User Manual

ENCODERmaster

Software version 01.01.06

Content

1 Introduction

1.1 Product assignment

The ENCODERmaster software, together with a electronic device (BiSS Adaptor), builds a system to program the following Baumer encoders:

Table 1: Product assignment

Product family	Product
Encoder	BHF 1P. xxxxxxxxx-xx-x
Encoder	BHG 1P. xxxxxxxxx-xx-x

1.2 Safety and operating instructions

Supplementary information
- This manual is intended as a supplement to already existing documentation (catalogues, data sheets and assembly instructions).
- The manual must be read carefully before initial commissioning of the equipment.

Intended purpose of hardware and software
- The encoder is a precision measurement device. It is used to determine angular positions and revolutions, and to prepare and supply measured values in the form of electrical output signals for the follow-on device systems. The encoder may only be used for this purpose.
- The ENCODERmaster software, in combination with a electronic device (BiSS Adaptor), must solely be used to program assigned Baumer encoders listed in table 1.

Commissioning
- Installation and assembly by suitably qualified experts only.
- Observe the manufacturers operating instructions of all related machines.

Safety remarks
- Prior to commissioning the equipment, check all electrical connections.
- If installation, electrical connection or any other work performed at the encoder or at the equipment is not correctly executed, malfunction or failure of the equipment can result.
- Steps must be taken to exclude any risk of personal injury, damage to the plant or to the operating equipment as a result of encoder failure or malfunction by providing suitable safety precautions.
- Encoders and equipment must not be operated outside the specified limited values (see detailed product documentation).

Failure to comply with the safety remarks can result in malfunctions, personal injury or damage to property.

Transport and storage
- Always transport or store encoders in their original packaging.
- Never drop encoders and equipment or expose them to major vibrations.

Assembly
- Avoid impacts or shocks on the housing and shaft.
- Avoid any twist or torsion on the housing.
- Never make rigid connections between the encoder shaft and drive shaft.
- Do not open the encoder or make any mechanical changes to it.

The shaft, ball bearings, glass pane or electronic components can be damaged. In this case, safe and reliable operation cannot be guaranteed.

Electrical commissioning
- Do not make any electrical changes at the encoder.
- Do not carry out any wiring work while the encoder is in operation.
- Never plug or unplug the electrical connection while the encoder is in operation.
- Ensure that the entire plant is installed in line with EMC requirements. The installation environment and wiring affect the electromagnetic compatibility of the encoder. Install the encoder and supply cables separately or at a long distance from cables with high interference emissions (frequency converters, contactors etc.)
- Where working with consumers which have high interference emissions, make available a separate power supply.
- Completely shield the housings and connecting cables.
- Connect the encoder to the protective earth (PE) conductor using shielded cable. The braided shield must be connected to the cable gland or plug. Ideally, aim at bilateral connection to protective earth (PE), the housing via the mechanical assembly, the cable shield via the downstream connected devices. In case of earth loop problems, earth on one side only as a minimum requirement.

Failure to observe these instructions can result in malfunctions, material damage or personal injury.

2   Functional description

The ENCODERmaster software allows to easily program Baumer incremental encoders by setting numerous parameters. Number of pulses, direction of rotation and zero pulse readout can be adjusted with only a few mouse clicks using the ENCODERmaster-software. At any time it is possible to load and save the factory default settings in order to reinstall the status of the delivery.

3   Software installation under Windows 2000, XP®

Important: In order to install software and drivers administrator rights are needed.

The figures below refer to installations under Windows XP®. Other Windows versions might result in a slightly different appearance.

Step 1: The ENCODERmaster software is located on the fieldbus CD-ROM (Art.No. 147362) or can be downloaded from the internet.

Step 2: Please start the "setup.exe" installation program and follow the instructions.

Step 3: It is possible to change the destination folder in which the ENCODERmaster software will be installed by clicking on *Change…* Afterwards click on *Next* to start the installation.
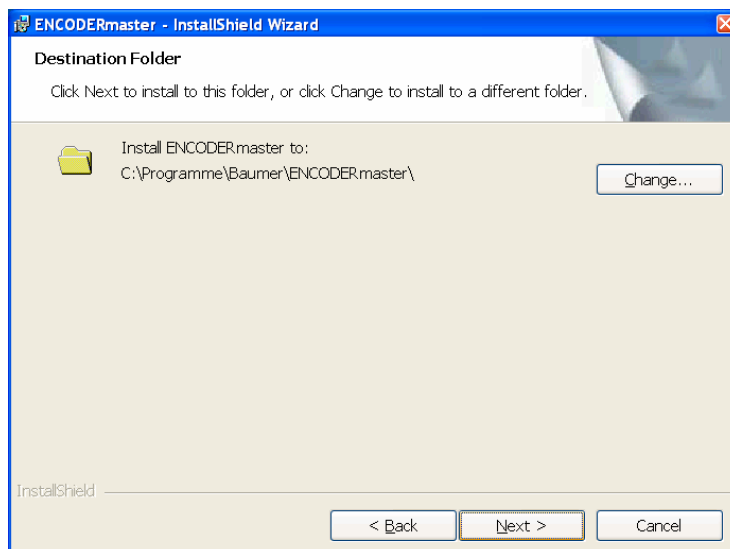

Figure1: Installation window

Step 4: Finish the installation by clicking on *Finish.* The software icon appears on the desktop and in the *Start menu* under *Programs* in the program folder *Baumer.*
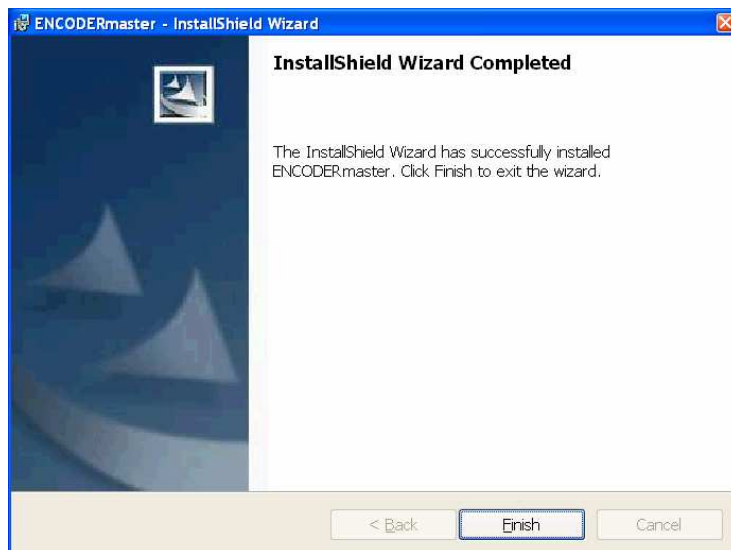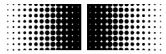

Figure 2: Final window after successful installation

Step 5: First connect the power supply adapter with the BiSS Adaptor. Afterwards connect the BiSS Adaptor with the USB port of your PC by using a USB-AB cable. A new message „Found New Hardware" appears in the taskbar.

Figure 3: Recognition of the BiSS Adaptor

Step 6: The wizard for the search of new hardware appears automatically. Choose the option *No, not this time* and click on *Next*.

Figure 4: Start window of the hardware installation

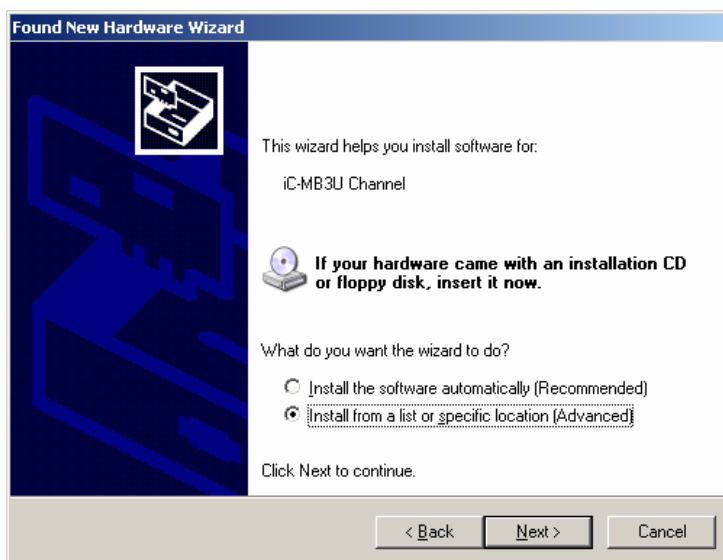**Step 7:** Choose the option *Install from a list or specific location* and click on *Next*.

Figure 5: Choose the driver source

Step 8: Choose the checkbox *Include this location in the search* and set the path to:
E:\EncoderMaster\FTDIDriver
where E stands for your CD drive where the Fieldbus CD-ROM is.
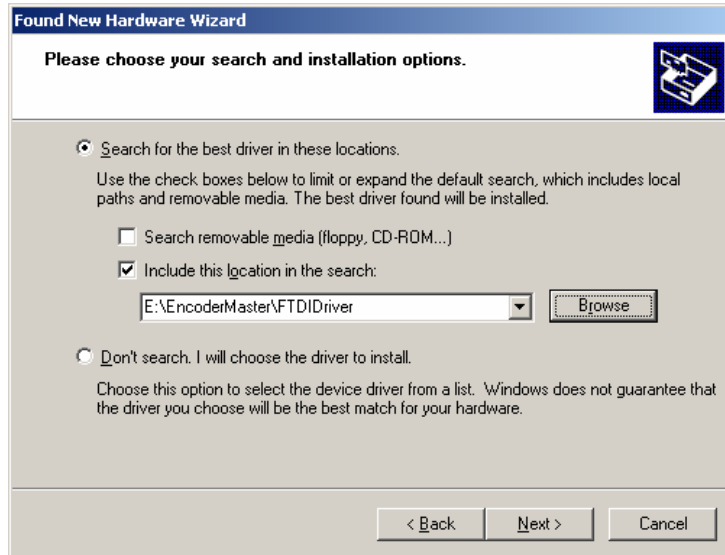
Figure 6: Path for the driver

Step 9: Close the installation by clicking on *Finish*.

Figure 7: Final window after successful driver installation

Important: If the operating system is Windows 2000 step 6 eventually has to be done twice.

4 Hardware installation

4.1 Connection of BiSS Adaptor

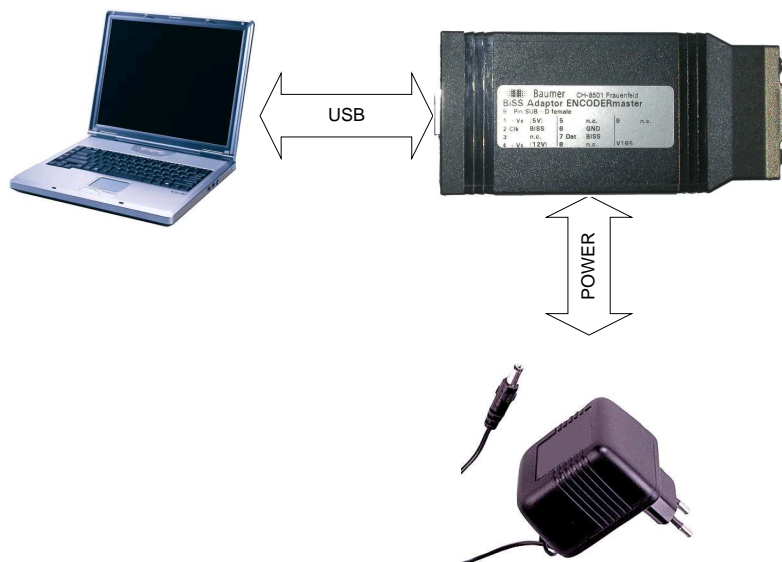Connect the BiSS Adaptor to the power supply. After that, connect the BiSS Adaptor to the PC by using a USB-AB cable.

USB

POWER

Figure 8: Cabling

ATTENTION: It is recommended to connect the power supply to the BiSS Adaptor all the time during operation.
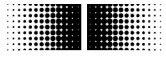
4.2   Connection of an encoder to the BiSS Adaptor

Use the programming cable included in the delivery to connect the encoder to the BiSS Adaptor. The programming connector of the encoder is located under the locking screw on the encoder housing.

ATTENTION: When using an encoders with cable outlet (-5), the loose wires must not build contact to eachother, otherwise no programming can be done!

Figure 9: Connection of encoder to BiSS Adaptor

5 User instruction for ENCODERmaster software

After connecting the encoder with the BiSS Adaptor and the PC the ENCODERmaster software can be started. Click on the icon on your desktop or click on *Start – Programs – Baumer – EncoderMaster*. After a short display of the start window the programming window with the setting options is displayed. During the start the encoder is identified. The factory settings and the actually stored settings are read from the encoder and displayed on the software GUI.
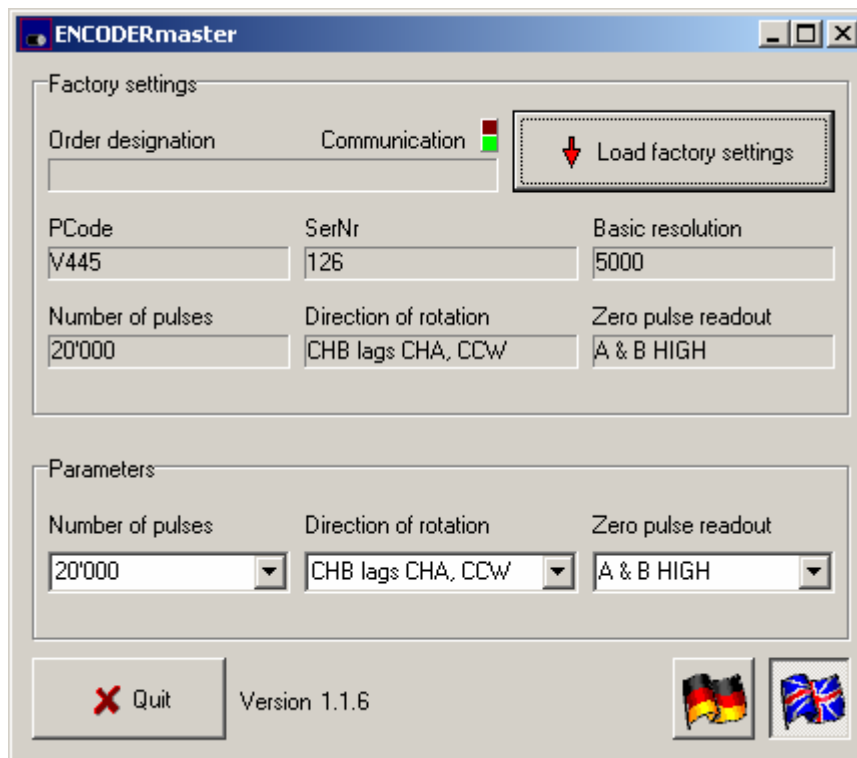
Figure 10: Programming window of ENCODERmaster

Factory settings: The block *Factory settings* shows the parameter values, which were stored on the encoder before delivery to the customer. It includes the order designation, production code (PCode), serial number (SerNr), Basic resolution, Number of pulses, Direction of rotation and Zero pulse readout.

Parameters: The block *Parameters* shows the actually set parameter values. These are Number of pulses, Direction of rotation and Zero pulse readout.
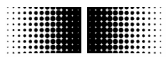
5.1   Setting of specific parameters

The parameter values in the *Parameters* block are active in the encoder at any time. If a value is changed with the pull-down menu this parameter is loaded onto the encoder simultaneously.

5.1.1   Number of pulses

The number of pulses per rotation can be chosen with the pull-down menu.

5.1.2   Direction of rotation

The pull-down menu *Direction of rotation* defines the chronological order of the A and B signals. As a default channel A precedes channel B by a ¼ period if the encoder turns counterclockwise (looking onto the shaft).

5.1.3   Zero pulse readout

The zero pulse readout can be set by using the pull-down menu according to the figure 11 below.
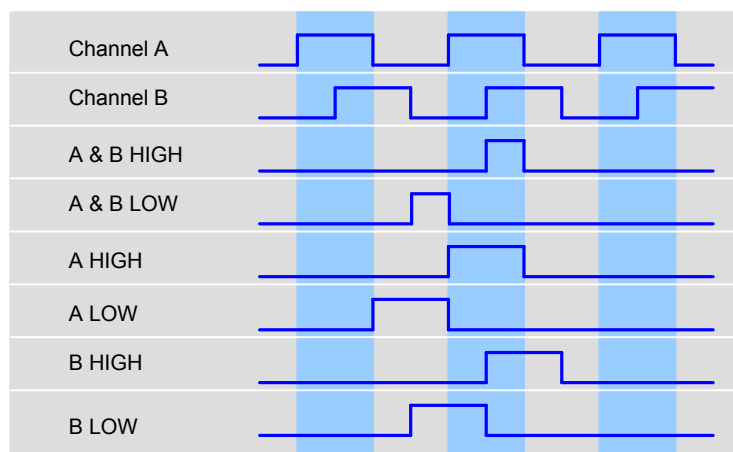
Figure 11: Channel order

5.2   Reset the factory settings

The default factory settings can be reinstalled by clicking on *Load factory settings.*

5.3   Connect new encoder

Encoders can be exchanged while the adapter is running. Please note that the recognition of a new encoder might last up to 10 seconds. If an encoder is not identified correctly all values are invisible and the red indicator *Communication* lights up on the left side of the button *Factory settings*.
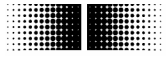
6 Diagnostics messages

6.1 Message: USB-BiSS-Adaptor not connected

The message appears if the BiSS Adaptor has not been connected correctly. Make sure that the adaptor is supplied with the correct voltage and that it is connected correctly with the USB port. Check if all drivers are installed correctly: look if both devices "USB Serial Converter A" and „USB Serial Converter B" are listed in the Windows System Manager under USB controller. Install the drivers again if they are not listed.

Attention: Always first connect the power supply and afterwards the USB cable. Otherwise it could happen that the BiSS Adaptor cannot be identified correctly.

6.2 Message: Encoder not connected

This message appears if the encoder has not been identified or has not been connected correctly. Make sure that it is connected correctly according to chapter 4.2. Check if the encoder is an assigned product (see table 1). Also check the power supply.

Attention: Incorrect connection of the power supply could result in destruction of the encoder!

7 Appendix

7.1 Overview max. rpm / switching frequency

Table 2: Overview encoder disk 2'048

Pulse disk	Number of pulses	max. revolutions (rpm)	max. switching frequency (Hz) **(05A output circuit)**
2'048	2'048	6'000	250'000
2'048	4'096	6'000	500'000
2'048	8'192	6'000	1'000'000
2'048	16'384	4'763	1'300'000
2'048	32'768	2'380	1'300'000
2'048	65'536	1'190	1'300'000
2'048	131'072	595	1'300'000

Pulse disk	Number of pulses	max. revolutions (rpm)	max. switching frequency (Hz) **(24K output circuit)**
2'048	2'048	6'000	250'000
2'048	4'096	4'394	300'000
2'048	8'192	2'197	300'000
2'048	16'384	1'100	300'000
2'048	32'768	549	300'000
2'048	65'536	279	300'000
2'048	131'072	137	300'000

Table 3: Overview encoder disk 5'000

Pulse disk	Number of pulses	max. revolutions (rpm)	max. switching frequency (Hz) **(05A output circuit)**
5'000	5'000	3'000	250'000
5'000	10'000	3'000	500'000
5'000	20'000	3'000	1'000'000
5'000	40'000	1'950	1'300'000
5'000	80'000	975	1'300'000
5'000	160'000	488	1'300'000
5'000	320'000	244	1'300'000

Pulse disk	Number of pulses	max. revolutions (rpm)	max. switching frequency (Hz) **(24K output circuit)**
5'000	5'000	3'000	250'000
5'000	10'000	1'800	300'000
5'000	20'000	900	300'000
5'000	40'000	450	300'000
5'000	80'000	225	300'000
5'000	160'000	112	300'000
5'000	320'000	56	300'000

7.2   Order designations

Programming set complete: Art. Nr. 161910

Consisting of:
Biss Adaptor with USB cable and power supply 230 V   Art. Nr. 162968
Software CD-ROM with EncoderMaster-software   Art. Nr. 147362
Programming cable   Art. Nr. 165345