INTERFACE CARD P

FOR THYRO-P AND THYRO-P MC

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ABBREVIATIONS

The following specific abbreviations are used in this description:
Advanced Energy - Advanced Energy Industries GmbH
MC - Multi-Channel

1. SAFETY NOTES

The safety notes and the operating instructions are to be read carefully before installing and commissioning.

1.1 OBLIGATORY INSTRUCTION

These safety notes and the operating instructions shall carefully be read by the persons deployed for work using and employing the Thyro-P Ethernet plug-in card PROFINET prior to assembly, installation and the initial start-up of the Thyro-P Ethernet plug-in card PROFINET. These operating instructions are part of the Thyro-P Ethernet plug-in card PROFINET.

The operator of this device is committed to provide these operating instructions without limitation to all persons, who transport the device, start it up, maintain it, or perform other work tasks to it.

In accordance with the Product Liability Act the manufacturer of this product is obligated to inform about and warn against

• other than the intended use of a product
• the residual hazards of a product as well as
• incorrect usages and their consequences

The following information is intended for this purpose. This information should warn the product user and protect him and his appliances.

1.2 APPROPRIATE USAGE

• The Thyro-P Ethernet plug-in card PROFINET is an interface component which may only be operated in connection with the Thyro-P.
• As a component the Thyro-P Ethernet plug-in card PROFINET is not functional on its own and must be project planned for its appropriate usage in order to minimize the residual hazards of the product.
• The Thyro-P Ethernet plug-in card PROFINET may only be used for the purpose for which it was intended, as persons may otherwise be exposed to dangers (e.g. electric shock, burns) and systems also (e. g. overload).
• It is not permitted to make any unauthorized modifications to the device or to use any spare parts or replacement parts not approved by Advanced Energy, or to use the device for any other purpose.
• The warranty obligations of the manufacturer are only applicable if these operating instructions are observed and complied with.
• The Thyro-P Ethernet plug-in card PROFINET connects a Thyro-P with a master.

- The devices supplied have been produced in accordance with the ISO 9001 quality standard.
- Multiple plug-in cards can be used on one assembly.
- The power supply for the plug-in card comes through the Thyro-P.

1.3 RESIDUAL HAZARDS OF THE PRODUCT

Even with intended use it is possible, in the case of an error, that the currents, voltages or power in the load circuit are no longer affected by the Thyro-P Ethernet plug-in card PROFINET.

If the power components are destroyed, for example, the following cases are possible: current interruption, continual flow of energy. If such a case occurs, then the occuring load voltages and currents result from the physical sizes of the overall circuit. Throughout the project planning of the system it must be ensured, that no uncontrolled large currents, voltages or power can occur.

1.4 INCORRECT OPERATION AND THEIR CONSEQUENCES

In the case of incorrect operations, higher power, voltages or currents than intended can reach the Thyro-P Ethernet plug-in card PROFINET, the thyristor power controller or the load. This can cause damage to the Thyro-P Ethernet plug-in card PROFINET, the thyristor power controller or the load.

In particular, factory-set parameters may not be altered in such a way that the Thyro-P or the Thyro-P Ethernet plug-in card PROFINET are overloaded.

1.5 SCOPE OF SUPPLY

The supply consists of the following parts:
- Thyro-P Ethernet plug-in card PROFINET
- Operating instructions

1.6 STORAGE

The devices may be stored originally OEM packaged in rooms, which are dry and ventilated.

Permissible ambient temperature: -25 °C to +55 °C

Permissible relative air humidity: max. 85%

For longer storage durations, the devices should be contained in airtight plastic skins with the addition of commercially available drying agents.

1.7 ASSEMBLY

• If stored in cold environments it must be ensured that the device is absolutely dry before commissioning. Therefore allow at least 2 hours acclimatization time before commissioning.
• Ensure sufficient ventilation and deaeration of the cabinet if mounted in a cabinet.
• Observe minimum spacing.
• Ensure that the device cannot be heated up by heat sources below it. (see Technical data).
• Ground the device in accordance with the local regulations.
• Connect the device in accordance with the connection diagrams.

1.8 CONNECTION

Before connection, the indicated voltage on the type plate is to be compared with the mains voltage to make sure they match.
The electrical connection is made at the points labelled on the Thyro-P.

1.9 OPERATION

The Thyro-P Ethernet plug-in card PROFINET may only be started when there is absolutely no danger to persons or system.
• Protect the device against dust and damp.
• Ensure that the ventilation opening is not blocked.

1.10 MAINTENANCE, SERVICE, FAULTS

The symbols used in the following are explained in the chapter on safety requirements.
In order to avoid damage to personnel or property the user must note the following points before all work:

CAUTION
In the case of smoke or smell development, as well as in the case of fire, the device must be disconnected from all external voltage sources.

CAUTION
For maintenance and repair works the device must be disconnected from all external voltage sources and safeguarded against it being switched on again. After switching off wait at least two minutes for the snubber capacitors to discharge. The absence of voltage is to be ascertained using appropriate measurement instruments. The device is to be grounded an short-circuited. Adjacent components under voltage are to be covered or separated off. These activities may only be carried out by an electrically qualified person. The local electro-technical regulations are to be adhered to.

CAUTION
The thyristor controller contains voltages which are hazardous. Repairs are strictly only to be carried out by qualified and trained maintenance personnel.

CAUTION
Hazard of electric shocks. Even after the separation from the mains, capacitors can still contain dangerously high levels of energy.

CAUTION
Hazard of electric shocks. Even with a non-activated thyristor controller the load circuit is not separated from the mains by the thyristor controller.

ATTENTION
Different power components are screwed in place with exact torques according to their function. For safety reasons repairs to power components are to be carried out by Advanced Energy.

1.11 SHUT DOWN, DIS-ASSEMBLY

If shutting down and dis-assembling the device for the reason of venue change or for disposal purposes the following safety rules must be complied with prior to the beginning of all work performed:

ATTENTION MAINS VOLTAGE!

Safety rules for work performed to electrical facilities:

1. Disconnect the device from the power supply (establish a voltage free status)
2. Secure against re-activation
3. Verify by measurement that there is no voltage present
4. Ground and short-circuit equipment
5. Cover or separate adjacent parts which are under voltage

For dis-assembly, perform the following steps:

1. Separate the device from the 230 VAC, respectively 110 VAC, power supply.
2. Separate all other connections.

Electrical connections are thus dis-assembled and now, the device can be removed by dis-assembly from the overhead rail.

2. SAFETY REQUIREMENTS

2.1 IMPORTANT INSTRUCTIONS AND EXPLANATIONS

For the protection of personnel and the maintenance of good working order, usage and repairs must be in line with the guidelines, and the safety requirements listed must be adhered to. The personnel who set up/disassemble the devices, start them up, operate them, maintain them, must know and adhere to these safety requirements. All works may only be carried out by specialist personnel trained for the purpose and equipped with faultless tools, appliances, means of testing and material required and intended for that purpose. In these operating instructions, there are important warnings before dangerous actions. These warnings are divided into the following classes of hazards:

DANGER
Hazards that can lead to serious injuries or fatal injuries.

WARNING
Hazards that can lead to serious injuries or consicerable damage to property.

CAUTION
Hazards that can lead to injuries and damage to property.

CAUTION
Hazards that can lead to minor damage to property.

The warnings can also be supplemented with a special danger symbol (e.g. "Electric current" or "Hot device"), e.g.

in case of risk of electric current or

in case of risk of burns.

In addition to the warnings, there is also a general note for useful information.

NOTE
Content of note

2.2 GENERAL DANGER INFORMATION

DANGER
Not adhering to the safety requirements in the operating instructions of the power controllers being used can lead to danger of injury/danger of damaging the device or system.
> Adhere to all safety requirements in the chapter "Safety" of the operating instructions of the power controllers being used.

DANGER
ELECTRIC CURRENT
Risk of injury from current carrying parts/danger of damaging the plug-in card.
Never operate the device without covering.
Make adjustments and connections disconnected from the power supply.

NOTE
COMMUNICATION ERROR
In order to avoid communication errors the following point has to be taken into account:
Use shielded cables.

2.3 QUALIFIED PERSONNEL

Only qualified personnel who are familiar with the pertinent safety and instal-
lation regulations may perform the following with the the Thyro-P Ethernet
plug-in card PROFINET:
• transport
• installation
• connection
• commissioning
• maintenance
• testing
• operation
These operating instructions must be read carefully by all persons
working with or on the device prior to installation and initial start-up.

2.4 REQUIREMENTS TO THE OPERATOR

The person responsible for the system must ensure that
• Safety notes and operating instructions are available and adhered to.
• Operating conditions and technical data are heeded.
• Protective devices are used.
• Maintenance personnel are informed immediately or the Thyro-P Ethernet
  plug-in card PROFINET or the Thyro-P, respectively, is taken out of action
  immediately if abnormal voltages or noises, higher temperatures, vibrations
  or similar occur, in order to identify the cause.
• The accident prevention regulations valid in the respective country of use
  and the general safety regulations are observed.
• All safety devices (covers, warning signs etc.) are present, in perfect condi-
  tion and are used correctly.
• The national and regional safety regulations are observed.
• The personnel have access to the operating instructions and safety regulati-
  ons at all times.

2.5 INTENDED USE

CAUTION

The Thyro-P Ethernet plug-in card PROFINET in connection with the Thyro-P may only be used for the purpose for which it was intended, as persons may otherwise be exposed to dangers (e.g. electric shock, burns) and systems also (e. g. overload).

It is not permitted to make any unauthorised modifications to the Thyro-P Ethernet plug-in card PROFINET or to use any spare parts or replacement parts not approved by Advanced Energy, or to use the device for any other purpose.

These operating instructions contain all the information required by skilled personnel using the device. Additional information and notes for non-qualified persons and for the use of the device outside of industrial assemblies are not contained in these operating instructions.

The warranty obligations of the manufacturer are only applicable if these operating instructions are observed and complied with.

2.6 LIABILITY

No liability is burdened for non-intended by the manufacturer use of the Thyro-P Ethernet plug-in card PROFINET. The operator or user, respectively, shall burden the responsibility for possibly necessary measures for the prevention of people and asset damage. In case of complaints, please contact us immediately and include the following information:

• type designation
• fabrication number /serial number
• complaint description
• duration in operations
• ambient conditions of the device
• mode of operation

3. NOTES ON THESE OPERATING INSTRUCTIONS

3.1 VALIDITY

These operating instructions correspond with the technical status of the Thyro-P Ethernet plug-in card PROFINET at the time of issue. The content is not the subject of the contract, but rather serves to provide information. We reserve the right to make amendments to the details in these operating instructions, in particular to technical data, operation, measurements and weights. Advanced Energy reserves the right to make content amendments and technical alterations to the details in these operating instructions unannounced. Advanced Energy cannot be held responsible for any inaccuracies or incorrect details in these operating instructions as there is no obligation to make ongoing updates to these operating instructions.

These operating instructions serve only as an addition to be used in conjunction with the operating instructions of the Advanced Energy Thyro-P power controllers in the versions of the types indicated on the covering page. The safety instructions contained therein are to be observed in particular.

3.2 HANDLING

These operating instructions for the Thyro-P Ethernet plug-in card PROFINET are structured in a manner so that according expert personnel may perform all work necessary for commissioning, maintenance, and repair. If threats to personnel and material cannot be ruled out for certain work, such tasks are marked with a pictogram, from which the according content may be extracted from the before mentioned chapter "Safety requirements".

3.3 TYPE DESIGNATION

Thyro-P Ethernet plug-in card PROFINET   order no. 2000 000 396

3.4 LOSS OF WARRANTY

Our supplies and services are subject to the general conditions of supply for products of the electrical industry, as well as our general sales conditions. Claims in connection with supplied goods must be submitted within eight days upon receipt, along with the packing slip. Claims made later cannot receive consideration.

Advanced Energy will rescind all possible obligations such as warranty agreements, service contracts, etc. entered into by Advanced Energy or its distributors without prior notice if maintenance and repair work is carried out using anything other than original Advanced Energy spare parts or spare parts purchased from Advanced Energy .

3.5 COPYRIGHT

No part of these operating instructions may be transmitted, reproduced and/or copied by any electronic or mechanical means without the express prior written permission of Advanced Energy.
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3.6 FURTHER INFORMATION ON COPYRIGHT

Thyro-™, Thyro-P™ are registered trademark of Advanced Energy Industries GmbH.
All other company and product names are (registered) trademarks of the respective owners.

4. CONTACT

4.1 TECHNICAL QUERIES

Do you have any technical queries regarding the subjects dealt with in these operating instructions?
If so, please get in touch with our team for power controllers:
Phone +49 (0) 2902 763-520

4.2 COMMERCIAL QUERIES

Do you have any commercial queries on power controllers?
If so, please get in touch with our team for power controllers.
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4.4 INTERNET

Further information about our company or products please see
http://www.advanced-energy.com

5. INTRODUCTION

5.1 GENERAL INFORMATION

The Ethernet plug-in card connects a Thyro-P or Thyro-P MC with a master.
Several plug-in cards can be used on one system.
The power supply of the plug-in card comes from the Thyro-P.

5.2 SPECIAL FEATURES

• The Ethernet plug-in card connects the devices with several Ethernet bus
  systems. By setting the "Protocol" switch to 0, the Ethernet plug-in card
  becomes a PROFINET IO-Device.
• Function control via LED
• 3 free digital inputs or local operation of a setpoint

6. INSTALLATION

DANGER

DANGER DURING INSTALLATION

Danger of injury/danger of damaging the device or system. Adhere to all safety stipulations in the chapter "Safety".
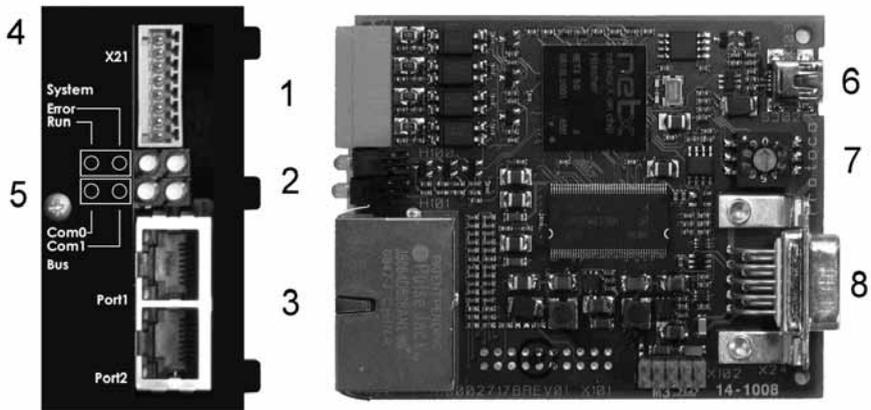
1 Terminal X21 digital inputs
2 System and Bus LEDs
3 Ethernet Port 1 & 2
4 Front cover

5 Fastening screw
6 USB (Softwareupdate)
7 Switch "Protocol"
8 Connection to Thyro-P (SSC, 5V)

FIG. 1 HARDWARE STRUCTURE

6.1 SETTING THE PROTOCOL

The Ethernet plug-in card supports various real time Ethernet bus systems. The desired system can be selected using the rotary switch "Protocol". For PROFINET this needs to be set to 0.

The rotary switch protocols are:

POSITION	PROTOCOL
0	PROFINET
1	Modbus TCP
2	Ethernet IP
9	Set all default

When position 9 is active the card will be reset to factory defaults for settings and address.

6.2 INSTALLATION OF THE PLUG-IN CARD

The Thyro-P Ethernet plug-in card PROFINET is connected by a 9 pole SUB-D connector X24 to the Thyro-P. The plug-in card is inserted into the front side of the Thyro-P controlling device and is ready to operate immediately following parameterization of the bus system.

CAUTION
The installation of the plug-in card is to be carried out without current.

6.3 CONNECTING THE ETHERNET PLUG-IN CARD TO THE MASTER

The Ethernet plug-in card has two Ethernet ports which are equipped with a switch functionality which allows a line topology to be constructed.
A standard patch cable is required for connecting with a switch. For a direct connection (line topology) a crossover cable is required.

7. DIGITAL INPUTS

The Ethernet plug-in card makes available three digital inputs as well as an input for activating local operation (see chapter 7) via the 8 pole terminal (X21). The status of the inputs can be requested using the "digital inputs" parameter.

PIN	NAME	FUNCTION
1	IN 0	input 0
2	IN 1	input 1
3	IN 2	input 2
4	Loc	input 3
5	M	ground for IN 0-3
6	+24	+24 V/internal 24 V supply
7	M24	ground/internal 24 V supply
8	earth	earth

TAB. 1 TERMINAL CONFIGURATION X21

Inputs 0-3 always correlate to the ground (M). To connect simple indicators such as limit switches or similar there is also an additional 24 V supply available. As such, the following connection options are available:
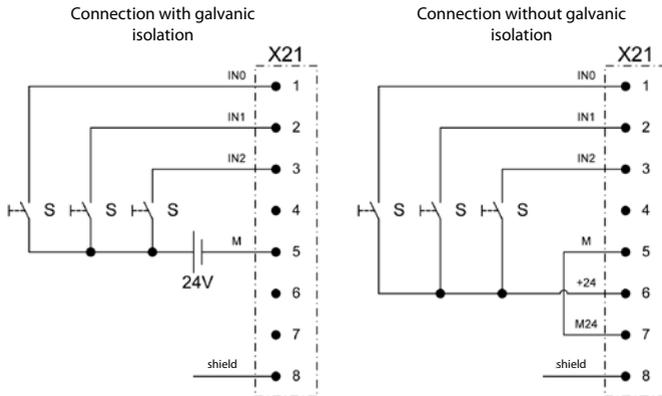
FIG. 2 EXAMPLE FOR INPUT CONNECTIONS

8. LOCAL OPERATION OF A SETPOINT

In certain situations, such as, for example, the Ethernet failing, it may be necessary to change the setpoint quickly. This can in fact be done using the local operating and display unit (LBA-2), however, this may be too time consuming in certain usages. To overcome this shortcoming the option of operating the setpoint locally was created. The local operation can be activated via the input Loc (Pin 4). It is then possible to switch the setpoint SW_ACTIV between remote (open) and local (closed) via input IN0 (Pin 3).

Which setpoints are active can be set for remote and local using the start configuration. These configurations are saved on the Ethernet plug-in card so that the functionality is available even after the failure of the Ethernet.

If the local setpoint motor potentiometer was selected in a channel, then the motor potentiometer setpoint can be altered via inputs IN1 and IN2. When the switch is pressed the setpoint changes in accor-dance with Fig. 3. For example, the setpoint is increased by 30% if the UP button is pressed for 10 seconds. When simultaneously activating the Up and Down buttons the setpoint is reduced.
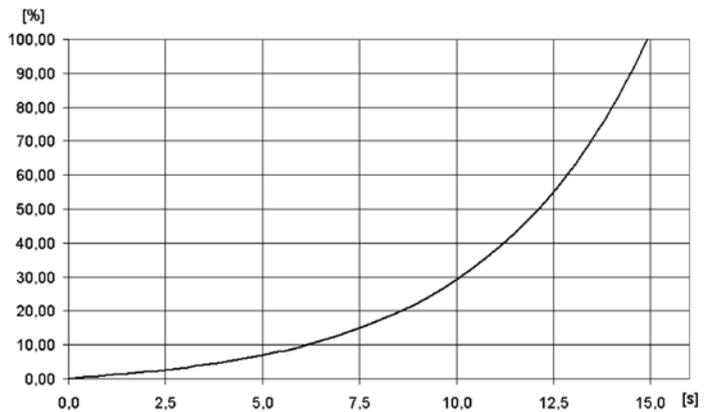
FIG. 3 RELATIVE ALTERATION OF THE MOTOR POTENTIOMETER SETPOINT
OVER THE TIME

For local operation terminal X21 is to be connected as follows.
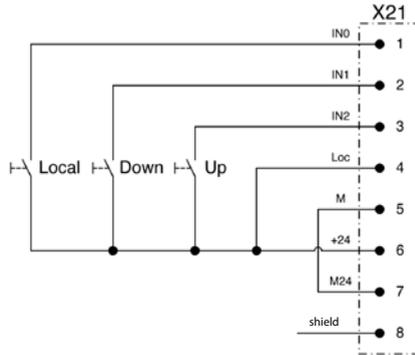
FIG. 4 LOCAL OPERATION OF THE MOTOR POTENTIOMETER SETPOINT

ATTENTION

When using local operation please be aware of the following points:

1. To avoid a volatile alteration of the setpoint when switching from remote to local, please activate the function "motor potentiometer = master".

2. In the case of the "local" switch being closed ("4 digital inputs" bit 0 = 0) the process controller is to be deactivated and the "master setpoint" set to be the same as the "total setpoint" to enable a non-volatile switch from local to remote. To do this the total of the setpoint is to be transferred cyclically.

3. When switching from local to remote the process controller is to be initialized with the total setpoint and then activated. The above configurations then result in the following process diagram (see. Fig. 5).
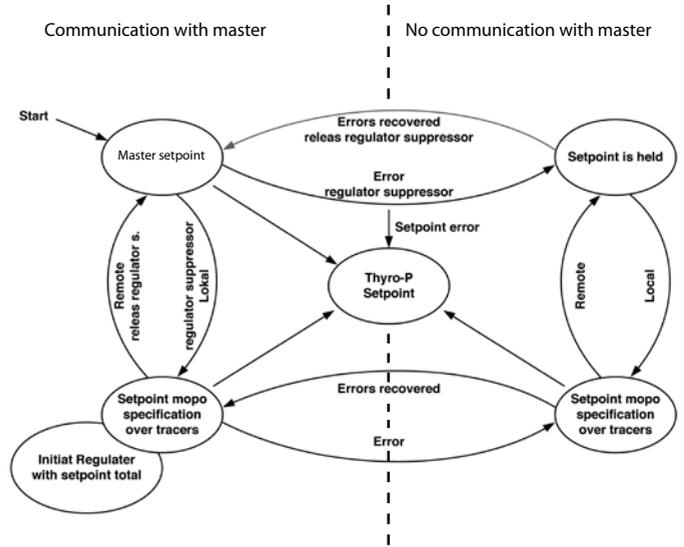
FIG. 5 STATE DIAGRAM

9. PROJECT PLANNING

9.1 SETTING THE DEVICE NAME

Every PROFINET IO device is identified by its device name. The setting of the device name in the device can be undertaken using, for example, the program "Step 7 - HW Config" in the menu "Target system/Ethernet/ Edit Ethernet participant…".

9.2 INSTALLING THE DEVICE DESCRIPTION FILE (GSDML)

For project planning the project planning tool, for example, "Step 7", needs a device description file (GSDML) of the devices which are to be project planned. This must first be installed. This can take place, for example, in the program "Step 7 - HW Config" via the menu "Install Extras/GSD files". Following the installation of the GSDML file the following devices appear in the catalog under PROFINET IO/Additional FIELD DEVICES/General/AEI Thyro-.

Thyro-P bus card
A device which actuates one, two or three phases.

Thyro-P bus card MC
A device which actuates one phase three times.

By dragging the device onto the PROFINET bus it is added to the project. Finally, the device name, which is listed in chapter 9.1, must also be entered here (double click on the symbol).

9.3 START CONFIGURATIONS (PARAMETERIZATION)

Via the parameterization (in step 7 - HW Config –> double-click on slot 0 of the Thyro-P –> parameter tab) the following settings can be undertaken.

No connection to Master setpoint =:
Here you can set which setpoint should be used if the connection to the master is interrupted.

Setpoint master error   In the case of an error the setpoint master error is used. Its default value is 0.

Setpoint master   In the case of an error the setpoint master will continue to be used.

Motor potentiometer = master:
This setting activates the writing of the "master setpoint" to the "motor potentiometer setpoint" in remote operation if the "local operation of a setpoint" is used. This prevents a volatile alteration of the setpoint occuring when switching over from remote to local.

Discount all output data in local:
This setting actviates the discounting of all output data in local operation. This can, for example, be useful if the control has set the controller inhibit and, in spite of this, the controller needs to be switched locally. If the controller inhibit needs to be set at the time of switching over from remote to local then the motor potentiometer setpoint is set to 0 and the controller inhibit is deactivated.

Averaging actual values:
Here you can enter the number of actual values which flow into the averaging. A new value is calculated once a second. Values from 0-20 can be entered, whereby 0 or 1 deactivates this function.

Quick actual values power:
Quick actual values load voltage :
Quick actual values current:
Quick actual values conductance:
Quick actual values load temperature:
Quick actual values mains voltage:

Deactivate   Switches off the quick cyclical read-out of these actual values.

Activate   Activates the quick read-out of these actual values.

Setpoint local Thyro-P:
Setpoint local channel 1:
Setpoint local channel 2:
Setpoint local channel 3:
Here you can configure which setpoints are active in local operation (see chapter 9.4).

Terminal 10	Only the setpoint from terminal 10 is active.
Terminal 11	Only the setpoint from terminal 11 is active.
Terminal 10+11	Only the setpoints from terminal 10 and 11 are active.
Master	Only the setpoint master is active.
Motor potentiometer	Only the setpoint motor potentiometer is active.

Setpoint remote Thyro-P:
Setpoint remote channel 1:
Setpoint remote channel 2:
Setpoint remote channel 3:
Here you can configure which setpoints are active in remote operation (see chapter 9.4).

Terminal 10	Only the setpoint from terminal 10 is active.
Terminal 11	Only the setpoint from terminal 11 is active.
Terminal 10+11	Only the setpoints from terminal 10 and 11 are active.
Master	Only the setpoint master is active.
Motor potentiometer	Only the setpoint motor potentiometer is active.

Use of output data when Bit is set:
The suppression of certain output data can be activated here.

Deactivate	New output data are always adopted.
Activate	New output date are only adopted if Bit 2 is set in output "functions".

Diag. (diagnosis message):
For each status message (see table 5) you can configure if these should be displayed via the device-specific diagnosis massage system or not.

9.4 CYCLICAL DATA TRANSMISSION (CONFIGURATION)

The configuration of the cyclical data traffic is undertaken by adding modules. The input and output data depend on the device types. The following tables show the input and output data available for each of the devices. In the Slot column is listed in which slot each module can be inserted.

INPUT DATA	DATA TYPE	SIZE	UNIT	SLOT Thyro-P	Thyro-P MC
Setpoint active	integer	2	-	5-40	5-29, 35-59, 65-89
Total setpoint	integer	2	16383 == 100[%]	5-40	5-29, 35-59, 65-89
Total setpoint float	float	4	[W,V,A,%]	5-40	5-29, 35-59, 65-89
Setpoint terminal 10	integer	2	16383 == 100[%]	5-40	5-29, 35-59, 65-89
Setpoint terminal 11	integer	2	16383 == 100[%]	5-40	5-29, 35-59, 65-89

OUTPUT DATA	DATA TYPE	SIZE	UNIT	SLOT Thyro-P	Thyro-P MC
Setpoint master	integer	2	16383 == 100[%]	2	2, 32, 62
Setpoint master float	float	4	[W,V,A,%]	2	2, 32, 62
Setpoint master error	integer	2	16383 == 100[%]	3	3, 33, 63
Setpoint master error float	float	4	[W,V,A,%]	3	3, 33, 63
Setpoint motor potentiometer	integer	2	16383 == 100[%]	5-40	5-29, 35-59, 65-89
Setpoint motor potentiometer float	float	4	[W,V,A,%]	5-40	5-29, 35-59, 65-89

TAB. 2 SETPOINTS Thyro-P

INPUT DATA	DATA TYPE	SIZE	UNIT	Thyro-P	SLOT Thyro-P MC
Load voltage L1	float	4	[V]	5-40	5-29, 35-59, 65-89
Load voltage L2	float	4	[V]	5-40	5-29, 35-59, 65-89
Load voltage L3	float	4	[V]	5-40	5-29, 35-59, 65-89
Load current L1	float	4	[A]	5-40	5-29, 35-59, 65-89
Load current L2	float	4	[A]	5-40	5-29, 35-59, 65-89
Load current L3	float	4	[A]	5-40	5-29, 35-59, 65-89
Power L1	float	4	[W]	5-40	5-29, 35-59, 65-89
Power L2	float	4	[W]	5-40	-
Power L3	float	4	[W]	5-40	-
Total power L3	float	4	[W]	5-40	-
Conductance L1	float	4	[W]	5-40	5-29, 35-59, 65-89
Conductance L2	float	4	[W]	5-40	-
Conductance L3	float	4	[W]	5-40	-
Mains voltage L1	integer	2	[V]	5-40	5-29, 35-59, 65-89
Mains voltage L2	integer	2	[V]	5-40	-
Mains voltage L3	integer	2	[V]	5-40	-
Load temperature L1	integer	2	[°C]	5-40	5-29, 35-59, 65-89
Load temperature L2	integer	2	[°C]	5-40	-
Load temperature L3	integer	2	[°C]	5-40	-
Energy	integer	2	[kWh]	5-40	5-29, 35-59, 65-89
LED and relays state (see table 6)	integer	2	-	5-40	5-29, 35-59, 65-89
Operating hours	integer	2	[h]	5-40	5-29, 35-59, 65-89
Cycle period	integer	2	[µs]	5-40	5-29, 35-59, 65-89
Status (see table 5)	integer	2	-	5-40	5-29, 35-59, 65-89
Switch-on angle alpha	integer	2	[0.01 °el]	5-40	5-29, 35-59, 65-89
Switch-on time Ts	integer	2	[period]	5-40	5-29, 35-59, 65-89
Temperature	integer	2	[°C]	5-40	5-29, 35-59, 65-89

TAB. 3 ACTUAL VALUES Thyro-P

| | | | | | SLOT |
INPUT DATA	DATA TYPE	SIZE	UNIT	Thyro-P	Thyro-P MC
Digital inputs	integer	2	-	5-40	5-29, 35-59, 65-89
Read value 16 bit	integer	2	-	5-40	5-29, 35-59, 65-89
Read value 32 bit	integer	4	-	5-40	5-29, 35-59, 65-89

| | | | | | SLOT |
OUTPUT DATA	DATA TYPE	SIZE	UNIT	Thyro-P	Thyro-P MC
Functions (see table 7)	integer	2	-	4	4, 34, 64
Write value 16 bit	integer	2	-	5-40	5-29, 35-59, 65-89
Write value 32 bit	integer	4	-	5-40	5-29, 35-59, 65-89

TAB. 4 SEVERAL Thyro-P VALUES

BIT	STATUS
0	SSC fault
1	res.
2	sensor breakage or short circuit
3	Pulse switch-off
4	P limit
5	I limit
6	U limit
7	limit
8	overtemperature
9	controller inhibit
10	undercurrent in load circuit
11	overcurrent in load circuit
12	undervoltage in mains
13	overvoltage in mains
14	SYNC fault
15	MOSI in peak current limitation

TAB. 5 STATUS MESSAGES

BIT	STATUS
0	LED Control
1	LED Limit
2	LED Pulse Lock
3	LED Fault
4	LED Overheat
5	relay K1
6	relay K2
7	relay K3

TAB. 6 LED AND RELAY STATUS

BIT	STATIC FUNCTIONS
0	control lock
1	ext. fault indication
…	

BIT	RISING EDGE CONTROLLED
8	acknowledge error
9	reset
10	save
11	reset energy indication
…	

TAB. 7 FUNCTIONS

9.5 ACYCLIC DATA TRANSMISSION (PARAMETERIZATION)

Via the acyclic parameter data transmission, parameters of the devices can be changed or selected. Cyclical and acyclical services can be used in the network simultaneously.

Read data record "RDREC":
For reading access to a data record, the slot, index and length of the data record must be entered. At step 7 and when using the SFB 52 the logical address of the slot is to be entered instead of the slot. However, as multiple slots are occupied by the same controller, here the slot of the master setpoint or its logical address is to be given.

ERROR CODE	MEANING
DE80B000	The unit does not recognize the parameter (invalid index)
DE80B100	The length entry of the parameter is incorrect
DE80B200	The projected slot is not occupied
DE80B300	The actual unit type does not match the set unit type

Write data record "WRREC":
For writing access to a data record, the slot, index, length of the data record and the new value must be entered. At step 7 and when using the SFB 53 the logical address of the slot is to be entered instead of the slot. However, as multiple slots are occupied by the same controller, here the slot of the master setpoint or its logical address is to be given.

ERROR CODE	MEANING
DF80B000	The unit does not recognize the parameter (invalid index)
DF80B100	The length entry of the parameter is incorrect
DF80B200	The projected slot is not occupied
DF80B300	The actual unit type does not match the set unit type
DF80B600	The parameter cannot be changed
DF80B700	Invalid range of values of a parameter

9.6 PARAMETER TABLES (ACYCLIC)

You will find the parameter tables (acyclic) of each of the device types in the following table:

Thyro-P ADDRESS	SYMBOL	NAME	DATA TYP	VALUE RANGE	COMBO-OPT.	UNIT	R/W	DEFAULT
5	BETR	operating mode	u16	0…7	TAKT, VAR, SSSD, res, res, res, VSC_VAR, res		r/w	TAKT
6	MOSI	op. of molybdenum silicide rods	u16	0..2	OFF, RAMP, STELL		r/w	OFF
7	SCHW_POL	phase shift polarity	u16	0...1	PLUS, MINUS		r/w	PLUS
8	SEB	service mode	u16	0...1	OFF, ON		r/w	OFF
9	ASM	automatic synchronization for multiple controller applications	u16	0...1	OFF, ON		r	OFF
11	TYP	number of controlled phases	u16	1..3			r/w	1
12	AN1	phase angle of the 1st half-wave	u16	0...18000		0.01 °el	r/w	60 °el
13	SST	soft-start time (setting)	u16	0..499		period	r/w	6 period
14	SDN	soft-down time (setting)	u16	0..499		period	r/w	6 period
15	T0	cycle period	u16	1...T0_MAX		period	r/w	50 period
16	MP	minimum pause	u16	0…10		period	r/w	3 period
17	TSMAX	maximum cycle on-time	u16	0...T0		period	r/w	50 period
18	TSMIN	minimum cycle on-time	u16	0...T0		period	r/w	0 period
19	SYNC_EXT	synchronous cycle internal/external	u16	0...1	internal, external		r/w	internal
20	SYNC_ADR	synchronous cycle address	u16	0..65535		period/2	r/w	0 period
22	RE	regulation	u16	0..8	Uload2, Uload eff, Iload2, Iload eff, active power, res, res, res, without regulation		r/w	Uload2
23	STD_RE	standard controller	u16	0...1	OFF, ON		r/w	ON
24	TI_1	PID-controller, I-part	u16	0 = OFF 0..65535			r/w	800
25	KP_1	PID-controller, P-part	u16	1..65535			r/w	160
26	KR_1	PID-controller, counter P-part	u16	0 = OFF 0..65535			r/w	1
27	TD_1	PID-controller, D-part	u16	0 = OFF 0..65535			r/w	OFF
33	SCHW_L1	phase shift L1	u16	0…36000		0.01 °el	r/w	0 °el
34	SCHW_L2	phase shift L2	u16	0…36000		0.01 °el	r/w	0 °el
35	SCHW_L3	phase shift L3	u16	0…36000		0.01 °el	r/w	0 °el
36	UEMI	minimum r.m.s. voltage setpoint	u16	0..65535		V	r/w	0 V
37	IEMI	minimum r.m.s. current setpoint	u16	0..65535		A	r/w	0 A
38	PMI	minimum power setpoint	u32	0…		W	r/w	0 W

Thyro-P ADDRESS	SYMBOL	NAME	DATA TYP	VALUE RANGE	COMBO-OPT.	UNIT	R/W	DEFAULT
40	V_IE	front pulse limit position	u16	0...18000		0.01 °el	r/w	180 °el
41	H_IE	back pulse limit position	u16	0...18000		0,01 °el	r/w	0 °el
42	SW_INP_IU_10	input voltage/current terminal 10	u16	0...2	5 V, 10 V, 20 mA		r/w	20 mA
43	SW_INP_IU_11	input voltage/current terminal 11	u16	0...2	5 V, 10 V, 20 mA		r/w	5 V
44	STA_REGLER	control start controller input terminal 10	u16	0...20480		0,3 mV, 0,6 mV, 1,22 uA	r/w	292 uA (240)
45	STE_REGLER	control end controller input terminal 10	u16	0...20480		0,3 mV, 0,6 mV, 1,22 uA	r/w	20 mA (16383)
46	STA_POTI	control start controller input terminal 11	u16	0...20480		0,3 mV, 0,6 mV, 1,22 uA	r/w	72 mV (240)
47	STE_POTI	control end controller input terminal 11	u16	0...20480		0,3 mV, 0,6 mV, 1,22 uA	r/w	5 V (16383)
48	UEMA	minimum r.m.s. voltage setpoint	u16	0...65535		V	r/w	440 V
49	IEMA	minimum r.m.s. current setpoint	u16	0...65535		A	r/w	110 A
50	PMA	minimum power setpoint	u32	0...		W	r/w	48400 W
52	SW	setpoint linking	u16	0...3	_ADD, IADD, _PRO, IPRO		r/w	_ADD
53	STA_MASTER	control start master	u16	0...16383			r/w	0
54	STE_MASTER	control end master	u16	0...16383			r/w	16383
55	STA_MOPO	control start motor potentiometer	u16	0...16383			r/w	0
56	STE_MOPO	control end motor potentiometer	u16	0...16383			r/w	16383
57	SW_SPRUNG	setpoint jump correction	u16	0...1	OFF, ON		r/w	ON
59	TEMP_KVE	characteristic number	u16	0...7	characteristic 0...7		r/w	characteristic 2
60	OF_1	offset 1	u16	0...20000		uA	r/w	0 uA
61	OF_2	offset 2	u16	0...20000		uA	r/w	0 uA
62	OF_3	offset 3	u16	0...20000		uA	r/w	0 uA
63	IST_1	actual value output 1	u16	0...1	20 mA, 10 V		r/w	20 mA
64	IST_2	actual value output 2	u16	0...1	20 mA, 10 V		r/w	20 mA
65	IST_3	actual value output 3	u16	0...1	20 mA, 10 V		r/w	20 mA
66	I_FA_1	scale end value current actual value output 1	u16	0...65535		A	r/w	150 A
67	I_FA_2	scale end value current actual value output 2	u16	0...65535		A	r/w	150 A
68	I_FA_3	scale end value current actual value output 3	u16	0...65535		A	r/w	150 A
69	U_FA_1	scale end value voltage actual value output 1	u16	0...65535		V	r/w	500 V
70	U_FA_2	scale end value voltage actual value output 2	u16	0...65535		V	r/w	500 V
71	U_FA_3	scale end value voltage actual value output 3	u16	0...65535		V	r/w	500 V
72	P_FA_1	scale end value power actual value output 1	u32	0...		W	r/w	50000 W

Thyro-P ADDRESS	SYMBOL	NAME	DATA TYP	VALUE RANGE	COMBO-OPT.	UNIT	R/W	DEFAULT
74	P_FA_2	scale end value power actual value output 2	u32	0…		W	r/w	50000 W
76	P_FA_3	scale end value power actual value output 3	u32	0…		W	r/w	50000 W
78	ALPHA_FA_1	scale end value alpha actual value output 1	u16	0...18000		0.01 °el	r/w	180 °el
79	ALPHA_FA_2	scale end value alpha actual value output 2	u16	0...18000		0.01 °el	r/w	180 °el
80	ALPHA_FA_3	scale end value alpha actual value output 3	u16	0...18000		0.01 °el	r/w	180 °el
81	DAC_1_CTRL	configuration register actual value output 1	u16	bitwise			r/w	18
82	DAC_1_CTRL	configuration register actual value output 2	u16	bitwise			r/w	20
83	DAC_1_CTRL	configuration register actual value output 3	u16	bitwise			r/w	22
84	DAC1_VA_U	measuring instrument full-scale deflection DAC1, voltage	u16	0…10000		mV	r/w	10 V
85	DAC1_VA_I	measuring instrument full-scale deflection DAC1, current	u16	0...20000		uA	r/w	20 mA
86	DAC2_VA_U	measuring instrument full-scale deflection DAC2, voltage	u16	0…10000		mV	r/w	10 V
87	DAC2_VA_I	measuring instrument full-scale deflection DAC2, current	u16	0...20000		uA	r/w	20 mA
88	DAC3_VA_U	measuring instrument full-scale deflection DAC3, voltage	u16	0…10000		mV	r/w	10V
89	DAC3_VA_I	measuring instrument full-scale deflection DAC3, current	u16	0...20000		uA	r/w	20 mA
90	I_TYP	power controller rated current	u16	0...65535		A	r	110 A
91	R_BUERDE_U	load resistor range 0	u16	0...65535		Ohm	r	1680 Ohm
92	R_BUERDE_I	load resistor current	u16	0...65535		0.01 Ohm	r	0,91 Ohm
93	U_TYP	power controller connection voltage	u16	0…1000		V	r	400 V
94	SW_ACTIV	setpoint activation	u16	0...15	Bit 0 = 1 (setpoint terminal 10 active) etc.		r/w	15
95	U_NETZ_ANW	mains voltage user	u16	0...1000		V	r	400 V
96	UE_U	voltage converter ratio	u16	0...1000			r	16
97	UE_I	current converter ratio	u16	0...65535			r	100
100	IMAB	pulse switch-off on error register	u32	bitwise			r/w	0
102	K1RU	LED & Relays work principle	u16	0...255 bitwise	Operating current principle, closed current principle		r/w	224
104	I_SCHW	current value threshold	u16	0...65535		0.1 A	r/w	6500 A
105	TI_FA	potentiometer controller parameter Ti	u16	0...65535			r/w	0
106	KP_FA	potentiometer controller parameter Kp	u16	0...65535			r/w	0

Thyro-P ADDRESS	SYMBOL	NAME	DATA TYP	VALUE RANGE	COMBO-OPT.	UNIT	R/W	DEFAULT
107	FREQ_MIN	min. frequency	u16	14286...25000, 1/X * 10^6		Hz	r/w	45 Hz (22222)
108	FREQ_MAX	max. frequency	u16	14286...25000, 1/X * 10^6		Hz	r/w	66 Hz (15151)
109	FREQ_TOL	frequency tolerance	u16	0…100		%	r/w	0.1
112	NORM_I	scaling factor current	u16	0..65535			r	847
113	I_TYP_LSB	rated current in LSB	u16	0..65535			r	847
114	R_TEIL	voltage divider resistor	u16	0..65535		Ohm	r	36000
115	U_NORM_230	scaling factor 230 V	u16	0..65535			r	958
116	U_NORM_400	scaling factor 400 V	u16	0..65535			r	993
117	U_NORM_690	scaling factor 500-690 V	u16	0..65535			r	1008
118	U_TYP_LSB	rated voltage in LSB	u16	0..65535			r	1216
119	P_TYP_LSB	rated power in LSB	u32	0…			r	1031367
121	P_TYP	power controller rated power	u32	0…		W	r	25300
123	TYP_BEREICH	voltage range changeover	u16	0..2	230 V, 400 V, 500-690 V		r	400 V
124	R_BUERDE_U_1	load resistor range 1	u16	0..65535		Ohm	r	1680 Ohm
125	R_BUERDE_U_2	load resistor range 2	u16	0..65535		Ohm	r	1680 Ohm
126	SPG_MIN	mains voltage monitoring minimum	u16	0...1000		V	r/w	180
127	SPG_MAX	mains voltage monitoring maximum	u16	0...1000		V	r/w	480
128	UN_S	undercurrent monitoring	u16	0...1	OFF, ON		r/w	OFF
130	UE_S	overcurrent monitoring	u16	0...1	OFF, ON		r/w	OFF
132	OUT0_CFG	LED CONTROL Mode	u16	0..65535 bitwise			r/w	4096
133	OUT1_CFG	LED LIMIT Mode	u16	0..65535 bitwise			r/w	0
134	OUT2_CFG	LED PULSE LOCK Mode	u16	0..65535 bitwise			r/w	0
135	OUT3_CFG	LED FAULT Mode	u16	0..65535 bitwise			r/w	1792
136	OUT4_CFG	LED OVERHEAT Mode	u16	0..65535 bitwise			r/w	1536
137	OUT5_CFG	Relay K1 Mode	u16	0..65535 bitwise			r/w	1792
138	OUT6_CFG	Relay K2 Mode	u16	0..65535 bitwise			r/w	768
139	OUT7_CFG	Relay K3 Mode	u16	0..65535 bitwise			r/w	59392
140	OUT0_STOERM_L	LED CONTROL config. 0	u16	0..65535 bitwise			r/w	0
141	OUT1_STOERM_L	LED LIMIT config. 0	u16	0..65535 bitwise			r/w	2048
142	OUT2_STOERM_L	LED PULSE LOCK config. 0	u16	0..65535 bitwise			r/w	256
143	OUT3_STOERM_L	LED FAULT config. 0	u16	0..65535 bitwise			r/w	0
144	OUT4_STOERM_L	LED OVERHEAT config. 0	u16	0..65535 bitwise			r/w	0
145	OUT5_STOERM_L	Relay K1 config. 0	u16	0..65535 bitwise			r/w	0
146	OUT6_STOERM_L	Relay K2 config. 0	u16	0..65535 bitwise			r/w	2048
147	OUT7_STOERM_L	Relay K3 config. 0	u16	0..65535 bitwise			r/w	1

Thyro-P ADDRESS	SYMBOL	NAME	DATA TYP	VALUE RANGE	COMBO-OPT.	UNIT	R/W	DEFAULT
148	OUT0_STOERM_H	LED CONTROL config. 1	u16	0...65535 bitwise			r/w	0
149	OUT1_STOERM_H	LED LIMIT config. 1	u16	0...65535 bitwise			r/w	0
150	OUT2_STOERM_H	LED PULSE LOCK config. 1	u16	0...65535 bitwise			r/w	0
151	OUT3_STOERM_H	LED FAULT config. 1	u16	0...65535 bitwise			r/w	256
152	OUT4_STOERM_H	LED OVERHEAT config. 1	u16	0...65535 bitwise			r/w	0
153	OUT5_STOERM_H	Relay K1 config. 1	u16	0...65535 bitwise			r/w	256
154	OUT6_STOERM_H	Relay K2 config. 1	u16	0...65535 bitwise			r/w	0
155	OUT7_STOERM_H	Relay K3 config. 1	u16	0...65535 bitwise			r/w	0
159	LASTBRUCH_ MIN_ABS	load interrupt, absolute minimum value	u16	0..65535			r/w	0
160	LASTBRUCH_ MAX_ABS	load interrupt, absolute maximum value	u16	0..65535			r/w	0
297	DA_EN	data logger enable register	u32	bitwise			r/w	524288
303	AV_AVERAGE	Average	u16	0…20	OFF 1…20		r/w	AUS
311	LASTBRUCH_MIN	load interrupt, minimum value	u16	0…99		%	r/w	0 %
312	LASTBRUCH_MAX	load interrupt, maximum value	u16	0…255		%	r/w	0 %
313	REL_ABS	load interrupt	u16	0…1	REL_, ABS		r/w	REL_
315	NLT	neutral conductor	u16	0...1	OFF, ON		r/w	OFF
318	ASM_SUMM	ASM total current	u16	1...65535		A	r/w	220
319		ASM threshold	u16	1...65535			r/w	200
320		ASM tolerance	u16	1...65535			r/w	100
321	SYNC_ANZ	number of sync voltages	u16	1...3			r/w	1
322	SYNC_DREHF	rotating field	u16	0...1	right, left		r/w	right
323	SCHW	phase shift	u16	0...1	OFF, ON		r/w	OFF
324	NACHIMP	re-ignitions	u16	0...1	OFF, ON		r/w	OFF
325	MITTEL	averaging	u16	0...1000			r/w	25
326	NACHIMP_DAUER	Duration of re-ignitions	u16	1...18000		0.01 °el	r/w	90°el
333	MESS	meter circuit	u16	0...5	Aron, 1/2 Aron 1, 1/2 Aron 2, 1/2 Aron 3, asymmetric load, symmetric load		r	
335	TI_3	PID limit controller, I-part	u16	0 = OFF 0...65535			r/w	800
336	KP_3	PID limit controller, P-part	u16	1...65535			r/w	160

Thyro-P ADDRESS	SYMBOL	NAME	DATA TYP	VALUE RANGE	COMBO-OPT.	UNIT	R/W	DEFAULT
337	KR_3	PID limit controller, counter P-part	u16	0 = OFF 0...65535			r/w	1
338	TD_3	PID limit controller, D-part	u16	0 = OFF 0...65535			r/w	OFF
339	LoadTempPn_a0	coefficient a0 load temp. pol.	f32				r/w	1.0
341	LoadTempPn_a1	coefficient a1 load temp. pol.	f32				r/w	1.0
343	LoadTempPn_a2	coefficient a2 load temp. pol.	f32				r/w	1.0
345	LoadTempPn_a3	coefficient a3 load temp. pol.	f32				r/w	1.0
347	LoadTempPn_a4	coefficient a4 load temp. pol.	f32				r/w	1.0
349	LoadTempPn_a5	coefficient a5 load temp. pol.	f32				r/w	1.0
351	T_FA_1_MIN	scale start value load temperature actual value output 1	u16	0...65535		℃	r/w	0 ℃
352	T_FA_1	scale end value load temperature actual value output 1	u16	0...65535		℃	r/w	1000 ℃
353	T_FA_2_MIN	scale start value load temperature actual value output 2	u16	0...65535		℃	r/w	0℃
354	T_FA_2	scale end value load temperature actual value output 2	u16	0...65535		℃	r/w	1000 ℃
355	T_FA_3_MIN	scale start value load temperature actual value output 3	u16	0...65535		℃	r/w	0 ℃
356	T_FA_3	scale end value load temperature actual value output 3	u16	0...65535		℃	r/w	1000 ℃
357	LdTrafoRatio	load transformer ratio	f32				r/w	1.0
360	I_PEAK_L1	Fast current monitoring L1	u16	0 = OFF 0...65535		[A]	r/w	AUS
361	I_PEAK_L2	Fast current monitoring L2	u16	0 = OFF 0...65535		[A]	r/w	AUS
362	I_PEAK_L3	Fast current monitoring L3	u16	0 = OFF 0...65535		[A]	r/w	AUS
363	VSC_STEPS	No. of stages	u16	2...3			r/w	
364	VSC_OVERLAP	VSC overlapping	u16	0...50		[%]	r/w	13
365	VSC_EXTERN	External measurement	u16	0…1	Intern, Extern		r/w	Intern
409	USER_PARA_0	user parameter 0	u16	0...65535			r/w	0
410	USER_PARA_1	user parameter 1	u16	0...65535			r/w	1
411	USER_PARA_2	user parameter 2	u16	0...65535			r/w	2
412	USER_PARA_3	user parameter 3	u16	0...65535			r/w	3

413	USER_PARA_4	user parameter 4	u16	0...65535			r/w	4
414	USER_PARA_5	user parameter 5	u16	0...65535			r/w	5
415	USER_PARA_6	user parameter 6	u16	0...65535			r/w	6
416	USER_PARA_7	user parameter 7	u16	0...65535			r/w	7
417	USER_PARA_8	user parameter 8	u16	0...65535			r/w	8
418	USER_PARA_9	user parameter 9	u16	0...65535			r/w	9
419	USER_PARA_10	user parameter 10	u16	0...65535			r/w	10
420	USER_PARA_11	user parameter 11	u16	0...65535			r/w	11
421	USER_PARA_12	user parameter 12	u16	0...65535			r/w	12
422	USER_PARA_13	user parameter 13	u16	0...65535			r/w	13
423	USER_PARA_14	user parameter 14	u16	0...65535			r/w	14
502	MOSI_IS_FA	factor peak current limitation	u16	0...50		0.1	r/w	2.5
503	MOSI_WI_GE_1	rate of angular displacement 1	u16	0...65535		0.02 °el/s	r/w	22 °el/s (1100)
504	MOSI_WI_GE_2	rate of angular displacement 2	u16	0...65535		0.02 °el/s	r/w	1 °el/s (50)
505	T0_MAX	cycle period max.	u16	1...65535		period	r/w	250 period
506	TI_1_STD	PID-controller, I-part, default value	u16	0 = OFF 0...65535			r	800
507	KP_1_STD	PID-controller, P-part, default value	u16	1...65535			r	160
508	KR_1_STD	PID-controller, counter P-part, default value	u16	0 = OFF 0...65535			r	1
509	TD_1_STD	PID-controller, D-part, default value	u16	0 = OFF 0...65535			r	OFF
514	TEMP	temperature sensor	u16	0...3	No, Pt100, PT1000, NTC		r/w	No
515	FU_DR_BR	level wire break	u16	0...4000		Ohm	r/w	2000 Ohm
516	FU_KURZ	level short circuit	u16	0...4000		Ohm	r/w	800 Ohm
571		ASM time constant	u16	1...65535			r/w	100
571		ASM delay	u16	1...65535			r/w	1
600		DAC multiplexer	u16	bitwise			r/w	0
604	KANALTREN	channel separation	u16	0...1	OFF, ON		r/w	ON
630	L2_ENA	monitoring L2 enable	u16	0...1	OFF, ON		r/w	OFF
631	L3_ENA	monitoring L3 enable	u16	0...1	OFF, ON		r/w	OFF
655	NR_GER	device number	u32				r	
657	NR_LFD	serial number	u16				r	
658	NR_LK	PCB number	u32				r	

662	TEMP_FE_DAU	temperature error duration	u16	1…1000	period	r/w	10 period
676	RESET	reset trigger on error register	u32	bitwise		r/w	0
679	dASM_UNITS	No. of devices	u16	0…32		r/w	
680	dASM_LOAD_LI-MIT	Power threshold	u32	0…		r/w	
691	TI_3_STD	PID limit controller, I-part, default value	u16	0 = OFF 0..65535		r	800
692	KP_3_STD	PID limit controller, P-part, default value	u16	1..65535		r	160
693	KR_3_STD	PID limit controller, counter P-part, default value	u16	0 = OFF 0..65535		r	1
694	TD_3_STD	PID limit controller, D-part, default value	u16	0 = OFF 0..65535		r	OFF
695		measured value multiplexer 1	u16	bitwise		r/w	0
696		measured value multiplexer 2	u16	bitwise		r/w	0
697		measured value multiplexer 3	u16	bitwise		r/w	0
806	VERS_J	version year	u16	0…9999		r	
807	VERS_M	version month	u16	1…12		r	
808	VERS_T	version day	u16	1…31		r	

TAB. 8 CONTROLLER PARAMETER (Thyro-P/Thyro-P MC)

10. DIAGNOSIS

For the analysis of faults there are several LEDs on the plug-in card. They provide a picture of the status of the application and the bus system. Status information on the Thyro-P (MC) is sent to the PROFINET master with diagnosis messages.

10.1 LED STATUS INDICATIONS

LED		COLOR	STATUS	MEANING
System	Run	Green	On	Operating system is running
			Off	Error see error LED
	Error	Red	Flashing at 5 Hz	Hardware error
			Flashing at 1 Hz	Error boot routine
			On	Waiting for boot routine (check switch setting "Protocol")
			Off	No supply voltage

TAB. 9 OPERATING STATUS OF THE ETHERNET PLUG-IN CARD

LED	COLOR	STATUS	MEANING
Link	Green	On	There is an Ethernet connection
Activity	Yellow	On	Data are being exchanged via the Ethernet

TAB. 10 STATUS LED OF ETHERNET PORTS 1 AND 2

10.2 DIAGNOSIS MESSAGES

For each message which displays the status word (see table 5) a device-specific diagnosis message (default) is sent to the master. This can be deactivated via the start configurations (see chapter 9.3). The current status can continue to be read out cyclically from the status word.

11. EXTERNAL CONNECTIONS

11.1 ETHERNET INTERFACE

Communication medium	CAT 5e
Network topology	tree, star and line
Maximum cable length	100 m
PROFINET participants	restricted to the maximum supported number of devices by the controller used
PNO identification number	0x0188
Device ID	0x0002
Transmission rate	100 Mbit/s

12. APPROVALS AND CONFORMITIES

Quality standard in accordance with EN ISO 9001
CE conformity
PROFINET conformity
RoHS (RoHS compliant 5/6) [RoHS]

DIRECTIVES

The devices of the type series Thyro-P, Thyro-P Ethernet plug-in card PROFI-
NET is a part hereof, comply with the currently applicable
EN 50178 and EN 60146-1-1. By adhering to VDE 0106, section 100, BGV A2
(VBG4) is covered.
The CE sign attached to the device confirms compliance with the EC direc-
tives for 2006/95/EEC for low voltage and 2004/108/EEC for electro-magnetic
compatibility, if the installation and commissioning instructions described
within the operating instructions are followed.
Regulations and definitions for specialists are included in DIN 57105/VDE
0105 section 1.
Safe separation in accordance with VDE 0160 (EN 50178 chapter 3).

In detail

DEVICE APPLICATION CONDITIONS

PROFINET		IEC 61158, IEC 61784
Built-in device (VDE0160)		DIN EN 50 178
Storage temperature (D)		-25 °C – +55 °C
Transport temperature (E)		-25 °C – +70 °C
Operating temperature (better B)		-10 °C – +55 °C
Humidity class	B	DIN EN 50 178 tab. 7 (EN 60 721)
Degree of contamination	2	DIN EN 50 178 tab. 2
Air pressure		900 mbar * 1000 m above sea level
Degree of protection	IP00	DIN EN 69 529
EMC-testing		EN 61000-6-2 (-4)
Emitted interference		CISPR 16
Radiated immunity		EN/IEC 61000-4-3
Conducted immunity		EN/IEC 61000-4-6
ESD	8 kV(A)	EN/IEC 61000-4-2
Burst control lines	1 kV (A)	EN 61000-4-4

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