Instruction Manual

Absolute Rotary Encoder with EtherNet√IP

EVS58N-***-IZ EVM58N-***-IZ ESS58N-***-IZ ESM58N-***-IZ





CE



Part. No. xxxxxx / DOCT-2115A / 24th January 2012

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Used symbols



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

Warning



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



This symbol calls attention to important notes.r



Security advice



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.

This device contains sub-assemblies that are electrostatically sensitive. Only qualified specialists may open the device to perform maintenance and repair tasks. Touching the components without protection involves the risk of dangerous electrostatic discharge, and must be avoided. Destruction of basic components caused by an electrostatic discharge voids the warrantee!

Subject to technical modifications.

Pepperl+Fuchs GmbH in D-68301 Mannheim maintains a quality assurance system certified according to ISO 9001.

CE





1 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 13 Bit, the standard Multi-Turn version 25 Bit.

The integrated Ethernet interface of the absolute rotary encoder supports all necessary the EtherNet/IP functions.

The protocol supports the programming of the following additional functions in several ways:

Code sequence (Complement)

Resolution per revolution

Total resolution

Preset value

IP-Address

The general use of absolute rotary encoders with EtherNet/IP interface is guaranteed. The data will transmit in a standard Ethernet frame in the data section, see at the bottom of this side the pink field with the blue frame.

The MAC Address for each encoder is available on the type label.

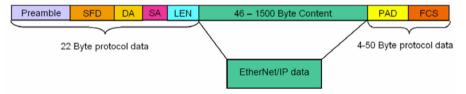
The IP address can be programmed with DHCP or BOOTP by configuration tools of the PLC.

General information's about EtherNet/IP are available:

www.ethernetip.de (German)

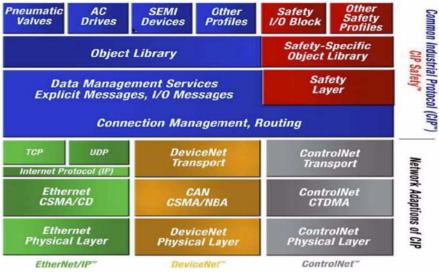
www.odva.org/default.aspx?tabid=67 (English)

Setup of an Ethernet data package on layer 2



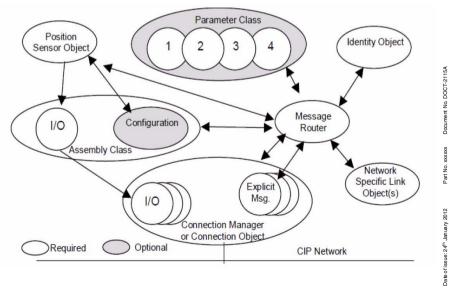


1.1 Control and Information Protocol (CIP)



1.2 Object model

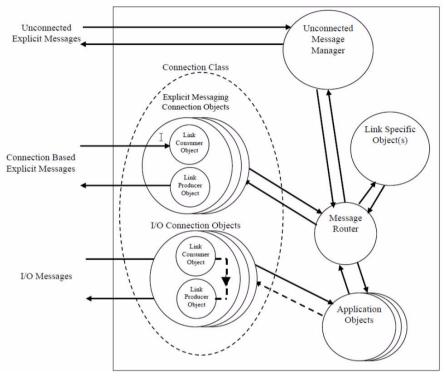
EtherNet/IP describes all data and functions of a device considering an object model. By means of that object oriented description, a device can be defined complete with single objects. A object is defined across the centralization by associated attributes (e.g. process data), its functions (read- or write access of a single attribute) as well as by the defined behavior. The absolute rotary encoder support the Encoder Device Type: 22_{hex} or Generic Device Type: 0_{hex} . This is programmable, see chapter 4.1.6. All parameters will be used with Big Endian notation.





2 Data Transmission

The data transmission in the EtherNet/IP network is realized by implicit or explicit messaging. Explicit messages are split in unconnected and connection based versions. Unconnected messages will be use i.e. by EtherNet/IP scanners.



2.1 Implicit Messaging I/O Connection

Provide dedicated, special-purpose communica-tion paths between a producing application and one or more consuming applications for the purpose of moving application-specific data. This is often referred to as implicit messaging. Class 0 and 1 are supported.

2.1.1 I/O Assembly Instances

Instance	Туре	Name
1	Input	Position Value
3	Input	Position Value and Velocity

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2.1.1.1 Data Attribute Format

Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	0	Position V	alue (low l	Byte)					
	1								
	2								
	3	Position V	alue (high	Byte)					
3	0	Position V	low l	Byte)					
	1								
	2								
	3	Position V	alue (high	Byte)					
	4	Velocity (I	ow Byte)						
	5								
	6								
	7	Velocity (h	nigh Byte)						

2.1.2 Data Mapping

Data Component	Class		Instance	Attribute	
Name	Name	Number	Number	Name	Number
Position Value	Position Sensor	23 _{hex}	1	Position Value	0A _{hex}
Velocity	Position Sensor	23 _{hex}	1	Velocity	18 _{hex}

2.1.3 Data Mapping (Parameter)

On every Forward Open Request, the following parameters, will be sent from the controller to the encoder.

Assembly Instance Configuration: 7, size 12 Bytes

Configuration Parameter	Class		Instance	Attribute	
Name	Name	Number	Number	Name	Number
Direct Counting Toggle	Position Sensor	23 _{hex}	1	Direct Counting Toggle	0C _{hex}
Scaling Function Control	Position Sensor	23 _{hex}	1	Scaling Function Control	0E _{hex}
Measuring units per Revolution	Position Sensor	23 _{hex}	1	Measuring Units per Span	10 _{hex}
Total Measuring Range in measuring units	Position Sensor	23 _{hex}	1	measuring units	11 _{hex}
Velocity Format	Position Sensor	23 _{hex}	1	Velocity Format	19 _{hex}

2.1.3.1 Data Offset

Byte Offset	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Direction	Counting	Toggle				•	
1	Scaling	Function Co	ontrol					
2	Measuri	ng units per	^r Revolutio	n (low byte	e)			
3								
4								
5	Measuri	ng units per	^r Revolutio	n (high byt	e)			
6	Total Me	asuring Ra	nge in mea	asuring uni	ts (low b	yte)		
7								
8								
9	Total Me	asuring Ra	nge in mea	asuring uni	ts (high l	oyte)		
10	Velocity	Format (lov	v byte)					
11	Velocity	(high byte)						



2.1.4 Connection Path

Is made up of a byte stream that defines the application object to which a connection instance applies. This path will be created from the configuration tools and are available in the EDS file too. This path will sent during power up to the encoder. For some tools it is necessary to use the connection path as parameter:

[20] [04] [24 07]	[2C 06] [2C 01]	[80 06 00 01 00100000 00200000 041F]
Segment Groups	Segment	Description
Application Path	20 04	Assembly object class
	24 07	Instance segment type with Assembly Instance 7 (Configuration)
	2C 06	Assembly Instance 6 (Output controller to encoder)
	2C01	I/O Assembly Instance 1 (Position value)
	80 06	Data segment with lenght of 6 Bytes
	00 01 00100000 00200000 041F	Configuration Data, see chapter 2.1.3.1 for details

2.2 Explicit Messaging

Provide generic, multi-purpose communication paths between two devices. These connections often are referred to as just Messaging Connections. Explicit Messages provide the typical request/response-oriented network communications. Class 2 and 3 are supported.

2.2.1 CIP Common Services

Supported Service Code	Service Name	Comment
05 _{hex}	Reset	Boot up of the encoder, the programmed parameter from the customer will use again
0E _{hex}	Get_Attribute_Single	Read out attribute from the encoder
10 _{hex}	Set_Attribute_Single	Write attribute to the encoder
15 _{hex}	Restore	Restore the saved parameters
16 _{hex}	Save	Save the parameters from chapter 2.1.3 to the nonvolatile memory

Position Sensor Objects

Instance Attributes (Get: read, Set: write + read)

Class Code: 23hex

Attrib. ID	Access	Name	Data Type	Description
01 _{hex}	Get	Number of Attributes	USINT	Number of supported Attributes
02 _{hex}	Get	Attribute List	Array of USINT	List of supported Attribute
0A _{hex}	Get	Position Value Signed	DINT	Current position signed
0B _{hex}	Get	Position Sensor Type	UINT	Specifies the device type
0C _{hex}	Set	Direction Counting Toggle	Boolean	Controls the code sequence clockwise or counterclockwise
0E _{hex}	Set	Scaling Function Control	Boolean	Scaling function on/off
10 _{hex}	Set	Measuring units per Span	UDINT	Resolution for one revolution
11 _{hex}	Set	Total Measuring Range in Measuring Units	UDINT	Total resolution
13 _{hex}	Set	Preset Value	DINT	Setting a defined position value
18 _{hex}	Get	Velocity Value	DINT	Current speed in format of attribute 19 hex and 2A hex
19 _{hex}	Set	Velocity Format	ENGUINT	Format of the velocity attributes
29 _{hex}	Get	Operating Status	BYTE	Encoder diagnostic operating status
2A _{hex}	Get	Physical Resolution Span	UDINT	Resolution for one revolution
2B _{hex}	Get	Number of Spans	UINT	Number of revolutions
33 _{hex}	Get	Offset Value	DINT	Shift position value with the calculated value
64 _{hex}	Set	Device Type	DINT	Encoder device = 22_{hex} Generic device = 0 (default)
65 _{hex}	Set	Endless Shaft	DINT	Off = 0, On = 1, Auto = 2
66 _{hex}	Set	Velocity Filter	DINT	Fine = 0, Middle = 1, Raw = 2



2.3 TCP/IP Interface Object

The TCP/IP Interface Object provides the mechanism to configure a device's TCP/IP net-work interface. With this parameter it is possible i.e. to read or write the device's IP Address and Net-work Mask.

Class	Code:	F5 _{hex}
-------	-------	-------------------

Attribute ID	Access	Name	Data Type	Description
01 _{hex}	Get	Status	DWORD	Interface status, details in chapter 2.3.1
02 _{hex}	Get	Configuration Capability	DWORD	Interface capability flags, details in chapter 2.3.2
03 _{hex}	Set	Configuration Control	DWORD	Interface control flags, details in chapter 2.3.3
04 _{hex}	Get	Physical Link Object	STRUCT of:	Path to physical link object
-		Path size	UINT	Size of path
		Path	Padded EPATH	Logical segments identifying the physical link object
05 _{hex}	Set	Interface Configuration	STRUCT of:	TCP/IP network interface configuration
-		IP Address	UDINT	The device's IP address
		Network Mask	UDINT	The device's network mask
06 _{hex}	Set	Host Name	STRING	

2.3.1 Status Instance Attribute (01_{hex})

Bit(s)	Called	Definition				
0-3	Interface	Indicates the status of the $0 =$ The Interface Configuration attribute has not been configure	d.			
	Configuration	Interface Configuration 1 = The Interface Configuration attribute contains valid configura	tion			
	Status	attribute. obtained from BOOTP, DHCP or nonvolatile storage.				
		2 = The Interface Configuration attribute contains valid configura				
		obtained from hardware settings (e.g.: pushwheel, thumbwheel,	etc.)			
		3-15 = Reserved for future use.				
4	Mcast	ndicates a pending configuration change in the TTL Value and/or Mcast Config				
	Pending	attributes. This bit shall be set when either the TTL Value or Mcast Config attribute				
		s set, and shall be cleared the next time the device starts.				
5-31	Reserved	Reserved for future use and shall be set to zero.				

2.3.2 Configuration Instance Attribute (02_{hex})

Bit(s)	Called	Definition
0	BOOTP Client	1 (TRUE) shall indicate the device is capable of obtaining its network configuration via BOOTP.
1	DNS Client	Not supported
2	DHCP Client	1 (TRUE) shall indicate the device is capable of obtaining its network configuration via DHCP.
3	DHCP-DNS Update	Not supported
4	Configuration Settable	 (TRUE) shall indicate the Interface Configuration attribute is settable. Some devices, for example a PC or workstation, may not allow the Interface Configuration to be set via the TCP/IP Interface Object.
5-31	Reserved	Reserved for future use and shall be set to zero.

2.3.3 Configuration Control Inst. Attribute (04 hex)

Bit(s)	Called	Definition		
0-3		Determines how the device shall obtain its initial configuration at start up	 0 = The device shall use the interface configuration values previously stored (for example, in non-volatile memory or via hardware switches, etc). 1 = The device shall obtain its interface configuration values via BOOTP. 2 = The device shall obtain its interface configuration values via DHCP upon start-up. 3-15 = Reserved for future use. 	

Date of issue: 24th January 2012



2.3.4 Physical Link Object (05 hex)

This attribute identifies the object associated with the underlying physical communications interface (e.g., an 802.3 interface). There are two components to the attribute: a Path Size (in UINTs) and a Path. The Path shall contain a Logical Segment, type Class, and a Logical Segment, type Instance that identifies the physical link object. The maximum Path Size is 6 (assuming a 32 bit logical segment for each of the class and instance).

The physical link object itself typically maintains link-specific counters as well as any link specific configuration attributes. If the CIP port associated with the TCP/IP Interface Object has an Ethernet physical layer, this attribute shall point to an instance of the Ethernet Link Object (class code = $F6_{hex}$). When there are multiple physical interfaces that correspond to the TCP/IP interface, this attribute shall either contain a Path Size of 0, or shall contain a path to the object representing an internal communications interface (often used in the case of an embedded switch).

For example, the path could be as follows:

Path	Meaning
0-3	[20] = 8 bit class segment type; [F6] = Ethernet Link Object class;
0-3	[24] = 8 bit instance segment type; [01] = instance 1.

2.3.5 Interface Configuration (06_{hex})

Name	Meaning
IP	The device's IP address. Value of 0 indicates no IP address has been configured. Otherwise, the IP address
Address	shall be set to a valid Class A, B, or C address and shall not be set to the loopback address (127.0.0.1).
Network	The device's network mask. The network mask is used when the IP network has been partitioned into subnets.
mask	The network mask is used to determine whether an IP address is located on another subnet. Value of 0 indi-
	cates no network mask address has been configured.

2.3.6 Host Name

	Meaning
	ASCII characters. Maximum length is 64 characters. Shall be padded to an even number of characters (pad not
Name	included in length). A length of 0 shall indicate no Host Name is configured.

2.4 Ethernet Link Object

Class Code: F6hex

Attribute ID	Access	Name	Data Type	Description	Semantics of Values
01 _{hex}	Get	Revision	UINT	Revision of this object	The minimum value shall be 1. Shall be 2 or greater if instance attribute 6 is imple- mented. Shall be 3 if any instance attributes 7-10 are implemented. The maximum value shall be 3.
02 _{hex}	Get	Max Instance		Maximum instance number of an object currently created in this class level of the device	The largest instance number of a created object at this class hierarchy level
03 _{hex}	Get	Number of Instances	UINT	Number of object instances currently created at this class level of the device	The number of object instances at this class hierarchy level



2.4.1 Instance Attributes

ID	Access	Name	Data Type	Description of Attribute	Semantics of Values
1	Get	Interface Speed	UINT	Interface speed cur- rently in use	Speed in Mbps (e.g., 10, 100
2	Get	Interface Rags	DWORD	Interface status flags	See chapter 2.4.1
3	Get	Physical Address	ARRAY of 6 USINTs	MAC layer address	Displayed format "XX-XX-XXXX- XX-XX"
7	Get	Interface Type	USINT	Type of interface	1 = The interface is internal to the device, i.e. in the case of an embedded switch 2 = Twisted-pair (e.g. 100Base-TX)
8	Get	Interface State	USINT	Current state of the interface	0 = No link 1 = The interface is enabled and is ready to send and receive data
10	Get	Interface Label	SHORT_S TRING	Human readable identification	"Internal switch" or "External Port 1" or "External Port 2"

2.4.2 Instance Flags

Bit(s)	Called	Definition
0	Link Status	Indicates whether or not the Ethernet 802.3 communications interface is connected to an active
		network. 0 indicates an inactive link; 1 indicates an active link. The determination of link status
		is implementation specific. In some cases devices can tell whether the link is active via hard-
		ware/driver support. In other cases, the device may only be able to tell whether the link is active
		by the presence of incoming packets.
1	Half/Full	Indicates the duplex mode currently in use. 0 indicates the interface is running half duplex; 1
	Duplex	indicates full duplex. Note that if the Link Status flag is 0, then the value of the Half/Full Duplex
		flag is indeterminate.
2-4	Negotiation	Indicates the status of link auto-negotiation
	Status	0 = Auto-negotiation in progress.
		1 = Auto-negotiation and speed detection failed. Using default values for speed and duplex.
		Default values are product-dependent; recommended defaults are 10Mbps and half duplex.
		2 = Auto negotiation failed but detected speed. Duplex was defaulted.
		Default value is product-dependent; recommended default is half duplex.
		3 = Successfully negotiated speed and duplex.
		4 = Auto-negotiation not attempted. Forced speed and duplex.
5	Manual Setting	 3 = Successfully negotiated speed and duplex. 4 = Auto-negotiation not attempted. Forced speed and duplex. 0 indicates the interface can activate changes to link parameters (autonegotiate, duplex mode, interface speed) automatically. 1 indicates the device requires a Reset service be issued to its Identity Object in order for the changes to take effect. 0 indicates the interface detects no local hardware fault; 1 indicates a local hardware fault is detected. The meaning of this is product-specific. Examples are an AUI/MI interface detects no transceiver attached or a radio modem detects no antennae attached. In contrast to the soft, possible selfcorrecting nature of the Link Satus being inactive, this is assumed a hardfault requiring user intervention. Shall be set to zero
	Requires Reset	interface speed) automatically. 1 indicates the device requires a Reset service be issued to its
		Identity Object in order for the changes to take effect.
6	Local Hardware	0 indicates the interface detects no local hardware fault; 1 indicates a local hardware fault is
	Fault	detected. The meaning of this is product-specific. Examples are an AUI/MII interface detects no
		transceiver attached or a radio modern detects no antennae attached. In contrast to the soft,
		possible selfcorrecting nature of the Link Status being inactive, this is assumed a hardfault
		requiring user intervention.
7	Reserved	Shall be set to zero

2.4.3 Common Service

Service Code	Class	Instance*	Service Name	Description of Service
0E _{hex}	Conditional	Required	Get_Attribute_Single	Returns the contents of the specified attribute
10 _{hex}	n/a	Conditional	Set_Attribute_Single	Modifies a single attribute



2.4.4 Link Object Instances

Instance	Description
1	Internal interface
2	Intern switch Port 1
3	Intern switch Port 2

2. 5 Setting parameters with scanners

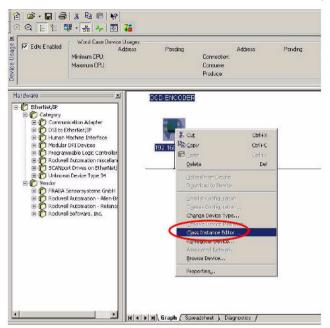
There are several external scanners for EtherNet/IP available. RS-NetWorksTM has one such scanner. In the figure is an example where the IP-Address (FD 00 A8 C0 complies 192.168.0.253) and the Gateway (00 FF FF FF complains 255.255.255.0) was read out of the second

encoder

	and the second second second second	anner Demo - Unbenannt	_0×
Ele	yiew Networ	k Bequest I/O Help	
	Send to: 1921 Adapter 1921 Service (hex) Instance (hex) Member (hex) Symbol Tag Request Data E value, separated	but IP addresses are in hex) 58.0.253 68.0.200 e Class (hex) 15 1 Attribute (hex) 5 1 Attribute (hex) 5 100 00 00 00 00 00 00	EIPScan Test Tool Sost 192.168.0.200 OCD-ENCODER 192.168.0.253
×I	[<u> </u>
ND	Timestamp 16:45:37:79	Message Ethernet/IP Scanner Library is online	
J	41		NUM



In RSNetWorx is a scanner available too. In the next section is a sample to set the Preset value.



2.5.1 Read out position value

Get Single Attribute Position sensor value: Class: 0x23 (Position sensor object) Instance: 0x01 Attribute: 0x0A (Position Value)

Dbject Address
Class: Instance: Attribute
23 1 A
Send the attribute ID
ata <u>s</u> ent to the device
Values in decimal
the discount of the state of th
ived from the device:
ived from the device:





2.5.2 Set preset value

Set Single Attribute Position Preset Value to 1 Class: 0x23 (Position sensor object) Instance: 0x01 Attribute: 0x13 (Preset Value)

Service Code	Diject Address
	Class: Instance: Attribute:
Value Description	23 1 13
10 Set Single At	tribute 🔳 🛛 🔽 Send the attribute ID
Transmit data size:	Data sent to the device:
Double (4 bytes)	00000001
	Values in <u>d</u> ecimal
Receive Data	
Output size format:	Data received from the device:
Double (4 bytes)	The execution was completed.
D'ouble (4 bytes)	
Output radix format:	

2.5.3 Get preset value

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Get Single Attribute Position Value Class: 0x23 (Position sensor object) Instance: 0x01 Attribute: 0x13 (Preset Value)

		BLACK FILME
Service	Code	Dbject Address
Value	Description	Class: Instance: Attribute:
E	Get Single Attribute	
	-	Send the attribute ID
Transmi	it data size: I	Data <u>s</u> ent to the device
Double	(4 byles)	
		Values in decimal
		Values in decimal
	Data	
_	Data sge format: Data rec	Values in decinal Execute
Dulput Double	Data sge format: Data rec (4 bytes) 💌 1	
Dulput Double	Data sge format: Data rec (4 byles) 💌 1 radix format:	



3 Diagnostic

LED	Color	EtherNet/IP name	Description	
Active1	Yellow	Network Status Indicator 1	Dotoile in table 2	
Link1	Green	THEINVOIR Status Indicator T	Details III table 2	
Active2	Yellow	Network Status Indicator 2	Dotails in table 2	
Link2	Green		Details II I table 2	
Stat1	Green	Module Status Indicator	Details in table 1	
Stat2	Red	Noucle Status Indicator		

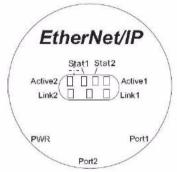


Table 1: Module Status Indicator Stat1/Stat2

LED Summary		Requirements	
Steady Off	No power		
Steady On Green	Device operational	If the device is operating correctly, the module status indicator shall be steady green	
Flashing Green 1	Standby	If the device has not been configured including the IP-Address, the module status indicator shall be flashing green with 1 Hz	
Flashing Green 2	Missing IP	If the device does not have an IP-Address, the module status indi- cator shall be flashing green with 4 Hz	
Flashing Red	Minor fault	If the device has detected a recoverable minor fault. I.e. an incor- rect or inconsistent configuration	
Steady On Red	Major fault	If the device has detected a non-recoverable major fault	
Flashing	Self-test	While the device is performing its power up testing, the Stat1 and Stat2 LED shall be flashing red / green	

Table 2: Network Status Indicator Stat2



LED Summary		Summary	Requirements
Steady Off	0	No power, no IP address	If the device does not have an IP address or is powered off
Steady Green	0	Connected	If the device has at least one established connection (even to the Message router)
Flashing Green	☆	No connection	If the device has no established connections, but has obtained an IP address
Flashing Yellow	*	Connection timeout	If one or more of the connections in which this device is the target has timed out. This shall be left only if all timed out connections are reestablished or if the device is reset
Steady Yellow	Ö	Duplicate IP	If the device has detected that its IP address is already in use
Flashing 🎇 Yellow / Gree	₽ en	Self-test	While the device is performing its power up testing, the Stat1 and Stat2 LED shall be flashing yellow / green

4 Programmable Parameters

4.1 Encoder parameters for Position Sensor Object Class 23_{hex}

4.1.1 Direction counting

This operating parameter can be used to select the code sequence. The parameter can set with Configuration Assembly and Explicit Messaging

Attribute ID	Default value	Value range	Data Type
0C _{hex}	0 _{hex}	0 _{hex} -1 _{hex}	Boolean

The parameter code sequence (complement) defines the counting direction of the process value as seen on the shaft (clockwise or counter clockwise).

The counting direction is defined in the attribute 0Chex:

Bit 0	Counting direction	Position values
0	CW	Increase
1	COW	Decrease

4.1.2 Scaling function control

If the Scaling function control is deactivated then complains the output value the physical resolution.

Attribute ID	Default value	Value range	Data Type
0E _{hex}	1 _{hex}	0 _{hex} -1 _{hex}	Boolean

If the Scaling function control is deactivated then complains the output value the physical resolution.

Bit 0	Scaling function on/off
0	on
1	off

This parameter can be set with Configuration Assembly and Explicit Messaging



4.1.3 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 label) can be realized.

The parameter can set with Configuration Assembly and Explicit Messaging.

Attribute ID	Default value	Value range	Data Type
10 _{hex}	(*)	0 _{hex} - 10000 _{hex}	Double Integer32

(*) see type label, Maximum resolution:

16 Bit Encoder: 10,000_{hex} (65,536)

When the value is set larger than 8192 for a 13Bit 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 8192 measuring steps.

4.1.4 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 25 bit = 33,554,432 steps. Please note the value written on the type shield. The parameter can set with Configuration Assembly and Explicit Messaging

ſ	Attribute ID	Default value	Value range	Data Type
	11 _{hex}	(*)	0 _{hex} - 40,000,000 _{hex}	Unsigned Integer 32

(*) see type shield

Maximum total resolution

30 Bit Encoder: 40,000,000hex (1,073,741,824)

Attention:

The following formula letters will be used:

- PGA Physical total resolution of the encoder (see type label)
- PAU Physical resolution per revolution (see type label)
- 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, if AU < PAU

Example: Customer requirement: AU = 2048,

Encoder type shield: PGA=25 bit, PAU=13 bit

GA = 16777216 * 2048 / 8192

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:

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4.1.5 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. The parameter can set with Explicit Messaging.

Set the preset value only in standstill!

Attribute ID	Default value	Value range	Data Type
13 _{hex}	O _{hex}	0 _{hex} - total measuring range	Unsigned Integer 32

4.1.6 Velocity Format

Default value for Velocity Format is steps persecond. This parameter can be set with Configuration Assembly and Explicit Messaging.

Attribute ID	Default value	Value range	Data length
19 _{hex}	1F04 _{hex}	1F04 _{hex}	Steps per second
		1F05 _{hex}	Steps per millisecond
		1F06 _{hex}	Steps per microsecond
		1F07 _{hex}	Steps per minute
		1F0F _{hex}	RPM

4.1.7 Velocity Filter

To manage the noise of the velocity it is possible to switch between three classes. See the diagramms to see the differences.

Attribute ID	Default value	Value range	Description	Data Type
66 _{hex}	0 _{hex}	0 _{hex} /1 _{hex} /2 _{hex}	0 = Fine, 1 = Middle, 2 = Raw	Double Integer

Diagram 1

Diagram 2

Diagram 3

4.1.8 Device Type

The EtherNet/IP interface supports the Encoder Device with device type 22 hex functionality or the Generic Device type 0hex according to the CIP specification. As all controllers do not support the Encoder Device the encoder changed to the Device Type. This parameter can set only with Explicit Messaging.

Attribute ID	Default value	Value range	Data Type
64 _{hex}	O _{hex}	0 _{hex} /22 _{hex}	Double Integer

4.1.9 Endless Shaft

Normally the period, i.e. "Total resolution"/"measuring units" per revolution must be an integer and it must fit an integer number of times (integer multiple) into 4096 for an encoder with 12 Bit for the revolutions. So the following equation must apply:

(4096 x measuring units per revolution) / Total resolution = integer

But with this EtherNet/IP encoder it is possible to solve this problem. If the Endless Shaft is activated then this problem will be solved by the encoder. The default value is Auto. In this case the encoder checks if the parameters need the endless shaft. The parameter can be set only

with Explicit Messaging.

Note: The internal software routine only works if the encoder is in operation. If it is necessary to turn the encoder shaft more than 1024 revolutions without power supply this can lead to problems (the internal routine will not work without power supply). In this case the rule ahead should be observed even with new devices.

Attribute ID	Default value	Value range	Description	Data Type
65 _{hex}	2 _{hex}	0 _{hex} /1 _{hex} /2 _{hex}	0 = off, 1 = on, 2 = Auto	Double Integer

5 Installation

5.1 Electrical connection

The rotary encoder is connected by a 4 pin M12 connector for the power supply and two 4 pin, D-coded M12 connector for Ethernet. The Encoder uses a second D-coded connector and provides an integrated switch functionality.

On or in the packaging of the connector is the mounting description.

Connector Ethernet

Δ	nin	fema	ا ما	D-cod	Ьd
4	pin	rema	ie, i	D-COU	eu

Pin Number	Signal	Pir
1	Tx+	1
2	Rx+	2
3	Tx-	3
4	Rx-	4

Connector power supply

4 pin male, A-coded

· [
Pin Number	Signal
1	US (15 - 30 V DC)
2	n.c.
3	GND (0 V)
4	n.c.

Sketch as seen on the encoder





5. 2 Ethernet cables

5.2.1 RJ45 - M12 crossed

Signal	RJ45 Pin	M12 Pin	Signal
Tx+	1	2	Rx+
Tx-	2	4	Rx-
Rx+	3	1	Tx+
Rx-	6	3	Tx-

5.2.2 RJ45 - M12 straight

Signal	RJ45 Pin	M12 Pin	Signal
Tx+	3	1	Tx+
Tx-	6	3	Tx-
Rx+	1	2	Rx+
Rx-	2	4	Rx-

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5.2.3 RJ45 - M12 - M12 crossed

Signal	M12 Pin	M12 Pin	Signal
Tx+	1	2	Rx+
Tx-	3	4	Rx-
Rx+	2	1	Tx+
Rx-	4	3	Tx-

6 Power On

After power on the LED's on the absolute rotary encoder will flash between green and red or yellow.

7 Installation

7.1 Rockwell configuration tools

7.1.1 Setting IP-Address (BOOTP/DHCP)

To set the IP Address there are special tools available. I.e. the BOOTP/DHCP Server is installed with the software package from RSNetWorx[™]. The server scan the network for the MAC Addresses of all products with active BOOTP or DHCP. If one MAC address is selected in the Request History then the IP Address can be set by the "Add to Relation List" button. The MAC Address of each EtherNet/IP encoder is available on the type label.

Note:

After a power up the encoder send the BOOTP or DHCP request often. But after several time comes no answer the frequency of requests decrease. A power up after a longer pause could solve the missing requests.

If not all encoders are listed in the BOOTP/DHCP Server then check the following points:

- LED status of the encoder OK?
- · Is the Network setting correct?
- Is the BOOTP and/or DHCP enabled?

If the encoder has got his IP-Address, the BOOTP and DHCP must be disabled with the corresponding button. Otherwise the encoder start up to get a new IP-Address again. After setting the IP-Address the Status LED is flashing with 1 Hz. But in this case save the configuration in the File menu, because the products cannot be found by the BOOTP/DHCP Server. After loading this file the MAC Addresses and IP-Addresses are available and BOOTP or DHCP can be activated by the corresponding button. Possible IP-Range:

Class A-C (0.0.0.0 - 223.255.255.255) without Loopback range (127.x.x.x)



Referenced IP-Address range: 192.168.0.x

quest History Clear History		Relation List			New Entry	
hrmin:sec) 15:41:04 15:40:32 15:40:17 15:40:09 15:40:06	Type BOOTP BOOTP BOOTP BOOTP BOOTP	Ethemet Address (MAC) 00:0E:CF:03:10:27 00:0E:CF:03:10:27 00:0E:CF:03:10:27 00:0E:CF:03:10:27 00:0E:CF:03:10:27	IP Address	Hostname	Ethernet Address (MAC): IP Address: Hostname: Description:	00:0E:CF:03:10:27
New Delet	ess (MAC)	e BOOTP Enable DHCP I Type IP Address BOOTP 192.168.0.2			e to retain configuration i	n memo
00.0E.CF.03.1						
10:0E:CF:03:1						

quest History Clear History	Add to	Relation List			
(hr:min:sec)	Туре	Ethernet Address (MAC)	IP Address	Hostname	
15:41:04	BOOTP	00:0E:CF:03:10:27	192.168.0.252		
15:40:32 15:40:17 15:40:09 15:40:06	BOOTP BOOTP BOOTP BOOTP	00:0E:CF:03:10:27 00:0E:CF:03:10:27 00:0E:CF:03:10:27 00:0E:CF:03:10:27 00:0E:CF:03:10:27			
elation List					
elation List New Delet	e Enable	e BOOTP Enable DHCP	Disable BOOTP/DHCP]	
New Deler Ethernet Addr	ess (MAC)	Type IP Address	Hostname	Description	
New Delet	ess (MAC)		Hostname	Description	Entries

After setting the IP-Address with this tool the IPAddress will be available only after the next BOOTP request.

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7.1.2 Configuration RSLinx Classic™

RSLinx[™] is a complete communication server providing plant-floor device connectivity for a wide variety of Rockwell Software applications such as RSLogix[™], RSNetWorx[™],...

To start a new project add first a new RSLinx Classic[™] Driver for EtherNet/IP under <u>Communications Configuration Drivers</u> and input the name.

vailable Driver Types:		Close
*	Add New	
RS-232 DF1 devices Ethernet devices		Help
Ethernet/IP Driver 1784-KT/KTX(D)/PKTX(D)/PCMK for DH+/DH-485 devices		
1784-KTC(X) for ControlNet devices	Status	
DF1 Polling Master Driver		Configure
1784-PCC for ControlNet devices 1784-PCIC(S) for ControlNet devices		
1747-PIC / AIC+ Driver		Startup.
DF1 Slave Driver		
S-S SD/SD2 for DH+ devices Virtual Backplane (SoftLogix58xx)		Start
DeviceNet Drivers (1784-PCD/PCIDS,1770-KFD,SDNPT drivers)		
PLC-5 (DH+) Emulator driver SLC 500 (DH485) Emulator driver		Stop
SoftLogix5 driver		Delete
Remote Devices via Linx Gateway		Devote

×
OK
Cancel



Use Browse Local Subnet to find the EtherNet/IP components in the network. The status should be "Running". Then push the *Close* button to finish this configuration.

figure driver: OCD_NET	الكا	\times	
emet/IP Settings			
ি Browse Local Subnet ○ Browse Remo	ote Subnet		
IP Address:	2		
Subnet Mask:			
	1		
OK Abbrechen	Demehmen		
	J <u>þ</u> ernehmen ∫ Hife		? 🗙
nfigure Drivers	Demehmen Hife		
nfigure Drivers	Demehmen Hife	Add New	Close
Available Driver Types:		Add New	
figure Drivers Available Driver Types: Ethernet/IP Driver Configured Drivers: Name and Description	_ 	atus	<u>C</u> lose <u>H</u> elp
figure Drivers Available Driver Types: Ethernet/IP Driver Configured Drivers:	_ 		Close
figure Drivers Available Driver Types: Ethernet/IP Driver Configured Drivers: Name and Description	_ 	atus	<u>C</u> lose <u>H</u> elp
figure Drivers Available Driver Types: Ethernet/IP Driver Configured Drivers: Name and Description	_ 	atus	<u>C</u> lose <u>H</u> elp Configure
figure Drivers Available Driver Types: Ethernet/IP Driver Configured Drivers: Name and Description	_ 	atus	<u>C</u> lose <u>H</u> elp Configure Starjup
figure Drivers Available Driver Types: Ethernet/IP Driver Configured Drivers: Name and Description	_ 	atus	<u>C</u> lose <u>H</u> elp Configure Startup <u>S</u> tart

7.1.3 RSNetWorx™

lanuary 2012 RSNetWorx[™] products provide design and configuration management services for EtherNet/ IP. The program defines and configures the devices on the network quickly through issue: 24th a simple software interface. This definition can take place offline using drag and drop operations or online by using RSLinx® to browse a EtherNet/IP network. Dateof



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. In this sample the PLC uses address 192.168.0.100 and the encoder 192.100.0.252.

To install the EDS file the EDS Wizard has to be started, that can be done in the menu <u>Tools/EDS</u> <u>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 <u>Register a directory of EDS files</u> has to be chosen and with <u>Browse</u> the path of the EDS file(s). That is indicated in the next pictures.

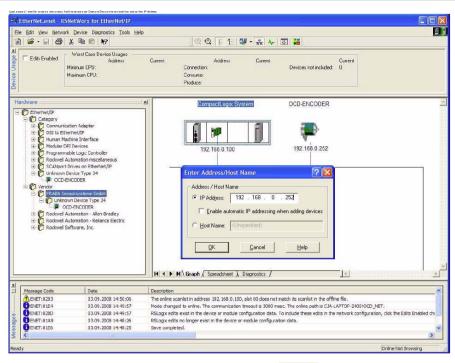




Rockwell Software's EDS Wizard
Registration Electronic Data Sheet file(s) will be added to your system for use in Rockwell Software applications.
Register a gingle file
C Register a greatery of EDS files
<u>Named.</u>
E:\EDS\Postal_OCD_Encoer.eds
• If there is an icon file (ico) with the same name as the file(e) you are registering then this image will be associated with the device.
To perform an installation test on the file(s). click Next
< Zurück Weiter > Abbrechen
Rockwell Software's EDS Wizard
EDS File Installation Test Results
EUS Hile Installation 1 est Heautits This test evaluates each EDS file for errors in the EDS file. This test does not guarantee EDS file validity.
□ C_ installation Test Results s *ada*positial_cood_encourtede
<u></u>
< <u>Z</u> urück Wetter > Abbrechen
Rockwell Software's EDS Wizard
Change Graphic Image You can change the graphic image that is associated with a device.
Product Types
Change icon
< Zurück Weiter > Abbrachen

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 picture 1.3) pictures can be selected for the using nodes. With the button *weiter* the installation can be continued and finished.

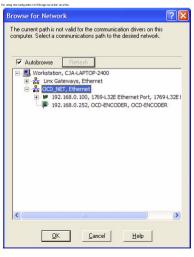
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Optional browse the network with all devices with Button So it is not necessary to set the IP-Address manually.



or Upload from Network.

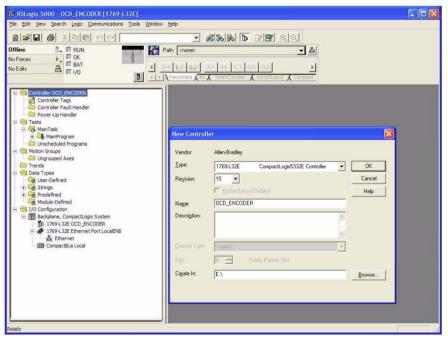




7.1.4 Configuration RSLogix 5000

The RSLogix 5000 Series environment offers an easy-to-use, IEC61131-3 compliant interface, symbolic programming with structures and arrays, and a comprehensive instruction set that serves many types of applications. It supports relay ladder, structured text, function block diagram, and sequential function chart editors for you to develop application programs.

In the first step load a configuration or add a new controller and input a name. In this sample is used the CompactLogix5332E.



Start the configuration of the controller or load the *.enep file in the module properties of tab RSNetWorx[™] that was created with RSNetWorx[™].



🖁 RSLogix 5000 - OCD_ENCODER [1769-L32		19 - m.			
Ele Edit View Search Logic Communications II Image: Search Logic Communications II	Path	_ æi	& &] [] ++ () -∪> -(mer/Counter X (no	B B B B B B B Compare	
Controller OCD_ENCODER Controller Tags Controller Tags Controller Fault Hander Controller Fault Hander Controller Fault Hander Controller Fault Hander Controller South Hande	18	General Connec Type: 1 Vendor: A Parent C	tion RSNetWorx N 769-L32E Ethernet Pc Iler-Bradley ontroller occaENB	art 10/100 Mbps Etherne	ernet Port 15.3)
eady Module Properties: Controller:1 (1769-L32E I	Ethernet Port	15.3)		3
General* Connection RSNetWork* Mod EtherNet/IP file (enet): okumente und Ein Found in: c:\dokumente und Launch RSNetWork for EtherNet/IP C View and edit th C Audit the EtherNet/IP RSNetWork for EtherNet/IP cannot be laun	stellunger\Adm einstellungen\a e EtherNet/IP r let/IP network	inistrator\Desktop dministrator\deskt	VEtherNet.enet	Browse	
Status: Offline	ОК	Cancel	Apply	Help	L



File Edit View Search Logic Communications Tools Window Help	
Image: Solution of the solution	
Controller OCD_ENCODER2 Controller Fault Handler Power-Up Handler Tasks MainTask MainTask MainTask MainTask MainTask Moton Groups Moton Groups Data Types Data Types Predefined Predefined Module-Defined Data Types Data	

Select the network in the I/O Configuration and add New Module.

For using a Generic Device select the Generic Ethernet Module. Some PLC's support Encoder Devices too. Please check that the matching EDS file complies to the configuration of the encoder. The device type is programmable.

Module	Description	Vendor
1788-EN2DN/A 1788-ENBT/A 1788-EWEB/A 1794-AENT/A	10/100 Mbps Ethernet Port on CompactLogxX333E 1788 Ethernet to DeviceNet Linking Device 1788 10/100 Mbps Ethernet Bridge, Twisted-Pair Media 1788 10/100 Mbps Ethernet Adapter, Twisted-Pair Media 10/100 Mbps Ethernet Adapter, Twisted-Pair Media 10/100 Mbps Ethernet Adapter, Twisted-Pair Media	Allen-Bradley Allen-Bradley Allen-Bradley Allen-Bradley Allen-Bradley Allen-Bradley Allen-Bradley
ETHERNET-MODULE	Generic Ethernet Module	Allen-Bradley
	SoftLogixS800 EtherNet/IP Ethernet Adapter, Twisted-Pair Media	Allen-Bradley Parker Hannif
•		•
	Eind	Add Favorite
By Category By V	endor Favorites	



Set the Connection Parameters	according the	following figure.
-------------------------------	---------------	-------------------

Type: Vendor:	ETHERNET-MODULE Gene Allen-Bradley	ric Ethernet Module			
Parent Name: Description: Comm <u>F</u> orma	LocalENB OCD k Input Data - DINT - Run/Pre	Connection Pa	Assembly Instance: 3 105	0	2-bit) bit)
Address /) P Add P Add C Host N	ress: 192 . 168 . 0 .				UK)

Set the cycle time.

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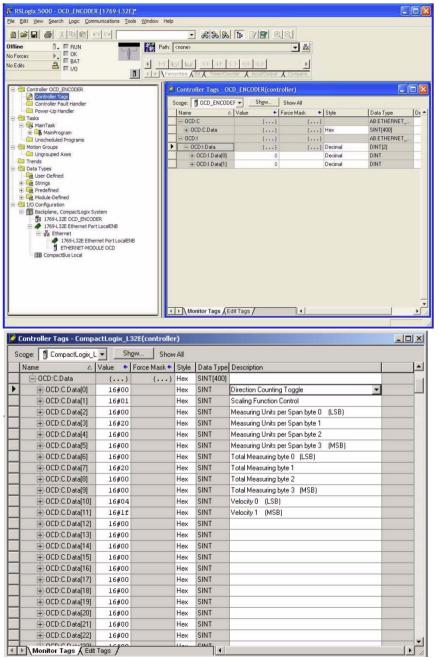
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No Forces	W Belp ▼ 36336 So The PPP QQ Patr: (none) F lot lies 1+ 44 () () () () > V avorites A TextCapit A TextCapit A Compare
Controller OCD_ENCODER Controller OCD_ENCODER Controller Fault Hander Power-Up Handler Task MainTask Gontroller Ault Hander Unscheduled Programs Moint Orouge Moint Orouge Trends Gont Upgrouped Axes Trends Trends Trends Trends Trends Trends To Configuration ToolsJaz Ethernet Port LocaEN8 TrenetNET-MODULE OCD TrenetNetNetNotLe OCD TrenetNetNetNotLe OCD TrenetNetNetNotLe OCD TrenetNetNetNotLe OCD TrenetNetNetNotLe OCD TrenetNetNetNotLe OCD	Module Properties: LocalENB (ETHERNET-MODULE 1.1) General Connection Module Info Bequested Packet Interval (RPI) 10.0 ms (1.0 - 3200.0 ms) [rhibit Module Module Info Major Fault On Controller II Connection Fails White in Run Mode Use Scheduled Connection over Cantrol Let. Module Fault Status: Offine OK Cancel Apply Help



To read or write data use Logic - Monitor Tags



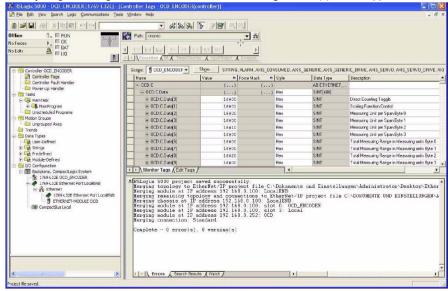
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- If the value is 00 then the standard configuration will be used
- · If the Paramter are out of range the maximum value of the encoder will be used as parameter
- To change parameters open <u>Communication Who Active</u>, <u>Go Offline</u>, <u>File Save</u>, select controller,
- Download , Run
- These parameter can set by a standard EtherNet/IP scanner tool too.

✓ Autobrowse Refresh ✓ Autobrowse Refresh ✓ Morkstation, CJA-LAPTOP-2400 Go Online ✓ Linx dateways, Ethernet Upload ✓ Backplane, CompactLogix System Upload ✓ Backplane, CompactLogix System Qownload ✓ 01, 1769-132E Ethernet Port 192.168.0.252, OCD_ENCODER Qiose ✓ 03, Local 1769 Bus Adapter, VA1769/A Close Lip ✓ 192.168.0.252, OCD_ENCODER, OCD_ENCODER Help Compact Logix System Set Project Pathatin in Project: (none)		
Workstation, CJA-LAPTOP-2400 Convert, Ethernet C	Who Active	
	Autobrowse Refresh	_/
CO_NET, Ethernet Upload Upload Upload Upload Upload Doc.net.copix System Set Project Path ath: 0CD_NET\192.168.0.100\Backplane\0 Set Project Path		<u>G</u> o Online
	는 '' 물 OCD_NET, Ethernet	
Update <u>Firmware</u> Update <u>Firmware</u> Update <u>Firmware</u> Update <u>Firmware</u> Update <u>Firmware</u> <u>Close</u> Help Set Project Path ath: OCD_NET\192.168.0.100\Backplane\0 Set Project Path	🖃 📶 Backplane, CompactLogix System	<u>D</u> ownload
		Update <u>F</u> irmware
Help Help C C C C C C C C C C C C C		Close
ath: 0CD_NET\192.168.0.100\Backplane\0 Set Project Path ath in Project: <pre>cnone></pre>		Help
ath: 0CD_NET\192.168.0.100\Backplane\0 Set Project Path ath in Project: <pre>cnone></pre>	<	3
ath in Project: <none></none>		
Clear Project Pat		<u>set Project Path</u>
	antin'i repais. The net	Clear Project Path

If everything is running then, in the "Errors tab" the message 0 error(s) should appear.





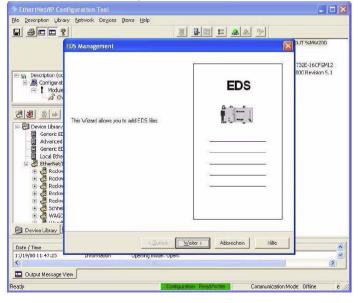
Date of

7.2 Schneider configuration tools

In the software tool Unity it is possible to configure the parameters of the encoders. EDS file help to change the parameters on an easy way. Select the EtherNet/IP module and start the EtherNet/IP configuration tool.

+ Unity Pro XL : ocd*	
File Edit Yeak Services Tools Build FLC Debug Window Help	
<u> </u> 2 ≠ ■ ⇒]33 × 60 ∽ ~ ∞ × 4 , ∞ ■ ±	
Project Browser	1
B Structural view	oo 📃 🗖 🗙
PREMIUM ETHERNE	T/IP MODULE
E TSX ETC 100	Coofiguration
	Project Network name (W shutoteer man) : [255]
¥u, Loop = ≹u, Smuletion = ®u, TBIminaIPort	reputs Dutputs solver index 200
	Marsice. 100 Marsice. 100
Derived Data Types Derived PB Types Jorived BT instances	EP configuration Tool EtherNeVIP Lpdax application
Constants of the function	
Sementary PB Instances Motion Motion	
Communication	
×	
User errors & Search/R	eplace
Ready HMI R/W mode	VEFLINE TCPIP 127.0.0,1

In the first time it is necessary to install the EDSFile with the wizard.





Select the EDS-File, available on our web side, and follow the wizard to the end.

EDS Management	EDS Management				
EtherNet/IP>		Ethe	rNet/IP	>	
Select the Location of the EDS File(s):	Product Name Sta	atu:	Major Revision	Minor Revision	Vendor Name
Add File(s) Add all the EDS from the Directory Took in Subfolders Directory or File Name:	✓ OCD-ENCODER Co	orrectly added.	1	7	FRABA Posital Grr
D.\WDRK\4T0\Development\Projects\Profinet\Firmware\ENC0DER_ERTEC200_P050					
The EDS files unable in EIP-CT are registered in the EDS base. Select the location of the file(s) and click on Next button to inset the EDS files in the base.	List of the files added in th		n Next to comple	te he addition.	View Selected File
<zurück weiter=""> Abbrechen Hilfe</zurück>		< Zurüc	k <u>W</u> eiter>	Abbreche	en Hilfe

Select the encoder in the Device Library and Insert in Configuration (menu opens on right button click of the mouse).

<u>8</u> 00 <u>?</u>	Sch	eider Electric	Image: Balance Image:
B Description (ocd) ■	0		
EtherNet/IP De	eric EDS Explicit Messaging IP slave vices tal GmbH Y	es	
Rockwell Au Rockwell Au Rockwell Au Rockwell Au Rockwell Au Rockwell Au	연 Add 평 Delete 晗 Sort	Ins Supp	
	 Insert in Configu Properties 		
Device Library		Space	
Device Library 1985	Level	Event	
		Adding file(s)	complete

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Set the IP-Adress of the encoder in the General-Tab. In Tab *Connections under Configuration Setting* is it possible to change the parameters in the offline state. The PLC will send this parameters to the encoder during the start up phase.

IO ENCODER Densel Connectio	one Online Pavaneters Part Carliguetion EDS File	0CD314C0000
Device Derigna Device Name : Number Comment		Configuration Connections Parameters: Display by Grap, ♥ Image: International Control of the Construction Parameters: Display by Grap, ♥ Image: International Control of the Construction Parameters: Display by Grap, ♥ Image: International Control of the Construction Parameters: Display by Grap, ♥ Image: International Control of the Construction Parameters: Display by Grap, ♥ Image: International Control of the Construction Parameters: Display by Grap, ♥ Image: International Control of the Construction Parameters: Display by Grap, ♥ Image: International Control of the Construction Parameters: Display by Grap, ♥ Image: International Control of the Construction Parameters: Display by Grap, ♥ Image: International Control of the Construction Parameters: Display by Grap, ♥ Image: International Construction Control of The Const
- Network Propert	let Harme Value Use sci • EffAccelance 152:160:000.155. sci sci • Ender DHCP FALSE sci sci IP address of the patrier device. gr gr gr gr	← Dividen Counting Toggle Fall.5E
Pro Pro Pro Prop Prop Prop Prop Pro Pro Pro Pro Pro Pro Pro Pro Pro Pro	Ping Rewitt	Cencepton
<i>NG</i>		DK Dencet Help

In Tab Online Parameters can be changed or read out all parameters. There can set i.e. the preset value. Change all parameters, push the Synchronize button and Send Values to the device.

Name		Value	Unit	
 Measuring Unit Per Span Total Measuring Range in 1 Position Sensor Value Velocity value 	feasuring Units	8192 33554431 0 0	Steps Steps Steps steps per sec-	Sygchronize
- Preset		100	steps	Get Values from EDS
Velocity Format Round Avis Velocity Filter Direction Counting Toggle Scaling Function Control		7940 2 0 FALSE FALSE	counts per se value value	
	Synchronia	e Action		×
	What would	value from dev you like to do alues (EIP-CT to Values (Devis	o Device)	mEIP-CT value.
	-	04		Lancel
Description Preset				



8 FAQ

8.1 Problem:

IP Address unknown and BOOTP/DHCP deactivated

Solution:

Use a Ethernet "sniffer" (i.e. http://www.wireshark.org) or

8.2 Problem:

Replace a rotary encoder in the machine and the controller cannot start the application. Additional the Stat LED is flashing with 2 Hz

Solution:

Start the BOOTP/DHCP server to set the IP-Address. See chapter 7.1

9 Glossar

Term	Explanation
10Base-T	Transmission line with 10 Mbit data transmission rate
100Base-T	Transmission line with 100 Mbit data transmission rate
Baudrate	Transmission rate; it display the transmission bits per second
Big Endian	Variables will use Byte 0 as Low and last Byte as High
Binary	Numeric system with value 0 or 1.
BootP	A UDP network protocol used by a network client to obtain its IP address automatically
CAT5	Terminations for transmission rates up to 100 Mbit
CIP	Control and Information Protocol
DHCP	Dynamic Host Configuration Protocol is a protocol used by networked devices (clients) to obtain
	the parameters necessary for operation in an Internet Protocol network. This protocol reduces sys-
	tem administration workload, allowing devices to be added to the network with little or no manual
	configuration.
EIP	EtheNet/IP
EMC	Electromagnetic compatibility, there are rules to verifying devices.
ENIP	EtherNet/IP
Ethernet	Ethernet is a computer network technology based on frames.
Explicit Messages	Communication between i.e. a Ethernet scanner and encoder
Fast Ethernet	Transmission technology with 100 Mbit transmission rate
Flash	Internal memory, saved data will be available after power down
	IO Connection: communication between controller and device
IP-Address	Allow a logic addressing from computer in a network
IP-Protocol	The Internet Protocol is widespread in computer networks. It is the implementation of the internet
	layer of the TCP/IP-model
MAC Address	World wide explicit address of a device.
	The encoder use three MAC Adresses: one for internal interface and two for the ports
Mbit	Transmission rate or baud rate, million bits per second
OCD	Acronym: OPTOCODE, name of an encoder series manufactured by FRABA POSITAL
OSI-Model	The Open System Interconnection reference model is a open layer model for the organization of a
	communication.
Scanner	Program to send Explicit Messages to the encoder
Switch	A switch is an electronic device to connect computers e.g. network segments in a local network.
	Unlike a hub, a switch uses stacks to avoid network collisions
TCP	The Transmission Control Protocol is a connection orientated transmission protocol, in a network.
UDP	User Datagram rotocol is utilized to send data that does not need to be transferred in a reliable
	way.





FACTORY AUTOMATION – SENSING YOUR NEEDS



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