

Instruction manual

EXP-ETH-IP-ADV

Industrial Ethernet* interface expansion card



* Compatible to industry standards.

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1. Introduction

This manual describes the EXP-ETH-IP-ADV option card aimed at connecting the ADV200 series Drives to Industrial Ethernet networks.

It is possible to use only one field bus expansion card per Drive.

This manual is intended for design engineers and technicians responsible for the maintenance, commissioning and operation of Industrial Ethernet systems.

Basic knowledge of Industrial Ethernet is required. The EXP-ETH-IP-ADV200 card is only suitable for use with drives running firmware version 4.00 or later.

1.1. Reinforced insulation

PELV (Protective Extra Low Voltage) EN 61800-5-1.

1.2. Features

- Standard RJ45 with support for shielded twisted pair, half-duplex / full-duplex and 10Mbs / 100Mbs connectivity
- Dual 100Mbps Industrial Ethernet interfaces for use in line topologies i.e. daisy chaining
- Control cycle times down to 1ms
- Configured Station Alias
- Maximum input data length 32+4 bytes
- Maximum output data length 32 bytes
- Vendor ID = 949

1.3. What is EtherNet/IP?

EtherNet/IP is the name given to the Common Industrial Protocol (CIP) , as implemented over standard Ethernet ($\sf IEEE~802.3$ and the TCP/IP protocol suite).

EtherNet/IP is an industrial Ethernet solution available for manufacturing automation , based on the Common Industrial Protocol (CIP) , a media independent connection based , object oriented protocol designed for automation applications , encompassing a comprehensive set of communication services for automation applications : control , safety , synchronization , motion , configuration and information .

The "IP" in "EtherNet/IP" refers to "Industrial Protocol". It is built on the Ethernet physical layer network infrastructure and the TCP-IP protocol, and therefore can be used in automation networks which can tolerate some amount of non-determinism. Among other things this enables :

- Transfer of basic I/O data via User Datagram Protocol (UDP)-based Implicit Messaging,
- Uploading and downloading of parameters via TCP , using Explicit Messaging
- Polled monitoring via UDP,
- "EtherNet/IP" makes use of well known TCP port number 44818 for explicit, messaging and UDP port number 2222 for implicit messaging.

1.4. Safety

Before installing the card, read the safety instruction section carefully, see ADV200 Quick Start-up guide, Chapter 1 - Safety Precautions.

1.5. Mounting

Refer to ADV200 Quick Start up manual, chapter "Installation of optional cards": the card must be inserted on slot 3.



Use only supplied screws.

1.6. Connections

Bus media

The Industrial Ethernet option module incorporates two 100 BASE-TX RJ45 interfaces.

Cabling considerations

To ensure long-term reliability it is recommended that any cables used to connect a system together be tested using a suitable Ethernet cable tester, this is of particular importance when cables are constructed on site.

Cable

Cables should be shielded and as a minimum, meet TIA Cat 5e requirements.

Cabling issues are the single biggest cause of network downtime. Ensure cabling is correctly routed, wiring is correct, connectors are correctly installed and any switches or routers used are rated for industrial use. Office grade Ethernet equipment does not generally offer the same degree of noise immunity as equipment intended for industrial use.

Maximum network length

The main restriction imposed on Ethernet cabling is the length of a single segment of cable.

The ADV-Industrial Ethernet module has two 100BASE-TX Ethernet ports, which support segment lengths of up to 100m. This means that the maximum cable length which can be used between one ADV-Industrial Ethernet port and another 100BASE-TX port is 100m however it is not recommended that the full 100m cable length is used.

The total network length is not restricted by the Ethernet standard but depends on the number of devices on the network and the transmission media (copper, fiber optic, etc.).

The Industrial Ethernet system designer must consider the impact that the selected network structure will have on performance.

ADV-Industrial Ethernet terminal descriptions

The ADV-Industrial Ethernet module has two RJ45 Ethernet ports for the Industrial Ethernet network.



	Industrial Ethernet terminal connections				
Pin	A - IN (J1(Pin	B - OUT (J2)		
1	Transmit +	1	Transmit +		
2	Transmit -	2	Transmit -		
3	Receive +	3	Receive +		
4	Not used	4	Not used		
5	Not used	5	Not used		
6	Receive -	6	Receive -		
7	Not used	7	Not used		
8	Not used	8	Not used		

Network topology

Devices may be connected via daisy chaining:



The two Ethernet ports are interchangeable, in that there is no specific input or output port; the card acts as an Ethernet switch.

Minimum node-to-node cable length

There is no minimum length of cable recommended in the Ethernet standards.

To avoid possible problems it is recommended that you allow sufficient cable length to ensure good bend radii on cables and avoid unnecessary strain on connectors.

1.7. Leds - Rotary switch - Jumper - Terminal



				LEDS
Reference	Color	Display	Status	Descriptions
LINK (J1)		off	-	no connection with the previous Industrial Ethernet device
(Eth0 IN)	yellow	on	linked	previous Industrial Ethernet-device connected
		blinking	active	communication with the previous Industrial Ethernet device
ACT (J1) (Eth0 IN)	green	off	-	no connection with the previous Industrial Ethernet device
		on	-	no communication with the previous Industrial Ethernet device
LINK (J2)	vellew	off	-	no connection with the next Industrial Ethernet device
(Eth1 OUT)	yenow	on	linked	next Industrial Ethernet device connected
		blinking	active	communication with the next Industrial Ethernet device
ACT (J2) (Eth1 OUT)	green	off	-	no connection with the next Industrial Ethernet device
,		on	-	o communication with next previous Industrial Ethernet device
H1 (RDY)	yellow			Indicates the processor mode. Off in boot mode. On when the software is installed.
H2 (RUN)	green			RUN: Indicates that the processor is executing a software program. Off when the processor is executing the program. Flashes in boot mode.
H3 (FAIL)	red			FAIL: Indicates a system malfunction. Lit when errors are present.
H4 (PWR)	yellow			PWR: Indicates the presence of the card power supply. Lit when the card is powered.
	•		0	ROTARY SWITCH
Reference				Descriptions
S4	Node add	ress for 1. It mus	t always be let	ft in position 0.
S3	Node add	ress for 10. It mu	ist always be l	eft in position 0.
S2	Node add	ress for 100. It m	ust always be	left in position 0.
				JUMPER
Reference				Descriptions
P2	If terminals are mounted, the jumper must be installed in position 2-3.			
				TERMINAL
Reference		Descriptions		
TB1	If contacts	are mounted the	ey must be left	NOT CONNECTED.

1.8. Optional card recognition



At power-on, the drive recognizes the presence of optional card in the expansion slot 3, this message is shown on the display.



On 02 DRIVE INFO menu, select the PAR 534 Slot 3 card type to read the recognized card type.

Value	Description	Card type
0	None	-
516 RTE		EXP-ETH-IP-ADV
255 Unknown		-

2. Start-up guide

This section is intended to provide a generic guide for setting up module with a master/controller PLC. It will cover the basic steps required to get cyclic data communicating using the Industrial Ethernet protocol on the module.

WEG EDS file

WEG provides an Industrial Ethernet device description file EXP-ETH-IP-ADV200, "RTE v1.1.eds", which contains all the information required by the Industrial Ethernet master to facilitate configuration. Please contact the WEG Customer Service: technohelp@weg.net.

Configuring the -Industrial Ethernet module for cyclic communications

Configuring the Industrial Ethernet module for cyclic communication

In the Industrial Ethernet protocol configuration, the instances for describing I/O polling data exchange have a fixed size, which must correspond to the settings on the master and on the device.

The network transmission speed is fixed. The module must be associated with a unique IP address for the sub-network in which it is used, according to the procedure described in "Industrial Ethernet node address".

The LED on the front of the module relating to the connector to be used indicates whether the Ethernet cable has been connected properly to the Industrial Ethernet module on the drive: if it is green, the master is connected, if it is not lit check the wiring and that the master has started the communication.

Set the IP address of the EXP-ETH-IP-ADV200 card as described in paragraph "5. IP address Management Procedure" on page 25.

In the master, scan the network to check that the Industrial Ethernet module has been properly connected to the master. If the network has been configured correctly, one or more Industrial Ethernet nodes will appear in the master PLC.

Decide which input/output data are to be sent cyclically (objects and/or parameters). The input/output data associated with polling cyclic data exchange can be configured directly via the drive parameters (setting in the FIELDBUS M2S and FIELDBUS S2M menus).

It is important to set a data area size that is compatible with the Master and the Industrial Ethernet device: if set on the drive, make sure the number of bytes used corresponds to the size of the I/O area set on the master. The size in bytes used by the drive is obtained from the settings in the FIELDBUS M2S and S2M menus, by adding the size in bytes of each parameter set via the relative "Fieldbus M->S n sys" or "Fieldbus S->M n sys" parameter, according to the table below:

Not assigned	The datum in question and all subsequent data (even if assigned) do not contribute to the I/O area.
Count16,Par16,Fill16,MdpPlc16,Eu	2 byte
Count32,Par32,Fill32,MdpPlc32,	4 byte
Eu float	

The I/O data area of the "Master to Slave (M2S)" and "Slave to Master(S2M)" drive and the assembly instance are associated as follows:

- M2S assembly instance 100 connection output
- S2M assembly instance101 connection input.

IMPOPTANE

IMPORTANT:

the size of the connection input on the master must always be increased by 4 bytes.

Download the configuration to the master

After downloading the configuration to the master the LED(s) on the front of the Industrial Ethernet should flash, depending on the port(s) connected.

If configured correctly, when the master passes to "Run" mode (drive parameter 4014 "Fieldbus State" passes to "Operational") the output values sent by the master are visible in the drive parameters associated with the channels configured in the "Fieldbus M2S" menu, while the input values received are updated to the values of the "Fieldbus S2M" menu parameters.

Menu Fieldbus

To enable the EXP-ETH-IP-ADV card set PAR 4000 **Fieldbus type** as "RTE". The following parameters are available in the COMMUNICATION->FIELDBUS CONFIG menu:

PAR	Parameter description	Туре	Default value	Attr
4000	Fieldbus Type	Enum	RTE	Write
4006	Fieldbus address	2 byte unsigned	0	Write
4010	Fieldbus M->S enable	Enum	On	Write
4012	Fieldbus alarm mode	2 byte unsigned	0	Write
4014	Fieldbus state	Enum	Stop	Read only
4398	RTE protocol	Enum	None	Read only

Note:

The drive must be reset to make all fieldbus settings and configurations effective.

- Fieldbus address = not used. The master identifies the card via the IP address (see "5. IP address Management Procedure" on page 25).
- Fieldbus M->S enable = if set to Off the data the PLC sends the drive (master to slave) are not updated anymore by the drive and the current values are maintained.
- Fieldbus alarm mode = if set to On the drive generates Opt Bus Fault errors relating to the loss of communication (Bus Loss) even when the drive is not enabled.
- Fieldbus state = state of the communication on the RTE network :

Industrial Ethernet	PAR 4014 Fieldbus state
Boot	Stop
Init	Init
No connection (explicit messages available)	Pre-operational
Connecting	Safe-op
Connection established	Operational

RTE Protocol = EthernetIP

Configuration example

This chapter provides an example of how to configure the parameters of ADV200 drives so that they can be read and written by a Scanner Industrial Ethernet via the processing channels (Dati di input/output cyclic datas). See the chapter "2.2.2. Writing Output data" on page 14 for the configuration channels.

The paragraph "2.1. Industrial Ethernet Scanner" on page 10 provides the information required on a Scanner Industrial Ethernet controlling a machine. The paragraph "2.1.3. Composition of I/O" on page 11 contains basic information for programming the ADV200 drive starting from the factory settings.

2.1. Industrial Ethernet Scanner

This section contains an example of data exchange seen from the PLC side. This is the data normally contained in the machine specifications in the case of applications controlled by a Industrial Ethernet Scanner.

2.1.1. Description of Master -> Slave cyclic input/output data communication

There are two parameters to be written via the processing channels. The first is a control word, in which the single bits contain certain commands (e.g. enable, start, etc.). The second processing channel contains the ramp reference 1 (RampRef1) in rpm.

Position	Description	Format	Unit of Measure
Word1 M -> S	Control word	16 bit Word	
Word2 M -> S	Ramp Ref 1	Int 16 bit	rpm
Word3 M -> S			
Word4 M -> S			
Word5 M -> S			
Word6 M -> S			
Word7 M -> S			
Word16 $M > S$			

Industrial Ethernet cyclic input/output data: Master -> Drive (max 16 words)

CONTROL WORD

Bit	Description	Remarks
0	EnableCmd	Enable command from PLC
1	StartCmd	Start command from PLC
2	Free	
3	Free	
4	Free	
5	Free	
6	Free	
7	Free	
8	Digital Out3	Digital output 3 command from PLC
9	Digital Out4	Digital output 4 command from PLC
10	Free	
11	Free	
12	Free	
13	Free	
14	Free	
15	Free	

2.1.2. Description of Slave -> Master cyclic input/output data communication

The Industrial Ethernet Scanner reads three parameters from the drive. The first contains a status word in which the single bits carry information about the status of the drive (e.g. DriveOk). The second parameter is the actual speed in rpm. The third parameter contains the value of analog input 2.

Position	Description	Format	Unit of Measure
Word1 S -> M	Status Word	16 bit Word	BitWide
Word2 S -> M	Actual Speed	Int 16 bit	rpm
Word3 S -> M	Analog Input 2	Int 16 bit	
Word4 S -> M			
Word5 S -> M			
Word6 S -> M			
Word7 S -> M			
Word16 S -> M			

Industrial Ethernet Slave > Master cyclic input/output data (max 16 Words)

STATUS WORD

Bit	Description	Remarks
0	EnableState	Drive enabled
1	Drive Ok	Drive Ok
2	Speed is zero	Zero speed threshold
3	Free	
4	Free	
5	Free	
6	Free	
7	Free	
8	Digital Input 4	ADV200 digital input 4 status
9	Digital Input 5	ADV200 digital input 5 status
10	Free	
11	Free	
12	Free	
13	Free	
14	Free	
15	Free	

2.1.3. Composition of I/O

By analysing the size of the data in the composition instances we know that:

- Input instance 101, associated with 3 read parameters, is made up of 6 bytes, to which 4 bytes must be added (reserved), for a total of 10 bytes;
- Output instance 100, associated with 2 write parameters, is made up of 4 bytes.

Controller TESTmio	Module Pro	perties - LocalENB (ETHERN	ET-MOD	ULE 1.1)			×
🖉 Controller Tags	General Com	and a first state to take 1					
Controller Fault Handler	Cienciai Cor	nection Module Into					
Power-Up Handler	Type:	ETHERNET-MODULE Gener	ic Ethernel	t Module			
📇 Tasks	Vendor:						
🖻 🤕 MainTask	Parent:	LocalENB					
🗄 🖳 🗸 MainProgram	Name:	Drive		Connection Par	ameters		
Cill Unscheduled Programs	110 <u>1</u> 00	Duve			Assembly		
- 😁 Motion Groups	Description:		-		Instance:	Size:	
Cill Ungrouped Axes	_		_	Input	101	5 11	6-bit)
- Trends			-		The second secon		
📇 Data Types		1	<u> </u>	Output:	100	2 1	6-bit)
	Comm Forma	t Data - INT	Ŧ		-		
😟 🔙 Strings	-Address / h	lost Name		Configuration:	P	10 3 8	-bit)
🗄 🚂 Predefined	Address / I		20	Claim family			
🗄 🖼 Module-Defined	• IP <u>A</u> ddr	ess: 192.168.16.	30	<u>s</u> tatus input:			
- 🔁 I/O Configuration							
[1] 1769-L32E Ethernet Port LocalENB	C Host N	ame:					
ETHERNET-MODULE Drive							

The I/O data are thus associated in the instances:

•	Composition	of Instance	101:
---	-------------	-------------	------

Mode	Instance	Byte no.	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
		0				Rese	erved			
		1				Rese	erved			
		2				Rese	erved			
		3				Rese	erved			
		4		Lo	w byte	(4432	Word c	omp mo	on)	
Trononoront	101	5		Hi	gh byte	(4432)	Word co	omp mo	n)	
Transparent	101	6			Low by	te (260) Motor	Speed)		
		7			High by	/te (260	Motor	Speed)		
		8	Low byte (1500 Analog input 1mon)						ion)	
		9		Hig	h byte (1500 A	nalog ir	nput 1m	on)	
		ххх								

Composition of Instance 100:

Mode	Instance	Byte no.	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
		0		Lov	w byte	(4452 \	Nord de	comp s	rc)		
		1		Hig	gh byte	(4452 \	Nord de	comp s	rc)		
		2		ef 1 src	src)						
		3		High byte (610 Ramp ref 1 src)							
		4									
Transmort	100	5									
Transparent	100	100	6								
					7						
		8									
		9									
		ХХХ									

2.2. ADV200 Configuration

The example given in this section is based on the assumption that the parameters of the ADV200 drive are the factory settings (**Default parameter** command).

The I/O data exchanged via the EXP-ETH-IP-ADV200 card can be configured by associating them with the drive parameters. The data written by the Industrial Ethernet scanner to the drive are associated with output instance 100 and configured on the drive via the parameters in the "Fieldbus M2S" (Master to Slave) menu.

The data read by the scanner are associated with input instance 101 and configured on the drive via the parameters in the "Fieldbus S2M" (Slave to Master) menu.

Parameters can be either 2 or 4 bytes long, depending on the associated format, selected via the "Fieldbus M2S n sys" and "Fieldbus S2M n sys" settings.

There are 16 input channels and 16 output channels in which from 0 to 16 data

can be configured, as long as the total number of bytes requested does not exceed 32 input bytes and 32 output bytes.

Example:

It is possible to have:

- from 0 to 16 data items of 2 byte
- 1 datum of 4 bytes + from 0 to 14 data items of 2 bytes
- 2 data items of 4 bytes + from 0 to 12 data items of 2 bytes
- ...
- 8 data items of 4 bytes

The data exchanged via the PDC can be of two types:

- drive parameters
- variables of an MDPIc application

2.2.1. Reading states and writing commands to the drive

Specific parameters are available for reading states and writing commands to the drive, in which each bit can be programmed and associated with a function.

Commands can be sent to the drive using the functions of PAR 4452 **Word decomp src**. The meaning of the single bits is programmable. It can be set on a Field bus M->Sn channel as Count 16.

The drive state is read in PAR 4432 **Word Comp mon**, programmable on any Field bus S->Mn channel as Count 16. The meaning of each single bit can be selected by the user using PAR 4400 **Word Bit 0 src** ... PAR 4430 **Word Bit 15 src**.

For a detailed description of these parameters see the drive manual.

2.2.1.1. FIELDBUS CONFIG menu

The drive must be reset to make all fieldbus settings and configurations effective.

Configure the fieldbus menu parameters as shown below:

	W	면백	品 光 留 🗔 🐄	8 8 4 8	EASY 🗰 🖋	0 11	🔥 🕼 🖽 🥵		
lenu	x	IPA	Short Description	Value	Default	Unit	Туре	Min	Max
Menu selection		4000	Fieldbus type	Rte	Off		Enum		
MOTOR DATA		4004	Fieldbus baudrate	Auto	500k		Enum		
O ENCODER CONFIG		4006	Fieldbus address	3	3		Short	0	255
🕅 SPEED REG GAINS		4010	Fieldbus M->S enable	Enable	Enable		Enum		
🌔 REGULATOR PARAM		4012	Fieldbus alarm mode	0	0		Int	0	1
- CONFIG		4014*	Fieldbus state	PreOperational	Stop		Enum		
VF PARAMETERS		4398*	RTE protocol	EthernetiP	None		Enum		
🕅 FIELDBUS M2S									
FIELDBUS M25 FIELDBUS S2M FIELDBUS S2M WORD COMP WORD DECOMP ALARM CONFIG APPLICATION InterfaceMenu WIZARD WIZARD	ш								
FIELDBUS M2S FIELDBUS S2M FIELDBUS S2M WORD DECOMP WORD DECOMP ALAMN CONFIG APPLICATION InterfaceMenu WIZARD DIAGRAMS DIAGRAMS DISTINATIONS	4 m								

I/O data exchange is only actually active when parameter 4014 "Fieldbus state" is

Note:

set to "Operational". In all other cases, the scanner has not started to exchange I/O data with the EXP-ETH-IP-ADV200 card. This could be due to incorrect assembly instance configuration, for example if the size set on the scanner is not the same as that obtained from the settings in the "Fieldbus M2S" and "Fieldbus S2M" menus, or if the scanner is not in the "Run" state.

If parameter 4014 "Fieldbus state" is "Operational" the I/O data are updated with the programmed parameter values. The drive can only be enabled in this state.

2.2.2. Writing Output data

2.2.2.1. Fieldbus M2S Menu

Wdecomp is used to **configure the control word**. The Wdecomp configuration on the first M -> S word ("Export" mode) is shown below:

🗊 📽 🖬 🛐 🎾 🎜 R	w	면면	品 🗶 📾 🔼 🐿	a = + ?	EASY 🛄 🏓	0 iii	🔥 🖣 🖽 🥵		
lenu	×	IPA	Short Description	Value	Default	Unit	Type	Min	Max
Menu selection	1	4020	Fieldbus M->S1 ipa	4452	0		UnsignedShort	0	20000
MOTOR DATA		4022	Fieldbus M->S1 sys	Count 16	Not assign		Enum		
ENCODER CONFIG		4024*	Fieldbus M->S1 mon	0			Int		
👸 SPEED REG GAINS		4026	Fieldbus M->S1 div	1	1		Float	1	1000
🌔 REGULATOR PARAM		4030	Fieldbus M->S2 ipa	610	0		UnsignedShort	0	20000
🜔 TORQUE CONFIG		4032	Fieldbus M->S2 sys	Eu	Not assign		Enum		
🜔 VF PARAMETERS		4034*	Fieldbus M->S2 mon	0			Int		
		4036	Fieldbus M->S2 div	1	1		Float	1	1000
		4040	Fieldbus M->S3 ipa	0	0		UnsignedShort	0	20000
ETEL DRUS CONFIG		4042	Fieldbus M->S3 sys	Not assigned	Not assigne		Enum		
FIELDBUS M2S		4044*	Fieldbus M->S3 mon	0			Int		
FIELDBUS S2M		4046	Fieldbus M->S3 div	1	1		Float	1	1000
WORD COMP		4050	Fieldbus M->S4 ipa	0	0		UnsignedShort	0	20000
WORD DECOMP	Ξ	4052	Fieldbus M->S4 sys	Not assigned	Not assign		Enum		
🌔 ALARM CONFIG		4054*	Fieldbus M->S4 mon	0			Int		
- 🌔 APPLICATION		4056	Fieldbus M->S4 div	1	1		Float	1	1000
InterfaceMenu		4060	Fieldbus M->S5 ipa	0	0		UnsignedShort	0	20000
WIZARD		4062	Fieldbus M->S5 sys	Not assigned	Not assigne		Enum		
		4064*	Fieldbus M->S5 mon	0			Int		
		4066	Fieldhus M->S5 div	1	1		Float	1	1000
		•							•

Now simply connect the single Wdecomp bits. For Commands the drive must be set to "**Remote**" and "**Digital**" mode, as explained in the ADV200 manual.

Configure the first two bits in the commands menu as shown below:

♫☞⊌∥∰」⊁∣♫ ₽	w	핀막	H X 🗊 🖻 🖻		EXP 🗰 🥖	11	🔺 🛯 🖭 👘		
enu	×	IPA	Short Description	Value	Default	Unit	Туре	Min	Max
Menu selection		1000	Commands remote se	I Digital	Terminal		Enum		
MainMenu		1002	Commands local sel	Keypad	Keypad		Enum		
- MONITOR		1004	Enable/disable mode	Stop/FS&Spd=0	Stop/FS&St		Enum		
🍘 DRIVE INFO		1006	Speed 0 disable dly	1000	1000	ms	UnsignedShort	0	1000
🌔 DRIVE CONFIG		1008	Stop key mode	Inactive	Inactive		Enum		
🖗 REFERENCES		1010	Commands safe start	On	On		Boolean		
🕅 RAMPS		1012	Dig local/remote	Remote	Remote		Enum		
MULTI REFERENCE MOTORPOTENTIOMET OG FUNCTION MONITOR FUNCTION	E	1014	Local/remote src	Dig local/remote	Dig local/re		Enum		
		1016	Terminal Start src	FR start mon	FR start mo		Enum		
		1018	Digital Enable src	Bit0 decomp mon	Null		Enum		
COMMANDS		1020	Digital Start src	Bit1 decomp mon	Null		Enum		
DIGITAL INPUTS		1022	FastStop src	Null	Null		Enum		
DIGITAL OUTPUTS	Ш.	1024*	Enable cmd mon	0			UnsignedShort		
🕅 ANALOG INPUTS		1026*	Start cmd mon	0			UnsignedShort		
🌔 ANALOG OUTPUTS		1028*	FastStop cmd mon	0			UnsignedShort	1000	
MOTOR DATA		1040	FR mode	Two wire	Two wire		Enum		
🕅 ENCODER CONFIG		1042	FR forward src	Digital input 1 mon	Digital inpu		Enum		
SPEED REG GAINS		1044	FR reverse src	Digital input 2 mon	Digital inpu		Enum		
TOPOLIE CONFIG		1046	FR *stop src	Null	Null		Enum		
TORQUE CONFIG		1048*	ER start mon	0			UnsignedShort		

Configure bits 8 and 9 of the "Command word" as shown below (Digital Outputs menu):

) 🛎 🖬 📳 🎾 🎜 R	w	핀맨	品 ※ 📽 🖪 🖻		EASH 🗰 🖋 🕚	📅 🔥 🐜 🖽 🥵		
inu	×	IPA	Short Description	Value	Default U	nit Type	Min	Max
Menu selection	1	1310	Digital output 1 src	Drive OK	Drive OK	Enum		
MainMenu		1312	Digital output 2 src	Drive ready	Drive ready	Enum		
MONITOR	m.	1314	Digital output 3 src	Bit8 decomp mon	Speed is 0	Enum		
🖗 DRIVE INFO		1316	Digital output 4 src	Bit9 decomp mon	Ref is 0 del	Enum		
- P DRIVE CONFIG		1330	Dig out 1 inversion	Off	Off	Boolean		
🎁 REFERENCES		1332	Dig out 2 inversion	Off	Off	Boolean		
- 🕅 RAMPS		1334	Dig out 3 inversion	Off	Off	Boolean		
MULTI REFERENCE MOTORPOTENTIOMET OG FUNCTION MONITOR FUNCTION	Е	1336	Dig out 4 inversion	Off	Off	Boolean		
		1410	Dig output 1X src	Null	Null	Enum		
	NC		1412	Dig output 2X src	Null	Null	Enum	
COMMANDS		1414	Dig output 3X src	Null	Null	Enum	1000	
DIGITAL INPUTS		1416	Dig output 4X src	Null	Null	Enum		
DIGITAL OUTPUTS	Ш.	1418	Dig output 5X src	Null	Null	Enum		
- 🌔 ANALOG INPUTS		1420	Dig output 6X src	Null	Null	Enum		
🜔 ANALOG OUTPUTS		1422	Dig output 7X src	Null	Null	Enum	1000	
- 🕅 MOTOR DATA		1424	Dig output 8X src	Null	Null	Enum		
🕅 ENCODER CONFIG		1430	Dig out 1X inversion	Off	Off	Boolean		
SPEED REG GAINS		1432	Dig out 2X inversion	Off	Off	Boolean		
TOPOLIE CONFIG		1434	Dig out 3X inversion	Off	Off	Boolean		
	1	1436	Din out 4X inversion	Off	Off	Boolean		
								,

2.2.2.2. REFERENCES Menù

The second word is configured in the "References" menu:

) 🛎 🖬 🛃 🎾 🎜 R	w	핀맨	品 🗶 🖆 🛅 🐿	2 3 2 4 ?	EAST 🗰 🖋	0 iii	🔥 40 🖭 🥐		
nu	×	IPA	Short Description	Value	Default	Unit	Туре	Min	Ma
Menu selection		600	Dig ramp ref 1	0	0	rpm	Short		
🎁 MainMenu		602	Dig ramp ref 2	0	0	rpm	Short		
- MONITOR		604	Dig ramp ref 3	0	0	rpm	Short		
🎁 DRIVE INFO		610	Ramp ref 1 src	Fieldbus M->S2 mon	Analog inpu		Enum		
PRIVE CONFIG		612	Ramp ref 2 src	Dig ramp ref 2	Dig ramp re		Enum		
- C REFERENCES		614	Ramp ref 3 src	Mpot output mon	Mpot output		Enum		
CONTRACTOR CONTRA		616	Ramp ref invert src	FR reverse mon	FR reverse		Enum		
	E	620*	Ramp ref 1 mon	0		rpm	Short		
		622*	Ramp ref 2 mon	0		rpm	Short		
		624*	Ramp ref 3 mon	0		rpm	Short		
COMMANDS		634	Ramp ref top lim	1500	0	rpm	Int	0	
DIGITAL INPUTS		636	Ramp ref bottom lim	0	0	rpm	Int	0	
DIGITAL OUTPUTS		630	Reference skip set	0	0	rpm	Short	0	
🕅 ANALOG INPUTS		632	Reference skip band	0	0	rpm	Short	0	
🌔 ANALOG OUTPUTS		640	Dig speed ref 1	0	0	rpm	Short	2225	
🕅 MOTOR DATA		642	Dig speed ref 2	0	0	rpm	Short		
I ENCODER CONFIG		650	Speed ref 1 src	Dig speed ref 1	Dig speed i		Enum		
SPEED REG GAINS		652	Speed ref 2 src	Dig speed ref 2	Dig speed i		Enum		
TOPOUS CONFIG		654	Speed ref invert src	Null	Null		Enum		
III III		660*	Sneed ref 1 mon	0		mm	Short		

After sending a save command and re-starting the drive, check that the M -> S channels have been configured correctly as shown (Html page):

e <u>View P</u> arameters <u>I</u> arget]] 📽 🖬 📳 🍠 🎜 R	W	rvice <u>H</u> e 맨 맨		<u>r</u> > 2 - 2 - 2	EASY 🛍 🖋 🛛 📆 🚹	네 또트 (종)
Menu selection C ENCODER CONFIG SPEED REG GAINS REGULATOR PARAM TORQUE CONFIG TORQUE CONFIG FUNCTIONS	*	Fiel Numbe Numbe	dbus N r of paramete r of words m	M2S Words Mappi ers exchanged: 2 apped: 2	Esc key	
		Word	Ipa	Parameter name	Format exchange	
		1	4452	Word decomp src	Count 16 - 16bit	
ETEL DRUS M2S		2	610	Ramp ref 1 src	Eu - 16bit	
ETEL DRUS S2M			-	-	-	
PIELOBUS SZIVI			<u> </u>		-	
WORD DECOMP					-	
WORD DECOMP			· · ·		-	
ALARM CONFIG		1.00				
APPLICATION				-	-	
InterfaceMenu		-		-	-	
WIZARD	-	2-3			-	
				-	-	
DESTINATIONS		-			-	
E FIELDBUS WORDS MAP						
		-			-	
M2S	1100	-		-	-	
M2S S2M				-		
⊡ M2S ⊡ S2M ∭ Recipes		-				
	-	Ŀ				

2.2.3. Writing Input data

2.2.3.1. FIELDBUS S2M Menu

These channels are configured in the Fieldbus S2M menu. Use Wcomp to configure the first channel.

S2M configuration is shown below:

🖼 🗟 🛃 🎾 🖉 R W	/ 肥 嬰	R X 📽 🖪 🖻	🖾 🖨 🖶 🔶 🐔	EASY 🗰 ۶ 🕚	ini 🔥 La 👯 🤹	
u X	IPA	Short Description	Value	Default value U	Jnit Type	Min
Menu selection	4180	Fieldbus S->M1 ipa	4432	0	UnsignedShort	0
ENCODER CONFIG	4182	Fieldbus S->M1 sys	Count 16	Not assigned	Enum	
SPEED REG GAINS	4184	Dig Fieldbus S->M1	0	0	Int	
REGULATOR PARAM	4186	Fieldbus S->M1 mul	1	1	Float	1
🎁 TORQUE CONFIG	4190	Fieldbus S->M2 ipa	260	0	UnsignedShort	0
VF PARAMETERS VF PARAMETERS VF PUNCTIONS COMMUNICATION COMMUNICATION RS485 M^ FIELDBUS CONFIG	4192	Fieldbus S->M2 sys	Eu	Not assigned	Enum	
	4194	Dig Fieldbus S->M2	0	0	Int	
	4196	Fieldbus S->M2 mul	1	1	Float	1
	4200	Fieldbus S->M3 ipa	1500	0	UnsignedShort	0
FIELDBUS M2S	4202	Fieldbus S->M3 sys	Count 16	Not assigned	Enum	
FIELDBUS S2M	4204	Dig Fieldbus S->M3	0	0	Int	
WORD COMP	4206	Fieldbus S->M3 mul	1	1	Float	1
WORD DECOMP	4210	Fieldbus S->M4 ipa	0	0	UnsignedShort	0
ALARM CONFIG	4212	Fieldbus S->M4 sys	Not assigned	Not assigned	Enum	
PLICATION	4214	Dig Fieldbus S->M4	0	0	Int	
InterfaceMenu	4216	Fieldbus S->M4 mul	1	1	Float	1
WIZARD DIACRANAS	4220	Fieldbus S->M5 ipa	0	0	UnsignedShort	0
	4222	Fieldbus S->M5 sys	Not assigned	Not assigned	Enum	
FIELDBUS WORDS MAP	4224	Dig Fieldbus S->M5	0	0	Int	
	4226	Fieldbus S->M5 mul	1	1	Float	1

Wcomp configuration is shown below:

		핀막	W W 🔍 🕞 💩		EASY 🗰 🖋 🚺 F	ї 🔬 🖣 반 👘 👘	
nu	×	IPA	Short Description	Value	Default value Ur	nit Type	Min
Menu selection		4400	Word bit0 src	Enable state mon	Null	Enum	
ENCODER CONFIG		4402	Word bit1 src	Drive OK	Null	Enum	
SPEED REG GAINS		4404	Word bit2 src	Speed is 0	Null	Enum	
REGULATOR PARAM		4406	Word bit3 src	Null	Null	Enum	
🍘 TORQUE CONFIG		4408	Word bit4 src	Null	Null	Enum	
VF PARAMETERS		4410	Word bit5 src	Null	Null	Enum	
COMMUNICATION COMMUNICATION R5485 FIELDBUS CONFIG FIELDBUS CONFIG FIELDBUS M2S		4412	Word bit6 src	Null	Null	Enum	
		4414	Word bit7 src	Null	Null	Enum	
		4416	Word bit8 src	Digital input 4 mon	Null	Enum	
		4418	Word bit9 src	Digital input 5 mon	Null	Enum	***
FIELDBUS S2M		4420	Word bit10 src	Null	Null	Enum	
WORD COMP		4422	Word bit11 src	Null	Null	Enum	
WORD DECOMP		4424	Word bit12 src	Null	Null	Enum	
🌔 ALARM CONFIG	E	4426	Word bit13 src	Null	Null	Enum	
APPLICATION		4428	Word bit14 src	Null	Null	Enum	
InterfaceMenu		4430	Word bit15 src	Null	Null	Enum	
WIZARD		4432*	Word comp mon	0000h		UnsignedInt	

Save and then re-start the drive to check the correct configuration of the Slave -> Master channels in the same way:

ADV200_4_X_0.gft [S2M] - GF_eXp File View Parameters Target Set	ress ervice <u>H</u> el	p			
🔯 🖨 🖶 🞐 🖉 С R W	맨백)	R X 🖆	' 🖪 🖻 🖉 👘 😵	EASY 🗰 🖋 🛛 👬 🚹	40 EE 🤹
Menu X Menu selection C ENCODER CONFIG C SPEED REG GAINS C REGULATOR PARAM C TORQUE CONFIG C VRQUE CONFIG C VRQUE CONFIG	Fiel Number	dbus r of param r of word:	S2M Words Mapp neters exchanged: 3 s mapped: 3	ping Esc key	
FUNCTIONS GOMMUNICATION SA45 FILDBUS CONFIG FILLDBUS S2M FILLDBUS S2M FILLDBUS S2M	Word 1 2 3	Ipa 4432 260 1500	Parameter name Word comp mon Motor speed Analog input 1 mon	Format exchange Count 16 - 16bit Eu - 16bit Count 16 - 16bit	E
WORD COMP WORD DECOMP OWORD DECOMP ALARM CONFIG APPLICATION InterfaceMenu		- - - -	-		
WIZARD			-		
Recipes +				· · ·	*
O No alarms			M	odbus, Addr:1, Port:COM4	CONNECTED

2.3. Communication check

Some notes/suggestions for checking communication.

- Cyclic input/output data communication is only active if the state of parameter 4014 **Fieldbus state** is "Operational". Check the status using WEG_eXpress or the expansion card LED.
- For Master -> Slave communication in the FIELDBUS M2S menu you can check the value received by the communication channel (e.g. for the first channel it is the Fieldbus M->S1 Mon parameter).
- For EU (engineering unit) communication, remember that the value read on the Mon parameters of FIELDBUS MS2 is in internal units (see conversion tables on chapter 5.0 SYSTEM INTERNAL VARIABLES, "ADV200, Write the applications with the MDPIc" manual available on www.weg.net).

3. Protocols

The EXP-ETH-IP-ADV200 board operates as an "Industrial Ethernet I/O adapter", receiving implicit communication request from an I/O scannet and produces I/O data. It is also an "Explicit message server". The following features are supported :

- Industrial Ethernet 'Transparent mode'
- I/O connection: 1 explicit owner , 2 listen only
- I/O connection type: cyclic, (minimum 2 ms)
- Explicit messages supported
- UCMM supported
- Identity object
- Message Router object
- Assembly object
- Connection object
- Ethernet link object
- TCP/IP object
- DHCP/BOOTP
- Baud rate: 10 / 100 mbit autosensing
- Data transport layer: Ethernet II , IEEE 802.3
- Default IP address: 192.168.1.100 /24.

3.1. Description of data exchanged by an RTE device

The basic diagram of the device is shown below:



Addressing data within a CIP device utilizes an object oriented view. A class (of objects) is a set of objects that represent the same type of system component (See next figure). Sometimes it is necessary to have more than one "copy" of an object, called object instances, within a device. This set of objects is called an "object class". Each instance of the object class will have the same set of attributes, but a unique set of values. An object instance or an object class has attributes, providing services and implementing behavior.



Accessing data within a device using a non-time critical message (explicit message) contains the following information : network address ,Class ID , Instance ID, Attribute ID, Service Code. This addressing is also used in Electronic Data Sheets (EDS) to identify configurable parameters within a device .

In addition to specifying how device data is represented, CIP also specifies methods by which I/O data can be accessed, using triggers, and how data from different objects can be combined in an I/O or configuration message using the Assembly Object.

3.2. Description of objects

Identity Object (0x01)

This object is used to identify and obtain general information from the device.

		Attribute		Supported	l Services
Instance	Name	ID	Name	Get Attribute Single	Services Get Attribute All yes
		1	Revision		
	Class	2	Max. Instance		
	Class	6	Max. Class Attrib.	yes	yes
		7	Max. Instance Attrib.		
		1	Vendor		
		2	Product type		
		3	Product code		
	Instance	4	Major Revision		
	Attributes	5	Status	yes	yes
		6	Serial number		
		7	Product Name		
		10	Heartbeat interval		

Message Router Object (0x02)

This object allows a potential client to address the device and gather information in server classes.

Object close	Attributes	Not supported
Object class	Services	Not supported
	Attributes	Not supported
Ubject Instance	Services	Not supported

Assembly Object (0x04)

Assembly instances are used to connect input/output data to the communication connection.

		Attribute		Supported Services		
Instance	Name	ID	Name	Get Attribute Single	Set Attribute Single	
0 0	Class	1	Revision	yes	no	
		2	Max. Instance	yes	no	
1.v	Instance	3	Data	yes	yes	
1-X	Attributes	4	Size	yes	no	

Composition of assembly instances

Mode	Instance	Byte no.	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
		0	User s	pecific i	input (lit	ttle end	ian form	iat)		
	100	1								
	(Output)	2								
	(Output)									
Trananarant		Ххх								
Папърагени		0	User s	pecific	output (little en	dian for	mat)		
	101	1								
	(Input)	2								
	(input)									
		Ххх								

• Vendor_Class_Parameter (0x90)

This is used to read and write data about the connected device using explicit messages.

		Attributo		Supported	l Services
Instance	Name	ID	Name	Get Attribute Single	Set Attribute Single
0	Class	1	Revision	yes	no
		1	Sub-Index 1		
		2	Sub-Index 2		
1-x		3	Sub-Index 3		
		4	Sub-Index 4		
		5	Sub-Index 5	1/00	Set Attribute Single no yes
	Instance	6	Sub-Index 6	yes	
	Attributes	7	Sub-Index 7		yes
		8	Sub-Index 8		
		9	Sub-Index 9		
		10	Sub-Index 10		
		200	Sub-Index 200	yes	

Drive parameters can be accessed via this class: the instance is given by the number of the parameter + 8192, the attribute (sub-index) is always 1.

Example of how to access a read parameter:

Supposing you want to read parameter 250 "Output current", send the following request via explicit message to the "Vendor Class Parameter", using the standard "get_attribute_single" service.

- 0xe Service
- Class 0x90
- Instance 0x20FA (250 + 8192 = 8442)
- Attribute 1

The response contains the value of parameter 250 "Output current", divided into 4 bytes with 32-bit IEEE754 float, since this is a float parameter (see the drive manual for information about the format of individual parameters).

4. Alarm

If the drive detects a problem with the Industrial Ethernet communication, it may generate the "Opt bus fault" alarm, which indicates the presence of a fault condition.

The "Opt bus fault" alarm may be generated for a series of reasons:

- Configuration alarm. This appears at drive start-up (press Esc to continue: however, Industrial Ethernet communication will not be available).
 It indicates an unrecoverable problem in the configuration of the drive or EXP-ETH-IP-ADV200 card. Check the settings in the "Fieldbus", "Fieldbus M2S" and "Fieldbus S2M" menus. The alarm sub-code indicates the cause of the problem.
- Hardware alarm. This indicates an unrecoverable problem on the EXP-ETH-IP-ADV200 card, which occurred after start-up and during normal operation. If the problem persists, replace the card.
- Bus loss alarm, sub-code = 0. This indicates the loss of communication (passage from network Run to Off) when the drive is enabled, or parameter 4012
 1. Data exchange must be active (4014 = Operational) when the drive is enabled.

Subcode	Description	Note
0	Bus Loss	connection with the scanner no longer present or Industrial Ethernet state no more Operational
0x8101	NetX system error.	If not recoverable, replace the module.
0x8102,0x8104	DPRAM Error, after WarmStart.	If not recoverable, replace the module
0x8110	Not Ready timeout, NetX not available.	If not recoverable, replace the module.
0xFF02	Communication with the module not available	DPRAM not recognized. Replace the module
0xFF04	Module software version not compatible	
FF01	Fieldbus type does not match expansion card	Verify if EXP-ETH-IP-ADV card is properly installed
FF14FF23	Wrong object selected for mapping in channel M2S n	Check "Fieldbus M-> Sn Dest"
FF24FF33	More than 1 Src pointing to M2S Channel n	Check for multiple destinations on "Fieldbus M-> Sn Dest"
FF34FF43	M2S Channel n, data size is wrong (16 bits on 32 bits or 32 bits on 16 bits parameter)	Check "Fieldbus M-> Sn sys"
FF44FF53	Invalid parameter in Channel S2M	Check "Fieldbus S-> Mn src"
FF54FF63	S2M Channel n, data size is wrong (16 bits on 32 bits or 32 bits on 16 bits parameter)	Check "Fieldbus S-> Mn sys"
FF64FF73	Wrong object selected for mapping in Channel S2M n	Check "Fieldbus S-> Mn src"
FF74FF83	M2S Channel n: too many words in PDC	"Fieldbus M-> Sn Dest" & "Fieldbus M-> Sn sys" address more than 16 words in PDC
FF84FF93	S2M Channel n: too many words in PDC	"Fieldbus S-> Mn src" & "Fieldbus S-> Mn sys" address more than 16 words in PDC
FFB4FFC3	Internal database error on Channel n	Internal error, contact manufacturer

Parameter 4670 "Optionbus activity" can be used to configure drive operation in the loss of communication condition. The default setting is "Disable", which indicates that the drive must be disabled. This parameter may also be set to "Warning", in which case the drive can continue to operate, but an error message is displayed. For further details please consult the drive manual.

With WEG_eXpress you can obtain a description of what caused the "Opt bus fault" alarm, by logging on to the relative HTML page as shown in the figure below:

view Parameters Target Se	UNCE He	BW cSP 1		927 m Ø o m A	Le GFE #5.
Menu selection	Fie	Idbus N	I2S Words Mappin	Esckey	Active alarm: Opt Bus fault
	Numb Numb	er of paramete er of words m guration err	rs exchanged: 2 apped: 2 or - Subcode: FF35h - M2S o	hannel 2, data size	is wrong (16 bits on 32 bits or 32 bits on 16 bits paramet
R5485	Word	Ipa	Parameter name	Format exchange	
- FIELDBUS CONFIG	1	4452	Word decomp src	Count 16 - 16bit	
- FIELDBUS M2S	2	3700	Pad 1	Count 16 - 16bit	
- FIELDBUS S2M	- ·		· .		
WORD COMP	· ·		· .		
WORD DECOMP					
ALARM CONFIG	· ·				
ADDI ICATION	· ·	· ·			
a later for the set of	· ·	· ·			
Interfacementa	- ·	-			
WIZARD	- ·		·		
E DIAGRAMS	- ·		· .		
the second			-		
E E DESTINATIONS	<u> </u>		-		
E ESTINATIONS		<u> </u>			
DESTINATIONS FIELDBUS WORDS MAP M2S	· ·				
DESTINATIONS FIELDBUS WORDS MAP S2M	- ·				1
DESTINATIONS DESTINATIONS FIELOBUS WORDS MAP S2M Recipes			· 1		

5. IP address Management Procedure

The default setting for the EXP-ETH-IP-ADV200 card is to use IP address 192.168.1.100. Each device in a local Industrial Ethernet network must have a unique address. You must therefore configure different addresses for each single EXP-ETH-IP-ADV200 card in the network.

This can be done using a PC with Ethernet card.

The PC Ethernet card must be configured with an address that is not the same as any of those to be used, yet compatible with the sub-network of the card whose address is to be modified. The PC is now ready for connection to the Industrial Ethernet network.

The WEG_eXpress configurator includes an integrated tool for configuring the IP address of the EXP-ETH-IP-ADV200 card, accessible via the toolbar icon:



- 2. Press the Refresh List button and wait while browsing the network
- 3. Click on the MAC field of the drive in the "List of devices Found"
- 4. Set the new parameters (number 3) IP =192.168.27.101, NM= 255.255.255.0 Gateway = 0.0.0.0
- 5. Press Apply changes
- 6. Reset the drive

Set IP for RTE-EthernetIP	X
List of devices found (MAC) :	IP: NetMask: Gateway:
Refresh list	BOOTP DHCP Apply changes

The RTE has a UDP communication channel to implement a protocol for discovering and setting TCP/IP communication parameters.

Send UDP broadcast messages to port 502 to contact an RTE device. Two messages have been implemented:

- Read
- Write

NB!

Reboot the device to enable the new Ethernet interface configuration values (IP, Netmask, gateway, DHCP, BOOTP).

5.1. Read command

The client must send a UDP broadcast message to port 502 of the server. The message consists of the following:

	Message from Client to Server (RTE)				
Byte 0	'R'				
Byte 1	't'	Massager (BtoD)			
Byte 2	'e'	Message: Rtek			
Byte 3	'R'				
	Total length 4 bytes				

		Message from Server (RTE) to client			
Byte 0	'R'				
Byte 1	'ť	Massara: 'DtaD'			
Byte 2	'e'	Message: 'KteK'			
Byte 3	'R'				
Byte 4	0x00				
Byte 5	0x02				
Byte 6	0xA2	Mag Address Les 00:02:42:21:17:EP			
Byte 7	0x21				
Byte 8	0x17				
Byte 9	xEB				
Byte 10	192				
Byte 11	168				
Byte 12	1	Ip Address : es. 192.166.1.100			
Byte 13	100				
Byte 14	255				
Byte 15	255	Not Mack Los 255 255 0			
Byte 16	255	INEL IMASK : ES. 200.200.200.0			
Byte 17	0				
Byte 18	192				
Byte 19	168	Cotoursuin Addressuics 102 160 1 254			
Byte 20	1	Gateway Ip Address: es. 192.168.1.254			
Byte 21	254				
Byte 22	0	Flag. Default value = 39 (No BOOTP, No DHCP)			
Byte 23	0	If BOOTP is active, flag = 47			
Byte 24	0	If DHCP is active, flag $= 55$			
Byte 25	39	If DHCP+BOOTP are active, flag = 63			
		Total length 26 bytes			

5.2. Write command

The client must send a UDP broadcast message to port 502 and specify the MAC address of the addressee. The message consists of the following:

	Message from Client to Server (RTE)					
Byte 0	'R'					
Byte 1	'ť	Magazza (DtaD)				
Byte 2	'e'	Message:'RteR'				
Byte 3	'W'					
Byte 4	0x00					
Byte 5	0x02					
Byte 6	0xA2	Addrogooo'o MAC Addrogou o a 00,02,42,21,17,EP				
Byte 7	0x21	Audressee's MAC Audress. e.g. 00.02.A2.21.17.ED				
Byte 8	0x17					
Byte 9	xEB					
Byte 10	102 (IP4)					
Byte 11	1 (IP3)	In Address i so 102 168 1 102				
Byte 12	168 (IP2)	IP Address : es. 192.100.1.102				
Byte 13	192 (IP1)					
Byte 14	0 (NM4)					
Byte 15	255 (NM3)	Not Maak : as 255 255 0				
Byte 16	255 (NM2)	IVEL IVIASK : ES. 255.255.255.U				
Byte 17	255 (NM1)					
Byte 18	254 (Gw 4)					
Byte 19	1 (Gw 3)	Catoway in Addresses on 102 169 1 254				
Byte 20	168 (Gw 2)	Galeway ip Address: es. 192.106.1.204				
Byte 21	192 (Gw 1)					
Byte 22	39 (FLG 4)	Flag. Default value = 39 (No BOOTP, No DHCP)				
Byte 23	0 (FLG 3)	If BOOTP is active, flag = 47				
Byte 24	0 (FLG 2)	If DHCP is active, flag $= 55$				
Byte 25	0 (FLG 1)	If DHCP+BOOTP are active, flag = 63				
		Total length 26 bytes				

Message from Server (RTE) to client			
Byte 0	'R'		
Byte 1	'ť	Message:'RteR'	
Byte 2	'e'		
Byte 3	'W'		
Total length 4 bytes			

6. In general

6.1. Glossary

I/O Scanner

Device that controls implicit I/O data exchange on the network. This is usually a PLC.

I/O Adapter

Device that receives requests for implicit communication connection from the scanner and responds with I/O data. The EXP-ETH-IP-ADV200 card installed in the drive acts as adapter and explicit message server.

Explicit Messaging

Connected or unconnected point-to-point messages used to access the objects of a device, with latency not predefined.

Implicit Messaging

Messages exchanged via I/O connections, to transmit specific process data with reduced latency.

Explicit Message Client

Starts the request for explicit communication. Devices of this type

Explicit Message Server

Responds to the client's requests for explicit communication. The EXP-ETH-IP-ADV200 card installed in the drive acts as the server.

Unconnected Messaging

Method for exchanging data between nodes without opening any CIP connection. Only used for explicit messages.

Connected Messaging

A CIP connection can be established between 2 or more application objects between different nodes. This creates a virtual data exchange circuit, in which the resources are pre-allocated and always available. It is used for both implicit (I/O) and explicit messages.

Ethernet

Networking technology for local area networks (LANs), standardized in IEEE 802.3

6.2. Abbreviations

EtherNet/IP	Ethernet Industrial Protocol
CIP	Common Industrial Protocol
TCP/IP	Transmission Control Protocol / Internet Protocol
UDP	User Datagram Protocol
I/O	Input / Output
M2S	Master to Slave (data written to drive), associated with the output instance
S2M	Slave to Master (data read by drive), associated with the input instance
PLC	Programmable Logic Controller.

6.3. References

- 1. PUB00213R0 "EtherNet/IP_Developers_Guide" Quick Start for Vendors Handbook
- 2. ADV200 "Quick Start-up guide Specification and installation" manual
- 3. ADV200 "Functions description and parameters" list manual