Phoenix Contact

PLC, BK and I/O

Quick Reference Guide to

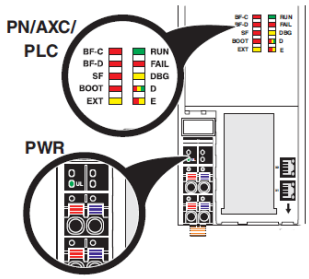
Diagnostic Lights and Meanings

Contents

1. PLCNext Diagnostics

Diagnostic and status indicators

The diagnostic and status indicators are used for quick local error diagnostics.

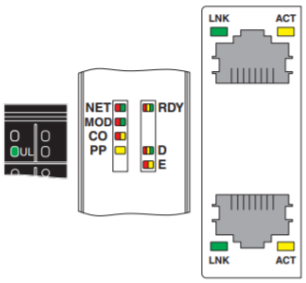


Diagnostic and status indicators

Desig-nation	Color	Meaning	State	Description
PN: PROFINET controller/device function				
BF-C	Red	Status of PROFINET communication/ communication error	**Controller as PROFINET controller**	
			Off	The controller has established an active communication connection to each configured PROFINET device.
			On	No link status on the Ethernet interfaces and/or no 100 Mbit transmission and/or no full duplex mode.
			Flashing (1 Hz)	– Link status present, at least one configured PROFINET device does not have a communication connection.
BF-D	Red	Status of PROFINET communication/ communication error	**Controller as PROFINET device**	
			Off	A PROFINET controller has established an active communication connection to the controller (PROFINET device).
			On	No PROFINET communication (no link status at the Ethernet interfaces).
			Flashing (1 Hz)	Link status present, no communication connection to the PROFINET controller. The SF LED is not flashing.
SF	Red	Group error (PROFINET)	Off	PROFINET diagnostics not present.
			On	PROFINET diagnostics present.
PLC: Controller diagnostics				
RUN	Green	Controller RUN status	Off	PLCnext runtime system is not ready for operation.
			Flashing (0.5 Hz)	PLCnext runtime system successfully initialized. The controller is in the READY/STOP state; application program is not being processed.
			Flashing (2 Hz)	Controller has been reset to the default status (see Section "Reset button (concealed)" on page 37).
			On	PLCnext runtime system successfully initialized and an application program is running. The controller is in the RUN state.
FAIL	Red	Failure	On	A runtime error has occurred in the application program of the PLCnext runtime system.
			Off	No runtime error has occurred in the application program of the PLCnext runtime system.
DBG	Yellow	Debug mode (troubleshooting)	On	The PLCnext runtime system/controller is in debug mode, i.e., debug mode has been activated in PLCnext Engineer (breakpoint(s) set). The status of the RUN LED is not affected.
BOOT	Red	Device firmware loading status	On	Device firmware is faulty.
			Flashing (2 Hz)	Device firmware is being loaded (boot process).
			Off	Device firmware running.

Desig-nation	Color	Meaning	State	Description
AXC: Axioline F diagnostics				
D	Red/yel-low/green	Axioline F: diagnostics for local bus communication	Green on	Run: The Axioline F station is ready for operation; communication within the Axioline F station is OK. All data is valid. No malfunction occurred.
			Flashing green	Active: The Axioline F station is ready for operation; communication within the Axioline F station is OK. The data is **not** valid. There is no valid data available from the controller. No malfunction occurred on the device.
			Yellow on	Ready: The Axioline F station is ready for operation; no data is being exchanged.
			Flashing yellow	Access from Startup+ in I/O check mode
			Flashing yellow/red	Local bus error during active I/O check
			Flashing red	Local bus error during startup Possible causes: – Configuration cannot be generated, information is missing from a device – Chip version of a device is <V 1.1 – Desired configuration and actual configuration differ – No local bus device connected – The maximum number of local bus devices has been exceeded.
			Red on	Bus error in RUN state The Axioline F station is ready for operation but has lost connection to at least one local bus device. Possible causes: – Communication error – Local bus device has been removed or configured local bus device is missing – Reset at a local bus device – Serious device error at a local bus device (local bus device can no longer be reached)
			Off	Power down: Local bus device is in (power) reset
E	Yel-low/red	Error/warning	Yellow on	I/O warning at a local bus device
			Red on	I/O error at a local bus device

2. Bus Coupler Diagnostics



Indicators D and E 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: – Configuration cannot be generated, information is missing from a device – Chip version of a device is <V1.1 – The desired and actual configuration are different – No local bus device connected – The maximum number of local bus devices is exceeded.
		Active	Flashing green	The station is ready for operation, communication within the station is OK. The data is **not** valid. Valid data from the controller/higher-level network is not available. 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: – Communication error – Local bus device has been removed or configured device is missing. – Reset at a local bus device – Serious device error at a local bus device (local bus device can no longer be 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.
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.

3. AXIOLine I/O Diagnostics

Indicators D and E on 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. All data is valid. There are no faults.
		Active	Flashing green	The device is ready for operation, communication within the station is OK. The data is **not** valid. Valid data from the controller/higher-level network is not available. 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. Output data **cannot** be output and/or input data **cannot** be read. 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.

For E1 / E2 Diagnostics, See the Following Pages.

3.1 AXL DI / DO Card

E1	Red	Peripheral fault	On	I/O error present.
			Off	No I/O error.
E2	Red	Channel error	On	Channel error present.
			Off	Channel error not present.
00 ... 03, 20 ... 23, 40 ... 43, 60 ... 63	Red/ yellow	Diagnostics / Status of the outputs	Red on	Short-circuit/overload of the output.
			Yellow on	Output is set.
			Off	No error, output is not set.

3.2 AXL AI / AO / UTH / RTD Card

E1	Red	Supply voltage error	On	Supply for analog modules (U_A) is faulty.
			Off	Supply for analog modules (U_A) is OK.
E2	Red	Error	On	I/O or channel error has occurred.
			Off	No error

Error	E1 LED	E2 LED
No error	off	off
Underrange	off	on
Overrange	off	on
Open circuit	off	on
Supply voltage faulty (supply for analog modules (U_A))	on	on
Parameter table invalid	off	on
Device error	off	on
Flash format error	off	on

3.3 AXL UTH / RTD Card

E1	Red	Supply voltage error	ON	Supply voltage is faulty.
			OFF	Supply voltage is present.
E2	Red	Error	ON	I/O or channel error has occurred.
			OFF	No error
10 ... 13	Red/Or-ange/ Green	Channel Scout/error message		
		Channel Scout	Orange flashing	Channel searched for
		Error message	Red ON	Open circuit, overrange or underrange
		OK	Green ON	Normal operation

Error	E1 LED	E2 LED
No error	off	off
Underrange	off	on
Overrange	off	on
Open circuit	off	on
Supply voltage faulty (supply for analog modules (U_A))	on	on
Parameter table invalid	off	on
Device error	off	on
Flash format error	off	on

3.4 AXL RS UNI Card

E1	Red	I/O error	On	I/O error present.
			Off	No I/O error.
E2	Red	Channel error	On	Channel error present.
			Off	Channel error not present.

Connector 2: RS-485/422				
Designation		**Color**	**State**	**Description**
00	TxD	Yellow	On	Module is transmitting data to the connected device
			Off	Module is not transmitting data
10	-	-	-	Not used
20	-	-	-	Not used
30	RS-485	Yellow	On	Module is parameterized for RS-485
			Off	Module is not parameterized for RS-485
01	RxD	Yellow	On	Module is receiving data from the connected device
			Off	Module is not receiving data
11	-	-	-	Not used
21	-	-	-	Not used
31	RS-422	Yellow	On	Module is parameterized for RS-422
			Off	Module is not parameterized for RS-422

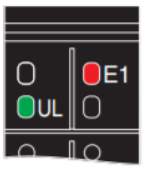
Connector 3: RS-232				
Designation		**Color**	**State**	**Description**
02	RxD	Yellow	On	Module is receiving data from the connected device
			Off	Module is not receiving data
12	RTS	Yellow		Request to send
			On	Handshake signal is set by the module
			Off	Handshake signal is not set
22	DTR	Yellow		Data terminal ready
			On	Handshake signal is set by the module
			Off	Handshake signal is not set
32	DCD	Yellow		Data carrier detect
			On	Handshake signal is set by partner
			Off	Handshake signal is not set
03	TxD	Yellow	On	Module is transmitting data to the connected device
			Off	Module is not transmitting data
13	CTS	Yellow		Clear to send
			On	Handshake signal is set by partner
			Off	Handshake signal is not set
23	DSR	Yellow	On	Data set ready
			On	Handshake signal is set by partner
			Off	Handshake signal is not set
33	RS-232	Yellow	On	Module is parameterized for RS-232
			Off	Module is not parameterized for RS-232

3.4 AXL CNT2 INC2 Card

E1	Red	Peripheral fault	ON	I/O error present.
			OFF	No I/O error.

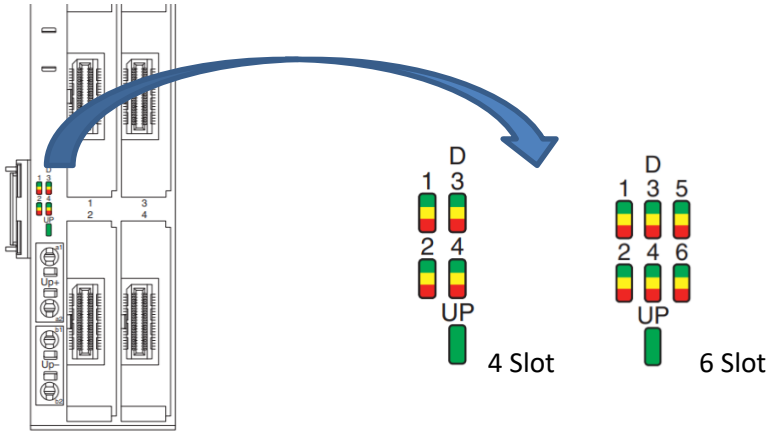
Designation	Color	Meaning	State	Description
Connector 2 (counter 1) / connector 4 (counter 2)				
00/04	Yellow	Status of counter input 1/2 (S1/S2, source 1/2)	ON	Input is set.
			OFF	Input is not set.
10/14	Yellow	Status of counter input 1/2 (G1/G2, gate 1/2)	ON	Input is set.
			OFF	Input is not set.
20/24	Yellow	Status of counting direction input 1/2 (Dir1/Dir2, direction 1/2)	ON	Input is set.
			OFF	Input is not set.
30/34	Red/ yellow	Status of output 1/2	Yellow ON	Output is set.
			Red ON	Short-circuit/overload of the output.
			OFF	Output is not set.
01/05	Yellow	Status of reference switch input 1/2 (Ref1/Ref2, reference 1/2)	ON	Input is set.
			OFF	Input is not set.
11/15	Yellow	Status of latch input 1/2 (L1/L2, latch 1/2)	ON	Input is set.
			OFF	Input is not set.
31/35	Red/ green	Status of sensor supply 1/2 (U_{S1}/U_{S2})	Green ON	Sensor supply is OK.
			Red ON	Short circuit/overload of the sensor supply.
			OFF	Sensor supply not present.
Connector 3 (incremental encoder 1) /connector 5 (incremental encoder 2)				
02/06	Yellow	Positive direction of rotation (UP)	ON	Module counting upwards.
			OFF and 12/16 OFF	Standstill or the corresponding INC channel is not parameterized.
12/16	Yellow	Negative direction of rotation (DN)	ON	Module counting downwards.
			OFF and 02/06 OFF	Standstill or the corresponding INC channel is not parameterized.
32/36	Red/ green	Status of the 5 V sensor supply (U_{E1}/U_{E2})	Green ON	Encoder supply is OK.
			Red ON	Short-circuit/overload of the encoder supply.
			OFF	Encoder supply not present.
03/07	Red	Encoder error	ON	An encoder error has occurred.
			OFF	No encoder error has occurred.

3.5 AXL PWR Card



Designation	Color	Meaning	State	Description
UL	Green/red	U_{Logic}	Green ON	Communications power U_{Bus} is present.
			Red ON	Communications power U_{Bus} is not present or overloaded.
				Communications power U_{Bus} downstream of the power module is not present.
			OFF	Communications power supply not present.
E1	Red	Error	Red ON	Module has been snapped on to the wrong bus base.
			OFF	Module has been snapped on to the right bus base.

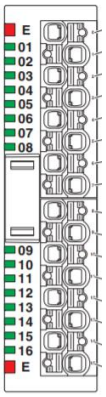
4. AXIOLine Smart Elements Diagnostics



Note: The SE backplane Boot up faster than the PLC or Bus Coupler on Power On. Please wait until the Head Station Boots before looking for the Below Diagnostics.

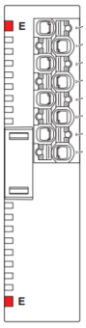
Designation	Color	Meaning	State	Description
D	Red/ yellow/ green	Diagnostics		Diagnostics for local bus communication for each Smart Element interface
		Run	Green on	The device is ready for operation, communication within the station is OK. All data is valid. An error has not occurred.
				The connection to the controller is present.
		Active	Green flashing	The device is ready to operate, communication within the station is OK. The data is **not** valid. The controller or superordinate network is not delivering valid data. There is no error on the module.
		Device application not active	Green/yellow flashing	The device is ready for operation, communication within the station is OK. Output data **cannot** be outputted and/or input data **cannot** be read. There is a fault on the periphery side of the module..
				The controller is providing valid process data.
				There is a malfunction on the I/O side of the Smart Element.
				The Smart Element cannot process the I/O data.
	Red/ yellow/ green	Ready	Yellow on	The device is ready for operation but did not detect a valid cycle after power-up.
				There has been no communication since the last power-up.
		Connected	Yellow flashing	The device is not (yet) part of the active configuration.
				There is an empty slot before the Smart Element.
		Reset	Red on	The device is ready for operation but has lost the connection to the bus head.
			Red on (one LED)	The local bus is interrupted. The LED blinking red shows the location of the error.
			Red on (all LEDs)	After power-up: there is a non-projecting Smart Element on the slot.
		Not connected	Red flashing	The device is ready for operation but there is no connection to the previously existing device.
		Power down	Off	Device is in (power) reset.
				The supply voltage not present.
				The Smart Element is not plugged in.
UP	Green	$U_{Peripherals}$		I/O supply voltage of the Smart Elements
			On	Supply voltage U_P is present.
			Off	Supply voltage U_P is not present.

4.1 SE DI / DO Modules



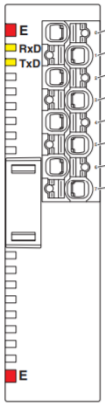
Designation	Color	Description	
E	Red	Error	
		Off	No error
		Flashing (0.5 Hz)	Error in Smart Element Replace the Smart Element.
		Flashing (4 Hz)	Communication errors Check whether the Smart Element has been plugged in correctly.
		On	I/O error Check the connected components and wiring. Remove the error.
01 ... 16	Yellow	Status of the input	
		On	Input is set.
		Off	Input is not set.

4.2 SE AI4 / AO4 / RTD PT100 Modules



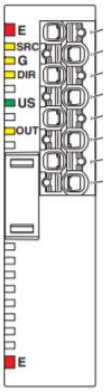
Designation	Color	Description	
E	Red	Error	
		Off	No error
		Flashing (0.5 Hz)	Error in Smart Element Replace the Smart Element.
		Flashing (4 Hz)	Communication errors Check whether the Smart Element has been plugged in correctly.
		On	I/O error Check the connected components and wiring. Remove the error.

4.3 SE RS485 Module



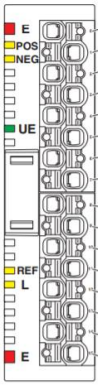
Designation	Color	Description	
E	Red	Error	
		Off	No error
		Flashing (0.5 Hz)	Error in Smart Element Replace the Smart Element.
		Flashing (4 Hz)	Communication errors Check whether the Smart Element has been plugged in correctly.
		On	I/O error Check the connected components and wiring. Remove the error.
RxD	Yellow	Receiving data	
		On	The Smart Element is receiving data from the connected device.
		Off	The Smart Element is not receiving any data.
TxD	Yellow	Transmit data	
		On	The Smart Element is transmitting data to the connected device.
		Off	The Smart Element is not transmitting any data.

4.4 SE CNT1 Module



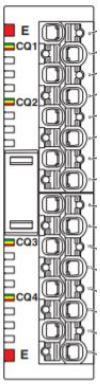
Designation	Color	Description	
E	Red	Error	
		Off	No error
		Flashing (0.5 Hz)	Error in Smart Element Replace the Smart Element.
		Flashing (4 Hz)	Communication errors Check whether the Smart Element has been plugged in correctly.
		On	I/O error Check the connected components and wiring. Remove the error.
SRC	Yellow	Status of the counter input (source)	
		On	Input is set. The brightness depends on the frequency.
		Off	Input is not set.
G	Yellow	Status of the control input (gate)	
		On	High level at the input
		Off	Low level at the input
DIR	Yellow	Status of hardware counting direction input (Dir, direction)	
		On	High level at the input
		Off	Low level at the input
US	Green	Status of the sensor supply	
		On	Sensor supply is present.
		Off	Sensor supply not present.
OUT	Yellow	Status of the digital output	
		On	High level at the output
		Off	Low level at the output

4.5 SE INC1 SYM Module



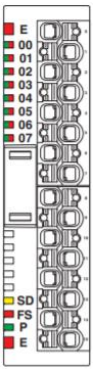
Designation	Color	Description	
E	Red	Error	
		Off	No error
		Flashing (0.5 Hz)	Error in Smart Element Replace the Smart Element.
		Flashing (4 Hz)	Communication errors Check whether the Smart Element has been plugged in correctly.
		On	I/O error Check the connected components and wiring. Remove the error.
POS	Yellow	Positive counting direction	
		On	Smart Element counts upwards.
		Off and NEG off	Standstill or signal frequency <2 Hz
NEG	Yellow	Negative counting direction	
		On	Smart Element counts downwards.
		Off and POS off	Standstill or signal frequency <2 Hz
UE	Green	Encoder supply	
		On	Encoder supply (5 V and 24 V) is present.
		Off	The encoder supply (5 V or 24 V) is not present.
REF	Yellow	Status of the reference input	
		On	Input is set.
		Off	Input is not set.
L	Yellow	Status of the latch input	
		On	Input is set.
		Off	Input is not set.

4.6 SE IOL4 Module



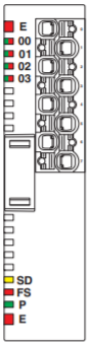
Designation	Color	Description	
E	Red	Error	
		Off	No error
		On	I/O error Check the connected components and wiring. Remove the error.
CQ1 ... CQ4	Red/yellow/green	Diagnostics/status of the IO-Link ports	
		Green on	In IO-Link operating mode: IO-Link communication present.
		Green flashing	In IO-Link operating mode: no IO-Link communication.
		Yellow on	In DI or DO operating mode: the digital input or output is set.
		Red on	In IO-Link mode: overload of the L+/L- cable
			In DI or DO mode: overload of the L+/L- cable
			Overload of the C/Q cable
		Off	In DI or DO mode: the digital input or output is not set.

4.7 SE PSDI8/3Module



Designation	Color	State	Description
00 ... 07	Green/red	**Status of each input and channel, IN0_CH1 to IN3_CH2**	
		Off	Input physically set to "0". No error present at the input.
		Green on	Input physically set to "1".
		Red on	Error present at the input.
SD	Yellow	**Acknowledgment request**	
		Off	No diagnostic message present that needs to be acknowledged.
		Yellow on	A diagnostic message is present that needs to be acknowledged for safe digital input errors, supply voltage errors or general errors.
FS	Red	**Diagnostics for failure state**	
		Red off	The Smart Element has a valid parameterization, and communications power is present. No error.
		Red on	Error that cannot be acknowledged. Communication to the higher-level controller is disabled. The Smart Element has entered the safe state (failure state).
		Flashing red 1 Hz	The Smart Element is not parameterized or parameterization was not accepted.
P	Green	**Diagnostics for safe communication protocol**	
		Green off	No safe communication.
		Green on	Safe communication is running without errors.
		Flashing green 1 Hz	Safe communication is running.The PROFIsafe system is requesting an acknowledgment.

4.8 SE PSDO4/2 Module



Designation	Color	State	Description
00 ... 03	Green/red	**Status of each output and channel, OUT0_CH1 to OUT1_CH2**	
		Off	The output is switched off. No error present at the output.
		Green on	Output enabled.
		Red on	Error present at the output.
SD	Yellow	**Acknowledgment request**	
		Off	No diagnostic message present that needs to be acknowledged.
		Yellow on	A diagnostic message is present that needs to be acknowledged for safe digital output errors, supply voltage errors or general errors.
FS	Red	**Diagnostics for failure state**	
		Red off	The Smart Element has a valid parameterization, and communications power is present. No error.
		Red on	Error that cannot be acknowledged. Communication to the higher-level controller is disabled. The Smart Element has entered the safe state (failure state).
		Flashing red 1 Hz	The Smart Element is not parameterized or parameterization was not accepted.
P	Green	**Diagnostics for safe communication protocol**	
		Green off	No safe communication.
		Green on	Safe communication is running without errors.
		Flashing green 1 Hz	Safe communication is running.The PROFIsafe system is requesting an acknowledgment.