

Communications

proNet - PROFINET / PROFIsafe communication module



The **proNet** module allows the features of amGardpro to become distributed IO (input output) on a PROFINET network; safety information is exchanged using the PROFIsafe extensions. The unit can connect the following modules to a PROFIsafe network; see individual datasheets for further details of the modules:

- A proLok safety switch with a vast array of options using modular adaptors, heads and actuators in the amGardpro range. The safety switches are communicated safely, with standard PNIO (PROFINET input output) for solenoid drive, monitor and head monitor.
- An e-stop and safety switch communicated safely across PROFIsafe.
- Up to eight lamps and pushbuttons from the proOption Pod range.

An integrated network switch facilitates 'daisy-chain' bus topologies with no additional hardware.

F-address set via web interface or DIP switches.

The following PROFINET features are supported:

- Complies with PROFINET IO Conformance class B
- SNMP with support for the following mibs: LLDP and MIB-II
- LLDP is supported (Topologi scan)

Variety of connection options including AIDA specification.

Diagnostic functions available via web interface:

- Supply voltage.
- Current PROFINET IO.
- Current F-address.
- Ethernet connection statistics.

IMPORTANT

This product is designed for use according to the installation and operating instructions enclosed. It must be installed by competent and qualified personnel who have read and understood the whole of this document prior to commencing installation. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired. Any modification to or deviation from these instructions invalidates all warranties. Fortress Interlocks Ltd accepts no liability whatsoever for any situation arising from misuse or misapplication of this product. The unit is a component to be added to a permanent electrical installation meeting the requirements of the applicable IEC/EN standards.

The voltages used within the proNet Interface and connected equipment must all be PELV or SELV circuits.

BEWARE OF INTENTIONAL MISUSE CAUSED BY OPERATORS WANTING TO BYPASS SAFETY SYSTEMS. THE INSTALLER SHOULD ASSESS THE RISKS AND MITIGATE AGAINST THEM.

IF YOU HAVE ANY QUESTIONS OR QUERIES OF ANY NATURE WHATSOEVER PLEASE CONTACT THE SUPPLIER WHO WILL BE PLEASED TO ADVISE AND ASSIST.

Function

This unit allows the amGard^{pro} range to connect with PROFINET and PROFIsafe networks.

The Safe address for the unit is set with the DIP switches under the lid of the *pro*Net interface; enter the binary representation of the required address.

Refer to the relevant operating instructions for details of connected components.

The following table defines the network data interface.

I0.0_Safe i/p Head/Sol 1	I	0.0	BOOL	Safety data - Indicates when the tongue is unlocked or out of the head
I0.1_Safe i/p Head/Sol 2	I	0.1	BOOL	Safety data - Indicates when the tongue is unlocked or out of the head
I0.2_Safe i/p Non-con 1	I	0.2	BOOL	Safety data - Indicates when the non-contact switch is made
I0.3_Safe i/p Non-con 2	I	0.3	BOOL	Safety data - Indicates when the non-contact switch is made
I0.4_Safe i/p e-stop 1	I	0.4	BOOL	Safety data - Indicates when the e-stop is pressed
I0.5_Safe i/p e-stop 2	I	0.5	BOOL	Safety data - Indicates when the e-stop is pressed
I1.0_Qual for Head/Sol 1	I	1.0	BOOL	Safety data - Indicates whether the signal from the LOK unit has been in an invalid state (latching)
I1.1_Qual for Head/Sol 2	I	1.1	BOOL	Safety data - Indicates whether the signal from the LOK unit has been in an invalid state (latching)
I1.2_Qual for Non-con 1	I	1.2	BOOL	Safety data - Indicates whether the signal from the non-contact unit has been in an invalid state (latching)
I1.3_Qual for Non-con 2	I	1.3	BOOL	Safety data - Indicates whether the signal from the non-contact unit has been in an invalid state (latching)
I1.4_Qual for e-stop 1	I	1.4	BOOL	Safety data - Indicates whether the signal from the e-stop unit has been in an invalid state (latching)
I1.5_Qual for e-stop 2	I	1.5	BOOL	Safety data - Indicates whether the signal from the e-stop unit has been in an invalid state (latching)
I2.0_Q safe output Ch0	I	2.0	BOOL	Not used
I2.1_Q safe output Ch1	I	2.1	BOOL	Not used
Q0.0_Safe output Ch0	Q	0.0	BOOL	Not used
Q0.1_Safe output Ch1	Q	0.1	BOOL	Not used
Q1.0_Reset safe i/p Head	Q	1.0	BOOL	Safety data - Set this bit to reset the qualifier bits if an invalid state has been experienced
Q1.1_Reset safe i/p Head	Q	1.1	BOOL	Safety data - Set this bit to reset the qualifier bits if an invalid state has been experienced
Q1.2_Reset safe i/p Non-	Q	1.2	BOOL	Safety data - Set this bit to reset the qualifier bits if an invalid state has been experienced
Q1.3_Reset safe i/p Non-	Q	1.3	BOOL	Safety data - Set this bit to reset the qualifier bits if an invalid state has been experienced
Q1.4_Reset safe i/p e-st	Q	1.4	BOOL	Safety data - Set this bit to reset the qualifier bits if an invalid state has been experienced
Q1.5_Reset safe i/p e-st	Q	1.5	BOOL	Safety data - Set this bit to reset the qualifier bits if an invalid state has been experienced
Q2.0_Reset safe output C	Q	2.0	BOOL	Not used
Q2.1_Reset safe output C	Q	2.1	BOOL	Not used
Switch 1	I	7.0	BOOL	Set when the switch is depressed
Switch 2	I	7.1	BOOL	Set when the switch is depressed
Switch 3	I	7.2	BOOL	Set when the switch is depressed
Switch 4	I	7.3	BOOL	Set when the switch is depressed
Switch 5	I	7.4	BOOL	Set when the switch is depressed
Switch 6	I	7.4	BOOL	Set when the switch is depressed
Switch 7	I	7.4	BOOL	Set when the switch is depressed
Switch 8	I	7.7	BOOL	Set when the switch is depressed
Lamp 1	Q	7.0	BOOL	Set to illuminate the lamp
Lamp 2	Q	7.1	BOOL	Set to illuminate the lamp
Lamp 3	Q	7.2	BOOL	Set to illuminate the lamp
Lamp 4	Q	7.3	BOOL	Set to illuminate the lamp
Lamp 5	Q	7.4	BOOL	Set to illuminate the lamp
Lamp 6	Q	7.4	BOOL	Set to illuminate the lamp
Lamp 7	Q	7.4	BOOL	Set to illuminate the lamp
Lamp 8	Q	7.7	BOOL	Set to illuminate the lamp
Gate monitor	I	8.0	BOOL	This bit will be set when the tongue is out of the head
Solenoid monitor	I	9.0	BOOL	This bit will be set when the gate is not locked
Solenoid drive	Q	8.0	BOOL	Setting this bit energises the solenoid (and attempts lock the tongue into the unit)

ATTENTION: Unconnected digital inputs in dual channel mode will cause the T100 to signal the inactive safe state for the input pair.

WARNING: The minimum time between the change of a single safe digital input and the transmission to the safety fieldbus is 6 ms. In case

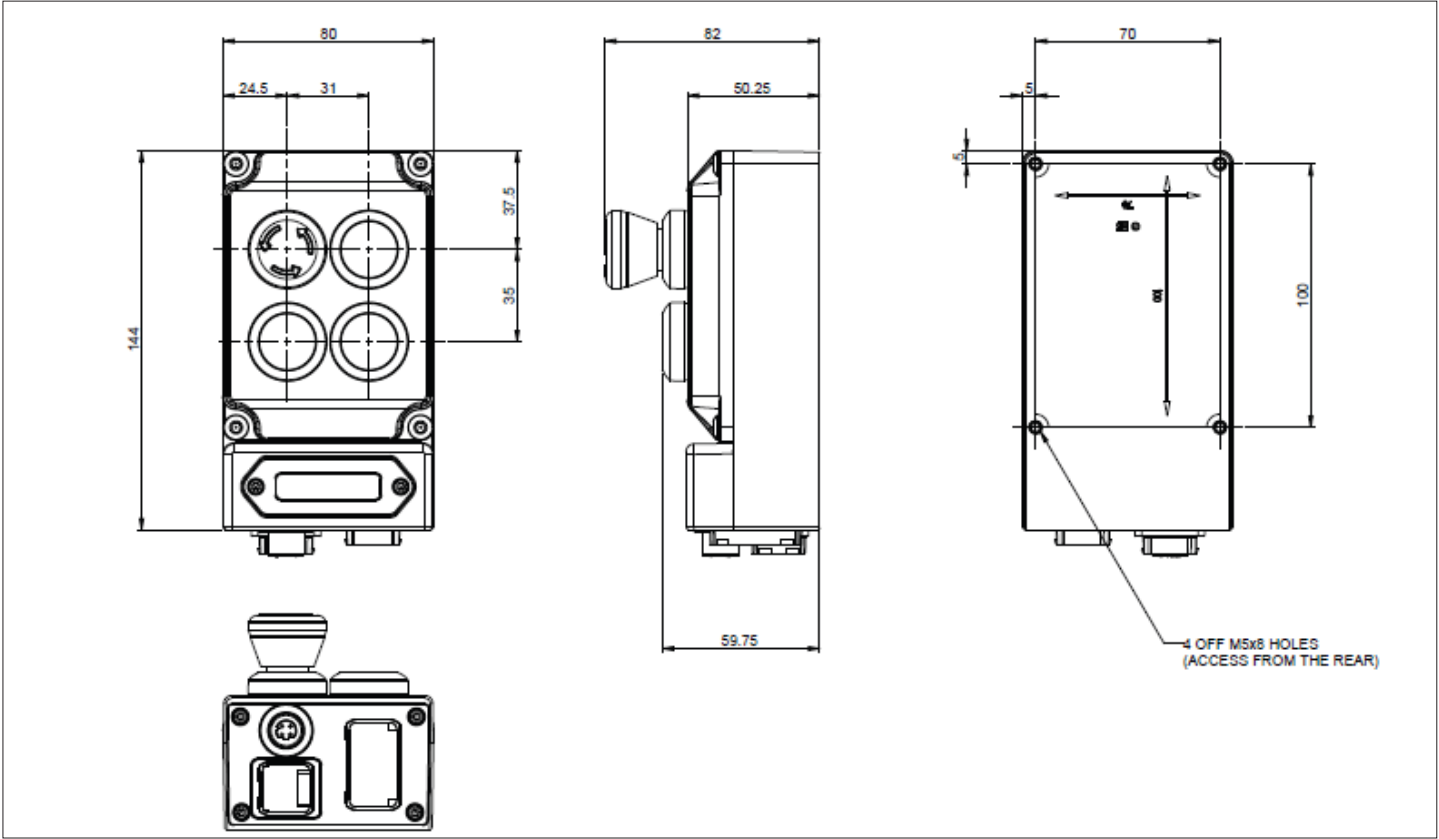
of an input level change at all 6 safe digital inputs at the same time, the maximum safe application reaction time is 16 ms (approx. 2ms [processing time per changed input]).

DANGER: Only use a safe configuration provide by Fortress Interlocks.

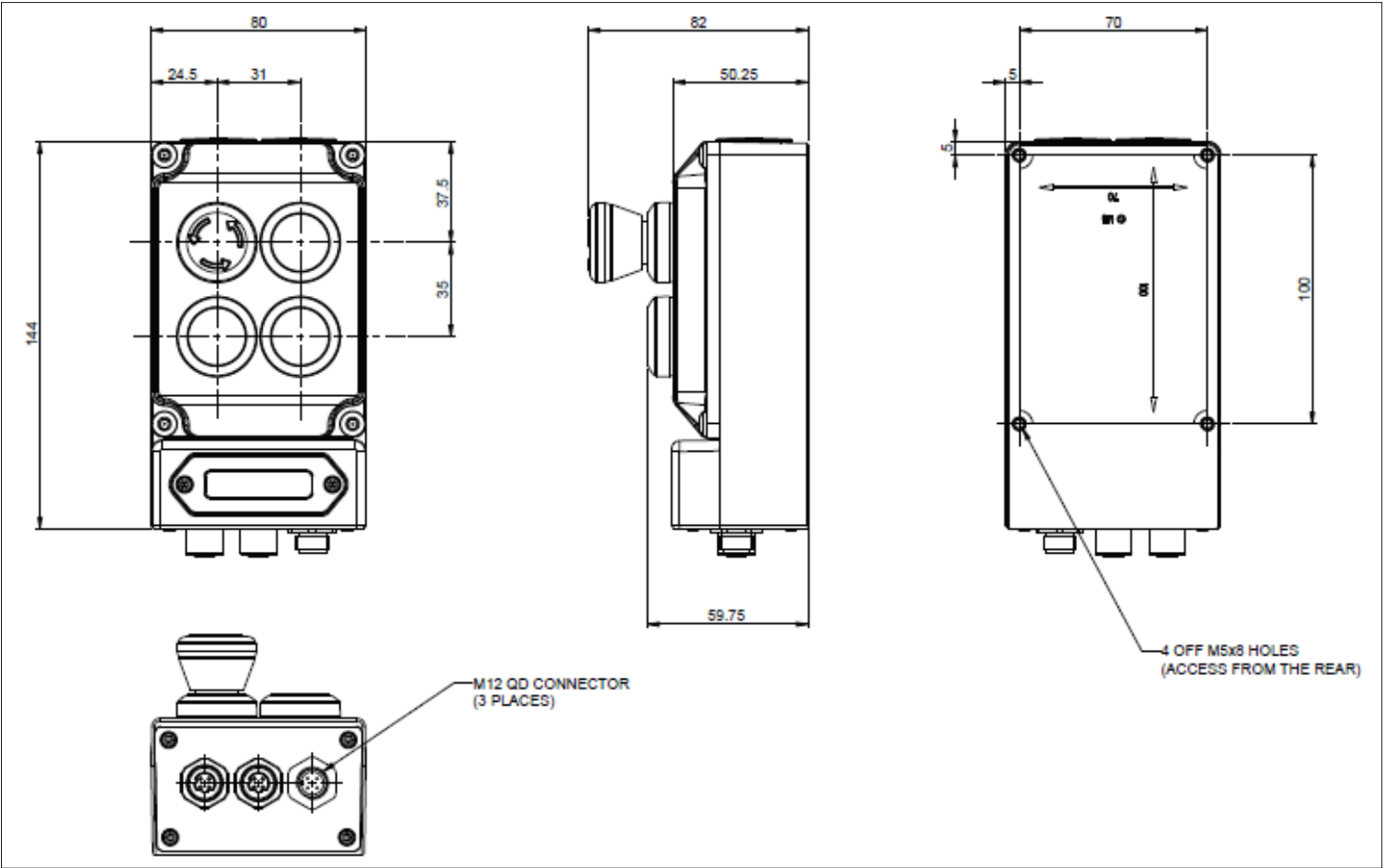
WARNING: Documentation (and review) of the configured iParameter for a certain safe application is mandatory and requires the safe generation and storage of the iParameter data set as supplement for the safety assessor of the entire safety system.

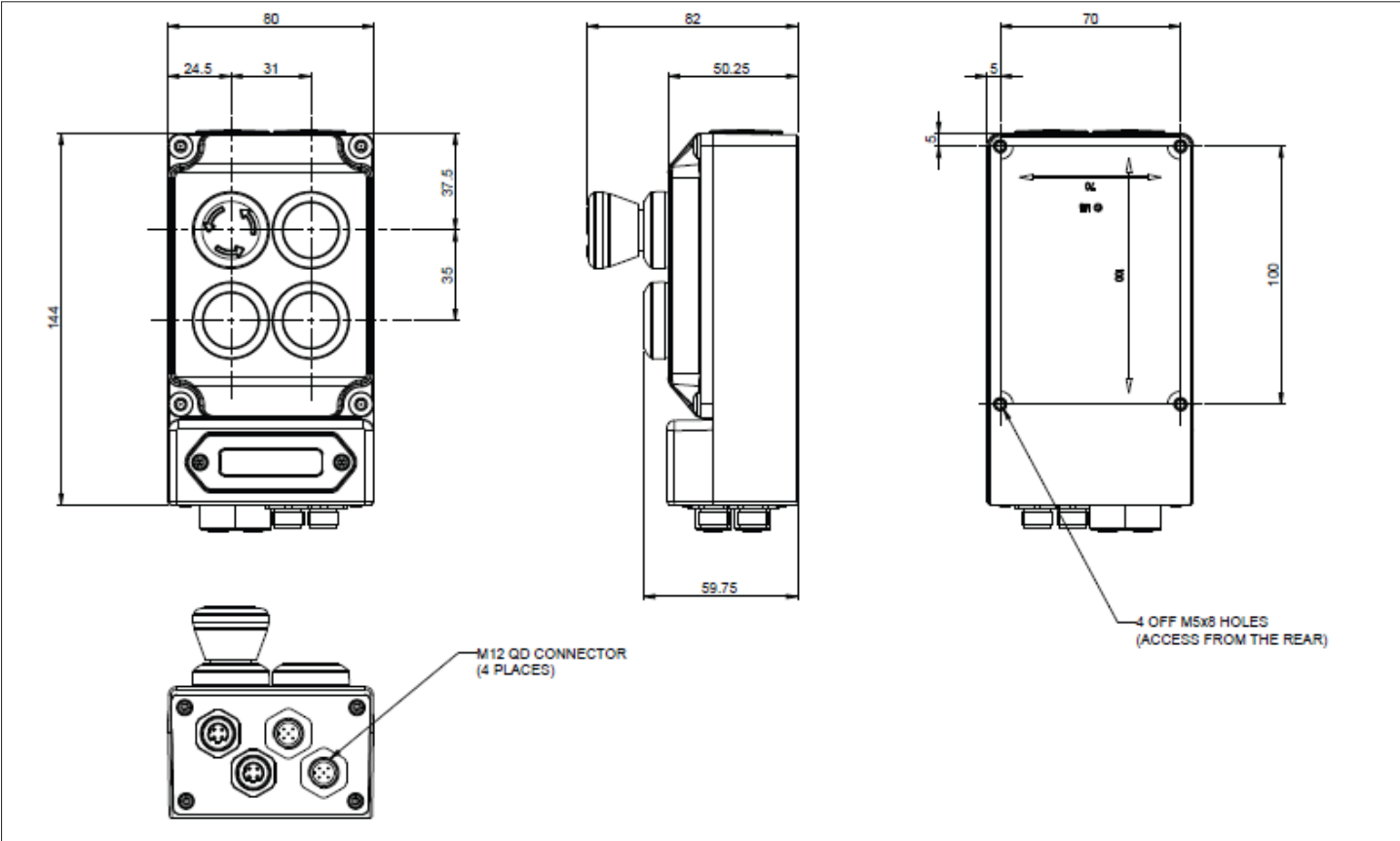
DANGER: Error-Bits reported by the T100/PS via PROFIsafe shall not be used to trigger the safety function of a device or system.

Dimensional Drawing PF04, PF05, PF06



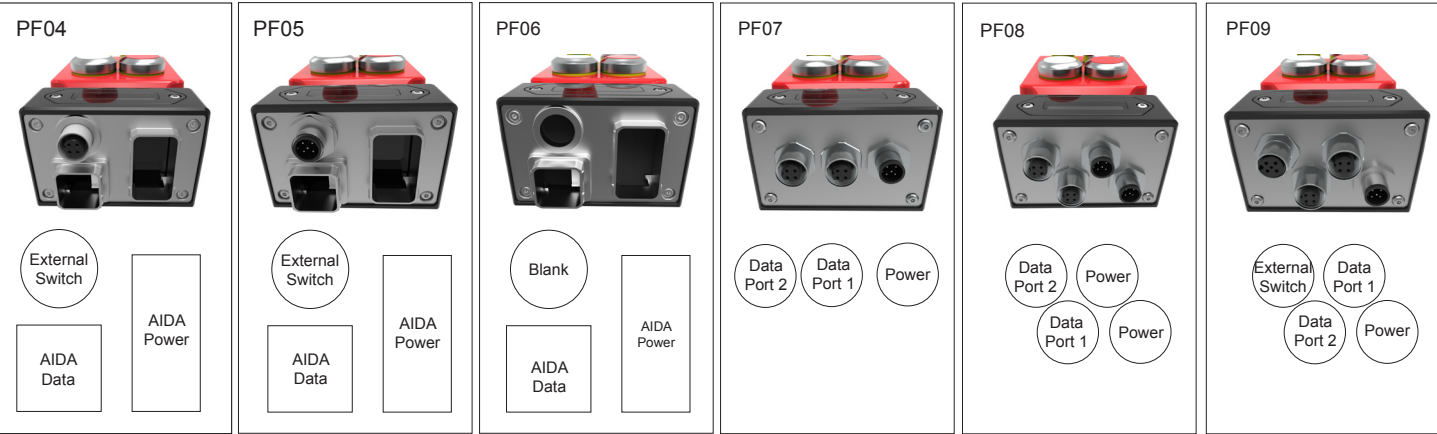
Dimensional Drawing PF07





Electrical connection

Pin Out									
Power		Data		External Safety Switch		AIDA Power		AIDA DATA	
M12 MALE - 5 Pin		M12 FEMALE - 4 Pin 'D' Coded		M12 FEMALE - 5 Pin		5 Pin Push Plug		RJ45	
1	+24V Supply*	1	TX+	1	S/C1	1	+24V Supply	1	RX+
2	0V**	2	RX+	2	S/C2	2	0V	2	RX-
3	0V**	3	TX-	3	S/C1	3		3	TX+
4	+24V Supply*	4	RX-	4	S/C2	4		4	
5	Case (Earth)			5		5	Functional EARTH	5	
*Internally connected								6	TX-
**Internally connected								7	
								8	



Max current consumption is 750mA.

Bond the case work of the unit to earth directly or the relevant power connection pin.

DANGER: The *proNet* interface shall be supplied by a 24V SELV/PELV power supply according to EN60950-1 which limits the maximum voltage in case of a failure to 60V.

Functional testing

Operate each attached safety interfaces (e.g. e-stop, enabling device, non-contact switch); ensure that the safety command is received at the appropriate PROFIsafe controller. Note any additional requirements for functional testing from attached equipment.

Service and inspection

Regular inspection of the following is necessary to ensure trouble-free, lasting operation:

- Correct operating function
- Secure mounting of components
- Debris and wear

Note any requirements for service and inspection of attached components.

DANGER: The maximum operation time (proof-test interval) of the T100 shall not exceed 20 years. When reaching the proof-test limit the T100 shall be replaced and put permanently out of order.

Disposal

This interlock does not contain any certified hazardous materials so should be disposed of as industrial waste.

Liability

Liability coverage is voided under the following conditions:

- If these instructions are not followed
- non-compliance with safety regulations
- Installation and electrical connection not performed by authorised personnel
- Non-implementation of functional checks

Environmental specification

Environment Type: Indoor & Outdoor

Max. Altitude: 2000m

Ambient Temperature: -5°C to +40°C

Maximum Relative Humidity: 80%@≤31°C; 50%@40°C

Transient Overvoltages Installation Category III

Pollution Degree (IEC 664) Degree 2

Ingress Protection of Electrical Items IP67

Vibration: Tested in accordance with: GS-ET-19

WARNING: The *proNet* interface is designed to be used in the environment of industrial automation or process control systems. The end-user shall check if the unit is allowed to be used within the environment of the final application.

WARNING: The vibration and shock limits of the final host device shall not exceed the values given in the environmental section of this document.

DANGER: The integrity of the units IP rating must be maintained in order to ensure the operating environment of the T100 shall be in the limits of pollution level 2 according to EN 60664.

Protection Against Environmental Influences

A lasting and correct safety function requires that the unit be protected against the ingress of foreign bodies such as swarf, sand, blasting shot, etc. The unit is to be mounted away from the machine, or by the use of anti-vibration mountings, in order to avoid the effects of vibration, shock and bump.

Use in Dusty Environments: Careful product selection is required, which is best performed under the guidance of a Fortress Sales Representative, in order to assess the dust type and product style required.

USE IN CORROSIVE ENVIRONMENTS IS NOT ALLOWED.

Modify design

This guide should be retained for future reference.

Repairs/returns/failures

Should you encounter any issues with the *proNet* interface or related products please contact your supplier. If you need to contact Fortress Interlocks directly you can do so: quality@fortressinterlocks.com.

DANGER: No repair or modification of the *proNet* interface is allowed.

DANGER: Safety critical failures which do not lead to the safe state shall be reported to Fortress Interlocks immediately.

DANGER: After detection of a safety critical error, the *proNet* interface shall not be kept in fail-safe state for more than 1h.

DANGER: Replace a malfunctioning *proNet* interface immediately.