

CANopen® protocol description PRO IONIZER

Description CANopen® protocol and object directory PRO IONIZER

In this document the CANopen® services as well as the implemented object dictionary supported by the PRO IONIZER are shown and explained.

Supported CANopen® services

The following standard CANopen® services and transfer types are supported:

- NMT services
- Node monitoring
- EMCY service
- LSS services
- SDO transfer
- PDO transfer

NMT services

With the Network Management Services (NMT) the selected power supply PRO IONIZER resp. the entire CANopen® network can be controlled by the master. All NMT commands are always sent from the master to the CANopen® slaves. The protocol for the transmission of NMT commands is shown below:

COB-ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0x000	NMT Command	Node ID	x	x	x	x	x	x

- NMT Command
Command to control the selected node
 - 0x01: Switch the node to operational state
 - 0x02: Stop the node
 - 0x80: Switch the node to pre-operational state
 - 0x81: Re-start of the node
 - 0x82: Re-start of the CANopen® communication of the node
- Node ID
The address of the selected node
 - 0x00: NMT command is globally executed for all nodes
 - 0x01 – 0x7F: NMT command is executed for the respective node
- X
not used

Node monitoring

With the PRO IONIZER the Heartbeat Protocol can be used to monitor the CANopen® node. The heartbeat is sent cyclically by the power supply in a time that can be set in steps of 100 ms. The structure of the protocol is shown below:

COB-ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0x700 + Node-ID	Node State	x	x	x	x	x	x	x

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- Node State
 - 0x00: Boot-Up node
 - 0x04: Node in Stopped Mode
 - 0x05: Node in Operational Mode
 - 0x7F: Node in Pre-Operational Mode

EMCY service

With the Emergency Service (EMCY), error and warning messages are transmitted from the power supply to the consumer of the EMCY messages. A confirmation by this service is also transmitted after the successful deletion of an error or a warning. The EMCY protocol is shown graphically below.

COB-ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0x080 + Node-ID	EMCY Error Code		Error Register	Type	Code	x	x	x

- EMCY Error Code
 - CANopen® specific error code of an error or warning
 - 0x0000: no error / warning occurred
 - 0x1000 – 0xFFFF: CANopen® specific error code; detailed information see CiA301
- Error Register
 - display of the error type
 - 0x00: no error / warning occurred resp. deleted
 - 0x01 – 0xFF: error / warning occurred; detailed information see CiA 301
- Type
 - Display of the error type
- 0x01: error
- 0x05: warning
- Code
 - number of the error / warning; detailed information see chapter 6.1 and 6.2 in the Operating Instructions of the PRO IONIZER.
- X
 - not used: always 0x00

LSS Services

The LSS services can be used to set the CANopen® node address and baud rate. The procedure for setting the node address and the baud rate is basically the same. First, the node is started in the LSS Config Status, then the new configuration parameters are transmitted with the Configure Node-ID Service or Configure Bit Timing Parameters Service. The parameters are saved by the Store Configuration Service.

The new parameters are available after restarting the node or communication using the NMT services. The new baud rate can also be activated via the Activate Bit Timing Parameter Service. However, it must be ensured that all devices in the CANopen® network are converted to the new baud rate. Otherwise, communication errors will occur on the individual devices. For further information regarding the LSS services see CiA 305.

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PDO Transfer

The Process Data Object (PDO) transfer represents a direct transfer (without confirmation) by the recipient. The data is transferred without further information - only with the CAN identifier (COB-ID) - for identification. The objects marked in the object directory for PDO mapping are marked in the respective data bytes. The PDO transfer is only available in the operational mode. In the other CANopen® modes, there is no transmission or evaluation of the PDO data.

For detailed information of the PDO transfer and the set parameters, see the PRO IONIZER object directory and the CiA 301 specification.

SDO Transfer

All entries in the object directory can be accessed using Service Data Objects (SDO). This transmission is always confirmed with a response from the selected node. The POWER IONIZER power supply is configured as an SDO server. This means that other devices (SDO clients) within the CANopen® network can access the individual objects by downloading (read access) and uploading (write access). Due to the maximum data length of four bytes, segmented SDO transfer and block transfer are not supported.

The structure of the protocol for the SDO transfer is shown below.

COB-ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
COB-ID	Command Byte	Object Index LSB	Object Index MSB	Object Subindex	Data LSB first			

- COB-ID
CAN Identifier of the message
 - 0x580 + Node-ID: Transfer from PRO IONIZER to SDO client
 - 0x600 + Node-ID: Transfer from SDO client to PRO IONIZER
- Command Byte
SDO type of access to the selected object
 - 0x22: write access by SDO client
 - 0x40: read access by SDO client
 - 0x43: confirmation by SDO server reading 4 bytes
 - 0x4B: confirmation by SDO server reading 2 bytes
 - 0x4F: confirmation by SDO server reading 1 byte
 - 0x80: cancellation of the SDO transfer by SDO server
- Object Index LSB
least significant byte of Object Index
- Object Index MSB
most significant byte of Object Index
- Object Subindex
subindex of the Object

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- Data (LSB first)
Data field with the content of the object data. The least significant byte is the first in the data field. In this area, the new data are transferred in the case of a write access. When reading, the data are contained in the response from the SDO server. Certain CANopen®-specific error codes are also transmitted in the data field in the case of error events. If the entries are not required for the transfer, they must always be filled with 0x00.
For further information see CANopen® specification CiA 301.

Overview PRO IONIZER CANopen® Object directory

All CANopen® objects supported by the PRO IONIZER are listed in the following table.

Object Index	Object name
0x1000	Device type
0x1001	Error register
0x1003	Pre-defined Error Field
0x1008	Manufacturer device name
0x100A	Manufacturer software version
0x1010	Store Parameter Field
0x1011	Restore Parameter Defaults
x01014	COB-ID EMCY message
0x1017	Producer Heartbeat time
0x1018	Identity Object
0x1200	Server SDO parameter
0x1400	1. Receive PDO parameter
0x1600	1. Receive PDO Mapping
0x1800	1. Transmit PDO parameter
0x1801	2. Transmit PDO parameter
0x1802	3. Transmit PDO parameter
0x1A00	1. Transmit PDO Mapping
0x1A01	2. Transmit PDO Mapping
0x1A02	3. Transmit PDO Mapping
0x2000	Read Operating Hours
0x2001	Read Actual Values
0x2002	Read/Write Parameters
0x2003	Clear Error/Warning
0x6000	Read Input 8 Bit
0x6200	Write Output 8 Bit
0x6401	Read Analog Input 16 Bit

In the further course of the document, the individual objects are explained regarding to the individual parameters for access and the sub-indices contained in an object. All these objects are also summarized in the CANopen® EDS Datei (ES61.eds).

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Object 0x1000 Device type

Object for the CANopen® device profile

Index	0x1000
Subindex	0x00
Name	Device type
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x000F0191
Low Limit	
High Limit	

Object 0x1001 Error register

Object for the CANopen® error register

Index	0x1001
Subindex	0x00
Name	Error register
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

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Object 0x1003 Pre-defined Error Field

Object for the CANopen[®] specifically Pre-defined error field

Index	0x1003
Name	Pre-defined Error Field
Object Code	ARRAY

Index	0x1003
Subindex	0x00
Name	Number of Errors
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	
High Limit	

Index	0x1003
Subindex	0x01
Name	Standard Error Field
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0
Low Limit	
High Limit	

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Object 0x1008 Manufacturer device name

Object for the Eltex device name

Index	0x1008
Subindex	0x00
Name	Manufacturer device name
Object Code	VAR
Data Type	VISIBLE STRING
Data Size	3 Byte
Access Type	CONST
PDO Mapping	No
Default Value	ES61
Low Limit	
High Limit	

Object 0x100A Manufacturer software version

Object for the software version

Index	0x100A
Subindex	0x00
Name	Manufacturer software version
Object Code	VAR
Data Type	VISIBLE STRING
Data Size	4 Byte
Access Type	CONST
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

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Object 0x1010 Store Parameter Field

Object for saving the parameter data. If the object 0x1010 subindex 0x01 is addressed with a write access, all parameter values are stored in an internal memory.

Index	0x1010
Name	Store Parameter Field
Object Code	ARRAY

Index	0x100
Subindex	0x00
Name	Number of entries
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x01
Low Limit	
High Limit	

Index	0x1010
Subindex	0x01
Name	Save all parameters
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

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Object 0x1011 Restore Default Parameters

Object for loading the factory settings for the parameters. If the object 0x1011 subindex 0x01 is addressed with a write access, all parameter values are reset to the factory settings; except the CANopen® node address and the bit timing; these parameters are not reset.

Index	0x1011
Name	Restore Parameter Defaults
Object Code	ARRAY

Index	0x101
Subindex	0x00
Name	Number of entries
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x01
Low Limit	
High Limit	

Index	0x1011
Subindex	0x01
Name	Restore all Default Parameters
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

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Object 0x1014 COB-ID EMCY Message

Object for the CAN Identifier of the EMCY message

Index	0x1014
Subindex	0x00
Name	COB-ID EMCY Message
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x80 + Node-ID
Low Limit	
High Limit	

Object 0x1017 Producer Heartbeat Time

The heartbeat time for node monitoring can be set with this object. The time can be set in a range of 100 ms – 60000 ms (1 min) in 100 ms steps. If the value 0 is selected, the heartbeat is deactivated. By default, the heartbeat is sent every second.

Index	0x1017
Subindex	0x00
Name	Producer heartbeat time
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	100
High Limit	60000

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Object 0x1018 Identity Object

Object to identify the CANopen[®] node

Index	0x1011
Name	Identity Object
Object Code	RECORD

Index	0x118
Subindex	0x00
Name	Number of entries
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Low Limit	
High Limit	

Index	0x1018
Subindex	0x01
Name	Vendor ID
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x0000024E
Low Limit	
High Limit	

Index	0x1018
Subindex	0x02
Name	Product Code
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

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Index	0x1018
Subindex	0x03
Name	Revision Number
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

Index	0x1018
Subindex	0x04
Name	Serial Number
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

Object 0x1200 1. Server SDO parameters

Object with the SDO Server parameters

Index	0x1200
Name	1. Server SDO parameters
Object Code	RECORD

Index	0x1200
Subindex	0x00
Name	Number of entries
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x02
Low Limit	
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Index	0x1200
Subindex	0x01
Name	COB-ID Client -> Server (rx)
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x600 + Node-ID
Low Limit	
High Limit	

Index	0x1200
Subindex	0x02
Name	COB-ID Server -> Client (tx)
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Low Limit	
High Limit	

Object 0x1400 1st Receive PDO parameter

Object with the communication parameters for the 1st Receive PDO

Index	0x1400
Name	1. Receive PDO Parameter
Object Code	RECORD

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Index	0x1400
Subindex	0x00
Name	Largest Sub-Index supported
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x02
Low Limit	
High Limit	

Index	0x1400
Subindex	0x01
Name	COB-ID used by PDO
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x200 + Node-ID
Low Limit	
High Limit	

Index	0x1400
Subindex	0x02
Name	Transmission Type
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	255
Low Limit	
High Limit	

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Object 0x1600 1st Receive PDO Mapping

Mapping parameter for the 1st Receive PDO

Index	0x1600
Name	1. Receive PDO Mapping
Object Code	RECORD

Index	0x1600
Subindex	0x00
Name	Number of mapped Application Objects supported
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x01
Low Limit	
High Limit	

Index	0x1600
Subindex	0x01
Name	1. mapped Object
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x62000108
Low Limit	
High Limit	

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Object 0x1800 1st Transmit PDO parameter

Object with the communication parameters for the 1st Transmit PDO

Index	0x1800
Name	1. Transmit PDO Parameter
Object Code	RECORD
Data Type	UNSIGNED32

Index	0x1800
Subindex	0x00
Name	Largest Sub-Index supported
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x02
Low Limit	
High Limit	

Index	0x1800
Subindex	0x01
Name	COB-ID used by PDO
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x180 + Node-ID
Low Limit	
High Limit	

Index	0x1800
Subindex	0x02
Name	Transmission Type
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	255
Low Limit	
High Limit	

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Object 0x1801 2nd Transmit PDO parameter

Object with the communication parameters for the 2nd Transmit PDO

Index	0x1801
Name	2. Transmit PDO Parameter
Object Code	RECORD

Index	0x1801
Subindex	0x00
Name	Largest Sub-Index supported
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x02
Low Limit	
High Limit	

Index	0x1801
Subindex	0x01
Name	COB-ID used by PDO
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x280 + Node-ID
Low Limit	
High Limit	

Index	0x1801
Subindex	0x02
Name	Transmission Type
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	255
Low Limit	
High Limit	

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Object 0x1802 3rd Transmit PDO parameter

Object with the communication parameters for the 3rd Transmit PDO

Index	0x1802
Name	3. Transmit PDO Parameter
Object Code	RECORD

Index	0x1802
Subindex	0x00
Name	Largest Sub-Index supported
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x02
Low Limit	
High Limit	

Index	0x1802
Subindex	0x01
Name	COB-ID used by PDO
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x380 + Node-ID
Low Limit	
High Limit	

Index	0x1802
Subindex	0x02
Name	Transmission Type
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	255
Low Limit	
High Limit	

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Object 0x1A00 1st Transmit PDO Mapping

Mapping parameter for the 1st Transmit PDO

Index	0x1A00
Name	1. Transmit PDO Mapping
Object Code	RECORD

Index	0x1A00
Subindex	0x00
Name	Number of mapped Application Objects supported
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x06
Low Limit	
High Limit	

Index	0x1A00
Subindex	0x01
Name	1. mapped Object
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x60000108
Low Limit	
High Limit	

Index	0x1A00
Subindex	0x02
Name	2. mapped Object
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x60000208
Low Limit	
High Limit	

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Index	0x1A00
Subindex	0x03
Name	3. mapped Object
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x60000308
Low Limit	
High Limit	

Index	0x1A00
Subindex	0x04
Name	4. mapped Object
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x60000408
Low Limit	
High Limit	

Index	0x1A00
Subindex	0x05
Name	5. mapped Object
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x60000508
Low Limit	
High Limit	

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Index	0x1A00
Subindex	0x06
Name	6. mapped Object
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x60000608
Low Limit	
High Limit	

Object 0x1A01 2nd Transmit PDO Mapping

Mapping parameter for the 2nd Transmit PDO

Index	0x1A01
Name	2. Transmit PDO Mapping
Object Code	RECORD

Index	0x1A01
Subindex	0x00
Name	Number of mapped Application Objects supported
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x04
Low Limit	
High Limit	

Index	0x1A01
Subindex	0x01
Name	1. mapped Object
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x64010110
Low Limit	
High Limit	

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Index	0x1A01
Subindex	0x02
Name	2. mapped Object
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x64010210
Low Limit	
High Limit	

Index	0x1A01
Subindex	0x03
Name	3. mapped Object
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x64010310
Low Limit	
High Limit	

Index	0x1A01
Subindex	0x04
Name	4. mapped Object
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x64010410
Low Limit	
High Limit	

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Object 0x1A02 3rd Transmit PDO Mapping

Mapping parameter for the 3rd Transmit PDO

Index	0x1A02
Name	3. Transmit PDO Mapping
Object Code	RECORD

Index	0x1A02
Subindex	0x00
Name	Number of mapped Application Objects supported
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x04
Low Limit	
High Limit	

Index	0x1A02
Subindex	0x01
Name	1. mapped Object
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x64010510
Low Limit	
High Limit	

Index	0x1A02
Subindex	0x02
Name	2. mapped Object
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x64010610
Low Limit	
High Limit	

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Index	0x1A02
Subindex	0x03
Name	3. mapped Object
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x64010710
Low Limit	
High Limit	

Index	0x1A02
Subindex	0x04
Name	4. mapped Object
Object Code	VAR
Data Type	UNSIGNED32
Data Size	4 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x64010810
Low Limit	
High Limit	

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Object 0x2000 Read Operating Hours

Object contains individual entries for reading out the individual operating hour counters. All entries can be read out by the SDO client. Write access is not supported.

Index	0x2000
Name	Read Operating Hours
Object Code	RECORD

Index	0x2000
Subindex	0x00
Name	Number of elements
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x0C
Low Limit	
High Limit	

- Subindex 0x01: Years of the operating hours counter

Index	0x2000
Subindex	0x01
Name	Read Operating Hours Years
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

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- Subindex 0x02: Days of the operating hours counter

Index	0x2000
Subindex	0x02
Name	Read Operating Hours Days
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x03: Hours of the operating hours counter

Index	0x2000
Subindex	0x03
Name	Read Operating Hours Hours
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x04: Minutes of the operating hours counter

Index	0x2000
Subindex	0x04
Name	Read Operating Hours Minutes
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

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- Subindex 0x09: Years of the Discharging hours counter

Index	0x2000
Subindex	0x09
Name	Read Discharging Hours Years
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x0A: Days of the Discharging hours counter

Index	0x2000
Subindex	0x0A
Name	Read Discharging Hours Days
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x0B: Hours of the Discharging hours counter

Index	0x2000
Subindex	0x0B
Name	Read Discharging Hours Hours
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

CANopen® protocol description PRO IONIZER

- Subindex 0x0C: Minutes of the Discharging hours counter

Index	0x2000
Subindex	0x0C
Name	Read Discharging Hours Minutes
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

Object 0x2001 Read Actual Values

The entries for reading out the measured actual values are summarized in this object and assigned to the measured variable.

All possible entries are listed here. Depending on the variant of the device, not all are supported. If an unsupported value is accessed, the SDO error 0x06090011 (Sub-index does not exist) is transmitted as a response.

Index	0x2001
Name	Read Actual Values
Object Code	RECORD

Index	0x2001
Subindex	0x00
Name	Number of elements
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x1A
Low Limit	
High Limit	

CANopen® protocol description PRO IONIZER

- Subindex 0x01: Effective voltage of the positive half-wave in V

Index	0x2001
Subindex	0x01
Name	Read Voltage Discharging Positive
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x02: Effective voltage of the negative half-wave in V

Index	0x2001
Subindex	0x01
Name	Read Voltage Discharging Negative
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x03: Supply voltage in mV

Index	0x2001
Subindex	0x03
Name	Read Supply Voltage
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

CANopen® protocol description PRO IONIZER

- Subindex 0x04: Internal device temperature in °C

Index	0x2001
Subindex	0x04
Name	Read Temperature Device
Object Code	VAR
Data Type	UNSIGNED16
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x05: Discharging mode

Discharge operating status.

The indication of the operating state is divided into two parts. The low-order byte represents the current operating mode. In the high-order byte the limiters of the discharge are represented.

- Discharge operating mode
 - 0 – Passive discharge
 - 1 – Active discharge
- Bit 8 – Limiter Discharge
 - 0 – Voltage limiter not active
 - 1 – Voltage limiter active

Index	0x2001
Subindex	0x05
Name	Read Discharging Mode
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

CANopen® protocol description PRO IONIZER

- Subindex 0x06: Effective power Discharge, connection 1 in mW.

Index	0x2001
Subindex	0x06
Name	Read Power Discharge 1
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x07: Effective power Discharge, connection 2 in mW.

Index	0x2001
Subindex	0x07
Name	Read Power Discharge 2
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x08: Effective power Discharge, connection 3 in mW.

Index	0x2001
Subindex	0x08
Name	Read Power Discharge 3
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x30
Low Limit	
High Limit	

CANopen® protocol description PRO IONIZER

- Subindex 0x09: Effective power Discharge, connection 4 in mW.

Index	0x2001
Subindex	0x09
Name	Read Power Discharge 4
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x0A: Pollution Discharge, connection 1 in %.

Index	0x2001
Subindex	0x0A
Name	Read Pollution Discharge 1
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x0B: Pollution Discharge, connection 2 in %.

Index	0x2001
Subindex	0x0B
Name	Read Pollution Discharge 1
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

CANopen® protocol description PRO IONIZER

- Subindex 0x0C: Pollution Discharge, connection 3 in %.

Index	0x2001
Subindex	0x0C
Name	Read Pollution Discharge 3
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x0D: Pollution Discharge, connection 4 in %.

Index	0x2001
Subindex	0x0D
Name	Read Pollution Discharge 4
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x0E: Number of revolutions of the speed sensor 1 per minute.

Index	0x2001
Subindex	0x0E
Name	Read Revolutions Speed Sensor 1
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

CANopen® protocol description PRO IONIZER

- Subindex 0x0F: Number of revolutions of the speed sensor 2 per minute.

Index	0x2001
Subindex	0x0F
Name	Read Revolutions Speed Sensor 2
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x10: Number of revolutions of the speed sensor 3 per minute.

Index	0x2001
Subindex	0x10
Name	Read Revolutions Speed Sensor 3
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x11: Number of revolutions of the speed sensor 4 per minute.

Index	0x2001
Subindex	0x11
Name	Read Revolutions Speed Sensor 4
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

CANopen® protocol description PRO IONIZER

- Subindex 0x12: Number of revolutions of the speed sensor 5 per minute.

Index	0x2001
Subindex	0x12
Name	Read Revolutions Speed Sensor 5
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x13: Number of revolutions of the speed sensor 6 per minute.

Index	0x2001
Subindex	0x13
Name	Read Revolutions Speed Sensor 6
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x14: Number of revolutions of the speed sensor 7 per minute.

Index	0x2001
Subindex	0x14
Name	Read Revolutions Speed Sensor 7
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

CANopen® protocol description PRO IONIZER

- Subindex 0x15: Number of revolutions of the speed sensor 8 per minute.

Index	0x2001
Subindex	0x15
Name	Read Revolutions Speed Sensor 8
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x16: Number of revolutions of the speed sensor 9 per minute.

Index	0x2001
Subindex	0x16
Name	Read Revolutions Speed Sensor 9
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x17: Number of revolutions of the speed sensor 10 per minute.

Index	0x2001
Subindex	0x17
Name	Read Revolutions Speed Sensor 10
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

CANopen® protocol description PRO IONIZER

- Subindex 0x18: Status of the digital input of the sensor inputs D1-D10 and A1-A2. The status is signalled by the corresponding bit for the respective sensor input. The digital status of the sensor input is arranged as follows:

Byte 0								Byte 1							
LSB				MSB				LSB				MSB			
D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	A1	A2				

Index	0x2001
Subindex	0x18
Name	Read State Digital Inputs D1-D10, A1-A2
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

CANopen[®] protocol description PRO IONIZER

- Subindex 0x19: Voltage of the analog sensor input A1 in mV

Index	0x2001
Subindex	0x19
Name	Read Analog Voltage Input A1
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x1A: Voltage of the analog sensor input A2 in mV

Index	0x2001
Subindex	0x1A
Name	Read Analog Voltage Input A2
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

CANopen® protocol description PRO IONIZER

Object 0x2002 Read/Write Parameter

With the entries of object 0x2002, all parameters for operating the power supply can be read and written. These entries represent the complete setting options.

All possible entries are listed here. Depending on the variant of the device, not all are supported. If an unsupported value is accessed, the SDO error 0x06090011 (Sub-index does not exist) is transmitted as a response.

Index	0x2002
Name	Read/Write Parameter
Object Code	RECORD

Index	0x2002
Subindex	0x00
Name	Number of elements
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x3C
Low Limit	
High Limit	

- Subindex 0x01: Read/Write Actual Value Transfer Time

Setting the cycle time for transferring the actual values that are mapped in the two transmit PDOs. Cycle times in the range from 100 ms – 60000 ms (1 min) can be set. A time of 500 ms is set by default. Setting this parameter, the entire bus load must be considered. If a lower time is set, the bus load increases.

Index	0x2002
Subindex	0x01
Name	Read/Write Actual Value Transfer Time
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	500
Low Limit	100
High Limit	60000

CANopen[®] protocol description PRO IONIZER

- Subindex 0x02: Read/Write HV Release Mode

Setting the release option of the high voltage. The individual release options can be activated separately from one another. The output of the high voltage starts after the conditions for the release are set.

- Bit 0 – Autostart
 - 0 – Autostart deactivated
 - 1 – Autostart activated (automatic setting of the software release after switching on the supply voltage)
- Bit 1 – HMI
 - 0 – HMI Release deactivated
 - 1 – HMI Release activated (release can be switched on / off via touch screen or keypad)
- Bit 2 – CANopen[®]
 - 0 – Release via CANopen[®] deactivated
 - 1 – Release via CANopen[®] activated (software release can be controlled via fieldbus)
- Bit 3 – Fieldbus Ethernet
 - 0 – Release via Ethernet deactivated
 - 1 – Release via Ethernet activated
- Bit 4 – Hardware release
 - 0 – Hardware release deactivated
 - 1 – Hardware release activated

Index	0x2002
Subindex	0x02
Name	Read/Write HV Release Mode
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	2
Low Limit	0
High Limit	31

CANopen® protocol description PRO IONIZER

- Subindex 0x03: Read/Write Output Signal Mode

Setting the mode for the message output for signaling the individual device states.

- 0 – HV active
- 1 – Warning
- 2 – Pollution

Index	0x2002
Subindex	0x03
Name	Read/Write Output Signal Mode
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	2

- Subindex 0x04: Read/Write HV Release Timeout

Timeout for the release of the high voltage. After the timeout has expired, the software release is automatically deleted. The timer is reset when the release is sent again via the bus. The timeout can be set in a range of 500 ms – 60000 ms. For values less than 500 ms, the value is set to 0. This deactivates the timeout.

Index	0x2002
Subindex	0x04
Name	Read/Write HV Release Timeout
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	60000

CANopen® protocol description PRO IONIZER

- Subindex 0x05: Read Burn-In Test State

Reading of the burn-in test status

0x00: No burn-in test was carried out.

0x01: Burn-in test was carried out successfully.

Index	0x2002
Subindex	0x05
Name	Read Burn-In Test State
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x06: Read/Write CANopen® Node ID

Setting of the CANopen® node address

To accept the new node address, it must first be saved using the SDO object 0x1010. The node must then be restarted. This can be done with the NMT command or by switching the supply voltage off and on.

Index	0x2002
Subindex	0x06
Name	Read/Write CANopen® Node ID
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	99
Low Limit	1
High Limit	127

CANopen[®] protocol description PRO IONIZER

- Subindex 0x07: Read/Write CANopen[®] Bit Timing

Setting the CANopen[®] baud rate by selecting the corresponding table entry for the bit timing.

To accept the new baud rate, it must first be saved using the SDO object 0x1010. The node must then be restarted. This can be done with the NMT command or by switching the supply voltage off and on.

- 0 – 1000 kBit/s
- 1 – 800 kBit/s
- 2 – 500 kBit/s
- 3 – 250 kBit/s
- 4 – 125 kBit/s
- 5 – not supported
- 6 – 50 kBit/s
- 7 – 25 kBit/s
- 8 – 10 kBit/s
- 9 - CANopen[®] Communication deactivated

Index	0x2002
Subindex	0x07
Name	Read/Write CANopen [®] Bit Timing
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	4
Low Limit	0
High Limit	9

CANopen® protocol description PRO IONIZER

- Subindex 0x08: Read/Write Voltage Setpoint Discharging
Setting of the voltage setpoint for the discharging in V.

Index	0x2002
Subindex	0x08
Name	Read/Write Voltage Setpoint Discharging
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	Maximum Voltage Discharging
Low Limit	Minimum Voltage Discharging
High Limit	Maximum Voltage Discharging

- Subindex 0x09: Read Current Setpoint Discharging
Setting of the current setpoint for the discharging in μA .

Index	0x2002
Subindex	0x09
Name	Read Current Setpoint Discharging
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

- Subindex 0x0A: Read Power Setpoint Discharging
Power set point of the discharge. The parameter is read-only.
Changes are made exclusively via internal conditions (e.g. temperatures, input power, etc.).

Index	0x2002
Subindex	0x0A
Name	Read Power Setpoint Discharging
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	
Low Limit	
High Limit	

CANopen® protocol description PRO IONIZER

- Subindex 0x0B: Read/Write Setpoint Percent Discharging

Setting of the voltage setpoint in % for the discharge.

Index	0x2002
Subindex	0x0B
Name	Read/Write Setpoint Percent Discharging
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	100
Low Limit	0
High Limit	100

- Subindex 0x0C: Read/Write Frequency Discharging

Setting the frequency for the discharge voltage.

The setting is made by selecting the respective index for the corresponding frequency. The following frequencies are available:

- 0 – 50,0 Hz
- 1 – 62,5 Hz
- 2 – 75,0 Hz
- 3 – 87,5 Hz
- 4 – 100 Hz
- 5 – 125 Hz
- 6 – 150 Hz
- 7 – 175 Hz
- 8 – 200 Hz

Index	0x2002
Subindex	0x0C
Name	Read/Write Frequency Discharging
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	8

CANopen® protocol description PRO IONIZER

- Subindex 0x0D: Read/Write Ion Balance Discharging

Adjustment of the balance between the positive and negative half-wave to optimize the residual charge. The ion balance is adjustable for both polarities to optimize the residual charge.

If the setting is 100 %, there is no adaption.

If the set value is below 100 %, the positive polarity is adapted and if the setting is above 100 %, the negative polarity is adapted.

Index	0x2002
Subindex	0x0D
Name	Read/Write Ion Balance Discharging
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	100
Low Limit	0
High Limit	200

- Subindex 0x0E: Read/Write Discharging Mode

Setting of the discharge mode: The following settings can be selected:

- 0 – Passive discharge
- 1 – Active discharge

Index	0x2002
Subindex	0x0E
Name	Read/Write Discharging Mode
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	1
Low Limit	0
High Limit	1

CANopen® protocol description PRO IONIZER

- Subindex 0x0F: Read/Write Keyboard Lock

Activation or deactivation of the keyboard lock of the keypad. When the keyboard lock is activated, an operation via the integrated keypad at the power supply is not possible. Note that this parameter is not saved, and the keyboard lock is always deactivated after the power supply is restarted.

The following settings are possible:

- 0 – Keyboard lock not activated
- 1 – Keyboard lock activated

Index	0x2002
Subindex	0x09
Name	Read/Write Keyboard Lock
Object Code	VAR
Data Type	UNSIGNED
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	1

CANopen® protocol description PRO IONIZER

- Subindex 0x0A: Read/Write LED Bar Mode

Setting of the mode for displaying the actual values using the integrated LED bar.
The following settings are possible:

- 0 – Display: Actual value of the voltage
- 1 – Display: Frequency parameter of the discharge
- 2 – Display: Parameter of the ion balance
- 3 – Display: Actual value of the pollution, connection 1
- 4 – Display: Actual value of the pollution, connection 2
- 5 – Display: Actual value of the pollution, connection 3
- 6 – Display: Actual value of the pollution, connection 4
- 7 – Display: Actual values of the pollution with automatic selection of the connection

Index	0x2002
Subindex	0x10A
Name	Read/Write LED Bar Mode
Object Code	VAR
Data Type	UNSIGNED
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	6

- Subindex 0x11: Read/Write Pollution Detection Discharge 1
Setting of the discharge pollution monitoring, connection 1.

- 0 – Pollution monitoring deactivated
- 1 – Pollution monitoring activated
- 2 – Calibration of the pollution monitoring

Index	0x2002
Subindex	0x11
Name	Read/Write Pollution Detection Discharge 1
Object Code	VAR
Data Type	UNSIGNED
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	2

CANopen® protocol description PRO IONIZER

- Subindex 0x12: Read/Write Pollution Detection Discharge 2
Setting of the discharge pollution monitoring, connection 2.
 - 0 – Pollution monitoring deactivated
 - 1 – Pollution monitoring activated
 - 2 – Calibration of the pollution monitoring

Index	0x2002
Subindex	0x12
Name	Read/Write Pollution Detection Discharge 2
Object Code	VAR
Data Type	UNSIGNE8
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	2

- Subindex 0x13: Read/Write Pollution Detection Discharge 3
Setting of the discharge pollution monitoring, connection 3.
 - 0 – Pollution monitoring deactivated
 - 1 – Pollution monitoring activated
 - 2 – Calibration of the pollution monitoring

Index	0x2002
Subindex	0x13
Name	Read/Write Pollution Detection Discharge 3
Object Code	VAR
Data Type	UNSIGNE8
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	2

CANopen® protocol description PRO IONIZER

- Subindex 0x14: Read/Write Pollution Detection Discharge 4
Setting of the discharge pollution monitoring, connection 4.
 - 0 – Pollution monitoring deactivated
 - 1 – Pollution monitoring activated
 - 2 – Calibration of the pollution monitoring

Index	0x2002
Subindex	0x14
Name	Read/Write Pollution Detection Discharge 4
Object Code	VAR
Data Type	UNSIGNE8
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	2

- Subindex 0x15: Read/Write Nominal Power Discharge 1
Setting of the nominal power in mW of the device operated at connection 1 determined by the calibration of the pollution monitoring. This value represents the 0 % reference point for determining the pollution for connection 1.

Index	0x2002
Subindex	0x15
Name	Read/Write Nominal Power Discharge 1
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	3500

CANopen[®] protocol description PRO IONIZER

- Subindex 0x16: Read/Write Nominal Power Discharge 2

Setting of the nominal power in mW of the device operated at connection 2 determined by the calibration of the pollution monitoring. This value represents the 0 % reference point for determining the pollution for connection 2.

Index	0x2002
Subindex	0x16
Name	Read/Write Nominal Power Discharge 2
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	3500

- Subindex 0x17: Read/Write Nominal Power Discharge 3

Setting of the nominal power in mW of the device operated at connection 3 determined by the calibration of the pollution monitoring. This value represents the 0 % reference point for determining the pollution for connection 3.

Index	0x2002
Subindex	0x17
Name	Read/Write Nominal Power Discharge 3
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	3500

CANopen® protocol description PRO IONIZER

- Subindex 0x18: Read/Write Nominal Power Discharge 4

Setting of the nominal power in mW of the device operated at connection 4 determined by the calibration of the pollution monitoring. This value represents the 0 % reference point for determining the pollution for connection 4.

Index	0x2002
Subindex	0x18
Name	Read/Write Nominal Power Discharge 4
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	3500

- Subindex 0x19: Read/Write Power Limit A Discharge 1

Setting the lower power limit in mW for calculating the pollution for connection 1. This value represents the 100 % reference point for determining the pollution for connection 1.

Index	0x2002
Subindex	0x19
Name	Read/Write Power Limit A Discharge 1
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	3500

CANopen® protocol description PRO IONIZER

- Subindex 0x1A: Read/Write Power Limit A Discharge 2

Setting the lower power limit in mW for calculating the pollution for connection 2. This value represents the 100 % reference point for determining the pollution for connection 2.

Index	0x2002
Subindex	0x1A
Name	Read/Write Power Limit A Discharge 2
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	3500

- Subindex 0x1B: Read/Write Power Limit A Discharge 3

Setting the lower power limit in mW for calculating the pollution for connection 3. This value represents the 100 % reference point for determining the pollution for connection 3.

Index	0x2002
Subindex	0x1B
Name	Read/Write Power Limit A Discharge 3
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	3500

CANopen® protocol description PRO IONIZER

- Subindex 0x1C: Read/Write Power Limit A Discharge 4

Setting the lower power limit in mW for calculating the pollution for connection 4. This value represents the 100 % reference point for determining the pollution for connection 4.

Index	0x2002
Subindex	0x1C
Name	Read/Write Power Limit A Discharge 4
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	3500

- Subindex 0x1D: Read/Write Power Limit B Discharge 1

Setting the upper power limit in mW for calculating the pollution for connection 1. This value represents the 100 % reference point for determining the pollution for connection 1.

Index	0x2002
Subindex	0x1D
Name	Read/Write Power Limit B Discharge 1
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	10000

CANopen® protocol description PRO IONIZER

- Subindex 0x1E: Read/Write Power Limit B Discharge 2

Setting the upper power limit in mW for calculating the pollution for connection 2. This value represents the 100 % reference point for determining the pollution for connection 2.

Index	0x2002
Subindex	0x1E
Name	Read/Write Power Limit B Discharge 2
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	10000

- Subindex 0x1F: Read/Write Power Limit B Discharge 3

Setting the upper power limit in mW for calculating the pollution for connection 3. This value represents the 100 % reference point for determining the pollution for connection 3.

Index	0x2002
Subindex	0x1F
Name	Read/Write Power Limit B Discharge 3
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	10000

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- Subindex 0x20: Read/Write Power Limit B Discharge 4

Setting the upper power limit in mW for calculating the pollution for connection 4. This value represents the 100 % reference point for determining the pollution for connection 4.

Index	0x2002
Subindex	0x20
Name	Read/Write Power Limit B Discharge 4
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	10000

- Subindex 0x21: Read/Write Active Length Discharge 1

Setting of the active length in mm of the device connected to connection 1. This setting adjusts the sensitivity of the pollution monitoring according to the setting.

Index	0x2002
Subindex	0x21
Name	Read/Write Active Length Discharge 1
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	6000

CANopen® protocol description PRO IONIZER

- Subindex 0x22: Read/Write Active Length Discharge 2

Setting of the active length in mm of the device connected to connection 2. This setting adjusts the sensitivity of the pollution monitoring according to the setting.

Index	0x2002
Subindex	0x22
Name	Read/Write Active Length Discharge 2
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	6000

- Subindex 0x23: Read/Write Active Length Discharge 3

Setting of the active length in mm of the device connected to connection 3. This setting adjusts the sensitivity of the pollution monitoring according to the setting.

Index	0x2002
Subindex	0x23
Name	Read/Write Active Length Discharge 3
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	6000

CANopen® protocol description PRO IONIZER

- Subindex 0x24: Read/Write Active Length Discharge 4

Setting of the active length in mm of the device connected to connection 4. This setting adjusts the sensitivity of the pollution monitoring according to the setting.

Index	0x2002
Subindex	0x24
Name	Read/Write Active Length Discharge 4
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	6000

- Subindex 0x25: Read/Write Cable Length Discharge 1

Setting of the cable length in dm of the device connected to connection 1. This setting adjusts the sensitivity of the pollution monitoring according to the setting.

Index	0x2002
Subindex	0x25
Name	Read/Write Cable Length Discharge 1
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	350

CANopen® protocol description PRO IONIZER

- Subindex 0x26: Read/Write Cable Length Discharge 2

Setting of the cable length in dm of the device connected to connection 2. This setting adjusts the sensitivity of the pollution monitoring according to the setting.

Index	0x2002
Subindex	0x26
Name	Read/Write Cable Length Discharge 2
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	350

- Subindex 0x27: Read/Write Cable Length Discharge 3

Setting of the cable length in dm of the device connected to connection 3. This setting adjusts the sensitivity of the pollution monitoring according to the setting.

Index	0x2002
Subindex	0x27
Name	Read/Write Cable Length Discharge 3
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	350

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- Subindex 0x28: Read/Write Cable Length Discharge 4

Setting of the cable length in dm of the device connected to connection 4. This setting adjusts the sensitivity of the pollution monitoring according to the setting.

Index	0x2002
Subindex	0x28
Name	Read/Write Cable Length Discharge 4
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	350

- Subindex 0x29: Warning Level Discharge 1

Setting of the warning level for the pollution of connection 1 in %.
If the calculated pollution for the connection exceeds the set value, the corresponding warning is set.

Index	0x2002
Subindex	0x29
Name	Read/Write Warning Level Discharge 1
Object Code	VAR
Data Type	UNSIGNE16
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	50
Low Limit	29
High Limit	90

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- Subindex 0x2A: Warning Level Discharge 2

Setting of the warning level for the pollution of connection 2 in %.
If the calculated pollution for the connection exceeds the set value, the corresponding warning is set.

Index	0x2002
Subindex	0x2A
Name	Read/Write Warning Level Discharge 2
Object Code	VAR
Data Type	UNSIGNE16
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	50
Low Limit	29
High Limit	90

- Subindex 0x2B: Warning Level Discharge 3

Setting of the warning level for the pollution of connection 3 in %.
If the calculated pollution for the connection exceeds the set value, the corresponding warning is set.

Index	0x2002
Subindex	0x2B
Name	Read/Write Warning Level Discharge 3
Object Code	VAR
Data Type	UNSIGNE16
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	50
Low Limit	29
High Limit	90

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- Subindex 0x2C: Warning Level Discharge 4

Setting of the warning level for the pollution of connection 4 in %.
If the calculated pollution for the connection exceeds the set value, the corresponding warning is set.

Index	0x2002
Subindex	0x2C
Name	Read/Write Warning Level Discharge 4
Object Code	VAR
Data Type	UNSIGNE16
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	50
Low Limit	29
High Limit	90

- Subindex 0x2D: Read/Write Reference Point Activation

Setting for activating the reference point. When the reference point is activated, the discharge voltage is set for a short time with the following settings:

- Discharge voltage: U_{max}
- Discharge frequency: 50 Hz
- Ion balance: 50

These settings are used to determine the current power of the connected devices in order to assess the current state of the respective load. After the determination has been carried out, the reference point is automatically deactivated and the previously set values for the discharge voltage are used again.

- 0 - HV Freigabe
- 1 - Reference point permanently activated
- 2 - Cyclical activation of the reference point, 1 minute interval
- 3 - Cyclical activation of the reference point, 10 minutes interval
- 4 - Cyclical activation of the reference point, 30 minutes interval
- 5 - Cyclical activation of the reference point, 60 minutes interval
- 6 - Activation on request via the field bus (see Index 0x6200)

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Index	0x2002
Subindex	0x2D
Name	Read/Write Reference Point Activation
Object Code	VAR
Data Type	UNSIGNED
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	6

- Subindex 0x2E: Read/Write Discharging Overload Warning
Setting to detect the warnings in case of an overload of the connection.
 - 0 - Overload detection Warnings deactivated
 - 1 - Overload detection Warnings activated

Index	0x2002
Subindex	0x2E
Name	Read/Write Discharging Overload Warning
Object Code	VAR
Data Type	UNSIGNED
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	1

CANopen® protocol description PRO IONIZER

- Subindex 0x2F: Read/Write Sensor Input Mode

Setting the mode for the sensor input

- 0 – Sensor input deactivated
- 1 – Speed sensor mode
- 2 – E-field sensor mode
- 3 – External sensor expansion box mode D1-D2, A1-A2
- 4 – External sensor expansion box mode D1-D6, A1-A2
- 5 – External sensor expansion box mode D1-D10, A1-A2

Index	0x2002
Subindex	0x2F
Name	Read/Write Sensor Input Mode
Object Code	VAR
Data Type	UNSIGNED
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	5

- Subindex 0x30: Read/Write Minimum Revolutions Speed Sensor

Setting of the minimum number of revolutions per minute of the connected speed sensors. If a sensor falls below this value, the device generates the corresponding warning.

Index	0x2002
Subindex	0x30
Name	Read/Write Minimum Revolutions Speed Sensor
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	300
Low Limit	0
High Limit	1200

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- Subindex 0x31: Read/Write Type E-Field Sensor 1

Setting the type of E-field sensor 1.

- 0 – SMC IZD 10-110
- 1 – SMC IZD 10-510

Index	0x2002
Subindex	0x31
Name	Read/Write Type E-Field Sensor 1
Object Code	VAR
Data Type	UNSIGNED
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	1

- Subindex 0x32: Read/Write Distance E-Field Sensor 1

Setting the working distance in mm for E-field sensor 1 to convert the measured E-field into the corresponding voltage.

Index	0x2002
Subindex	0x32
Name	Read/Write Distance E-Field Sensor 1
Object Code	VAR
Data Type	UNSIGNED
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	25 – SMC IZD 10-110 50 – SMC IZD 10-510
Low Limit	10 – SMC IZD 10-110 25 – SMC IZD 10-510
High Limit	50 – SMC IZD 10-110 75 – SMC IZD 10-510

CANopen® protocol description PRO IONIZER

- Subindex 0x33: Read/Write Warning Level E-Field Sensor 1

Setting the warning level in V to recognize the corresponding warning of E-field sensor 1.

Index	0x2002
Subindex	0x33
Name	Read/Write Warning Level E-Field Sensor 1
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	800 – SMC IZD 10-110 28000 – SMC IZD 10-510
Low Limit	0 – SMC IZD 10-110 0 – SMC IZD 10-510
High Limit	1000 – SMC IZD 10-110 30000 – SMC IZD 10-510

- Subindex 0x34: Read/Write Error Level E-Field Sensor 1

Setting the error level in V to recognize the corresponding error of E-field sensor 1.

Index	0x2002
Subindex	0x34
Name	Read/Write Error Level E-Field Sensor 1
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	1000 – SMC IZD 10-110 30000 – SMC IZD 10-510
Low Limit	0 – SMC IZD 10-110 0 – SMC IZD 10-510
High Limit	1000 – SMC IZD 10-110 30000 – SMC IZD 10-510

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- Subindex 0x35: Read/Write Zero Point E-Field Sensor 1

Setting the zero point deviation in V of the E-field sensor 1.

Index	0x2002
Subindex	0x35
Name	Read/Write Zero Point E-Field Sensor 1
Object Code	VAR
Data Type	INTEGER16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0 – SMC IZD 10-110 0 – SMC IZD 10-510
Low Limit	-100 – SMC IZD 10-110 -1000 – SMC IZD 10-510
High Limit	100 – SMC IZD 10-110 1000 – SMC IZD 10-510

- Subindex 0x36: Read/Write Type E-Field Sensor 2

Setting the type of E-field sensor 2.

- 0 – SMC IZD 10-110
- 1 – SMC IZD 10-510

Index	0x2002
Subindex	0x36
Name	Read/Write Type E-Field Sensor 2
Object Code	VAR
Data Type	UNSIGNED
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0
Low Limit	0
High Limit	1

CANopen® protocol description PRO IONIZER

- Subindex 0x37: Read/Write Distance E-Field Sensor 2

Setting the working distance in mm for E-field sensor 2 to convert the measured E-field into the corresponding voltage.

Index	0x2002
Subindex	0x37
Name	Read/Write Distance E-Field Sensor 2
Object Code	VAR
Data Type	UNSIGNE8
Data Size	1 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	25 – SMC IZD 10-110 50 – SMC IZD 10-510
Low Limit	10 – SMC IZD 10-110 25 – SMC IZD 10-510
High Limit	50 – SMC IZD 10-110 75 – SMC IZD 10-510

- Subindex 0x38: Read/Write Warning Level E-Field Sensor 2

Setting the warning level in V to recognize the corresponding warning of E-field sensor 2.

Index	0x2002
Subindex	0x38
Name	Read/Write Warning Level E-Field Sensor 2
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	800 – SMC IZD 10-110 28000 – SMC IZD 10-510
Low Limit	0 – SMC IZD 10-110 0 – SMC IZD 10-510
High Limit	1000 – SMC IZD 10-110 30000 – SMC IZD 10-510

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- Subindex 0x39: Read/Write Error Level E-Field Sensor 2

Setting the error level in V to recognize the corresponding error of E-field sensor 2.

Index	0x2002
Subindex	0x39
Name	Read/Write Error Level E-Field Sensor 2
Object Code	VAR
Data Type	UNSIGNE16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	1000 – SMC IZD 10-110 30000 – SMC IZD 10-510
Low Limit	0 – SMC IZD 10-110 0 – SMC IZD 10-510
High Limit	1000 – SMC IZD 10-110 30000 – SMC IZD 10-510

- Subindex 0x3A: Read/Write Zero Point E-Field Sensor 2

Setting the zero point deviation in V of the E-field sensor 2.

Index	0x2002
Subindex	0x3A
Name	Read/Write Zero Point E-Field Sensor 2
Object Code	VAR
Data Type	INTEGER16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0 – SMC IZD 10-110 0 – SMC IZD 10-510
Low Limit	-100 – SMC IZD 10-110 -1000 – SMC IZD 10-510
High Limit	100 – SMC IZD 10-110 1000 – SMC IZD 10-510

CANopen® protocol description PRO IONIZER

- Subindex 0x3B: Read/Write Sensor Extension Mode D1-D8

Selection of the mode of the external sensor expansion box of the sensors to be evaluated for the inputs D1-D8.

The following modes are available for evaluating the inputs:

- 0 – Sensor input deactivated
- 1 – Speed sensor selected for the sensor input

The mode selection for the respective sensor inputs is arranged as follows:

Byte 0				Byte 1			
LSB		MSB		LSB		MSB	
D1	D2	D3	D4	D5	D6	D7	D8

Index	0x2002
Subindex	0x3B
Name	Read/Write Sensor Extension Mode D1-D8
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0x0000
Low Limit	0x0000
High Limit	0xFFFF

CANopen® protocol description PRO IONIZER

- Subindex 0x3C: Read/Write Sensor Extension Mode D9-D10, A1-A2

Selection of the mode of the external sensor expansion box of the sensors to be evaluated for the inputs D9-D10 and A1-A2.

The following modes are available for evaluating the inputs D9-D10:

- 0 – Sensor input deactivated
- 1 – Speed sensor selected for the sensor input

The following modes are available for evaluating the inputs A1-A2:

- 0 – Sensor input deactivated
- 1 – E-field-sensor selected for the sensor input

The mode selection for the respective sensor inputs is arranged as follows:

Byte 0				Byte 1			
LSB		MSB		LSB		MSB	
D9	D10	A1	A2				

Index	0x2002
Subindex	0x3B
Name	Read/Write Sensor Extension Mode D9-D10, A1-A2
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read/Write
PDO Mapping	No
Default Value	0x0000
Low Limit	0x0000
High Limit	0x00FF

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Object 0x2003 Clear Error/Warning

Object with entries for acknowledging occurred errors and warnings

Index	0x2003
Name	Clear Error/Warning
Object Code	RECORD

Index	0x2003
Subindex	0x00
Name	Number of elements
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x05
Low Limit	
High Limit	

- Subindex 0x01: Clear Error

Entry for acknowledging errors. The transmitted error code is deleted after an internal check.

Index	0x2003
Subindex	0x01
Name	Clear Error
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Write Only
PDO Mapping	No
Low Limit	0x01
High Limit	0x50

CANopen® protocol description PRO IONIZER

- Subindex 0x02: Clear Warning

Entry for acknowledging warnings. The transmitted warning code is deleted after an internal check.

Index	0x2003
Subindex	0x02
Name	Clear Warning
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Write Only
PDO Mapping	No
Default Value	
Low Limit	0x01
High Limit	0x60

Object 0x6000 Read Input 8 Bit

Object with 8 bit input data. These entries are mapped to the 1st Transmit PDO. In this way, direct monitoring of the bar can be transferred without any great effort.

Index	0x6000
Name	Read Input 8 Bit
Object Code	ARRAY

Index	0x6000
Subindex	0x00
Name	Number of elements
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x04
Low Limit	
High Limit	

CANopen® protocol description PRO IONIZER

- Subindex 0x01: Read System Status

Current system status of the power supply. The status consists of several parts:

- Bit 0: High voltage release
 - 0 – high voltage deactivated
 - 1 – high voltage activated
- Bit 1: Error
 - 0 – no error active
 - 1 – error occurred
- Bit 2: Warning
 - 0 – no warning occurred
 - 1 – warning occurred
- Bit 4: Discharge
 - 0 – discharge deactivated (resp. with existing discharge: passive mode)
 - 1 – discharge active
- Bit 5: Software release
 - 0 – no software release
 - 1 – software release is set
- Bit 6: Hardware release
 - 0 – no hardware release
 - 1 – hardware release is set

Index	0x6000
Subindex	0x01
Name	Read System Status
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	Yes
Default Value	
Low Limit	
High Limit	

CANopen[®] protocol description PRO IONIZER

- Subindex 0x02: Read Discharging Capacity

Percentage utilization of the discharge capacity

Index	0x6000
Subindex	0x02
Name	Read Discharging Capacity
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	Yes
Default Value	
Low Limit	
High Limit	

- Subindex 0x03: Read Status Discharge 1

Discharge status of connection 1.

The individual values for the possible states are listed below:

- 0 – No device connected
- 1 – Device connected
- 2 – Pollution of the connected device detected
- 3 – Overload of the connection due to the connected device
- 4 – Error detected within the connection resp. the connected device

Index	0x6000
Subindex	0x03
Name	Read Status Discharge 1
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	Yes
Default Value	
Low Limit	
High Limit	

CANopen® protocol description PRO IONIZER

- Subindex 0x04: Read Status Discharge 2

Discharge status of connection 2.

The individual values for the possible states are listed below:

- 0 – No device connected
- 1 – Device connected
- 2 – Pollution of the connected device detected
- 3 – Overload of the connection due to the connected device
- 4 – Error detected within the connection resp. the connected device

Index	0x6000
Subindex	0x04
Name	Read Status Discharge 2
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	Yes
Default Value	
Low Limit	
High Limit	

- Subindex 0x05: Read Status Discharge 3

Discharge status of connection 3.

The individual values for the possible states are listed below:

- 0 – No device connected
- 1 – Device connected
- 2 – Pollution of the connected device detected
- 3 – Overload of the connection due to the connected device
- 4 – Error detected within the connection resp. the connected device

Index	0x6000
Subindex	0x05
Name	Read Status Discharge 3
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	Yes
Default Value	
Low Limit	
High Limit	

CANopen® protocol description PRO IONIZER

- Subindex 0x06: Read Status Discharge 4

Discharge status of connection 4.

The individual values for the possible states are listed below:

- 0 – No device connected
- 1 – Device connected
- 2 – Pollution of the connected device detected
- 3 – Overload of the connection due to the connected device
- 4 – Error detected within the connection resp. the connected device

Index	0x6000
Subindex	0x04
Name	Read Status Discharge 4
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	Yes
Default Value	
Low Limit	
High Limit	

Object 0x6200 Write Output 8 Bit

Object with 8-bit output data. These entries are mapped to the 1st Receive PDO. In this way, direct monitoring of the bar can be transferred without any great effort.

Index	0x6200
Name	Write Output 8 Bit
Object Code	ARRAY

Index	0x6200
Subindex	0x00
Name	Number of elements
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x01
Low Limit	
High Limit	

CANopen® protocol description PRO IONIZER

- Subindex 0x01: Write HV Release

The high voltage can be activated or deactivated via a write access. The option for a release via CANopen® must be set in the parameter, so that the controlling can take place via bus.

- 0x00 – Deleting the software release
- 0x000A – Setting the software release and activating the reference point to perform the connection monitoring. For more information, see Index 0x2002 Subindex 0x2D.
- 0x0F – Setting the software release

Index	0x6200
Subindex	0x01
Name	Write HV Release
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Write Only
PDO Mapping	Yes
Default Value	
Low Limit	
High Limit	

Object 0x6401 Read Analog Input 16 Bit

Object with 16-bit analog input data. These entries are mapped to the 1st Receive PDO. In this, way, direct monitoring of the bar can be transferred without any great effort.

Index	0x6401
Name	Read Analog Input 16 Bit
Object Code	ARRAY
Index	0x6401
Subindex	0x00
Name	Number of elements
Object Code	VAR
Data Type	UNSIGNED8
Data Size	1 Byte
Access Type	Read Only
PDO Mapping	No
Default Value	0x08
Low Limit	
High Limit	

CANopen® protocol description PRO IONIZER

- Subindex 0x01: Read Voltage Discharging

Actual value of the effective discharge voltage in V

Index	0x6401
Subindex	0x01
Name	Read Voltage Discharging
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	Yes
Default Value	
Low Limit	
High Limit	

- Subindex 0x02: Read AC Current Discharging

Actual voltage of the effective discharge current in μA

Index	0x6401
Subindex	0x02
Name	Read AC Current Discharging
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	Yes
Default Value	
Low Limit	
High Limit	

- Subindex 0x03: Read DC Current Discharging

Actual voltage of the signed DC discharge current in μA

Index	0x6401
Subindex	0x03
Name	DC Current Discharging
Object Code	VAR
Data Type	INTEGER16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	Yes
Default Value	
Low Limit	
High Limit	

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- Subindex 0x04: Read Power Discharging

Actual value of the effective discharge power in watts with one decimal place (value 759 corresponds to 75.9 W).

Index	0x6401
Subindex	0x04
Name	Read Power Discharging
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	Yes
Default Value	
Low Limit	
High Limit	

- Subindex 0x05: Read E-Field Sensor 1

Measured value of E-field sensor 1 in V

Index	0x6401
Subindex	0x05
Name	Read E-Field Sensor 1
Object Code	VAR
Data Type	INTEGER16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	Yes
Default Value	
Low Limit	
High Limit	

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- Subindex 0x06: Read Ripple E-Field Sensor 1
Ripple of the measured value E-field sensor 1 in V

Index	0x6401
Subindex	0x06
Name	Read Ripple E-Field Sensor 1
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	Yes
Default Value	
Low Limit	
High Limit	

- Subindex 0x07: Read E-Field Sensor 2
Measured value of the E-field sensor 2 in V

Index	0x6401
Subindex	0x07
Name	Read E-Field Sensor 2
Object Code	VAR
Data Type	INTEGER16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	Yes
Default Value	
Low Limit	
High Limit	

- Subindex 0x08: Read Ripple E-Field Sensor 2
Ripple of the measured value E-field sensor 2 in V

Index	0x6401
Subindex	0x08
Name	Read Ripple E-Field Sensor 2
Object Code	VAR
Data Type	UNSIGNED16
Data Size	2 Byte
Access Type	Read Only
PDO Mapping	Yes
Default Value	
Low Limit	
High Limit	