

1. GENERAL

The marking of the I/O Terminal shall include the following:

Ex ec IIC T4 Gc for power supply terminals type ELX9560-****-**** and type ELX9410-****-****

Ex ec [ia Ga] IIC T4 Gc for all other terminals

[Ex ia Da] IIIC

[Ex ia Ma] I

Description

The I/O system terminals type ELX****-****-**** is a modular I/O system with contacts rated in the type of protection "ec" (supply contact / E-bus connector / spring-blade contact). It consists of at least a power supply unit ELX9560, one of the signal terminals and a bus end cover ELX9012 to cover the power and E-bus contacts.

An integrated E-bus interface connects to ELX signal terminals right of the ELX9560 power supply unit. These signal terminals can be combined in any way. Their intrinsically safe output circuits, type of protection Ex ia, can be led into areas which require EPL Ga, EPL Da or EPL Ma equipment. The ELX9410 power supply terminal for E-bus is used to refresh the non-intrinsically safe E bus signal.

A fin at the front of the ELX9410 ensures the separation between the connection facilities of the signal terminal (intrinsically safe circuits) and the ELX9410 (non-intrinsically safe circuits). There are 2 possible constellations to use the ELX9410:

- An additional ELX9560 power supply terminal followed by further ELX signal terminals can be connected to the right side of the ELX9410.
- Two ELX9410 terminals can be installed in direct succession for continuing the same terminal strand with standard Beckhoff EtherCAT Terminals.

Subject and Type

I/O Terminal Series type ELX****-****-****

Instead of the *** in the complete denomination letters and numerals will be inserted which characterize the different modifications:

Type ELX **** - **** - ****

- 9560 Power supply terminal
- 9410 Power supply terminal for E-bus
- 1052 2-channel digital input terminal NAMUR
- 1054 4-channel digital input terminal NAMUR
- 2002 2-channel digital output terminal
- 3152 2-channel analog input terminal
- 0/4...20 mA
- 3181 1-channel analog input terminal
- 4...20 mA, HART
- 3202 2-channel analog input terminal RTD
- 3204 4-channel analog input terminal RTD
- 3312 2-channel analog input terminal thermocouple
- 3314 4-channel analog input terminal thermocouple
- 3351 1-channel analog input terminal strain gauge
- 4181 1-channel analog output terminal 0/4...20 mA, HART
- 5151 1-channel incremental encoder interface NAMUR
- Software variant
(Not Ex-relevant, for information purposes only)
- EtherCAT revision
(Not Ex-relevant, for information purposes only)

Parameters

Non-intrinsically safe circuits in level of protection ec
 Power supply terminal type ELX9560-****-****

Power supply circuit

Clamp connectors

red (24V), blue (0V)

Rated nominal input voltage (-15 %, +20 %)

Maximum voltage Um DC 24 V

AC 253 V

E-bus circuit

E-bus connector

Rated nominal voltage

Rated current

Maximum voltage Um DC 5 V

AC 40 mA

Power supply terminal for E-bus type ELX9410-****-****

Supply circuit

Clamp contacts 5 (Input 24V), 6 (Input 0V)

Rated nominal input voltage (-15 %, +20 %)

Maximum voltage Um DC 24 V

AC 253 V

E-bus circuit

E-bus connector

Rated nominal voltage

Rated current

Maximum voltage Um DC 5 V

AC 40 mA

Intrinsically safe output circuits in level of protection ia
 for connection of intrinsically safe sensors or actuators

Signal terminal type ELX1052-****-****

Channel 1: Clamp contacts 4 (Uv1), 1 (Input 1, I1)

Channel 2: Clamp contacts 8 (Uv2), 5 (Input 2, I2)

Each channel

Maximum output voltage Uo 10.75 V

Maximum output current Io 12 mA

Linear output characteristics

Maximum output power Po 33 mW

Maximum external capacitance Co or maximum external inductance Lo:

	I	IIA	IIB / IIIC	IIC
Co [μ F]	58	66	15	2.14
Lo [mH]	100	100	100	100

Signal terminal type ELX2002-****-****

Channel 1: Clamp contacts 1 (+Output1, +O1), 3 (-Output1, -O1)

Channel 2: Clamp contacts 5 (+Output2, +O2), 7(-Output2, -O2)

Each channel

Maximum output voltage Uo 27.7 V

Maximum output current Io 111 mA

Linear output characteristics

Maximum output power Po 768 mW

Maximum external capacitance Co or maximum external inductance Lo:

	I	IIA	IIB / IIIC	IIC
Co [μ F]	3.45	2.2	0.663	0.085
Lo [mH]	24	16	9.2	0.094

Signal terminal type ELX3152-****_****

Channel 1: Clamp contacts 1 (Uv1), 2 (GND, -I1), 3 (Input1, +I1)

Channel 2: Clamp contacts 5 (Uv2), 6 (GND, -I2), 7 (Input2, +I2)

Each channel Maximum output voltage	Uo	27.7 V
Maximum output current	Io	85 mA
Linear output characteristics		
Maximum output power	Po	565 mW

Maximum external capacitance Co or maximum external inductance Lo:

	I	IIA	IIB / IIIC	IIC
Co [μ F]	3.45	2.2	0.663	0.085
Lo [mH]	43	30	18	2

Signal terminal type ELX3181-****_****

Channel 1: Clamp contacts 8 (Uv1), 7(Input1, I1)

Maximum output voltage	Uo	27.7 V
Maximum output current	Io	85 mA
Linear output characteristics		
Maximum output power	Po	565 mW

Maximum external capacitance Co or maximum external inductance Lo:

	I	IIA	IIB / IIIC	IIC
Co [μ F]	3.45	2.2	0.663	0.085
Lo [mH]	43	30	18	2

Signal terminal type ELX3202-****_****

Channel 1: Clamp contacts 1 (+RL1), 2 (+R1), 5 (-RL1), 6 (-R1)

Channel 2: Clamp contacts 3 (+RL2), 4 (+R2), 7 (-RL2), 8 (-R2)

Each channel		
Maximum output voltage	Uo	4.94 V
Maximum output current	Io	12 mA
Linear output characteristics		
Maximum output power	Po	15 mW

Maximum external capacitance Co or maximum external inductance Lo:

	I, IIA, IIB, IIIC	IIC
Co [μ F]	1000	100
Lo [mH]	100	100

Signal terminal type ELX3204-****_****

Channel 1: Clamp contacts 1 (+R1), 5 (-R1)

Channel 2: Clamp contacts 2 (+R2), 6 (-R2)

Channel 3: Clamp contacts 3 (+R3), 7 (-R3)

Channel 4: Clamp contacts 4 (+R4), 8 (-R4)

Each channel		
Maximum output voltage	Uo	4.94 V
Maximum output current	Io	12 mA
Linear output characteristics		
Maximum output power	Po	15 mW

Maximum external capacitance Co or maximum external inductance Lo:

	I, IIA, IIB, IIIC	IIC
Co [μ F]	1000	100
Lo [mH]	100	100

Signal terminal type ELX3312-****-****

Channel 1: Clamp contacts 1 (+TC1), 5 (-TC1)

Channel 2: Clamp contacts 2 (+TC2), 6 (-TC2)

Each channel

Maximum output voltage	Uo	4.94 V
Maximum output current	Io	0.5 mA
Linear output characteristics		
Maximum output power	Po	0.5 mW

Maximum external capacitance Co or maximum external inductance Lo:

	I, IIA, IIB, IIIC	IIC
Co [μ F]	1000	100
Lo [mH]	100	100

Signal terminal type ELX3314-****-****

Channel 1: Clamp contacts 1 (+TC1), 5 (-TC1)

Channel 2: Clamp contacts 2 (+TC2), 6 (-TC2)

Channel 3: Clamp contacts 3 (+TC3), 7 (-TC3)

Channel 4: Clamp contacts 4 (+TC4), 8 (-TC4)

Each channel Maximum output voltage	Uo	4.94 V
Maximum output current	Io	0.5 mA
Linear output characteristics		
Maximum output power	Po	0.5 mW

Maximum external capacitance Co or maximum external inductance Lo:

	I, IIA, IIB, IIIC	IIC
Co [μ F]	1000	100
Lo [mH]	100	100

Signal terminal type ELX3351-****-****

Channel 1: Clamp contacts 2 (+UD), 6 (-UD), 3 (+UR), 7 (-UR), 4 (+UV), 8 (-UV)

Maximum output voltage	Uo	
voltage difference between 2 clamps		11.76 V
Maximum output current	Io	146 mA
Maximum output power	Po	214 mW

Maximum external capacitance Co or maximum external inductance Lo:

	I	IIA	IIB / IIIC	IIC
Co [μ F]	40	39	9.9	1.5
Lo [mH]	20	13.3	6.6	1.7

Signal terminal type ELX4181-****-****

Channel 1: Clamp contacts 8 (Output 1, O1), 6 (GND)

Maximum output voltage	Uo	27.7 V
Maximum output current	Io	85 mA
Linear output characteristics		
Maximum output power	Po	565 mW

Maximum external capacitance Co or maximum external inductance Lo:

	I	IIA	IIB / IIIC	IIC
Co [μ F]	3.45	2.2	0.663	0.085
Lo [mH]	43	30	18	2

Signal terminal type ELX5151-****-****

Channel 1: Clamp contacts 4 (Uv1), 1 (A)

Channel 2: Clamp contacts 8 (Uv2), 5 (B)

Each channel

Maximum output voltage	Uo	10.72 V
Maximum output current	Io	12.4 mA
Linear output characteristics		
Maximum output power	Po	33 mW

Maximum external capacitance Co or maximum external inductance Lo:

	I	IIA	IIB / IIIC	IIC
Co [μ F]	58	66	15	2.14
Lo [mH]	100	100	100	100

Signal terminal type ELX1054-****-****

Channel 1: Clamp contacts 2 (Uv1), 1 (I1)

Channel 2: Clamp contacts 6 (Uv2), 5 (I2)

Channel 3: Clamp contacts 3 (Uv3), 4 (I3)

Channel 4: Clamp contacts 7 (Uv4), 8 (I4)

Each channel Maximum output voltage	Uo	10.72 V
Maximum output current	Io	10.4 mA
Linear output characteristics		
Maximum output power	Po	28 mW

Maximum external capacitance Co or maximum external inductance Lo:

	I	IIA	IIB / IIIC	IIC
Co [μ F]	58	66	15	2.14
Lo [mH]	100	100	100	100

Ambient temperature range Ta -25 °C ... 60 °C

Listing of all components used referring to older standards

None

Based on the following documentation: IECEx BVS 18.0005X Issue No.: 3

2. INSTALLATION INSTRUCTIONS

It is the manufacturer's responsibility to supply installation instructions with each unit offered for sale as required by IEC/SANS 60079-0 Clause 30.

3. SPECIAL CONDITIONS FOR SAFE USE (denoted by "X" after certificate number)

- i. The equipment shall only be used in an area of at least pollution degree 2, as defined in IEC 60664-1.
- ii. The equipment shall be installed in an enclosure that provides a minimum ingress protection of IP54 in accordance with IEC 60079-0.
- iii. Transient protection shall be provided that is set at a level not exceeding 140 % of the peak rated voltage value at the supply terminals to the equipment.
- iv. The circuits shall be limited to overvoltage Category II as defined in IEC 60664-1.
- v. The Terminal system is suitable for use in a temperature range of -25 °C to +60 °C.
- vi. Do not disconnect energized terminals.
- vii. The last terminal of each segment is to be covered by a bus end cover ELX9012, unless two ELX9410 terminals are installed in direct succession for continuing the same terminal segment with standard Beckhoff EtherCAT terminals (e.g. EL/ES/EK).
- viii. An additional ELX9560 power supply terminal, followed by further ELX signal terminals can be connected to the right side of the ELX9410.

4. SCHEDULE OF LIMITATIONS (denoted by "U" after certificate number)

None.

