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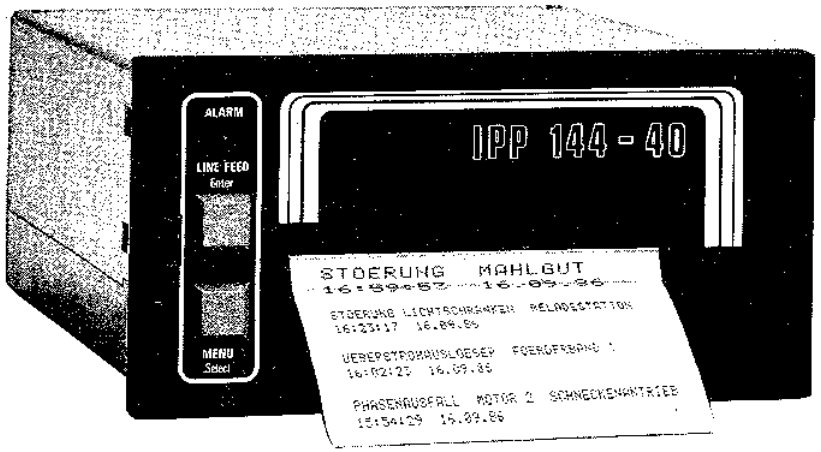
USER'S MANUAL



Alphanumeric Printer
IPP 144 - 40
IPP 144 - 40 E

Paper Reroll Mechanism
IPP - AW

Safety instructions (IEC 1010-1. Class I)

In order to preclude any danger to the operator, the following instructions should be followed:

a) In case any damage or malfunction is detected, take the unit out of operation without delay.

b) Before disassembling the unit, disconnectall inputs / outputs and the supply voltage. When mountingthe unit and the connections, make sure all live components are protected from being touched directly.

c) Comply with the usual regulations and safety provisions for low and high current systems, in particular country-specific safety provisions (e.g. VDE 0100).

d) The maximum admissible potential existing between the pin groups as well as to the external protective conductor must not be exceeded. Refer to the unit's identification label.

e) When connecting the unit to other devices (e.g. PCs), the connection must be carefully planned. Internal connections in external units (e.g. GND connected to protective earth) may cause excessive voltage potential.

f) This device must be groundet.

g) Make sure that the unit is property mounted before connection and power on !

In order to preclude any damage to the unit, the following items must be taken into account:

The maximum admissible potential between the pin groups must not be exceeded.
This applies in particular to hight voltage tests.

Refer to the instruction manual !

Warning: Hazardous live voltage !

WARNING:

There ar always hazardous voltages present in certain parts during the operation of electrical equipment. Non-observance of the safety instructions can result in severe personal injury or damage to property. Only qualified personnel should work on this equipment. The successful and safe operation of this equipment is dependant on proper transport, storage, set-up, installation and careful operation and maintenance.

QUALIFIED PERSONELL

Are personnel who are familiar with the set-up, installation, commissioning and operation of the product and have the qualifications corresponding to their activities, e.g.:

- Are trained and authorised to energise, de-energise, clear, ground and tag circuits and equipment / systems in accordance with established safety standards.
- Are trained in the proper care and use of protective equipment in accordance with established safety practices.
- Are trained in first aid.

Sicherheit nach IEC 1010-1, EN 61010, Nfc 42020, VDE 0411

Overvoltage category: refer to page 6 und 7;
Pollution degree: 2; indoor use; altitude < 2000 m; relative humidity < 80 % up to 31 °C;
Temperature: 5 °C to 40 °C.

Definition of overvoltage categories according to IEC 664:

CAT I: Special equipment or parts of lectric or electronic equipment with small transien overvoltages.
CAT II: Appliances, portable equipment.
CAT III: Fixed installations regarding distribution and circuits at the input of electric maintenance of buildings.

III Accessories

- Paper reroll mechanism IPP - AW
  (incl. connection cable)

- Protection cover for use of IPP together with
  IPP - AW (protection class: IP 64)
  Dimensions: 155 x 155 [mm]
  Material: Plexiglas and
  Santoprene 101-80 caoutchouc.

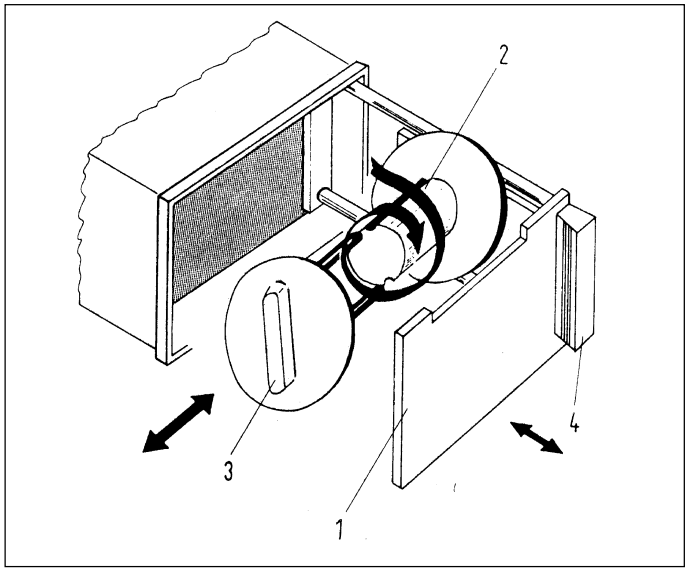
- Parallel option (BCD or Centronics),
  upgrade kit,
  screw terminal connection
  (not for IPP 144-40 S).

- Connection cable for serial data transmission
  to the following devices:

  IBM-PC XT and AT or compatibles
  Siemens PG 685 (V 24)
  Siemens PG 675 / 685 (printer interface)
  Message displays:
  DAA 144-120B / 288-120B / 288-240B, C
  Preh-Commander (keyboard)
  others on request.

- Text entry support software for IPP 144-40 E
  MWTA (3 1/2“ or 5 1/4“ format).

3. Operation



Removing the paper

- Use the handle (4) to pull out the front panel (1).
- Remove the holder (3) with the paper from roll body, rotate the notch of the holder as shown in the diagram.
- Remove the paper drum from the holder.

Inserting the paper

- Wind the paper once around the drum body (2) in the direction indicated by the arrow.
- Plug in the holder (3) in such a way that the pins fit into the notches of the body.
- Close the front panel.
- Briefly press the „LINE FEED“ key at the IPP 144-40 until the paper has been straightened out.

Tabel of Contents

Index

2. Technical Data

Winding

Motor with friction clutch, electronic lag	3 sec.
Paper width:	max. 80 mm
Paper lenght:	max. 15 m

Ambient conditions

Storage temperature range:	-20 °C to +80 °C
Operating temperature range:	0 °C to +70 °C
Climate :	Climate class 2 (acc. to VDE 3540)
Protection type housing:	IP 50 (acc. to DIN 40050)
Mech. strength:	acc. to IEC 1010
Security:	IEC 1010; Class1 CAT I 50 V Pollution degree: 2
EMC immunity	DIN EN 61 0004-1 to 4
EMC radiated interference	DIN EN 50081 class B
Susceptibility:	IEC 801, Level 3

Dimensions

Dimensions (WxHxD):	144 x 72 x 159 [mm]

Miscel-laneous

Connector:	Female multi point connector, 4 pin keyed
Connector cable	AWG 26, approx. 100 mm
Power supply:	by IPP (5 V DC)

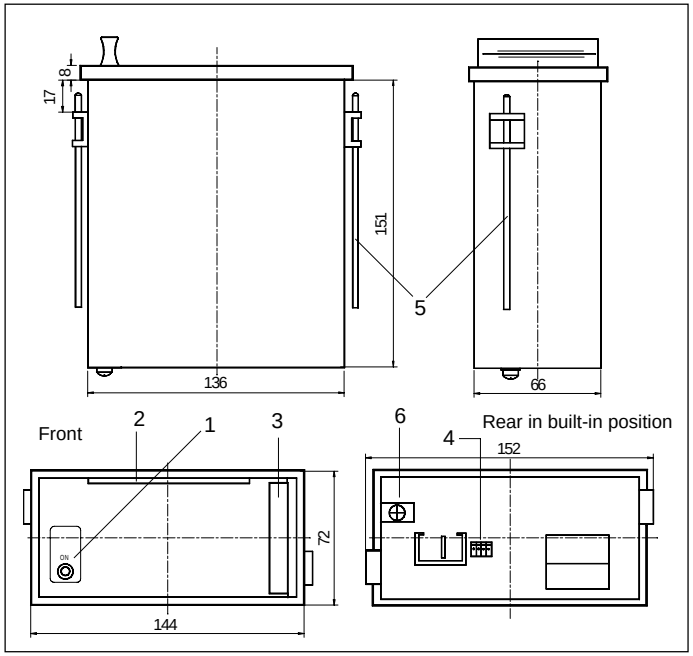
CE

Maintenance friction clutch

The torque of the friction clutch has been factory adjusted and should not require adjustment.
The winding force of the motor can be adjusted by slightly rotating the screw accessible through the left hand side hole in the body:

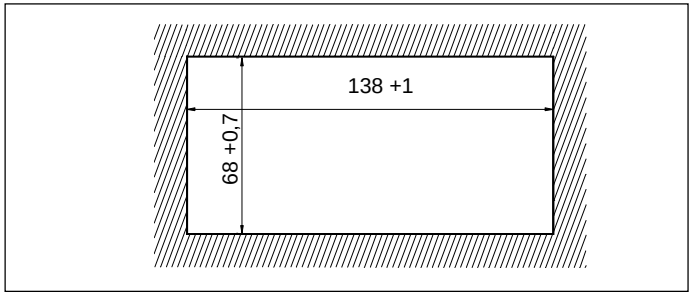
➡ **less** **= turn left**
➡ **more** **= turn right**

Design



1 Status indicator
2 Opening for paper feed
3 Handle
4 Connector for connector cable IPP 144-40 (pin connections: Motor control, +5 V, open, GND-)
5 Mounting screws
6 Protective conductor connection (must be connected to ground)

Installation

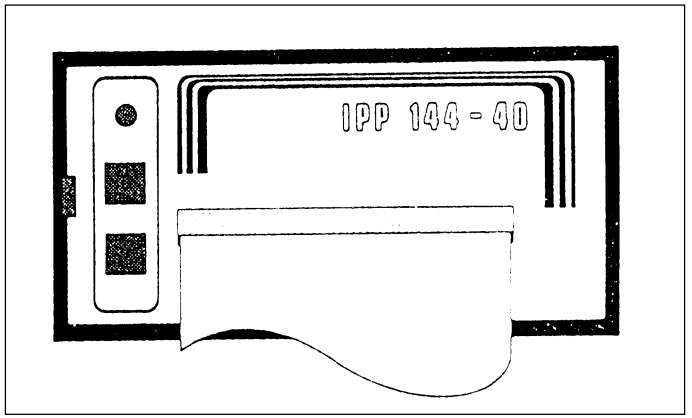


The paper reroll mechanism is inserted into the DIN size panel cutout from the front side and is clamped against the rear side of the switchboard using the mounting screws. The switchboard thickness must not exceed 12 mm.

Make sure that the unit is properly mounted before connection and power on.

I. IPP 144 - 40 / IPP 144 - 40 E

1. General Features

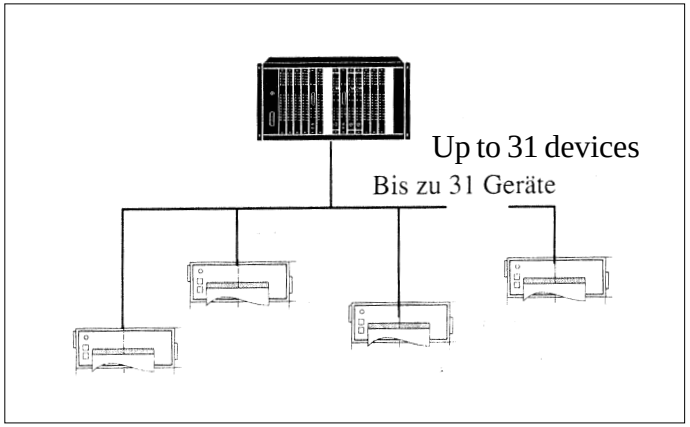


The IPP 144 - 40 (Industrial Process Printer) is a device designed for outputting text and data, i.e. measured values, machine and process states, error messages, production data, etc.

Two application examples:

- If connected to a digital voltmeter, the IPP 144 - 40 records the measuring values (with date / time for the E version).
- Its integrated interfaces allow the use of the IPP 144 - 40 as a pripheral for all PLCs (RS 232C; RS 422; RS 485).

The alphanumeric printer is a DIN size panel mounting unit which is able to print line widths of up to 40 characters per line. The 14 m paper roll (commercial grade document proof thermo paper) is located inside the housing and can be easily replaced by means of a swivel type front panel. An end of paper indicator lights up if the printer runs out of paper.



Each printer is addressable, wich allows the connection of up to 31 devices to one sender device via a data line at the RS 485 interface, e.g. to a PLC.

Basic version IPP 144 - 40

The basic version provides one serial interface capable of receiving only. Return (handshake) messages to the sender are sent via hardware line. Text and measuring values to be printed must be transmitted from the sender device since the basic version does not have an internal text memory.

Extended version IPP 144 - 40 E

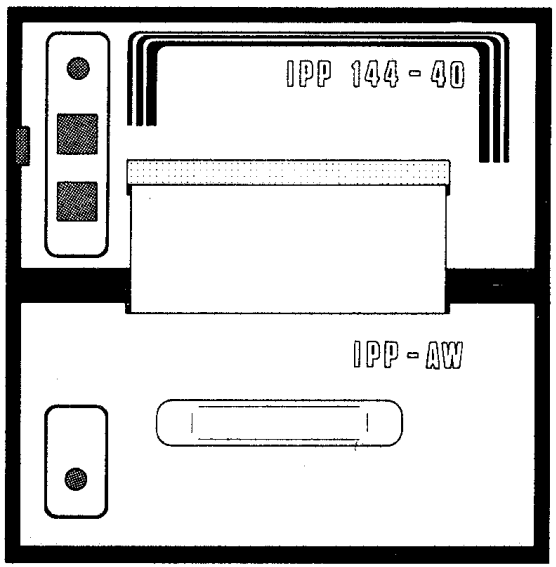
The extended version **IPP 144 - 40 E** provides a second, bidi-rectional serial interface capable of outputting return messages under program control in compliance with a protocol. In addition, this model includes a text memory capable of storing up to 15 texts which are called by specifying the corresponding text number. Moreover, date and time may be printed with texts and data.

It is not possible for the user to upgrade the basic version to the extended version; the extended version is a different factory version.

Parallel Interface (PI)
Both versions may be optionally equipped or upgraded with a parallel interface (BCD / Centronics)
(**IPP 144 - 40 PI** or **IPP 144 - 40 E PI**).

II Paper reroll mechanism IPP - AW

1. General information



The IPP - AW is a paper reroll mechanism designed for use with the IPP 144-40. It has been designed to match the printer in colour and style. It is preferrably installed directly underneath the printer. The printed paper is automatically wound on a drum by a motor. A swivel front panel allows easy paper handling.

The paper reroll mechanism is a DIN size panel mounting unit. It is supplied with power and controlled via the connector cable which comes with the unit and which is connected to connector 12 of the IPP 144-40 (see chapter 3). An LED indicates the ready status. Deoending on the distance between the two devices at least the last 9 lines printed remain visible.

8.4. Examples for Automatic text Insert Mode

Example 1: Consignment print-out, with time & date, marks and weights.

Data input:
10:15:33 15/10/98 <CR> 1 <CR> 123 <CR> 1 <CR> 1027 <CR> 997 <CR> 30 <CR>

Actual Print-out

10:15:33	15/10/98	
Product Ref.::	123	
Operator No.:	1	
Gross:	1027	kg
Nett:	997	kg
Tare:	30	kg

No.	Pre-stored texts („✳“ =spaces resevered for variable data)
1	✳✳✳✳✳✳
2	Product Ref. ✳✳✳✳✳✳
3	Operator No: ✳✳✳✳✳✳
4	Gross: ✳✳✳✳✳✳
5	Nett: ✳✳✳✳✳✳
6	Tara: ✳✳✳✳✳✳

6 block of data are inserted and printed in sequence.

Example 2: Quality test print-out, with several measured values.

In this example, the IPP..E automatically adds date & time from its own real-time clock using the „PRINT DATE / TIME-HEADLINE“ menu option. 4 blocks of variable data are sent to the printer.

Data input: 115 <CR> 33.7 <CR> 62.8 <CR> 228.7 <CR>

Actual Print-out

13.10.98	13:49:52	
M&W		
Kleinreuther Weg 88		
D-90408 Nürnberg		
Test Number:	115	
- - - TEST RESULTS - - -		
Ambient Temp.:	33.7	℃
Burn-in Temp.:	62,8	℃
Nom. Supply:	230	Vac
Actual:	228.7	Vac

No.	Pre-stored texts
1	M&W
2	Kleinreuther Weg 88
3	D-90408 Nürnberg
4	
5	Test Number: ✳✳✳✳✳✳
6	- - - TEST RESULTS - - -
7	Ambient Temp.: ✳✳✳✳✳✳℃
8	Burn-in Temp.: ✳✳✳✳✳✳℃
9	Nom. Supply: 230 Vac
10	Actual: ✳✳✳✳✳✳Vac

The print-out is 10 texts - 4 with variable data inserted and 6 without.

Example 3: A simple way to print a group of texts.

This mode can be used to print a group of texts, triggered by a single <CR> input, even if no variable data is required to be inserted. **NOTE:** Text No.7 is only preprogrammed with a variable a variable data field.

Data input: <CR>

Actual Print-out

15.10.98	10:34:53
Manufactured by:	
M&W	
Kleinreuther Weg 88	
D-90408 Nürnberg	

No.	Pre-stored texts
1	Manufactured by:
2	
3	M&W
4	Kleinreuther Weg 88
5	D-90408 Nürnberg
6	
7	✳✳✳✳✳✳

All the texts up to Text No.6 (without variable fields) are printed. Text No.7 (the first variable field) just prints a blank line. (If there was any variable data sent before the <CR> this would be inserted and printed here.)

2. Technical Data

2.1. Basic Version

Print mechanism

Type of printing	Thermo print head
Character representation	5 x 7 - dot-matrix
Print speed approx.	0,6 lines / s
Character height	2,4 mm
Characters / line	40 (in standard mode) 20 (in wide mode)
Charater set	ASC II 7 bit, german, french, danish / norwegian, swedish / finnish, cyrillic, spanish.
Service life	≤ 500.000 lines

Paper

Type paper	commercial grade. document proof thermo
Width	80 mm (+0 / -1 mm)
Length	approx. 14 m (approx. 4.000 lines)
Max. outer roll diameter	40 mm
Min. inner roll diameter	11,5 mm
Temperatur	standardpaper: 0 °C to 60 °C

Input buffer	seriell and Centronics	4 kB
Serial Interface I	Type	RS 232 C; RS 422; RS 485 current loop
	Baud rate	110; 150; 300; 600; 1200; 2400; 4800; 6900
	Data format	7 bit[1] / 8 bit
	Parity bit	even, odd, mark, space, no
	Safety	According to CEI 1010 - 1 Class 1 Pollution degree: 2
Voltage supply	Direct voltage DC	10 V ... 19 V approx. 8 W[2] , CAT I 19 V ... 36 V approx. 8 W[2] , CAT I with galvanic isolation
	Alternating voltage AC	230 V ± 10%, 45 - 65 Hz, approx. 12 VA, CAT III 115 V ± 10 %, 45 - 65 Hz, approx. 12 VA, CAT III 240 V ± 10 %, 45 - 65 Hz, approx. 12 VA, CAT III
Ambient conditions	Storage temperature	-20 °C to +60 °C
	Operating temperature	0 °C to +45 °C
	Climate	Class 2, acc. to VDE/VDI 3540
	Protection type housing	IP 50 acc. to DIN 40050
	Protection type terminals	IP 00 acc. to DIN 40050
	Isolation group	C acc. to VDE 0110
	Mech. strength	to IEC 1010
	EMC	
	Emission	EN 55011, Class B VDE 871, Class B
	Susceptibility	IEC 801, Level 3

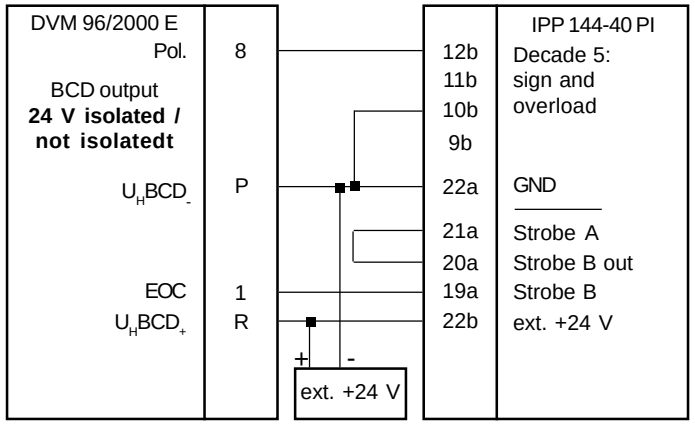
CE

[1] With 7 bit no parity, the sender must be set to 2 stop bit.

[2] Starting current approx. 1,2 A (10 V ... 19 V) or approx. 0,8 A (19 V ... 36 V). This values can be used to rate external fuse.

BCD output
24 V isolated / not isolated

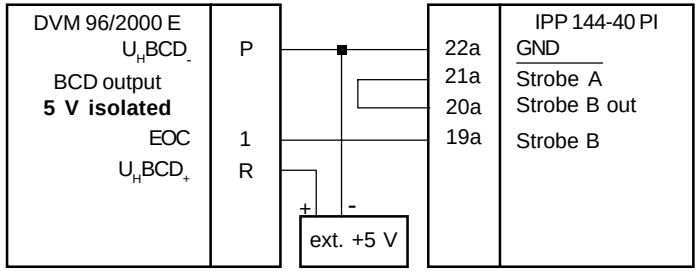
In order to the output signals from the device, an external voltage source (+24 V) must be connected to pin R-St.401 ($U_H BCD_+$) of the DVM.
The external voltage of +24 V is also required for the option 24 V-
output not isolated in order to increase the output signal level to 24 V (internally not feasible).
To be sure about the isolation do not connect the overflow pin 10 - St.101 (DVM standard unit).At the corresponding



If the EOC pulse has a rising edge as in this example, it is applied to pin 19a. Pin 20a and pin 21a must be connected to each other to invert the EOC pulse.

BCD-output
5 V isolated

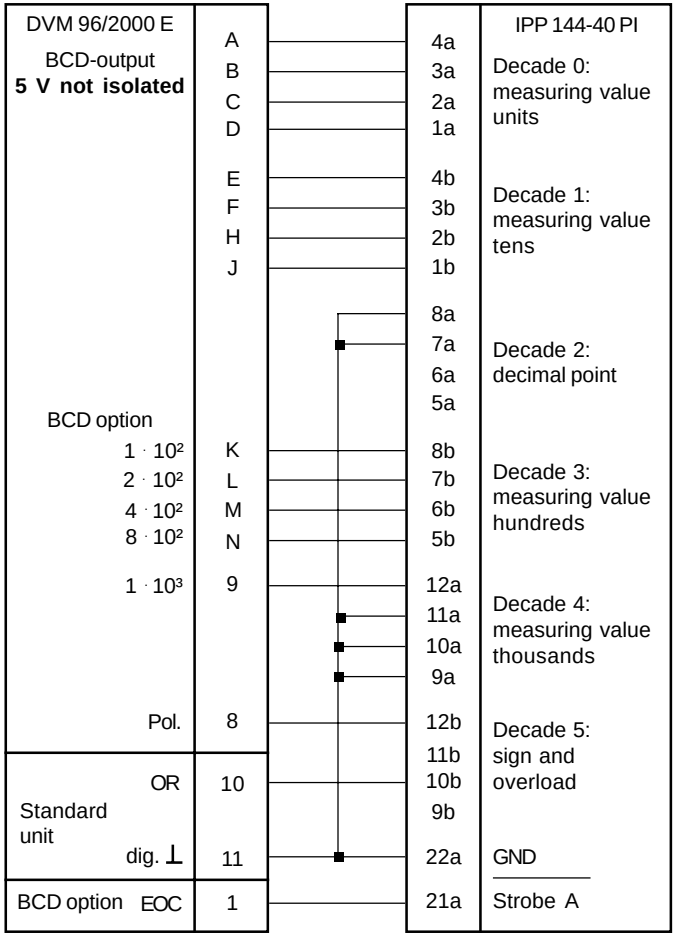
As opposed to the 24 V setup which requires the printer power to be supplied externally, in this setup the external voltage source of +5 V is only connected to the DVM.



8.3.3. Connection IPP 144-40 via BCD interface with the purpose of printing measuring values

Example: Connection to DVM 96/2000 E.

BCD-output
5 V not isolated



By exchanging the decades the decimal point can be moved to another position.
Open inputs correspond to a logical „1“, groundet ones to a logical „0“.
In the menu program under UNIT one of 31 possible measurement units can be set and can be printed with the measuring value. Alternatively, the control inputs (F, G, H, K) can be wired permanently in this case, however, only the first 15 of the 31 possible units are available.

Connections

Safety for interface and IPP - AW connectors	IEC 1010 - 1 Pollution degree 2 CAT I, 50 V max.
Voltage supply	Screw type / terminals 1,5 mm²
Interface 1	9 pin D-Sub socket
Interface 2	9 pin D-Sub socket
Parallel interface	44 pin with soldering tags,
Connection for paper reroll mechanism	4 pin MASCON, MLAS

Miscellaneous

Dimensions (WxHxD)	144 x 72 x 159 [mm]
Switchboard mounting	screws against rear side of switchboard
Alarm relay	normally open 50 V AC, 2 A 30 V DC, 2 A
Safety	IEC 1010 - 1, Class I CAT I, 50 V
Internal fuse (on power supply board)	24 V: 0,63 AS 12 V: 2 A
External fuse ratings (not included with delivery)	150 mAT (230 / 240 V) 300 mAT (115 V)

This operating manual applies to software version 502.2 and higher.

2.2. Version E

Serial interface 2	Type	RS 232 C oder RS 485[1)]
	Baud rate	110: 150; 300; 600; 1200; 2400; 4800; 9600
	Data format	7 bit[2)] / 8 bit
	Parity bit	even, odd, mark, space, no
Text entry for texts to be stored		1200 Baud max. separate configuration
Text memory	Type	CMOS-RAM (Lithium battery buffered)[3)]
	Memory size	600 Byte ≙ 15 Texte
	Battery life	10 years typical
Internal glock	Type	CMOS, Lithium battery[3)]
	Genauigkeit	± 10 ppm ≙ 0,8 sec / day

1) Please specify when ordering; if nothing is specified, RS 232 C is shipped.
2) With 7 bit no parity, the sender must be set to „2 stop bit".
3) Lithiumbatterie 3 V, VARTA CR 2/3 AA Typ 6237
PANASONIC BR 2/3 A 1 P

Warning !

This produkt contains a Lithium battery which must not be cut open, incinerated, exposed to temperature above +60 °C or recharged.
Dispose of in accordance with national regulations.

2.3. Option Parallel Interface

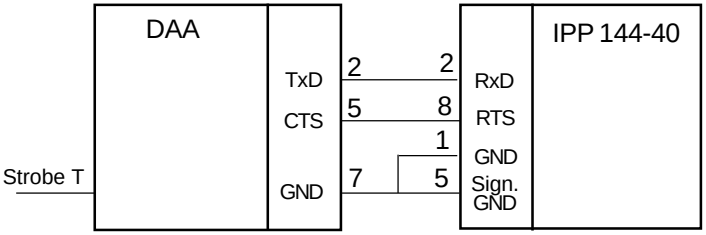
Format		BCD (6 decades) or Centronics
Input level	5 V:	low level 0 V ... 0,8 V (1 TTL load) high level 2 V ... 5,5 V
Input level	24 V:	low level 0 V ... +5 V high level +20 V ... +28 V Isink = 7 mA
Output level		low level < +0,4 V / 8 mA sink high level > +4,5 V / 0,2 mA
Output +5 V (pin 21b)		20 mA

All inputs and outputs are isolated. IEC 1010 Klasse I, CAT I.
Maximum voltage GND protective conductor: 50 V

8.3.2. Coupling of IPP 144-40 with a DAA message display to print fault messages.

Messages can be issued by all DAA type B and C versions. (The A version DAA are not capable of outputting data but only of displaying them since there is only one serial interface available which is used to receive data).

The connection of the printer is made via the interface II (RS 232 C) of the DAA. The printout is normally triggered by a control device (e.g. a PLC) with a strobe signal (strobe T) via the terminal strip for control inputs (parallel interface) at the DAA.



Interface RS - 232 C:

DAA 144 - 120 B:	9 pin	D - SUB	9 pin D - SUB
DAA 288 - 129 B:	25 pin	D - SUB	
DAA 288 - 240 B, C:	25 pin	D - SUB	

The required connection cable is available as an accessory.

Since the alarm type and the alarm hysteresis can be arbitrarily programmed with the DPM ... MF, there is a variety of possible uses for the above wiring.

Example:

		L	M	N	P		
Connection:							
Significance:		8	4	2	1		
OC 1/2 open:	→	0	0	1	1	→	3 = text 4
OC 1 switches (to ground)	→	0	0	1	0	→	2 = text 3
OC 2 switches (to ground)	→	0	0	0	0	→	0 = text 1

Since in the example date / time are to be printed, under the menu item PRINT DATE / TIME the parameter HEADLINE must be selected. The PRINT INTERVALL can be set, for example to 1 minute.

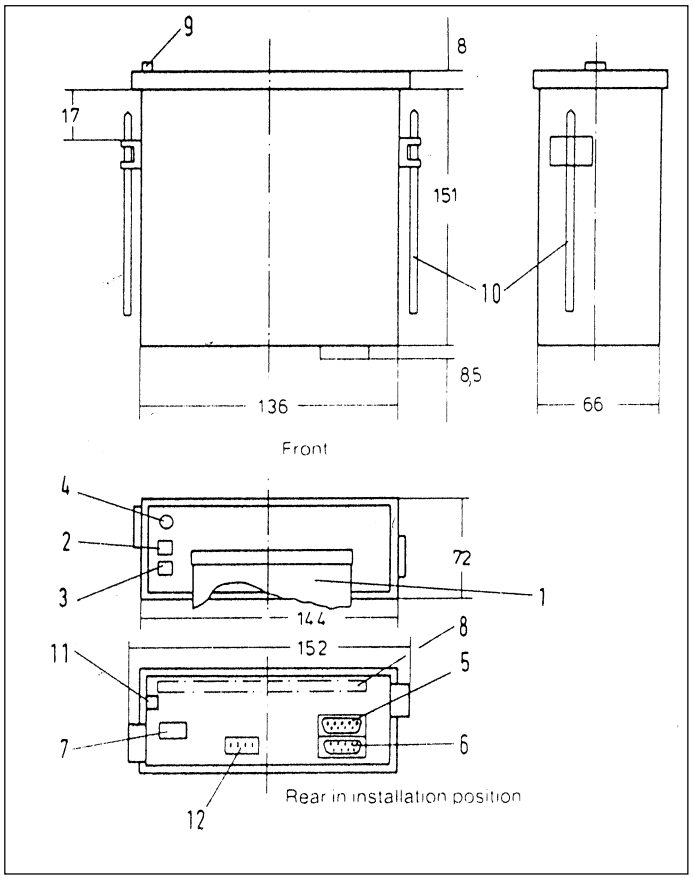
Printout

```
05.06.97        11:55:00
Boiler temperature      270,5 °C

05.06.97        11:56:00
Boiler temperature      283,3 °C

05.06.97        11:57:00
Alarm 1-valve   1 open          temp. 301,3 °C

05.06.97        11:58:00
Alarm 2-valve   2 open          temp. 322,7 °C
```

°C			
320	Text 4	Alarm 2-valve 2 open	temp. ... °C
300	Text 3	Alarm 1-valve 1 open	temp. ... °C
280	Text 1	Boiler temperature ... °C	
260			
240			

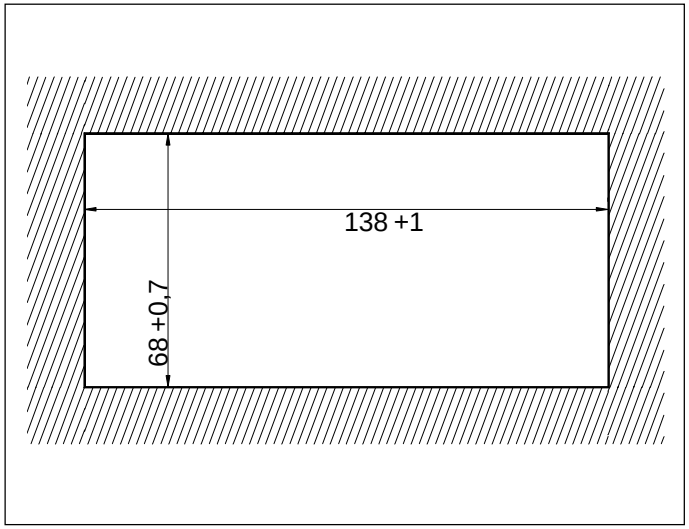
3. Design and Installation

Design



1 Papers and cutting edge
2 Key: LINE / FEED / ENTER
3 Key: MENU / Select
4 Alarm diode (paper end indicator)
5 Serial interface Interface II (only version E)
6 Serial Inerface Interface I
7 Voltage supply and alarm contact (paper end - only with version E)
8 Parallel interface (opt.)
9 Snap lock
10 Mounting screws
11 Protective conductor connection must be connected to ground
12 Connection paper reroll mechanism

Make sure that the unit is properly mounted before connection and power on.



The IPP 144 - 40 fits into a DIN standard panel cut-out.
It is inserted into the switchboard opening from the front side and is fixed against the switchboard rear using mounting screws.
The switchboard thickness must not exceed 12 mm.

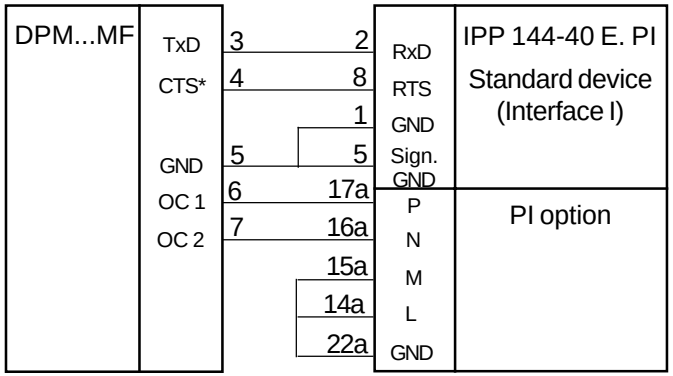
8.3. Connection Examples for Müller & Weigert instruments

8.3.1. Connection of the IPP 144-40 E to the DPM ... MF for the insertion of measured values into texts.

The configuration requires the E version with PI option installed. Since the standard version of the DPM ... MF is already equipped with 2 alarm outputs (open collector), these can be used for the switching from one text to another.

The printer receives the measuring values via interface I / RS 232 C (also possible via interface II); the text is selected via the parallel interface. The relevant interface is the interface for which the parameters have to be set in the menu program. The recommended configuration is: 8 data bits, no parity, 1 stop bit, 9600 baud. With 7 bit, no parity, the sender must be set to
2 stop bits.

CR (carriage return) transmitted from the DPM ... MF with each measuring value starts the printing of the text. The space for the the measuring value must be reserved within the text during text entry into the printer by „Ctrl V“.



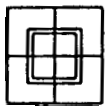
*) As a default, pin 4 is programmed as RxD, but if connected to the printer it must be programmed as CTS (this is done in the DPM menu program).
Open inputs of the parallel option (open collector / no alarm) correspond to a logical „1“, grounded inputs to a logical „0“.

33	!	71	G	109	m	147	ô	185	╣	222	▌		
34	"	72	H	110	n	148	ö	186	║	223			
35	#	73	I	111	o	149	ò	187	╗	224	α		
36	$	74	J	112	p	150	û	188	╝	225	β		
37	%	75	K	113	q	151	ù	189	╜	226	Γ		
38	&	76	L	114	r	152	ÿ	190	╛	227	π		
39	'	77	M	115	s	153	Ö	191	┐	228	Σ		
40	(	78	N	116	t	154	Ü	192	└	229	σ		
41	)	79	O	117	u	155	¢	193	┴	230	µ		
42	*	80	P	118	v	156	£	194	┬	231	τ		
43	+	81	Q	119	w	157	¥	195	├	232	Φ		
44	,	82	R	120	x	158	₧	196	─	233	Θ		
45	-	83	S	121	y	159	ƒ	197	┼	234	Ω		
46	.	84	T	122	z	160	á	198	╞	235	δ		
47	/	85	U	123	{	161	í	199	╟	236	∞		
48	0	86	V	124	¦	162	ó	200	╚	237	ø		
49	1	87	W	125	}	163	ú	201	╔	238	∈		
50	2	88	X	126	~	164	ñ	202	╩	239	∩		
51	3	89	Y	127	▀	165	Ñ	203	╦	240	≡		
52	4	90	Z	128	Ç	166	ª	204	╠	241	±		
53	5	91	[	129	ü	167	º	205	═	242	≥		
54	6	92	\	130	é	168	¿	206	╬	243	≤		
55	7	93	]	131	â	169	⌐	207	╧	244	⌠	*)	
56	8	94	^	132	ä	170	¬	208	╨	245	⌡		
57	9	95	_	133	à	171	½	209	╤	246	÷		
58	:	96	`	134	å	172	¼	210	╥	247	≈		
59	;	97	a	135	ç	173	¡	211	╙	248	°		
60	<	98	b	136	ê	174	«	212	╘	249	∙		
61	=	99	c	137	ë	175	»	213	╒	250	·		
62	>	100	d	138	è	176	▒	214	╓	251	√		
63	?	101	e	139	ï	177		215	╫	252	n		
64	@	102	f	140	î	178		216	╪	253	²		
65	A	103	g	141	ì	179		217	┘	254	■		
66	B	104	h	142	Ä	180		218	┌	255	□	*)	
67	C	105	i	143	Å	181		219	▌				
68	D	106	j	144	É	182		220	▄				
69	E	107	k	145	æ	183		221	▐				
70	F	108	l	146	Æ	184							

*) The following characters have been modified as compared to the IBM character set:

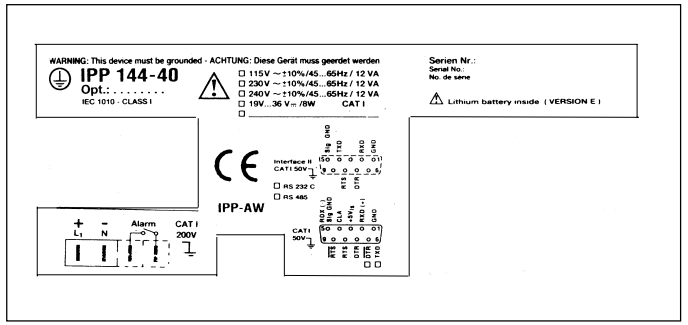
244	F4	" ⌠ "	⟶	"⌠"
245	F5	" ⌡ "	⟶	"⌡"
255	FF	" "	⟶	"□"

If you use graphics characters, be aware of the fact that the IPP is not a graphics printer; i.e. there may be gaps as shown below:

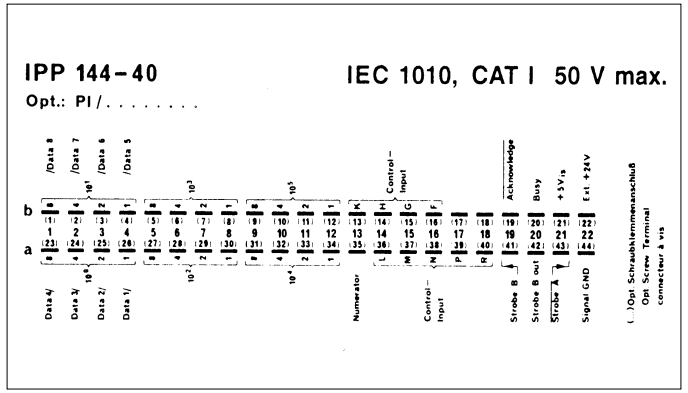
Graphics printer   IPP 144-40

4. Connection

4.1. Pin assignment

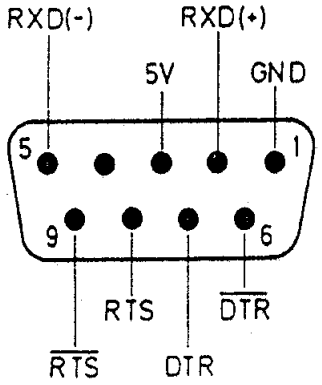


Pin assignment (without parallel interface)



Pin assignment parallel interface

Connect the unit as shown in the connection diagrams. Observe the national safety regulations (e.g. VDE 0100, IEC 1010 and VDE 0411), in particular with respect to mains supply.



Pin	Signal	
1	GND	Ground (shield)
2	RXD (+)	Receive data
3	+5 V	Output +5 V / 20 mA
4	blank	
5	RXD (-)	Signal ground
6	DTR	Open Collector; aktive if DTR is +12 V
7	DTR	(Data Terminal Ready) +12 V: ready to receive, -12 V: not ready to receive.
8	RTS	(Request To Send) +12 V: ready to receive, -12 V: not ready to receive. (text buffer is full)
9	RTS	Open Collector; aktive if RTS is +12 V

The serial interface I has been designed to follow the implementation of all widely used interfaces:
RS 232 C; RS 422; RS 485 and Current loop.

See chapter 4.3.: Connecting diagram.

8.2. Character Sets
Control Characters used for Data Transmission

General purpose characters

Character	HEX	Significance	Name
Ctrl D	04	End of transmission	EOT
Ctrl E	05	Set address	ENQ
Ctrl J	0A	Line feed	LF
Ctrl M	0D	Carriage return	CR
Ctrl Q	11	Ready to receive	XON
Ctrl S	13	Busy	XOFF

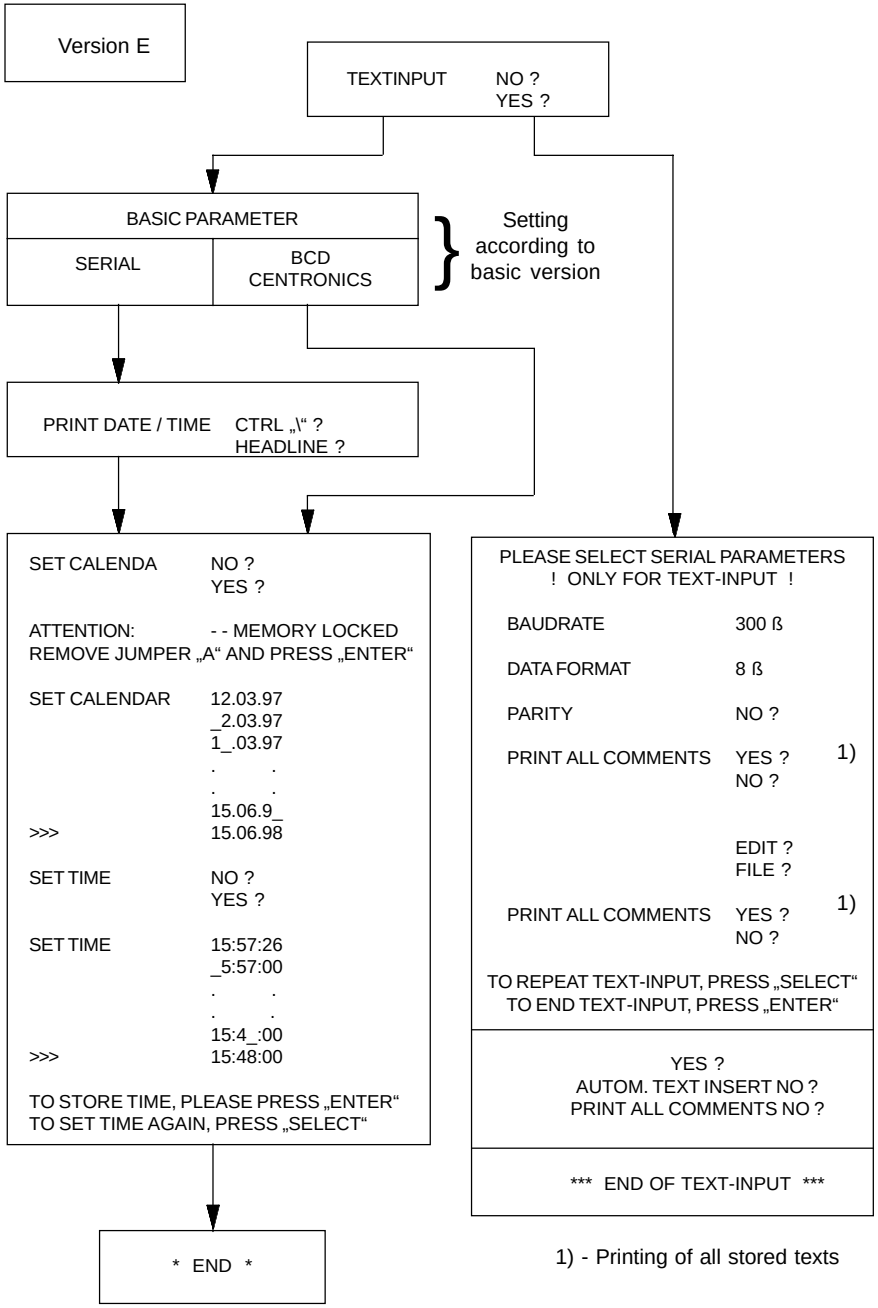
Additional characters used by the printer

Ctrl F	06	40 characters / line
Ctrl R	12	20 characters / line
Ctrl T	14	Inverted printing
Ctrl U	15	Normal printing
Ctrl W	17	Transmit request date / time
Ctrl \	1C	Print date / time in protocol
Ctrl A	01	Text entry (edit mode)
Ctrl C	03	Call text
Ctrl X	18	Start of text block
Ctrl Y	19	End of text block
Ctrl V	16	Reserve space for measured variable (6 digits)
Ctrl Z	1A	End of file mode
Ctrl [	1B	End of edit mode (ESC)

Character set - various languages

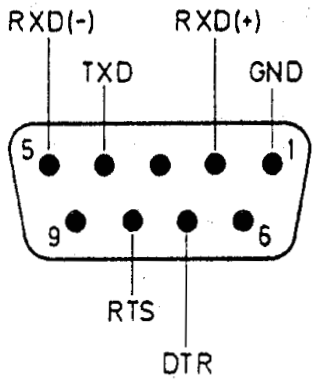
The following HEX codes differ from the ASCII character set:

Hex-Code	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
ASCII	#	$	@	[	\	]	^	`	{	¦	}	~
German	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
S / SF	§	¤	É	Ä	Ö	Å	^	é	ä	ö	å	ü
French	£	$	à	°	ç	§	^	ê	é	ù	è	ë
DK / N	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Spanish	#	$	@	Í	Ñ	¿	^	`	'	ñ	ç	··



1) - Printing of all stored texts

End of version E



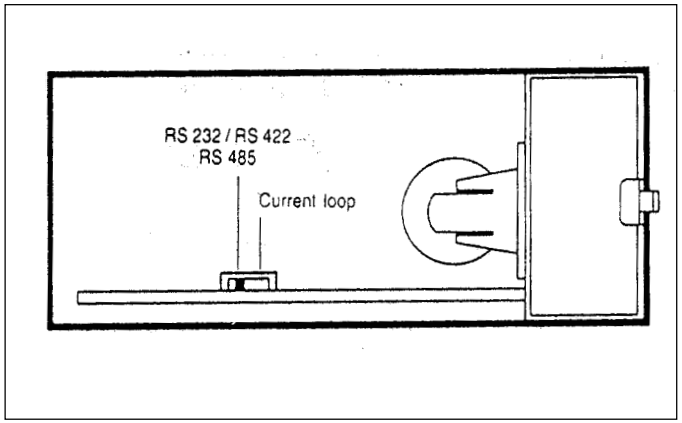
Serial Interface II (only IPP 144-40 E)

Pin	Signal	
1	GND	Ground (shield)
2	RXD (+)	Receive data
3	blank	
4	TXD	Transmit data
5	RXD (-)	Signal ground
6	frank	
7	DTR	(Data Terminal Ready) +12 V: ready to receive -12 V: not ready to receive
8	RTS	(Request To Send) +12 V: ready to receive -12 V: not ready to receive
9	blank	

This interface can optionally be operated under hardware handshake (DTR, RTS) or software handshake (XON / XOFF protocoll). This does not require special settings.

See chapter 4.4.: Connecting diagram.

4.2. Interface selection (Int I)



Slide snap lock to the right hand side, swivel front door out.
Now you can see the switch S 101 on the printes circuit board.

- For RS 232 C, RS 422 and RS 485 set S 101 to the **left** hand side.
- For Current loop, set switch S 101 to the **right** hand side.

IMPORTANT

This switching only applies to interface I.

If the printer is connected to the sender device (e.g. to a PLC), the interfaces must be adjusted to those at the sender device.
See chapter 6.2. which describes the setting of the baud rate,data format, stop bit and parity bit.
The parallel interface selection is also made via menu.

8. Appendix

8.1. Menu Program - Complete Selection

Basic version

MODE	ON LINE ?
	OFF LINE ?
PRINT STRENGTH	▌+.....0
	.
	.
	▌.....+ 0
PRINT FORMAT	INVERSE ?
	NORMAL ?
CHARACTERS / LINE	40 ?
	20 ?
CHARACTERSET	ASCII ?
	GERMAN ?
	SWEDISH / FINNISH
	FRENCH ?
	DANISH / NORWEGIAN
	CYRILLIC ?
	SPANISH ?
INTERFACE	CENTRONICS ?
	BCD ?
	SERIAL ?

SERIAL	
BAUDRATE	100 ?
	150 ?
	300 ?
	600 ?
	1200 ?
	2400 ?
	4800 ?
	9600 ?
DATA FORMAT	7 ?
	8 ?
PARITY	NO
	EVEN ?
	ODD ?
	MARK ?
	SPACE ?
CHANGE ADRESS (00)	NO ?
	YES ?
PRINTER ADRESS	_0
	3_
	31

BCD	
NUMERATOR	EXTERNAL RESET ?
	EXTERNAL CONTROL ?
UNIT	EXTERNAL ?
	MENU ?
	A ?
	.
	.
	ppm CO ?
>>>	ppm CO

PRINT INTERVALL	NO ?
	YES ?
	00h 00m _0s
	00h 0_m 50s
	00h _4m 50s
	0_h 34m 50s
	_2h 34m 50s
>>>	12h 34m 50s

End of basic version

* END *

e.g.:
15.06.97 16:57:30
Oil temperature 367,5 °C
Oil pressure o.k.
Boiler 1

Pause >

15.06.97 16:58:59
Boiler 2 still active
Temperature 258,6 °C

PRINT DATE / TIME	CTRL „ \ „

Date and time only precede the transmission if the character <Ctrl \> has been received.

BCD protocol

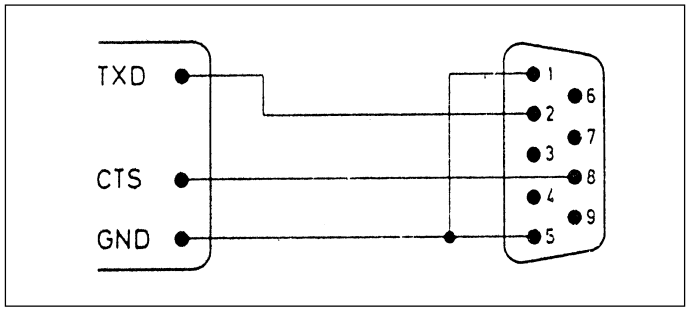
This requires that the control input R is connected to ground during the strobe pulse (additionally).
See chapter 7.4. - Timing Diagram !

The date & time is printed prior to measured values or texts.

4.3.Connecting diagram

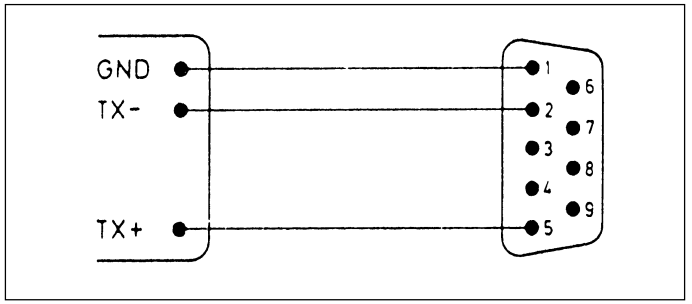
Interface 1
Set slider switch S 101 to the left hand side.
(see Interface selection 4.2.)

RS 232 C



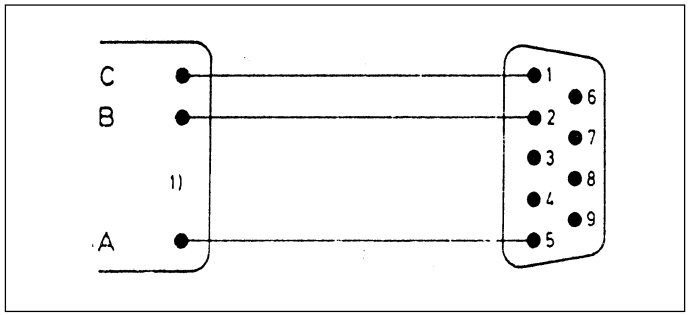
Sender IPP 144

RS 422



Sender IPP 144

RS 485



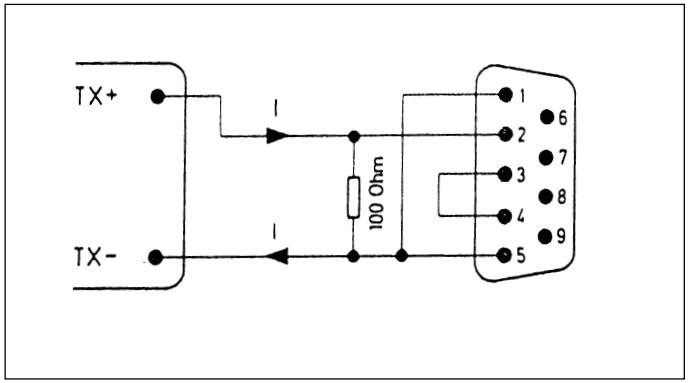
Sender IPP 144

1) see explanation on page 17

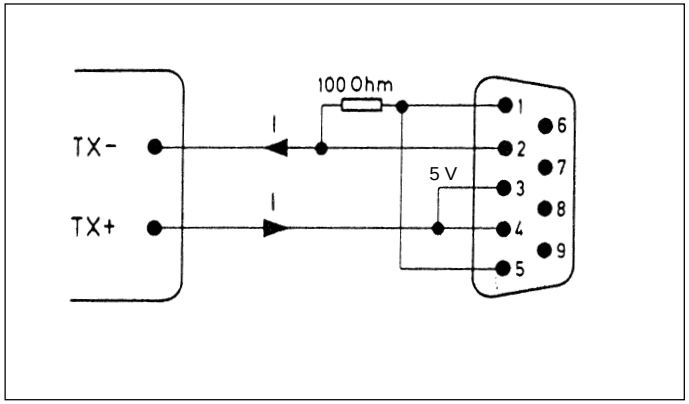
Current loop

Set slider S 101 to the right hand side !
(siehe „Einstellen der Schnittstelle“ 4.2.)

Sender
aktive,
IPP 144 - 40
passive



Sender
passive
IPP 144 - 40
aktive



„I“ identifies the direction in which the current flows (20 mA).

7.5. Date / Time Output (E Version)

Output

Date and time may be transmitted via the serial interface II.

Request: <Ctrl W> <CR>

Adressed: <Ctrl E> addr. <Ctrl E> <Ctrl W> <CR> <Ctrl D>

The IPP 144 returns date / time in the format:
<CR> <LF>
15.6.98 17:03:24
<CR> <LF>

During the transmission, nothing can be received (RTS = LOW).

With date & time

The IPP is capable of printing date and time together with measured values or text as a protocol. In this case, date and time precede the printout.

Serial protocol

Date and time may be printed ether always or only on request via control character.

This optional feature is selected in the menu program under:

PRINT DATE / TIME	HEADLINE

- Each transmission is preceded with the date / time (always).
- For several messages in a row (i.e. the IPP 144 is still printing), the date & time is printed once only at the beginning of the transmission.

It then searches its text file, starting at Text No. 1, and prints out that number of pre-stored texts where variable fields have been reserved and inserts the variable data in sequence. During the search, any texts without variable fields that it finds before, or amongst, texts in the file with variable fields are also printed.

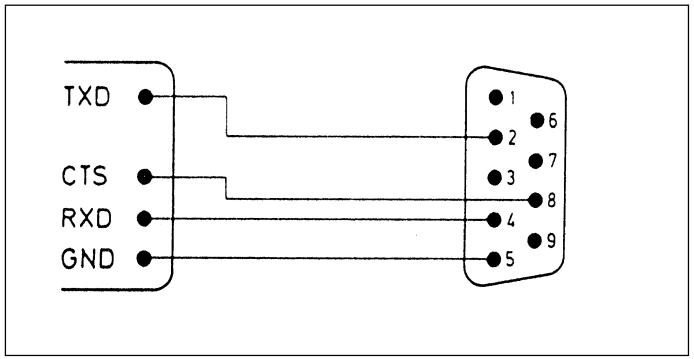
When the printing is complete, the IPP E resets itself and is ready again at Text No. 1.

For examples refer to page 60.

General comments:
Each message can now contain up to 40 ASCII characters in a variable field. During text programming <Ctrl V> automatically reserves 6 spaces and during printing variable data will be inserted from this point. Therefore, the pre-stored text should have adequate spaces to accept the data to be printed. The data will overwrite stored text if there are not enough spaces.
It is not necessary to mark a „text block“ with <Ctrl X> <Ctrl Y> during programming.
The PI option, if fitted, will not function while this mode is selected.
The „print interval“ function cannot be combined with this mode.
While this mode is selected the normal <Ctrl C> Text No. <CR> method to print individual pre-stored texts does not operate. The two modes cannot be mixed.
Since there is a maxima of 15 pre-stored texts, any input data which exeeds this limit will be ignored.

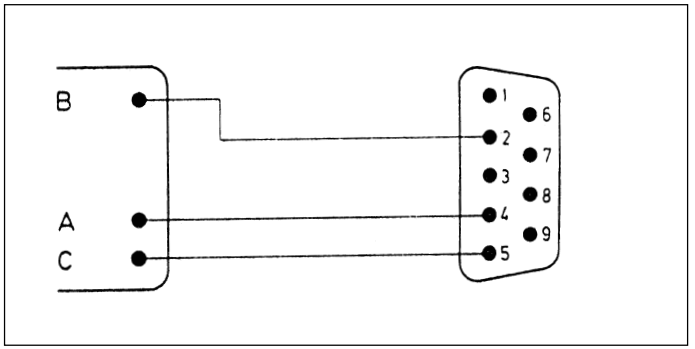
Interface II

RS 232 C



Sender / receiver IPP 144

RS 485
(option)



Sender / receiver IPP 144

1) Explanation concerning the signal names under RS 485

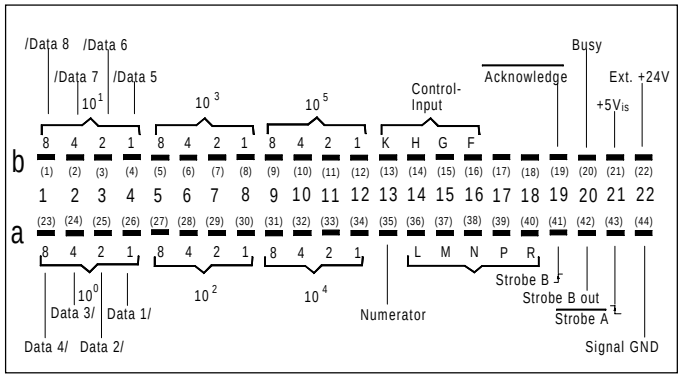
The names A, B, C correspond to the EIA 485 - standard:
inaktive or logical „1“; A > B
logical „0“: B > A

If an interface does not comply with that standard, the connections of A and B must be interchanged.

4.4.Pin Assignment Option PI

BCD pin assignment

If data are expected to arrive in BCD format or via Centronics protocol, a parallel interface is required.



In BCD format 6 decades (pins 1a ... 12b), see chapter 4.1. connection diagrams, can be printed, the following table summarizes the printable characters.

Character	Code 8 4 2 1	Character	Code 8 4 2 1
0	0 0 0 0	+	1 0 1 1
1	0 0 0 1	.	1 1 0 0
2	0 0 1 0	(blank)	1 1 0 1
3	0 0 1 1	<	1 1 1 0
4	0 1 0 0	>	1 1 1 1
5	0 1 0 1		
6	0 1 1 0	„0“ = GND	
7	0 1 1 1	„1“ = +5 V (or +24 V	
8	1 0 0 0	with external supply)	
9	1 0 0 1		
-	1 0 1 0	**open inputs are treated as “1“ !**	

- All 6 decades are equivalent,
  d.h., „-“ „+“ „.“ „<„ „>“ can be wired permanently or may sent variably.

In standard mode, this option uses TTL levels, in order to use 24-V levels, a **24-V voltage** source must be connected to pin 22b.

If within a text header another text number is called, only the text header following that text number is printed (e.g. text no. 5).

```
ORDER NO.
DATE:
EXAMINED BY:
AUXILIARY VOLTAGE:_____V
```

Alladditional options like printing of date [1] and time or measuring value insertion remain unaffected **(only 1 measured variable per call !)**.
[1] see following chapter.

Automatic Text Insert Mode

(Only valid with software 502.2 or higher)

It is now possible to use the <Ctrl C> Text No. <CR> method (via the serial interface) to call and insert variable data into a pre-stored text with new Automatic Text Insert mode.
This mode is selected in the set up menu, as follows:

```
        * * *  END OF TEXT INPUT  * * *
TO REPEAT TEXT-INPUT, PRESS                 „SELECT“
TO END TEXT-INPUT, PLEASE PRESS             „ENTER“
                              YES ?
AUTOM: TEXT INSERT            NO ?
PRINT ALL COMMENTS            NO ?
```

Yes means that IPP E will insert blocks of variables into one, pre-stored texts. It is not necessary, or indeed possible, to call the texts individually.
No means normal operation as before - using the PI interface, if fitted.

How does it operate ?
Each block of variable data is market by <CR>. The IPP... E takes and holds this data. After the last <CR> is received it waits about 2 seconds and then counts the number of <CR> markers it has received.

Possible mistakes:

A text without wildcards is selected:
The beginning of the text ix overwritten with a block character „ ■ „.

Text: Öil t emper ature too hight
is printed as: + 1234. 56 ■ ature too hight

BCD measured data

If during text entry space for measured variables has been reserved, the measured value is inserted in that position during printing (see chapter 6.4. / 7.4.). Valid charactersd are 0 ... 9 and 6 special characters (see chapter 4.4.).

Example:

MAINS VOLTAGE DROPPED TO 201.56 V

If by accident a text without reserved space was selected, a message is issued:

„ ERROR TEXT - NO. „

In addition, the measured value is output in the next line.

- Combinaton of measured values and text with date / time

7.4.3. Text block

A text block consists of a combination of several texts; it is printed in a single call.
(Only possible with BCD interface).
For the creation of blocks, refer to chapter 6.4.

A text header is called by calling the first text number within the text header.

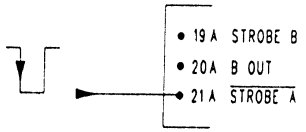
Example:

	Text - No.
MÜLLER & WEIGERT	1
D-90408 NÜRNBERG	2
	3
	4
ORDER NO.:	5
DATE:	6
EXAMINED BY:	7
	8
AUXILIARY VOLTAGE: _____ V	9

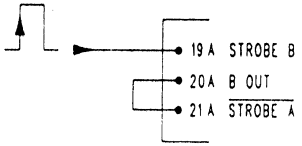
Data are read

This data are read in with a strobe pulse, minimum pulse length is 2 µs, edge triggered.

Connection for negative edge



Connection for positive edge



In addition to data, a unit caption may be printed (e.g. A; mm; % etc.).
The units are selected.

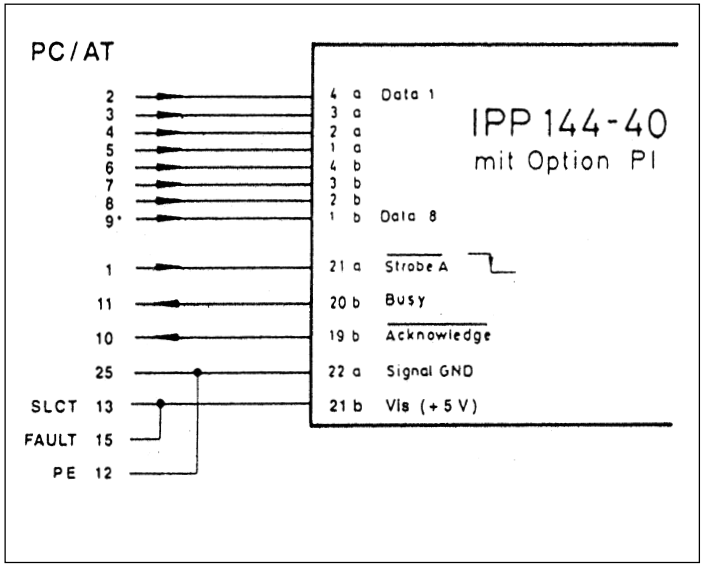
- via menu program (see chapter 6.3.); there are 31 options available
- using the 4 control inputs F, G, H, K (pins 13b to 16b); the first 15 of the 31 options.

Code

The following codes are used:

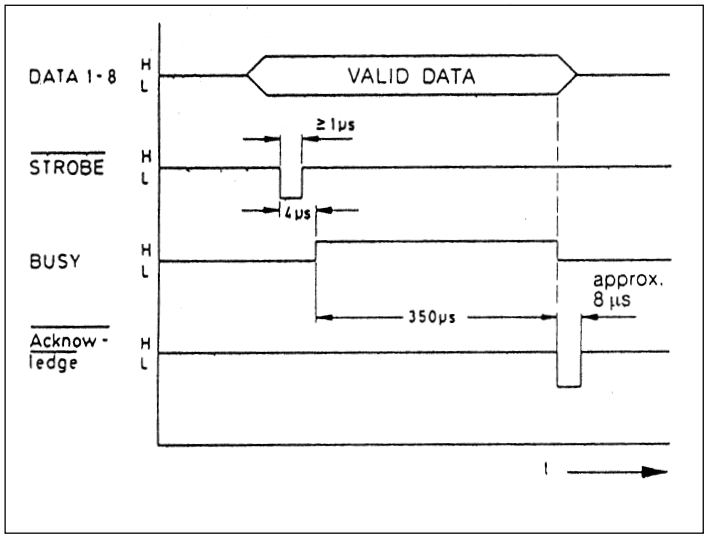
Unit	Control input K H G F	
A	0 0 0 0	
V	0 0 0 1	
g	0 0 1 0	
m	0 0 1 1	
mA	0 1 0 0	
mV	0 1 0 1	
mm	0 1 1 0	
m/min	0 1 1 1	
µA	1 0 0 0	
kV	1 0 0 1	
kW	1 0 1 0	
kp	1 0 1 1	
Hz	1 1 0 0	
°C	1 1 0 1	
%	1 1 1 0	
(blank)	1 1 1 1	(all open)

Centronics protocol: Pin assignment PC / AT



* In case of no function, put pin 9 on low (GND),
Note: Characters will be printed only up to 7F (HEX).

Timing



7.4.2. Fixed texts with variable measured data

Serial measured data

The calling of texts and the insertion of measured values differs from the calling of fixed texts described above in that:

- no control character must be transmitted.

This type may be used with devices which can only trensmit sign, measured value and <CR>.

- The text is selected via the PI option;
  those control inputs active at the **time <CR>** arrives are decoded. IPP in mode serial !

- The measured data received serially replaces the wildcards in the printout.
  Valid characters are **all ASCII characters**.

- Automatic Text input Mode (page 46, 47, 48).

Note:
If all of the control inputs L, M, N and P are open, the serial interface operates as in default mode, i.e. everything transmitted is printed.

Wildcards

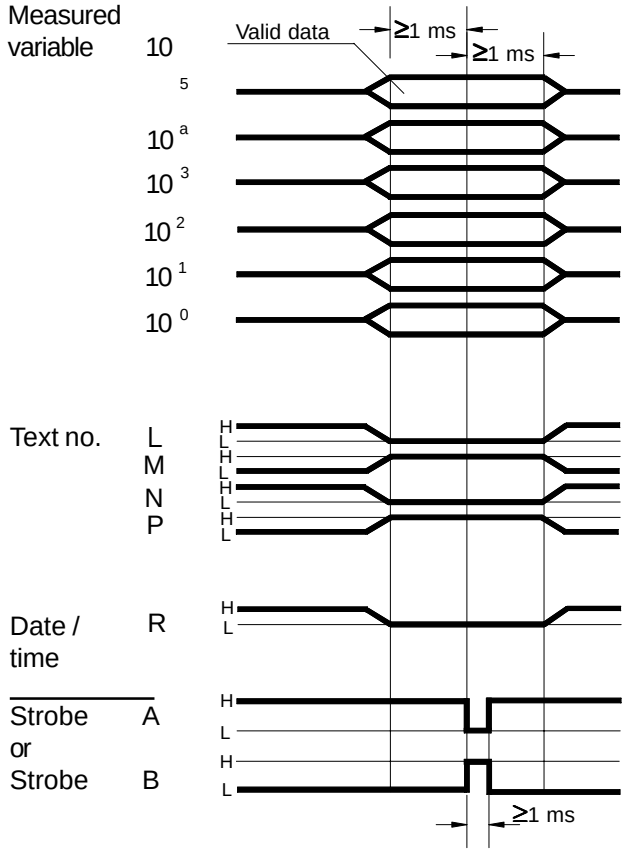
During text entry, in default mode up to six characters are reserved automatically (see chapter 6.4.) for the printing of measured variables; however, up to 10 digits may be printed. These additional digits require additional blanks to be inserted at text entry time, because otherwise characters to the right of the wildcards would be over-written. E.g.:

OIL TEMPERATURE X X X X X X ℃
2 additional blanks
„Ctrl V“ plus wildcards

If the wiring is correct, a measured value is printed:
+ 1 2 3 4. 5 6 ℃
overwritten blanks

Timing-diagramm for BCD option

Example: Calling text (6) with date / time and measured variable display.



Printout of example:
15. 06. 98
OIL TEMPERATURE 194,56 °C

5. Operation

5.1. Operating Controls

The numbers with operatingcontrols refer to the diagrams in chapter 3.

LED „Alarm“ (4)

If this LED is lit, the printer has run out of paper. Insert a new paper roll; see section 5.2., Replacing the Paper Roll.

LINE FEED / ENTER (2)

This key has two functions:

- LINE FEED:
  During operation used for manual paper feed.
- In the menu program it is used to accept and save the parameters selected via Select.

MENU / SELECT (3)

This key has two functions:

- MENU:
  If during operation this key is pressed continuously for more than 3 s, the printer switches to menu program mode in which device parameters are printed out and can be modified.
- Select:
  Within the menu program it is used for selecting the device parameters.

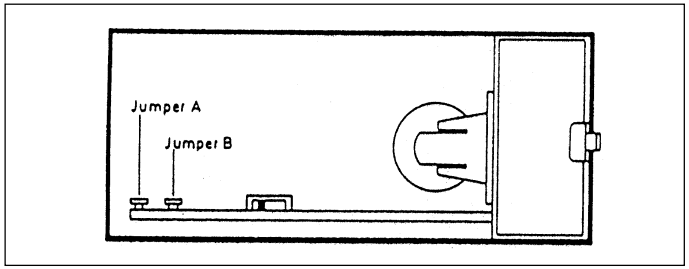
Paper cutting edge (1)

In order to tear off the paper, pull the paper quickly side-ways and up.

Snap lock (9)

Push this to the right hand side to open the front panel in order to be able to replace the paper roll or to set the slider switch S 101 which is used to the desired interface (see chapter 4.2. Interface selection).

Locking the Menu / Select key



If the jumper B is connected, the Menu / Select key is locked; menu parameters can neither be printed nor modified.

In order to print or modify parameters:
remove **jumper B** !

Write protection (only for IPP 144-40E)

If the jumper A is connected, no texts can be written into the text memory; date and time cannot be set either. If an attempt is made anyway, the printer issues a message.

! ATTENTION ! - MEMORY LOCKED PLEASE REMOVE JUMPER A AND PRESS „ENTER“

In order to enable the text save and date / time setting function: remove **jumper A** !

Calling via BCD Interface

Texts are called via the control inputs L, M, N and P.

Those control inputs which are active at the **time the strobe** occurs are decoded (see timing diagram).

Text no.	Code L	M	N	P	Remark
	8	4	2	1	
1	0	0	0	0	
2	0	0	0	1	
3	0	0	1	0	
4	0	0	1	1	
5	0	1	0	0	
6	0	1	0	1	
7	0	1	1	0	
8	0	1	1	1	Only input L to Ground
9	1	0	0	0	
10	1	0	0	1	
11	1	0	1	0	
12	1	0	1	1	Only input M to Ground
13	1	1	0	0	
14	1	1	0	1	Only input N to Ground
15	1	1	1	0	Only input P to Ground
	1	1	1	1	All inputs open

If all inputs are open, the unit caption is printed with the measured variable (see chapter 6.3.).

Error message „TEXT No. !“
occurs if no text was stored under this number.

7.4. Text Output (E Version)

7.4.1. Fixed Texts

Calling via serial Interface

In order to print must receive a trandmission with the following format:

< Ctrl C > text number < CR >

The printer looks up the stored text related with that number and prints it.

If there is no such text, nothing is printed.

Refer to: Automatic text insert mode (page 47 / 48).

Important notes:

- < LF > on its own does not start the printing !
- Between several text calls in a row there has to be a gap of at least 2 seconds to make sure no text is skipped during printing.
- Several text calls using < Ctrl C > and normal transmissions must not be combined !
- Combination of text and date / time (protocol) see chapter 7.5. !

The call for a printer with an address:

Precede the call with the address (see chapter 7.2.).

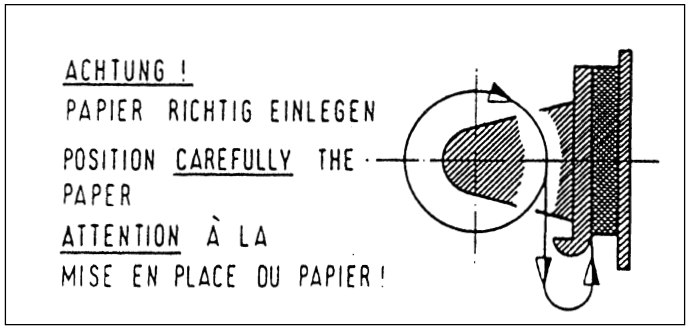
<Ctrl E> Adr. <Ctrl E> <Ctrl C> Nr. <CR> <Ctrl D>

5.2. Replacing the Paper Roll

Proceed as described below:

1. Push the snap lock to the right hand side and open the front panel.
2. Tilt the wire frame upwards;
   remove the old paper roll.
3. Insert new paper roll; make sure it rotates clockwise during printing (see figure).
4. Insert paper into paper inlet from the bottom as shown in the above diagram.
5. TPress the LINE FEED / ENTER key until the paper appears at the cutting edge.
6. If you have fed too much paper, carefully rewind the roll. Push the wire frame back over the roll.
7. Close the front panel (snap lock must lock). The ALARM LED extinguishes and the printer is ready.

Warning: Dangerous voltage
is accessible if replacing the paper roll after opening of the front panel !



5.3. Menu Program

All functions of the IPP 144 are set via menu program using the ENTER and SELACT keys and are saved when the user quits the program.
From then on the IPP 144 automatically uses these parameters.

The possible settings are explained in chapter 6.

Entering the menu program

Press the MENU / SELECT key for approx 3 s.

The IPP reacts by printing

„ACTUAL PARAMETERS ? PRESS ENTER“

Print current parameters

Press the ENTER key

the IPP 144 prints the currently set parameters.

The final printout reads

CHANGE PARAMETERS ?

Improved handshaking for pre-stored texts

With the software (V 502,2) the printer now sets RTS at „busy“ (and / or the signal „XOFF“ is transmitted) while a pre-stored text is being printed.
This hardware (or software) handshake can be used to control the data transmission and prevend rapid text calls being lost or overwritten. When the printing of pre-stored texts is complete, RTS is reset (and / or the signal „XON“ is transmitted).

Without handshake the following can occur, if the text calls are sent in too quickly:
Data input:<Ctrl C> 1 <CR> <Ctrl C> 7 <CR> <Ctrl C> 11 <CR>

Actual print-out

Machine No. TREE	pre-stored text no.1
7	just „7“ printed, Text no. 7 missing
11	just „11“ printed, text no.11 missing

With handshake, **provided** RTS (or XON / XOFF protocol) is used to control the data transmitter:
Data input: <Ctrl C> 1 <CR> <Ctrl C> 7 <CR> <Ctrl C> 11 <CR>

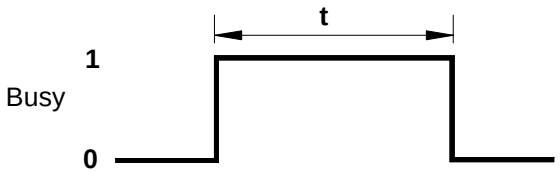
Actual print-out

Machine No. TREE	pre-stored text no. 1
Automatic mode	pre-stored text no. 7
Machine status NORMAL	pre-stored text no. 11

Option PI - BCD

BUSY

During the wait delay the line BUSY (pin 20b) is high.
During the delay the IPP 144-40 is unable to receive.
After expiry of the delay BUSY is reset and data can be received.
A strobe pulse starts the subsequent print process and the subsequent interval.



t: Time for printing (approx. 1,6 sec/line) or the corresponding interval time.

7.3. Handshake Messages

Serial Interface

RTS / DTR

These lines indicate the printer status to the sender; DTR (device is on) is rather insignificant and is in general not used.

RTS high (+12 V) indicates: printer is ready to receive
RTS low (-12 V) indicates: printer is not ready to receive

The reasons for printer not ready could be:

- Out of paper
- Print interval running
- Buffer is full
- Change menu

RTS / DTR are only used by the RS 232 C interface and can be used for interface I and 2.

Print interval (serial)

During the presed wait delay the interface is **not ready to** receive. After expiry of the wait delay the RTS signal (or XON) becomes active again and requests the subsequent transmission.

The next interval begins upon receiving of <CR> or <CR + LF>,
< LF > on its own is not accepted.

XON / XOFF

The report function printer ready / not ready are handled by this protocol if no handshake lines are connected (RS 232 C, RS 422 or RS 485).

XON is transmitted if the IPP 144-40 E is ready to receive.

XOFF is transmitted if the IPP 144-40 E is not ready to receive (see above).

Note:
If the IPP 144-40 E is not ready to receive, it transmits this character just once, not continuously.
No adjustments have to be made, this protocol always runs parallel to the hardware handshake.

The menu program Change Parameters

Press ENTER and SELECT simultaneously for approx 4 s; the IPP 144 brings up the first function which can be modified (see changing parameters).

The menu program Change Parameters can be called in one of two ways:

- **Without** prior printing of the current parameters:
  Press both keys following ACTUAL PARAMETERS ?
- **With** prior printing of the current parameters:
  Press both keys following CHANGE PARAMETERS ?

Quitting the menu program

The program is terminated by simultaneously pressing ENTER and SELECT.
Following the printout * END * all modified functions are saved.

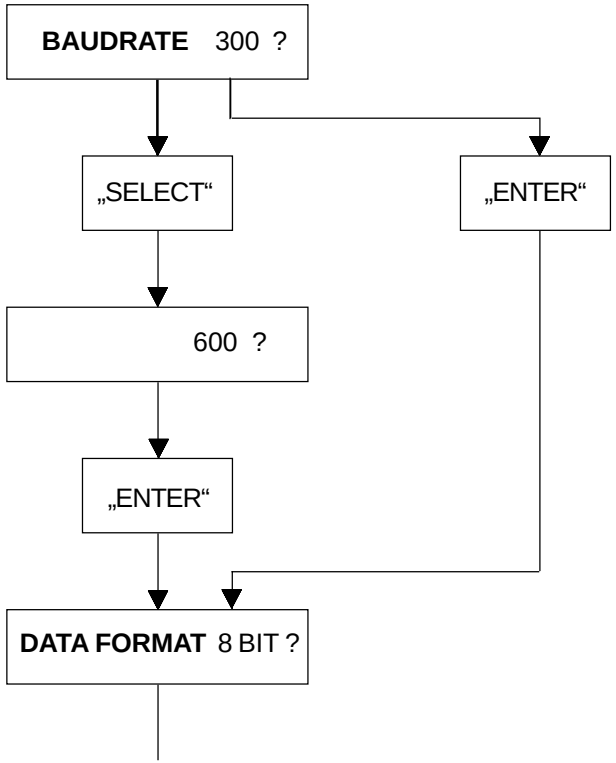
If there are no keys pressed over a period of approximately 3 minutes, the program is terminated automatically and any modifications made are not saved.

Changing parameters

The IPP 144 prints a changeable parameter with a „?“

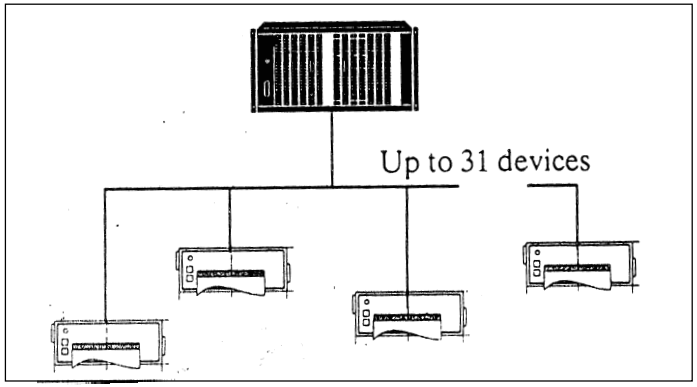
- Press ENTER to accept the parameter and to move to the next function.
- Press SELECT to display the next parameter option.

Example:



In case
1: Baud rate 600 (Baud)
is saved

In case
2: Baud rate 300 (Baud)
is saved



Address / ASCII character assignement example:

Address	Address in Protocol (HEX)	corresponding ASCII character
0	-	without addressing
1	31	1
▪	▪	▪
▪	▪	▪
▪	▪	▪
30	4 E	N
31	4 F	O

The addressing protocol is:

<Ctrl E> address <Ctrl E> text... <Ctrl D>
A text of more than one line is possible.

(<Ctrl E>, <Ctrl D>, see appendix).

A transmission is only accepted if the sequence
<Ctrl E> address <Ctrl E> is used.

e.g. print date / time / text:
<Ctrl E> address <Ctrl E> <Ctrl \> <CR> characters...
<CR> <Ctrl D>

7. Functional Description

7.1. Start Printing

To start the printing, the IPP 144-40 expects either one of the characters

<CR> Carriage retum, Enter

und

<LF> Line feed.

Valid combinations are:

<CR>, <CR> + <LF>, <LF>.

Note:
Both combinations <CR> + <LF> and <LF> + <CR> create two line feeds.
<LF> by itself has no effect combined with other control characters (calling text, send clock, start print intervall - see following sections).

If these characters are transmitted **without** a print triggering character, the IPP 144-40 prints them after approx. 3 seconds.

Other widely used print trigger characters such as <FF> form feed are ignored.

7.2. Adressing

Each IPP 144-40 / IPP 144-40 E printer is addressable. Thus, several printers can be supplied with different data via one data line.

Up to 31 printers can be connected by one sender device (e.g.
a PLC). The respective address is set in the menu program.

Note:
- Standard interface RS 232 only permits 1 sender / 1receiver - do not connect more than 4 IPPs as receiver.
- Only interface RS 485 allows up to 32 receivers.

6.Adjustments

6.1. General Functions

The various functions and device parameters are selected and set via the menu program (see chapter 5.3.).
The appendix contains a summary.

Mode

The are 2 operating modes:

- ONLINE: The device is ready to receive.
- OFFLINE: The device is not ready to receive.

Print Strength

The print strength can be set 8 steps.

The print strength changes immediately after the selection has been made.

Print Format

- NORMAL: The printout can be read during printing, the last print line is at the top.
- INVERTED: The printout is made top down, the last print line is at the bottom. In this case the printout is in the proper order after the paper has been torn off.
- Print formats can be switched via the serial interface (see appendix 8.2., additional control characters), if the inpout buffer is empty!

Character / Line

40: 40 characters per line = standard character width
20: 20 characters per line = wide characters

The character width can be switched via the serial interface (at the beginning of a line and only if the input buffer is empty).

Character Set

Available character sets are:
ASCII, german (D), french (F), swedish / finnish (S / SF). danish / norwegian (DK / N), spanish (E) and cyrillic.
Character sets see appendix !

Interface

SERIAL:
This sets the printer for data transmission via serial interface.

BCD:
The parallel interface (if fitted) is set for data transmission in BCD format.

CENTRONICS:
The parallel interface (if fitted) is set for Centronics protocol data transmission.

Print Interval

The printing of measuring values can be carried out under internal timer control.
Setting range: 10 s ... 24 h in steps of 10 s.

The interval starts **after** the printing of the line received last.

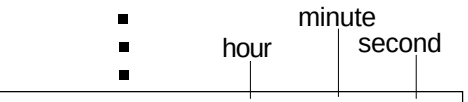
For the **Centronics interface** it is not possible to specify an interval.

- For more information see chapter 7.3. „Handshake“ !

Setting the time

The time is set like the date.
After the current date has been printed, the following line appears:

SET TIME	NO ?



SET TIME	12.	: 31.	: 33
	_2.	: 31.	: 00

If the time is modified, the seconds are automatically set to zero.
If the time has been entered and ENTER has been pressed, the following is displayed:

TO STORE TIME; PLEASE PRESS „ENTER“
TO SET TIME AGAIN; PRESS „SELECT“

So: If the time has been entered correctly, press ENTER.
If the time has been entered incorrectly, repeat the entry by pressing SELECT.
After both date and time have been entered, the following is displayed:

* * * END * * *

Summer time - Winter time - transposition

In order to move the clock one hour forward or back, the following prcedure must be carriet out under the item of the menu which is entered at the beginning after „MODE“:

„CHANGE TIME (WINTER <---> SUMMER)“

After confirmation with „YES“ the followingwill appear for selection

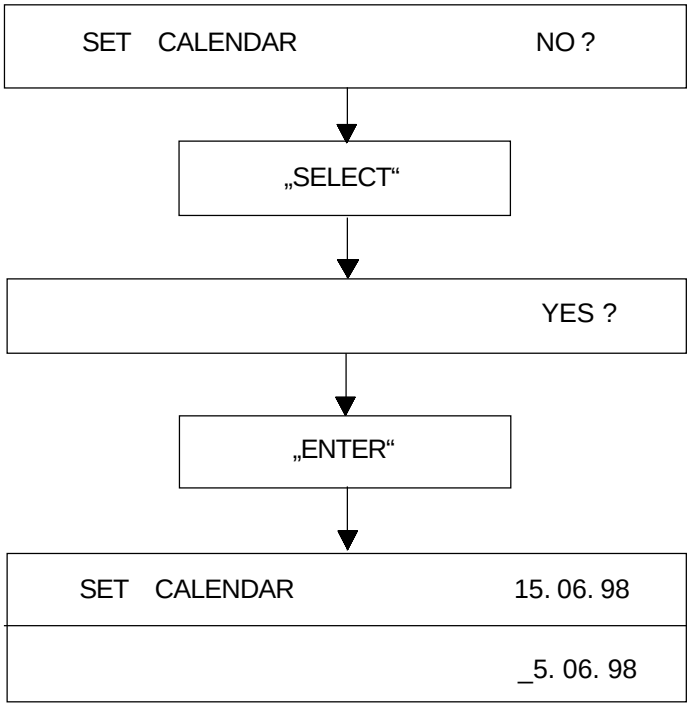
„W ---> S (+1 h)“
„S ---> W (-1 h)“

Subsequently the current time will be printed out again and the item of the menu will be quittedimmediately.

Date / Time

Date entry

Date and time are factory set. In order to modify these values the menu program must be called and the following message must be displayed.



The printed cursor to the left of the 5 indicates that this position can be modified; inour example this is the decimal digit of the day. The SELECT key is used to print the possible values successively; in our example this is 0, 1, 2, and 3. To accept the value press ENTER; the cursor jumps to the next position to the right ... etc.

>>>	24. 06. 98

Eventually, the current date is printed.

Note:

Incorrect entries, e.g. day 33 of the month, will not be accepted by the printer.
Instead, it starts over at the base value 00.

6.2. Serial Interfaces

Baudrate

The are 8 baud rates available:
110; 150; 300; 600; 1200; 2400; 4800 and 9600 baud.

Data Format

The are 2 formats available:
7 bit or 8 bit transmission,
1 start bit / ... / parity / 1 stop bit

ATTENTION:
With 7 bit no parity, the sender must be set to 2 stop bits.

Parity

There are 5 options available:
even, odd, mark, space, no parity.
There is no check made.

Printer Address

Each IPP 144-40 / IPP 144-40 E can be addressed. This allows the concurrent supply of different data to several printers via one data line.

Up to 31 printers may be called from one sender (e.g. a PLC). The respective address is set in the menu program.

For more information see chapter 7.2., Adressing !

6.3. The PI Option
BCD Interface

Numerator

This feature prints a three digit line numbering (1 ... 999).

EXTERNAL RESET:
The numbering is printed continuously. The line number is reset to 0 if during a strobe pulse there is a low signal at pin 13a.

EXTERNAL CONTROL:
If pin 13a is open (high signal), there is no line number printed.

The printing starts at number 1 if pin 13a is set to low signal.
It is continued while pin 13a remains low.

Unit

In addition to the numeric measuring values, a measuring unit may be printed (e.g. mm or kV).

The are 2 ways of setting the unit: in the menu program or via the control lines.

- MENU:
  There are 31 selectable units:
  A; V; g; m; mA; mV; mm; m/min; µA; kV; kW; kp; Hz; °C; %; W; kW; kVA; kHz; cosj; °F; °K; Upm; MW; bar; kWh; l/min; N; kN; cbm/h; ppm CO [1)].

- EXTERNAL:
  Via the control lines F, G, H, K , 15 units can be selected.

  The codes are listed in chapter 4.4..

[1)] The 2 underlined captions can be user specific and set at the factory.

So:

- In EDIT mode:
  <Ctrl A> **<Ctrl X>** text no. <CR> text no. <CR>
  <Ctrl A> text no. <CR> text no. <CR>
  ▪
  ▪
  ▪
  ▪
  <Ctrl A> **<Ctrl Y>** text no. <CR> Text <CR>

- In FILE mode:
  <Ctrl X> text no. <CR> text <CR>
  text no. <CR> text <CR>
  ▪
  ▪
  ▪
  <Ctrl Y> text no. <CR> text <CR>

The text within a text block must have **continuous** numbers.

To delete text within a text block without creating a blank line, the text numbers following the deleted line must be decreased by 1 to move them forward.
This is not done automatically but has to be entered manually.

Refer to page 46, 47, 48 und 60.

Call a text block

Reserving space for measured variables

In order to be able to insert measured values (variables) into text afterwards, the location within the text must be market using „Ctrl V“, which reserves 6 spaces into which any characters may be entered, since they are overwritten at a later time anyway; they are merely wildcards.

Example:
Entry:
TEMPERATURE <Ctrl V> XXXXX °C <CR>
<Ctrl> counts as one digit, so you only have to enter 5 wildcard characters.

The printout would look like this:
TEMPERATURE 263,45 °C.

Creating a text block

A text block is created by combining several texts.

A text block can be printed in a single call.

To achieve this, place beginning and the end of the text in brackets at entry time. Use the control characters:

Ctrl X = opening bracket
Ctrl Y = closing bracket

6.4. Version E (IPP 144 - 40 E)
Text Entry

Text can only entered via interface II, not via the parallel interface.

The maximum text length is 40 characters; if the text length exceeds 40 characters, only first 40 characters are saved.

Text may be input via any device capable of sending ASCII characters, e.g. programming devices, terminals, key-boards or personal computers.

The text entry program is called via „CHANGE PARAME-TERS“ (see chapter 5.3.) and „TEXT INPUT YES ?“.

- In the first place, the interface parameters of printer and input device must be adjusted to each other:

  PLEASE SELECT SERIAL PARAMETERS
  ! ! ONLY FOR TEXT - INPUT ! !

The baud rate limited to 1200 baud.

(After quitting the text entry program, the printer resumes its previous functions.)

- Differences between the modes „EDIT“ and „FILE“:

  FILE: There is a device available[1)] (PC etc.) which has its separate editing software (PC TOOLS, WORD etc.[1)]) which can be used to modify the text prior to the transmission. The transmission includes the entire file and all texts.

  EDIT: There is a keyboard or a terminal available; modifications of the text are made using the <**BS** > (Backspace) key or the arrow keys. Any text entered is immediately printed for checking purposes.

1) see accessories !
There is separate text entry software available.
MWTA Version for DOS or PCP/M.

Entry formats

FILE mode:

Text number <CR> Text <CR>

This sequence may be continued as required:

No. <CR> Text <CR> No. <CR> Text <CR>.

EDIT mode:
Each text number entry is preceded by the <Ctrl A> character:

<Ctrl A> No. <CR> Text <CR>

If <Ctrl A> is omitted, all following characters are ignored.

The text number may contain up to 3 characters, e.g. 5; 05 oder 005.
<CR> may be: <CR> by itself <CR> + <LF>.
<LF> by itself is not accepted.

Error messages

ERROR text - No. -
The entered text number is to high (>15) or is incorrect in another way.

MISSING text - No. -
<Ctrl A> was immediately followed by <CR>.

ERROR TEXT -
For blank texts, press the SPACE key once. <CR> is not accepted on its own.

TRANSMISSION ERROR (FILE mode) -
Transmission error - send file once more.

If this message occurs repeatedly, check the entry format, reduce the baud rate of printer and input device (recommended baud rate is 300 baud).

Terminating the text entry

in EDIT mode: < ESC >
in FILE mode: < Ctrl Z > or press printer ENTER key.

The message:

PRINT ALL COMMENTS NO ?

is display.
Valid options are YES and NO.
If YES is entered, all texts are printed once more in the order specified by their text numbers.

If NO is entered or after the printout has been completed, another message appears:

TO END TEXT - INPUT, PLEASE PRESS „ENTER“ TO REPEAT TEXT - INPUT, PRESS „SELECT“

So: To terminate the text entry, press ENTER;
to repeat, press SELECT.

If ENTER is pressed, the message:

* * * END OF TEXT - INPUT * * *

appears.

Adding, overwriting texts

If during text entry a text number which has been allocated before is selected, the old text is overwritten with the new text.

! Unselected text numberss are not deleted !

Deleting texts

Deleting certain texts:

<CtrlA > No. <CR> <DEL> <CR> (Edit)
or No. <CR> <DEL> <CR> (File)

<DEL> is the ASCII code 7F or the DELETE key (edit mode).