



## **Axioline F: Diagnostic registers, and error messages**

User manual

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### **Axioline F: Diagnostic registers, and error messages**

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Modules of the Axioline F product group

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## Please observe the following notes

### User group of this manual

The use of products described in this manual is oriented exclusively to qualified application programmers and software engineers, who are familiar with the safety concepts of automation technology and applicable standards.

### Explanation of symbols used and signal words



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety measures that follow this symbol to avoid possible injury or death.

There are three different categories of personal injury that are indicated with a signal word.

**DANGER** This indicates a hazardous situation which, if not avoided, will result in death or serious injury.

**WARNING** This indicates a hazardous situation which, if not avoided, could result in death or serious injury.

**CAUTION** This indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



This symbol together with the signal word **NOTE** and the accompanying text alert the reader to a situation which may cause damage or malfunction to the device, hardware/software, or surrounding property.



This symbol and the accompanying text provide the reader with additional information or refer to detailed sources of information.

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Flachsmarktstraße 8  
32825 Blomberg  
GERMANY

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# 1 Diagnostic registers of the Axioline F local bus master

Terms used in the document:

Local bus	Axioline F local bus
Local bus master	Head of an Axioline station, e.g., Axioline F bus coupler, Axioline F controller

All Axioline F 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.

In addition the module can report various errors to the local bus master which maps them to the diagnostic registers.

A local bus master has three diagnostic registers:

<b>Diagnostic status register</b>	The diagnostic status register indicates operating and error states of the local bus master (see Table 1-1 "Diagnostic status register").
<b>Diagnostic parameter register 1</b>	The first diagnostic parameter register returns the associated error code in the event of an error. For possible error codes, please refer to Section 2, "Error codes".
<b>Diagnostic parameter register 2</b>	The second diagnostic parameter register contains additional information. For localized bus or I/O errors this is the error location (device number).

**Diagnostic status register**

A local bus master state is assigned to each bit in the diagnostic status register. The states in the error bits (F\_PF\_BIT, F\_BUS\_BIT, F\_CTRL\_BIT) are described in greater detail using the two diagnostic parameter registers. The diagnostic parameter registers are always written to whenever one of the above error bits is set. Otherwise, they have the value 0000<sub>hex</sub>.

Table 1-1 Diagnostic status register

Bit	Designation	Meaning	
00	F_PW_BIT	I/O warning (peripheral warning)	The device detected a warning at the I/Os.
01	F_PF_BIT	I/O error (peripheral fault)	The device detected an I/O error (peripheral fault)
02	F_BUS_BIT	Bus error	A bus error occurred.
03	F_CTRL_BIT	Controller error	The driver 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	The configuration is active, PDI to the devices is possible, output data is disabled (substitute value behavior).
07	F_READY_BIT	Ready	The local bus master is ready for operation, no data exchange over the bus.
08	F_BD_BIT	Bus different	A device which does not belong to the current 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. Output data is blocked (substitute value behavior).
10	F_FORCE_BIT	Force mode	Force mode (start-up tool) is active.
11 ...15	-		Reserved

**Operating indicators**

The Ready, Active and Run operating indicators show the current state of the system. The diagnostic parameter registers are not used.

After initialization the driver is ready for operation. The Ready indicator bus is set (F\_READY\_BIT = 1).

If the driver has been configured and a configuration frame has been activated without errors, the system indicates 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, and CTRL error indicators report an error, PW a warning. Errors which are indicated with BUS or CTRL will cause the bus to be disconnected. The Run indication 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.

Table 1-2 Priorities of the error messages

Message	Priority
CTRL	1 (Highest priority)
BUS	2
PF	3
PW	4 (Lowest priority)

If there are I/O errors (PF) at several devices, the parameter registers show the message that occurred first. If this message has been removed, the next pending message with the lowest device number is shown.

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

After an error has been removed or disappears (e.g., elimination of an interrupt) the bus is started automatically and output data is enabled in the default setting. The Run indicator bus is set again (F\_RUN\_BIT = 1).



## 2 Error codes

Problems when calling 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 meanings of the individual codes.

The code listed in the tables consists of Error Class and Error Code. The Additional Code parameter contains a detailed description of the error reason.

### 2.1 Error codes for user errors

Table 2-1 Error codes for user errors

Code (hex)	Additional code	Meaning	Solution
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 services	Maximum number of permitted parallel services exceeded. (Processing conflict)	Wait for the service called previously to be completed, and then try again.
090A	Value transmitted in Parameter_Count	The number of parameters is inconsistent with the service. The Parameter_Count parameter does not agree with the number of subsequent words.	Match the number of parameters.
0913	Code of failed services	The service called is not supported.	Use a service that is supported.
0918	Code of the unknown service	Call of an unknown service code.	Check the call.
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 has currently the exclusive rights.	Wait for the exclusive rights to be enabled.
0934		The node already has the exclusive rights.	
0937	Faulty Variable_ID	Unknown Variable_ID component.	Check the call.
0938	Reserved Variable_ID	An internal Variable_ID was used.	Check the call.
0939	Variable_ID not enabled	The Variable_ID is not enabled. (Password protection)	Check the call.
093A	Incorrect Variable_ID	Length specification in the Variable_ID is 0 or incorrect.	Check the call.
093B	Incorrect Variable_Count	The number of variables has been calculated incorrectly.	Check the call.

## Axioline F: Diagnostics

Table 2-1 Error codes for user errors

Code (hex)	Additional code	Meaning	Solution
0A01		A hardware or firmware error occurred.	Restart the device. If the problem still occurs, please contact Phoenix Contact.
0A02	Current status of the local bus master	<p>A service was called 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 abort in Ready)</p> <p>0800 Active Fail (Communication abort in Active)</p> <p>1000 Param Ready Fail (Communication abort in Ready parameter)</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 abort 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 still occurs, please contact Phoenix Contact.
0A04		Inconsistent parameters	Check the call.
0A05		Invalid parameters	Check the call.
0A06		Access not supported.	Check the call.
0A07		Object does not exist.	Check the call.
0A08	Code of failed services	Maximum number of permitted parallel SM services exceeded. (Processing conflict)	Wait for the service called previously to be completed, and then try again.
0A0C	Unknown Variable_ID	Call of Set_Value or Read_Value with a Variable_ID that contains an unknown code.	Check the call.

Table 2-1 Error codes for user errors

Code (hex)	Additional code	Meaning	Solution
0A0D		A firmware error occurred.	Restart the device. If the problem still occurs, please contact Phoenix Contact.
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 the 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		A frame reference from 1 to 254 is permitted only.	Currently, the value 1 is permitted only.
0A54		The maximum number of I/O points was exceeded.	Reduce the number of I/O points to the maximum number.  To obtain the exact number, please refer to the documentation for your controller.
0A60		No configuration frames could be assigned.	Create the configuration frame.
0A70		A reserved bit has been set in the <i>Diag_Info</i> attribute.	Check the parameters.
0A73	Device number	Device present with a chip version in the local bus that is not supported.	Replace the device.
0A74	Device number	Device of a manufacturer that is not supported present in the local bus.	Replace the device.
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 still occurs, please contact Phoenix Contact.
0A82	Object index	Service (e.g, Create_Configuration) could not be executed due to PDI communication malfunctions (number).	
0A83	Object index	Service (e.g, Create_Configuration) could not be executed due to PDI communication malfunctions (error).	
0AFF		Call of Reset_Driver during PDI communication.	

## Axioline F: Diagnostics

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Table 2-1 Error codes for user errors

Code (hex)	Additional code	Meaning	Solution
0B01		A hardware or firmware error occurred.	Restart the device. If the problem still occurs, please contact Phoenix Contact.
0B02		A hardware or firmware error occurred.	
0B03		A hardware or firmware error occurred.	
0B04		A hardware or firmware error occurred.	
0B05		Invalid parameters	Check the parameters.
0B06		Access not supported. (E.g., write protection)	Restart the device. If the problem still occurs, please contact Phoenix Contact.
0B07		Object does not exist.	
0B0C		A hardware or firmware error occurred.	

## 2.2 Error codes for bus diagnostics

Table 2-2 Error codes for bus diagnostics

Code (hex)	Additional code	Meaning	Solution
0BD1		The bus could not be activated due to bus malfunctions.	Check the bus configuration.
0BF1			
0BF2			
0BF3			
0C01	Device number	The configured module is not accessible. A device present in the configuration frame has been removed from the physical bus structure after the configuration frame has been connected.	Check the configuration. Adapt the configuration frame if the modification was done on purpose.
0C02		A module has been detected that was not configured. 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 inserted at the different location of the physical bus structure after the configuration frame was connected.	
0C12		The module is accessible but was not put into operation 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		The module ID does not correspond to the configured value.	

## 2.3 Error codes when calling the PDI services

Table 2-3 Error codes when calling the PDI services

Code (hex)	Additional Code (hex)	Meaning	Solution
0502		Problem with the PDU size	Check the call.
	0031	Permissible length exceeded. Object cannot be read completely.	
0602	00A2	Hardware fault	Restart the device. If the problem still occurs, please contact Phoenix Contact.
0603	0000	Access to object denied	Check the call.
0605	0000	Inconsistent object attributes	
	0011	Subindex is not supported	
	0012	Code is not a request	
	0013	A reserved bit has been used	
	0014	Subslot is not supported	
	0015	Read/write service type is not supported	
	0016	Index of Request_Fetch service does not equal 0000 <sub>hex</sub>	
	0017	Length for Read or Fetch services does not equal zero	
	0018	Length does not correspond to the object length which has been read from the EEPROM	
	0019	Read only object cannot be overwritten	
0607	0000	Object does not exist	
8000	xx30	A reserved bit or reserved code was used during parameterization. xx: Number of the affected elements 30: Value is out of range	Check the parameterization.
0801	0000	Error writing the object	Check the call.
	00A2	Error reading the object	

Table 2-3 Error codes when calling the PDI services

Code (hex)	Additional Code (hex)	Meaning	Solution
0F01		Hardware or firmware error	Restart the device. If the problem still occurs, please contact Phoenix Contact.
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 call.
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 call.
0F0D		Internal error	Restart the device. If the problem still occurs, please contact Phoenix Contact.
0F11		Device not accessible (bus error).	Check the bus configuration.
0F12		Device not accessible (timeout)	Check the device.
0F21	Invalid device number	Invalid slot number (Value is 0 or larger than the maximum number of devices)	Check the call.
0F22	Invalid device number	Slot is not active.	Check the call.
0F23	Invalid data length	Invalid data length.	Check the call.
0F24	Invalid number of parameters	Invalid number of parameters.	Check the number of parameters.
0F31		Internal error	Restart the device. If the problem still occurs, please contact Phoenix Contact.
0F32			
0F33			

## 2.4 Error codes of the I/O modules

If there is an error 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.

Table 2-4 Error codes of the I/O modules

Code [hex]	Meaning	Text	Solution	
2130	Short circuit	Short circuit	Check the wiring.	
	Overload of the analog output or short circuit			
2211	Current inside the device, no. 1			
	Overload at an input			
2344	Overload at an output			
	Short circuit/overload of an output			
3300	Output voltage			
	Overload or short circuit at the output	Output		
3400	I/O supply voltage failure			Check the I/O supply.
3412	Initiator supply not present			
	I/O supply voltage failure			
3422	Actuator supply not present			
5112	+24 V supply			
	Faulty 24 V supply	24 V supply fail		
	Short circuit or overload of the 24 V supply	24 V supply no 1 24 V supply no 2		
5113	+5 V supply			
	Short circuit or overload of the 5 V supply	5 V supply no 1 5 V supply no 2		
5120	Air supply			
	Cold junction invalid	Cold Junction	Check the cold junction.	
5160	Supply of I/O devices supplied by the device.		Check the I/O supply.	
	Supply voltage faulty	Supply fail		
6300	Data record not OK			
	Parameter set faulty	Parameter set not ok	Check the parameterization of the specified device.	
6301	Data record no. 1		Restart the device. Replace the device if the error still occurs.	
	Device error	CS FLASH		
6302	Data record no. 2			
	Device error	FO FLASH		

Table 2-4 Error codes of the I/O modules

Code [hex]	Meaning	Text	Solution
6320	Parameter error		
	Parameter table invalid	Invalid para	Check the parameterization of the specified device.
7300	Sensor (at the device)		
	Sensor error	Sensor/encoder fail	Check the sensor.
7305	Incremental encoder 1 faulty		
	Encoder error	Malfunction of encoder	Check the encoder.
7610	RAM		
	Receive buffer full	Rx-Buf full	Read the receive buffer.
7611	Transmit buffer full	Tx-Buf full	Check the handshake.
7620	EPROM (device error)	CS ROM	Restart the device. Replace the device if the error still occurs.
7710	Open circuit at sensor cable		Remove the open circuit.
	Open circuit	Open circuit	
8600	Positioning controller		
	Input error of the incremental encoder	Encoder input signal error	<ul style="list-style-type: none"> <li>- Check the input signal.</li> <li>- Remove the short circuit.</li> <li>- Connect the sensor.</li> </ul>
8910	Overrange	Overrange	- Adapt the range.
8920	Underrange	Underrange	- Check the wiring.

**Add\_Error\_Info**

In diagnostic parameter register 2 the error location is given as Add\_Error\_Info for all I/O module errors.

