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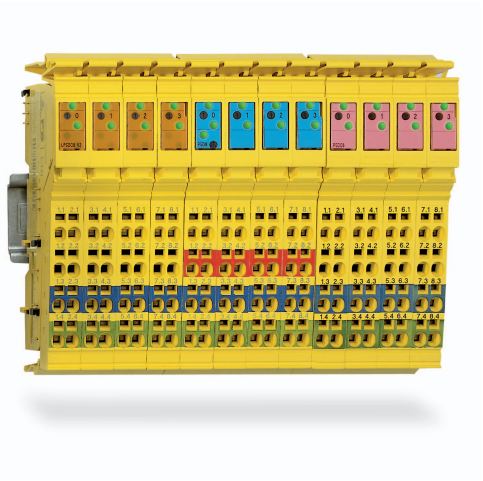
Altitude
Safe Inline I/O modules

Conditions for use at altitudes greater than 2000 m above sea level



Application note
107446_en_00

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1 Description

This application note describes the conditions for using safe Inline I/O modules at altitudes greater than 2000 m above sea level up to a maximum of 4500 m above sea level.

Observe the relevant data (technical data, derating, etc.) that is specific to the module being used. Refer to the data in the respective user documentation for the module.

2 Conditions

Use of the module at altitudes **greater than 2000 m above sea level up to a maximum of 4500 m above sea level** is possible under the following conditions:

1. Determine the maximum ambient temperature for operation with the corresponding factor in accordance with the table below.
2. If derating is specified, offset all the derating points by the corresponding factor in accordance with the table below.

Altitude above sea level	Temperature derating factor
2000 m	1
2500 m	0.953
3000 m	0.906
3500 m	0.859
4000 m	0.813
4500 m	0.766

For relay outputs:

3. Limit the maximum switching voltage for relay outputs in accordance with the table below. Observe the technical data for the module.

Max. switching voltage according to the technical data for the module	Max. switching voltage when used at altitudes greater than 2000 m above sea level
< 150 V AC/DC	Max. switching voltage according to the technical data for the module still valid
> 150 V AC/DC	Limited to max. 150 V AC/DC

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This document is valid for all products listed in “Ordering data” on page 2.

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3 Example calculation

The following calculation is an example for using a safe Inline I/O module at an altitude of 3000 m above sea level.
Perform the actual calculation for the module used according to the technical data from the user documentation for the module.

Data in the “Technical data and ordering data” section (example):

Derating	Up to 50°C, total current of all outputs 6 A, maximum Up to 55°C, total current of all outputs 4 A, maximum

Calculation:

50°C • 0.906 ≈ 45°C
55°C • 0.906 ≈ 50°C

Reduced derating:

Derating at 3000 m above sea level	Up to **45°C**, total current of all outputs 6 A, maximum Up to **50°C**, total current of all outputs 4 A, maximum

4 Ordering data

Description	Type	Order No.
Inline module with integrated safety logic and safe digital outputs, SafetyBridge technology V1	IB IL 24 LPSDO 8-PAC	2916024
Inline module with integrated safety logic and safe digital outputs, SafetyBridge technology V2	IB IL 24 LPSDO 8 V2-PAC	2700606
Inline module with integrated safety logic and safe digital outputs, SafetyBridge technology V3	IB IL 24 LPSDO 8 V3-PAC	2701625
Inline module with safe digital inputs	IB IL 24 PSDI 8-PAC	2985688
Inline module with safe digital inputs	IB IL 24 PSDI 16-PAC	2700994
Inline module with safe digital outputs	IB IL 24 PSDO 4/4-PAC	2916493
Inline module with safe digital outputs	IB IL 24 PSDO 8-PAC	2985631
Inline module with safe relay outputs	IB IL 24 PSDOR 4-PAC	2985864

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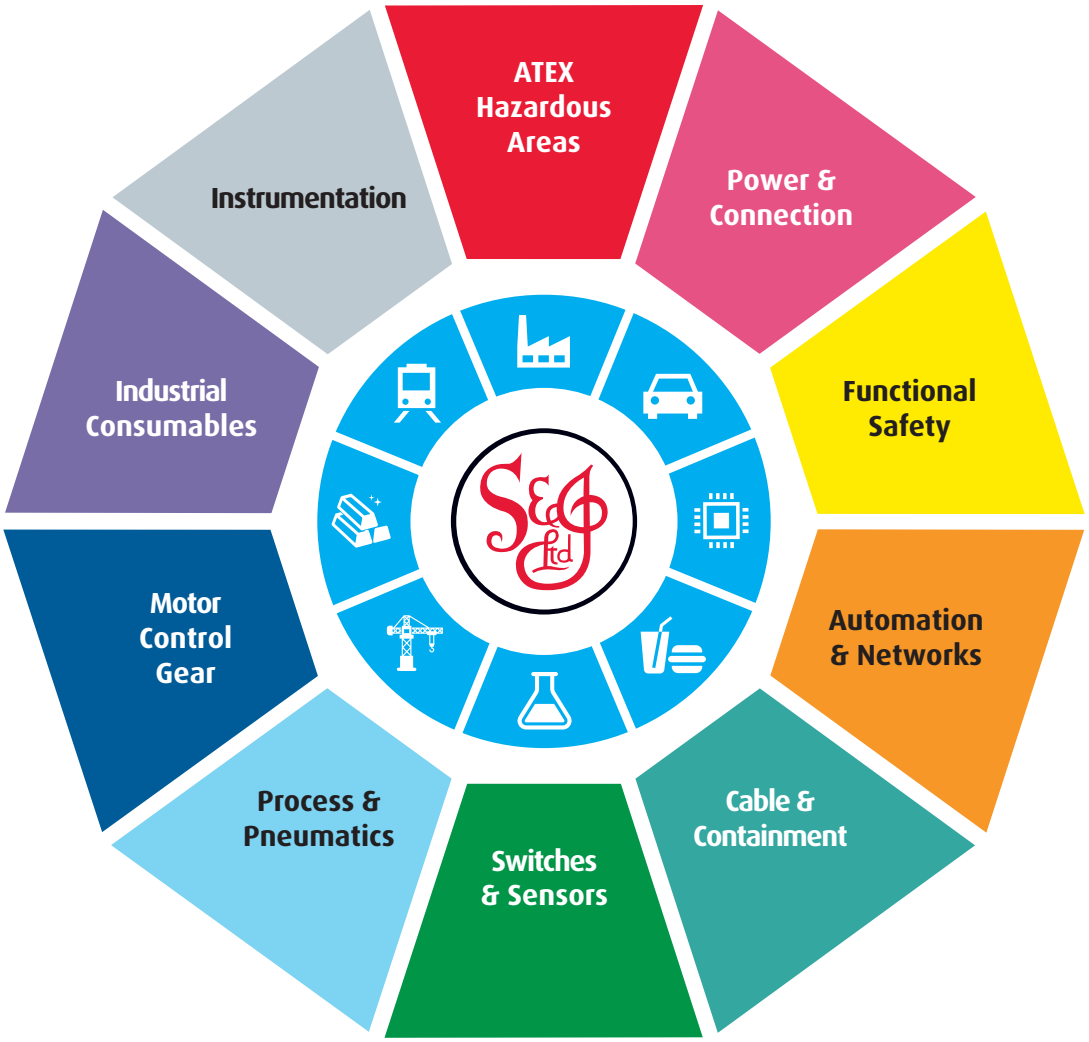

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