Baumer

Passion for Sensors

Operation Instruction

HENQ 1100

Encoder Analyzer

MB112EN - 11185046, 19A1, Baumer_HENQ1100_OI_EN

HÜBNER BERLIN
A Baumer Brand

TABLE OF CONTENTS

1. GENERAL NOTES

Symbol guide

Warning
Disregarding could result in serious injury, death or damage to property

Attention
Disregarding could result in damage to property or damage/malfunction of the HENQ 1100

i Information
Additional information and recommendations

The Baumer **H**übner **EN**coder **Q**uality measurement system HENQ 1100 is a precision device which must be handled with care by skilled personnel only.

EU Declaration of Conformity meeting to the European Directives.

We grant a 2-year warranty in accordance with the regulations of the ZVEI (Central Association of the German Electrical Industry).

In the event of queries or subsequent deliveries, the data on the device type label must be quoted, especially the type designation and the serial number.

i Warranty seal
Damaging the warranty seal on the HENQ 1100 invalidates warranty.

The storage temperature range of the encoder is between -15...+70 °C (caused by packing).

Disposal (environmental protection)

Do not dispose of electrical and electronic equipment in household waste. The product contains valuable raw materials for recycling. Whenever possible, waste electrical and electronic equipment should be disposed locally at the authorized collection point. If necessary, Baumer gives customers the opportunity to dispose of Baumer products professionally. For further information see www.baumer.com.

2. INTRODUCTION

The Baumer **H**übner **EN**coder **Q**uality Measurement System HENQ 1100 is a hand-held instrument for the testing of incremental encoders that produce HTL/TTL or SinCos signals.

Fast signal processing also facilitates the detection of sporadic errors, such as those caused by interference in the signal leads or short voltage drop-outs in the power supply. The angular position and speed are in addition displayed continuously.

As well as Baumer Hübner incremental encoders, encoders from other manufacturers that put out TTL/HTL or sin/cos signals can also be connected.

Power is fed to the encoder either via the HENQ 1100 or externally. So the encoder can be run separately, disconnected from its normal supply, or one can tap into a system that is running.

The operation of the instrument is carried out through the built-in user friendly keypad and a 4-line LCD with background lighting.

The memory makes it possible to collect measurements from several encoders and evaluate them.

It is possible to connect a laptop or PC via the integrated RS-485 interface (optional RS-232 or USB-RS-485-converter).

Then a Windows measurement application enables a continuous display and recording of current data, including any errors in the encoder or its wiring. Statistical evaluation is also possible.

User-defined profiles can be used to program various thresholds as parameters, for instance: permissible phase shift, permissible pulse/pause ratio.

Errors are signaled not only visually, through the LCD, but also acoustically, by a built-in buzzer.

3. TECHNICAL DATA

3.1 Technical data for the HENQ 1100

Voltage supply:	9...30 VDC
Current consumption:	≤500 mA
Permissible ambient temperature:	-10 °C...+50 °C
Input:	D-SUB connector (female) 15-pin
Output:	D-SUB connector (male) 15-pin RS485 connector (female) 9-pin Option: RS232 connector (female) 9-pin

Accumulator as option

Accumulator voltage:	12 V nominal
Subthreshold warning:	10 V
Charging time:	5 hours
Operating time (load-dependent):	~5 hours

3.2 Technical data for the connected encoder

Output frequency:	≤250 kHz
Power supply:	U_1 = UB - 1 V or by the HENQ 1100 U_2 = 5 V
Current consumption with encoder power supplied by the HENQ 1100 [1]:	≤300 mA
External supply voltage:	$U_1 = U_{REG1}$ or with measuring signal looped through $U_2 = U_{REG2}$
Current consumption with external supply voltage and encoder signal looped through [1]:	≤500 mA

[1] Limited by polymer fuse

4. INSTRUMENT FUNCTIONS

Continuous monitoring and display of

- the speed, angular position, and position of the zero pulse
- the phase shift between K1 and K2 (or A and B)
- the pulse/pause ratio for K1 and K2 (or A and B)
- the voltage range of the encoder output signals [1)]
- the supply voltage and current drawn by the encoder, with the power consumption calculated from these values

Continuous error monitoring

- elimination of signal disturbances through adaptive filtering
- comparision of the nominal/actual number of pulses per turn [2)]
- errors in connection with the zero pulse
- check of the quadrature coding by evaluation of the track signals and the zero pulse

Individual error messages

- Windows applications software for the PC, for graphical display and statistical evaluation of the measurements
- Recording of measurements and error messages in a logbook on the PC

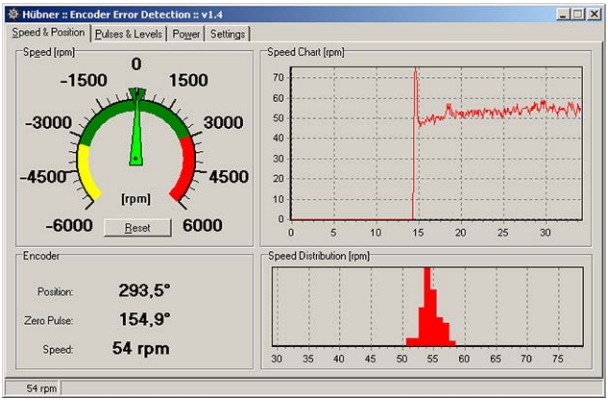


Fig.1: Data display via measurement programm, see section 8, page 24.

Display in plain text:

- Angular position
- Zero pulse position relative to the switching on position
- Speed
- Voltage and current
- Error messages

1) Not available for sine encoders
2) Only if a zero pulse is available

5. SETUP

5.1 Connecting the encoder

The incremental encoder is connected to the 15-pole SUB-D socket that is fitted on the left side of the HENQ 1100, see *section 6.3.1, page 11*. Please note that, in the interest of functional reliability, you should only wire up those pins in the encoder plug that are actually required for the particular encoder (applies in particular to the pins for the supply voltage 5 V oder 9...30 V).

As an option, prefabricated cables with plug connectors are available for the various types of encoder.

These cables have open cable ends on the encoder side.

5.2 Evaluation of sinewave signals

Evaluation of the signals from sinewave encoders can only be performed to a limited extent, since the differential signals from the encoder are converted into TTL signals. It is therefore not possible to check the levels.

The output from the HENQ 1100 is always a simulated TTL source, so that it is not possible to make a daisy-chain signal loop.

5.3 Connecting the supply voltage for the HENQ 1100

For proper operation, the HENQ 1100 requires a supply voltage of 9...30 V. The supply must be able to carry a current load of at least 500 mA.

The connection is made through a 2-pole round socket on the right side of the instrument with the inner conductor as positive pole, see *section 6.1.2, page 9*.

The encoder power is supplied either from the the HENQ 1100, see *section 6.2.1, page 10*, or from the frequency inverter or the control system, see *section 6.2.2, page 10*.
The selection is made in menu **F5** **INT/EXT** (**INT**: HENQ 1100, **EXT**: Controller).

5.4 HENQ 1100 with accumulator option

The HENQ 1100 can optionally be fitted with an accumulator (12 V block accumulator with integrated charging circuitry) that enables operation independently of the electrical supply for up to 5 hours.

If, during this operation, the accumulator voltage falls below the permissible level of approx. 12 V, then the device will produce a “Low Battery Voltage” warning.

If the device is then not switched off, and the accumulator voltage continues to drop, then the protection against complete discharge of the accumulator is activated, which will automatically switch off the device.

It will then only be possible to switch on the device again when the accumulator has been recharged. To fully recharge the accumulator, it is recommended that the HENQ 1100 is attached to the plug-in power supply for about 5 hours. Charging will automatically be ended as soon as the accumulator is fully recharged, and the voltage indicator (Menu **F4**) will show about 13 V.

In order to increase the operating time, a HENQ 1100 that is fitted with the accumulator option can be switched off by the On/Off switch.

If the HENQ 1100 is connected to the plug-in power supply, then the On/Off switch changes it from charging mode (no display indication, display lighting is inactive) to measurement mode and back again. On a HENQ 1100 without the accumulator option, the On/Off switch has no function.

The accumulator is not charged up in measurement mode.

In accumulator operation, the encoder can still be supplied from the HENQ 1100, whereby the current consumption of the encoder will decisively influence the operating time.

5.5 Entering the encoder data (menu F5)

The HENQ 1100 makes provision for the attachment of any encoder with TTL (RS422), HTL or SinCos output signals.

The encoder data are entered in menu **F5** as follows:

If the device is used in conjunction with encoders from Baumer Hübner, then the appropriate type (**1**-**40**) can be selected in the menu item **ENCODER**, siehe *Fig.5, page 16*. Because of the large number of Baumer Hübner encoder types, the field for selection is restricted to the most common models available at present. When the encoder type has been selected, the parameters **MaxSpeed**, **inv.Sig.**, **ZeroPuls**, **with K2**, **RefLevel** and **Pulse-No** are displayed for checking.

If your encoder is not present in the selection menu, select '**0**' (User Setting), see *Fig.6, page 16*, in the menu item **ENCODER**. Then you can set the encoder parameters through the menu items **inv.Sig.**, **ZeroPuls**, **with K2**, **RefLevel** and **Pulse-No**, see *Fig.4, page 16* and *Fig.6, page 16*, individually by hand.

It is also possible to edit the encoder database by using the "config" key, see *Fig.7, page 18*. In the following submenu, the parameters encoder name **##########**, **MaxSpeed**, **inv.Sig.**, **ZeroPuls**, **with K2**, **RefLevel** and **Pulse-No** can be set individually.

5.6 Measuring the encoder supply (menu F4)

After connecting up a incremental encoder, it is recommended to check the supply to the encoder, see *section 7.2.5, page 22*.

For this purpose, the HENQ 1100 offers the option in menu **F4** of displaying the supply voltages present at the encoder connection (5 V and 9...30 V), the current drawn (in mA) and the power consumption (in mW).
This makes it easy to detect wiring errors, such as a short-circuit or cable break, or an encoder fault.
The current drawn by the output driver that is integrated in the HENQ 1100 is shown in the last line of the display. This will only be non-zero if the encoder signals provided by the HENQ 1100 are passed on to a control system, see *section 6.2.2, page 10*.

5.7 Checking the signal levels (menu F3)

The signal levels of the encoder can be checked in this menu.

Evaluation of the signals from sinewave encoders can only be performed to a limited extent, since the differential signals from the encoder are converted into TTL signals. It is therefore not necessary to check the levels.

At standstill, the momentary HIGH (**H**) and LOW (**L**) levels of the encoder signals will be displayed. If the level is undefined or there is no corresponding signal (open input), then the '**?**' symbol will appear.
When the encoder is rotating, correct signal levels will be acknowledged by a '√' mark.

5.8 Display measurements as text (menu F2)

In menu **F2** the following measurements are displayed as text, see also *section 7.2.3, page 20*:

Display 1: *Speed in revolutions per minute (*`+00072 rpm`*)*

For encoders that provide two signals in quadrature (K1 and K2, with a 90° phase shift), the mathematical sign determines the direction of rotation. For encoders with a single K1 signal output, only the magnitude is shown.

Display 2: *Pulse/pause ratio of the K1 signal (*`K1=50:50`*)*

The first figure indicates the duration of the high level as a percentage of the entire cycle. The second figure indicates the duration of the low level of the K1 signal, as a percentage.

Display 3: *Pulse/pause ratio of the K2 signal (*`K2=48:52`*)*

The first figure indicates the duration of the high level as a percentage of the entire cycle. The second figure indicates the duration of the low level, as a percentage.

☞ Please note:
Principle limitations mean that the pulse/pause ratio will be affected during rapid acceleration.

Display 4: *Angular position (*`A=29.0°`*)*

Display of the angular position, in degrees.

Display 5: *Phase shift between K1 und K2 (*`P=089°`*)*

The displayed value is the phase shift (in degrees) between the rising edge of the K1 signal and the rising edge of the K2 signal.

☞ Please note:
If the pulse/pause ratio of the encoder signals K1 and/or K2 is other than 50:50, then there will be different values measured for the phase shift between K1 and K2, depending on the rotating direction.
Principle limitations also mean that the calculation of the phase shift will be affected during rapid acceleration.

Display 6: *Position of the reference signal (***Z=282°***)*

This value gives the position (in degrees) of the reference signal relative to the position of the encoder after the supply voltage for the HENQ 1100 is switched on or the encoder changed.

5.9 Display measurements as graphics (menu F1)

A bar graph display is used for online presentation of the measured values.

The values indicated are, see also *section 7.2.2, page 19*:

Column 1:

The speed value (shown at left, next to plain text with mathematical sign).

The scaling is made so that the highest bar corresponds to the value for the menu item **MaxSpeed** set in menu **F5**.

Column 3 and 4:

This value gives the position and the position of the reference signal relative to the position of the encoder after the supply voltage for the HENQ 1100 is switched on or the encoder changed.

The lowest bar corresponds to 0° and the highest corresponds to 360°.

Column 6 and 7:

The pulse/pause ratio of the encoder signals K1 and/or K2, whereby the middle of the bar corresponds to a 50:50 ratio. The highest or lowest value, respectively, refers to the maximum error **MS_Error** as set up in menu **F5** (for example 30:70 resp. 70:30).

Column 9:

The phase shift of K1 relative to the rising edge of K2, whereby the middle of the bar corresponds to 90°.

In menu **F5** the maximum permitted phase shift can be set up in the menu item **PhaseErr**.

The lowest bar corresponds to a [90° - **PhaseErr**] and the highest corresponds to a [90° + **PhaseErr**].

If a reference signal is available, its first appearance is acknowledged by **K0=OK!**.
If the reference signal fails then even once, this will be detected and signaled by **K0=ERR**.

6. CONNECTIONS

6.1 Connections on the device

Unused inputs must be left open!
Do not connect to ground, supply or a signal, or attach a cable.

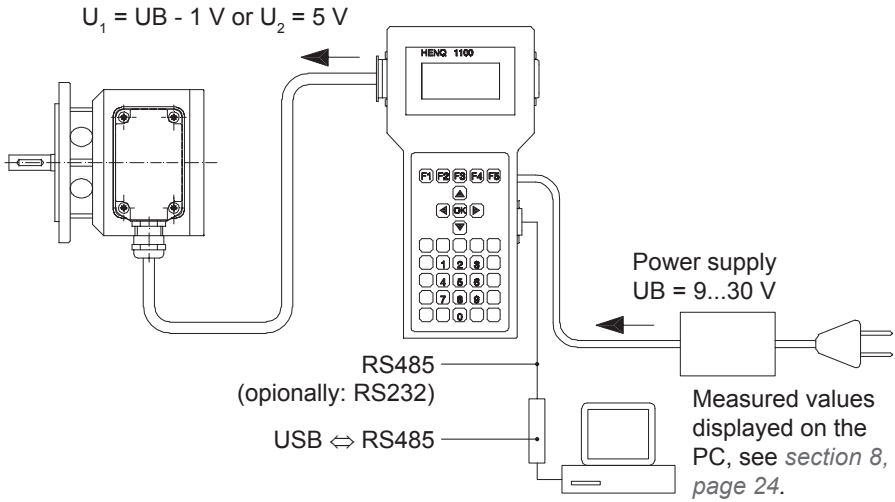
6.1.1 Device left side

6.1.2 Device right side

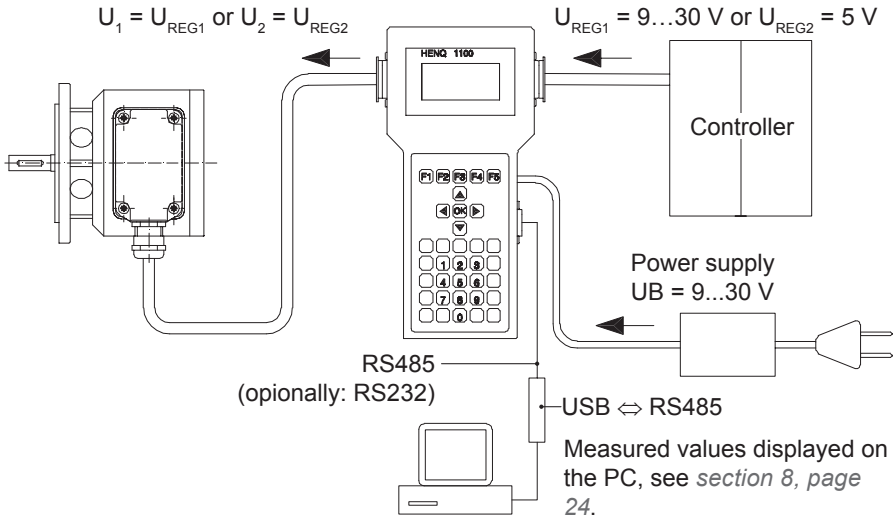
6.2 Power supply of the encoder

The encoder power is supplied either from the HENQ 1100 (**INT**), see *section 6.2.1*, or from the frequency inverter or the control system (**EXT**), see *section 6.2.2*.
The selection is made in menu **F5**, menu item **INT**/**EXT**, see *Fig.3, page 16*.

6.2.1 Encoder supply from the HENQ 1100



6.2.2 External power supply for the encoder



6.3 Assignments

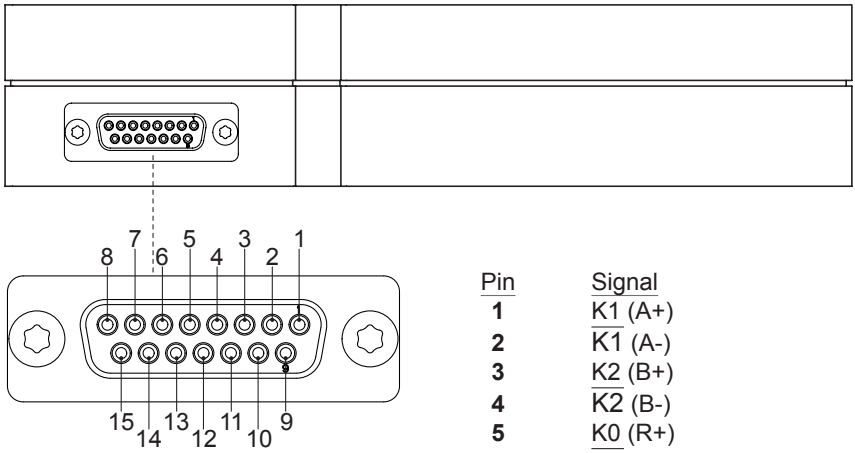
6.3.1 Device left side

6.3.1.1 Encoder connection

☞ The output signals of the HENQ 1100 are always differential!
It is not possible to make a daisy-chain signal loop with sinewave signals.

View device left side

Input D-SUB connector (female) 15-pin, see *section 6.1.1, page 9*.



Pin	Signal
1	K1 (A+)
2	$\overline{K1}$ (A-)
3	K2 (B+)
4	$\overline{K2}$ (B-)
5	K0 (R+)
6	$\overline{K0}$ (R-)
7	dnu
8	dnu
9	U_1 = 9...30 V
10	U_1 = 9...30 V
11	U_2 = 5 V
12	U_2 = 5 V
13	GND
14	GND
15	GND

dnu Do not use
GND Ground

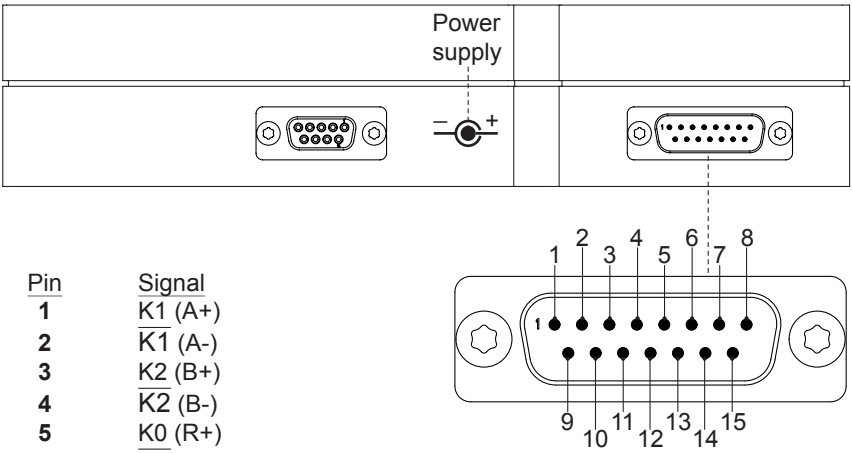
6.3.2 Device right side

6.3.2.1 Output

☞ The output signals of the HENQ 1100 are always differential!
It is not possible to make a daisy-chain signal loop with sinewave signals.

View device right side

Output D-SUB connector 15-pin, see *section 6.1.2, page 9*.



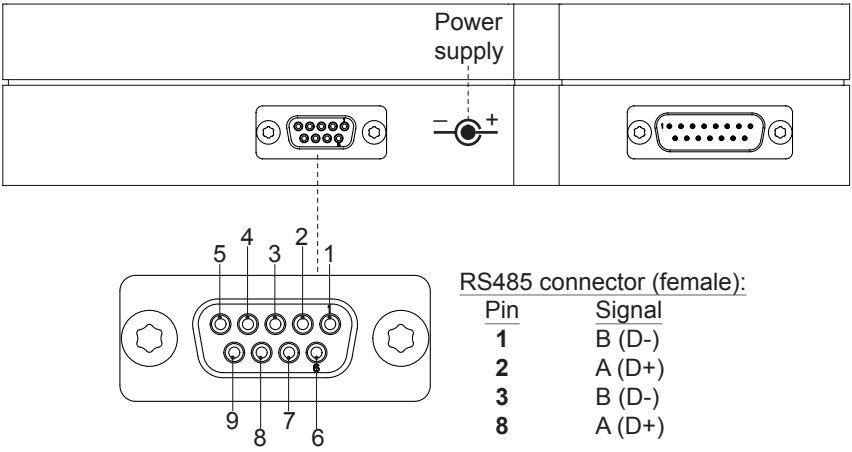
Pin	Signal
1	$\overline{K1}$ (A+)
2	$\overline{K1}$ (A-)
3	K2 (B+)
4	$\overline{K2}$ (B-)
5	K0 (R+)
6	$\overline{K0}$ (R-)
7	dnu
8	dnu
9	U_{REG1} = 9...30 V (from control unit)
10	U_{REG1} = 9...30 V (from control unit)
11	U_{REG2} = 5 V (from control unit)
12	U_{REG2} = 5 V (from control unit)
13	GND
14	GND
15	GND

dnu Do not use
GND Ground

6.3.2.2 PC/laptop interface

View device right side

Output RS485 connector (female) (option RS232 connector (female)), see *section 6.1.2, page 9*.



RS485 connector (female):

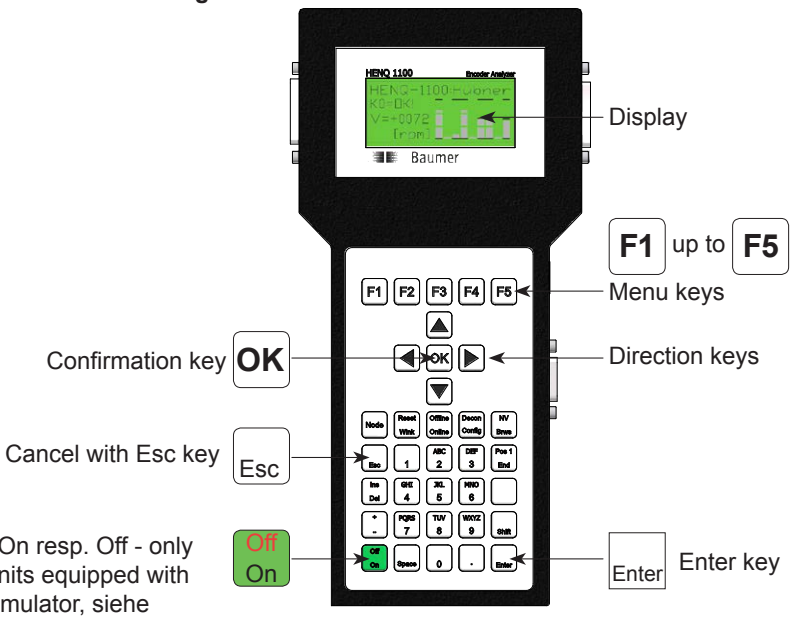
Pin	Signal
1	B (D-)
2	A (D+)
3	B (D-)
8	A (D+)

RS232 connector (female, option):

Pin	Signal
2	RX
3	TX
5	GND
7	RTS

7. OPERATION

7.1 Menu structure - Navigation



7.1.1 Navigation within the menu F5

Select item with the up/down keys

Open submenu with OK key or right key

Set the values for **MS-Error**, **PhaseErr** and **ENCODER** with the up and down keys. Select the other parameters in addition with right key and/or Enter key. Enter alphanumerical values via the input field.

Eingabefeld

Confirm value and exit the submenu with the OK key or left key

7.2 Menu description

7.2.1 Parameter setting (menu F5)

The HENQ 1100 makes provision for the attachment of any encoder with TTL (RS422), HTL or SinCos output signals.

The encoder data are entered in menu **F5** as follows:

If the device is used in conjunction with encoders from Baumer Hübner, then the appropriate type (**1**-**40**) can be selected in the menu item **ENCODER**, see *Fig.5, page 16*. Because of the large number of Baumer Hübner encoder types, the field for selection is restricted to the most common models available at present. When the encoder type has been selected, the parameters **MaxSpeed**, **inv.Sig.**, **Zero-Puls**, **with K2**, **RefLevel** and **Pulse-No** are displayed for checking.

If your encoder is not present in the selection menu, select '**0**' (User Setting, see *Fig.6, page 16*) in the menu item **ENCODER**. Then you can set the encoder parameters through the menu items **inv.Sig.**, **ZeroPuls**, **with K2**, **RefLevel** and **Pulse-No**, seee *Fig.4, page 16* + *Fig.5, page 16*, individually by hand.

It is also possible to edit the encoder database by using the "config" key, see *Fig.7, page 18*. In the following submenu, the parameters encoder name **##########**, **MaxSpeed**, **inv.Sig.**, **ZeroPuls**, **with K2**, **RefLevel** and **Pulse-No** can be set individually.

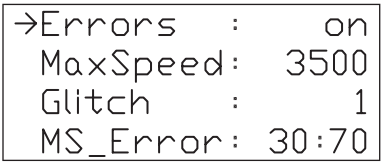


Fig.2: Display menu F5 picture 1

Errors: **on/off**

off: Error messages will be disabled (for error search).

MaxSpeed: **#####**

Maximum speed

Glitch: **#**

0 ≤ **#** ≤ 7 Settings of the glitch filter see *section 7.2.1.1*.

MS_Error: **##:##**

Pulse/pause error: setting the max. deviation.

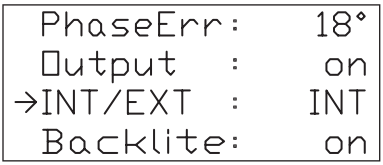


Fig.3: Display menu **F5** *picture 2*

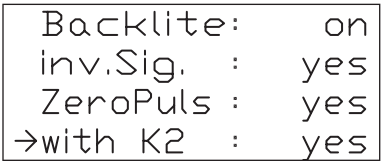


Fig.4: Display menu **F5** *picture 3*

PhaseErr: **##**

Threshold value for the phase shift

Output: **on/off**

The output driver can be switched off if required

INT/EXT: **INT/EXT**

INT = Encoder power supplied via HENQ 1100
EXT = External supply for the encoder

Backlite: **on/off**

Background lighting on/off

inv.Sig.: **yes/no**

Inverted signals yes/no

ZeroPuls: **yes/no**

Reference signal yes/no

with K2: **yes/no**

K2 yes/no

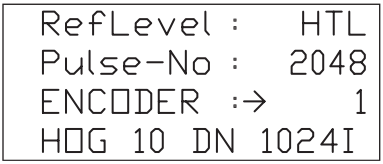


Fig.5: Display menu **F5** *picture 4a*

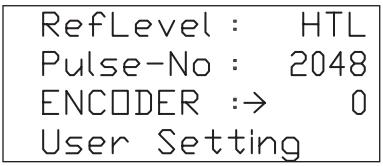


Fig.6: Display menu **F5** *picture 4b*

RefLevel: **TTL/HTL/SIN**

Reference level and level for output driver (TTL → TTL; HTL → HTL; SIN → TTL)
If „**RefLevel = SIN**“ is selected, the output simulates a TTL source.

Pulse-No: **#####**

Number of pulses

ENCODER: **#**

Encoder database (**# = 1-40**: predefined Baumer Hübner encoder types; **# = 0**: user setting)
Submenu **ENCODER** see *section 7.2.1.2*.

HOG 10 DN 1024I

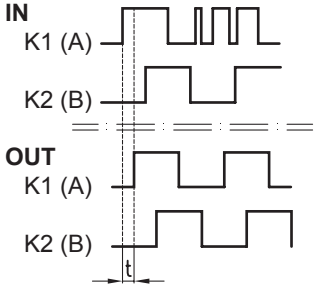
Encoder name from encoder database, see *Fig.5*.

User Setting

Encoder name user setting, see *Fig.6*.

7.2.1.1 Settings of the glitch filter

Filter parameter t



= 0: off

After the comparator the signals will be directed straight to the output

= 1: on

Pulse, smaller than als t = 750 ns will be disabled

= 2: on

Pulse, smaller than t = 1.25 µs will be disabled

= 3: on

Pulse, smaller than t = 1.75 µs will be disabled

= 4: on

Pulse, smaller than t = 2.25 µs will be disabled

= 5: on

Pulse, smaller than t = 2.75 µs will be disabled

= 6: on

Pulse, smaller than t = 3.25 µs will be disabled

= 7: on

Pulse, smaller than t = 3.75 µs will be disabled

7.2.1.2 Submenu „ENCODER“

If the menu item **ENCODER** is selected, the following submenu will appear for editing the encoder database after pressing the ”Config“ key, siehe *Fig.7*, (the Esc key ends the menu):

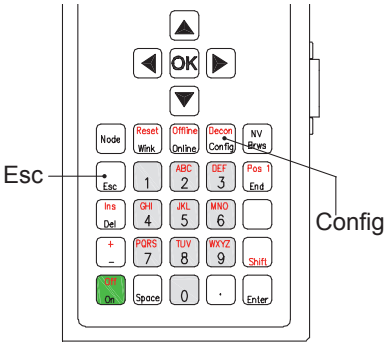


Fig.7: Key „Config“ and „Esc“

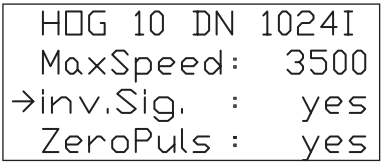


*Fig.8: Submenu „**ENCODER**“ picture 1*

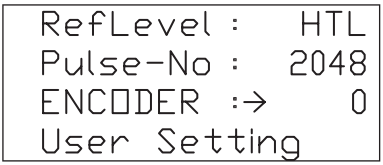


*Fig.9: Submenu „**ENCODER**“ picture 2*

NAME: **##############**

Enter the name with the keyboard

MaxSpeed: **#####**

Maximum speed

inv.Sig.: **yes/no**

Inverted signals yes/no

ZeroPuls: **yes/no**

Reference signal yes/no

with K2: **yes/no**

K2 yes/no

RefLevel: **TTL/HTL/SIN**

Reference level and level for output driver (TTL → TTL;
HTL → HTL; SIN → TTL)
If „**RefLevel = SIN**“ is selected, the output simulates a TTL source.

Pulse-No: **#####**

Number of pulses

7.2.2 Display measurements as graphics (menu F1)

A bar graph display is used for online presentation of the measured values.

The values indicated are:

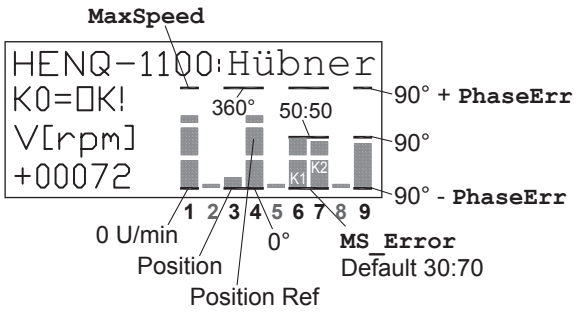


Fig.10: Display measurements as graphics

Column 1:

The speed value (shown at left, next to plain text with mathematical sign). The scaling is made so that the highest bar corresponds to the value for the menu item **MaxSpeed** set in menu F5.

Column 3 and 4:

This value gives the position and the position of the reference signal relative to the position of the encoder after the supply voltage for the HENQ 1100 is switched on or the encoder changed.
The lowest bar corresponds to 0° and the highest corresponds to 360°.

Column 6 and 7:

The pulse/pause ratio of the encoder signals K1 and/or K2, whereby the middle of the bar corresponds to a 50:50 ratio. The highest or lowest value, respectively, refers to the maximum error **MS_Error** as set up in menu F5 (for example 30:70 resp. 70:30).

Column 9:

The phase shift of K1 relative to the rising edge of K2, whereby the middle of the bar corresponds to 90°.
In menu F5 the maximum permitted phase shift can be set up in the menu item **PhaseErr**.
The lowest bar corresponds to a [90° - **PhaseErr**] and the highest corresponds to a [90° + **PhaseErr**].

If a reference signal is available, its first appearance is acknow-ledged by **K0=OK!**, see *Fig.10*.

If the reference signal fails then even once, this will be detected and signaled by **K0=ERR**, see *Fig.11*.

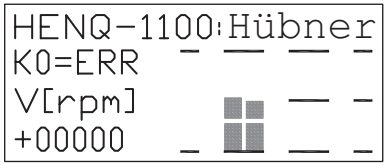


Fig.11: Display measurements as graphics at error

7.2.3 Display measurements as text (menu F2)

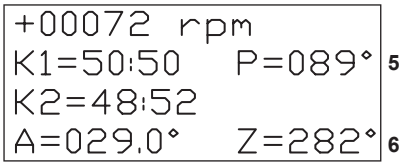


Fig.12: Display menu **F2**

Display 1: *Speed in revolutions per minute (*`+00072 rpm`*)*

For encoders that provide two signals in quadrature (K1 and K2, with a 90° phase shift), the mathematical sign determines the direction of rotation. For encoders with a single K1 signal output, only the magnitude is shown.

Display 2: *Pulse/pause ratio of the K1 signal (*`K1=50:50`*)*

The first figure indicates the duration of the high level as a percentage of the entire cycle. The second figure indicates the duration of the low level of the K1 signal, as a percentage.

Display 3: *Pulse/pause ratio of the K2 signal (*`K2=48:52`*)*

The first figure indicates the duration of the high level as a percentage of the entire cycle. The second figure indicates the duration of the low level , as a percentage.

☞ Please note:
Principle limitations mean that the pulse/pause ratio will be affected during rapid acceleration.

Display 4: *Angular position (*`A=29.0°`*)*

Display of the angular position, in degrees.

Display 5: *Phase shift between K1 und K2 (*`P=089°`*)*

The displayed value is the phase shift (in degrees) between the rising edge of the K1 signal and the rising edge of the K2 signal.

☞ Please note:
If the pulse/pause ratio of the encoder signals K1 and/or K2 is other than 50:50, then there will be different values measured for the phase shift between K1 and K2, depending on the rotating direction.
Principle limitations also mean that the calculation of the phase shift will be affected during rapid acceleration.

Display 6: *Position of the reference signal (*`Z=282°`*)*

This value gives the position (in degrees) of the reference signal relative to the position of the encoder when the supply voltage for the HENQ 1100 is switched on or the encoder changed.

7.2.4 Checking the signal level (menu F3)

The signal levels of the encoder can be checked in this menu.

Evaluation of the signals from sinewave encoders can only be performed to a limited extent, since the differential signals from the encoder are converted into TTL signals. It is therefore not possible to check the levels.

At standstill, the momentary high (**H**) and low (**L**) levels of the encoder signal will be displayed. If the level is undefined or there is no corresponding signal (open input), then the '**?**' symbol will appear. When the encoder is rotating, correct signal levels will be acknowledged by a '√' mark.

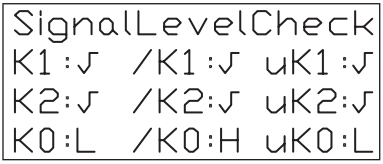


Fig.13: Display menu F3 at low speed

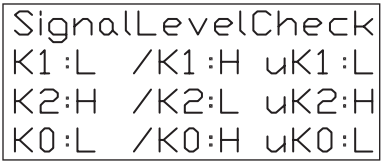


Fig.14: Display menu F3 at standstill: momentary values are displayed

?	Undefined level
L	HTL: level < 20% reference level TTL: level < 1 V reference level
H	HTL: level > 80% TTL: level > 2.5 V
√	Both level are achieved
K#	Signal
/K#	Inverted signal
uK#	Identified level

7.2.5 Measuring the encoder supply (menu F4)

After connecting up a incremental encoder, it is recommended to check the supply to the encoder.

For this purpose, the HENQ 1100 offers the option in menu **F4** of displaying the supply voltages present at the encoder connection (5 V and 9...30 V), the current drawn (in mA) and the power consumption (in mW).

This makes it easy to detect wiring errors, such as a short-circuit or cable break, or an encoder fault.

The current drawn by the output driver that is integrated in the HENQ 1100 is shown in the last line of the display. This will only be non-zero if the encoder signals provided by the HENQ 1100 are passed on to a control system, see *section 6.2.2, page 10*.

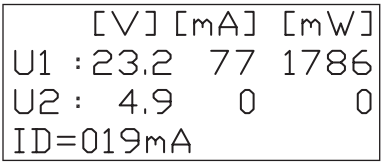


Fig.15: Display menu **F4**
Version without accumulator

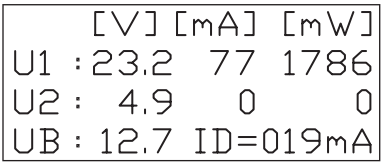


Fig.16: Display menu **F4**
Version with accumulator

U1	HTL supply voltage (9...30 V)
U2	5 V supply voltage
UB	Accumulator supply voltage (only in devices equipped with accumulator)
ID	Current consumption of the output driver

7.2.6 Error messages

☞ When an error message appears, press the enter key to see the next message. To disable error messages, set the value **Errors** to **off** in the menu **F5**, see *Fig.2, page 15*.

Dead channel	Signal is missing (for encoder with two channels displaced by 90°)
Quadrature Error	Illogical signals occurring / status (for encoder with two channels displaced by 90°)
Glitch detected	Glitch occurred
Missed Pulses	Missing pulses
Wrong PULSE-No	Wrong number of pulses
Low Voltage	U_1 or U_2 too small
Sticky pin	Did not reach signal level
Mark-Space	Deviation of pulse/pause ratio is larger than the set value (Default 30:70)
MaxSpeed	Maximum speed setting exceeded
Phase	Phase shift is larger than the set value (Default ±18° of nominal value 90°)
Missed ZeroPulse	Missing zero pulse (reference signal)
ZeroPulse incorrect	Incorrect reference signal
Output Error	Output driver overloaded
Low Battery Voltage	Accumulator must be recharched (only in devices equipped with accumulator)

8. PC PROGRAMM

8.1 System requirements / Installation

Operating systems: Windows 2000/XP

Installation of the Software:

The software for the HENQ 1100 is available for download at www.baumer.com.

» Save the file „SetupHENQ1100.exe“ on your drive.

» Start the file „SetupHENQ1100.exe“ with a double click.

» The installation manager guides you through the installation.

After installation, the programm can be started by ⇒ Start ⇒ Programs ⇒ HENQ 1100.

The driver of the USB → RS485 converter and a detailed installation instruction are also available for download at www.baumer.com.

The commissioning of the USB → RS485 converter is described in the installation instructions.

Please refer to this for questions about de-installation as well.

De-installation of the Software:

In ⇒ System Controls (Control Panel), open the entry for Software. In the list that now appears, look for the **HENQ1100 User Interface** entry. Mark this entry and click on **Change/ Delete**.

8.2 Register „Settings“

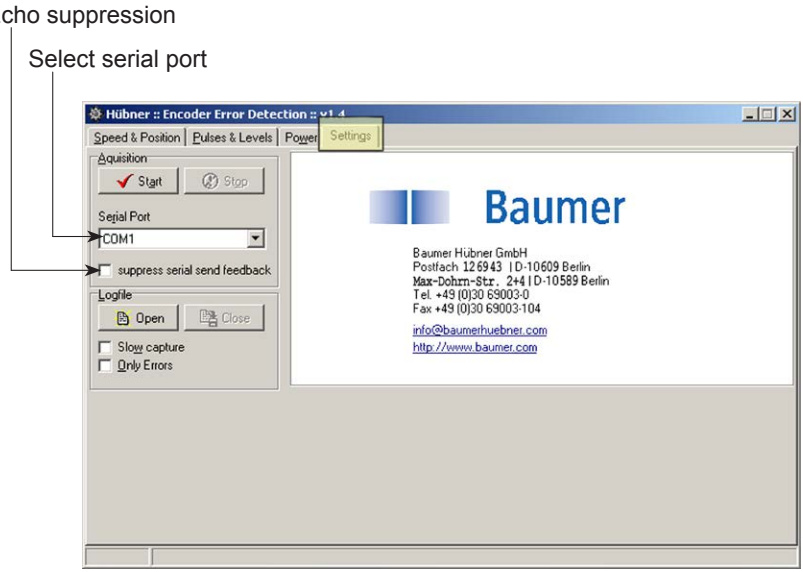


Fig.17: Register “Settings”

In the register card ”Settings” you can make settings for data transmission.

The echo suppression ”suppress serial send feedback” must be switched on or off, depending on which interface converter is used. The default setting for this option is off.

If the USB-485-MINI (available as an option) is used, then care must be taken that it is connected to the PC before the programm is started up.

To start the data acquisition, first select the COM port and then click on the ”Start“ button.

In order to record the measurements, the ”Open” button must be used to open a log file (text file).

The ”Slow capture” mode saves the measurements at one second intervals, whereby the recording rate is speeded up in the event of an error.

In the ”Only Errors” mode, values are only recorded if error messages appear.

The *.txt file that is hereby recorded (in Windows-ANSI format) can, for example, be imported into EXCEL for further processing. The following settings should be observed for importing:

Separator symbol:	Semicolon [;]
Text marker symbol:	Double commas [„]
Decimal separator symbol:	Point [.]
1000s separator symbol:	None

Measurements are recorded as follows:

[Time/s];[Angle/°];[Speed/rpm];“Error message with time and date mark“

Example of a log file:

0.000;217.969;-26;““
0.031;213.179;-30;““
0.063;203.159;-32;“07.04.2005 13:07:32 - Glitch detected“
0.094;197.534;-36;““
0.125;191.777;-33;““
0.156;186:724;-30““

8.3 Register „Speed & Position“

When the data acquisition has been started, a window appears with the speed and position display.

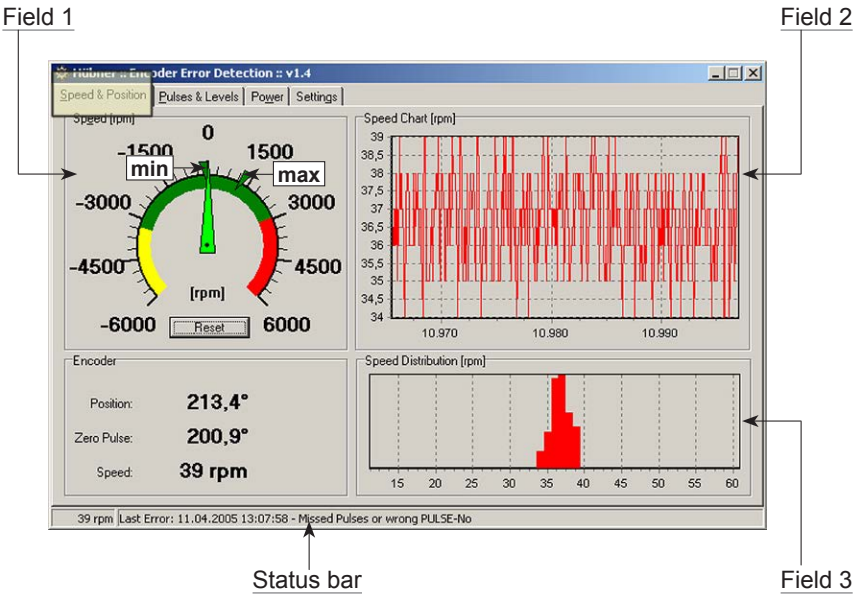


Fig.18: Register ”Speed & Position”

Status bar:

The status bar shows the present speed and the most recent error message with time and date mark.

Field 1:

The ”Speed [rpm]” indicator includes markers for the maximum and minimum speeds that have been recorded.

A click on the Reset button resets these markers.

Field 2:

The ”Speed Chart [rpm]” shows the last 500 speed values that were transmitted. It includes an Autoscale function that automatically adapts the display to suit the minimum and maximum values that have been measured.

Field 3:

The ”Speed Distribution [rpm]” diagram shows the distribution of the speed values. The most frequently occurring speed is shown at the top.

8.4 Register „Pulses & Levels“

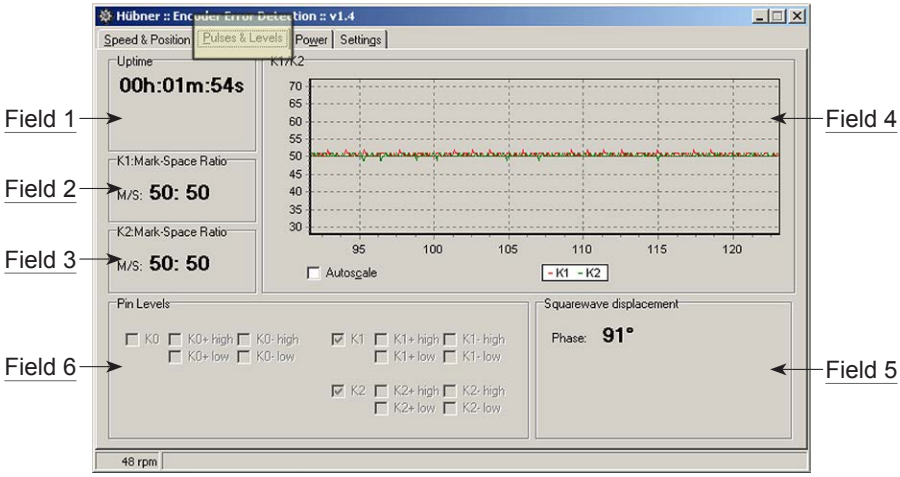


Fig.19: Register “Pulses & Levels“

Field 1: *”Uptime”*

This shows the time since the start of measuring in the HENQ 1100. It is reset if the encoder is changed or the HENQ 1100 is restarted.

Field 2: *”K1:Mark-Space Ratio”*

This is the pulse/pause ratio of K1 (A).
The first figure is the duration of the high level as a percentage of the complete cycle time. The second figure is the duration of the low level of the K1 (A) signal as a percentage of the time.

Field 3: *”K2:Mark-Space Ratio”*

This is the pulse/pause ratio of K2 (B).
The first figure is the duration of the high level as a percentage of the complete cycle time. The second figure is the duration of the low level of the K2 (B) signal as a percentage of the time.

Field 4: *”K1/K2”*

Representation of the ratio over time (time/s).

Field 5: *”Squarewave displacement”*

This shows the phase shift between the rising edges of K1 (A) and K2 (B).

Field 6: *”Pin Levels”*

This is the check on signal levels.
If the high and low values are achieved, it is comfirmed by a tick/check mark in the check box.

K#:	Identified signal
K#+high:	HIGH level (HTL ≥ 80%), (TTL ≥ 2.5 V)
K#+low:	LOW level (HTL ≤ 20%), (TTL ≤ 1.0 V)
K#-high:	Inverted signal HIGH level (HTL ≥ 80%), (TTL ≥ 2.5 V)
K#-low:	Inverted signal LOW level (HTL ≤ 20%), (TTL ≤ 1.0 V)

8.5 Register „Power“

The power is calculated from the measured supply voltage to the encoder and the measured current that is drawn.

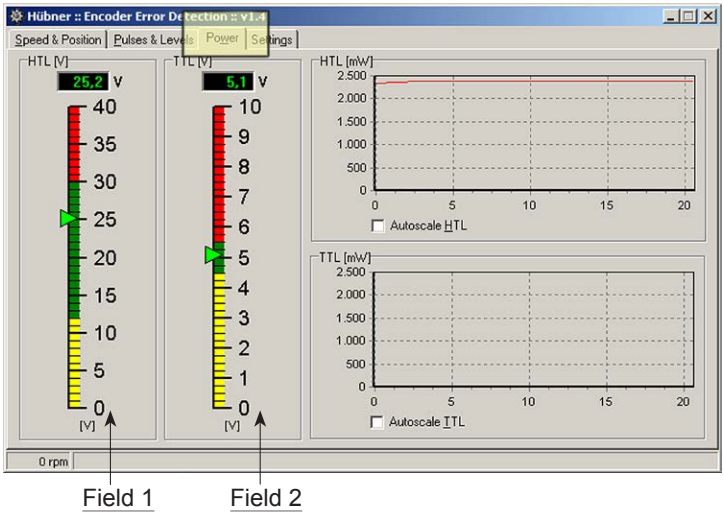


Fig.20: Register “Power“

Field 1: ”HTL [V]”

The measured voltage (in volts) at the supply pins 9+10 of the SUB-D socket, see *section 6.3.1.1, page 11*, which normally supplies HTL encoders, but also (regulated) TTL encoders.

Field 2: ”TTL [V]”

The measured voltage (in volts) at the supply pins 11+12 of the SUB-D socket, see *section 6.3.1.1, page 11*, which normally supplies TTL encoders and sinewave encoders.

9. TABLE OF FIGURES

Original language of this instruction is German. Technical modifications reserved.

Baumer Hübner GmbH
P.O. Box 12 69 43 · 10609 Berlin, Germany
Phone: +49 (0)30/69003-0 · Fax: +49 (0)30/69003-104
info@baumerhuebner.com · www.baumer.com/motion

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