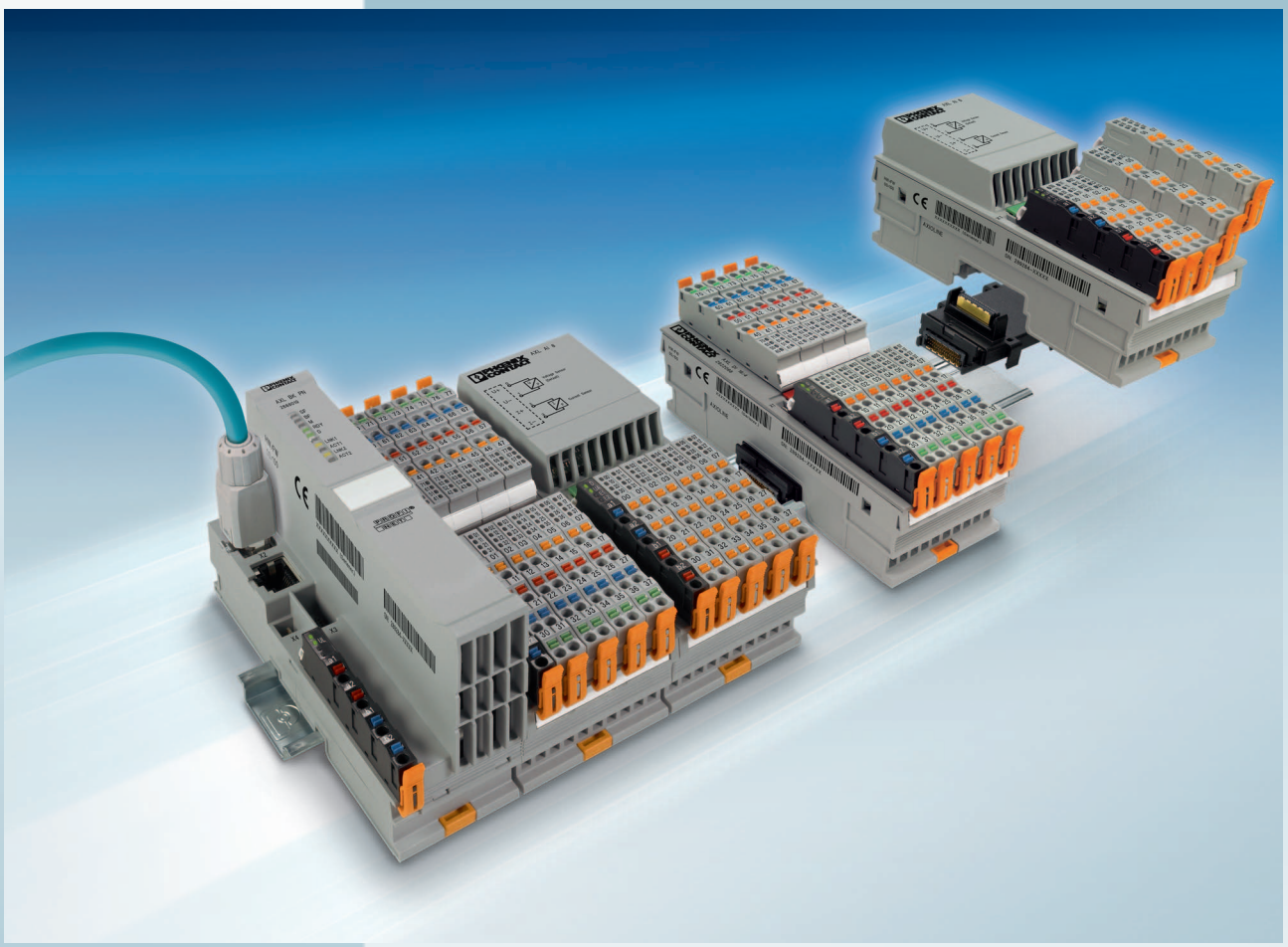
DOWNLOADED FROM WWW.SCATTS.CO.UK



# Axioline F: Diagnostic registers, and error messges

User manual

PHOENIX CONTACT
INSPIRING INNOVATIONS

DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK

# User manual

# Axioline F: Diagnostic registers, and error messges

2016-11-11

Designation: UM EN AXL F SYS DIAG

Revision: 03

Order No.: —

This manual is valid for:

Modules of the Axioline F product group



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK

# 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.

### How to contact us

**Internet**

Up-to-date information on Phoenix Contact products and our Terms and Conditions can be found on the Internet at:
phoenixcontact.com

Make sure you always use the latest documentation.
It can be downloaded at:
phoenixcontact.net/products

**Subsidiaries**

If there are any problems that cannot be solved using the documentation, please contact your Phoenix Contact subsidiary.
Subsidiary contact information is available at phoenixcontact.com.

**Published by**

PHOENIX CONTACT GmbH & Co. KG
Flachsmarktstraße 8
32825 Blomberg
GERMANY

Should you have any suggestions or recommendations for improvement of the contents and layout of our manuals, please send your comments to:
tecdoc@phoenixcontact.com



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



### General terms and conditions of use for technical documentation

Phoenix Contact reserves the right to alter, correct, and/or improve the technical documentation and the products described in the technical documentation at its own discretion and without giving prior notice, insofar as this is reasonable for the user. The same applies to any technical changes that serve the purpose of technical progress.

The receipt of technical documentation (in particular user documentation) does not constitute any further duty on the part of Phoenix Contact to furnish information on modifications to products and/or technical documentation. You are responsible to verify the suitability and intended use of the products in your specific application, in particular with regard to observing the applicable standards and regulations. All information made available in the technical data is supplied without any accompanying guarantee, whether expressly mentioned, implied or tacitly assumed.

In general, the provisions of the current standard Terms and Conditions of Phoenix Contact apply exclusively, in particular as concerns any warranty liability.

This manual, including all illustrations contained herein, is copyright protected. Any changes to the contents or the publication of extracts of this document is prohibited.

Phoenix Contact reserves the right to register its own intellectual property rights for the product identifications of Phoenix Contact products that are used here. Registration of such intellectual property rights by third parties is prohibited.

Other product identifications may be afforded legal protection, even where they may not be indicated as such.



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK

# Table of contents

1 Diagnostics in the Axioline F system ..... 7

1.1 Local diagnostics and status indicators ..... 7

1.1.1 Indicators D and E on controllers and bus couplers ..... 8

1.1.2 Indicators D and E on I/O modules ..... 9

1.2 Diagnostics via object $0018_{hex}$ (DiagState) ..... 10

1.3 Diagnostic registers of the local bus master ..... 12

1.3.1 Diagnostic status register ..... 12

1.3.2 Diagnostic parameter register ..... 14

1.4 Diagnostics register of the AXC ... controller ..... 15

1.5 Diagnostics register of the AXL F BK ... bus coupler ..... 16

2 Error codes ..... 17

2.1 Error codes for user errors ..... 17

2.2 Error codes for bus diagnostics ..... 22

2.3 Error codes when calling the PDI services ..... 23

2.4 Error codes of the I/O modules ..... 28



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK





DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



# 1 Diagnostics in the Axioline F system

Terms used in the document:

| | |
|---|---|
| Local bus | Axioline F local bus |
| Head of an Axioline F station | e.g., Axioline F bus coupler, Axioline F controller |
| Local bus master | Part of the head of the Axioline station that is responsible for the controller of the Axioline F local bus |
| Axioline F module | Any module of an Axioline F station, i. e., head of the Axioline F station or I/O module |

The Axioline F modules indicate the errors that occur in different ways:

– About the local diagnostics indicators
– About the diagnostics object $0018_{hex}$ (DiagState)
– About the diagnostics register of the AXC ... controller
– About the diagnostics registers of the AXL F BK ... bus coupler

## 1.1 Local diagnostics and status indicators

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.

**Diagnostics**

The diagnostics 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 functioning correctly if all of the green LEDs are on.

**Status**

The status indicators (yellow) display the status of the relevant input/output and the connected I/O device.

**Extended diagnostics**

Some modules have extended diagnostics. For example, a short circuit or an overload of the sensor supply can 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. Information about I/O errors is sent to the controller with precise details of the error type and is displayed using status indicators.

**The following only considers the LEDs D (diagnostics for local bus communication) and E (Error).**

An overview of all main diagnostics and status indicators in the Axioline F system and their meaning can be found in the UM EN AXL F SYS INST user manual:

Refer to the module-specific documentation for information on the diagnostics and status indicators on each special module and their meaning.

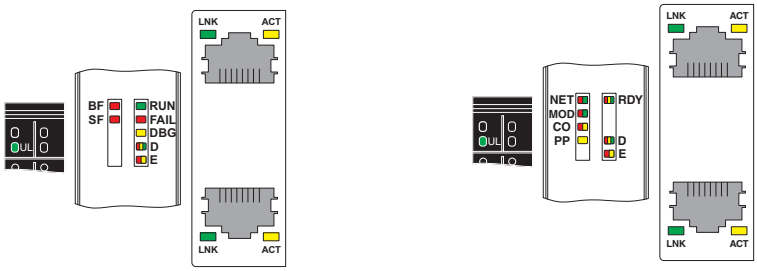


DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



### 1.1.1 Indicators D and E on controllers and bus couplers




Example: AXC 1050 Example: AXL F BK EIP

Figure 1-1 Indicators on controllers and bus couplers

Tabelle 2 Indicators on controllers and bus couplers

| Des. | Color | Meaning | State | Description |
|---|---|---|---|---|
| D | Red/ yellow/ green | Diagnostics for local bus communication | | |
| | | Power off | Off | The station coupler is in (power) reset. |
| | | Ready | Yellow on | The station is ready for operation, no data exchange taking place. |
| | | Ready + Bus error | Flashing red | Local bus error on startup |
| | | | | Possible causes:<br>– Configuration cannot be generated, information is missing from a device<br>– Chip version of a device is <V1.1<br>– The desired and actual configuration are different<br>– No local bus device connected<br>– The maximum number of local bus devices is exceeded. |
| | | Active | Flashing green | The station is ready for operation, communication within the station is OK.<br>The data is **not** valid. Valid data from the controller/higher-level network is not available.<br>There is no fault in the module. |
| | | Active + Force | Flashing yellow | Access from Startup+ in I/O check mode |
| | | | Flashing yellow/red | Local bus error during active I/O check |
| | | Active + Bus error | Red on | The station is ready for operation but has lost connection to at least one device. |
| | | | | Possible causes:<br>– Communication error<br>– Local bus device has been removed or configured device is missing.<br>– Reset at a local bus device<br>– Serious device error at a local bus device (local bus device can no longer be accessed) |
| | | Run | Green on | The bus coupler is ready for operation, communication within the station is OK. All data is valid. There are no faults. |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



Tabelle 2 Indicators on controllers and bus couplers

| Des. | Color | Meaning | State | Description |
|---|---|---|---|---|
| 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. |

### 1.1.2 Indicators D and E on I/O modules

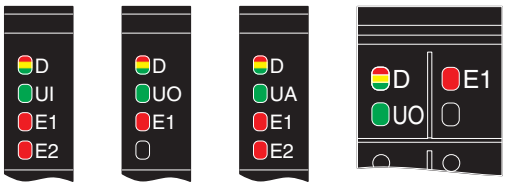



Figure 1-3 LEDs D and E on the power connectors of the I/O modules (examples)

Tabelle 4 LEDs D and E on the power connectors of the I/O modules

| Designation | Color | Meaning | State | Description |
|---|---|---|---|---|
| D | Red/yellow/green | Diagnostics for local bus communication | | |
| | | Run | Green on | The device is ready for operation, communication within the station is OK.<br>All data is valid. There are no faults. |
| | | Active | Flashing green | The device is ready for operation, communication within the station is OK.<br>The data is **not** valid. Valid data from the controller/higher-level network is not available.<br>There is no fault in the module. |
| | | Device application not active | Flashing green/yellow | The device is ready for operation, communication within the station is OK.<br>Output data **cannot** be output and/or input data **cannot** be read.<br>There is a fault on the I/O side of the module. |
| | | Ready | Yellow on | The device is ready for operation but has still not detected a valid cycle after power-on. |
| | | Connected | Flashing yellow | The device is not (yet) part of the active configuration. |
| | | Reset | Red on | The device is ready for operation but has lost the connection to the bus head. |
| | | Not connected | Flashing red | The device is ready for operation but there is no connection to the previously existing device. |
| | | Power down | Off | Device is in (power) reset. |
| E1/E2 | Red | Error | On | Error, see module-specific documentation. |
| | | | Off | No error. |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



## 1.2 Diagnostics via object $0018_{hex}$ (DiagState)

In addition, each I/O module is equipped with object $0018_{hex}$ (DiagState) that serves the structured reporting of an error. The I/O module also makes its diagnostics state available.

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

Table 1-1 Diagnostics state ($0018_{hex}$: DiagState) (general representation)

| **$0018_{hex}$: DiagState (Read)** | | | | | |
|---|---|---|---|---|---|
| **Subindex** | **Data type** | **Length in bytes** | **Meaning** | **Content** | |
| 0 | Record | 6 entries | Diagnostic state | Complete diagnostic information | |
| 1 | Unsigned 16 | 2 | Error number | Unique, consecutive number since the last power-up reset or the last reset of the diagnostics counter<br>0 ... $65535_{dec}$ | |
| 2 | Unsigned 8 | 1 | Priority | $00_{hex}$ | No error |
| | | | | $01_{hex}$ | Error |
| | | | | $02_{hex}$ | Warning |
| | | | | $03_{hex}$ | Information |
| | | | | $81_{hex}$ | Error eliminated |
| | | | | $82_{hex}$ | Warning eliminated |
| | | | | $83_{hex}$ | Information eliminated |
| 3 | Unsigned 8 | 1 | Channel/group/module | Channel, group or module where the error occurred.<br>Additional information under “Additional information”. | |
| | | | | $00_{hex}$ | No error |
| | | | | $xx_{hex}$ | Channel xx, groupxx or module xx |
| | | | | $FF_{hex}$ | Entire device |
| 4 | Unsigned 16 | 2 | Error code | Error code | |
| 5 | Unsigned 8 | 1 | Additional Information | $00_{hex}$ | Subindex 3 refers to a channel number. |
| | | | | $04_{hex}$ | Subindex 3 refers to a group number. |
| | | | | $08_{hex}$ | Subindex 3 refers to a module number. |
| | | | | Other | Currently not used. |
| 6 | Visible string | max. 51 | Text | Plain text message of the error | |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



Table 1-2 Classification of the error messages

| Priority | | Message type | Example | Note |
|---|---|---|---|---|
| $01_{hex}$ | High | Error (fault, alarm) | Supply voltage faulty<br>Parameter table invalid | An error is present, which must be responded to.<br>A fault leads e.g., to an activity in the drive, but does not necessarily require the system to be stopped with immediate effect. |
| $02_{hex}$ | Medium | Warning | Limit value not reached or exceeded | Risk of error.<br>A warning does not require action to be taken in the device. |
| $03_{hex}$ | Low | Information (message, notification) | General operating message: 10000 operating hours have elapsed. | General operating message: 10000 operating hours have elapsed. |

Diagnostic object $0018_{hex}$ is implemented with a storage depth of 1.

This means that:

– A higher priority message overwrites a lower priority message.

– Lower priority messages are not indicated if a higher priority message is already present.

The message with the priority $8x_{hex}$ is a one-time internal message to the bus coupler or controller that is converted to the error mechanisms of the higher-level system by the bus coupler.



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



## 1.3 Diagnostic registers of the local bus master

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

A local bus master has three diagnostic registers:

– Diagnostic status register:
  Operating and error states of the Axioline F 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 local bus or I/O errors (device number)

### 1.3.1 Diagnostic status register

Information on the operating state of the Axioline F local bus is stored in the diagnostic status register. Each bit in the diagnostic status register is assigned to a state of the Axioline F local bus.

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.

Table 1-3 Diagnostic status register

| Bit | Designation | Meaning | |
|---|---|---|---|
| 00 | F_PW_BIT | I/O warning | At least one device indicates an I/O warning. |
| 01 | F_PF_BIT | I/O error | At least one device indicates an I/O error. |
| 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 | Configuration is active, PDI to the devices is possible, data exchange with invalid/non-enabled process data. |
| 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 is active) |
| 10 | F_FORCE_BIT | Force mode | Force mode (startup tool/I/O check) is active. |
| 11 | F_SYNC_BIT | Synchronization | Synchronization between higher-level system and local bus master has failed. |
| 12 | F_PARA_REQ | Module parameter | At least one device is requesting parameters. |
| 13 …15 | - | | Reserved |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



### 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 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 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, PW 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.

Table 1-4 Priorities of the error messages

| Message | Priority |
|---|---|
| CTRL | 1 (Highest priority) |
| BUS | 2 |
| SYNC | 3 |
| PF | 4 |
| PW | 5 (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 I/O warnings 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 interrupt) the bus is started automatically and output data is enabled. The Run indicator bit is set again (F_RUN_BIT = 1).



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



### 1.3.2 Diagnostic parameter register

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

The diagnostic parameter registers provide additional information on the status indicated in the diagnostic status register when the error bits specified above are set.

The diagnostic parameter register 1 contains the error code.
An overview of the error codes can be found in Section 2, “Error codes”.

The 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 Axioline F modules that are installed one after another.



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



## 1.4 Diagnostics register of the AXC ... controller

With the help of the system variables, information on the diagnostic status register of an AXC ... controller can be read out.

Table 1-5 System variables of the diagnostic status register

| System variable | Type | Meaning |
|---|---|---|
| AXIO_DIAG_STATUS_REG_HI | BYTE | Diagnostic status register (high byte) |
| AXIO_DIAG_STATUS_REG_LOW | BYTE | Diagnostic status register (low byte) |
| AXIO_DIAG_STATUS_REG_PF | BOOL | I/O error |
| AXIO_DIAG_STATUS_REG_PW | BOOL | I/O warning |
| AXIO_DIAG_STATUS_REG_BUS | BOOL | Bus error |
| AXIO_DIAG_STATUS_REG_RUN | BOOL | Data transmission is active |
| AXIO_DIAG_STATUS_REG_ACT | BOOL | Selected configuration is ready to operate |
| AXIO_DIAG_STATUS_REG_RDY | BOOL | Axioline F local bus is ready for operation |
| AXIO_DIAG_STATUS_REG_SYSFAIL | BOOL | The Axioline F local bus switches to the SYSFAIL state when the controller is in the STOP state or there is no program present on it. |

Table 1-6 System variables of the diagnostic parameter register

| System variable | Type | Meaning |
|---|---|---|
| AXIO_DIAG_PARAM_REG_HI | BYTE | Diagnostic parameter register 1 (high byte) |
| AXIO_DIAG_PARAM_REG_LOW | BYTE | Diagnostic parameter register 1 (low byte) |
| AXIO_DIAG_PARAM_2_REG_HI | BYTE | Diagnostic parameter register 2 (high byte) |
| AXIO_DIAG_PARAM_2_REG_LOW | BYTE | Diagnostic parameterregister 2 (low byte) |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



## 1.5 Diagnostics register of the AXL F BK ... bus coupler

The diagnostic registers of the local bus master can be read via the diagnostic mechanisms of the higher-level system (see Table 1-7).

Table 1-7 Diagnostics mechanisms of the higher-level systems

| Bus coupler | Higher-level system | Diagnostics mechanism | See | Web-based Management |
|---|---|---|---|---|
| AXL F BK PB | PROFIBUS | Diagnostics in common format, block 6, byte 9 ... 12 | UM EN AXL F BK PB | No |
| AXL F BK EC | EtherCAT® | CoE object $F100_{hex}$:<br>Axioline Bus Coupler Diag Info | DB EN AXL F BK EC | No |
| AXL F BK PN ... | PROFINET | Diagnostic alarms | DB EN AXL F BK PN ...<br>UM EN PROFINET SYS | Yes |
| AXL F BK ETH ... | Ethernet | Modbus registers:<br>Local bus diagnostics:<br>7997 diagnostic status register<br>7998 diagnostic status register 1<br>7999 diagnostic status register 2<br>I/O diagnostics:<br>1801 ... 1989 I/O diagnostics of local bus devices | DB EN AXL F BK ETH ... | Yes |
| AXL F BK EIP ... | EtherNet/IP™ | Axioline F diagnostics object (class code 67hex) | UM EN AXL F BK EIP - OBJECTS | Yes |
| AXL F BK S3 | Sercos | Diagnostics IDNs | DB EN AXL F BK S3 | No |
| AXL F BK SAS | IEC 61850 | | | Yes |

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.

**When using the Startup+ software:**

- Right-click on the bus coupler to open the context menu and select the “Diagnostics” menu item.
  You can call the diagnostics for the station and the individual devices here.



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



# 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 | 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 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.<br>The Parameter_Count parameter does not agree with the number of subsequent words. | Match the number of parameters. |
| 0913 | Code of failed service | The service called is not supported. | Use a service that is supported. |
| 0917 | Code of failed service | Service decoding failed. | Restart the device. If the problem still occurs, please contact Phoenix Contact. |
| 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. |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



Table 2-1 Error codes for user errors [...]

| Code (hex) | Additional code | Meaning | Remedy |
|---|---|---|---|
| 093B | Incorrect Variable_Count | The number of variables has been calculated incorrectly. | Check the call. |
| 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 | A service was called that is not permitted in the current status of the local bus master.<br>Possible states:<br>0001 Ready<br>(After restart or reset)<br>0002 Load Config<br>(Configuration cannot be loaded)<br>0004 Config Ready<br>(Configuration loaded successfully)<br>0008 Active<br>(Configuration frame connected)<br>0010 Param Ready<br>(Parameterization of modules completed)<br>0020 Run<br>(Process data traffic running)<br>0080 Force Mode<br>(Startup tool specifies outputs)<br>0100 Ready Fail<br>(Communication abort in Ready)<br>0800 Active Fail<br>(Communication abort in Active)<br>1000 Param Ready Fail<br>(Communication abort in Ready parameter)<br>2000 Run Fail<br>(Process data traffic with subsystem)<br>4000 Force Fail<br>(Application timeout for all devices)<br>8000 Force Mode Fail<br>(Communication abort in Force_Mode) | 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 service | 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. |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



Table 2-1 Error codes for user errors [...]

| Code (hex) | Additional code | Meaning | Remedy |
|---|---|---|---|
| 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. |
| 0 A1 A | 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.<br>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 *Diag_Info* 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. |
| 0A75 | Device number | Device is indicating a serious error (e. g., faulty EEPROM). | Restart the device. If the problem still occurs, please contact Phoenix Contact. |
| 0A76 | Device number | The topology used by the device is not supported by the master. | Replace the device. |
| 0A77 | Device number | Error at the interface. | Check the connection between the electronics module and bus base module. |
| 0A7 A | | 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. |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



Table 2-1 Error codes for user errors [...]

| Code (hex) | Additional code | Meaning | Remedy |
|---|---|---|---|
| 0A82 | Object index | Service (e.g, Create_Configuration) could not be executed due to PDI communication malfunctions (number). | Restart the device. If the problem still occurs, please contact Phoenix Contact. |
| 0A83 | Object index | Service (e.g, Create_Configuration) could not be executed due to PDI communication malfunctions (error). | Restart the device. If the problem still occurs, please contact Phoenix Contact. |
| 0A90 | Device number | Device was selected for synchronization, however it does not support this. | Select a device that supports synchronization or change the selection. |
| 0A91 | Device number | Device was selected for synchronization, however it 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. | Selected different values for Input_Delay and Output_Delay or a different device. |
| 0AFF | | Call of Reset_Driver during PDI communication. | Restart the device. If the problem still occurs, please contact Phoenix Contact. |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



Table 2-1 Error codes for user errors [...]

| Code (hex) | Additional code | Meaning | Remedy |
|---|---|---|---|
| 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. | |
| OBC1 | | Supply voltage not available for the local bus. Too many devices connected or the higher-level power supply unit is too weak. | Use a suitable power supply unit.<br>Check the power consumption of the devices; if required, use a power module for communications power or install a further Axioline F station. |
| 0BDE | | Synchronization failed. Trigger signal does not correspond to the specification. | Check the synchronization signal of the higher-level system. Make sure that the cycle time specification is properly selected. |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



## 2.2 Error codes for bus diagnostics

Table 2-2 Error codes for bus diagnostics

| Code (hex) | Additional code | Meaning | Remedy |
|---|---|---|---|
| 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.<br>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.<br>Adapt the configuration frame if the modification was done on purpose. |
| 0C02 | | A module has been detected that was not configured.<br>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.<br>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.<br>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.<br>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. | |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



## 2.3 Error codes when calling the PDI services

In Table 2-3, only specify the additional code if it contains a special value. Pleas obtain the standard values for the additional code from Table 2-4.

Table 2-3 Error codes when calling the PDI services

| Code (hex) | Code (hex) | Additional code | Meaning | Remedy |
|---|---|---|---|---|
| 2 | | | Error in the communication relationship | Check the call. |
| | 1 | | Unable to access the object.<br>Possible causes:<br>– Module not present<br>– Incorrect module number | |
| | 0 | | Other error | |
| 5 | | | Faulty service | Check the call. |
| | 1 | | The current object state prevents the service from being executed. | |
| | 2 | | Problem with the PDU size | |
| | | | Permissible length exceeded. Object cannot be read completely. | |
| | 3 | | The service cannot be executed at present. | |
| | 4 | | The service contains inconsistent parameters. | |
| | 5 | | A parameter has an invalid value. | |
| | 0 | | Other error | |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



Table 2-3 Error codes when calling the PDI services [...]

| Code (hex) | Code (hex) | Additional code | Meaning | Remedy |
|---|---|---|---|---|
| 6 | | | Faulty access | Check the call. |
| | 1 | | Invalid object | |
| | 2 | | Hardware fault | Eliminate the hardware error (e.g., I/O voltage not present).<br>Restart the device. If the problem still occurs, please contact Phoenix Contact. |
| | 3 | | Access to object denied | Check the call. |
| | 4 | | Access to an invalid address | Check the call. |
| | 5 | | Inconsistent object attributes | |
| | 6 | | The service used cannot be applied to this object. | |
| | 7 | | Object does not exist | |
| | 8 | | Type conflict | |
| | A | | Data not ready at present. | |
| | 0 | | Other error | |
| 8 | 0 | xx30 | A reserved bit or reserved code was used during parameterization.<br>xx: Number of the affected elements<br>30: Value is out of range | Check the parameterization. |
| | 1 | | Error writing the object | Check the call. |
| | | | Error reading the object | |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



Table 2-3 Error codes when calling the PDI services [...]

| Code (hex) | Code (hex) | Additional code | Meaning | Remedy |
|---|---|---|---|---|
| F | 1 | | Hardware or firmware error | Restart the device. If the problem still occurs, please contact Phoenix Contact. |
| | 2 | | | |
| | 3 | | | |
| | 4 | | Inconsistent parameters | Check the parameters. |
| | 5 | PDI object index | Invalid parameters | Check the parameters. |
| | 6 | PDI object index | Access not supported. | Check the call. |
| | 8 | PDI object index | Maximum number of permitted parallel PDI services exceeded | Wait until the services have been processed. |
| | C | Unknown Variable_ID | Incorrect variable ID for Set_Value or Read_Value. | Check the call. |
| | D | | Internal error | Restart the device. If the problem still occurs, please contact Phoenix Contact. |
| | 11 | | Device not accessible (bus error). | Check the bus configuration. |
| | 12 | | Device cannot be reached (timeout). | Check the device. |
| | 13 | | Device not accessible because it was removed. | Check the bus configuration. |
| | 21 | Invalid device number | Invalid slot number (Value is 0 or larger than the maximum number of devices) | Check the call. |
| | 22 | Invalid device number | Slot is not active. | Check the call. |
| | 23 | Invalid data length | Invalid data length. | Check the call. |
| | 24 | Invalid number of parameters | Invalid number of parameters. | Check the call. |
| | 31 | | Internal error | Restart the device. If the problem still occurs, please contact Phoenix Contact. |
| | 32 | | | |
| | 33 | | | |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



Table 2-4 Additional codes

| Additional code (hex) | Meaning |
|---|---|
| 0000 | No detailed information on the cause of error. |
| 0010 | Service parameter with invalid value. |
| 0011 | Subindex not available |
| 0012 | Object access is not a request |
| 0013 | Service code is not supported |
| 0014 | Subslot is not supported |
| 0015 | Object access type not supported on this object. |
| 0016 | Object access request index for this AccessType does not equal $0000_{hex}$. |
| 0017 | Object access request length for this AccessType does not equal zero. |
| 0018 | Object length for this object does not match |
| 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 permitted. |
| 001C | Access requires Upload-Read or Download-Write. |
| 0020 | Service cannot be executed at present. |
| 0021 | Due to local control, service cannot be executed at present. |
| 0022 | Service cannot be executed in current device state (device control). |
| 0023 | Service cannot be executed at present as no object dictionary is available. |
| 0030 | Value range of a parameter out of range. |
| 0031 | Parameter value too large |
| 0032 | Parameter value too small |
| 0040 | Collision with other values |
| 0041 | Communication object cannot be mapped to the process data. |
| 0042 | Process data length exceeded |
| 0050 | Firmware download rejected: general. |
| 0051 | Firmware download rejected: incorrect update version. |
| 0052 | Firmware download rejected: incorrect firmware version for the hardware. |
| 0053 | Firmware download rejected: identical firmware block. |
| 0080 | Hardware error |
| 0081 | Application failed |
| 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) |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



Table 2-4 Additional codes [...]

| Additional code (hex) | Meaning |
|---|---|
| 00A6 | Segment missing: Fewer data blocks were received than specified in the last segment. |
| 00A7 | Excess segment: More data blocks were received than specified in the last segment. |
| 00A8 | Error reading the file (if file system is available). |
| 00A9 | Segment number invalid or 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. |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



## 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 2-5 Error codes of the I/O modules

| Code (hex) | Meaning | Remedy |
|---|---|---|
| **0000** | **No error** | |
| **1000** | **General fault** | |
| **2000** | **Current** | |
| 2130 | Short circuit | Check the wiring. |
| | Overload of the analog output or short circuit | |
| 2211 | Overload at an input | |
| | Sensor supply overload for the inputs | |
| 2344 | Overload at an output | |
| | Short circuit/overload of an output | |
| 2345 | Sensor supply overload | |
| **3000** | **Voltage** | |
| 3300 | Output voltage | |
| | Short circuit or overload at the output | |
| 3400 | I/O supply voltage failure | Check the I/O supply. |
| 3412 | Sensor supply not present | |
| | I/O supply voltage failure | |
| 3422 | Actuator supply not present | |
| **4000** | **Temperature** | |
| **5000** | **Device hardware** | |
| 5112 | Faulty 24 V supply | Check the I/O supply. |
| | Short circuit or overload at the 24 V supply | |
| | 24 V encoder supply for channel x faulty | |
| 5113 | Short circuit or overload of the 5 V supply | |
| 5120 | Cold junction invalid | Check the cold junction. |
| 5160 | Supply voltage faulty | Check the I/O supply. |
| | I/O supply overload | |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



Table 2-5 Error codes of the I/O modules [...]

| Code (hex) | Meaning | Remedy |
|---|---|---|
| **6000** | **Device software** | |
| 6300 | Parameter set faulty | Check the parameterization of the specified device. |
| 6301 | Device error | Restart the device. Replace the device if the error still occurs. |
| 6302 | Device error | |
| 6310 | Gerätefehler: Parameterverlust | Parametrieren Sie den angegebenen Teilnehmer.<br>Führen Sie einen Neustart aus.<br>Wenn der Fehler weiterhin auftritt, tauschen Sie das Gerät aus. |
| 6320 | Parameter table invalid | Check the parameterization of the specified device. |
| **7000** | **Additional modules** | |
| 7300 | Encoder error | Check the encoder. |
| 7305 | Encoder error | Check the encoder. |
| 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 still occurs. |
| 7710 | Open circuit at sensor cable | Remove the open circuit. |
| | Open circuit | |
| **8000** | **Monitoring** | |
| 8600 | Input error of incremental encoder | – Check the input signal.<br>– Remove the short circuit.<br>– Connect the sensor. |
| 8910 | Overrange | – Adapt the range.<br>– Check the wiring. |
| 8920 | Underrange | |



DOWNLOADED FROM WWW.SCATTS.CO.UK

DOWNLOADED FROM WWW.SCATTS.CO.UK



Table 2-5 Error codes of the I/O modules [...]

| 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. |
| A002 | Lower-level bus: incorrect module present | Check the specified device and its power supply. |
| 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 | |
| A012 | Lower-level bus: application on the module not ready | |
| A013 | Lower-level bus: device reset | |
| A020 | Lower-level bus: communication error | Check the specified device in the lower-level bus or in the part of the system for the following aspects:<br>– Missing or incorrect shielding of the bus line (connector)<br>– Missing or incorrect grounding, missing or incorrect equipotential bonding<br>– Faulty connections in the connector<br>– Voltage dips on the power supply |
| 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 still occurs. |
| A042 | Lower-level bus: firmware error | Check the parameterization of the specified device. |
| A043 | Lower-level bus is asynchronous to the higher-level system | |



DOWNLOADED FROM WWW.SCATTS.CO.UK

SCATTERGOOD & JOHNSON LTD
ELECTRICAL ENGINEERING & FLUID CONTROL DISTRIBUTORS
Est.1899

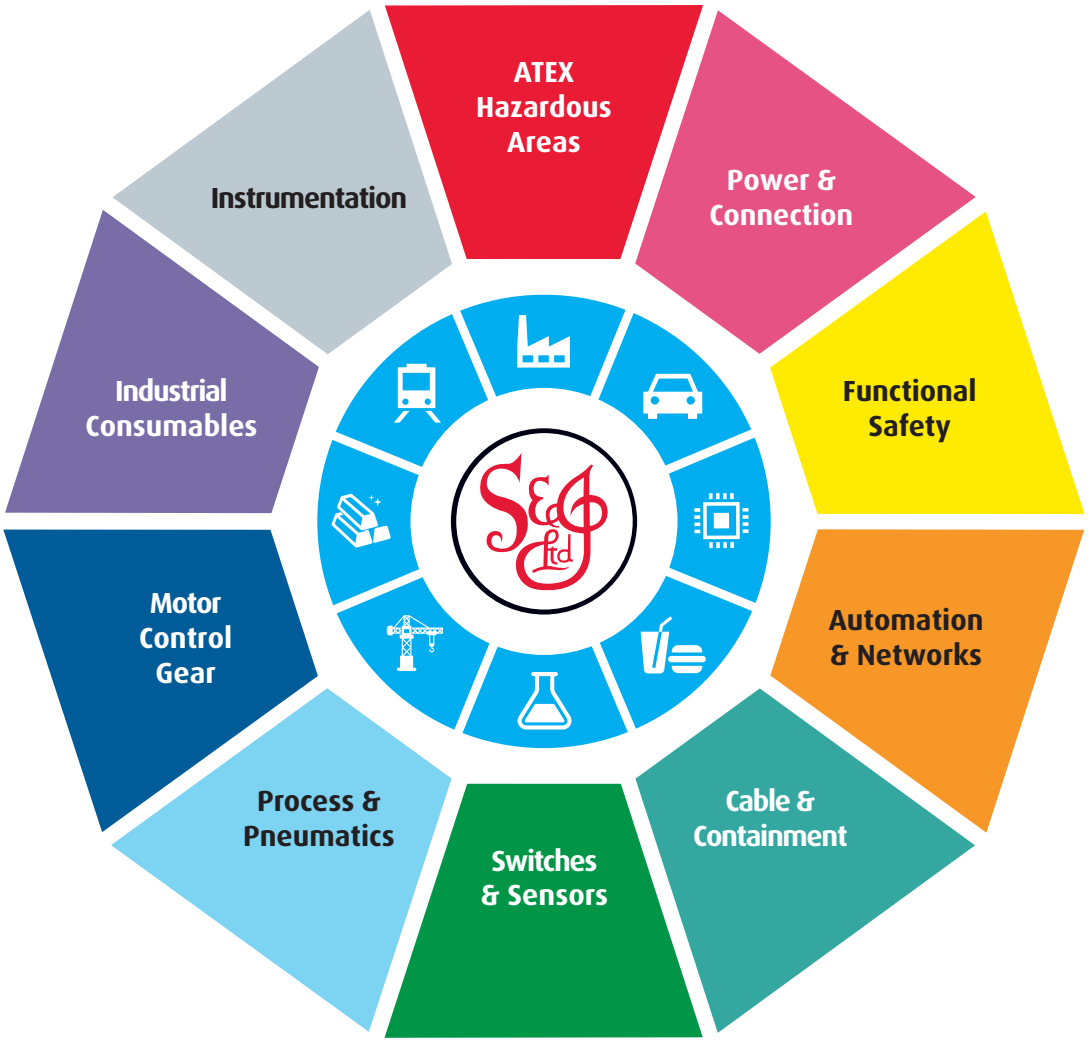
At Scattergood & Johnson Ltd, we pride ourselves on being a technical distributor to specialist industries.

Working with a range of quality product suppliers across a number of specialist markets, we are not your average 'box shifter' - we are your technical and supply chain partner.

We fully support every product we sell - for free! Our internal team and external sales engineers can answer any product or application question, no matter the complexity.

Backing up this technical ability is a range of 50,000+ products available from stock for nationwide next day delivery (same day if required!), or you can collect what you need from any of our trade counters around the UK.

Select your specialist interest below to learn more about how we can help.




Online, In Branch and On the Road - Scattergood & Johnson Ltd, there when you need us.

**www.scatts.co.uk**