



Italia

CERTIFICATO

CERTIFICATE

Sicurezza Funzionale
Functional Safety

Certificato No.:

Certificate No.:

TUV IT 25 SIL 0664 A

Nome ed indirizzo del fabbricante:

Name and address of manufacturer:

G.M. International S.p.A.

Via G. Mameli, 53-55

20852 Villasanta (MB)

Italy

Sede/i di produzione:

Address of production site:

Via G. Mameli, 53-55

20852 Villasanta (MB)

Italy

Prodotto:

Product:

SIL 3 16-pos X1-Series Termination Boards
for Termination Board for CX UIO 3903X and
AO 3810X Cards

Modello/tipo:

Model/type:

X1-TB-16-TRI-06

Rapporto Tecnico:

Technical report:

TUV SIL 722397990 A M009

**Si certifica che il componente E/EE/EP / SIS soddisfa, per la(le) Funzione(i) di
Sicurezza riportata(e) nell'allegato al presente certificato, i requisiti della(e)
norma(e):**

*We herewith certify that the E/EE/PE component / SIS meets the requirements of the following standard(s) for the
Safety Function(s) reported in the annex to this certificate:*

IEC 61508-2:2010

Data 1 emissione: 14-11-2025

First Issue date:

Data emissione: 14-11-2025

Issue date:

Data di scadenza: 13-11-2028

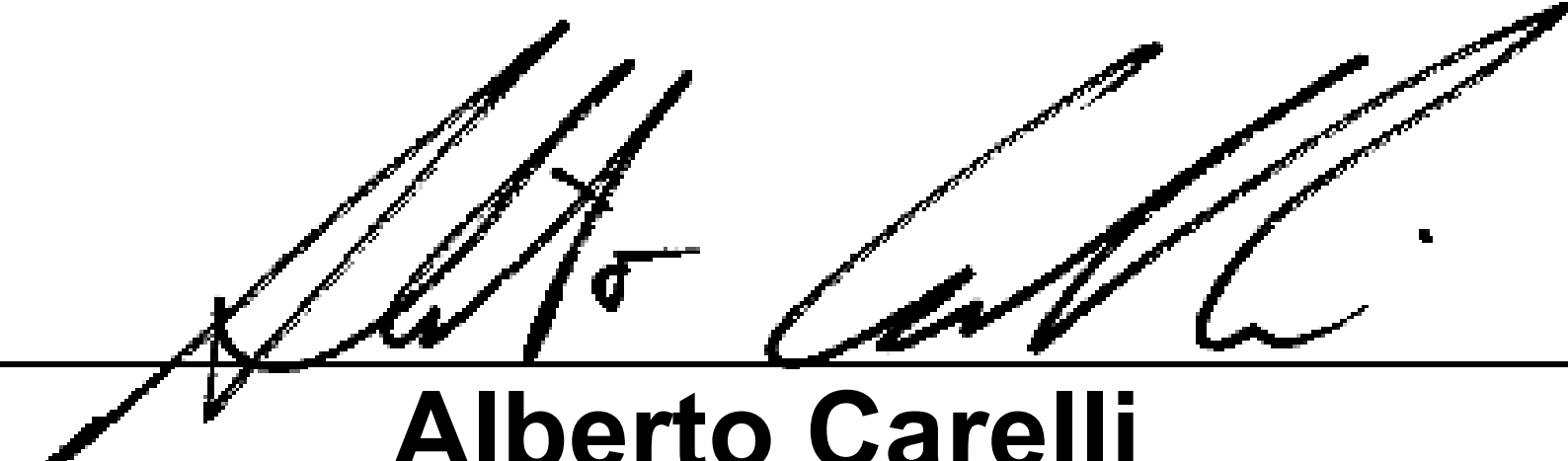
Expiry date:



00077



TÜV Italia S.r.l.


Alberto Carelli
Industry Service – Real Estate &
Infrastructure
Managing Director



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1. Safety Function(s):

The Tricon CX Universal card 3903X has got internal diagnostics to monitor both supply source voltages V1 and V2 and also 24 Vdc redundant power supply voltage after OR-ing diode mixing of PWR1 and PWR2, detecting and notifying possible failure of these power supply lines.

1st Safety Function: it is valid when X1-TB-16-TRI-06 is connected to Universal IO card 3903X or Analog Output card 3810X. The failure behavior of a TB channel, considering AI, TMP, AO, UNI, DI, RLI, DO, RLO or PAS module-system loop with DTT de-energized to trip or DTS de-energized to safe condition, is described by the following definitions:

- Fail-Safe State: it is defined as the redundant power supply of TB going to 0 Vdc, with de-energizing condition (DTT) of the system loop connected to AI, TMP, AO, UNI, DI, RLI, DO, RLO or PAS module. Tricon CX 3903X card internal diagnostics can be used to detect and notify this failure so that it can be considered safe detected (SD).
- Fail Safe: failure mode that causes the (sub)system to go to the defined Fail-Safe state without a demand from the process.
- Fail Dangerous: failure mode that implies the redundant power supply voltage of TB is blocked or oscillating in the range above 0 Vdc and below 20 Vdc or above 28.8 Vdc.
- Fail "No effect": failure mode of a component that is part of the safety function but is neither a safe failure nor a dangerous failure, so that the redundant power supply voltage of TB is in the range 20 to 28.8 Vdc. When calculating the SFF, this failure mode is not taken into account.
- Fail "Not part": failure mode of a component that is not part of the safety function but part of the circuit diagram and is listed for completeness. When calculating the SFF, this failure mode is not taken into account.



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2nd Safety Function: it is valid when X1-TB-16-TRI-06 is only connected to Universal IO card 3903X, which must be enabled to detect and notify possible failure of TB power supply lines and it must be configured to detect very high or low impedance condition of open or short circuited module-system input loop. These failure detections must be enabled because they are important to detect dangerous failures. The failure behavior of a TB channel, considering X1-NIS-RLO/SS-(03 or 05)-S or X1-NIS-RLO/EM-(03 or 05)-S module-system loop with ETT energized to trip or ETS energized to safe condition, is described by the following definitions:

- Fail-Safe State: it is defined as the redundant power supply voltage of TB in the range 20 to 28.8 Vdc, with energizing condition (ETT) of the RLO/(EM or SS)-(03 or 05) input loop connected to the system card.
- Fail Safe: failure mode that causes the (sub)system to go to the defined Fail-Safe state without a demand from the process.
- Fail Dangerous is a failure mode that does not respond to a demand from the process because:
 - a) X1-NIS-RLO/SS-(03 or 05)-S module cannot: receive redundant power supply of TB or be connected to field load and load supply.
 - b) X1-NIS-RLO/EM-(03 or 05)-S module cannot be connected to field load and load supply.
- Fail Dangerous Detected: failure mode that causes:
 - 1) redundant power supply voltage of TB blocked or oscillating below 20 Vdc or above 28.8 Vdc. Tricon CX 3903X card internal diagnostics must be used to detect and notify this failure so that it is considered dangerous detected (DD).
 - 2) TB channel de-energization because RLO/(EM or SS)-(03 or 05) input loop (connected to the system card) is open or short circuited. With Tricon CX 3903X card configured to detect very high or low impedance condition of open or short circuited module-system input loop, this failure is dangerous detected (DD).
- Fail "Not part": failure mode of a component that is not part of the safety function but part of the circuit diagram and is listed for completeness. When calculating the SFF, this failure mode is not taken into account.



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2. Main Technical Features

Item name	Proof test time (T _{Proof})	Configuration	Allowed SIL	Allowed Systematic SIL	Notes
X1-TB-16-TRI-06	20 years	channel in DTT - DTS module-system loop	SIL3*	SIL3	none

(*Considering the products do not contribute more than 10% of total SIF dangerous failure

Item name	Proof test time (T _{Proof})	Configuration	Allowed SIL	Allowed Systematic SIL	Notes
X1-TB-16-TRI-06	20 years	ETT - ETS module-system loop with X1-NIS-RLO/SS-(03 or 05)-S	SIL3*	SIL3	none

(*Considering the products do not contribute more than 10% of total SIF dangerous failure

Item name	Proof test time (T _{Proof})	Configuration	Allowed SIL	Allowed Systematic SIL	Notes
X1-TB-16-TRI-06	20 years	ETT - ETS module-system loop with X1-NIS-RLO/EM-(03 or 05)-S	SIL3*	SIL3	none

(*Considering the products do not contribute more than 10% of total SIF dangerous failure

3. Notes

The applicant shall inform TÜV Italia of all modifications that have been made or are intended to be made.

A copy of technical report n.: TUV SIL 722397990 A M009 is given to the manufacturer.

This annex is an integral part of the certificate TUV IT 25 SIL 0664 A

Milan, 14-11-2025