Electric Drives and Controls | Hydraulics | Linear Motion and Assembly Technologies | Pneumatics | Service

Rexroth Bosch Group

VT-VPCD – Digital closed loop control electronics for axial piston pumps A4VS... with HS4 control and A2V with EO4 control

RE 30028-03-Z/08.06

Start-up DeviceNet interface

Contents

1 Introduction

1.1 Document

Version: 1.2

1.2 General

Bodac may be used to configure the bus tables. The bus tables de-fine which parameters are mapped in the Transmit and the Receive screens. The mapped parameters in the Transmit screen are sent to the master from the VT-VPCD while the mapped parameters in the Receive screen are sent by the master to the VT-VPCD.

This configuration of the bus tables will be refered to as Mapping in the remainder of this document.

This manual only describes the installation and operation of the controller in respect to the Fieldbus system. Information regarding the commissioning of the controller using BODAC can be found in the manual “Installation and operation of the VPCD controller card”. A list of available documentation can be found in the chapter “Addi-tional documentation”.

The examples used in this manual to show the commis-sioning of the VT-VPCD-1-1X/V0/1-D-0 are done with Al-len Bradley products.

Additional documentation

"VT-VPCD-1 Digital Controller for Electromechanical and Electro-hydraulic Drives" has apart from this manual additional documenta-tion.

It includes:

- RE-sheet "RE 30 028".
- Document RE30 028-B: "VT-VPCD Digital Control Amplifier for Driving Axial Pump Units A4VS... with HS4-Control: Installation and Operation”
- Document RE 30 028-01-B: " VT-VPCD Digital Control Amplifier for Driving Axial Pump Units A4VS... with HS4-Control: Start-up and Operation"
- Document RE 30 028-U: „Declaration on environmental com-patibility in the field of EMC, climate and mechanical stress“
- Internet: www.boschrexroth.com/VPCD

Signs and symbols used in this document

The following signs and symbols are used in this manual:

- ➢ Activity symbol: The text following this sign describes activi-ties. These are to be performed from top to bottom in the order indicated.
- ✓ Result symbol: The text following this sign describes the result of an action.

After this symbol you will find notes and useful tips for op-timal usage of the controller card.

Following this symbol you will find references to additional documentation.

Warning symbols

Special safety notes are provided at the relevant locations. These are indicated by the following symbols.

General hazard potential

Indicates a potentially hazardous condition which, if not avoided, could result in death or serious injury.

If the hazard source can be specifically indicated, the corresponding pictogram will be used.

Electrical current hazard

This symbol refers to a hazardous condition caused by electrical current which, if not avoided, could result in death or serious injury.

Equipment damage

This symbol pertains to actions which could result in damage to equipment.

2 Requirements

2.1 Mapping

Mapping requirements:

- PC with WIN95/98 or WIN NT, with an available COM port or one of the specified USB/RS232 converters
- BODAC (Version 487 and up)
- VPCD Card with DeviceNet (e.g. VT-VPCD-1-1X/V0/1-D-1)
- Experience with DeviceNet
- PLC or Industrial PC with a DeviceNet Master

Only personnel familiar with DeviceNet and the VPCD should con-figure the VT-VPCD-1X/V0/1-D-0.

DeviceNet connections and cabling has to conform to the De-viceNet specifications developed by the ODVA (Open DeviceNet Vendor Association).

Termination of 120 Ohm is necessary at both ends of the trunk.

The VPCD can only be used as a slave.

For detailed information on the DeviceNet connectionn, cabling and termination requirements please refer to the ODVA DeviceNet specification.

3 DeviceNet

3.1 General

DeviceNet is a communications link mainly used in industrial appli-cations. It can use fast, cyclical data exchange with pre-defined pa-rameters or communicate specific parameters using “Explicit Mes-saging”.

Different parameters can be defined using the transmit and receive screens in the BODAC Busmanager. Parameters are either 2 bytes or 4 bytes. A maximum of 16 parameters (4 bytes per parame-ter=64bytes) can be configured in both the DeviceNet Transmit and DeviceNet Receive screen. The screens in BODAC are used for the fast cyclical communication.

Both the parameter map (See Chapter 5) and the EDS (Electronic Data Sheet) file are needed to use the VT-VPCD-1-1X/V0/1-D-1.

This controller is a class 2 DeviceNet device. Communication with the VT-VPCD can be achieved using Transmit and Receive screens or „Explicit Messaging“.

With “Explicit Messaging” the following information is needed to communicate:

Service Get single attribute (0E hex)
Set single attribute (10 hex)

Class Parameter Object (F)

Instance VPCD Parameter number (From the memory map)

Attribute Always 1

The transfer of the parameters is done in the internal dataformat of the VT-VPCD. On the PLC side this internal dataformat has to be converted to engineering units. The limits of the parameters have to be monitored on the PLC side.

3.2 Configure DeviceNet communications using BODAC

Configure DeviceNet by selecting the DeviceNet screen that is lo-cated in the configure pulldown menu of the Main screen.

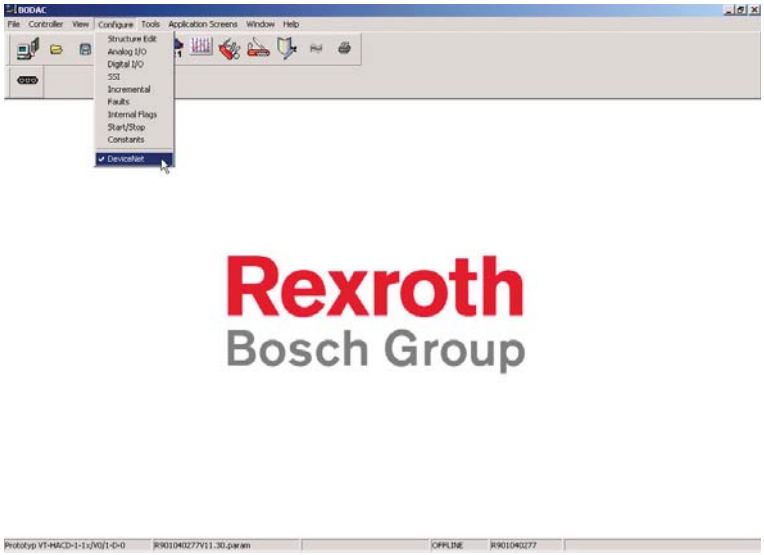

Fig. 1 Main screen VT-VPCD-1-1X/V0/1-D-1

3.3 ID, Baudrate and Active Bus

After selecting DeviceNet the following screen will appear in which the user has to configure the ID (Address) and Baudrate using the available pull down menu's.

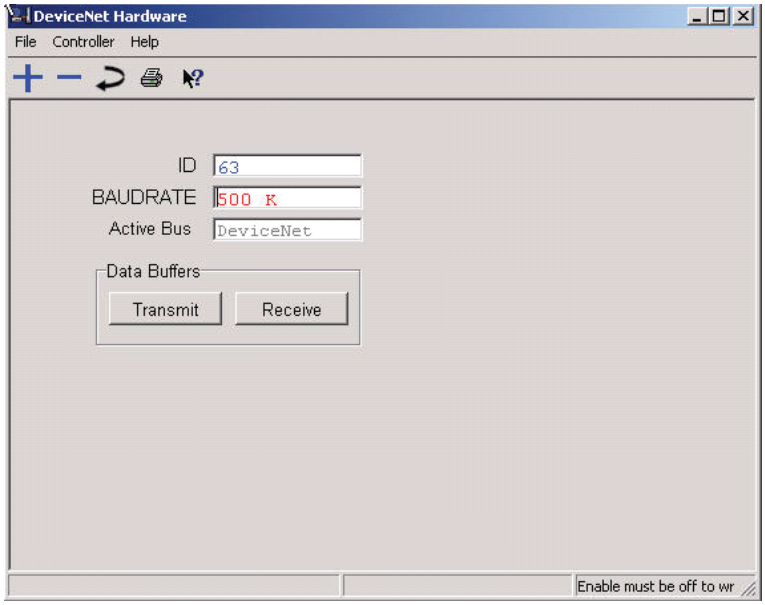

Fig. 2 DeviceNet Hardware screen

ID Configuring the address of the VPCD is done in software using the DeviceNet congiguration screen. The address allowed lies between 1 and 63 (default address). Once the ID has been configured this information needs to be stored in the card using the “Write Parame-ters to VPCD” icon and the user will be prompted for writing the changes to FLASH when exiting the DeviceNet Hardware screen. After the save to FLASH is complete the user is prompted that the card will be reinitialized.

When configuring the ID the user has to ensure that every DeviceNet device connected to the bus has a unique ID.

Baudrate This is the rate with which the data is transmitted and received over DeviceNet. The VT-VPCD supports 125kBit, 250kBit and 500kBit. The default setting for the Baudrate is 125kBit.

The Baudrate of all DeviceNet devices on the trunk need to be equal.

Active Bus Indicates the active bus supported on the VT-VPCD the user is connected to.

4 Data definition

4.1 Example

The parameters defined in the Transmit and Receive screen in BODAC also have to be defined at the PLC side. We will demon-strate this with an example.

The following parameters have to be transferred:

Data to the VPCD:

4 Byte BUS TRIGGER	BUS ID=3199
4 Byte LS1 LOOP1 BLOCK1	BUS ID=1004

Data from the VPCD:

4 Byte C1-1	BUS ID=2742
4 Byte C1-2	BUS ID=2743
4 Byte OUT1 d30	BUS ID=2775

The Transmit (Data from the VPCD : VPCD → PLC) and Receive (Data to the VPCD : VPCD ← PLC) screens are used to define the parameters. The fast cyclic mode in DeviceNet is used to commu-nicate the information when using these screens. A maximum of 16 items (64 bytes of data) for both Transmit and Receive can be se-lected.

4.2 Definition of data from the VPCD

The table on the left of the Transmit screen contains all the pa-rameters that can be transferred from the VT-VPCD to the master using the fast cyclic communication. 2 and 4 byte values can be chosen. In the figure below is the configuration of our example.

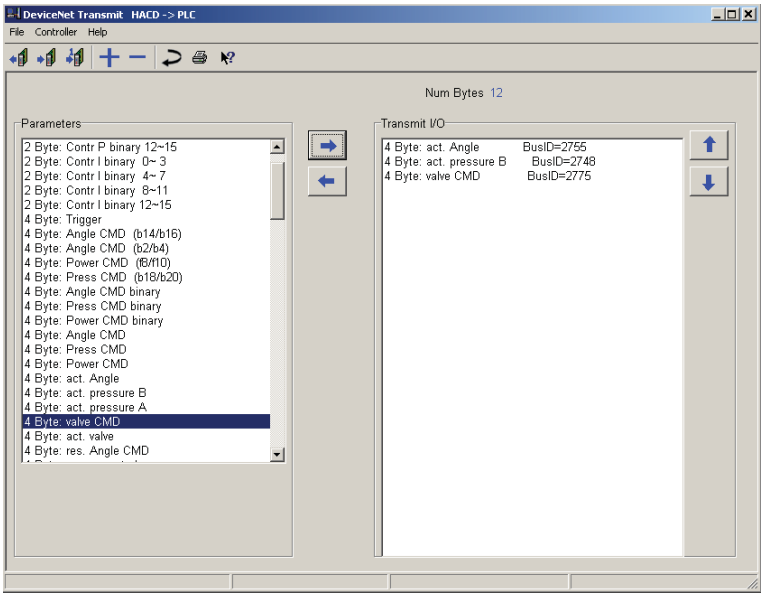

Fig. 3 DeviceNet Transmit VPCD → PLC screen

4.3 Definition of data to the VPCD

Data to the VPCD also has to be configured in the busmanager. Below again is the configuration of our example.

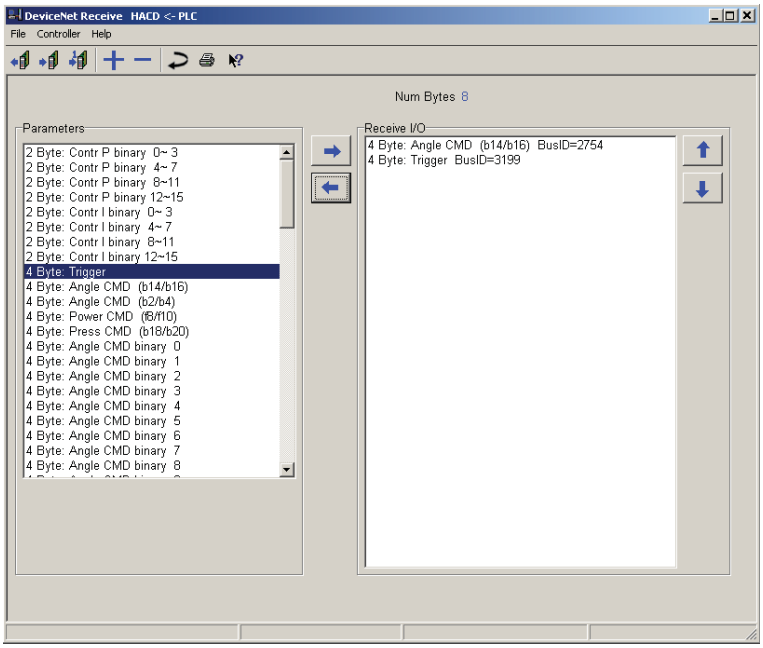

Fig. 4 DeviceNet Transmit VPCD ←PLC screen

After successful configuration of the mapping parameters the data has to be written to FLASH for permanent stor-age in the VPCD.

4.4 Establishing DeviceNet Communication with the VPCD

The following is a description of how to connect to a controller based on the VPCD controller using DeviceNet. In our example we are using software packages like Rockwell RSNetworx and RSLinx along with a communication card like the Rockwell 1784-PCD inter-face. The user has to be familiar with these software packages and hardware to be able to successfully set-up the VT-VPCD and the DeviceNet scanner.

The EDS file for the controller will have to be registered using RSNetworx. The parameter map is located in Chapter 5 of this manual.

The EDS file can be downloaded from the Bosch Rex-roth Homepage.
www.boschrexroth.com/VPCD

Remember that 24 VDC is needed to power the bus. The bus power must be used to power the VT-VPCD.

Start RSLinx and browse the bus with the interface being used. The VT-VPCD will have a default node ID of 63. After the browse is complete the screen should look similar to the following.

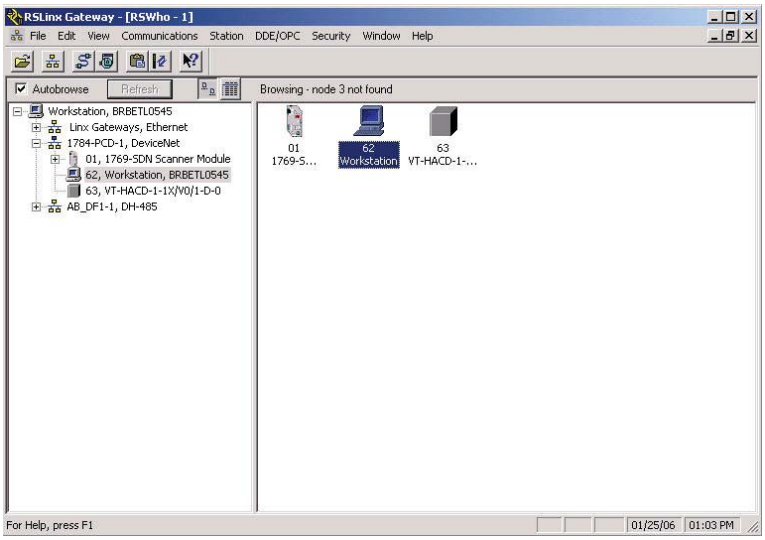

Fig. 5 : RSLinx Gateway screen.

After this the user has to start RS Networx. Start a browse of the DeviceNet network by going online. After the browse is complete RS Networx will display the DeviceNet network with all the devices that were detected. The following screen illustrates this.

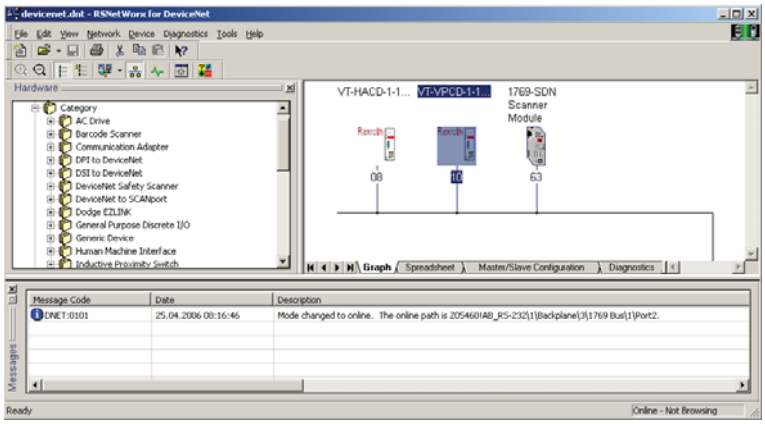

Fig. 6 : RS Networx for DeviceNet screen.

After establishing that the VT-VPCD is connected to the DeviceNet network and is recognized by the software a Node Commission to the controller has to be performed. In the menu bar of the “RS Net-worx for DeviceNet” screen under Tools “Node Commissioning” may be performed if not previously done using BODAC. The pro-gram prompts you to browse for the device that needs to be com-missioned. After completion the program will return with the follow-ing screen.

The Address and Data rate shown in the above screen have to match the setting of the DeviceNet Hardware screen.

To view the VPCD controller parameters and read-only values over DeviceNet double click the controller from the RSNetworx online screen and select the Parameters tab. Now perform an upload. Af-ter the upload a list of all the items in the EDS file should appear in the DeviceNet Parameter screen.

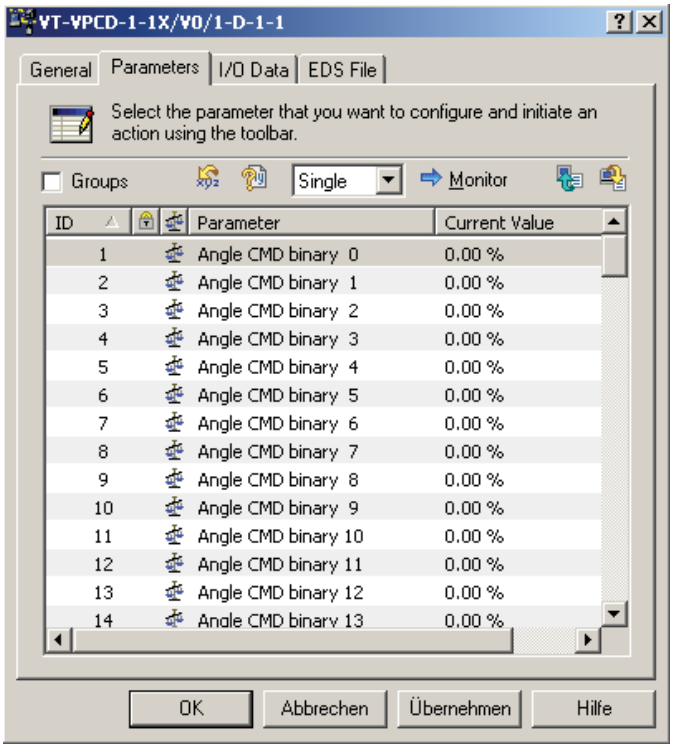

Fig. 7 : RSNetworx parameter screen .

4.5 Scaling of the data transferred

The data transferred has the internal dataformat of the VPCD. Therefor all data to and from the VPCD has to be converted on the PLC side. Scale and offset are needed for conversion. Scale and offset can be different for every parameter and can be found in the EDS file.

The conversion can be calculated using the following formula's:

PLC → VPCD:

(Engineering units – offset) * scale = internal dataformat VPCD

VPCD → PLC:

(Internal dataformat VPCD/ scale) + offset = Engineering units

Engineering unit = Technical unit

4 Data definition

For transferring angle CMD Setpoint CMD1 to the VPCD the following values can be found in the parameter table:

Name		Angle CMD	
Object nr.	Index	3310	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

(4,0 – 0) * 327,67 = 1310,68 (decimal)

This value is mathematically rounded (= 1311) and converted to a hexadecimal value (= 0x051F). Now the value can be transferred.

Monitoring of the parameter limits (min/max value) has to be done in the PLC. Values outside the defined limits can result in incorrect values on the VPCD (e.g. overflow could lead to a negative number instead of a high positive number).

5 Busparameter

5.1 act. Angle

Name		act. Angle	
Object nr.	Index	2755	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.2 act. pressure A

Name		act. pressure A	
Object nr.	Index	2749	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		1	600
Scale	Offset	327,67	0

5.3 act. pressure B

Name		act. pressure B	
Object nr.	Index	2748	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		1	600
Scale	Offset	327,67	0

5.4 act. valve

Name		act. valve	
Object nr.	Index	2752	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,7	0

5.5 Angle CMD

Name		Angle CMD	
Object nr.	Index	3310	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.6 Angle CMD (BUS)

Name		Angle CMD (BUS)	
Object nr.	Index	2831	0
Bytes	Units	4	
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.7 Angle CMD (b14/b16)

Name		Angle CMD (b14/b16)	
Object nr.	Index	2754	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.8 Angle CMD (b2/b4)

Name		Angle CMD (b2/b4)	
Object nr.	Index	2753	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.9 Angle CMD binary

Name		Angle CMD binary	
Object nr.	Index	3306	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.10 Angle CMD binary 0

Name		Angle CMD binary 0	
Object nr.	Index	1100	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.11 Angle CMD binary 1

Name		Angle CMD binary 1	
Object nr.	Index	1103	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.12 Angle CMD binary 2

Name		Angle CMD binary 2	
Object nr.	Index	1106	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.13 Angle CMD binary 3

Name		Angle CMD binary 3	
Object nr.	Index	1109	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.14 Angle CMD binary 4

Name		Angle CMD binary 4	
Object nr.	Index	1112	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.15 Angle CMD binary 5

Name		Angle CMD binary 5	
Object nr.	Index	1115	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.16 Angle CMD binary 6

Name		Angle CMD binary 6	
Object nr.	Index	1118	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.17 Angle CMD binary 7

Name		Angle CMD binary 7	
Object nr.	Index	1121	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.18 Angle CMD binary 8

Name		Angle CMD binary 8	
Object nr.	Index	1124	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.19 Angle CMD binary 9

Name		Angle CMD binary 9	
Object nr.	Index	1127	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.20 Angle CMD binary 10

Name		Angle CMD binary 10	
Object nr.	Index	1130	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.21 Angle CMD binary 11

Name		Angle CMD binary 11	
Object nr.	Index	1133	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.22 Angle CMD binary 12

Name		Angle CMD binary 12	
Object nr.	Index	1136	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.23 Angle CMD binary 13

Name		Angle CMD binary 13	
Object nr.	Index	1139	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.24 Angle CMD binary 14

Name		Angle CMD binary 14	
Object nr.	Index	1142	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.25 Angle CMD binary 15

Name		Angle CMD binary 15	
Object nr.	Index	1145	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.26 Angle Ramp binary 0

Name		Angle Ramp binary 0	
Object nr.	Index	1196	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.27 Angle Ramp binary 1

Name		Angle Ramp binary 1	
Object nr.	Index	1199	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.28 Angle Ramp binary 2

Name		Angle Ramp binary 2	
Object nr.	Index	1202	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.29 Angle Ramp binary 3

Name		Angle Ramp binary 3	
Object nr.	Index	1205	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.30 Angle Ramp binary 4

Name		Angle Ramp binary 4	
Object nr.	Index	1208	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.31 Angle Ramp binary 5

Name		Angle Ramp binary 5	
Object nr.	Index	1211	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.32 Angle Ramp binary 6

Name		Angle Ramp binary 6	
Object nr.	Index	1214	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.33 Angle Ramp binary 7

Name		Angle Ramp binary 7	
Object nr.	Index	1217	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.34 Angle Ramp binary 8

Name		Angle Ramp binary 8	
Object nr.	Index	1220	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.35 Angle Ramp binary 9

Name		Angle Ramp binary 9	
Object nr.	Index	1223	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.36 Angle Ramp binary 10

Name		Angle Ramp binary 10	
Object nr.	Index	1226	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.37 Angle Ramp binary 11

Name		Angle Ramp binary 11	
Object nr.	Index	1229	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.38 Angle Ramp binary 12

Name		Angle Ramp binary 12	
Object nr.	Index	1232	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.39 Angle Ramp binary 13

Name		Angle Ramp binary 13	
Object nr.	Index	1235	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.40 Angle Ramp binary 14

Name		Angle Ramp binary 14	
Object nr.	Index	1238	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.41 Angle Ramp binary 15

Name		Angle Ramp binary 15	
Object nr.	Index	1241	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.42 Bus Status

Name		Bus Status	
Object nr.	Index	3190	0
Bytes	Units	2	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	1	0
Description		Highbyte = Errorflags Bits 15 = Error|Error 8 Bits 14 = Error|Error 7 Bits 13 = Error|Error 6 Bits 12 = Error|Error 5 Bits 11 = Error|Error 4 Bits 10 = Error|Error 3 Bits 09 = Error|Error 2 Bits 08 = Error|Error 1 Lowbyte =Nummber of Fault Angle Cmd Stopp = 0 Pressure CMD Stopp = 1 Power CMD Stopp = 2 act.Pressure B Stopp = 3 act.Pressure A Stopp = 4 res.Angle CMD Stopp = 5 MCP-40/4742 Stopp = 6 Timeout Stopp = 16 Trigger Stopp = 18 Loop Fault Stopp = 19 Checksum = 22 Checksum = 23 Voltage Ub = 24 Reference Voltage = 25 DO1 Short = 26 DO1 Short = 27 DO1 Short = 28 DO1 Short = 29 DO1 Short = 30 DO1 Short = 31 DO1 Short = 32 DO1 Short = 33	

5.43 Contr l binary 0~ 3

Name		Contr l binary 0~ 3	
Object nr.	Index	1677	0
Bytes	Units	2	ms
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		2	30000
Scale	Offset	1	0

5.44 Contr l binary 4~ 7

Name		Contr l binary 4~ 7	
Object nr.	Index	1689	0
Bytes	Units	2	ms
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		2	30000
Scale	Offset	1	0

5.45 Contr l binary 8~11

Name		Contr l binary 8~11	
Object nr.	Index	1701	0
Bytes	Units	2	ms
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		2	30000
Scale	Offset	1	0

5.46 Contr I binary 12~15

Name		Contr I binary 12~15	
Object nr.	Index	1713	0
Bytes	Units	2	ms
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		2	30000
Scale	Offset	1	0

5.47 Contr P binary 0~ 3

Name		Contr P binary 0~ 3	
Object nr.	Index	1581	0
Bytes	Units	2	
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	255
Scale	Offset	128	0

5.48 Contr P binary 4~ 7

Name		Contr P binary 4~ 7	
Object nr.	Index	1593	0
Bytes	Units	2	
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	255
Scale	Offset	128	0

5.49 Contr P binary 8~11

Name		Contr P binary 8~11	
Object nr.	Index	1605	0
Bytes	Units	2	
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	255
Scale	Offset	128	0

5.50 Contr P binary 12~15

Name		Contr P binary 12~15	
Object nr.	Index	1617	0
Bytes	Units	2	
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	255
Scale	Offset	128	0

5.51 Discrete Inputs

Name		Discrete Inputs	
Object nr.	Index	2779	0
Bytes	Units	2	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	511
Scale	Offset	1	0
Description		bit 1 = binary 1 (DI1) bit 2 = binary 2 (DI2) bit 3 = binary 4 (DI3) bit 4 = binary 8 (DI4) bit 5 = Master (DI5) bit 6 = binary enable (DI6) bit 7 = n.c. bit 8 = n.c. bit 9 = Enable	

5.52 Discrete Outputs

Name		Discrete Outputs	
Object nr.	Index	2782	0
Bytes	Units	2	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	255
Scale	Offset	1	0
Description		Bit 1 = DO1 Bit 2 = OK Bit 3 = DO2 Bit 4 = DO3 Bit 5 = DO4 Bit 6 = DO5 Bit 7 = DO6 Bit 8 = DO7	

5.53 Gain LVDT pump

Name		Gain LVDT pump	
Object nr.	Index	160	0
Bytes	Units	2	
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	200
Scale	Offset	12,6	0

5.54 Power CMD

Name		Power CMD	
Object nr.	Index	2762	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,67	0

5.55 Power CMD (BUS)

Name		Power CMD (BUS)	
Object nr.	Index	2839	0
Bytes	Units	4	
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,67	0

5.56 Power CMD (f8/f10)

Name		Power CMD (f8/f10)	
Object nr.	Index	2758	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,67	0

5.57 Power CMD binary

Name		Power CMD binary	
Object nr.	Index	3308	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.58 Power CMD binary 0

Name		Power CMD binary 0	
Object nr.	Index	1102	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,7	0

5.59 Power CMD binary 1

Name		Power CMD binary 1	
Object nr.	Index	1105	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,7	0

5.60 Power CMD binary 2

Name		Power CMD binary 2	
Object nr.	Index	1108	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,7	0

5.61 Power CMD binary 3

Name		Power CMD binary 3	
Object nr.	Index	1111	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,7	0

5.62 Power CMD binary 4

Name		Power CMD binary 4	
Object nr.	Index	1114	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,7	0

5.63 Power CMD binary 5

Name		Power CMD binary 5	
Object nr.	Index	1117	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,7	0

5.64 Power CMD binary 6

Name		Power CMD binary 6	
Object nr.	Index	1120	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,7	0

5.65 Power CMD binary 7

Name		Power CMD binary 7	
Object nr.	Index	1123	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,7	0

5.66 Power CMD binary 8

Name		Power CMD binary 8	
Object nr.	Index	1126	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,7	0

5.67 Power CMD binary 9

Name		Power CMD binary 9	
Object nr.	Index	1129	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,7	0

5.68 Power CMD binary 10

Name		Power CMD binary 10	
Object nr.	Index	1132	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,7	0

5.69 Power CMD binary 11

Name		Power CMD binary 11	
Object nr.	Index	1135	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,7	0

5.70 Power CMD binary 12

Name		Power CMD binary 12	
Object nr.	Index	1138	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,7	0

5.71 Power CMD binary 13

Name		Power CMD binary 13	
Object nr.	Index	1141	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,7	0

5.72 Power CMD binary 14

Name		Power CMD binary 14	
Object nr.	Index	1144	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,7	0

5.73 Power CMD binary 15

Name		Power CMD binary 15	
Object nr.	Index	1147	0
Bytes	Units	4	%
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	100
Scale	Offset	327,7	0

5.74 Press CMD

Name		Press CMD	
Object nr.	Index	2761	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		1	600
Scale	Offset	324,7	0

5.75 Press CMD (b18/b20)

Name		Press CMD (b18/b20)	
Object nr.	Index	2756	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		1	600
Scale	Offset	327,67	0

5.76 Press CMD binary

Name		Press CMD binary	
Object nr.	Index	3307	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.77 Press Ramp binary 0

Name		Press Ramp binary 0	
Object nr.	Index	1197	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.78 Press Ramp binary 1

Name		Press Ramp binary 1	
Object nr.	Index	1200	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.79 Press Ramp binary 2

Name		Press Ramp binary 2	
Object nr.	Index	1203	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.80 Press Ramp binary 3

Name		Press Ramp binary 3	
Object nr.	Index	1206	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.81 Press Ramp binary 4

Name		Press Ramp binary 4	
Object nr.	Index	1209	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.82 Press Ramp binary 5

Name		Press Ramp binary 5	
Object nr.	Index	1212	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.83 Press Ramp binary 6

Name		Press Ramp binary 6	
Object nr.	Index	1215	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.84 Press Ramp binary 7

Name		Press Ramp binary 7	
Object nr.	Index	1218	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.85 Press Ramp binary 8

Name		Press Ramp binary 8	
Object nr.	Index	1221	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.86 Press Ramp binary 9

Name		Press Ramp binary 9	
Object nr.	Index	1224	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.87 Press Ramp binary 10

Name		Press Ramp binary 10	
Object nr.	Index	1227	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.88 Press Ramp binary 11

Name		Press Ramp binary 11	
Object nr.	Index	1230	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.89 Press Ramp binary 12

Name		Press Ramp binary 12	
Object nr.	Index	1233	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.90 Press Ramp binary 13

Name		Press Ramp binary 13	
Object nr.	Index	1236	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.91 Press Ramp binary 14

Name		Press Ramp binary 14	
Object nr.	Index	1239	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.92 Press Ramp binary 15

Name		Press Ramp binary 15	
Object nr.	Index	1242	0
Bytes	Units	2	s
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	300
Scale	Offset	125	0

5.93 Press. CMD binary 0

Name		Press. CMD binary 0	
Object nr.	Index	1101	0
Bytes	Units	4	bar
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	600
Scale	Offset	327,7	0

5.94 Press. CMD binary 1

Name		Press. CMD binary 1	
Object nr.	Index	1104	0
Bytes	Units	4	bar
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	600
Scale	Offset	327,7	0

5.95 Press. CMD binary 2

Name		Press. CMD binary 2	
Object nr.	Index	1107	0
Bytes	Units	4	bar
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	600
Scale	Offset	327,7	0

5.96 Press. CMD binary 3

Name		Press. CMD binary 3	
Object nr.	Index	1110	0
Bytes	Units	4	bar
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	600
Scale	Offset	327,7	0

5.97 Press. CMD binary 4

Name		Press. CMD binary 4	
Object nr.	Index	1113	0
Bytes	Units	4	bar
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	600
Scale	Offset	327,7	0

5.98 Press. CMD binary 5

Name		Press. CMD binary 5	
Object nr.	Index	1116	0
Bytes	Units	4	bar
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	600
Scale	Offset	327,7	0

5.99 Press. CMD binary 6

Name		Press. CMD binary 6	
Object nr.	Index	1119	0
Bytes	Units	4	bar
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	600
Scale	Offset	327,7	0

5.100 Press. CMD binary 7

Name		Press. CMD binary 7	
Object nr.	Index	1122	0
Bytes	Units	4	bar
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	600
Scale	Offset	327,7	0

5.101 Press. CMD binary 8

Name		Press. CMD binary 8	
Object nr.	Index	1125	0
Bytes	Units	4	bar
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	600
Scale	Offset	327,7	0

5.102 Press. CMD binary 9

Name		Press. CMD binary 9	
Object nr.	Index	1128	0
Bytes	Units	4	bar
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	600
Scale	Offset	327,7	0

5.103 Press. CMD binary 10

Name		Press. CMD binary 10	
Object nr.	Index	1131	0
Bytes	Units	4	bar
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	600
Scale	Offset	327,7	0

5.104 Press. CMD binary 11

Name		Press. CMD binary 11	
Object nr.	Index	1134	0
Bytes	Units	4	bar
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	600
Scale	Offset	327,7	0

5.105 Press. CMD binary 12

Name		Press. CMD binary 12	
Object nr.	Index	1137	0
Bytes	Units	4	bar
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	600
Scale	Offset	327,7	0

5.106 Press. CMD binary 13

Name		Press. CMD binary 13	
Object nr.	Index	1140	0
Bytes	Units	4	bar
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	600
Scale	Offset	327,7	0

5.107 Press. CMD binary 14

Name		Press. CMD binary 14	
Object nr.	Index	1143	0
Bytes	Units	4	bar
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	600
Scale	Offset	327,7	0

5.108 Press. CMD binary 15

Name		Press. CMD binary 15	
Object nr.	Index	1146	0
Bytes	Units	4	bar
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	600
Scale	Offset	327,7	0

5.109 Pressure CMD (BUS)

Name		Pressure CMD (BUS)	
Object nr.	Index	2835	0
Bytes	Units	4	
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,67	0

5.110 pressure stroke

Name		pressure stroke	
Object nr.	Index	3311	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,7	0

5.111 res. Angle CMD

Name		res. Angle CMD	
Object nr.	Index	2776	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,7	0

5.112 res. Angle CMD (BUS)

Name		res. Angle CMD (BUS)	
Object nr.	Index	2842	0
Bytes	Units	4	
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		1	600
Scale	Offset	327,67	0

5.113 Trigger

Name		Trigger	
Object nr.	Index	3199	0
Bytes	Units	4	
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		0	32
Scale	Offset	1	0
Description		Bit 0 = binary 0 Bit 1 = binary 1 Bit 2 = binary 2 Bit 3 = binary 3 Bit 4 = binary 4 Bit 5 = binary 5 Bit 6 = binary 6 Bit 7 = binary 7 Bit 8 = binary 8 Bit 9 = binary 9 Bit 10 = binary 10 Bit 11 = binary 11 Bit 12 = binary 12 Bit 13 = binary 13 Bit 14 = binary 14 Bit 15 = binary 15 Bit 16 = Slave	

5.114 valve CMD

Name		valve CMD	
Object nr.	Index	2775	0
Bytes	Units	4	
Access		Read Only	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-100	100
Scale	Offset	327,7	0

5.115 Zeropoint pump

Name		Zeropoint pump	
Object nr.	Index	3180	0
Bytes	Units	4	
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-20	20
Scale	Offset	327,7	0

5.116 Zeropoint valve

Name		Zeropoint valve	
Object nr.	Index	163	0
Bytes	Units	2	[%]
Access		Read/Write	
Value Acceptance		also with active enabling	
Busmanager		available	
Min./Max. Value		-12	12
Scale	Offset	150	0

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