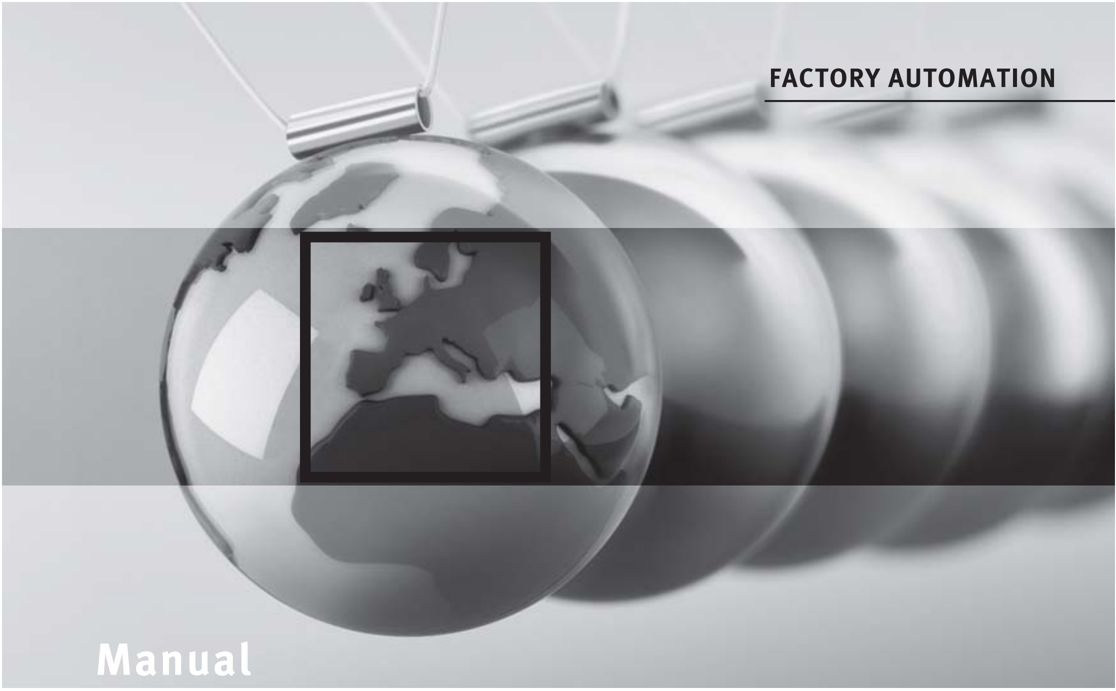
FACTORY AUTOMATION



Manual

Absolute Rotary Encoder for DeviceNet

DeviceNet™

PEPPERL+FUCHS

SENSING YOUR NEEDS

Used symbols

Warning

This symbol warns the user of potential danger. Nonobservance may lead to personal injury or death and/or damage to property.

Attention

This symbol warns the user of potential device failure. Nonobservance may lead to the complete failure of the device or other devices connected.

Note

This symbol calls attention to important notes.r

Security advice

Warning

This product must not be used in applications, where safety of persons depend on the correct device function.
This product is not a safety device according to EC machinery directive.

Notes

These operating instructions refer to proper and intended use of this product. They must be read and observed by all persons making use of this product. This product is only able to fulfill the tasks for which it is designed if it is used in accordance with specifications of Pepperl+Fuchs.

The warrantee offered by Pepperl+Fuchs for this product is null and void if the product is not used in accordance with the specifications of Pepperl+Fuchs.

Changes to the devices or components and the use of defective or incomplete devices or components are not permitted. Repairs to devices or components may only be performed by Pepperl+Fuchs or authorized work shops. These work shops are responsible for acquiring the latest technical information about Pepperl+Fuchs devices and components.Repair tasks made on the product that are not performed by Pepperl+Fuchs are not subject to influence on the part of Pepperl+Fuchs. Our liability is thus limited to repair tasks that are performed by Pepperl+Fuchs.

The preceding information does not change information regarding warrantee and liability in the terms and conditions of sale and delivery of Pepperl+Fuchs.

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ISO9001

2016-08

1 Introduction

Absolute rotary encoders provide a definite value for every possible position. All these values are

reflected on one or more code discs. The beams of infrared LEDs are sent through code discs and detected by Opto-Arrays. The output signals are electronically amplified and the resulting value is transferred to the interface.

The absolute rotary encoder has a maximum resolution of 65536 steps per revolution (16 Bit). The Multi-Turn version can detect up to 16384 revolutions (14 Bit). Therefore the largest resulting resolution is 30 Bit = 1.073.741.824 steps. The standard Single-Turn version has 12 Bit, the standard Multi-Turn version 24 Bit.

The integrated CAN-Bus interface of the absolute rotary encoder supports all of the DeviceNet functions. The following modes can be programmed and enabled or disabled:

- Polled Mode
- Change of State

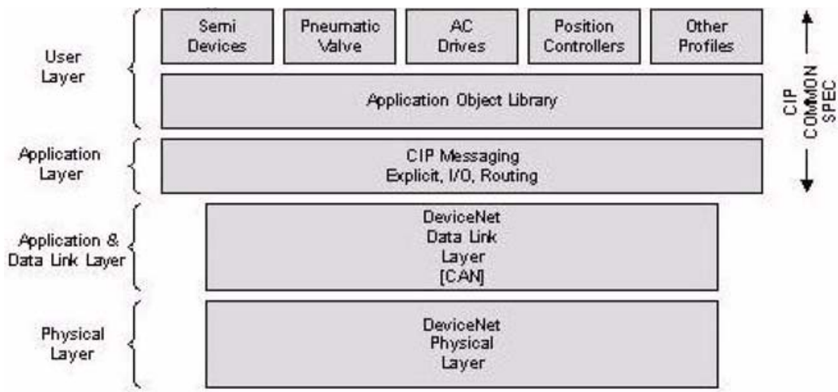
The protocol supports the programming of the following additional functions:

- Code sequence (Complement)
- Resolution per revolution
- Total resolution
- Preset value
- Baudrate
- MAC-ID

The general use of absolute rotary encoders with

DeviceNet interface is guaranteed.

1. 1 Control and Information Protocol (CIP)



The DeviceNet specification defines the Application Layer and the Physical Layer. The Data Link layer is based on the CANspecification. For the optimal industrial control will be defined two different messaging types.

I/O messaging (Implicit Messaging) and explicit messaging.With Implicit Messaging becoming I/O data exchanged in realtime and with Explicit Messaging becoming data exchanged to configure a device.

CIP (Common Industrial Protocol) make for the user available four essential functions:

- Unique control service
- Unique communication service
- Unique allocation of messaging
- Common knowledge base

1. 2 Object modell

DeviceNet describes all data and functions of a device considering as object model. By means of that object-oriented description a device can be defined complete with single objects. A object is defined across the centralization by associated attributes (e.g. processdata), his functions (read- or write access of a single attribute) as well as by the defined behaviour.

DeviceNet distinction is drawn between three different objects:

- Communication object
  Define the exchange messages over DeviceNet and becoming designated as Connection Objects. (DeviceNet Object, Message Router Object, Connection Object, Acknowledge Handler Object)
- System objects
  Define common DeviceNet-specific data and functions. (Identity Object, Parameter Object)
- Applications-specific objects
  Define device-specific data and functions. (Application Object, Assembly Object)

2 Data Transmission

The data transmission in the DeviceNet network is realised by message telegrams. Basically, these telegrams can be divided into the CAN-ID and 8 following bytes as shown in the table below:

COB-ID	Message Header	Message Body
11 Bit	1 Byte	7 Byte

2. 1 The Object Dictionary

Instance Attribute of the Position Sensor Objects Class Code: 23_{hex}

Attribut ID	Access	Name	Data Type	Description
1_{hex}	Get	Number of Attributes	USINT	Number of supported Attributes
2_{hex}	Get	Attribute	Array of USINT	List of supported Attribute
3_{hex}	Get	Position valuet	DINT	current position
70_{hex}	Get/Set	Code sequence	Boolean	Controls the code sequence clockwise or counterclockwise
71_{hex}	Get/Set	resolution per revolution	INT	resolution for one revolution
72_{hex}	Get/Set	total resolution	DINT	total measurable resolution
73_{hex}	Get/Set	preset value	DINT	setting a defined position value
$6E_{hex}$	Get/Set	Baudrate		Adjustment of the Baudrate
$6F_{hex}$	Get/Set	MAC ID		Adjustment of the MAC ID

Get/Set: read, write

2. 2 Definition of the CAN-ID

DeviceNet is based on the standard CANprotocol and used a 11Bit (2048 specifiable messages) messages identifier. For the identification of a device in a DeviceNet network are 6Bit enough because a network belongs 64 nodes. That nodes will be call MAC-ID. The CAN-Identifier consists of the Message Group, Message ID and the MAC ID of the device.

By our absolute rotary encoder it is a matter of a Group 2 Messages. In the table below a user can see the importance CAN-IDs for a certain communication type.

10	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**	**Identity Usage**	**Hex Range**
0	Group 1 Message ID				Source MAC ID						GROUP 1 Message	000-3ff
0	1	1	0	1	Source MAC ID						Slave's I/O Change of State or Cyclic Message	
0	1	1	1	1	Source MAC ID						Slave's I/O Poll Response or Change of State/Cyclic Acknowledge Message	
1	0	MAC ID						Group 2 Message ID			GROUP 2 Messages	400-5ff
1	0	Destination MAC ID						0	1	0	Master's Change of State or Cyclic Acknowledge Message	
1	0	Source MAC ID						0	1	1	Slave's Explicit/Unconnected Response Messages	
1	0	Destination MAC ID						1	0	0	Master's Explicit Request Message	
1	0	Destination MAC ID						1	0	1	Master's I/O Poll Command/Change of State/Cyclic Message	
1	0	Destination MAC ID						1	1	0	Group 2 Only Unconnected Explicit Request Message (reserved)	
1	0	Destination MAC ID						1	1	1	Duplicate MAC ID Check Messages	

3 Programmable Parameters

3. 1 Encoder parameters

3.1.1 Operating Parameter

The operating parameter can be used to select the code sequence.

Attribut ID	**Default value**	**Value range**	**Data Type**
70_{hex}	1_{hex}	0_{hex} - 1_{hex}	Boolean

The parameter code sequence (complement) defines the counting direction of the process value

as seen on the shaft whether clockwise or counter clockwise. The counting direction is defined in the attribute 70 hex:

Bit 0	**Counting direction**	**Output code**
1	CW	Raising
0	CCW	Falling

3.1.2 Resolution per revolution:

The parameter resolution per revolution is used to program the encoder to set a desired number of steps per revolution. Each value between 1 and the maximum (see type shield) can be realised

Attribut ID	Default value	Value range	Data Type
71_{hex}	(*)	0_{hex} - 2000_{hex}	Unsigned Integer16

(*) see type shield, Maximum resolution:
Maximum resolution if
12/24 Bit Encoder: 1.000 $_{hex}$ (4096)
13/25 Bit Encoder: 2.000 $_{hex}$(8182)

When the value is set larger than 4096 (8192 for a 13/25 Bit encoder), the process value of the encoder will not be single stepped and values will be skipped while rotating the shaft.

So, it is recommended, to keep the measuring steps per revolution below 4096 (8192) measuring steps.

3.1.3 Total resolution

This value is used to program the desired number of measuring steps over the total measuring range. This value must not exceed the total resolution of the encoder with 24 bit = 16,777,216 steps (25 bit = 33,554,432 steps). Please note the value written on the type shield.

Attribut ID	Default value	Value range	Data Type
72_{hex}	(*)	0_{hex} - $2.000.000_{hex}$	Unsigned Integer32

(*) see type shield
Maximum total resolution
24 Bit Encoder: 1.000.000 $_{hex}$
25 Bit Encoder: 2.000.000 $_{hex}$

Attention:

The following formula letters will be used:

PGA Physical total resolution of the encoder (see type shield)

PAU Physical resolution per revolution (see type shield)

GA Total resolution (customer parameter)

AU Resolution per revolution (customer parameter)

If the desired resolution per revolution is less than the physical resolution per revolution of the encoder, then the total resolution must be entered as follows:

Total resolution GA = PGA * AU / PAU, wenn AU < PAU

Example:

Customer requirement:AU = 2048,

Encoder type shield:PGA= 24 Bit, PAU = 12 Bit

GA = 16777216 * 2048 / 4096

GA = 8388608

If the total resolution of the encoder is less than the physical total resolution, the parameter total

resolution must be a multiple of the physical total resolution:

k = PGA / GA

k = integer

3.1.4 Preset value

The preset value is the desired position value, which should be reached at a certain physical position of the axis. The position value of the encoder is set to the desired process value by the parameter preset. The preset value must not exceed the parameter total measuring units.

Attribut ID	Default value	Value range	Data Type
73_{hex}	0_{hex}	0_{hex} - total measuring range	Unsigned Integer32

3.1.5 MAC-ID

Each node in a Device Net network is identified using a MAC-ID (Media Access Control Identifier). Every device needs an explicit and unique MAC-ID. A Device Net netwok supports 64 nedoes. The MAC-ID can only be adjusted via explicit messaging. The default MAC-ID is setting on d63..

Attribut ID	Default value	Value range	Data length
$6F_{hex}$	0_{hex}	0_{hex} - $3F_{hex}$	Byte

3.1.6 Baudrate

Device Net supports three different baurates that are being showed in the below table. The baudrate can be changed via explicit messages and stored in the EEPROM with a save command. It is to insure that the selective baudrate has to be the same as the Device Net network baudrate. The default baudrate is setting 125kBaud.

Attribut ID	Default value	Value range	Data length
$6E_{hex}$	0_{hex}	0_{hex} - 2_{hex}	Byte

Byte	Baudrate
0	125 kbaud
1	250 kbaud
2	500 kbaud

4 Operating Mode

4. 1 Polled Mode

For switching the polled mode on the following telegrams are needed. Further it is assumed in the following example a master MAC ID of 0A hex and a slave MAC ID of 03 hex.

Allocate Master / Slave Connection Set

1. Allocate Polling

Byte Offset	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Frag [0]	XID	MAC ID					
1	R/R [0]	Service [4B]						
	Class ID [03]							
	Instance ID [01]							
	Allocation Choice [03]							
	0	0	Allocator MAC ID					

10	9	8	7	6	5	4	3	2	1	0	Identity Usage	Hex Range
0	Group 1 Message ID				Source MAC ID						Group 1 Message	000-3ffh
0	1	1	0	1	Source MAC ID						Slave's I/O Change of State or Cyclic Message	
0	1	1	1	1	Source MAC ID						Slave's I/O Poll Response or Change of State/Cyclic Acknowl-edge Message	

Example:

CAN ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5
41E	0A	4B	03	01	03	0A

1. Setting the Expected_packet_rate of the Explicit Message Connection on 0:

Definition CAN-ID

10	9	8	7	6	5	4	3	2	1	0	Identity Usage	Hex Range
1	0	Destination MAC ID						1	0	0	Master´s Explicit Request Message	

Example:

CAN ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
41C	0A	10	05	01	09	06	00

1. Setting the Expected_packet_rate of the Polling Connection on 0: n:

Example:

CAN ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
41C	0A	10	05	01	09	00	00

Release Master / Slave Connection Set

Release Polling

Byte Offset	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Frag [0]	XID	MAC ID					
1	R/R [0]	Service [4C]						
	Class ID [03]							
	Instance ID [01]							
	Release Choice [03]							

Example:

CAN ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4
41E	0A	4C	03	01	03

4. 2 Change of State Mode

The absolute rotary encoder sends data, without any request from the host, when the actual process value is changing. No telegram will occur when the position value is not changing. This results in a reduced bus loading.

Allocate Master / Slave Connection Set

Allocate COS

Byte Offset	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Frag [0]	XID	MAC ID					
1	R/R [0]	Service [4B]						
	Class ID [03]							
	Instance ID [01]							
	Allocation Choice [51] [03]							
	0	0	Allocator MAC ID					

Example:

CAN ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5
41E	0A	4B	03	01	51	0A

2. Setting Expected_packet_rate of the Explicit Message

Connection on 0:

Example:

CAN ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
41C	0A	10	05	04	09	00	00

Release Master / Slave Connection Set

Release COS

Byte Offset	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Frag [0]	XID	MAC ID					
1	R/R [0]	Service [4C]						
	Class ID [03]							
	Instance ID [01]							
	Release Choice [51]]							

Example:

CAN ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4
41E	0A	4C	03	01	51

4. 3 Saving Parameter

The parameters of the absolute rotary encoder are saved in a non-volatile FLASH memory. Because of a limited number of writing cycles (» 1,000), it is useful to transmit the modified parameter in the first step only in the RAM area. After adjusting and examination, those values can be saved in the FLASH memory. After successful saving of the parameter the encoder sends his MAC-ID on the bus. To get the process value a new allocation of the slave is require

Byte Offset	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Frag [0]	XID	MAC ID					
1	R/R [0]	Service [32]						
	Class ID [23]							
	Instance ID [01]							

Examplar (MAC-ID Master: $0A_{hex}$, MAC-ID Slave: 03_{hex})

CAN ID	Byte 0	Byte 1	Byte 2	Byte 3
41C	0A	32	23	01

5 Transmission of the actual position

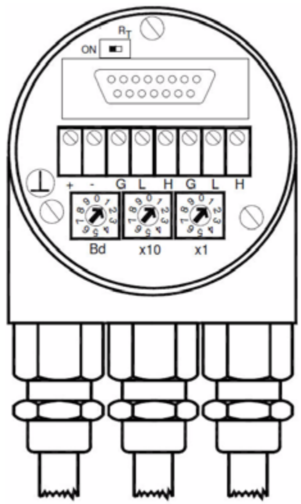
The process value is transmitted according to the following table.

CAN ID	process value			
11 Bit	**Byte 0**	**Byte 1**	**Byte 2**	**Byte 3**
	2^7 to 2^0	2^{15} to 2^9	2^{23} to 2^{16}	2^{31} to 2^{24}

6 Installation

6. 1 Electrical connection

The rotary encoder is connected by three cables. The power supply is achieved with a two-wire connection cable through one PG 9. Each one of the twisted-pair and shielded bus lines are guided in and out through two PG 9 on the right side (as seen on clamps). There is a resistor provided in the connection cap, which must be used as a line termination on the last device



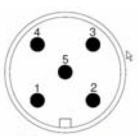
Clamp	Description
⊥	Ground
+	24 V Supply voltage
-	0 V Supply voltage
G	CAN Ground
L	CAN Low
H	CAN High
G	CAN Ground
L	CAN Low
H	CAN High

6. 2 Cable

Pin	Signal	Description	Color
1	V-	GND	Black
2	CAN-L	CAN Bus signal (dominant low)	Blue
3	CAN-H	CAN Bus signal (dominant high)	White
4	V+	External voltage supply Vcc	Red

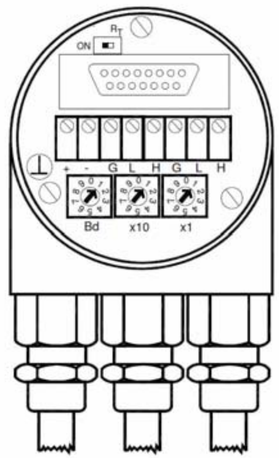
6. 3 Connector

Pin	Signal	Description	Color
2	V+	External voltage supply Vcc	Red
3	V-	GND	Black
4	CAN-H	CAN Bus signal (dominant high)	White
5	CAN-L	CAN Bus signal (dominant low)	Blue



7 Power On

7. 1 CAN-ID / MAC-ID adjustment



The setting of the node number is achieved by 2 turn-switches in the connection cap. Possible addresses lie between 0 and 63 whereby every address can only be used once.

2 rotary switches	
	Device adress 0...63
x1	Setting CAN-node number (units)
x10	Setting CAN-node number (tens)

7. 2 Setting of the baudrate

Baudrate in kBit/s	BCD coded rotary switches
125	0
250	1
500	2
reserved	3 ... 9

7. 3 Bus termination resistor

You can connect or disconnect a bus termination resistor by means of the sliding switch R_T. The bus termination resistor is connected to the bus when the switch is in position ON. Ensure, that only the last device on the bus has the termination resistor activated.

7. 4 Operating Mode

After power on the absolute rotary encoder sends two times his MAC ID telegram on the bus. 2 LEDs on the backside of the connection cap show the operating status of the encoder.

7. 5 Programming

If some parameters should not be modified you can skip over this chapter.

The following numbers are given in hexadecimal format. In the examples, the CAN ID and MAC ID are 0A (hex) and for the slave 03 (hex).

The changeable values are written in an italics.

7.5.1 Operating Parameter

Master to absolute rotary encoder: Set-Parame

CAN ID	MAC ID	Service Code	Class ID	Instance ID	Attribut ID	Data		
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
41 C	0A	10	23	01	70	X	-	-

X: 1_{hex} for CW (Default)
0_{hex} for CCW

Absolute Rotary Encoder to Master: Confirmation

CAN ID	MAC ID	Service Code
	Byte 0	Byte 1
41B	0A	90

7.5.2 Resolution per revolution

Master to Absolute Rotary Encoder: Set-Parameter

CAN ID	MAC ID	Service Code	Class ID	Instance ID	Attribut ID	Data		
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
41 C	0A	10	23	01	71	X	X	-

X: desired resolution per revolution

Absolute rotary encoder to master: Confirmation

CAN ID	MAC ID	Service Code
	Byte 0	Byte 1
41B	0A	90

7.5.3 Total resolution

A fragmented transmission is needed, when the total resolution must be sent to the encoder.

So here are more messages necessary.

Master to Absolute Rotary Encoder: Set-Parameter

CAN ID	MAC ID	Fragment	Service Code	Class ID	Instandce ID	Attribut ID		
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
41 C	8A	00	10	23	01	72	X	X

X: desired resolution per revolution

Absolute Rotary Encoder to Master: Confirmation

CAN ID	MAC ID		
	Byte 0	Byte 1	Byte 2
41B	8A	C0	00

Master to Absolute Rotary Encoder: Set-Parameter

CAN ID	MAC ID	Fragment		
	Byte 0	Byte 1	Byte 6	Byte 7
41 C	8A	81	X	X

X: desired resolution per revolution

Absolute Rotary Encoder to Master: Confirmation

CAN ID	MAC ID		
	Byte 0	Byte 1	Byte 2
41B	8A	C1	00

Absolute Rotary Encoder to Master: Confirmation

CAN ID	MAC ID	Service Code
	Byte 0	Byte 1
41 C	0A	90

X: desired resolution per revolutiong

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7.5.4 Preset Value

Master to Absolute Rotary Encoder: Set-Parameter

CAN ID	MAC ID	Fragment	Service Code	Class ID	Instandce ID	Attribut ID		
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
41 C	8A	00	10	23	01	73	X	X

X: desired preset value

Absolute Rotary Encoder to Master Confirmation

CAN ID	MAC ID		
	Byte 0	Byte 1	Byte 2
41B	8A	C1	00

Absolute Rotary Encoder to Master Confirmation

CAN ID	MAC ID	Service Code
	Byte 0	Byte 1
		90

7.5.5 Baudrate

Master to encoder: Set-Parameter

CAN ID	MAC ID	Service Code	Class ID	Instandce ID	Attribut ID	Data		
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
41 C	0A	10	23	01	6E	X	-	-

X: Value of the Baudrate

X	Baudrate
0	125 kbaud
1	250 kbaud
2	500 kbaud

Encoder to Master: Confirmation

CAN ID	MAC ID	Service Code
	Byte 0	Byte 1
41B	0A	90

7.5.6 MAC-ID

Master to encoder: Set-Parameter

CAN ID	MAC ID	Service Code	Class ID	Instandce ID	Attribut ID	Data		
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
41 C	0A	10	23	01	6F	X	-	-

X: Value of the MAC-ID

Encoder to Master: Confirmation

CAN ID	MAC ID	Service Code
	Byte 0	Byte 1
41B	0A	90

7.5.7 Parameter Saving

Master to Absolute Rotary Encoder: Set-Parame

CAN ID	MAC ID	Service Code	Class ID	Instandce ID
	Byte 0	Byte 1	Byte 2	Byte 3
41 C	0A	32	23	01

If the transfer has been successful, the absolute rotary encoder responds after 3-4s with the Duplicate MAC-ID. After that the master must reallocate the slave.

If the transfer is not successful, an error message will be sent. The service code used to save the parameter set is manufacturer specific.

8 Engineering with RsNetworx

8. 1 EDS Wizard

The EDS File contains information about device specific parameters as well as possible operating modes of the encoder. With this file you have a data sheet in an electronic format, which can be used to configure the device in the network, for example with RsNetworx from Rockwell.

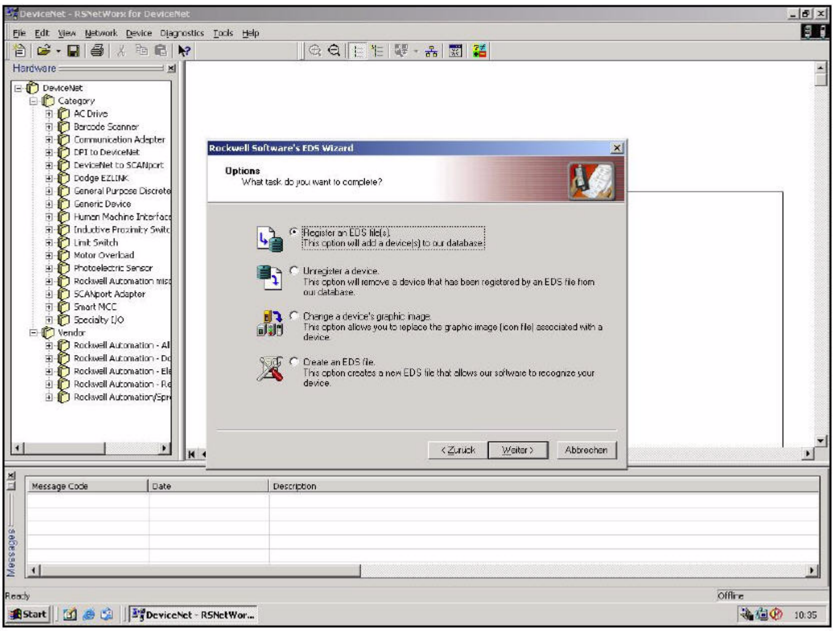

Fig.8.1: EDS Wizard

To install the EDS file the EDS Wizard has to be started, that can be done in the menu <u>*Tools/ EDS Wizard*</u>. If the EDS Wizard is activated successfully the <u>*Register an EDS File(s)*</u> has to be chosen and after that the button weiter. In the next step the *Register a directory of EDS files* has to be chosen and with <u>*Browse*</u> the path of the EDS file(s). That is indicated in figure 8.2.

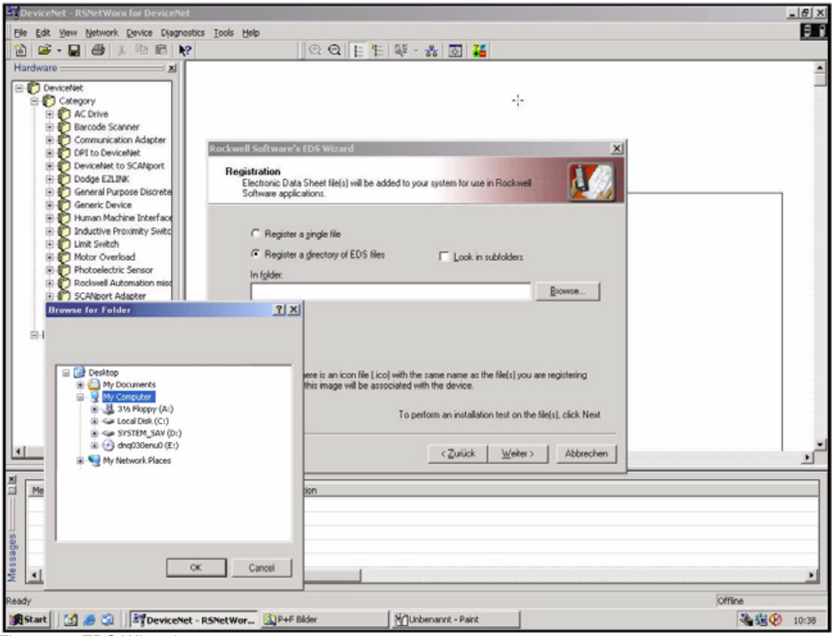

Fig.8.2: EDS Wizard

The Wizard finds all EDS files that are discarded in the choosing path and operates a test to check the EDS files on errors. In the next step (see figure 8.3) pictures can be selected for the using nodes. With the button *weiter* the installation can be continued and finished.

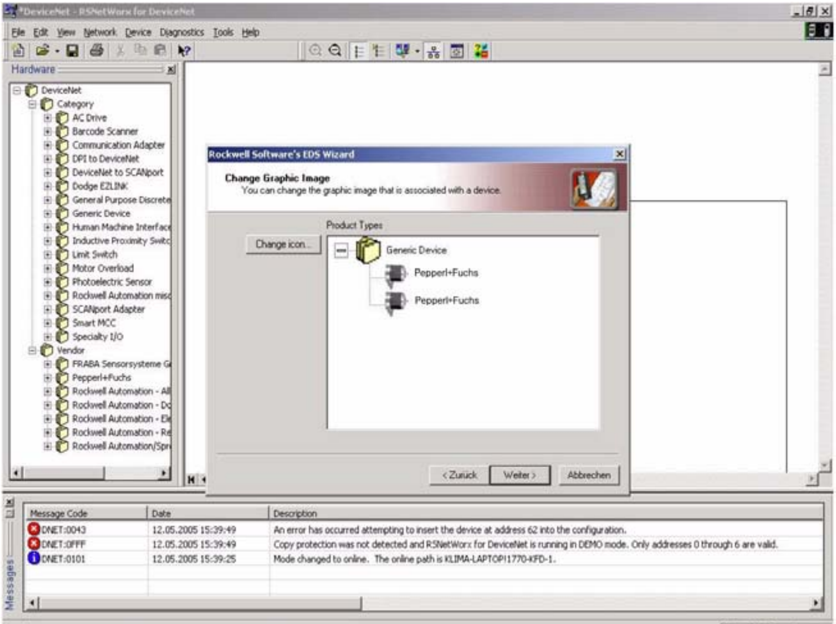

Fig.8.3: EDS Wizard

8. 2 Driver Configuration

After a successful installing of the EDS file the next step is to choose the suitable driver. With *Start/Programme/Rockwell Software/RSLinx* in the menu the programm RSLinx can be started. With this programm the suitable driver can be chosen. For this example the driver typ 1770-KFD is being used. In the next step the window *Configure Drivers* in the menu *Communications/Configure Drivers* has to be started. In the drop down Menü *Available Driver Types* the driver typ 1770-KFD has to be chosen and confirmed with the button Add New. (See figure 8.4)

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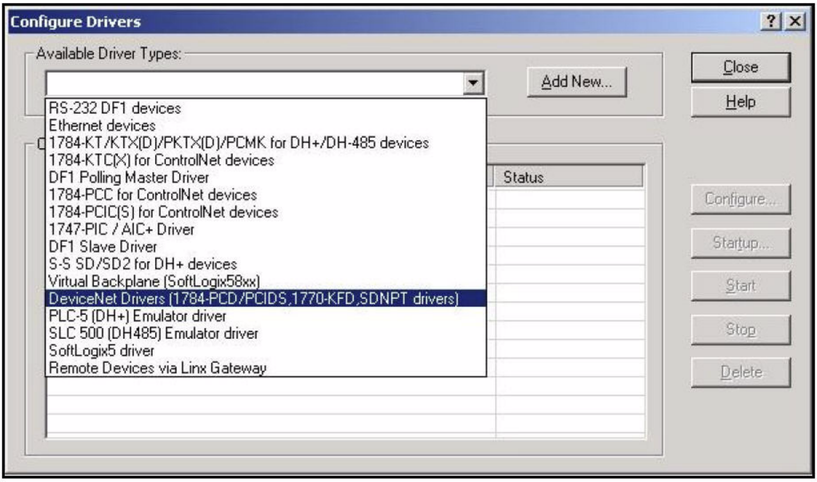

Fig.8.4: Configure Drivers

If the suitable driver is chosen it can be configured in the window *Driver Configuration*. In this step the correct data rate has to be registered (figure 8.5). In the next step a requested name can be registered.

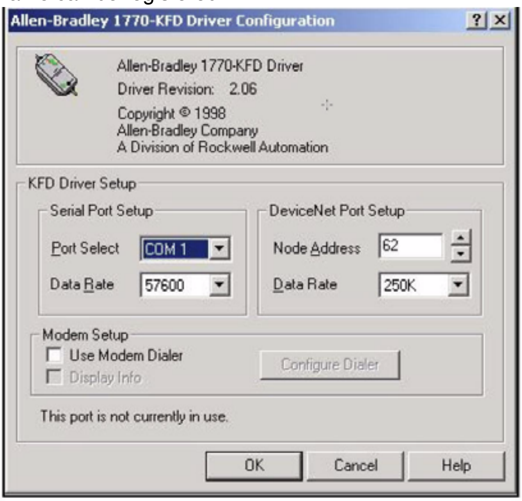

Fig.8.5: Driver Configuration

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8. 3 Network Connection

This chapter will explain how to switch a network online and how to parametrise a encoder. In the menu *Network/ Online* the window *Browse for network* will be opened. If the driver *1770-KFD* has been choosen, this is explained in chapter 6.2, the network is online. After that RsNetworx searches in the network for connecting nodes. That is also being showed in figure 8.6.

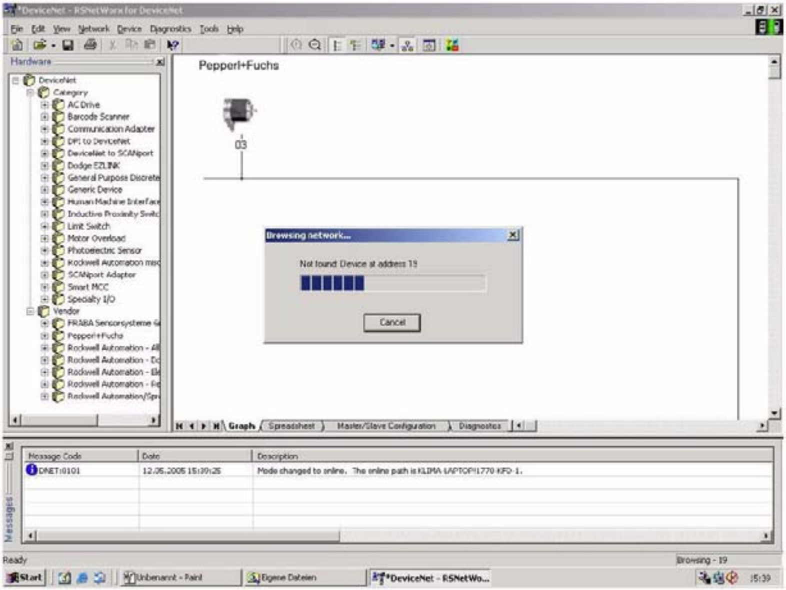

Fig.8.6: Browsing Network

To cofigure the encoder the configuration window in the menu *Device/Properties* has to be opened. By pushing *Parameters* an upload of the encoder parameter is realized.

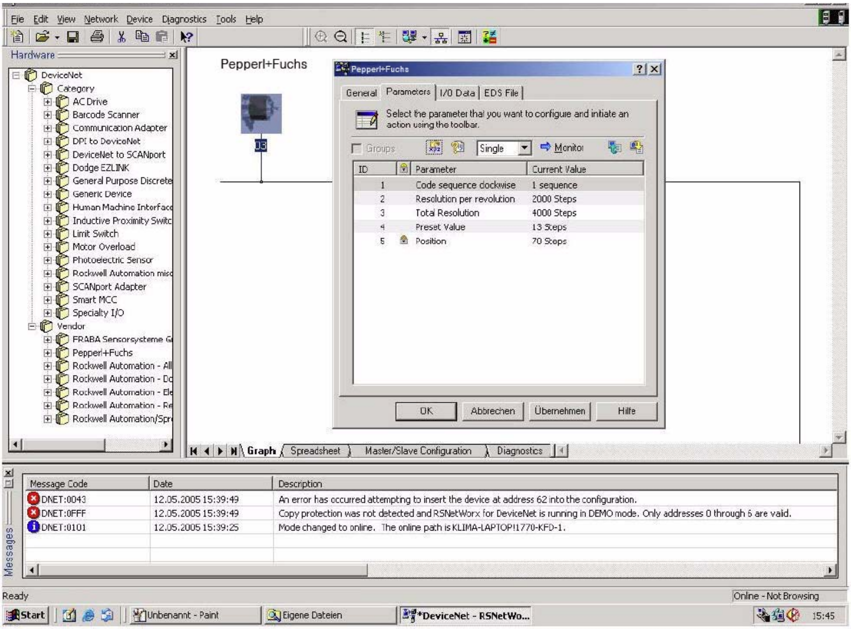

Fig.8.7: Upload Parameters

After a successful upload of the parameters, those can be configured as the figure 8.8 below shows. A download of the configured parameters can be realized with the yellow arrow that is showing down and is placed at the top right in the configuration window. An upload can be realized with the arrow beside the download arrow which is showing up. To show the position value the button *Monitor* has to be pushed. It should be noticed that the configuration parameters are not stored in the EEPROM. To store the parameters in the EEPROM the window in the menu *Device/Class Instance Editor* has to be opened. The entries that are necessary to store the parameters are being showed in the figure 8.9 below. At last the button *execute* has to be executed to store the parameters in the EEPROM.

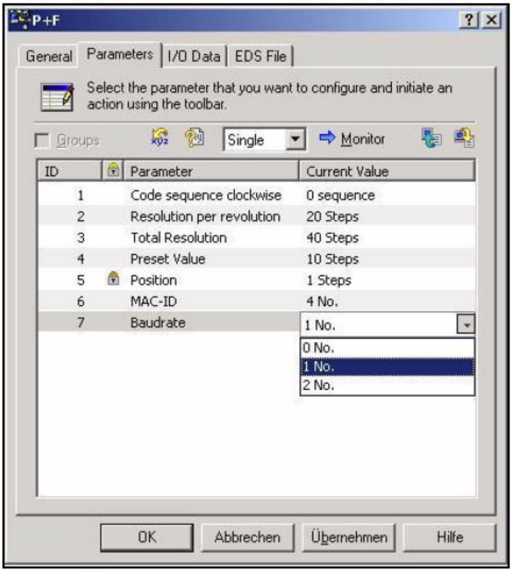

Fig.8.8: Configure Parameters

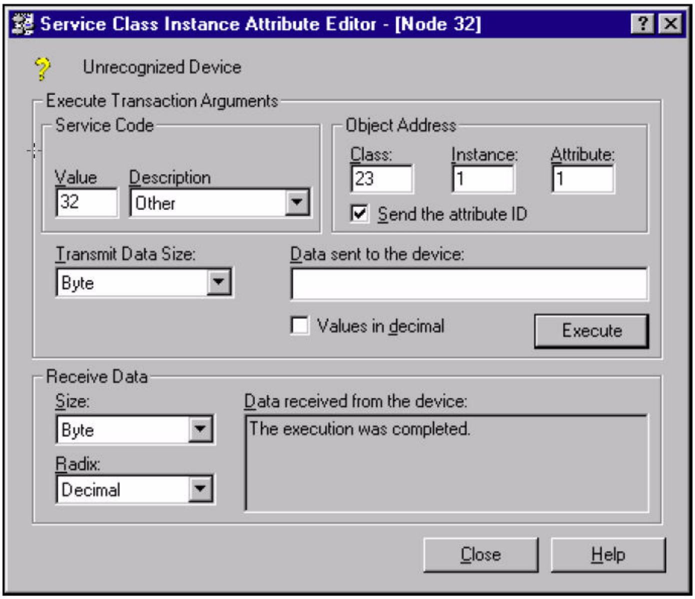

Fig.8.9: Service Class Instance Attribute Editor

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9 Notes

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