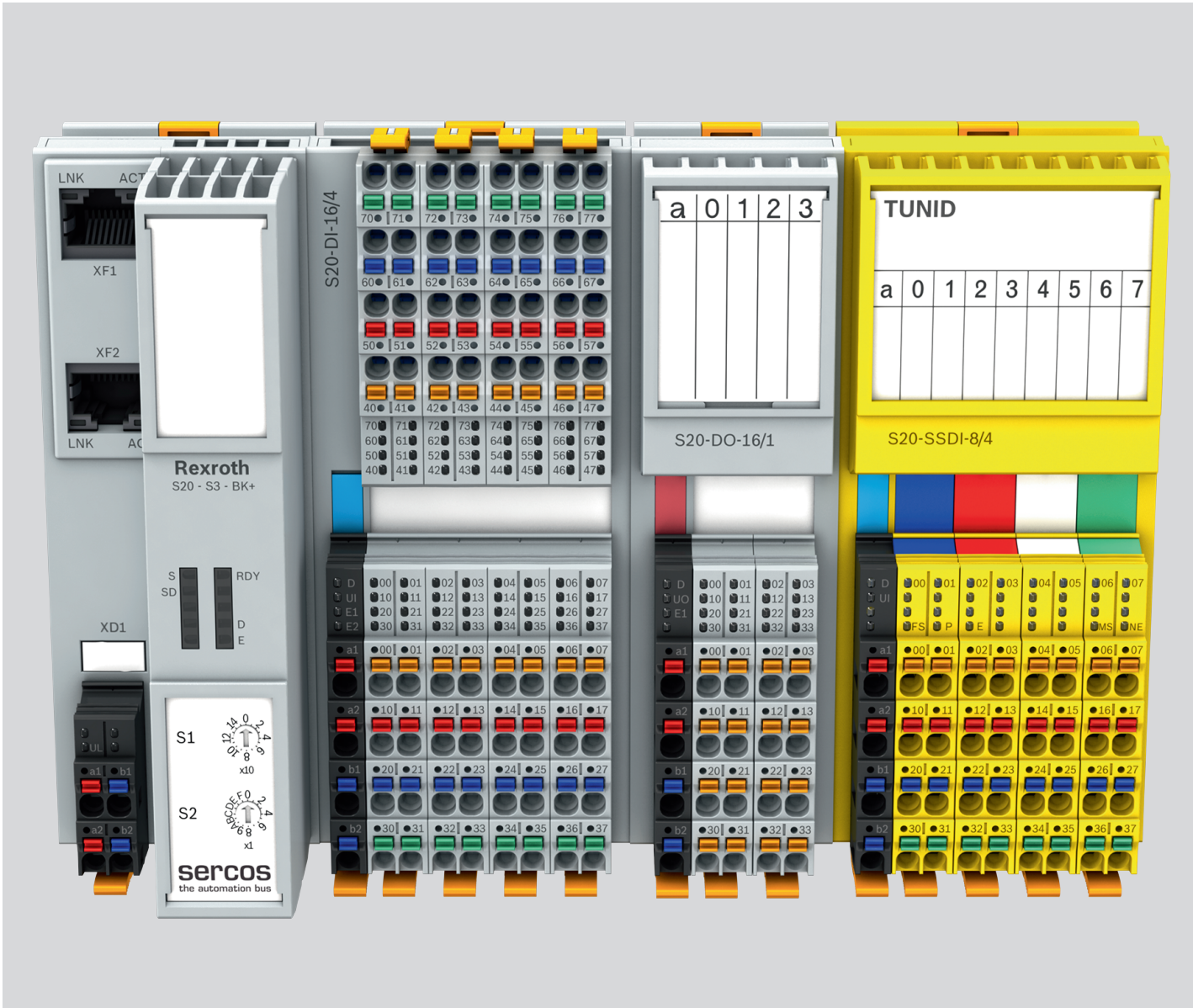


IndraControl S20 Error Messages

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Table of Contents

	Page
1 Use of the safety instructions	3
1.1 Structure of the safety instructions	3
1.2 Explaining signal words and safety alert symbol	3
1.3 Symbols used	4
2 Diagnostics in the IndraControl S20 system	5
2.1 Local diagnostic and status indicators.....	5
2.1.1 D and E indicators on bus couplers	6
2.1.2 Indicators on I/O modules	7
2.2 Diagnostics via object 0018 _{hex} (DiagState).....	8
2.3 Diagnostic registers of the local bus master	11
2.3.1 Diagnostic status register	11
2.3.2 Diagnostic parameter registers	13
2.4 Diagnostic registers of the bus couplers.....	14
3 Error codes	15
3.1 Error codes for user errors	15
3.2 Error codes for bus diagnostics.....	19
3.3 Error codes when invoking the PDI services	20
3.4 Error codes of the I/O modules.....	24
4 Service and support	27

Table of Contents

Page

1 Use of the safety instructions

1.1 Structure of the safety instructions

The safety instructions are structured as follows:

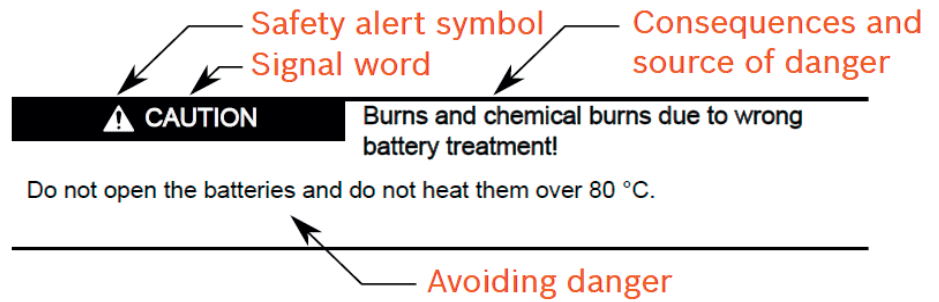


Abb. 1-1 Structure of the safety instructions

1.2 Explaining signal words and safety alert symbol

The safety instructions in this documentation contain specific signal words (danger, warning, caution, notice) and, if necessary, a safety alert symbol (according to ANSI Z535.6-2006).

The signal word is used to draw attention to the safety instruction and also provides information on the severity of the hazard.

The safety alert symbol (a triangle with an exclamation point), which precedes the signal words danger, warning and caution is used to alert the reader to personal injury hazards.

▲ DANGER:
In case of non-compliance with this safety instruction, death or serious injury **will** occur.

▲ WARNING:
In case of non-compliance with this safety instruction, death or serious injury **can** occur.

▲ CAUTION:
In case of non-compliance with this safety instruction, minor or moderate injury can occur.

NOTICE
In case of non-compliance with this safety instruction, material damage can occur.

Use of the safety instructions

1.3 Symbols used

Hints are represented as follows:



This is an information.

Tips are represented as follows:



This is a tip for the user.

2 Diagnostics in the IndraControl S20 system

Terms used in the document:

Local bus	IndraControl S20 local bus
Head of an IndraControl S20 station	E.g., IndraControl S20 bus coupler, IndraControl S20 controller
Local bus master	Part of the head of the IndraControl S20 station that is responsible for controlling the IndraControl S20 local bus
IndraControl S20 module	Any module of an IndraControl S20 station, i.e., head of the IndraControl S20 station or I/O module

The IndraControl S20 modules indicate the errors that occur in various ways:

- Via the local diagnostic indicators
- Via diagnostic object 0018_{hex} (DiagState)
- Via the diagnostic registers of the bus couplers

2.1 Local diagnostic and status indicators

All IndraControl S20 modules are provided with diagnostic and status indicators for quick local error diagnostics. They enable the clear localization of system errors (bus errors) or I/O errors.

Diagnostics The diagnostic indicators (red, yellow or green) provide information about the state of the module and, in the event of an error, provide information about the type and location of the error. The module is working correctly when all of its green LEDs are on.

Status The status indicators (yellow) indicate the status of the associated input or output and of the connected I/O device.

Extended diagnostics Some modules have extended diagnostics. For example, this enables a short circuit or overload of the sensor supply to be detected and reported. If a short circuit occurs at an output, some output modules can diagnose each channel individually. Information about the supply voltage is also reported. The module sends information about I/O errors to the controller with precise details of the error type. In addition, the status indicators signal the error.



Only the D (diagnostics for local bus communication) and E (error) LEDs are described below.

For an overview of all the main diagnostic and status indicators in the IndraControl S20 system and their meaning, please refer to the DOK-CONTRL-S20*SYS*INS-APRS-EN-P, R911335988 application description.

For information regarding the diagnostic and status indicators on a particular module and their meaning, please refer to the module-specific documentation.

Diagnostics in the IndraControl S20 system

2.1.1 D and E indicators on bus couplers

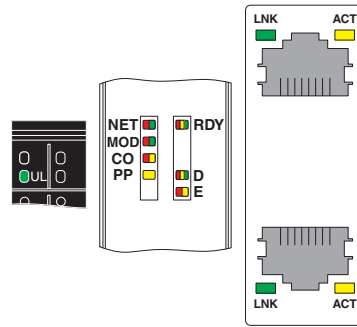


Fig. 2-1 Indicators on bus couplers, example: S20-EIP-BK

Designation	Color	Meaning	State	Description
D	Red/ yellow/ green	Diagnostics for local bus communication		
		Run	Green on	The station is ready to operate, communication within the station is OK. All data is valid. A malfunction has not occurred.
		Active	Flashing green	The station is ready to operate, communication within the station is OK. The data is not valid. The controller or higher-level network is not providing valid data. A malfunction has not occurred on the module.
			Flashing green/red	A rest system will be operated, at least one device of the configuration cannot be reached.
		Ready	Yellow on	The station is ready to operate. No data is being exchanged.
		Active + Force	Flashing yellow	Access via DTM in I/O check mode
			Flashing yellow/red	Local bus error during active I/O check
		Ready + Bus error	Flashing red	Local bus error during active I/O check
				Possible causes: <ul style="list-style-type: none"> • Configuration cannot be generated, information is missing from a device • Chip version of a device is <V1.1 • The desired and actual configuration are different • No local bus device connected • Maximum number of local bus devices exceeded
		Active + Bus error	Red on	The station is ready to operate, but has lost connection to at least one device.
Possible causes: <ul style="list-style-type: none"> • Communication error • Local bus device has been removed or a configured device is missing • Reset at a local bus device • Serious device error at a local bus device (local bus device can no longer be reached) 				
Power down	Off	The station is in (power) reset or in energy-saving mode.		
E	Yellow/ red	Error	Yellow on	I/O warning at a local bus device
			Red on	I/O error at a local bus device
			Off	No I/O messages present.

Fig. 2-2 D and E indicators on controllers and bus couplers

2.1.2 Indicators on I/O modules

2.1.2.1 D and E indicators on I/O modules



Fig. 2-3 D and E LEDs on the power connectors of the I/O modules (examples)

Designation	Color	Meaning	State	Description
D	Red/ yellow/ green	Diagnostics for local bus communication		
		Run	Green on	The device is ready to operate, communication within the station is OK. All data is valid. A malfunction has not occurred. <ul style="list-style-type: none"> The connection to the controller is present.
		Active	Flashing green	The device is ready to operate, communication within the station is OK. The data is not valid. The controller or higher-level network is not providing valid data. A malfunction has not occurred on the module.
		Device application not active	Flashing green/ yellow	The device is ready to operate, communication within the station is OK. Output data cannot be output and/or input data cannot be read in. There is a malfunction on the I/O side of the module. <ul style="list-style-type: none"> The controller is providing valid process data.
		Ready	Yellow on	The device is ready to operate, but has still not detected a valid cycle after power up. <ul style="list-style-type: none"> There has been no communication since the last power up.
		Connected	Flashing yellow 1 Hz	The device is not (yet) part of the active configuration.
		Reset	Red on	The device is ready to operate, but has lost the connection to the bus head.
		Not connected	Flashing red	The device is ready to operate, but there is no connection to the previous device.
		Power down	Off	Device is in (power) reset. <ul style="list-style-type: none"> The supply voltage is not present. Energy-saving mode is active.
E1/E2	Red	Error	On	Error, see module-specific documentation.
			Off	No error.

Fig. 2-4 D and E LEDs on the power connectors of the I/O modules

Diagnostics in the IndraControl S20 system

2.2 Diagnostics via object 0018_{hex} (DiagState)

In addition, each I/O module features object 0018_{hex} (DiagState), which is used for the structured reporting of an error. The I/O module also provides its diagnostic state in this way.

The object is illustrated in the module-specific documentation of each I/O module.

Index [hex]	Object name	Data type	Length in bytes	Meaning	
0018	DiagState	Record		Diagnostic state	Complete diagnostic information
.1	Consecutive no.	UINT16	2	Error number	0 ... 65535 _{dec} Unique, consecutive error number since the last power up or reset of the diagnostic counter
.2	Priority	UINT8	1	Priority	Priority of the message. 1: Highest priority See Fig. 2-8 on page 2-10
					00 _{hex} No malfunction
					01 _{hex} Error
					02 _{hex} Warning
					03 _{hex} Information
					81 _{hex} Error removed
					82 _{hex} Warning removed
					83 _{hex} Information removed
.3	Channel/ Group/ Module	UINT8	1	Channel/ group/ module	Channel, group or module where the malfunction occurred. Additional information available under "Additional information".
					00 _{hex} No malfunction
					xx _{hex} Channel xx, group xx or module xx
					FF _{hex} Entire device
.4	Code	Octet string	2	Error code	
.5	MoreFollows	Bit string 8	1	Additional information	Further information about the malfunction
					00 _{hex} Subindex 3 = channel number
					04 _{hex} Subindex 3 = group number
					08 _{hex} Subindex 3 = module number
					Other Not used at present.
.6	Text	Visible string	Max. 51	Text	Plain text message. Default: Status OK

Fig. 2-5 Diagnostic state (read) according to basic profile V2.x

Diagnostics in the IndraControl S20 system

Index [hex]	Object name	Data type	Length in bytes	Meaning		
0018	DiagState		23 + max. 100	Diagnostic state	Current diagnostic state of the device in short form	
.01	Consecutive no.	UINT16	2	Consecutive number	0 ... 65535 _{dec} Unique, consecutive error number since the last power up or reset of the diagnostic counter	
.02	Priority	UINT8	1	Priority	Priority of the malfunction. 1: Highest priority See Fig. 2-8 on page 2-10	
					00 _{hex}	No malfunction
					01 _{hex}	Error
					02 _{hex}	Warning
					03 _{hex}	Information
					81 _{hex}	Error removed
					82 _{hex}	Warning removed
					83 _{hex}	Information removed
.03	Channel	UINT8	1	Channel	Channel on which the malfunction occurred.	
					00 _{hex}	No malfunction
					xx _{hex}	Channel xx
					FF _{hex}	Entire device
.04	Code	Octet string	2	Error code		
.05	MoreFollows	Bit string 8	1	Additional information	Information for interpreting the following data (see Fig. 2-7)	
.06	Reserved	Octet string	2	Reserved	(= 0000 _{hex})	
.07	SubModNo	UINT8	1	Submodule number	If the device is a modular device, the corresponding submodule is specified here. If the device is not a modular device, "0" is entered here.	
.08	Function-Group	Octet string	8	Function group	Short designation of the function of the group reporting diagnostics. For example: DI (0x44, 0x49, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00) RTD (0x52, 0x54, 0x44, 0x00, 0x00, 0x00, 0x00, 0x00) AI, AO, DO, IOL, CNT, INC, RS485, PSDI, PSDO, SC The manufacturer-specific designation (e.g., "Relay OUT") is specified in the diagnostic text (0x0018.11).	

Fig. 2-6 Objects for diagnostics: Diagnostic state (read) according to basic profile V3.x

Diagnostics in the IndraControl S20 system

Index [hex]	Object name	Data type	Length in bytes	Meaning	
.09	AddValue	Octet string	4	Additional information	“Additional value” for the current diagnostic state of the device.
.0A	TextLength	UINT8	1	Text length	Length of the following diagnostic text in bytes.
.0B	Text	Visible string	Max. 100	Diagnostic text	<p>Device-specific explanation of the malfunction that occurred.</p> <p>Information includes:</p> <ul style="list-style-type: none"> • Error type • Function group and channel • Terminal point • Option for action for the user <p>Default: “Status OK”</p> <p>The string is terminated with 00_{hex}.</p>

Fig. 2-6 Objects for diagnostics: Diagnostic state (read) according to basic profile V3.x [...]

Byte/bit	Value	Meaning
Byte	00 _{hex}	No further information
Bit 0	1	There is further information about this error. You can read it via object E800 _{hex} “DiagStateLong” (if implemented).
Bits 1 ... 3	0	Reserved
Bit 4	1	There are additional simultaneously occurring diagnostic events. You can read them via object E806 _{hex} “ComplDiagState” (if implemented).
Bits 5 ... 6	0	Reserved
Bit 7	1	Indication that this is an extended version of object 0018 _{hex} (compared to version V2.x).

Fig. 2-7 Index 5: Additional information

Priority	Message type	Example	Note
01 _{hex}	High	Error (malfunction, alarm) Supply voltage faulty Parameter table invalid	A malfunction has occurred that requires a response. For example, a malfunction requires action in the drive, but does not necessarily require the system to be stopped with immediate effect.
02 _{hex}	Medium	Warning Limit value undershot or exceeded	Risk of an error. A warning does not require action to be taken in the device.
03 _{hex}	Low	Information (message, notification) General operating message: 10,000 operating hours have elapsed.	General operating message: 10,000 operating hours have elapsed.

Fig. 2-8 Classification of the error messages



Diagnostic object 0018_{hex} is implemented with a storage depth of 1. This means that:

- A higher priority message overwrites a lower priority message.
- If a higher priority message is already present, lower priority messages will not be reported.

2.3 Diagnostic registers of the local bus master

The errors reported to the local bus master by the I/O modules are mapped to the diagnostic registers of the local bus master.

A local bus master has three diagnostic registers:

- Diagnostic status register:
Operating and error states of the IndraControl S20 local bus
- Diagnostic parameter register 1:
Returns the associated error code in the event of an error
- Diagnostic parameter register 2:
Returns the error location for localized bus or I/O errors (device number)

2.3.1 Diagnostic status register

Information on the operating and error states of the IndraControl S20 local bus is stored in the diagnostic status register. An local bus state is assigned to each bit in the diagnostic status register.

The states in the error bits (F_PW_BIT, F_PF_BIT, F_BUS_BIT, F_CTRL_BIT) are described in greater detail using the two diagnostic parameter registers.

Bit	Designation	Meaning	
00	F_PW_BIT	I/O warning	At least one device is indicating an I/O warning.
01	F_PF_BIT	I/O error	At least one device is indicating an I/O error.
02	F_BUS_BIT	Bus error	A bus error has occurred.
03	F_CTRL_BIT	Controller error	The driver has detected an internal error.
04	-		Reserved
05	F_RUN_BIT	Run	Data cycles are being exchanged, output data is enabled.
06	F_ACTIVE_BIT	Active	Configuration is active, PDI to the devices is possible, data exchange with invalid/non-enabled process data.
07	F_READY_BIT	Ready	Local bus master is ready to operate, no data exchange via the bus.
08	F_BD_BIT	Bus different	A device which does not belong to the active configuration has been detected at the last interface.
09	F_BASP_BIT	SYS_FAIL	The controller is in the STOP state or no application program has been loaded. The output data is blocked (substitute value behavior is active)
10	F_FORCE_BIT	Force mode	Force mode is active.
11	F_SYNC_BIT	Synchronization	Synchronization between higher-level system and local bus master failed.
12	F_PARA_REQ	Module parameter	At least one device is requesting parameters.
13 ...15	-		Reserved

Fig. 2-9 Diagnostic status register

Diagnostics in the IndraControl S20 system

Status displays

The Ready, Active, and Run status displays indicate the current state of the system. The diagnostic parameter registers are not used.

Following initialization, the driver is ready to operate. The Ready indicator bit is set (F_READY_BIT = 1).

If the driver has been configured and a configuration frame has been activated without errors, the system indicates that it is active. The Ready and Active indicator bits are set (F_READY_BIT = 1, F_ACTIVE_BIT = 1).

In addition, the Run indicator bit is set (F_READY_BIT = 1, F_ACTIVE_BIT = 1, and F_RUN_BIT = 1) when data exchange is started.

Error indicators

The PF, BUS, CTRL, and SYNC error indicators report an error, while PW reports a warning.

Errors which are indicated with BUS or CTRL will cause the bus to be disconnected. The Run indicator bit is reset (F_RUN_BIT = 0).

Further information on the error cause is provided by the two diagnostic parameter registers.

If several error bits are 1 at the same time, the values in the parameter registers represent the error with the highest priority.

Message	Priority
CTRL	1 (highest priority)
BUS	2
SYNC	3
PF	4
PW	5 (lowest priority)

Fig. 2-10 Priorities of the error messages

If there are I/O errors (PF= peripheral fault) at several devices, the parameter registers show the message that occurred first. When you remove this message, the next pending message with the lowest device number is shown.

If there are I/O warnings (PW = peripheral warning) from several devices, the warnings are shown in the same way as the I/O errors.

After an error has been removed or disappears (e.g., elimination of an interruption), the bus is started again automatically and the output data is enabled again. The Run indicator bit is set again (F_RUN_BIT = 1).

2.3.2 Diagnostic parameter registers

The diagnostic parameter registers are always written to when a malfunction occurs and whenever one of the error bits (F_PW_BIT, F_PF_BIT, F_BUS_BIT, F_CTRL_BIT) is set. Otherwise, the diagnostic parameter registers have the value 0000_{hex}.

When the aforementioned error bits are set, the diagnostic parameter registers provide additional information on the status indicated in the diagnostic status register.

Diagnostic parameter register 1 contains the error code.

For an overview of the error codes, please refer to [Section 3, "Error codes"](#).

Diagnostic parameter register 2 contains additional information. For localized bus or I/O errors, this is the error location or the device number. The error location is stored as a slot number. This starts at 1 and corresponds to the sequential number of the IndraControl S20 modules that are installed one after another.

Diagnostics in the IndraControl S20 system

2.4 Diagnostic registers of the bus couplers

The diagnostic registers of the local bus master can be read via the diagnostic mechanisms of the higher-level system (see Fig. 2-11).

Bus coupler	Higher-level system	Diagnostic mechanism	See	Web-based management
S20-PB-BK	PROFIBUS	Diagnostics in common format, block 6, bytes 9 ... 12	DOK-CONTRL-S20*PB*BK**-APRS-EN-P, R911343914	No
S20-EC-BK	EtherCAT®	CoE object F100 _{hex} : Bus Coupler Diag Info	DOK-CONTRL-S20*EC*BK**-DARS-EN-P, R911372200	No
S20-PN-BK....	PROFINET	Diagnostic alarms	DOK-CONTRL-S20*PN*BK+*-DARS-EN-P, R911342784	Yes
S20-ETH-BK	Ethernet	Modbus registers: Local bus diagnostics: 7997 diagnostic status register 7998 diagnostic status register 1 7999 diagnostic status register 2 I/O diagnostics: 1801 ... 1989 I/O diagnostics of the local bus devices	DOK-CONTRL-S20*ETH*BK*-DARS-EN-P, R911372205	Yes
S20-EIP-BK	EtherNet/IP™	Diagnostic object (class code 67 _{hex})	DOK-CONTRL-S20*EIP*BK*-APRS-EN-P, R911377106	Yes
S20-S3-BK+	Sercos	Diagnostic IDNs	DOK-CONTRL-S20*S3*BK+*-DARS-EN-P, R911342782	No

Fig. 2-11 Diagnostic mechanisms of higher-level systems



Further options for diagnostics:

For devices with web-based management:

- Open the “Diagnostics” menu item.
You can call the diagnostics for the bus coupler and local bus here.

3 Error codes

Problems when invoking the firmware services or problems during operation are reported with error codes to determine the exact cause of the error. The following sections explain the meaning of the individual codes.

The code listed in the tables consists of the error class and error code. The Additional Code parameter contains a more detailed description of the error cause.

3.1 Error codes for user errors

Code (hex)	Additional code	Meaning	Remedy
0903		Memory problem (e.g., buffer too small)	Reduce the amount of data.
0904		Inconsistent parameters.	Check the parameters.
0905		Invalid parameters.	Check the parameters.
0908	Code of failed service	Maximum number of permitted parallel services exceeded. (Processing conflict)	Wait for the previously invoked service to be completed and try again.
090A	Value transmitted in Parameter_Count	The number of parameters is inconsistent with the service. The Parameter_Count parameter does not match the number of subsequent words.	Adjust the number of parameters.
0913	Code of failed service	The invoked service is not supported.	Use a service that is supported.
0917	Code of failed service	Service decoding failed.	Restart the device. If the problem persists, please contact Bosch Rexroth.
0918	Code of the unknown service	Invocation of an unknown service code.	Check the invocation.
0928		An exclusive service was to be executed without the appropriate rights.	Wait for the exclusive rights to be enabled.
0932		Attempt to pass on the exclusive rights without having these rights.	
0933		Another node currently has the exclusive rights.	Wait for the exclusive rights to be enabled.
0934		Node already has the exclusive rights.	
0937	Invalid Variable_ID	Unknown variable ID component.	Check the invocation.
0938	Reserved Variable_ID	An internal variable ID was used.	Check the invocation.
0939	Variable_ID not enabled	The variable ID is not enabled. (Password protection)	Check the invocation.
093A	Incorrect Variable_ID	Length specification in the variable ID is 0 or incorrect.	Check the invocation.
093B	Incorrect Variable_Count	The number of variables has been calculated incorrectly.	Check the invocation.

Fig. 3-1 Error codes for user errors

Error codes

Code (hex)	Additional code	Meaning	Remedy
0A01		A hardware fault or firmware error has occurred.	Restart the device. If the problem persists, please contact Bosch Rexroth.
0A02	Current state of the local bus master	<p>A service was invoked that is not permitted in the current status of the local bus master.</p> <p>Possible states:</p> <p>0001 Ready (After restart or reset)</p> <p>0002 Load config (Configuration cannot be loaded)</p> <p>0004 Config ready (Configuration loaded successfully)</p> <p>0008 Active (Configuration frame connected)</p> <p>0010 Param ready (Parameterization of modules completed)</p> <p>0020 Run (Process data traffic running)</p> <p>0080 Force mode (Startup tool specifies outputs)</p> <p>0100 Ready fail (Communication breakdown in Ready)</p> <p>0800 Active fail (Communication breakdown in Active)</p> <p>1000 Param ready fail (Communication breakdown in Param Ready)</p> <p>2000 Run fail (Process data traffic with subsystem)</p> <p>4000 Force fail (Application timeout for all devices)</p> <p>8000 Force Mode Fail (Communication breakdown in force mode)</p>	Set the local bus master to the required state.
0A03		Memory problem (e.g., buffer too small)	Restart the device. If the problem persists, please contact Bosch Rexroth.
0A04		Inconsistent parameters.	Check the invocation.
0A05		Invalid parameters.	Check the invocation.
0A06		Access not supported.	Check the invocation.
0A07		Object does not exist.	Check the invocation.
0A08	Code of failed service	Maximum number of permitted parallel SM services exceeded. (Processing conflict)	Wait for the previously invoked service to be completed and try again.
0A0C	Unknown Variable_ID	Invocation of Set_Value or Read_Value with a Variable_ID that contains an unknown code.	Check the invocation.
0A0D		A firmware error occurred.	Restart the device. If the problem persists, please contact Bosch Rexroth.
0A0E	Current state of the local bus master	Energy-saving mode cannot be activated in the current state of the local bus master.	Set the local bus master to the required state.

Fig. 3-1 Error codes for user errors [...]

Error codes

Code (hex)	Additional code	Meaning	Remedy
0A18	Invalid Used_Attributes parameter	A reserved bit is set in Used_Attributes.	Check the parameters.
0A19	Number of bus devices	The end of the frame was exceeded when accessing the configuration or line 0 was accessed.	Check access.
0A1A	Invalid Frame_Reference (if specified)	The frame reference specified for the service does not exist.	Check the parameters.
0A1C	Number of connected devices	Maximum number of devices exceeded.	Reduce the bus configuration.
0A2F		Number of devices is zero.	Connect the device and check the connection.
0A51		Only a frame reference from 1 to 254 is permitted.	Only the value 1 is permitted at present.
0A54		The maximum number of permissible I/O points was exceeded.	Reduce the number of I/O points to the maximum number. For the exact number, please refer to the documentation for your controller.
0A60		A configuration frame could not be assigned.	Create the configuration frame.
0A70		A reserved bit is set in the Diag Info attribute.	Check the parameters.
0A73	Device number	Device with an unsupported chip version present in the local bus.	Replace the device.
0A74	Device number	Device from an unsupported manufacturer present in the local bus.	Replace the device.
0A75	Device number	Device is reporting a serious error (e.g., faulty EEPROM).	Restart the device. If the problem persists, please contact Bosch Rexroth.
0A76	Device number	The master does not support the topology used by the device.	Replace the device.
0A77	Device number	Error at the interface.	Check the connection between the electronics module and bus base module.
0A79	Device number	The device requires parameters for correct operation.	Parameterize the device or restart it.
0A7A		Invalid Dev_Type specified during loading.	Check the parameters.
0A7B		Invalid Dev_ID specified during loading.	Check the parameters.
0A7C		Invalid Dev_Length specified during loading.	Check the parameters.
0A81	Object index	Service (e.g., Create_Configuration) could not be executed due to PDI communication malfunctions (timeout).	Restart the device. If the problem persists, please contact Bosch Rexroth.
0A82	Object index	Service (e.g., Create_Configuration) could not be executed due to PDI communication malfunctions (number).	Restart the device. If the problem persists, please contact Bosch Rexroth.

Fig. 3-1 Error codes for user errors [...]

Error codes

Code (hex)	Additional code	Meaning	Remedy
0A83	Object index	Service (e.g., Create_Configuration) could not be executed due to PDI communication malfunctions (error).	Restart the device. If the problem persists, please contact Bosch Rexroth.
0A90	Device number	Device was selected for synchronization, but does not support this.	Select a device that supports synchronization or change the selection.
0A91	Device number	Device was selected for synchronization, but does not support the specified cycle time.	Select a different cycle time or a different device.
0A92	Device number	Device was selected for synchronization, but does not support the specified value for Input_Delay.	Select a different value for Input_Delay or a different device.
0A93	Device number	Device was selected for synchronization, but does not support the specified value for Output_Delay.	Select a different value for Output_Delay or a different device.
0A94	Device number	Device was selected for synchronization, but does not support the specified values for Input_Delay and Output_Delay.	Select different values for Input_Delay and Output_Delay or a different device.
0AFF		Invocation of Reset_Driver during PDI communication.	Restart the device. If the problem persists, please contact Bosch Rexroth.
0B01		A hardware fault or firmware error has occurred.	Restart the device. If the problem persists, please contact Bosch Rexroth.
0B02		A hardware fault or firmware error has occurred.	
0B03		A hardware fault or firmware error has occurred.	
0B04		A hardware fault or firmware error has occurred.	
0B05		Invalid parameters.	Check the parameters.
0B06		Access not supported. (E.g., write protection)	Restart the device. If the problem persists, please contact Bosch Rexroth.
0B07		Object does not exist.	
0B0C		A hardware fault or firmware error has occurred.	
0BC1		Supply voltage for the local bus not present. Too many devices connected or the higher-level power supply unit is too weak.	Use a suitable power supply unit. Check the current consumption of the devices. If necessary, use a power module or set up another IndraControl S20 station.
0BC2		The local bus is in energy-saving mode. The supply voltage has been switched off.	Deactivate energy-saving mode.
0BDE		Synchronization failed. Trigger signal does not correspond to the specification.	Check the synchronization signal of the higher-level system. Make sure that you have selected the cycle time specification correctly.

Fig. 3-1 Error codes for user errors [...]

3.2 Error codes for bus diagnostics

Code (hex)	Additional code	Meaning	Remedy
0BD1		The bus could not be activated successfully due to malfunctions on the bus.	Check the bus configuration.
0BF1			
0BF2			
0BF3			
0C01	Device number	The configured module cannot be reached. A device present in the configuration frame has been removed from the physical bus structure after the configuration frame was connected.	Check the configuration. Adapt the configuration frame if the change was made on purpose.
0C02		An unconfigured module has been detected. An additional device was added at the end of the physical bus structure after the configuration frame was connected.	
0C11		The module is not located in the configured slot. An active device was placed elsewhere in the physical bus structure after the configuration frame was connected.	
0C12		The module can be reached, but was not started up due to missing parameters. An active device was replaced by an unknown device in the physical bus structure after the configuration frame was connected (wrong instance ID).	
0C13		The process data length does not correspond to the configured value. The process data width of an active device was changed after the configuration frame was connected.	
0C14		The module type does not correspond to the configured value.	
0C15			
0C16			An address conflict has occurred.

Fig. 3-2 Error codes for bus diagnostics

Error codes

3.3 Error codes when invoking the PDI services



In Fig. 3-3, the additional code is only specified if it contains a special value. The standard values for the additional code are listed in Fig. 3-4.

The code consists of the error code and error class.

Example:

Code = 0501_{hex}: Error class = 05_{hex}, Error code = 01_{hex}

Code (hex)	Additional code	Meaning	Remedy
02xx		Error in the communication relationship	Check the invocation.
0200		Miscellaneous error	
0201		Unable to access the object. Possible causes: <ul style="list-style-type: none"> • Module not present • Incorrect module number 	
05xx		Invalid service	Check the invocation.
0500		Miscellaneous error	
0501		The current object state is preventing the service from being executed.	
0502		Problem with the PDU size	
		Permissible length exceeded. Object cannot be read in full.	
0503		The service cannot be executed at present.	
0504		The service contains inconsistent parameters.	
0505		A parameter has an impermissible value.	
06xx		Invalid access	Check the invocation.
0600		Miscellaneous error	
0601		Invalid object	Eliminate the hardware fault (e.g., I/O voltage not present). Restart the device. If the problem persists, please contact Bosch Rexroth.
0602		Hardware fault	
0603		Access to object denied, insufficient access rights	Check the invocation.
0604		Access to an invalid internal address	
0605		Inconsistent object attributes	
0606		The service used cannot be applied to this object.	
0607		Object does not exist	
0608		The data does not correspond to the data type of the object.	
060A		The object data cannot be accessed at present (e.g., during reparameterization).	

Fig. 3-3 Error codes when invoking the PDI services

Error codes

Code (hex)	Additional code	Meaning	Remedy
08xx		Error in the application	
0800		The service was not executed. The reason is specific to the application or manufacturer and only affects the actual data item. Refer to the additional code for the precise reason. Example: A certain object value is not permitted in this special application.	
	xx30	A reserved bit or reserved code was used during parameterization. xx: Number of the affected element 30: Value is out of range	Check the parameterization.
0801		The service was not executed. The reason is specific to the device. Refer to the additional code for the precise reason.	
080B		The service cannot be completed by the device in the expected time. The estimated time still required for the data to become available is given in ms in the additional code. "0xFFFF" means that the estimated time for completion is unknown.	
0F01		Hardware fault or firmware error	Restart the device. If the problem persists, please contact Bosch Rexroth.
0F02			
0F03			
0F04		Inconsistent parameters.	Check the parameters.
0F05	PDI object index	Invalid parameters.	Check the parameters.
0F06	PDI object index	Access not supported.	Check the invocation.
0F08	PDI object index	Maximum number of permitted parallel PDI services exceeded.	Wait until the services have been processed.
0F0C	Unknown Variable_ID	Incorrect variable ID for Set_Value or Read_Value.	Check the invocation.
0F0D		Internal error	Restart the device. If the problem persists, please contact Bosch Rexroth.
0F11		Internal error	
0F12		Device cannot be reached (timeout).	Check the device.
0F13		Device cannot be reached because it was removed.	Check the bus configuration.
0F21	Invalid device number	Invalid slot number. (Value is 0 or greater than the maximum number of devices)	Check the invocation.
0F22	Invalid device number	Slot is not active.	Check the invocation.

Fig. 3-3 Error codes when invoking the PDI services [...]

Error codes

Code (hex)	Additional code	Meaning	Remedy
0F23	Invalid data length	Invalid data length.	Check the invocation.
0F24	Invalid number of parameters	Invalid number of parameters.	Check the invocation.
0F31		Internal error	Restart the device. If the problem persists, please contact Bosch Rexroth.
0F32			
0F33			

Fig. 3-3 Error codes when invoking the PDI services [...]

Additional code (hex)	Meaning
0000	No detailed information on the cause of the error.
0010	Service parameter with impermissible value.
0011	Subindex is not present.
0012	Object access is not a request.
0013	Service code is not supported.
0014	Subslot is not supported.
0015	Object access type is not supported on this object.
0016	Object access request index for this AccessType must equal 000 _{hex} .
0017	Object access request length for this AccessType must equal 0.
0018	Object length is not suitable for this object.
0019	Object is ReadOnly and cannot be overwritten.
001A	Object is WriteOnly and cannot be read.
001B	Write/read access to the object is not supported.
001C	Due to the object length, Upload Read or Download Write is required for access to the object.
001D	Object length is not suitable for this object (0018). Too much data was transmitted.
001E	Object length is not suitable for this object (0018). Too little data was transmitted.
0020	Service cannot be executed at present.
0021	Service cannot be executed at present, as the device is currently being controlled locally.
0022	Service cannot be executed in current device state (device control).
0023	Service cannot be executed at present, as no object dictionary is available.
0024	Index is not available.
0030	Parameter value is out of range.
0031	Parameter value is too large.
0032	Parameter value is too small.
0040	Collision with other values, dependency was not taken into consideration.
0041	Communication object cannot be mapped to the process data.
0042	Process data length exceeded.

Fig. 3-4 Additional codes

Error codes

Additional code (hex)	Meaning
0050	Firmware update: General. <ul style="list-style-type: none"> • Firmware is incorrect for the device • Device unable to process firmware
0051	Firmware update: <ul style="list-style-type: none"> • Due to the object length, Upload Read or Download Write is required for access to the object. • Incorrect firmware header or update version.
0052	Firmware update: Firmware version is incorrect for the device. <ul style="list-style-type: none"> • Below minimum firmware version (e.g., hardware is too old)
0053	Firmware update: Indicates the option to bypass the download of a FW update block to the device.
0080	Hardware fault
0081	Application has failed.
0082	Hardware is temporarily faulty.
00A0	Invalid segment number, e.g., upload without initiation with subindex ==FF _{hex} .
00A1	Resource not available. No more resources (memory) available for download.
00A2	Incorrect CRC (checksum)
00A3	Error opening the file (if file system is available).
00A4	Error writing the file (if file system is available).
00A5	Error closing the file (if file system is available).
00A6	Segment missing: Fewer data blocks were received than specified in the last segment.
00A7	Extra segment: More data blocks were received than specified in the last segment.
00A8	Error reading the file (if file system is available).
00A9	Invalid segment number (segment duplicated, segment ignored).
00B1	The password cannot be replaced (deleted).
00B2	The password cannot be added (too many passwords).
00B3	The password cannot be assigned for the desired type of access.

Fig. 3-4 Additional codes [...]

Error codes

3.4 Error codes of the I/O modules

If an error occurs on an I/O module, the module reports this error to the local bus master.



Please refer to the module-specific data sheets for the error types that a module reports.

Code (hex)	Meaning	Remedy
0000	No malfunction	
1000	General malfunction	
2000	Current	
2130	Short circuit	Check the wiring.
	Overload of the analog output or short circuit	
2211	Input overload	
	Overload of the sensor supply for the inputs	
2340	Overload or short circuit of the sensor supply	
	Overload or short circuit of the actuator supply	
	Overload or short circuit (L+)	
2344	Output overload	
	Short circuit or overload of an output	
	Overload or short circuit (C/Q cable)	
2345	Sensor supply overload	
3000	Voltage	
3184	Overvoltage at a signal input of the incremental encoder	Check the wiring.
3186	Undervoltage at a signal input of the incremental encoder	Check the wiring.
3300	Output voltage	Check the wiring.
	Short circuit or overload at the output	
3400	I/O supply voltage failure	Check the supply.
3401	Overvoltage at port x	
3403	Undervoltage at port x	
3412	Sensor supply not present	
	I/O supply voltage failure	
3422	Actuator supply not present	
4000	Temperature	
4210	Overtemperature	Reduce the temperature, for example: <ul style="list-style-type: none"> • Reduce the ambient temperature • Ensure sufficient ventilation • Reduce the load • Check the mounting position

Fig. 3-5 Error codes of the I/O modules

Error codes

Code (hex)	Meaning	Remedy
5000	Device hardware	
5112	Faulty 24 V supply	Check the supply.
	Short circuit or overload at the 24 V supply	
	24 V encoder supply for channel x faulty	
5113	Short circuit or overload at the 5 V supply	
5120	Cold junction invalid	Check the cold junction.
5160	Supply voltage faulty	Check the supply.
	I/O supply overload	
6000	Device software	
6300	Parameter record incorrect	Check the parameterization of the specified device.
6301	Device error	Restart the device.
6302	Device error	Replace the device if the error persists.
6310	Device error: Lost parameters	Parameterize the specified device. Restart the device. Replace the device if the error persists.
6320	Parameter table invalid	Check the parameterization of the specified device.
7000	Additional modules	
7300	Encoder error	Check the encoder.
7305	Encoder error	
7330	Electrical encoder error	
7340	Logical encoder error	
7610	Receive buffer full	Read the receive buffer.
7611	Transmit buffer full	Check the handshake.
7620	EPROM (device error)	Restart the device. Replace the device if the error persists.
7710	Wire break on cable to sensor	Remove the wire break.
	Wire break	
	Wire break on signal line	
8000	Monitoring	
8152	Transmit buffer full	Check the handshake.
815A	Receive buffer full	Read the receive buffer.
8600	Incremental encoder input error	<ul style="list-style-type: none"> • Check the input signal. • Remove the short circuit. • Connect the encoder.
8910	Measuring range violated (overrange)	<ul style="list-style-type: none"> • Adjust the range.
8920	Measuring range violated (underrange)	<ul style="list-style-type: none"> • Check the wiring.

Fig. 3-5 Error codes of the I/O modules [...]

Error codes

Code (hex)	Meaning	Remedy
A000	Modular devices, lower-level bus (sub-bus)	
A001	Lower-level bus: No module present	Check the connected lower-level bus and its power supply.
	No module found at a port configured as IO-Link (after 5 seconds following port configuration)	<ul style="list-style-type: none"> • Check whether the IO-Link device is connected correctly. • Check the cabling. • Replace the IO-Link device.
A002	Lower-level bus: Incorrect module present	<ul style="list-style-type: none"> • Check the specified device and its power supply. • Check the desired and actual configuration.
	Connected IO-Link device does not match IO-Link port configuration.	
A003	Lower-level bus: Module replaced with compatible one	
A004	Lower-level bus: More modules than expected	
A005	Lower-level bus: Residual system operated	
A010	Lower-level bus: Module error	
	Device at the port reporting an event	
A012	Lower-level bus: Application on the module not ready	
A013	Lower-level bus: Device reset	
A014	Lower-level bus: Parameterization error on the device	Check the parameterization.
	Parameterization error on the device at the relevant port. Data storage problem.	
A020	Lower-level bus: Communication error with device	Check the specified device in the lower-level bus or in the system section for the following aspects: <ul style="list-style-type: none"> • Missing or incorrect shielding of the bus line (connector) • Missing or incorrect grounding, missing or incorrect equipotential bonding • Faulty connections in the connector • Voltage dips on the power supply
	Communication error at the relevant port with the connected device.	
A021	Lower-level bus: Timeout	
A022	Lower-level bus: Multiple transmission errors	
A023	Lower-level bus: I/O data communication error	
A024	Lower-level bus: Management data communication error	Check the specified device and its power supply.
A030	Lower-level bus: Configuration error	Check the parameterization of the specified device.
A041	Lower-level bus: Hardware fault	Restart the device. Replace the device if the error persists.
A042	Lower-level bus: Firmware error	Check the parameterization of the specified device.
A043	Lower-level bus is asynchronous to the higher-level system	

Fig. 3-5 Error codes of the I/O modules [...]

4 Service and support

Our worldwide service network provides an optimized and efficient support. Our experts offer you advice and assistance should you have any queries. You can contact us **24/7**.

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Contact the **Service Hotline** and **Service Helpdesk** under:

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Additional information on service, repair (e.g. delivery addresses) and training can be found on our internet sites.

Service worldwide Outside Germany, please contact your local service office first. For hotline numbers, refer to the sales office addresses on the internet.

Preparing information To be able to help you more quickly and efficiently, please have the following information ready:

- Detailed description of malfunction and circumstances
- Type plate specifications of the affected products, in particular type codes and serial numbers
- Your contact data (phone and fax number as well as your e-mail address)

Service and support

Notes

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