

Manual

GK473 - Gateway RS485 -

Version 1.00 and up

Applicable for:

Spindle position display N 140 / N 141 / N 142 / N 150 / N 152 / N 153 / N 155

Baumer IVO GmbH & Co. KG
Dauchinger Strasse 58-62
DE-78056 Villingen-Schwenningen
Phone +49 (0)7720 942-0
Fax +49 (0)7720 942-900
info.de@baumerivo.com
www.baumerivo.com

23.04.08 · 174.02.042/2
Subject to technical and design modifications.
Errors and omissions excepted.

Contents

1. Introduction	3
1.1. Product assignment	3
2. Overview	3
3. Safety precautions and operating information	4
4. Commissioning	5
4.1. Scope of delivery	5
4.2. Mechanical Mounting	5
4.3. Electrical connection	5
4.3.1. Electrical commissioning	5
4.3.2. Supply voltage connection	5
4.3.3. Shield connection / functional earth	5
4.3.4. Profibus - RS485 bus connection	6
4.4. Device parameters	7
4.4.1. How to open the housing (partial pull-out)	7
4.4.2. Setting the Profibus user address	7
4.4.3. Setting the Profibus bus termination	7
4.4.4. Gateway projecting in Profibus project	8
5. Profibus-DP interface description	9
5.1. General information	9
5.2. Data transfer structure	9
5.3. Transparent gateway function	10
5.3.1. General information	10
5.3.2. Broadcast commands	10
5.3.3. Interface documentation	10
5.4. Automatic gateway functions	10
5.4.1. Automatic SPA recognition	10
5.4.2. Continuous scanning of all connected SPAs	11
5.5. Profibus-specific commands	11
5.5.1. Batched information „SPAs connected“	11
5.5.2. Batched information „Check Position“	12
5.5.3. Batched information „Device Status“	12
5.5.4. Automatic SPA scanning ON or OFF	13
5.5.5. Readout gateway version or serial number	13
5.6. Error signals (data exchange)	13
5.7. Error and warning signals (diagnostic data)	14
5.8. Front panel display elements (LEDs)	15
6. Technical Data	16

1. Introduction

1.1. Product assignment

Product	GSD-File	Product family
GK473.0073PDx	GK4_059B.gsd	multicon

2. Overview

GK473 gateway (interface transformer) is connecting the spindle position displays (SPAs) of the Baumer IVO multicon system (for example: N 140 / N 142 / N 150) to a Profibus-DP-capable PLC. The gateway is transforming the data blocks of the SPA's RS485 interface into Profibus DP protocol (or vice-versa).

Some gateway functions simplify considerably programming the PLC.

The gateway allows connection of max. 32 SPAs to Profibus DP and can be used for all multicon SPAs (spindle position displays).

In addition, it is possible to use several gateways with the Profibus in order to connect more SPAs.

3. Safety precautions and operating information

Supplementary information

- This manual is intended as a supplement to already existing documentation (catalogues, product information and mounting instructions).
- It is imperative to read the manual prior to initial commissioning of the equipment.

Intended purpose

- The gateway is an interface transformer for RS485 serial interface and Profibus DP. It comprises specific modifications for the IVO multicon spindle positioning system.
- The gateway may only be used for this purpose.

Commissioning

- The gateway may only be installed and mounted by qualified experts.
- Observe the operating instructions of the machine manufacturer.

Safety remarks

- Prior to commissioning of the equipment, check all electrical connections.
- If installation, e-connection or any other work performed at the gateway and at the equipment is not carried out correctly this can result in malfunction or failure of the gateway.
- Steps must be taken to exclude any risk of personal injury, damage to the plant or to the operating equipment as a result of gateway failure or malfunction by providing corresponding safety precautions.
- The gateway must not be operated beyond the limit values specified in the product information.

Failure to comply with the safety remarks can result in malfunctions, personal injury or damage of property.

Transport and storage

- Transport and storage in the original packaging only.
- Never drop the gateway or expose it to major shocks.

Mounting

- Avoid impacts or shocks on the housing.

Disposal

- Gateway components are to be disposed of according to the legal regulations prevailing in the respective country.

4. Commissioning

4.1. Scope of delivery

- Gateway
- Two screw terminals
- Strain relief/shield connection terminal
- Data carrier with GSD file
- Manual

4.2. Mechanical Mounting

The gateway features a small housing for DIN rail mounting. It can easily be opened by screwdriver and pulled out partially in order to set the bus node ID and bus termination.

- Width of pattern 22.5 mm, height approx. 100 mm and depth approx. 110 mm
- For mounting onto 35 mm DIN rails

For mounting onto the DIN rail, the gateway is inserted from rear into the DIN rail and then pressed down to lock.

4.3. Electrical connection

4.3.1. Electrical commissioning

- Do not carry out any electrical modifications at the gateway.
- Ensure that the entire equipment is installed in line with EMC requirements. Ambient installation and wiring affect the electromagnetic compatibility of the gateway. Install gateway and supply cables in separate rooms or far away from cables with high interference emission (frequency converters, protections, etc).
- Provide a separate supply voltage for the gateway where working with consumers with high interference emission.
- Connect the gateway to protective earth (PE) conductor using shielded cable. The braided shield must be connected to cable gland or plug. Ideally, aim at a bilateral connection to protective earth (PE), i.e. housing via mechanical assembly and cable shield via downstream devices. In case of earth loop problems, earth on one side only as a minimum requirement.

Failure to observe these instructions may result in malfunctions, material damage or personal injury.

4.3.2. Supply voltage connection

Supply voltage connection for gateway and SPA by pin 5 (GNDB) and 6 (UB) or by pin 7 (GNDB) and 8 (UB). Pin 5 and 7 as well as 6 and 8 are internally connected with each other for looping the operating voltage down to other consumers (for example to SPA).

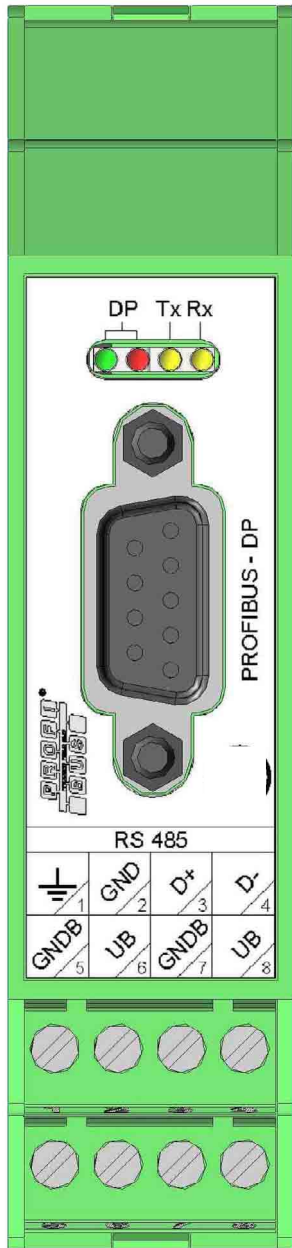
UB: 12...24 VDC, ripple less than 5 %, 200 mA.

In addition, each spindle position display (without motive drive) is consuming approx. 30 mA. For specific data of the SPA power consumption please refer to the respective data sheet.

4.3.3. Shield connection / functional earth

Connection of protective earth to pin 1 which is at the same time serving for connecting the RS485 bus shield. There is a connection between pin 1 and the housing of the 9-pin D-Sub connector (Profibus). The PE (protective earth) connection is additionally carried out by the DIN rail mounting. For this intention the DIN rail has to be connected to functional earth by low-impedance.

4.3.4. Profibus - RS485 bus connection



Profibus

CAN Bus connection is provided by 9-pin D-SUB connector (female) that is integrated in the front panel.

PIN	Function
1	Shield/functional earth
2	
3	Profibus B (+)
4	
5	
6	
7	
8	Profibus A (-)
9	

Connector-housing: shield / functional earth.

Any requested Profibus looping can be proceeded in the attachment connector itself (not included in the delivery). Corresponding connectors are available in specialized shops. It is imperative to avoid stub lines in cabling but to proceed any Profibus loops directly at the device itself.

RS485 Bus

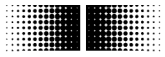
RS485 Bus connection and power supply is provided by 2 x 4-pin screw terminal connectors

Pin	Funktion
1	Protective earth
2	Signal-GND
3	Rx/Tx +
4	Rx/Tx -
5	GNDB
6	UB
7	GNDB
8	UB

UB:12..24 VDC, ripple 5%, 40 mA

Supplementary consumption of each spindle position display (with no motive drive): approx. 30 mA.

It is possible to connect up to 32 multicon SPAs to the RS485 bus in any combination. The bus terminator is firmly installed in the gateway. That's why the gateway always has to be at one of the two ends of an RS485 string. The respectively remaining end has to provide a bus terminating connector at the final SPA.



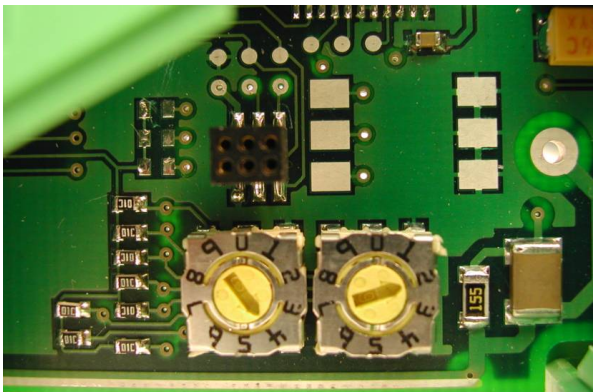
4.4. Device parameters

4.4.1. How to open the housing (partial pull-out)



Setting the user address requires partial opening of the gateway housing. Please use a small screwdriver, press-in the snap-locks provided at the top and bottom behind the screw terminals and pull out the housing halfway until stop so that the operating elements are accessible. The housing is closed again by pulling it back to its original position until both locks snap in again.

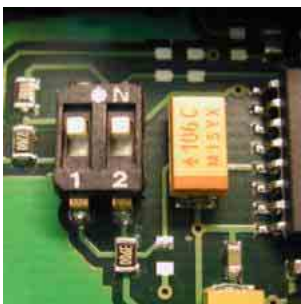
4.4.2. Setting the Profibus user address



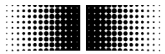
The Profibus-user address is set decimally within the range from 00 to 99 using two BCD rotary switches. Please consider that the lower addresses are often reserved to the Profibus master, reason why an address of 0, 1 or is not recommended. Default setting is 00.

The illustration shows the address switch in position „42“, the decimal digit at the left, the unit digit at the right.

4.4.3. Setting the Profibus bus termination



The gateway provides a two-pole DIP switch for bus termination. Both switches have always to be pushed together. The bus terminator will be active if both DIP switches are in „ON“ position. Default setting is OFF.



A bus termination is imperative as soon as the connected gateway is the final user in a Profibus segment. Make sure that only the first and the last user in the Profibus segment provide a bus termination.

The bus termination in the arriving D-Sub connector must not be used since it is not actively terminating the Bus to 0 V and + 5 V.

4.4.4. Gateway projecting in Profibus project

For gateway projecting in the Profibus project there is a GSD file attached that first is to be imported into the projecting software. Proceed as usual with all other DP slaves and place the bus Node ID set in the gateway.

For parameterization you have the following options:

Auto Scan SPA

Default: ON

During operation the gateway is automatically and continuously scanning all SPAs connected, checking whether they are „in position“. If required, this information can be compiled by special command for read in by Profibus. AutoScan spares the DP master cyclic polling of each SPA itself.

However, there are situations where this feature is not welcome. In this case please refer to the gateway command „SPA AutoScan ON or OFF“ that has an impact on this function also during operation.

Auto message SPA position

Default: OFF

If active, in the following situations the gateway will automatically transmit a message without prior DP master request.

- After all SPAs having been „in position“ before, now at least one SPA is no longer. If further SPAs are no more „in position“ either, no supplementary message will be transmitted. A message is also transmitted upon one SPA signalling „error“ status.
- After at least one SPA having been not „in position“ before, now all are „in position“ again.

This option is only available with Auto Scan SPA =ON. The message transmitted is identical to the response on the command „Batched information Check Position“ of block number 20h.

Auto message SPA error

Default: OFF

If active, in the following situations the gateway will automatically transmit a message without prior DP master request.

- After all SPAs having transmitted „no error“ („in position“ or „not in position“), now at least one SPA is in „error“ status. If further SPAs join, no supplementary message will be transmitted.
- After at least one SPA having been in „error“ status, now all SPAs are „in position“ or „not in position“.

This option is only available with Auto Scan SPA =ON. The message transmitted is identical to the response on the command „Batched information Device Status“ of block number 20h.

5. Profibus-DP interface description

5.1. General information

The gateway provides the connection between the SPA's RS 485 protocol and the Profibus-DP.

The Profibus-DP interface is in line with Profibus standard DP-V0 (cyclic communication) according DIN EN 50170. Possible transmission rates are 9600, 19200, 93,75k, 187,5k, 500k, 1.5M, 3M, 6M and 12M Baud. The baud rate applied is recognised and set automatically.

Since there are no existing standards for gateway profiles they are manufacturer-specific.

5.2. Data transfer structure

The PLC output data to the gateway contain the complete command for the addressed SPA. The command is added by tokens for start and stop as well as by the CRC check sum and passed by the gateway via RS485. In the Profibus line the gateway has a firm length of 16 byte I/O data.

In direction vice-versa, the tokens for start and stop as well as the CRC check sum are removed from the RS485 message, but latter is passed with unchanged content to the data block of a Profibus message so that it is available at the PLC as consistent input data.

Furthermore, the gateway provides additional functions to relieve the upstream PLC and its program editing.

To identify new RS485 telegrams, the Profibus telegram comprises an additional count byte that is altered or better incremented with each new RS485 telegram.

Contrary to the RS485 protocol of the SPA, the Profibus data block has a firmly defined length of 16 byte. Basically it is consistently transferred in both directions and also has to be evaluated this way by the PLC. Consistency means in this case that all bytes belong together and must not be separated.

The example below is showing how a „check position“ command is transformed from Profibus into RS485 as well as the transformation of the RS485 response into Profibus.

The gateway is receiving the following, consistent data block from the PLC. The first 00h is serving as footer token marking the end of the command so that its length can be recognised by the gateway. The count byte zz was incremented in the PLC to activate reception in the gateway.

transmit	Zhl	Adr	Cmd	data												
	zz	27h	43h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h

Now the SPA (address 7 = 27h) is getting the following command by the gateway:

transmit	SOH	Adr	Cmd	EOT	CRC
	01h	27h	43h	04h	16h

In the SPA profile number 5 is active, the SPA is „in position“ (token „o“) SPA replies to gateway by

response	SOH	Adr	Cmd	Stat.	Profil-Nr=05	EOT	CRC
	01h	27h	43h	6Fh	30h	35h	04h 45h

The gateway transforms the response into the following consistent data block. The count byte is incremented to release reception in the PLC.

response	Zhl	Adr	Cmd	data												
	zz	27h	43h	6Fh	30h	35h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h

5.3. Transparent gateway function

5.3.1. General information

Basically all commands with code „A“ ... „z“ are transparently transmitted by Profibus to the SPAs and vice-versa, allowing addressing each SPA individually or altogether by PLC broadcast command. The gateway does not check whether an SPA is connected by the registered address, neither the code of the command.

The gateway will only accept commands with code „@“ for local processing without SPA commitment, the response is transmitted immediately to the Profibus master by Profibus.

Basically the gateway is responding to every command received from DP-Master (PLC).

The DP-Master always has to wait for the response prior to sending another command to the gateway. This enables the DP Master to always recognise when a command is successfully accomplished.

The response will be

- by passing transparently the SPA response if an individual SPA was addressed and is duly replying.
- by error signal if the SPA does not reply after having elapsed the timeout (approx. 100 ms)
- by confirmatory response after having transmitted a broadcast command (to address 99, 83h) to all SPAs.

Any timeout in the DP master for monitoring the gateway replies should not be less than 400 ms.

5.3.2. Broadcast commands

Due to the bus conflict, SPAs are generally not in a position to reply via RS485 interface to broadcast commands, i.e. to commands addressed to all SPAs at the same time (address 99, 83h). Therefore, on behalf of the SPA the gateway will transmit a response to the DP master in the format described below. The response is only repeating broadcast address (99) and command code. It is only to confirm that the broadcast command was transmitted by RS485 interface to all SPA. It is NOT confirming any acceptance or accomplishment at the end of the SPA.

Example: Broadcast command „i“ is programming all SPA to „mm“ as measuring unit.

transmit	Zhl	Adr	Cmd	data												
	zz	83h	69h	30h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h

response	Zhl	Adr	Cmd	data												
	zz	83h	69h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h

5.3.3. Interface documentation

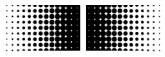
The respective SPA's interface description(s) is giving complete information on the SPA interface. The interface description is indispensable for editing a gateway application.

5.4. Automatic gateway functions

5.4.1. Automatic SPA recognition

After switch on the gateway will automatically scan all SPA addresses. Each address found is stored in the internal memory. Later, the addresses of all SPAs connected may be compiled by special command for read-in by Profibus.

This function takes for granted that all SPA are already "ON" or at least being switched on together with the gateway. A reliable information on all SPA connected is available at the beginning of the Profibus communication.



5.4.2. Continuous scanning of all connected SPAs

During operation the gateway is automatically scanning all SPA connected, checking whether they are „in position“ or in error status. If requested, this information may be compiled by special command for read-in by Profibus.

This function is optional in projecting (GSD file) and can even later be switched on or off by supplementary command.

5.5. Profibus-specific commands

There is a class of its own regarding commands for direct communication with the gateway without any SPA commitment. All of these commands provide the „@“ code followed by a sub-code defining the function in detail.

The total length of command and response is always 16, due to the constant Profibus transmission length.

The “address” (Adr.) parameter is only for keeping the standard command structure, the value is always 20h. Any bytes not used at the end of a message have always to be = 00h. They serve to Profibus master and gateway for identification of the message length.

Significance of abbreviations applied. All numbers provide the offset of 20h.

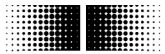
- Zhl count byte (value zz)
- Adr SPA device address including offset 20h
- Cmd command (command code)
- SCmd sub command (sub command code)
- BNr block number including offset 20h
- Anz number of SPA including offset 20h
- Daten data transmitted or received
- Rsvd reserved byte

5.5.1. Batched information „SPAs connected“

The batched information „SPAs connected“ (command @-A) provides the total number of SPA’s connected to the gateway together with the corresponding address information in bunches of 10. First the Profibus Master should give the command with block number 0 (20h). In case of more than 10 SPAs being connected, the Profibus Master will scan the following SPAs in groups of 10 by further command (block number 1..3 (21..23h)).The addresses are in ascending order and may vary in the range from 20h ..83h. The “Anz” parameter is always indicating the total number of all SPAs connected.

Example: There are three SPAs (Adr. 25h, 26h and 27h) connected to the gateway

transmit	Zhl	Adr	Cmd	Scmd	BNr	data										
	zz	20h	40h	41h	20h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h
response	Zhl	Adr	Cmd	Scmd	BNr	Anz	data									
	zz	20h	40h	41h	20h	23h	25h	26h	27h	20h	20h	20h	20h	20h	20h	20h



5.5.2. Batched information „Check Position“

The batched information „Check Position“ (command @-C) provides by the „Anz“ parameter the total number of SPAs being „not in position“. The data field comprises the addresses of 10 SPAs each being „not in position“. First the Profibus Master should give the command with block number 20h. This will already be sufficient as basic information whether all SPAs are in position. In case of more than 10 SPAs being not in position and it is of interest which ones, the Profibus-Master is able to check the remaining SPAs connected in groups of 10 by further commands (block number 21..23h). The addresses are in ascending order and may vary within the value range from 20h..83h. The „Anz“ parameter is always indicating the total number of SPAs being „not in position“.

Example: All SPAs are in position.

transmit	Zhl	Adr	Cmd	Scmd	BNr	data										
	zz	20h	40h	43h	20h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h
response	Zhl	Adr	Cmd	Scmd	BNr	Anz	data									
	zz	20h	40h	43h	20h	20h	20h	20h	20h	20h	20h	20h	20h	20h	20h	20h

Example: 15 SPAs are not in position (SPA Adr 40h, 41h,42h, ..., 4Eh)

transmit	Zhl	Adr	Cmd	Scmd	BNr	data										
	zz	20h	40h	43h	20h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h
response	Zhl	Adr	Cmd	Scmd	BNr	Anz	data									
	zz	20h	40h	43h	20h	2Fh	40h	41h	42h	43h	44h	45h	46h	47h	48h	49h

5.5.3. Batched information „Device Status“

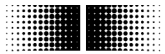
The batched information „device status“ (command @-F) provides by the „Anz“ parameter the total number of SPAs indicating an error status. The data field comprises the addresses of 10 SPAs each indicating an error status. First the Profibus Master should give the command of block number 20h. This will already be sufficient for the basic information whether all SPAs are error-free. In case of more than 10 SPAs indicating an error status the Profibus Master is able to scan the remaining SPAs in bunches of 10 by further commands (block number 21...23h. The addresses are in ascending order and may vary within the range from 20h .. 83 h. The “anz” parameter is always indicating the total number of SPAs being in error status.

Example 1: All SPAs remain without error signal.

transmit	Zhl	Adr	Cmd	Scmd	BNr	data										
	zz	20h	40h	46h	20h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h
response	Zhl	Adr	Cmd	Scmd	BNr	Anz	data									
	zz	20h	40h	46h	20h	20h	20h	20h	20h	20h	20h	20h	20h	20h	20h	20h

Example 2: Two SPAs have signaled error status (SPA Adr 46h, 49h)

transmit	Zhl	Adr	Cmd	Scmd	BNr	data										
	zz	20h	40h	46h	20h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h
response	Zhl	Adr	Cmd	Scmd	BNr	Anz	data									
	zz	20h	40h	46h	20h	22h	46h	49h	20h	20h	20h	20h	20h	20h	20h	20h



5.5.4. Automatic SPA scanning ON or OFF

The command (@-Z) is for switching on and off the automatic scanning of all SPAs connected. The preset parameters are overwritten (but not altered permanently).

- Data = 0 (30h) = scan OFF
- Data = 1 (31h) = scan ON

Several commands to the SPA are only valid until another command is being received (for example display SPA address in the bottom line of the display). Any automatic scan would turn these commands void. Furthermore, any long-distance scan is occupying the RS485 bus line so that *scan OFF* enables the gateway to handle any Profibus commands much more rapidly.

Example : Scan OFF.

transmit	Zhl	Adr	Cmd	Scmd	data										
	zz	20h	40h	5Ah	30h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h
response	Zhl	Adr	Cmd	Scmd	data										
	zz	20h	40h	5Ah	30h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h

5.5.5. Readout gateway version or serial number

The command @-X is for reading out the firmware version or serial number of the gateway. To make a difference, a sub-command „V“ or „S“ is added.

The version number is transmitted in four digits. The digital digit of the main release will be depicted as a blank, if zero.

- Example: V 1.23 = 20h 31h 32h 33h
- Example: V 12.34 = 31h 32h 33h 34h

At present the serial number is not yet supported, it is always 00000000.

The total length of command and response is always 16 due to the consistent Profibus transmission length.

The „address“ parameter (Adr) is only serving for keeping the standard command structure, the value is always 20h.

Example 1: Read out version number (V 1.00)

transmit	Zhl	Adr	Cmd	Scmd	„V“	data									
	zz	20h	40h	58h	56h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h
response	Zhl	Adr	Cmd	Scmd	„V“	data									
	zz	20h	40h	58h	56h	20h	31h	30h	30h	00h	00h	00h	00h	00h	00h

Example 2: Read out serial number

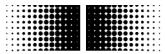
Senden	Zhl	Adr	Cmd	Scmd	„S“	data									
	zz	20h	40h	58h	53h	00h	00h	00h	00h	00h	00h	00h	00h	00h	00h
response	Zhl	Adr	Cmd	Scmd	„S“	data									
	zz	20h	40h	58h	53h	30h	30h	30h	30h	30h	30h	30h	30h	00h	00h

5.6. Error signals (data exchange)

Messages relating to SPA communication are handled within the standard data exchange procedure.

There is a difference between SPA messages and gateway messages.

- A SPA indicates an error after a transparently passed command. Regarding the respective message please refer to the corresponding SPA interface description. Both messages „format error“ and CRC error“ are possible.



- The gateway itself will indicate error if the error is due to a gateway command (code „@“). Furthermore, the gateway will also indicate error if the error status results from any automatic function (for example cyclic SPA scanning).

The gateway error messages comprise dummy address 20h, command „@“ (40h), sub-command „e“ (65h) as well as the error number. The message is of the following format:

message	Zhl	Adr	Cmd	Scmd	„S“	data										
	zz	20h	40h	65h	53h	30h	30h	30h	30h	30h	30h	30h	30h	30h	00h	00h

To maintain the figure description usual in RS485 communication, all error numbers provide an offset of 20h.

error number-	error occurred
20h	no error
21h	void sign in protocol
22h	SPA indicates repeatedly CRC error
23h	data value beyond the permitted range
24h	number of commands/data beyond the permitted range
25h	timeout during waiting for SPA response, with transparent commands only
26h	unknown gateway command (@xxx)
27h...2Fh	reserved

5.7. Error and warning signals (diagnostic data)

Diagnostic data are only for transmission of messages indicating any gateway error status that might endanger Profibus operation.

Messages relating to SPA communication are processed by the standard data exchange (see error messages data exchange). Only exception is indication of a lost SPA (error 20h) which does not react anymore even after having tried three times.

Diagnostic data are of 11 byte in length. The first 6 byte are used for standard diagnostic data for automatic evaluation by PLC, the remaining 5 byte for external gateway diagnosis. The last byte contains the gateway error information.

diagnostic byte	type	
1	standard	standard diagnostic byte 1
2	standard	standard diagnostic byte 2
3	standard	standard diagnostic byte 3
4	standard	Master address after parameterizing (previously FFh)
5	standard	Ident-number high byte
6	standard	Ident-number low byte
7	external	information on length of external diagnosis (05h)
8	external	reserved, always 00h
9	external	reserved, always 00h
10	external	reserved, always 00h
11	external	error number, -see chart below

error number	errors occurred
00h	no error
01h	selftest: program memory error (flash)
02h	selftest: ERM error
03h	selftest: ROM error (EEPROM)
21h	loss of SPA connected
80h..8Fh	internal error

Errors in configuration and parameterizing should not occur when the attached GSD file is applied. Both errors are transferred as single bit by standard diagnostic data and therefore do not require a specific error code in external data.

In case of configuration error, bit „diag.cfg.fault“ is set in diagnostic byte 1.

In case of parameterizing error, bit „diag.prm_fault“ is set in diagnostic byte 1.

For any proceedings regarding error status evaluation and treatment please refer to the relevant Profibus Master documentation.

5.8. Front panel display elements (LEDs)

The gateway's front panel provides four LEDs to indicate the RS485 and Profibus-DP operating status.

- DP (red) indicates Profibus-DP operating and error status.
 - together with green LED: Gateway is awaiting configuration and parameterization

(Profibus status WAIT_PRM)

- sole, red continuous: Profibus alarm
 - sole, red flashing quickly (5 Hz): configuration error
 - sole, red flashing slowly (1 Hz): parameterization error
- DP (green) indicates Profibus-DP operating status.
 - together with red LED: Gateway is awaiting configuration and parameterization (Profibus -status WAIT_PRM)
 - sole, green continuous: active cyclic data transfer with DP-Master (Profibus status DATA_EXCHANGE)
 - TX (yellow) transmission of a token by RS485 interface
 - RX (yellow) reception of a token by RS 485 interface

6. Technical Data

Technical data – electrical ratings

Supply voltage	12...24 VDC
Current consumption	≤200 mA
Display	4 LED's as operating status indicators
LED operating status	DP (green) fieldbus operating status DP (red) operating and error status RX / TX (yellow) receiving / transmitting a token (RS485)
Interfaces	CANopen, DeviceNet, Profibus-DPV0
Interface to SPA	EIA RS485 (ASCII protocol)
Data memory	>10 years (flash / EEPROM)
Programmable parameters	Auto-Check functions Auto Scan SPA Auto Message SPA Position Auto Message SPA Error
Emitted interference	DIN EN 61000-6-4
Interference immunity	DIN EN 61000-6-2

Technical data – mechanical design

Operating temperature	-10...+50 °C
Storing temperature	-20...+70 °C
Relative humidity	80 % non-condensing
Protection DIN EN 60529	IP 20
E-connection	D-SUB-female connector, 9-pins Plug-in screw terminals
Housing type	DIN rail housing EN 50022
Dimensions W x H x L	22.6 x 99 x 114.5 mm
Mounting	DIN rail housing EN 50022
Weight approx.	120 g
Material	Polyamide green, UL 94V-0