



This document will cover gathering fault log information from a Banner XS26 safety controller into a Siemens PLC. The following information uses Totally Integrated Automation (TIA) Portal software package from Siemens. See the XS26 Manual for information on the Fault Logs for more information on them. This document will show you how to install and use the provided data types to gather the fault log information. Contact Banner Engineering with any questions that you have.

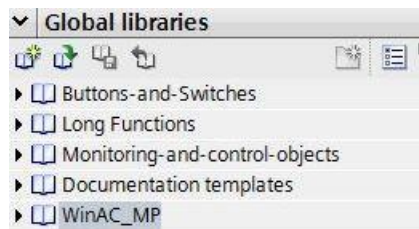
Components

Library: Banner XS26 Tools

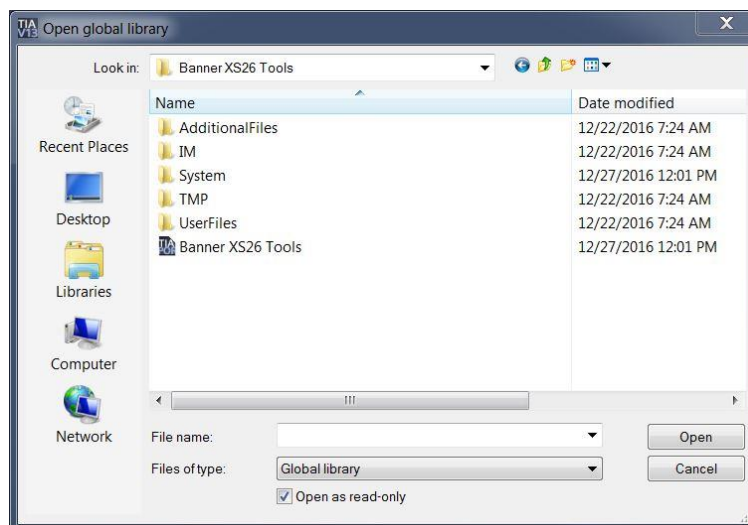
Installation Process

This section describes how to install the PLC Data Types from the Banner XS26 Tools library into TIA Portal.

1. Open up a project.
2. Select the Library tab on the right hand side of TIA portal. Expand the Global libraries option. Should see something similar to the below image. Press the Open Global Library button.



3. A standard windows selection box will appear. Navigate to the correct file location. Select the **Banner XS26 Tools** file. This is the library that has the Reset or Cancel Delay function blocks in it. Press the Open button to load the library.

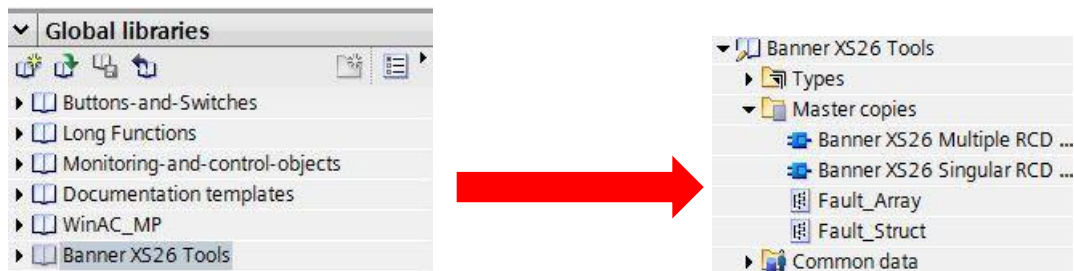


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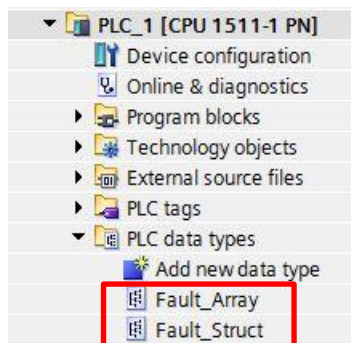
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4. Expand the library by pressing the arrow to the left of the **Banner XS26 Tools library**. Drag the Fault_Array and Fault_Struct into the PLC Data Types folder area of the project.



5. The PLC data types area will now be similar to the below image after data types have been moved.



6. PLC data types have been successfully added to the project. Next sections will describe to gather the fault log information.



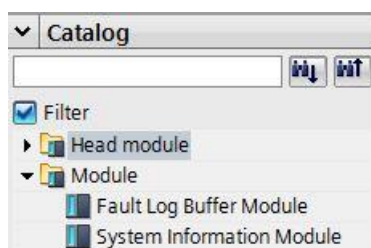
Banner XS26 Fault Log – Setup Steps

This section shows how to use the Fault_Array to gather the fault log information from a Banner XS26 safety controller.

1. Add a XS26 Safety Controller via Devices and Networks if necessary. Device View in the Device Overview area should show something similar to the below image. This shows how all of the information is being sent back and forth from the PLC and the XS26 Safety Controller.

Module	Rack	Slot	I address	Q address	Type	Article no.
▼ xs26	0	0			XS26	Banner-XS26-Series
► I	0	0 X1			xs26	
4 Status Bytes, Bits 0..31_1	0	1	2...5		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_2	0	2	6...9		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_3	0	3	10...13		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_4	0	4	14...17		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_5	0	5	18...21		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_6	0	6	22...25		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_7	0	7	26...29		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_8	0	8	30...33		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_9	0	9	34...37		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_10	0	10	38...41		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_11	0	11	42...45		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_12	0	12	46...49		4 Status Bytes, Bits ..	
8 Bytes Virtual On/Off/ME Da.	0	13		256...263	8 Bytes Virtual On/...	
2 Bytes RCD Data_1	0	14		264...265	2 Bytes RCD Data	
2 Byte RCD Acutation Code_1	0	15		266...267	2 Byte RCD Acutati...	
RCD Data Feedback Register	0	16	256...257		RCD Data Feedback.	
RCD Passcode Feedback Reg	0	17	258...259		RCD Passcode Feed.	
	0	18				
	0	19				

2. Add the Fault Log Buffer Modules from the Catalog.





- After the Fault Log Buffer Module has been added Device View should now look similar to the below image.

Module	Rack	Slot	I address	Q address	Type	Article no.
▼ xs26	0	0			XS26	Banner-XS26-Series
▶ I	0	0 X1			xs26	
4 Status Bytes, Bits 0..31_1	0	1	2...5		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_2	0	2	6...9		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_3	0	3	10...13		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_4	0	4	14...17		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_5	0	5	18...21		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_6	0	6	22...25		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_7	0	7	26...29		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_8	0	8	30...33		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_9	0	9	34...37		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_10	0	10	38...41		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_11	0	11	42...45		4 Status Bytes, Bits ..	
4 Status Bytes, Bits 0..31_12	0	12	46...49		4 Status Bytes, Bits ..	
8 Bytes Virtual On/Off/ME Da.	0	13		256...263	8 Bytes Virtual On/...	
2 Bytes RCD Data_1	0	14		264...265	2 Bytes RCD Data	
2 Byte RCD Acutuation Code_1	0	15		266...267	2 Byte RCD Acutati...	
RCD Data Feedback Register	0	16	256...257		RCD Data Feedback.	
RCD Passcode Feedback Reg	0	17	258...259		RCD Passcode Feed.	
Fault Log Buffer Module_1	0	18	260...559		Fault Log Buffer M...	

- Next create create a PLC tag. Below is an example of what the tag should look like. Ensure that the tag is linked to the first byte:bit of the Fault Log Buffer Module from Device View. In this case the first byte:bit was %I260.0.

9	▼ XS26 Fault Log	"Fault_Array"	%I260.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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5. Now let's discuss how the information is organized. Below you will see an expanded view of XS26 Fault Log. If no fault has occurred yet the Fault Log will be empty. There are ten entry's for the XS26 Fault Log. Each entry stores the same information. A brief description of the items in the XS26 Fault Log will be given.

9	XS26 Fault Log	"Fault_Array"	%I260.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
10	Fault	Array[1..10] of ...	%I260.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
11	Fault[1]	Fault_Struct	%I260.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
12	TimeStamp	UDInt	%ID260	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
13	NameLength	UDInt	%ID264	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
14	NameStringArray	Array[0..11] of ...	%I268.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
15	NameStringArray[0]	Char	%IB268	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
16	NameStringArray[1]	Char	%IB269	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
17	NameStringArray[2]	Char	%IB270	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
18	NameStringArray[3]	Char	%IB271	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
19	NameStringArray[4]	Char	%IB272	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
20	NameStringArray[5]	Char	%IB273	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
21	NameStringArray[6]	Char	%IB274	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
22	NameStringArray[7]	Char	%IB275	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
23	NameStringArray[8]	Char	%IB276	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
24	NameStringArray[9]	Char	%IB277	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
25	NameStringArray[10]	Char	%IB278	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
26	NameStringArray[11]	Char	%IB279	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
27	ErrorCode	UInt	%IW280	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
28	Advanced Error Code	UInt	%IW282	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
29	ErrorMessageIndex	UInt	%IW284	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
30	CompleteFaultCode	UDInt	%ID286	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0

- a. Time Stamp: represents the number of seconds since power up.
 - b. Name Length: states how many characters long the Name String Array is.
 - c. Name String Array: gives the names of the device that has erred out. Each instance of the array is one ASCII character.
 - d. Error Code: states the upper section of the error code.
 - e. Advanced Error Code: states the lower section of the error code.
 - f. Error Message Index: states the full error code number.
 - g. Complete Fault Code: reserved for additional information on the error.
6. The XS26 Fault Log is setup and ready to use at this point. The following steps will show how the fault log is populated with errors.
 7. The fault log is populated from 1 to 10. The newest error will be at 1 while the oldest error will be at 10.



8. Below is an example of when a fault occurs. The name of the device that has a fault is GS1. With that information it is possible to look in the XS26 program to know what to look at. The fault code 2.01. Fault codes can be referenced in the XS26 Manual of in Appendix A of this document.

9	XS26 Fault Log	"Fault_Array"	%I260.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
10	Fault	Array[1..10] of ...	%I260.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
11	Fault[1]	Fault_Struct	%I260.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
12	TimeStamp	UDInt	%ID260	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		47
13	NameLength	UDInt	%ID264	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		3
14	NameStringArray	Array[0..11] of ...	%I268.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
15	NameStringArray[0]	Char	%IB268	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		'G'
16	NameStringArray[1]	Char	%IB269	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		'S'
17	NameStringArray[2]	Char	%IB270	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		'1'
18	NameStringArray[3]	Char	%IB271	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		'\$00'
19	NameStringArray[4]	Char	%IB272	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		'\$00'
20	NameStringArray[5]	Char	%IB273	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		'\$00'
21	NameStringArray[6]	Char	%IB274	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		'\$00'
22	NameStringArray[7]	Char	%IB275	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		'\$00'
23	NameStringArray[8]	Char	%IB276	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		'\$00'
24	NameStringArray[9]	Char	%IB277	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		'\$00'
25	NameStringArray[10]	Char	%IB278	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		'\$00'
26	NameStringArray[11]	Char	%IB279	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		'\$00'
27	ErrorCode	UInt	%IW280	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		2
28	Advanced Error Code	UInt	%IW282	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		1
29	ErrorMessageIndex	UInt	%IW284	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		201
30	CompleteFaultCode	UDInt	%ID286	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		65554

9. When another fault occurs the fault log will be updated. The new Fault[1] could look like the following. The fault code for this error is 2.02.

9	XS26 Fault Log	"Fault_Array"	%I260.0			
10	Fault	Array[1..10] of ...	%I260.0			
11	Fault[1]	Fault_Struct	%I260.0			
12	TimeStamp	UDInt	%ID260			230
13	NameLength	UDInt	%ID264			3
14	NameStringArray	Array[0..11] of ...	%I268.0			
15	NameStringArray[0]	Char	%IB268			'G'
16	NameStringArray[1]	Char	%IB269			'S'
17	NameStringArray[2]	Char	%IB270			'1'
18	NameStringArray[3]	Char	%IB271			'\$00'
19	NameStringArray[4]	Char	%IB272			'\$00'
20	NameStringArray[5]	Char	%IB273			'\$00'
21	NameStringArray[6]	Char	%IB274			'\$00'
22	NameStringArray[7]	Char	%IB275			'\$00'
23	NameStringArray[8]	Char	%IB276			'\$00'
24	NameStringArray[9]	Char	%IB277			'\$00'
25	NameStringArray[10]	Char	%IB278			'\$00'
26	NameStringArray[11]	Char	%IB279			'\$00'
27	ErrorCode	UInt	%IW280			2
28	Advanced Error Code	UInt	%IW282			2
29	ErrorMessageIndex	UInt	%IW284			202
30	CompleteFaultCode	UDInt	%ID286			65570



10. Fault[2] now has the previous fault information. Remember the fault log can store the last 10 faults.

31	▼ Fault[2]	Fault_Struct	%I290.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
32	Timestamp	UDInt	%ID290	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	47
33	NameLength	UDInt	%ID294	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3
34	▼ NameStringArray	Array[0..11] of ...	%I298.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
35	NameStringArray[0]	Char	%IB298	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'G'
36	NameStringArray[1]	Char	%IB299	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'S'
37	NameStringArray[2]	Char	%IB300	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'1'
38	NameStringArray[3]	Char	%IB301	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
39	NameStringArray[4]	Char	%IB302	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
40	NameStringArray[5]	Char	%IB303	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
41	NameStringArray[6]	Char	%IB304	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
42	NameStringArray[7]	Char	%IB305	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
43	NameStringArray[8]	Char	%IB306	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
44	NameStringArray[9]	Char	%IB307	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
45	NameStringArray[10]	Char	%IB308	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
46	NameStringArray[11]	Char	%IB309	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	'\$00'
47	ErrorCode	UInt	%IW310	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2
48	Advanced Error Code	UInt	%IW312	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1
49	ErrorMessageIndex	UInt	%IW314	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	201
50	CompleteFaultCode	UDInt	%ID316	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	65554

11. Use this information as necessary to track how the system is operating.

12. This completes the overview of how to setup a XS26 Fault Log.



Appendix A

The below tables are taken from the XS26 Instruction manual. They are shown here for reference.

Fault Code	Displayed Message	Additional Message	Steps to resolve
1.1	Output Fault	Check for shorts	A Safety Output appears On when it should be Off: <ul style="list-style-type: none">• Check for a short to the external voltage source• Check the DC common wire size connected to the Safety Output loads. The wire must be a heavy-gauge wire or be as short as possible to minimize resistance and voltage drop. If necessary, use a separate DC common wire for each pair of outputs and/or avoid sharing this DC common return path with other devices (see Common Wire Installation on page 95)
1.2	Output Fault	Check for shorts	A Safety Output is sensing a fault to another voltage source while the output is On: <ul style="list-style-type: none">• Check for a short between Safety Outputs• Check for a short to the external voltage source• Check load device compatibility• Check the DC common wire size connected to the Safety Output loads. The wire must be a heavy-gauge wire or be as short as possible to minimize resistance and voltage drop. If necessary, use a separate DC common wire for each pair of outputs and/or avoid sharing this DC common return path with other devices (see Common Wire Installation on page 95)
1.3 – 1.8	Internal Fault	-	Internal failure—Contact Banner Engineering (see Repairs and Warranty Service on page 118)
1.9	Output Fault	Internal Relay Failure	<ul style="list-style-type: none">• Replace Relay module
1.10	Output Fault	Check Input Timing	Sequence timing error: <ul style="list-style-type: none">• Perform a System Reset to clear the fault

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Fault Code	Displayed Message	Additional Message	Steps to resolve
2.1	Concurrency Fault	Cycle Input	On a dual-channel input with both inputs in the Run state, one input went to the Stop state then back to Run: <ul style="list-style-type: none"> • Check the wiring • Check the input signals • Consider adjusting the debounce times
2.2	Simultaneity Fault	Cycle Input	On a dual-channel input, one input went into the Run state but the other input did not follow within 3 seconds: <ul style="list-style-type: none"> • Check the wiring • Check the input signal timing
2.3 or 2.5	Concurrency Fault	Cycle Input	On a complementary pair with both inputs in the Run state, one of the inputs changed to Stop then back to Run: <ul style="list-style-type: none"> • Check the wiring • Check the input signals • Check the power supply providing input signals • Consider adjusting the debounce times
2.4 or 2.6	Simultaneity Fault	Cycle Input	On a complementary pair, one input went into the Run state but the other input did not follow within the time limit: <ul style="list-style-type: none"> • Check the wiring • Check the input signal timing
2.7	Internal Fault	Check Terminal xx	Internal failure—Contact Banner Engineering (see <i>Repairs and Warranty Service</i> on page 118)
2.8 – 2.9	Input Fault	Check Terminal xx	Input stuck high: <ul style="list-style-type: none"> • Check for shorts to other inputs or other voltage sources • Check the input device compatibility
2.10	Input Fault	Check Terminal xx	<ul style="list-style-type: none"> • Check for a short between inputs
2.11 – 2.12	Input Fault	Check Terminal xx	<ul style="list-style-type: none"> • Check for a short to ground
2.13	Input Fault	Check Terminal xx	Input stuck low <ul style="list-style-type: none"> • Check for a short to ground
2.14	Input Fault	Check Terminal xx	Missing test pulses: <ul style="list-style-type: none"> • Check for a short to other inputs or other voltage sources
2.15	Open Lead	Check Terminal xx	<ul style="list-style-type: none"> • Check for an open lead
2.16 – 2.18	Input Fault	Check Terminal xx	Missing test pulses: <ul style="list-style-type: none"> • Check for a short to other inputs or other voltage sources
2.19	Open Lead	Check Terminal xx	<ul style="list-style-type: none"> • Check for an open lead
2.20	Input Fault	Check Terminal xx	Missing test pulses: <ul style="list-style-type: none"> • Check for a short to ground
2.21	Open Lead	Check Terminal xx	<ul style="list-style-type: none"> • Check for an open lead
2.22 – 2.23	Input Fault	Check Terminal xx	<ul style="list-style-type: none"> • Check for an unstable signal on the input
2.24	Input Activated While Bypassed	Perform System Reset	A Two-Hand Control input was activated (turned On) while it was bypassed.
2.25	Input Fault	Monitoring Timer Expired Before AVM Closed	After the associated Safety Output turned Off, the AVM input did not close before its AVM monitoring time expired: <ul style="list-style-type: none"> • The AVM may be disconnected. Check the wiring to the AVM • Either the AVM is disconnected, or its response to the Safety Output turning Off is too slow • Check the wiring to the AVM • Check the timing setting; increase the setting if necessary • Contact Banner Engineering
2.26	Input Fault	AVM Not Closed When Output Turned On	The AVM input was open, but should have been closed, when the associated Safety Output was commanded On: <ul style="list-style-type: none"> • The AVM may be disconnected. Check the wiring to the AVM
3.1	EDMxx Fault	Check Terminal xx	EDM contact opened prior to turning On the Safety Outputs: <ul style="list-style-type: none"> • Check for a stuck On contactor or relay • Check for an open wire

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Fault Code	Displayed Message	Additional Message	Steps to resolve
3.2	EDMxx Fault	Check Terminal xx	EDM contact(s) failed to close within 250 ms after the Safety Outputs turned Off: <ul style="list-style-type: none"> Check for a slow or stuck On contactor or relay Check for an open wire
3.3	EDMxx Fault	Check Terminal xx	EDM contact(s) opened prior to turning On the Safety Outputs: <ul style="list-style-type: none"> Check for a stuck On contactor or relay Check for an open wire
3.4	EDMxx Fault	Check Terminal xx	EDM contact pair mismatched for longer than 250 ms: <ul style="list-style-type: none"> Check for a slow or stuck On contactor or relay Check for an open wire
3.5	EDMxx Fault	Check Terminal xx	<ul style="list-style-type: none"> Check for an unstable signal on the Input
3.6	EDMxx Fault	Check Terminal xx	<ul style="list-style-type: none"> Check for a short to ground
3.7	EDMxx Fault	Check Terminal xx	<ul style="list-style-type: none"> Check for a short between inputs
3.8	AVMxx Fault	Perform System Reset	After this Safety Output turned Off, an AVM Input associated with this output did not close before its AVM monitoring time expired: <ul style="list-style-type: none"> The AVM may be disconnected or its response to the Safety Output turning Off may be too slow Check the AVM Input and then perform a System Reset to clear the fault
3.9	Input Fault	AVM Not Closed When Output Turned On	The AVM input was open, but should have been closed, when the associated Safety Output was commanded On: <ul style="list-style-type: none"> The AVM may be disconnected. Check the wiring to the AVM
4.1	Supply Voltage Low	Check the power supply	The supply voltage dropped below the rated voltage for longer than 6 ms: <ul style="list-style-type: none"> Check the power supply voltage and current rating Check for an overload on the outputs that might cause the power supply to limit the current
4.2	Internal Fault		A configuration parameter has become corrupt. To fix the configuration: <ul style="list-style-type: none"> Replace the configuration by using a backup copy of the configuration Recreate the configuration using the PC Interface and write it to the Controller
4.3 – 4.11	Internal Fault	-	Internal failure—Contact Banner Engineering (see Repairs and Warranty Service on page 118).
4.12	Configuration Timeout	Check Configuration	The Safety Controller was left in Configuration mode for more than one hour without pressing any keys.
4.13	Configuration Timeout	Check Configuration	The Safety Controller was left in Configuration mode for more than one hour without receiving any commands from the PC Interface.
4.14	Configuration Unconfirmed	Confirm Configuration	The Configuration was not confirmed after being edited: <ul style="list-style-type: none"> Confirm configuration using the PC Interface
4.15 – 4.19	Internal Fault	-	Internal failure—Contact Banner Engineering (see Repairs and Warranty Service on page 118).
4.20	Unassigned Terminal in Use	Check Terminal xx	This terminal is not mapped to any device in the present configuration and should not be active: <ul style="list-style-type: none"> Check the wiring
4.21 – 4.34	Internal Fault	-	Internal failure—Contact Banner Engineering (see Repairs and Warranty Service on page 118).
4.35	Overtemperature	-	An internal overtemperature condition has occurred.
4.36 – 4.39	Internal Fault	-	Internal failure—Contact Banner Engineering (see Repairs and Warranty Service on page 118).
4.40-4.41	Module Communication Failure	Check module power	An output expansion module lost contact with the Base Controller.
4.42	Module Mismatch	-	The expansion module detected does not match the Controller configuration.
4.43	Module Communication Failure	Check module power	An expansion module lost contact with the Base Controller.
4.44-4.45	Internal Fault	-	Internal failure—Contact Banner Engineering (see Repairs and Warranty Service on page 118).
4.46-4.47	Internal Fault	-	Internal failure—Contact Banner Engineering (see Repairs and Warranty Service on page 118).
4.48	Unused output	Check output wiring	An output is detected but it is not part of the Controller Configuration.

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Fault Code	Displayed Message	Additional Message	Steps to resolve
4.49 – 4.55	Internal Fault	-	Internal failure—Contact Banner Engineering (see Repairs and Warranty Service on page 118).
4.56	Display Comm Failure	-	Display Communication Failure: <ul style="list-style-type: none">• Cycle power to the Controller. If fault code persists, contact Banner Engineering (see Repairs and Warranty Service on page 118)
4.57 – 4.59	Internal Fault	-	Internal failure—Contact Banner Engineering (see Repairs and Warranty Service on page 118).
4.60	Output Fault	Check for shorts	An output terminal detected a short. Check output fault for details.
5.1 – 5.3	Internal Fault	-	Internal failure—Contact Banner Engineering (see Repairs and Warranty Service on page 118)
6.xx	Internal Fault	-	Invalid configuration data. Possible internal failure: <ul style="list-style-type: none">• Try writing a new configuration to the Controller

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