CONTENTS

1 General Information

1.1 ⚠ Safety Instructions

Wherever you see this sign ⚠ you will find information on potential hazards. Please read these sections with particular care!

⚠ **Warning!** Before opening the instrument disconnect the mains plug!

⚠ **Attention!** If the fuse has to be changed, use only G fuse-link 5 × 20 according to IEC 127 (see 4.1)!

1.2 ⚠ Switching the Operating Voltage 230 V~/115 V~

Your instrument left the factory to 230 V~. Switching to 115 V~ requires the instrument to be opened, which should only be done by trained personnel.

Setting the Operating Voltage 115 V~

1. Disconnect the instrument from the mains.
2. Remove upper caps and loosen the screws below.
3. Identify the mains voltage switch with the following illustration.
4. Switch the voltage mains voltage switch (slide switch) located under the power switch to the indication “115”.
5. Remove safety cover at the mains plug and replace the fuse with the fuse for 115 V supplied with the instrument.
6. Fasten upper caps and put the sticker supplied with the instrument for marking the switch-over to 115 V on to the type label.

Mains Voltage Switch

115 V position

230 V position

1.3 ⚠ Mains Connection

The design of the unit meets the requirements of safety class I according to EN 61010-1, i. e. all metal parts accessible from outside and exposed to contact are connected with the protective conducto of the supply network.
Power is supplied via a mains cable with earthing contact.

1.4 Installing the Power Supply Unit

The unit should not be operated close to equipment that develops heat.

1.5 Switching on

The unit is switched on using the power switch at the front. The power switch separates the unit completely from the primary side of the transformer.
The LED *ON/OFF* serves as an operation indicator.

1.6 EMC

The unit is interference-free according to the EN 50081-1 and EN 50081-2. In order to fulfil the limiting values in line with present standards, it is absolutely necessary that only cables which are in perfect condition be connected to the unit. The following information applies here:

- Metallic or metallized socket cases must be used for interface RS-232C. The socket cases and the braided screen of the cables must be connected at the shortest distance possible. The signal earth must not be connected to the braided screen.
- After opening and closing the unit ensure that if all the fixing parts and contact springs are installed as before that all the screws are fixed and tightly.

1.7 Inspection and Maintenance

If service is needed, due attention should be paid to the regulations according to VDE 0701. The unit should only be repaired by trained personnel.

1.8 Warranty

GRUNDIG guarantees the perfect working order of the unit for 12 months as from delivery.
There is no warranty for faults arising from improper operation or from changes made to the unit or from inappropriate application.
If a fault occurs please contact or send your unit to:

The unit should be sent in appropriate packing - if possible in the original packing. Please enclose a detailed fault report (functions working incorrectly, deviating specifications and so on) including unit type and serial number.
Kindly verify warranty cases by enclosing your supply delivery note. Any repairs carried out without reference to a valid warranty will initially be at the owner's expense.
Should the warranty have expired, we will, of course, be glad to repair the unit as per our General Terms Of Assembly And Service.

1.9 Accessories Supplied

1 mains cable
2 fine wire fuses (T 200 mAL/250 V and T 100 mAL/250 V)
1 coaxial cable
1 operating instructions
1 sticker of marking for 115 V switch-over

2 Application

- The table measuring unit UZ 2400 is a compact two-channel counter controlled by a microprocessor and allows frequency measurements of period signals via channel A within the range of 10 Hz to 100 MHz and via channel C from 50 MHz to 2.4 GHz.

- Moreover, the period length of periodic signals from 100 µs to100 ms can be measured within the range of and pulses can be counted from 1 to 10^9 pulses via channel A.

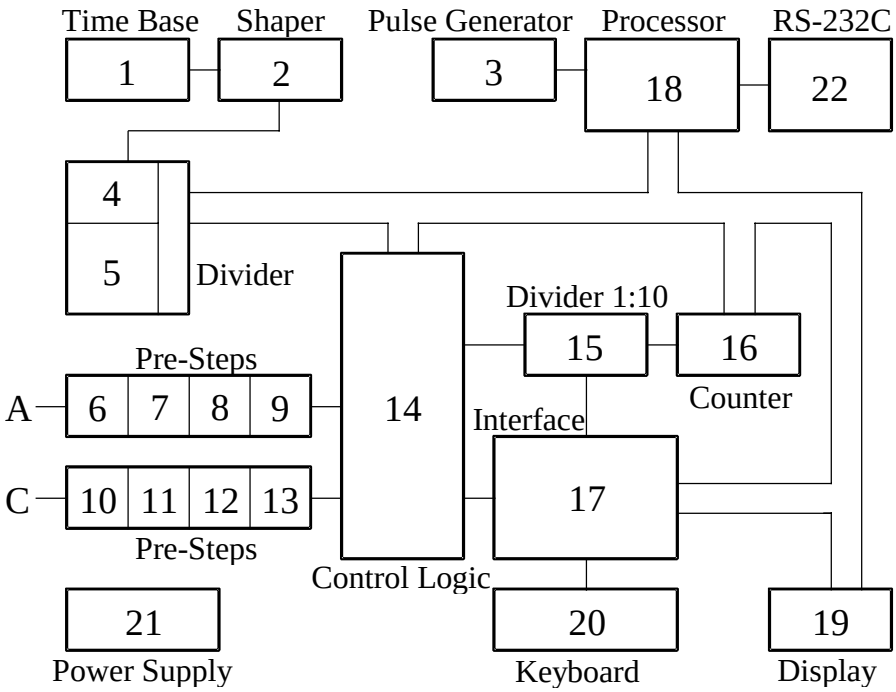
- The trigger level can be set and measuring amplitudes up to 50 V can be attenuated at the ratio of 10:1 on channel A.

- Functions and measuring ranges can be set by means of 4 buttons in the form of a menu and they are clearly depicted on a 16-digit display.

- The unit is supplied with a serial interface RS-232C which allows both remote control and a further processing of the data.

3 Set-up and Functional Description

3.1 Block Diagram



3.2 Description

The unit's internal measuring operation is controlled by a one-chip microprocessor MCS-51 with the help of additional circuits. The processor [18] which gets its time frequency from the pulse generator [3] can also communicate with superior systems via the serial interface [22].
The time base which is supplied with the standard frequency of 10 MHz [1] provides precise frequencies for single measuring intervals. The standard frequency is led to a special circuit via the shaper [2]. This circuit contains an internal predivider of 1:10 [4] and a programmable dividing decade [5]. Furthermore it provides reference frequencies of 1 MHz and 10 MHz. The generated measuring intervals are led on the input of the switch- and control logic [14].
The measuring signal passing through channel A is led to a Schmitt-trigger [8] after being set [6] and boosted [7], and, subsequently, it is converted from ECL to TTL level [9]. This signal also is led to the input of the switch- and control logic.
The measuring signal passing through channel C is also set and boosted [10, 11], and led to a fast divider [12] and converted from ECL to TTL. Before passing the switch- and control logic the high-frequency signal is divided further [13].
The signal gated in [14] is led to a high-speed predivider of 1:10 [15] which is counted by a decadic counter [16] and shown on an alphanumeric LCD-display [19]. The processor, thereby, organizes the reading of the keyboard [20], the setting of the control logic, the resetting of the counting decades and the repetition of the measurement by means of the interface circuit [17].

4 Technical Data

4.1 General Data

Rated temperature:	+ 23 °C ± 2 °C
Operational temperature:	+ 5 to + 40 °C
Relative humidity:	20 ... 80 %
Atmospheric pressure:	86 ... 106 kPa
Operational position:	horizontal or inclined by ± 15 °
Operational voltage:	sinusoidal alternating voltage (distortion factor < 5 %)
	115/230 V ± 10 % (internal switchable)
Frequency:	50 ... 60 Hz (± 5 %)
Power input:	20 VA
Fuses:	T 100 mAL/250 V (230 V~)
	T 200 mAL/250 V (115 V~)
Safety class:	1, according to EN 61010 Part 1
Radio interference suppression:	EN 55011 Class B
Dimensions (L × H × D):	225 mm × 85 mm × 200 mm
Dimensions of packing:	310 mm × 110 mm × 265 mm
Weight:	
of universal counter	approx. 1.8 kg
incl. packing and accessories:	approx. 2.6 kg

4.2 Specifications

4.2.1 Characteristics of Channel A

Frequency range:	10 Hz ... 100 MHz
Basic sensitiveness:	V_{rms} = 25 mV (sinusoidal signal)
(Voltage divider 1:1):	V_{pp} = 75 mV on pulses with minimal width of ≥ 10 ns
Coupling:	alternating voltage
Input impedance:	1 MΩ (< 20 pF)
Input divider:	1:1 or 10:1
Dynamic range:	75 mV ≤ V_{pp} ≤ 5 mV
(with divider 10:1):	750 mV ≤ V_{pp} ≤ 50 mV
Maximum input voltage:	50 V (V = + V_{pp}) with divider 10:1
	8 V with divider 1:1, f > 50 kHz
Trigger level setting:	adjustable by potentiometer
(voltage divider 1:1)	+ 0.5 ... – 0.5 V
(voltage divider 10:1)	+ 5 ... – 5 V

4.2.2 Characteristics of Channel C

Frequency range:	50 ... 2,400 MHz	
Dividing ratio:	100:1	
Sensitiveness:	V_{rms} = 25 mV on	100 MHz ≤ f ≤ 2 GHz
	V_{rms} = 50 mV on	50 MHz ≤ f ≤ 100 MHz
		2 GHz ≤ f ≤ 2.4 GHz
Input impedance:	50 Ω	
Standing wave ratio:	≤ 2.5	
Coupling:	alternating voltage	
Maximum input voltage:	V_{rms} = 2.5 V (sinusoidal signal) ± 40 V direct-voltage portion	
Optimal input voltage:	indicated by extinguishing of LEDs “MIN” and “MAX”	

4.3 Functions

4.3.1 Diagnostic Unit Function “CHK”

Measuring range:	10 MHz
Measuring times (GATE TIME):	t_{Gate} = 10 µs, 100 µs, 1 ms, 10 s, 100 ms, 1 s, 10 s
Accuracy:	± 1 LSD[1)]
Result display:	MHz with decimal point

4.3.2 Frequency Measurement on Channel A “FRA”

Measuring range:	10 Hz ... 100 MHz
Measuring times (GATE TIME):	t_{Gate} = 10 µs, 100 µs, 1 ms, 10 ms, 100 ms, 1 s, 10 s
Frequency resolution:	$f = 1 / t_{Gate}$ (max. 8 digits)
Accuracy:	± 1 LSD[1)] ± time base error
Result display:	Hz, kHz, MHz with decimal point

4.3.3 Frequency Measurement on Channel C “FRC”

Measuring range:	50 MHz ... 2.4 GHz
Input voltage:	25 mV ≤ V_{rms} ≤ 2.5 V
Measuring times (GATE TIME):	t_{Gate} = 10 µs, 100 µs, 1 ms, 10 ms, 100 ms, 1 s, 10 s
Frequency resolution:	$f = 100 / t_{Gate}$ (max. 8 digits)
Accuracy:	± 1 LSD[1)] ± time base error
Result display:	MHz, GHz with decimal point

4.3.4 Period Length Measurement on Channel A “PER”

Measuring range:	100 µs ... 100 ms
Sensitiveness:	V_{rms} = 100 mV
Measuring unit:	100 ms
Accuracy:	± 1 LSD[1)] ± time base error ± trigger error[2)]
Result display:	µs, ms, s with decimal point

4.3.5 Simple Pulse Counting On Channel A "TOT"

Measuring range:	1 ... 10^9 events
Frequency range:	0 ... 100 MHz
Accuracy:	± 1 LSD[1)]
Result display:	without measuring unit and decimal point

Note: The setting of the gate time does not influence the functions period length measurement and simple pulse counting. The repetition speed is about 200 ms on automatic operation.

1) LSD: Last significant digit of displayed value; corresponds to the resolution within the respective measuring range.

2) The trigger error (effective value) is computed as described:

$$\Delta Ts = \frac{\sqrt{\left(V_{noise}^2 + V_{in-noise}^2\right)}}{S}$$

V_{noise} - noise voltage within signal

$V_{in-noise}$ - internal noise voltage within amplifier

S (V/s) - pulse rate-off-rise of measured signal portion in the trigger point

4.4 Time Base

Start-up time:	15 min
Operational frequency of quartz oscillator:	10 MHz
Accuracy of frequency setting:	$\pm 5 \cdot 10^{-9}$
Frequency deviations after 24 hours:	$\leq \pm 10^{-8}$
Influence of temperature:	$< \pm 5 \cdot 10^{-9}$/°C

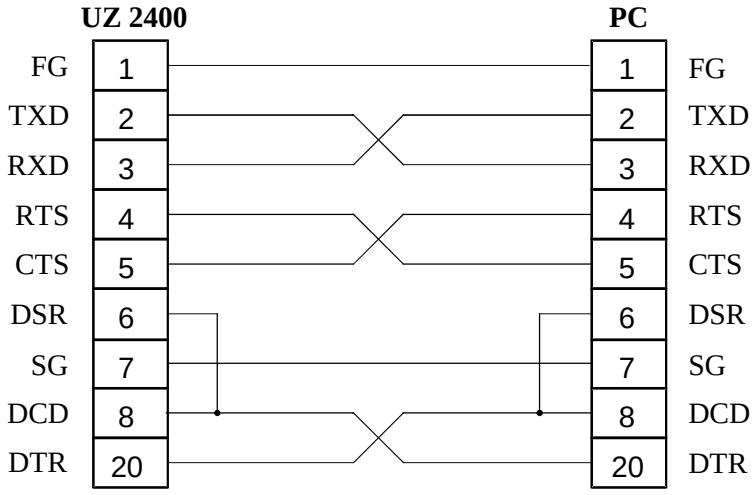
4.5 Display

The unit is equipped with a 16-digit alphanumeric LCD-matrix display. The first three digits indicate the selected function and the next one indicates the unit operation. Eight digits are reserved for the measuring result and the last four digits are for the display of measuring units. In addition to the measured value, the selected function, the set measuring time, the input voltage dividing ratio and the data transmission rate during remote control operation can also be indicated on the display.

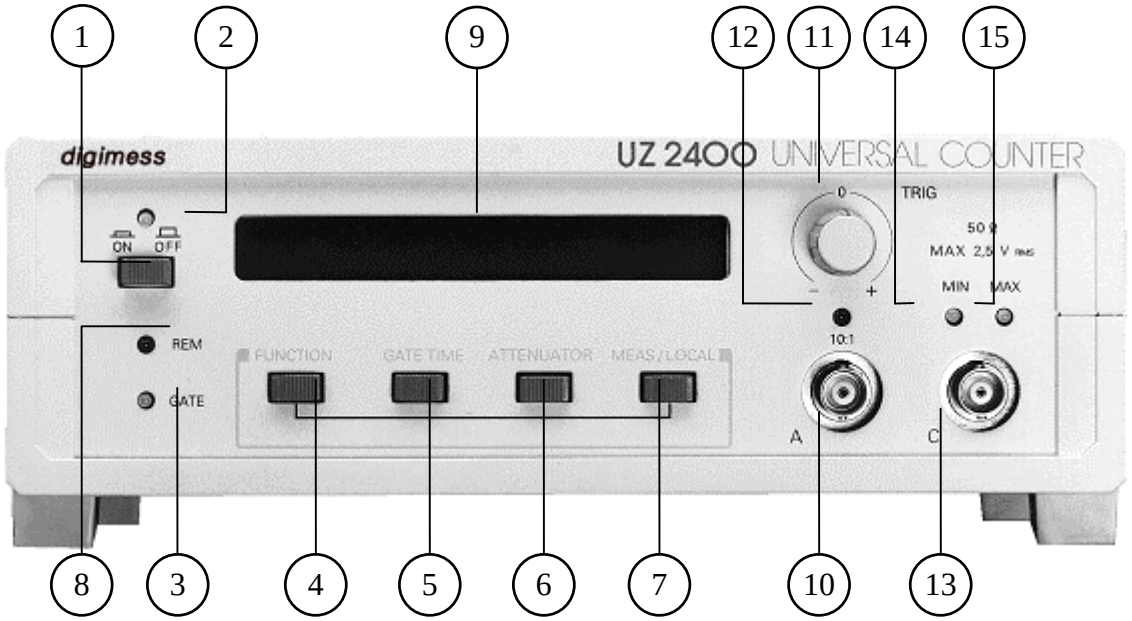
4.6 Interface RS-232C

The counter can be fully controlled via the serial interface RS-232C apart from the setting of the trigger level. The data transfer is based on the ASCII character set with the data transmission rate being optional.

Data transmission rate:	1,200 ... 9,600 Bd
Length of data character:	8 bit
Number of STOP bits:	1
Parity:	none
Record:	without
Seperation characters:	LF, ∅AH
Reservation of plug connections:	



5 Control Elements



(1) **Power switch**

(2) **Control indication**
The LED indicates whether the unit is ready for operation.

(3) C**ontrol indication "GATE"**
The LED lights up during the measuring time (GATE TIME).

(4) **"FUNCTION" button**
After switching on the function "CHK" (function control) is automatically set.
Via repeated actuating of the button "FUNCTION" the following functions are selected and displayed:

"FRA" (frequency measurement: channel A),
"FRC" (frequency measurement: channel C),
"PER" (period length measurement: channel A),
"TOT" (simple pulse counting: channel A),
"CHK" and so on.

(5) **"GATE TIME" button**
The repeated actuating of this button allows the setting of the measuring times 10 µs, 100 µs, 1 ms, 10 ms, 100 ms, 1 s, 10 s and is displayed as follows:
"Gate time: 10 µs (100 µs, 1 ms, 10 ms, 100 ms, 1 s, 10 s)".

(6) **"ATTENUATOR" button**
The button "ATTENUATOR" is used to set the input voltage ratio to "1:1" or "10:1" on channel A.

(7) **“MEAS/LOCAL” button**
On pressing this button the function menu is left and the respective measurement is started.

(8) **“REM” display**
The LED lights up if data is transmitted via the serial interface RS-232C.

(9) **16-digit LCD display**
See 4.5.

(10) **BNC input socket: channel A**
Measuring signals with frequencies up to 100 MHz can be led to this input. Furthermore, period length measurements and the simple pulse counting can be carried out via this channel.

(11) **Potentiometer “TRIG”**
The desired trigger level can be set by turning the potentiometer to the left for negative values on triggering to falling edge, or to the right for positive values on triggering to rising edge.

(12) **Display “10:1”**
The LED lights up if the input voltage divider was set to the ratio 10:1.

(13) **BNC input socket: channel C**
Measuring signals with frequencies of 50 MHz to 2.4 GHz can be led to this input. This socket is only for frequency measurements.

(14) **Display “MIN”**
The LED indicates an input voltage too low for channel C.

(15) **Display “MAX”**
The LED indicates an input voltage too high for channel C.

Power is supplied by a **fused plug for non-heating appliances**. The unit is provided with a fuse of T 100 L/250 V for 230 V~ or T 200 L/250 V for 115 V~ net voltage respectively. The **operating voltage indication** shows which operating voltage is to be used.
The serial interface **RS-232C** serve the purpose of data transmission on remote via external devices.
The mains plug with fuse, the operating voltage indication, the interfaces and the **type plate of the unit** can be found at the back of the counter.

6 Realization of Measurements

6.1 Starting

For external control of the unit the connecting cable RS-232C has to be connected before switching on the operational voltage.
After pushing the button Power switch [1] the LED [2] lights up and the message "Testing ...." appears on the display. Internal unit tests for checking operational readiness are started after switching on and if everthing is in order, the message "UZ 2400 READY !" is displayed. The unit otherwise displays an error message with a respective notice of the reason, e. g. "TEST EPROM: ERR!". The unit interrupts the test until the defect is eliminated.
When the test is successfully completed the unit is set to diagnostic function with the frequency of the internal time base being measured and displayed with "CHK: 10.00000 MHz". The measuring time (GATE TIME) is set to 100 ms and the input voltage divider is set to 1:1.
Now the unit basically is ready to start measurements, but the specified parameters for the time base are only fully set 15 minutes after switching the unit on.

6.1.1 Settings for Channel A

The signal has to be led to the input socket "A" [10]. Then select the attenuation with the help of the button "ATTENUATOR" [6]. The message "Attenuator: 1(0):1" appears on the display [9] and on selecting the divider ratio 10:1 the LED "10:1" [12] lights up. Set the trigger level with the potentiometer [11] so that a stable value is displayed. Now set the desired measuring function by means of the button "Function" [4] (see 5/(4)).
No settings have to be made for measurements on channel C.

6.2 Frequency Measurement (FRA, FRC)

Measuring signals with frequencies between 10 Hz and 100 MHz are led to the input socket "A" [10]. If the periodic signals are between 50 MHz and 2.4 GHz they have to be led to the input socket "C" [13]. The selection of channel A or C is made by the button "FUNCTION" and is displayed. The desired measuring times (see 5/(5)) are selected with the button "GATE TIME" [5]. They are indicated on the display [9]. On pressing the button "MEAS/LOCAL" [7] the menu operation is finished and the measurement is started.
The input level can be observed with the help of the LEDs "MIN" [14] and "MAX" [15]. The measuring time is indicated by the LED "GATE" [3] the interval between the single measurements being fixed at about 200 ms.

6.3 Period Length Measurement

Put the input signal on channel "A" [10]. Turn the counter to the function "PER" (period length measurement) by actuating the button "FUNCTION" [4]. The selection of a measuring time (GATE TIME) does not influence the measurement. The measurement is started by pressing the button "MEAS/LOCAL" [7]. Every second period of the signal is measured.

6.4 Simple Pulse Counting

Lead the events to channel “A” [10]. Select the function “TOT” (simple pulse counting) with the button “FUNCTION” [4]. The selection of a measuring time (GATE TIME) does not influence the counting of simple pulses. After actuating the button “MEAS/LOCAL” [7] all counting decades are reset and the counting process is started. The simple pulse counting runs constantly and can only be interrupted by pressing one button ([4], [5], [6]) or started again by pressing [7].

6.5 Error Messages

The measuring decades can be overflown in some cases due to unfavourable selection of the measuring range (GATE TIME). In this case the faulty result is not displayed but the error message “ERR: OVERFLOW !” is displayed.

7 Remote Control by Program

7.1 General Information

A remote control of the universal counter by a personal computer is possible via the serial interface RS-232C. The interface of the personal computer has to have the configuration described under 4.6.
All parameter settings, measuring functions and measuring value outputs can be realized via remote control. The setting of the trigger level is the exception to this; it has to be done manually.

7.2 Preparation on the Counter

7.2.1 Test of the Data Transmission Line

A testing device is necessary for checking the serial interface RS-232C on the counter. This is a plug with the connection pins of the data lines RXD and TXD as well as RTS and CTS being connected. The simultaneous pressing of the buttons “MEAS/LOCAL” [7] and “GATE TIME” [5] starts the test. The message “Test RS 232C: ERR!” documents an interface error.
On pressing the button “MEAS/LOCAL” the former operation mode is called up.

7.2.2 Preparations for the Remote Control

Several parameters can be set before switching to remote control. The simultaneous pressing of the buttons “MEAS/LOCAL” [7] and “FUNCTION” [4] causes the assignment of new functions to the buttons “FUNCTION”, “GATE TIME” and “MEAS/LOCAL”. The names “Set”, “Test” and “Exit” stand above them on the display.

The transmission rates “Baud Rate: 1200”, “Baud Rate: 2400”, “Baud Rate: 4800” and “Baud Rate: 9600” can be adjusted by repeated pressing of the button “FUNCTION” (Set). The value is saved with the help of the button “MEAS/LOCAL” (Exit) and the former operation mode is called up again.

The unit's internal test is switched on by actuating the button “GATE TIME” (Test). The units involved in the remote control are checked then. The same messages appear as when the unit is switched on (see 6.1).

7.2.3 Transition: Remote Control ⇔ Local Control

On transmitting the command "*REM" from the personal computer the counter is in the state of remote control which is indicated by the LED "REM" [8]. Afterwards a control of the unit by the local control elements is not possible.

There are several ways for switching from remote control to local control of the unit:

- by transmitting the command "*GTL" (Go To Local) from the personal computer,
- by pressing the button "MEAS/LOCAL" at the counter if the unit keyboard have not been locked by the command "*LLO" (Lock Local Out),
- by switching off and on the power switch POWER [1].

7.3 Messages of the Unit on Remote Control

After receiving a command containing a question-mark "?" the control device transmits a respective information of the following structure: "_NZK",

with

_	blank character,
N	description for the message,
Z	the message,
K	end character LF (ASCII: ∅AH).

The description "N" can be different and can be divided into the following groups.

7.3.1 Description of the Unit State

"IDN"	Indicates that an identification word follows.
"STB"	Indicates that a status byte of the unit follows.

7.3.2 Description of the Result

"VAL" Indicates that the measuring value will follow in the "_TVK" format

with

_	blank character	(ASCII: 2∅H),
T	measuring unit	(Hz, S, -),
V	the number in free format,	
K	the end character LF	(ASCII ∅AH).

7.3.3 Description of the Unit Settings

"FCE"	indicates that a message about the unit settings follows
"GT"	signalizes that a message about the measuring time follows
"ATT:"	means that a message about the setting of the voltage divider follows

7.3.4 Description of the Error

"ERR." Signalizes that an error message follows. The message it self refers to errors in data transmission, faulty settings and errors in measurements:

"NO DATA!"	Message that no valid data is available; the command for reading data was not preceded by an order to measurement.
"CMD TOO LONG!"	Message that the received command or the group of commands were too long.
"OVERFLOW!"	Message that the counting decades were overflown during the measurement.
"ILLEGAL CMD!"	Message that the unit received an unknown command.
"TIME OUT!"	Message that the operation did not run in certain time intervals.

Note: If an error occurs on receiving a group of commands or if an incorrect command was transmitted by the host system (personal computer), all following commands until the end character "LF" are ignored.

⚠ **Attention!** Some PC-XT/AT 386 computers transmit random signals after being turned on or after hardware resets. They might be evaluated as error by the measuring unit.

7.4 Overview of Commands on Remote Control

7.4.1 Group of Common Commands

"*IDN?"	identification of unit and software version
"*RST?"	RESET of the unit
"*TRG"	single measuring cycle according to preceding settings
"*TRG?"	single measuring cycle according to preceding settings and transmission of the measuring result
"*STB?"	reading of the status byte
"*CLS"	resetting the status byte
"*GTL"	switching from remote control to local control of the unit
"*LLO"	locking of the unit keyboard
"*REM"	switching from local control to remote control of the unit
"*TEXT:"	After this command the unit receives characters following the colon as text and shows them on the display.
"*?"	command for sending data to the data bus
"*READ?"	This command has the same meaning as "*?".

7.4.2 Group of Commands for Reading the Unit Settings

“FCE?”	reading the set measuring function
“GATE?”	reading the set measuring time
“ATT?”	reading the setting of the input voltage divider

7.4.3 Group of Commands for Setting the Unit Functions

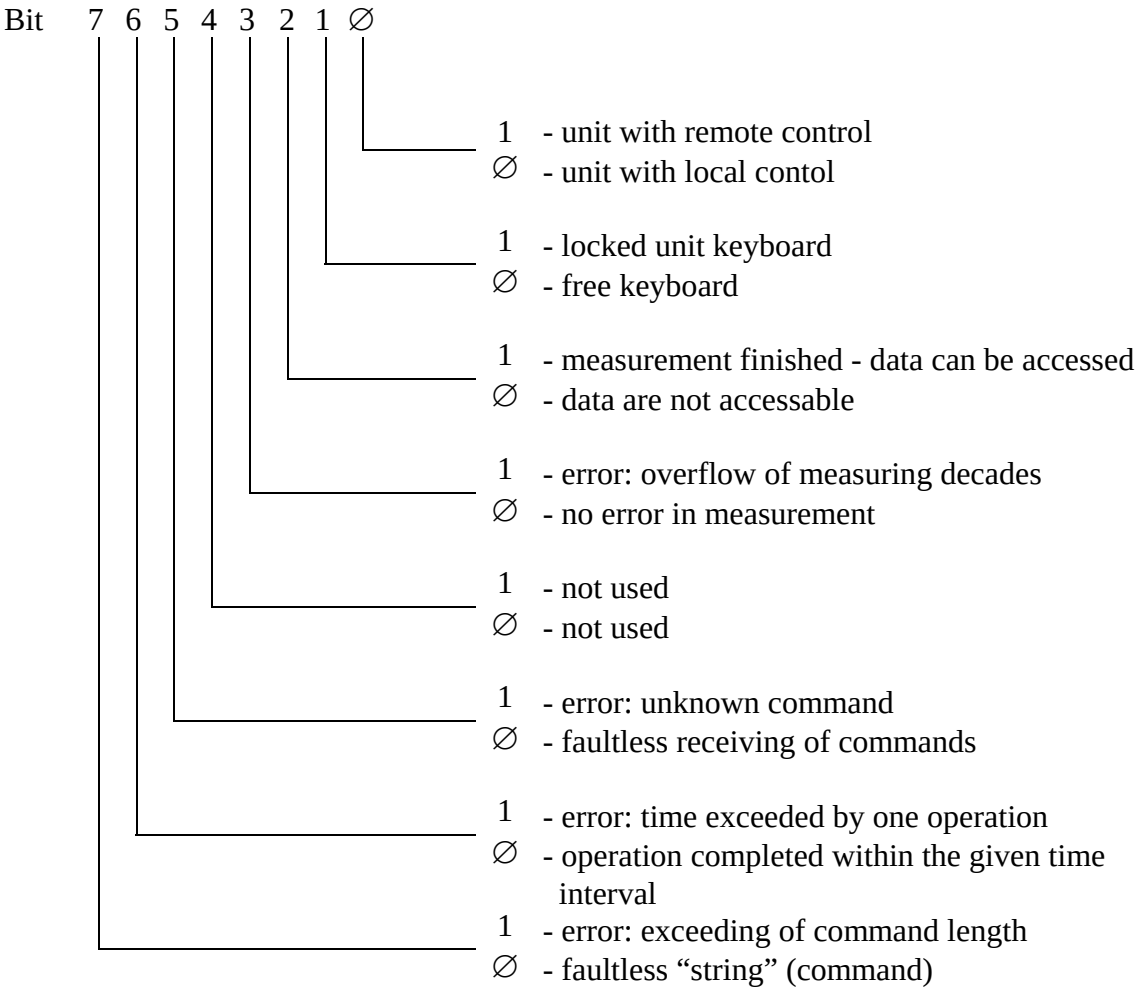
“CHECK”	setting of the unit for the operation test
“FREQA”	frequency measurement on channel A
“FREQC”	frequency measurement on channel C
“PERA”	period length measurement on channel A
“TOTA”	simple pulse counting on channel A
“CHECK?”	single test of unit operation and transmission of the measuring result
“FREQA?”	frequency measurement on channel A and transmission of the measuring result
“FREQC?”	frequency measurement on channel C and transmission of the measuring result
“PERA?”	period length measurement on channel A and transmission of the measuring result
“TOTA?”	simple pulse counting on channel A and transmission of the measuring result

7.4.4 Group of Commands for Setting the Measurement Parameters

“GATE:”	setting of the measuring time on the counter This command is followed by the printout “GT:” and the following “parameter” (measuring times) are displayed for selection: “10US” (10 µs), “100US” (100 µs), “1MS” (1 ms), “10MS” (10 ms), “100MS” (100 ms), “1S” (1 s), “10S” (10 s).
“ATT:”	setting of the input voltage divider ratio This command is followed by the printout “ATT:” and the following parameters (divider ratios) are displayed for selection: “1” (1:1), “10” (10:1).

7.5 Status Byte

The status byte indicates the current state of the operating conditions of the unit and of any errors which occurred during measurement and transmission.



7.6 Measuring by Remote Control

After switching on the counter is in the starting position, i. e. the function “CHK”, the measuring time 100 ms and the divider ratio 1:1 are set. The operation is done at the unit.
The unit is switched to remote control and afterwards is controlled by the respective commands. Thereby, it should be noted that single commands or group of commands have to be separated by “;” (ASCII: 3BH) and ended by the end character LF (ASCII: ∅AH). Certain commands can contain parameters which are separated by a colon “:” (ASCII: 3AH) from the command.
A simple example would be: “*REM”, ∅AH
“FREQA;GATE:1MS;ATT:10”, ∅AH
“*TRG?”, ∅AH.

7.7 Program Example (Q Basic)

```
 10 CLS
 20 PRINT
 30 PRINT"Program for remote control of UZ 2400 by PC"
 40 PRINT"----------------------------------------"
 50 PRINT"             [Ctrl_Break → end of program]"
 60 PRINT
 70 OPEN "com1:1200,n,8,1" FOR RANDOM AS #1
 80 REM rate 1200 bd,without parity, 8 data bits, 1 stop bit
 90 COM(1) ON
100 ON COM(1) GOSUB 510
110 K$=INKEY$
120 IF K$=CHR$ (13) THEN GOSUB 210
130 GOTO 100
200 REM data transmission rate
210 INPUT "Input message ? .....", A$
220 PRINT
230 PRINT #1, A$;CHR$ (10);
240 RETURN
500 REM receiving data
510 A$=INPUT$ (1,#1)
520 B$=B$+A$
530 IF A$ <> CHR$ (10) THEN GOTO 510
540 COLOR (12)
550 PRINT"                          received message:", B$;
560 COLOR (7)
570 B$=""
580 PRINT
590 RETURN
```

8 Maintenance

The unit does not require special maintenance if it is used and handled correctly. Only use a soft wet rag with some soap-suds or a soft rinse liquid for cleaning. Avoid acrid cleanser and solvents.

Service work should only be done by trained personnel.

In case of repairs it is vital to ensure that the design characteristics of the unit are not changed thus reducing the safety and that replacement parts match the original ones and are installed properly (original state).

⚠ **Warning!** The unit must be separated from all power sources before maintenance work is carried out and before parts or fuses are repaired or replaced.

9 Appendix

9.1 List of Messages on Display

"Testing ...."	- internal unit tests are started
"UZ 2400 READY ! "	- internal tests is ended successfully, unit is ready to start measurements
"Test CPU: ERR!"	- error by testing CPU
"Test RAM: ERR!"	- error by testing RAM
"Test EPROM: ERR!"	- error by testing EPROM
"Test BUS: ERR!"	- error by testing BUS
"Test RS232: ERR!"	- error by testing interface
"ERR: OVERFLOW ! "	- overflow for measuring decades
"CHK: 10.00000MHz"	- diagnostic function for unit: value, unit
"FRA: kHz"	- frequency measurement on channel A: value, unit
"FRC: GHz"	- frequency measurement on channel C: value, unit
"PER: ms"	- period length measurement on channel A: value, unit
"TOT: "	- simple pulse counting on channel A: value
"Gate time: 100ms"	- adjustment for time of measurement: value, unit
"Gate time: 1 s"	
"Gate time: 10 s"	
"Gate time: 10µs"	
"Gate time: 100µs"	
"Gate time: 1ms"	
"Gate time: 10ms"	
"Attenuator: 1:1"	- adjustment for attenuator
"Attenuator: 10:1"	
"Set Test Exit"	- additional menu (the simultaneous pressing of the buttons "MEAS/LOCAL" and "FUNCTION")
"Baud Rate: 1200"	- adjustment for baud rate: value
"Baud Rate: 2400"	
"Baud Rate: 4800"	
"Baud Rate: 9600"	

9.2 Declaration of Conformity

digimess	**Konformitätserklärung** **Declaration of Conformity / Déclaration de Conformité** 136/**95**	CE

Der Hersteller/Importeur
The manufacturer/importer
Le producteur/importateur

digimess
Professional Electronics GmbH

Anschrift / Address / Adresse

Würzburger Straße 150
90766 Fürth
Germany

erklärt hiermit eigenverantwortlich, daß das Produkt:
hereby declares, that the product: / déclare, que le produit:

Bezeichnung / Name / Description

Universal Zähler
Universal-Counter
Compteur universel

Type / Model / Type

UZ 2400

Bestell-Nr. / Order-No. / N° de réf.

H.UC 10-00

folgenden Normen entspricht:
is in accordance with the following specifications: / correspond aux normes suivantes:

EN 61010-1 (1994)

DIN EN 50081-1 (1993)DIN EN 50081-2 (1994)

EN 55011 (1991) Class B

EN 55022 (1987) Class B

IEC 801-2 (1991) / prEN 55024-2 (1992) *8* kV

IEC 801-4 (1988) / prEN 55024-4 (1993) 1 kV Burst

IEC 801-3 (1984) *3V/m ; 0,15-150 MHz*

Das Produkt erfüllt somit die Forderungen folgender EG-Richtlinien:
Therefore the product fulfils the demands of the following EC-Directives:
Le produit satisfait ainsi aux conditions des directives suivantes de la CE:

73/23/EWG **Richtlinie betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen**
Directive relating to electrical equipment designed for use within certain voltage limits
Directive relatives au matériel électrique destiné à être employé dans certaines limites de tension

89/336/EWG **Richtlinie über die elektromagnetische Verträglichkeit**
Directive relating to electromagnetic compatibility
Directive relatives à la compatibilité électromagnétique

Fürth, 26.9.1995

Henninger
Leiter Qualitätsmanagement
Q-Manager / Directeur Contrôle de Qualité