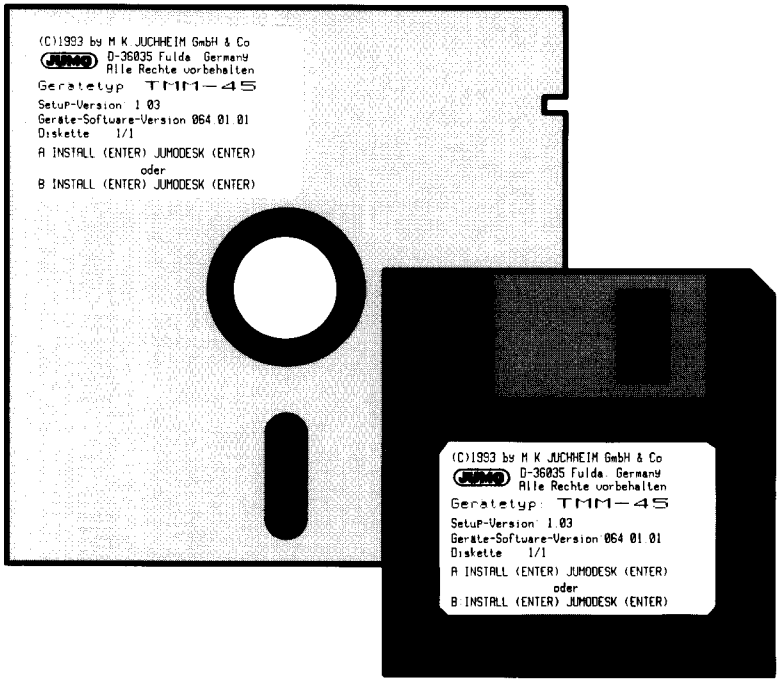
JUMO

MEASUREMENT AND CONTROL

Configuration software

Programmable transmitter
Type TMM-45/...



B 95.6510.3

8.95/V 00307244

Operating Instructions

M. K. JUCHHEIM & CO · 36035 FULDA · GERMANY
Phone (0661) 6003-0 · Fax (0661) 6003-607 · Telex 49701 jufd

Introductory note:

Please read these Operating Instructions before you use the configuration software. Keep the Operating Instructions in a place accessible to all users. Please assist us in incorporating improvements in these instructions. You suggestions will be very welcome.

Technical Documentation GB II
Phone Germany: (06 61) 60 03-2 12
abroad: (int. + 49) 6 61-60 03-2 12
Fax Germany: (06 61) 60 03-6 07
abroad: (int. + 49) 6 61-60 03-6 07

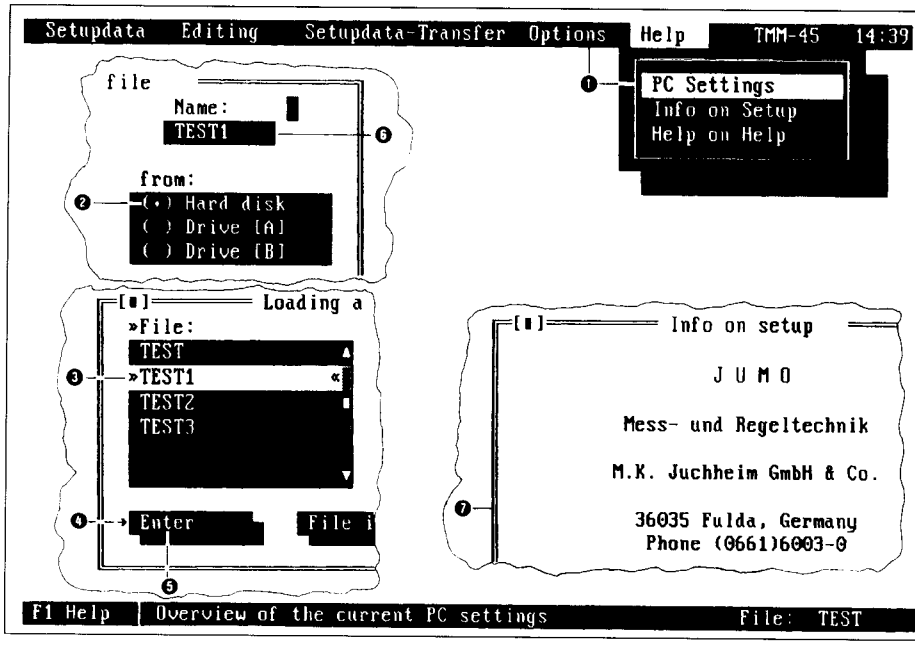
CONTENTS

CONTENTS

Note:

All settings which can be executed with the configuration software are described in these Operating Instructions. If any problems should arise during installation or during program execution please contact the nearest office or the factory. You are also asked not to carry out any manipulations on the software or interface which are not permitted. You could endanger your rights under the warranty!

+ **Please ensure that the diskette cannot be erased unintentionally. Store the diskette in a place where it is protected against strong magnetic fields, high temperatures, dust or splash water.**
Save and archive your setup data regularly.
No TSR (terminate stay resident) programs must be active on your computer while the program is running.



1.1 Important information and conventions

❶ Menu line and window
It shows all available functions which can be executed on this screen and which may in turn contain several sub-functions. These are shown in a window underneath each other.

❷ Selection symbol
Symbol for selecting an option from any number.

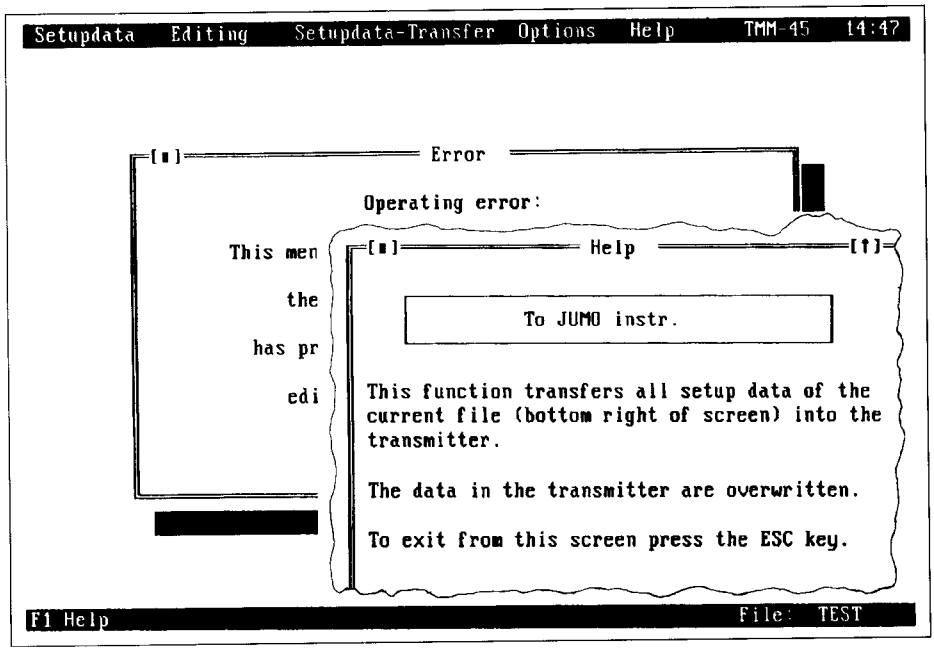
❸ Selection line
Auxiliary element with which the information shown can be scrolled with the mouse in order to select an entry.

❹ Selection fields
Termination of a dialogue or call-up of another dialogue, e.g. OK, editing, others, abort.

❺ Short command
A function can be executed directly by pressing the letter highlighted in the function name in conjunction with the Alt key.

❻ Input dialogue window
Input or alteration of setting or set-up data.

❼ Information window
Draws the user's attention to particularly important points.



Typographical conventions

These Operating Instructions employ certain conventions which illustrate particular operating sequences for the user. These symbols are valid for the entire Instructions and have the following meaning:

Presentation	Explanation
*	action instruction
»Setup data«	quotation from screen
»editing → signal inputs«	shows the operating sequence,the way a function can be reached
↵ ESC	keys are shown as symbol or as text in a frame

Logic program sequence

Functions backed grey (on colour screens) or at low contrast (on black-white screens) can not be executed.
They appear when the operator is not keeping to the logic program sequence.

Example:
data can not be edited when no file has been set up or loaded.

Function keys

The keys F1 to F10 are assigned different functions.

Help function

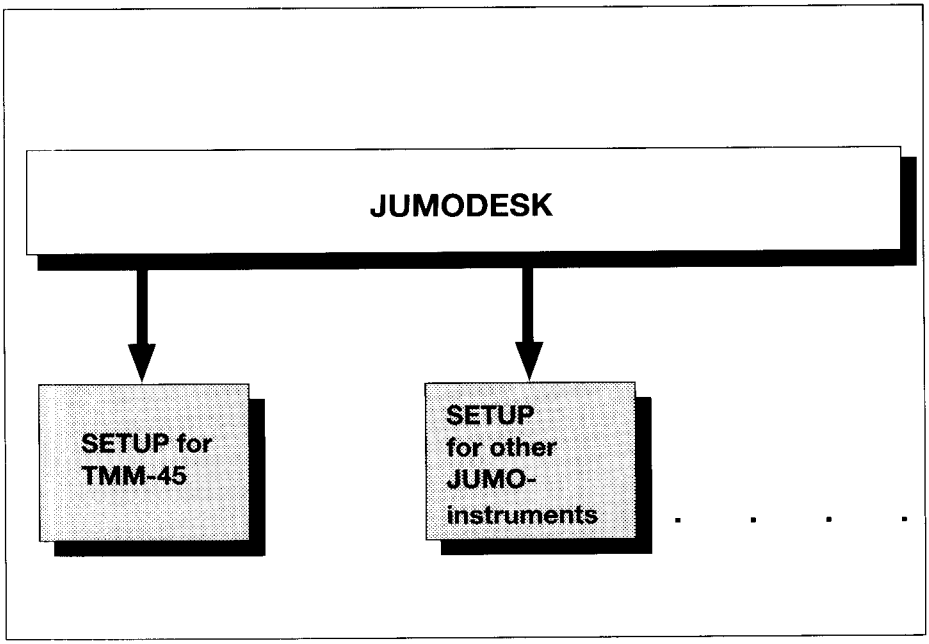
Help can be called up for each screen using the key F1.
A dialogue with the user is produced during operation by the status line which appears at the bottom screen edge with brief information. The help window is enlarged or reduced using the key F5.

Error messages

Invalid inputs result in error messages (error windows) on entering which indicate the cause of the error. They have to be acknowledged (operating window) in order to cancel the error message.

Default values

Default values are provided for each screen setting. These default values are standard settings which can be altered.



1.2 The SAA Standard

The word SAA means Systems Application Architecture and represents an agreement on the uniform arrangement of a user surface, laying down a consistent presentation for different software products.

Through the regular use of software which is at least generally similar to the SAA Standard the user saves time since the learning process is continuously shortened.

JUMO uses this Standard as a base of the setup programs of its instruments with highly diverse applications.

The external appearance does however remain the same and the operating sequences are always repeated.

Fixed mouse functions and standardised keyboard operation simplify operation, as does the status line which directly provides additional information, and help texts which do this indirectly.

1.3 Menu arrangement

The JUMO configuration software consists of two parts, the user surface JUMODESK and the setup program.

Functions of the user surface:

- make screen settings
- select interfaces
- select printer
- select language
- comfortable call-up of the setup program and automatic recognition of the JUMO instrument
- make computer system settings
- auto-setup start
- instrument selection/setup start

Functions of the setup software:

- read data set from the transmitter
- make data set
- edit (alter) data set
- transfer data set to the transmitter
- store and read data set
- output data set to printer

A data set contains all the configuration data of the transmitter.

1.4 Hardware and software requirements

Hardware requirements

IBM-PC AT or compatible computer with the following specification:

- 640 K RAM
  of which 480 K free (determine through chdsk)
- 3-1/2" or 5-1/4" disk drive
- hard disk drive
  3 M free
- 1 serial interface RS 232 for data interchange between PC and transmitter
- 1 serial interface RS 232 for connecting a mouse.
  This interface is not required when using a bus mouse.

The program can also be operated without a mouse.

Software requirements

Can be run from MS-DOS[1] Version 3.3 with the following mouse driver versions:
Microsoft from Version 6.24
Logitech from Version 4.10
Genius from Version 9.02

1.5 Installation on the PC

* Insert diskette into drive
* Input a: Install ↵ or b: install ↵
* Select language with the arrow keys
* Enter with ↵
* Leave directory name C:\ JUMOSET or input a different name, press ↵
* Overview of the installation data
  enter with ↵
  (program is being installed)[2]
* Question »README.DOC Display ?«
  Confirm with ↵
* The text can be scrolled with PgUp or PgDn
* Press ESC to leave the installation program
* Input jumodesk ↵ (JUMODESK starts)

1.6 Start/quit program

Starting program

* Input jumodesk ↵

Terminating program

* Terminate SETUP with
  »Setup data → quit«
* Terminate JUMODESK with
  »programs → quit« (DOS level)

1. MS-DOS is a registered Trademark of the Microsoft Corporation.
2. LHA 213.EXE Version 2.13 and all associated files are part of the compression software LHA 2.13 Copyright (c) Haruyasu Yoshizaki, 1988-91.

1.7 Operation with and without mouse

Operation with mouse

If a mouse is being used to control the program it is necessary for a mouse driver to be **present and loaded**. If this is not the case the configuration program does not react to the mouse movements.

Possible errors:
- no mouse driver
- mouse connected to the wrong interface (this interface can be set in the user surface, see Item 2.3.1)
- mouse hardware can not run with the mouse driver

Only the left mouse key is active. A window can be shifted by placing the cursor on the top window edge, holding down the left mouse key and moving the mouse. Klicking on the selection fields executes the command as for a short command.

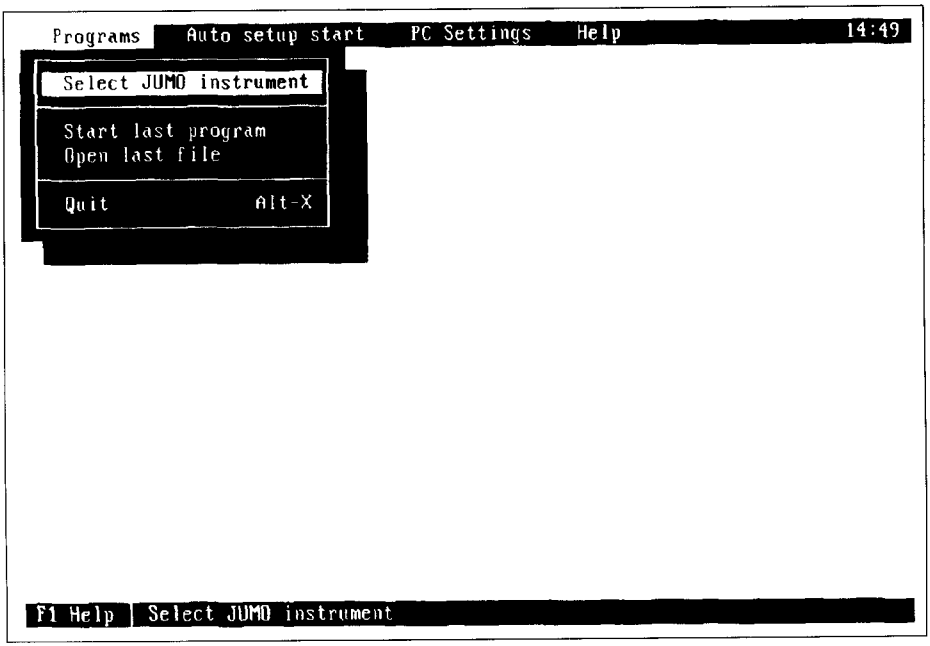
In the help windows and in the menu »File → Info Text« the size of the window can be enlarged =[↓]=and reduced [↑].

The window is closed with =[■]= .

Operation without mouse

If no mouse is connected or if none is available the program can also be controlled from the keyboard.

Key	Meaning	Function
←┘	return	execute the function of the selected field
→ ←	cursor keys	moving the cursor in the arrow direction
→| |←	tab key	run cyclically through input windows
ESC	escape key	closes a window, enters no data/executes no command



JUMODESK is a user surface which permits making screen settings, selecting printer, monitor, language and interfaces, recognising JUMO instruments and starting the appropriate setup program.

This user surface is the same for all JUMO instruments. It is required for adapting the program to a PC or laptop and to select a setup program.

Once a setting has been made it is retained when the program is restarted.

2.1 Programs

2.1.1 Select JUMO instrument

This function selects the JUMO instrument to be configured.

2.1.2 Start last program

This function automatically starts the setup program which had been opened last. It saves selecting a JUMO instrument and selecting a software version.

2.1.3 Open last file

This function automatically starts the setup program which had been edited last and opens the file edited last.

The right bottom corner of the screen shows the file name with a dark background (blue on colour monitors).

This function is used to save selecting a JUMO instrument, selecting a software version and loading a file.

The file can be edited immediately.

2.1.4 Quit

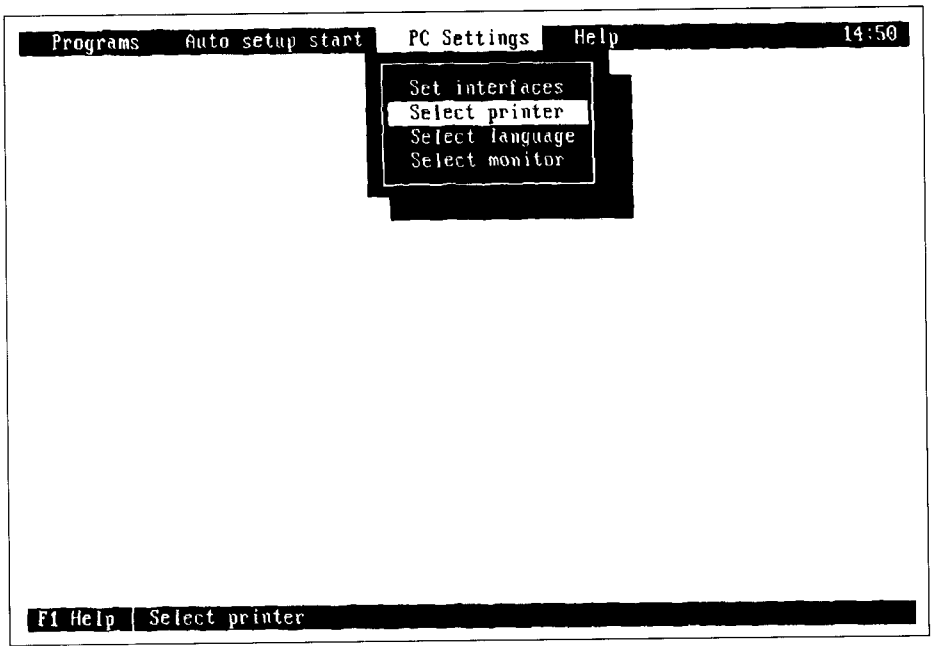
With this function you leave JUMODESK and return to the DOS level.

2.2 Auto setup start

2.2.1 Recognise JUMO instrum. and start setup

This function recognises the JUMO instrument connected to the serial interface and the software version, and automatically starts the corresponding setup program.

It saves selecting a JUMO instrument and a software version.



2.3 PC Settings

2.3.1 Set interfaces

This function permits setting the interface for transferring the setup data and for connecting a mouse. The setting for the mouse has no effect on the function of the mouse; it only helps to prevent having the same interface for setup data and mouse. The program can however also be operated without a mouse, e.g. if there is only one serial interface. In this case the interface for the setup data is set to the interface available, while the mouse is set to the other interface. It is immaterial whether that interface exists or not.

2.3.2 Select printer

This function is used to set the printer type which you want to use to print your setup data. It must be connected to LPT1.

2.3.3 Select language

This function selects the language required and is activated after operating the ENTER key.

2.3.4 Select monitor

This function is used to set the monitor type connected to the computer. If a black-white monitor is being used when a colour monitor has been set, the display quality may be unsatisfactory.

2.4 Help

2.4.1 PC settings

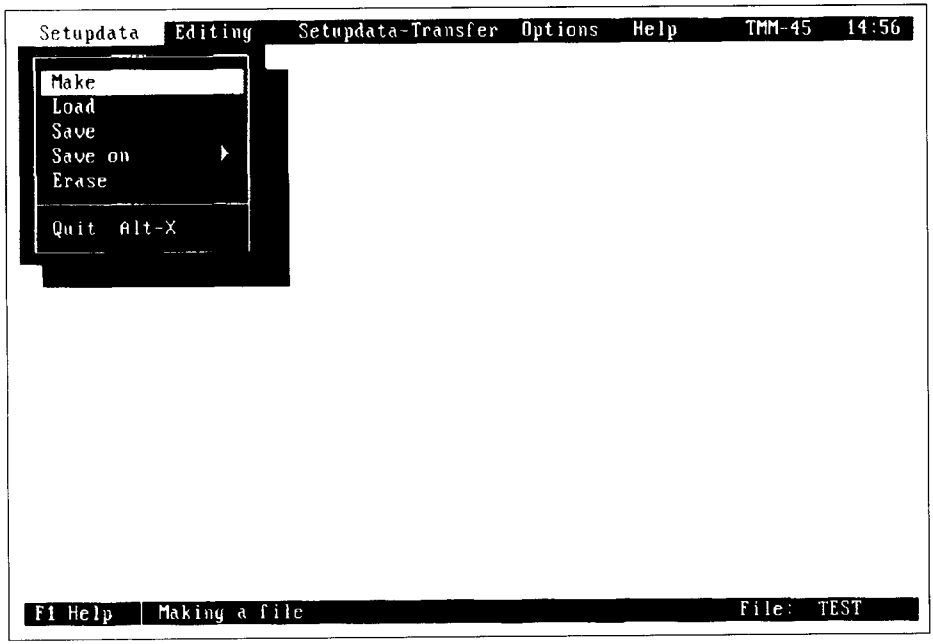
This overview shows all settings for printer, interfaces, language and monitor.

2.4.2 Info(rmation) on JUMODESK

This functions shows the Company address and the software version of JUMODESK and closes automatically after about 10 sec.

2.4.3 Help on Help

This function is a help text which shows how to call up the help functions, how to quit, and which help functions are available.



3.1 Setupdata

3.1.1 Make

This function makes a new file with setup data; its name and the setup data have to be input by the user. All data are given default values initially. They can be altered as required. Invalid inputs produce an error message.

3.1.2 Load

This function loads an existing setup file. In addition the file info header is displayed which contains important file information such as "prepared by", "date" etc.

The file info header is followed immediately by the file info text. Clicking on the field »File Info« switches the display to the entire screen and the text can be viewed (scroll, arrow keys).

The input of this information is described in Section 3.2.6

3.1.3 Save

This function saves the current status of the selected setup data to the hard disk.

3.1.4 Save on

This function permits saving setup data on other storage media (drive A and B). A different file name can be input when saving the file (copying function).

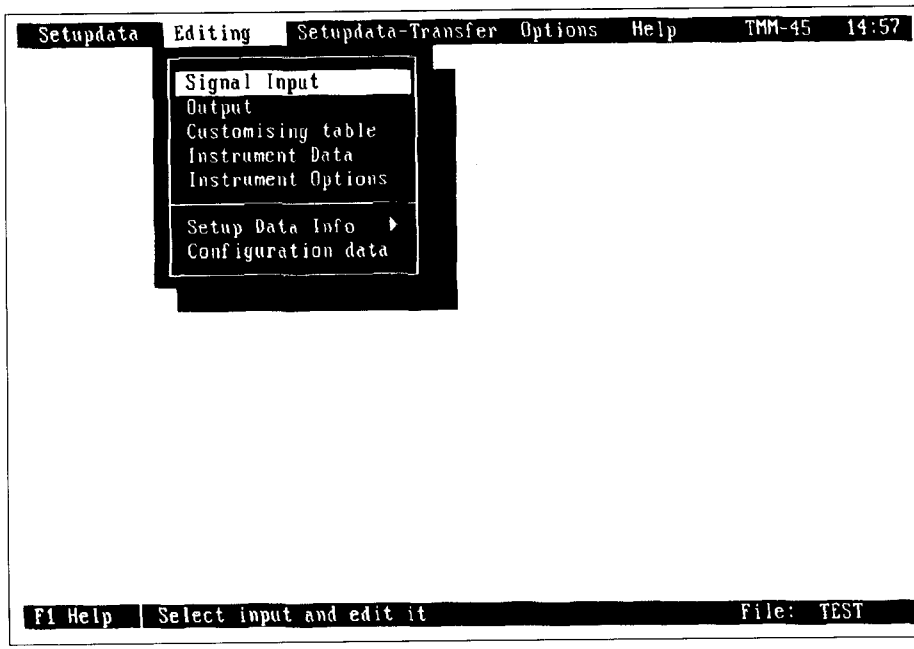
3.1.5 Erase

This function can erase a file after the file to be erased has been selected by the user. A question prevents unintentional erasing.

3.1.6 Quit

This function terminates SETUP and returns to the JUMODESK user surface.
The program must be properly terminated with this function!

Note: do not simply switch off the computer!



3.2 Editing

3.2.1 Signal Input

This function can be used to select and edit the signal input. If a customised linearisation has been selected in editing the signal input, the screen shows additional x values for resistance thermometer and thermocouple, or additional y values for voltage, current, resistance transmitter and potentiometer.

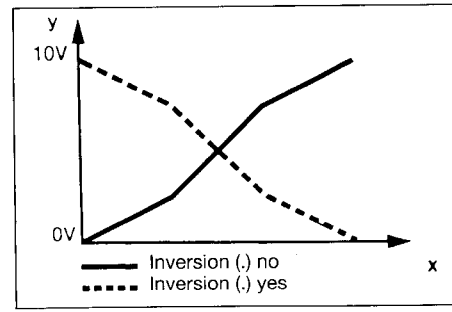
These value pairs provide the first and last calibration points for the customising table.

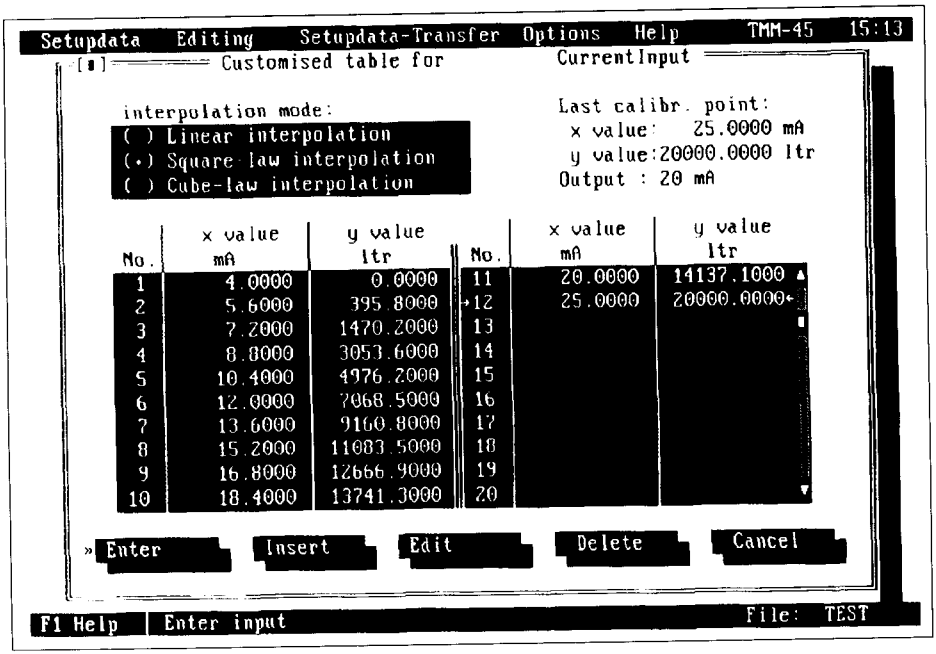
3.2.2 Output

This function can be used to set output signal, inversion, and action on probe break.

To change from current to voltage output it is necessary to alter the solder links on the instrument, see Operating Instructions B 95.6510.

Inversion produces a reversal of the output signal characteristic.





3.2.3 Customising table

This function produces a customised linearisation table with up to 61 calibration points. Additionally it sets the way the calibration points are linked together.

In the menu item »Editing → signal inputs« the linearisation of the signal input must be on customised, and settings for range start and end have to be input.
These are automatically available as first and last calibration points in the customising table.

The x values ❶ (values along the x axis) always refer to the input side with its characteristic units. It is mapped on the output (y values) through the calibration points and their interpolation.

The y values ❷ (values along the y axis) always refer to the output side. The unit can be selected and can be called up for example via the interface (option RS 485) together with the output value. This may perhaps provide the signal for an actuator whose physical unit can be freely input here. This unit has no further significance for the correct function of the transmitter.

Note:
if at any time during the processing of a setup file the function »setup data transfer → from JUMO instrument« is executed the customising table can no longer be called up.

Reason:
during the transfer of a setup file with customised linearisation the transfer covers not the calibration points themselves but only linearisation coefficients which do not permit any conclusions concerning the calibration points.

Remedy:
store and archive the file on diskette before the setup transfer into the instrument.
The function has to be monotonously rising or falling.

The simplest case of a customising table is the input of the last calibration point (top right corner of the screen) combined with linear interpolation.

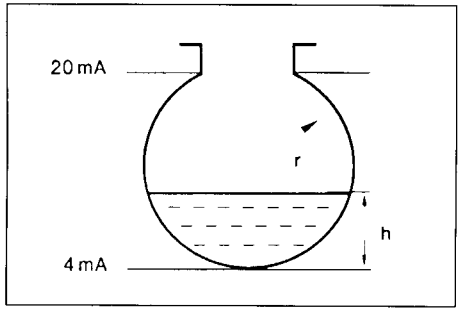
A customised linearisation with 12 calibration points and square-law interpolation is shown by the following example.

Programming example

The volume of a spherical tank has to be indicated. A float or depth probe provides a standard signal of 0 - 20 mA for the liquid level h.
A signal lamp has to indicate when the level falls below a certain volume.

A 4-1/2 digit indicator has to indicate the volume in litres and requires a standard signal of 0 - 20 mA to indicate 0 to 19999 digit.

Parameters used:
h = liquid level
V = volume
r = radius of sphere (here 15 dm)



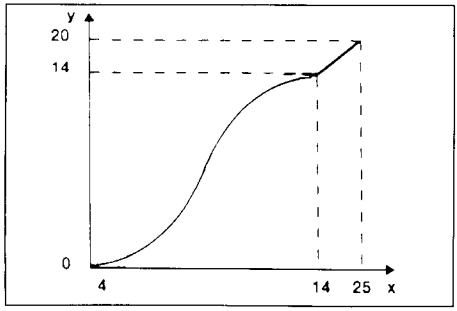
The volume has been calculated for 10 different levels using the formula below, and the values are entered in a table:

$$V = \frac{\pi \cdot h^2 (3r - h)}{3}$$

h [dm]	Float signal [mA]	V [l]
0	4	0
3	5,6	395,8
6	7,2	1470,2
9	8,8	3053,6
12	10,4	4976,2
15	12	7068,5
18	13,6	9160,8
21	15,2	11083,5
24	16,8	12666,9
27	18,4	13741,3
30	20	14137,1
–	25	20000,0

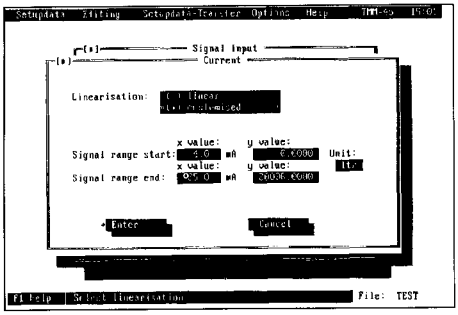
This diagram shows the relationship between the float signal (x axis) and the output signal at the transmitter (y axis).

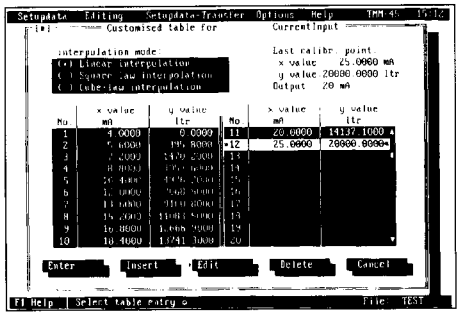
The transmitter outputs a signal of 0 - 20 mA. The maximum float signal with the spherical tank full is 14.1 mA according to the table, but for reasons of definition it has to be continued to 20 mA.



3 CONFIGURATION SOFTWARE

* Connect transmitter to PC via the interface
* Using the setup program set signal input to current
* Select linearisation »customised«
* Set range start x value to 4
* Set range start y value to 00
* Input unit ltr. (litre)
* Set range end x value to 25
* Set range end y value to 20000
* Connect 5Ω shunt as calculated from configuration program to terminals 11+ and 12- (> 170 mV) since the input current produces a voltage drop of 1 V max. from Ohm's Law.
* Input calibration points in customising table in ascending order
* Select linearisation



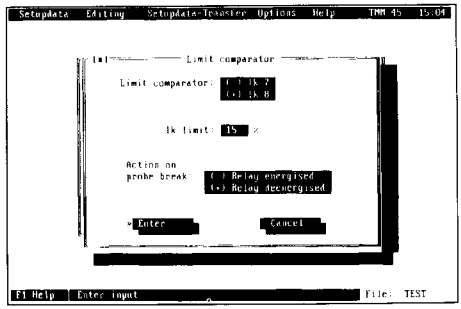


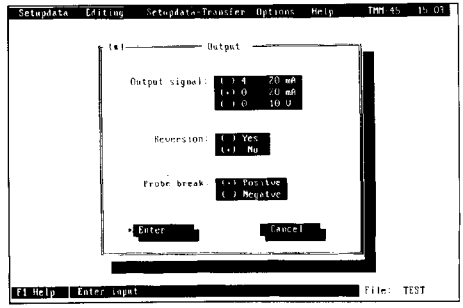
Setting the signal lamp
The signal lamp has to be alight when the volume falls below 3053 litres, i.e. approx. 3 mA

20 000 l = 100%
3 053 l = x %

$$x = \frac{100\% \cdot 3053\ l}{20\,000\ l} = 15\%$$

* In setup during editing ⟶ instrument options, select limit comparator option
* Set Ik8
* Set Ik limit to 15%
* Input "0-20 mA output"
* Set inversion no
* Enter data
* Carry out setup data transfer to JUMO instrument

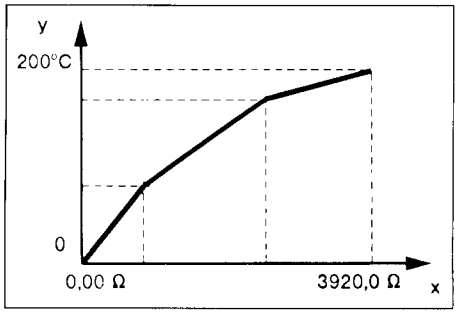




Display on the screen

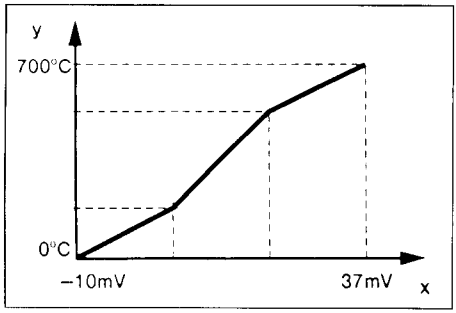
Resistance thermometer:

	y value	x value
range start:	0°C	0.00 Ω
range end:	200°C	3920.0 Ω



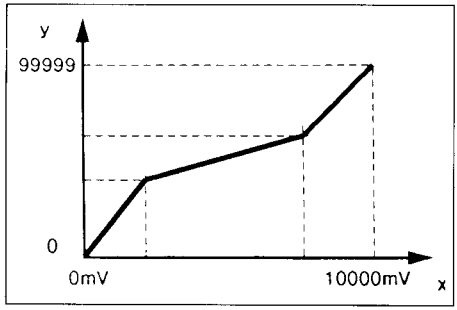
Thermocouple:

	y value	x value
range start:	0°C	−10 mV
range end:	700°C	37 mV



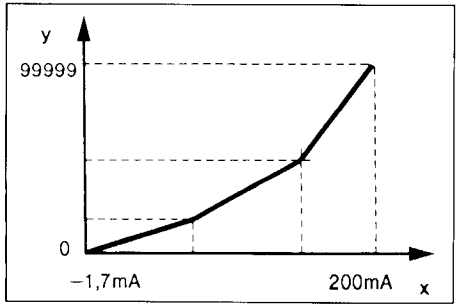
Voltage:

	x value	y value
range start:	0 mV	0.0000
		☐ unit
range end:	10000 mV	99999



Current:

	x value	y value
range start:	−1.7 mA	0
		☐ unit
range end:	200 mA	99999

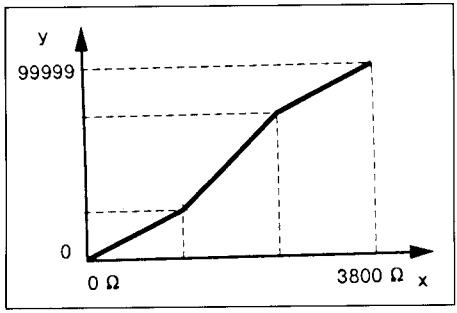


Display on the screen

Resistance transmitter

Ra: 50Ω	y value start:	0
Rs: 3800 Ω	y unit:	
Re: 50 Ω	y value end:	99999

Ra + Rs + Re ≤ 3900 Ω

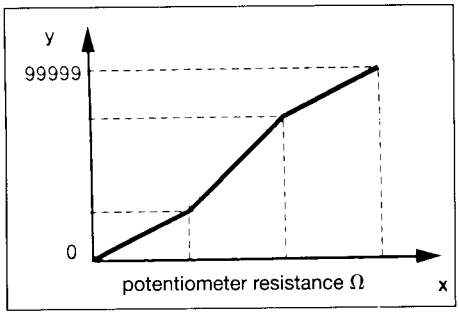


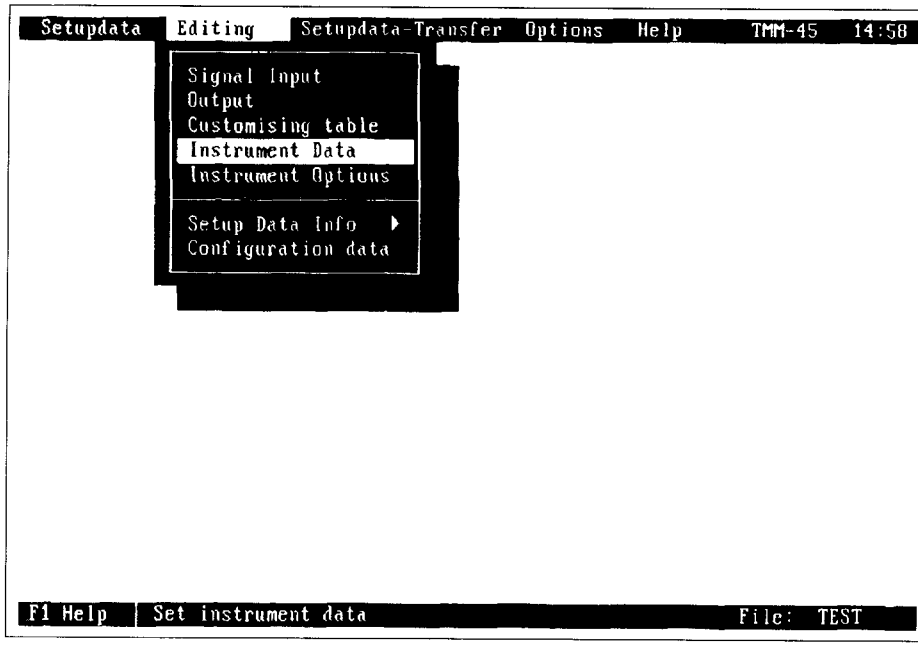
Potentiometer:

Offset resistance: 0 Ω

Potentiometer resistance	x value 3800 Ω	
	y value start:	0
	y unit:	
	y value end:	99999

Offset resistance + potentiometer resistance ≤ 3900 Ω





3.2.4 Instrument Data

This function is used to input various instrument data, such as e.g. supply frequency and filter constant of the built-in digital filter.

Two freely edited fields for user designation 1 and 2 are transferred to the transmitter together with the other setup data.

Suitable contents could be date and Company name or plant designation.

Values for zero and full scale correction are indicated. When transferring the setup data there are default settings (offset 0, factor 1). In »Setup transfer – from JUMO instrument« the actual settings are shown here which have been set on the transmitter using the keys for fine adjustment.

3.2.5 Instrument Options

This function sets the options "limit comparator" or "RS 485" interface which are mutually exclusive.

On the limit comparator the type, the action on probe break, and the limit value can be selected; on the RS 485 the device address, baud rate, parity, data bits and stop bits.

3.2.6 Setup Data Info

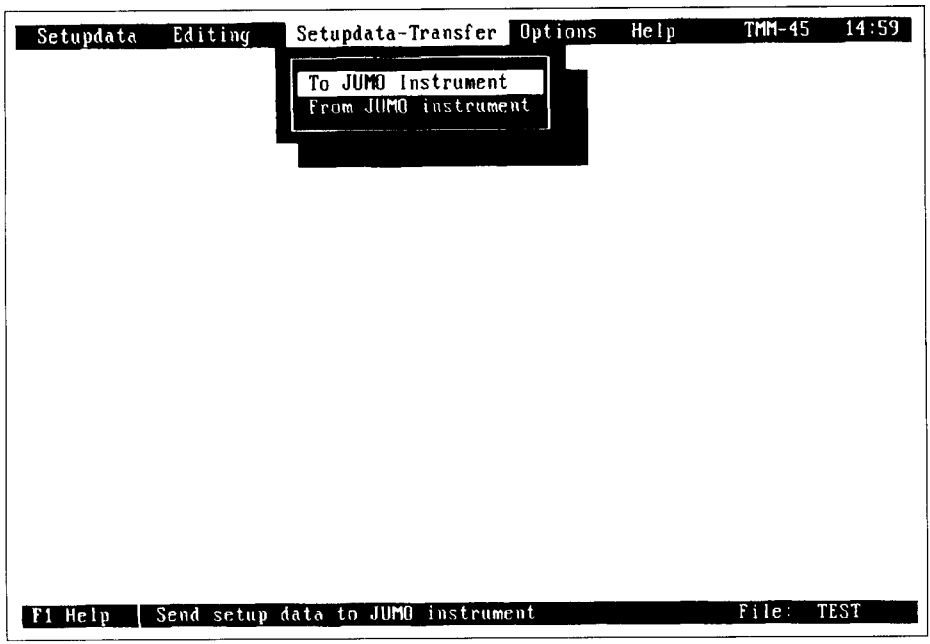
This menu item is divided into two functions.

»Data Info Header« is a structured summary of important project data and serves for archiving the setup data.
In the item »Setup–load« the Data Info Header in the lower part of the screen assists in selecting the required file.

»Data Info Text« is a freely edited text field of 50 lines, each with up to 60 characters, for additional information on system, linearisation or the person who prepared it. This field, too, is shown under the menu item »Setup data–load« underneath the File Information.

3.2.7 Configuration data

This function shows:
- instrument name,
- instrument software version,
- serial No.,
- change at configuration level,
- date,
- clock time,
- change at parameter level



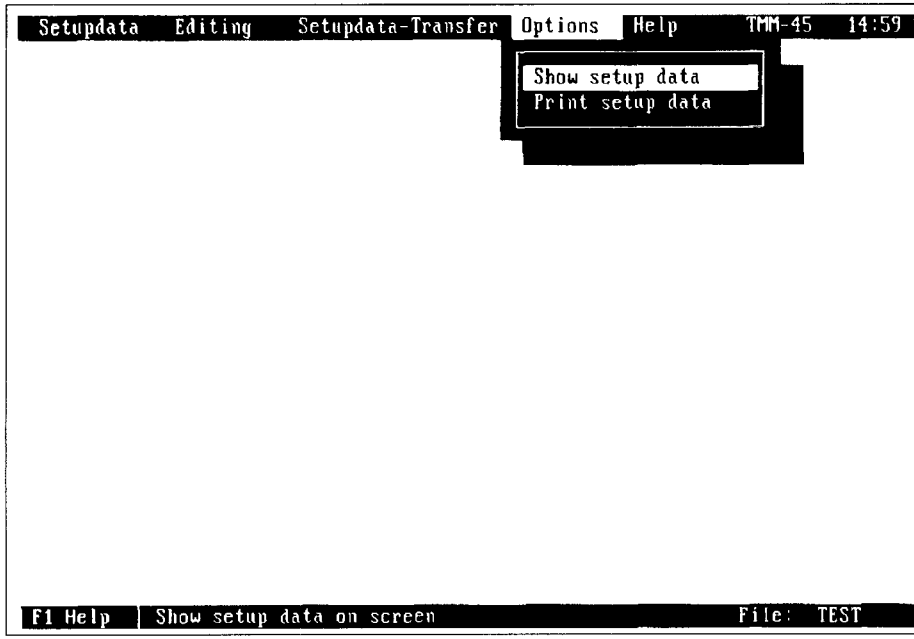
3.3 Setupdata-Transfer

3.3.1 To JUMO Instrument

This function transfers all setup data of the current file (right bottom corner of screen) to the transmitter.
The old configuration in the transmitter is overwritten.

3.3.2 From JUMO instrument

Note:
This function inhibits the customised table, see Section 3.2.3.
This function reads all setup data from a transmitter connected to the PC into the current file on the PC (right bottom corner of the screen). Data in this file are overwritten.



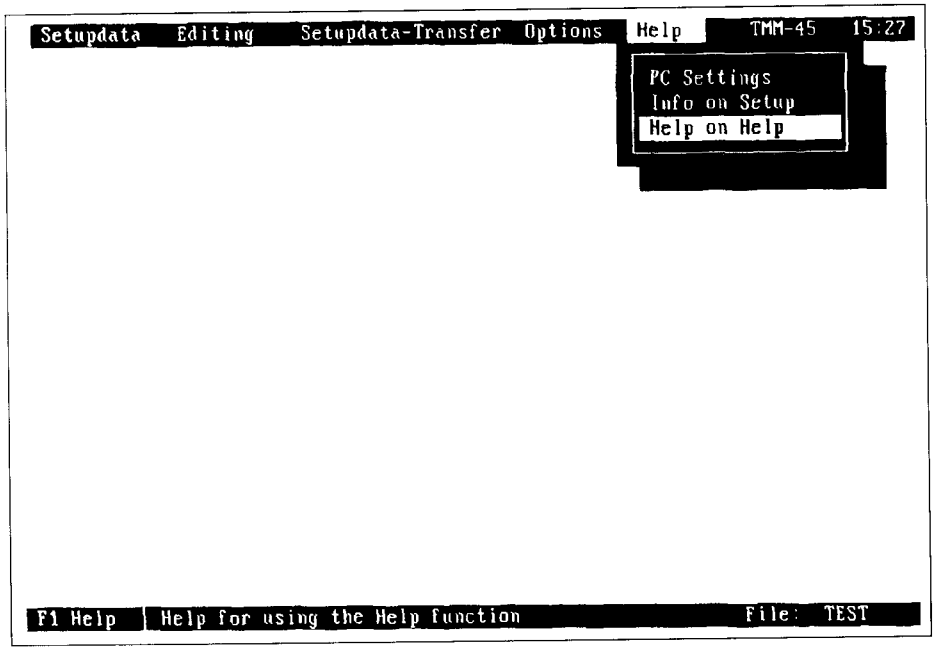
3.4 Options

3.4.1 Show setup data

This function shows a summary of all setup data settings.

3.4.2 Print setup data

This function outputs all set setup data to a printer.



3.5 Help

3.5.1 PC Settings

This overview gives a short summary of the settings for printer, interfaces, language and monitor. These can be set in JUMODESK.

3.5.2 Info(rmation) on Setup

This function shows the Company address and the software version of SETUP and closes automatically after about 10 sec.

3.5.3 Help on Help

This function is a help text which shows how to call up the help function, how to quit, and which help functions are available

4.1 Programming example

* Connect together the PC and transmitter interfaces
* Execute first the command »Setup data transfer ← from JUMO instrument« and save the file under the name "Baseset" (base setting). This saves the current configuration of the instrument before altering the data in the instrument.
* Configure the instrument as shown in the flow diagram.