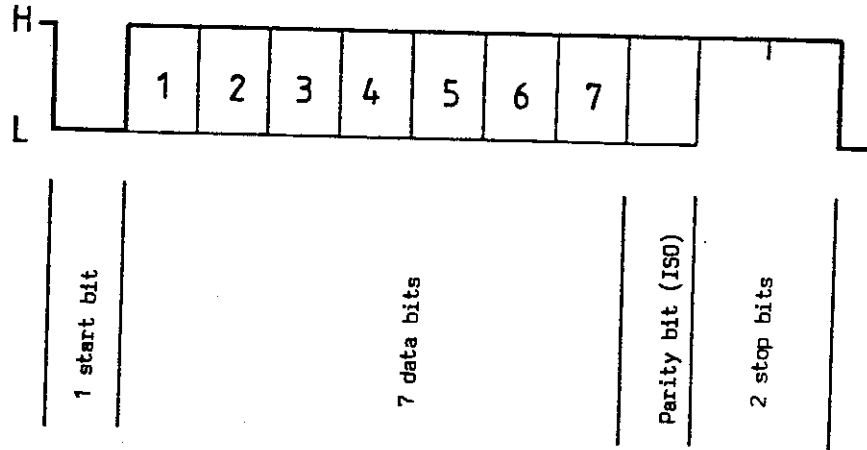


5.2 Signal identification

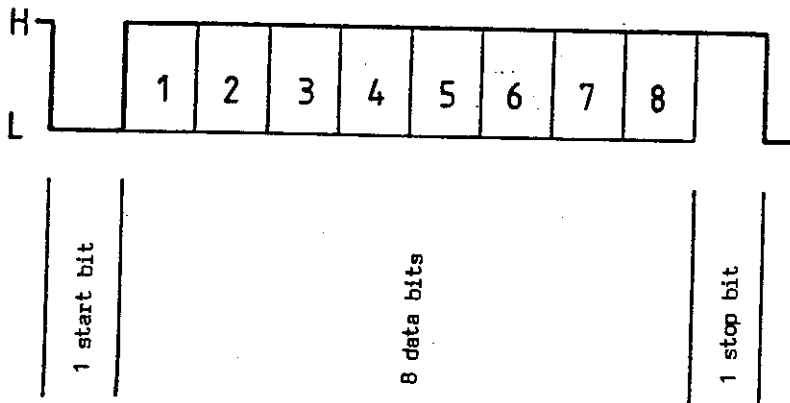
TD	Transmit data	V.24
RD	Receive data	V.24
RTS	Request to send	V.24
CTS	Clear to send	V.24
SG	Signal ground	V.24
TX+	Transmit data +	20mA
TX-	Transmit data -	20mA
RX+	Receive data +	20mA
RX-	Receive data -	20mA
TX	Transmit data	Cassette recorder
RX	Receive data	Cassette recorder
SG	Signal ground	Cassette recorder
A	Send and receive	RS 485
B	differential circuits	RS 485

### 5.3.2 Cassette recorder interface format

#### Transmit format:



#### Receive format:



6. Program format

6.1 Permissible ASCII codes

ASCII input		ASCII input		ASCII input		ASCII input	
HEX	CODE	HEX	CODE	HEX	CODE	HEX	CODE
+00	NUL	+20	SP	40	@	60	
01	SOH	21	!	+ 41	A	61	a
02	STX	22	"	X 42	B	62	b
03	ETX	23	#	+ 43	C	63	c
04	EOT	X24	\$	+ 44	D	64	d
05	ENQ	X25	%	X 45	E	65	e
06	ACK	X26	&	+ 46	F	66	f
07	BEL	27	'	+ 47	G	67	g
08	BS	X28	(	X 48	H	68	h
09	HT	X29	)	+ 49	I	69	i
+0A	LF	+2A	*	+ 4A	J	6A	j
0B	VT	+2B	+	+ 4B	K	6B	k
0C	FF	2C	,	+ 4C	L	6C	l
+0D	CR	+2D	-	+ 4D	M	6D	m
0E	SO	+2E	.	+ 4E	N	6E	n
0F	SI	X2F	/	X 4F	O	6F	o
10	DLE	+30	0	X 50	P	70	p
11	DC1	+31	1	X 51	Q	71	q
12	DC2	+32	2	+ 52	R	72	r
13	DC3	+33	3	+ 53	S	73	s
14	DC4	+34	4	+ 54	T	74	t
15	NAK	+35	5	+ 55	U	75	u
16	SYN	+36	6	X 56	V	76	v
17	ETB	+37	7	+ 57	W	77	w
18	CAN	+38	8	+ 58	X	78	x
19	EM	+39	9	+ 59	Y	79	y
1A	SUB	3A	:	+ 5A	Z	7A	z
1B	ESC	3B	;	5B	[	7B	{
1C	FS	3C	<	5C	\	7C	
1D	GS	3D	=	5D	]	7D	}
1E	RS	3E	>	5E	^	7E	~
1F	US	X3F	?	5F	_	7F	DEL

+ Permissible code

x Permitted in tape leader and trailer only

Line feed		CR LF NUL NUL
Last block number	N9999	
Space		SP
M function	M2	
Line feed		CR LF NUL NUL
Line feed		CR LF NUL NUL
1st subroutine number	N*1	
Space		SP
Milling cycle	G71	
Space		SP
.		
.		
.		
Line feed		CR LF NUL NUL
3rd subroutine number	N*3	
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

Consists of 50 ASCII codes "NUL".

### Trailer

Consists of 63 ASCII codes "NUL".

ASCII codes "NUL" "CR" "LF" "SP" serve only to make the printout more legible and are ignored by the control system.

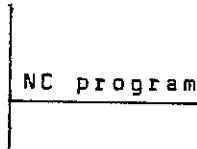
The cassette format differs from the this punched tape format only in that the former uses a different LEADER.

The cassette leader has 50 ASCII codes "U".

### 6.3 Memory load and checksum

Sample program:

```
%  
(%X1/000058"EXAMPLE)  
N1 G0 X0 Y0 Z100  
N2 T1  
N3 G0 Z0 D1  
N4 G1 X100 Y50 F500 S+0  
N5 M30  
  
?  
0B4E
```



Memory load : dec 88 (hex 000058)

Checksum : dec 2891 (hex 0B4E)

#### 6.4 Word structure (metric)

%06, %06\*03, N06, N\*06, G02, XL+043, YL+043,  
ZL+043, CL+043, D+02, ID043, JD043, KD043,  
F04, S+04, M02, T02, L02, AD043, WL+043

#### Key:

1st letter	address	
2nd letter	L	Absolute/incremental
2nd letter	D	Incremental
Prefix sign	+	Absolute dimensions with positive or negative prefix.
1st numeral	0	Leading zeros may be omitted: variable word length.
2nd numeral	decades	Number of digits
2nd and	decades	Number of digits
3rd numeral		before and after decimal point. (coordinate values X, Y,Z,I,J,K in mm)

7. Selection of interface and baud rate

You can select the desired type of interface and the baud rate for both universal interfaces from an on-screen menu in operating mode 14. Please refer to your Operator's Manual for further details.

Suppliers:

3-conductor plug, type PJ 068:  
available from the firm Bürklin, Munich and  
Düsseldorf.

