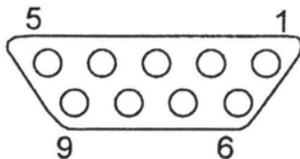


# Serial Interface



## 19. Interface RS232C or RS485 (depending on the unit version)

The following circulator functions can be controlled by a computer via the interfaces:

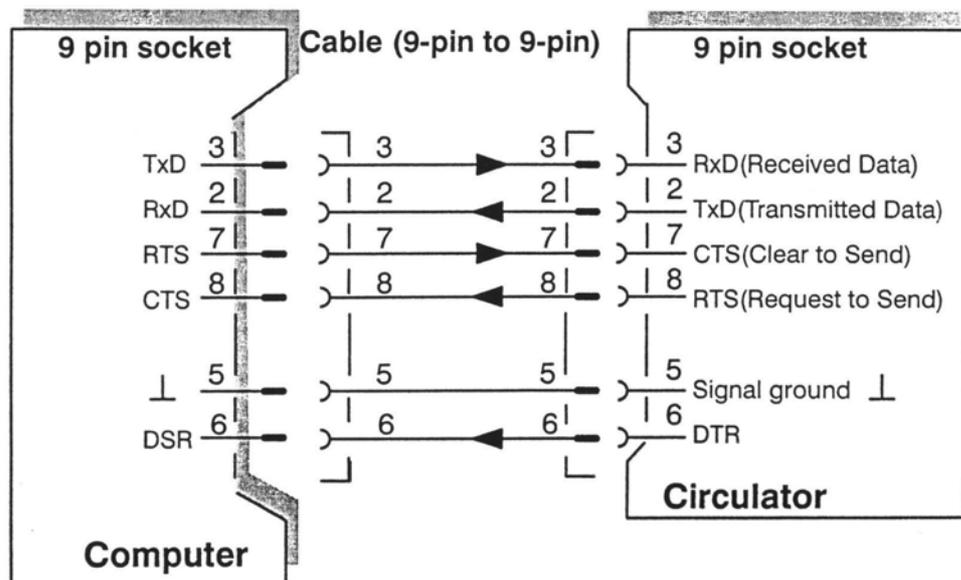
- Setting of the set values "SET S, SET F1 – SET F3", the correction factors "RTA S, RTA F1 – RTA F3" and the temperature deviation "dT" is possible;
- the actual temperature can be read off;
- the circulator can be reset, started or stopped;
- any fault messages can also be displayed.

The RS232C interface uses separate lines for sending and receiving data whereas data transfer is carried out bi-directionally with the RS485 interface whereby the directional assignment is given via the software by switching. This switching is carried out automatically at the circulator whereby the data directional assignment for the interface board must be set by the user at the PC.

### 19.1 Connecting to a computer

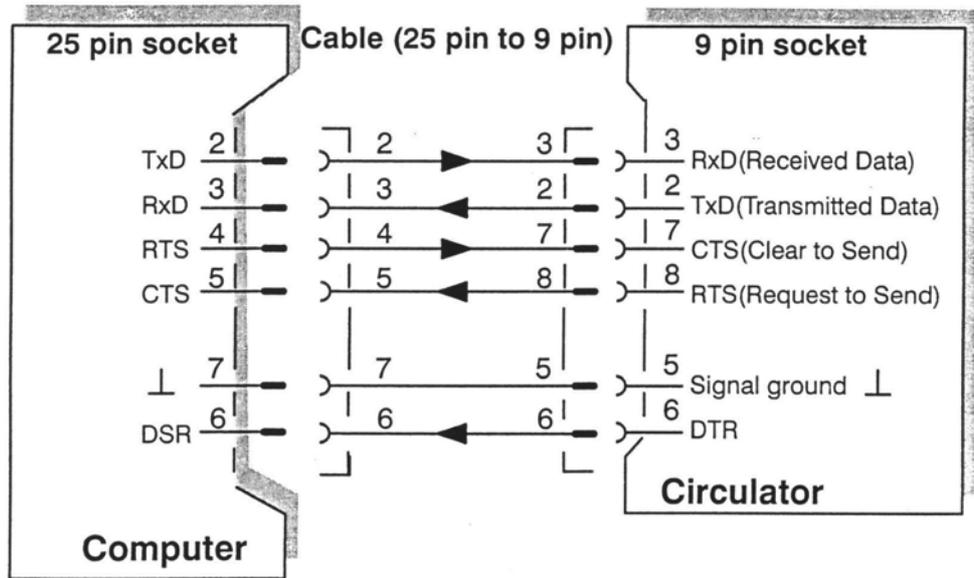
#### 19.1.1 PC with an RS232C interface

The pin assignment required when connecting the circulator to a computer via a 9-pin socket is as follows:



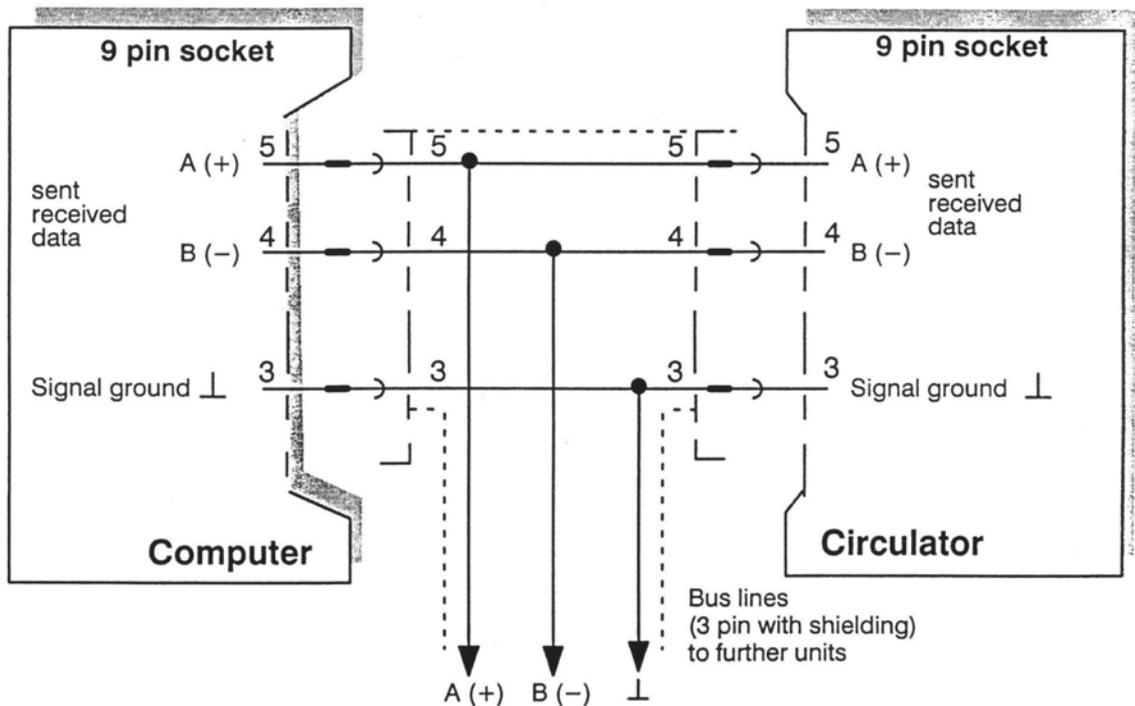
# Serial Interface

The pin assignment required when connecting the circulator to a computer via a **25-pin** socket is as follows:



## 19.1.2 PC with an RS485 interface

The pin assignment required when connecting the circulator to a computer via a **9-pin** socket is as follows:



☞ Check the connection assignments of the PC interface board with the diagram above before starting up!

# Serial Interface

---

## 19.2 Interface parameter

Interface parameters can be set via the circulator as follows:

Baud rate (600, 1200, 2400, 4800, 9600)

Parity (OFF= without parity  
odd = odd  
E = even)

Handshake (OFF= without RTS/CTS  
on = with RTS/CTS)

All these transfer parameters **cannot** be altered via the interface.

### Maximum baud rate

Recommendation for the maximum baudrate: **4800 bauds**

The communication between the computer and the circulator should not take place at a baud rate higher than 4800. Occasional transfer failures can occur at a baud rate of 9600.

## 19.3 Requirements made of external units

Only units which have been tested according to EN 60 950 (=IEC 950) should be connected to the interface of the circulator.

## 19.4 Storing of desired values

If the desired value is set via the computer ...

- the set values "SET S, SET F1 – SET F3"
- the correction factors "RTA S, RTA F1 – RTA F3"
- the temperature deviation values "dT"

... are stored permanently, even if the mains supply current of the DC50 is switched off or the interface connection is interrupted.

## Serial Interface

### 19.5 Commands

**For interface RS485:** The string 'ADR<unit address>' must precede every command in case of programming. The unit address is set according to chapter 15.19.

cr : carriage return

<value> : any value with positive or negative sign, comma can be omitted with whole numbers (e.g. 12 = 12.0 = 12.00 = 12.000)

DC50-command	Alternative command	Answer	
'W ST',cr	'ST',cr	\$<cr><lf>	Stop control
'W GO',cr	'GO',cr	\$<cr><lf>	Start control
'R V',cr	'V',cr	DC50:1.00-04/97\$<cr><lf>	VERSION DC50
'R VE',cr	'VE',cr	DC50:1.00-04/97\$<cr><lf>	
'W RS',cr	'RS',cr	\$<cr><lf>	RESET-Command
'R B',cr	'B',cr	BS00101000000\$<cr><lf>	read operating status
'R BS',cr	'BS',cr	BS00101000000\$<cr><lf>	
'R S',cr	'S',cr	S0+0023.50\$<cr><lf>	read active set value (set value S selected)
'R SW',cr	'SW',cr	S1-0012.50\$<cr><lf>	read active set value (fixed temp.1 select.)
		S2+0023.50\$<cr><lf>	read active set value (fixed temp.2 select.)
		S3-0012.50\$<cr><lf>	read active set value (fixed temp.3 select.)
'R I',cr	'I',cr	T1+0023.50\$<cr><lf>	read internal sensor
'R T1',cr	'T1',cr	T1+0023.50\$<cr><lf>	
'R T3',cr	'T3',cr	T3+0023.50\$<cr><lf>	read external sensor
'W AL',cr	'AL',cr	\$<cr><lf>	Alarm triggering
'W ER',cr	'ER',cr	\$<cr><lf>	unlocking executed
'W EG',cr	'EG',cr	\$<cr><lf>	
'W ER',cr	'ER',cr	!<cr><lf>	Alarm source or just unlocked
'W EG',cr	'EG',cr	!<cr><lf>	
'W NS 1',cr	NS 1,cr	\$<cr><lf>	1 decimal place at actual temp. display
'W NS 2',cr	NS 2,cr	\$<cr><lf>	2 decimal places at actual temp. display
'W L',cr	'L',cr	\$<cr><lf>	blocking the ENTER key
'W U',cr	'U',cr	\$<cr><lf>	releasing the ENTER key
'R HL',cr	'HL',cr	HL+0150.00\$<cr><lf>	read high limit
'R LL',cr	'LL',cr	LL- 0030.00\$<cr><lf>	read low limit

## Serial Interface

DC50-command	Alternative command	Answer	
'W EX',cr	'EX',cr	\$<cr><lf>	set external control
'W IN',cr	'IN',cr	\$<cr><lf>	set internal control
'R ZR',cr	'ZR'	ZR0\$<cr><lf>	read control mode (internal)
'R ZR',cr	'ZR'	ZR1\$<cr><lf>	read control mode (external)
'R IS',cr	'IS',cr	IS+00.30\$<cr><lf>	read RTA S internal for set value S
'R I1',cr	'I1',cr	I1+00.30\$<cr><lf>	read RTA F1 internal for fixed temp.1
'R I2',cr	'I2',cr	I2+00.30\$<cr><lf>	read RTA F2 internal for fixed temp.2
'R I3',cr	'I3',cr	I3+00.30\$<cr><lf>	read RTA F3 internal for fixed temp.3
'R ES',cr	'ES',cr	ES+00.30\$<cr><lf>	read RTA external cS for set value S
'R E1',cr	'E1',cr	E1+00.30\$<cr><lf>	read RTA F1 external for fixed temp.1
'R E2',cr	'E2',cr	E2+00.30\$<cr><lf>	read RTA F2 external for fixed temp.2
'R E3',cr	'E3',cr	E3+00.30\$<cr><lf>	read RTA F3 external for fixed temp.3
'W IS <value>',cr	'IS xxxx',cr	\$<cr><lf>	change RTA S internal for set value S
'W I1 <value>',cr	'I1 xxxx',cr	\$<cr><lf>	change RTA F1 internal for fixed temp.1
'W I2 <value>',cr	'I2 xxxx',cr	\$<cr><lf>	change RTA F2 internal for fixed temp.2
'W I3 <value>',cr	'I3 xxxx',cr	\$<cr><lf>	change RTA F3 internal for fixed temp.3
'W ES <value>',cr	'ES xxxx',cr	\$<cr><lf>	change RTA S external for set value S
'W E1 <value>',cr	'E1 xxxx',cr	\$<cr><lf>	change RTA F1 external for fixed temp.1
'W E2 <value>',cr	'E2 xxxx',cr	\$<cr><lf>	change RTA F2 external for fixed temp.2
'W E3 <value>',cr	'E3 xxxx',cr	\$<cr><lf>	change RTA F3 external for fixed temp.3
'R S0',cr	'S0',cr	S0+0020.30\$<cr><lf>	read set value S
'R S1',cr	'S1',cr	S1+0070.00\$<cr><lf>	read fixed temperature 1
'R S2',cr	'S2',cr	S2-0010.00\$<cr><lf>	read fixed temperature 2
'R S3',cr	'S3',cr	S3+0040.00\$<cr><lf>	read fixed temperature 3
'W S0 <value>',cr	'S0 xxxx',cr	\$<cr><lf>	change set value S with storing
'W S1 <value>',cr	'S1 xxxx',cr	\$<cr><lf>	change fixed temperature 1 with storing
'W S2 <value>',cr	'S2 xxxx',cr	\$<cr><lf>	change fixed temperature 2 with storing
'W S3 <value>',cr	'S3 xxxx',cr	\$<cr><lf>	change fixed temperature 3 with storing
'R DS',cr	'DS',cr	DS+20.00\$<cr><lf>	read dT for set value S
'R D1',cr	'D1',cr	D1+20.00\$<cr><lf>	read dT for fixed temperature 1
'R D2',cr	'D2',cr	D2+20.00\$<cr><lf>	read dT for fixed temperature 2
'R D3',cr	'D3',cr	D3+20.00\$<cr><lf>	read dT for fixed temperature 3
'W DS <value>',cr	'D0 xxxx',cr	\$<cr><lf>	change dT for set value S
'W D1 <value>',cr	'D1 xxxx',cr	\$<cr><lf>	change dT for fixed temperature 1
'W D2 <value>',cr	'D2 xxxx',cr	\$<cr><lf>	change dT for fixed temperature 2
'W D3 <value>',cr	'D3 xxxx',cr	\$<cr><lf>	change dT for fixed temperature 3

## Serial Interface

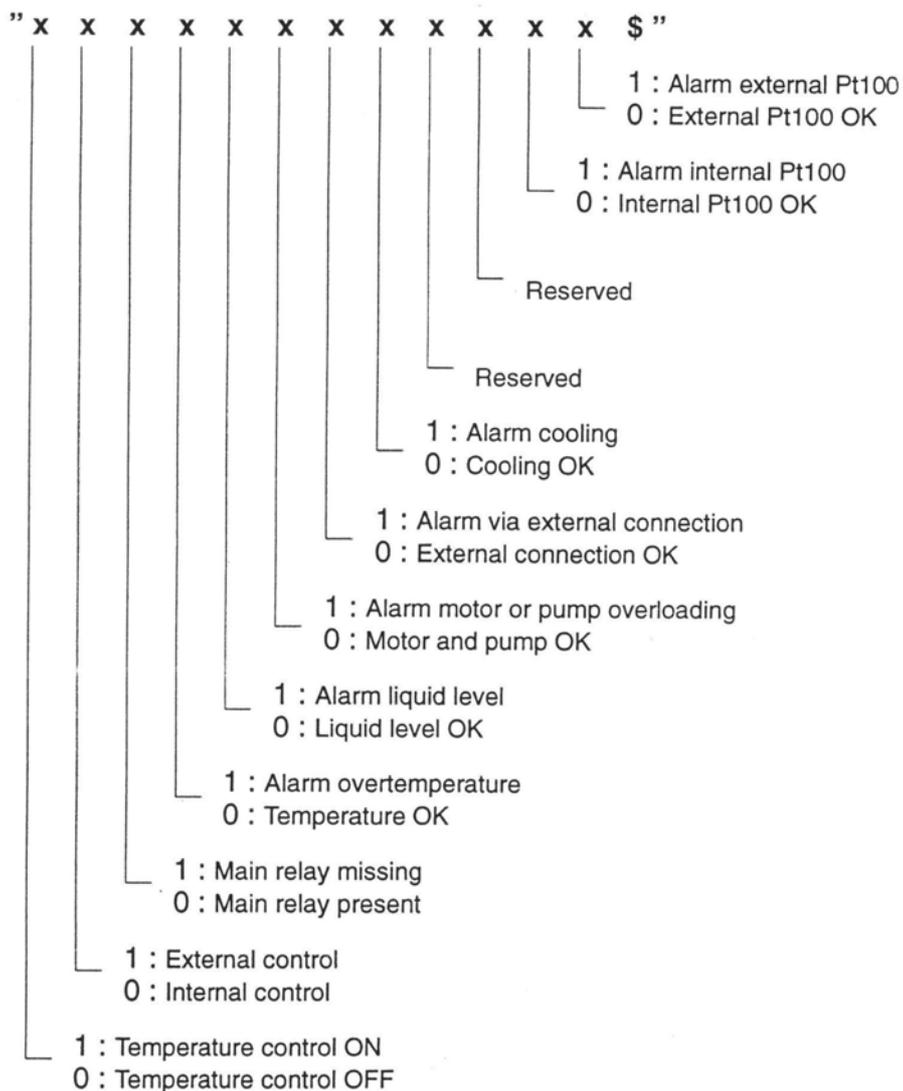
DC50-command	Alternative command	Answer	
'R GT',cr	GT,cr	GT00\$<cr><lf>	read type of cooling unit
			03: no cooling
			00: K40/K41
			01: K35/K50
			02: K75
'R GK',cr	GK,cr	GK00\$<cr><lf>	read type of temperature control module
			02: DC50
'W KG 0',cr		\$<cr><lf>	cooling OFF
'W KG 1',cr		\$<cr><lf>	cooling ON
'R KG',cr	'KG',cr	KG0\$<cr><lf>	read cooling status (OFF)
'R KG',cr	'KG',cr	KG1\$<cr><lf>	read cooling status (ON)
'W KH 0',cr		\$<cr><lf>	switch cooling at SET >100°C OFF
'W KH 1',cr		\$<cr><lf>	switch cooling at SET >100°C ON
'R KH',cr	'KH',cr	KH0\$<cr><lf>	read cooling status at SET >100°C (OFF)
'R KH',cr	'KH',cr	KH1\$<cr><lf>	read cooling status at SET >100°C (ON)
'W ZA 0',cr		\$<cr><lf>	switch Autostart OFF
'W ZA 1',cr		\$<cr><lf>	switch Autostart ON
'R ZA',cr	'ZA',cr	ZA0\$<cr><lf>	read Autostart status (OFF)
'R ZA',cr	'ZA',cr	ZA1\$<cr><lf>	read Autostart status (ON)

# Serial Interface

## 19.6 Operating status / Error message

R\_BS<cr> Call up operating status:

After entering one of these commands, the following twelve "state flags" are shown:



## ***Serial Interface***

---

### **19.7 Controlling via a BASIC program**

The range of commands stored in the unit can be activated by this simple program:

```
REM  command procedure
REM  enter 1st command
REM  2nd command is passed on to the unit
CLOSE
OPEN "COM2:4800,N,8,1,CS0,DS0,CD0" AS #1
```

loop:

```
  b$ = " "
  INPUT "command: ";b$
  if b$ = "X" then markend
  if b$ = "x" then markend
```

repeat command:

```
  PRINT #1,b$
  PRINT
  PRINT "return message"
  PRINT "-----"
```

GOSUB enter

GOTO loop

markend:

END

enter:

```
  A$ = " "
```

read loop:

```
  X = ASC (INPUT$(1,#1))
  IF X = 10 THEN read end
  A$ = A$ + CHR$(X)
  GOTO read loop
```

read end:

```
  print a$
  RETURN
```

#### **Note:**

Only capital letters are accepted for commands!