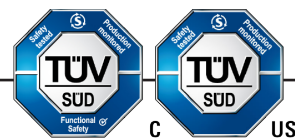


## Operating Instructions: Networked Option Pods



Option Pods

### Description

#### proNet Option Pod

A network communications module to add to an amGardpro unit to provide distributed I/O on PROFINET or EtherNet/IP networks. 3 Dual Channel Safety Inputs are available to be exchanged using PROFIsafe or CIP Safety fail-safe communications. The proNet Option Pod is configured alongside other amGardpro modules to create a networked interlock (with or without guard locking).

- Head & Solenoid NC safety switches are communicated via the safe protocol as the primary dual channel safety input.
- Head & Solenoid NO monitoring contacts and solenoid drive are communicated via the non-safe protocol.
- Emergency Stop NC contacts, if fitted, are communicated via the safe protocol as the secondary dual channel safety input.
- Up to 6 or 5 (if emergency stop fitted) pushbuttons and lamp indicators are available in an interlocking product and are communicated via the non-safe protocol
- The third auxiliary dual channel safety input can be configured to support a connection at the guard lock to a hold-to-run device or other external safety switch.
- An integrated network switch facilitates 'daisy-chain' bus topologies with no additional hardware.

IP address are set via a web interface or the DIP switches. Supply voltage and ethernet connection statistics are also available via the web interface.



### I/O Mapping

In PROFINET/PROFIsafe control systems, GSDML files are available from Fortress to integrate a proNet Option Pod within an interlock assembly. Use the 'Unsafe I/O Data' and the 'Safety Module' for standard configurations. Custom configurations are application specific so may differ. If installation support is required, please contact Fortress Technical Support (technical.support@fortressinterlocks.com)

In EtherNet/IP CIP Safety control systems, EDS files are available from Fortress to integrate a proNet Option Pod within an interlock assembly. Use the I/O mapping supplied in this document for standard configurations or the part number specific memory map supplied with custom configurations. If installation support is required, please contact Fortress Technical Support (technical.support@fortressinterlocks.com). EtherNet/IP Configuration Instructions are available from Fortress for a step by step walk through. The proNet Support Tool is a downloadable application to assist with IP Addressing and Safety Ownership Resetting.

# Operating Instructions: Networked Option Pods

proNet Option Pod										
PROFINET/ PROFIsafe	EtherNet/ IP CIP Safety	Description	Bits							
			0	1	2	3	4	5	6	7
Non Safe Inputs										
IO Switches Byte 0	Byte 0	Bit is set when the switch is pressed	Button 1	Button 2	Button 3	Button 4	Button 5	Button 6	-	-
Head Monitor Byte 0	Byte 1	Bit is set when the tongue is out of the head	Head Mon	-	-	-	-	-	-	-
Solenoid Monitor Byte 0	Byte 2	Bit is set when the gate is unlocked	Sol Mon	-	-	-	-	-	-	-
Non-Safe Outputs										
IO Lamps Byte 0	Byte 0	Lamp is illuminated when bit is set	Lamp 1	Lamp 2	Lamp 3	Lamp 4	Lamp 5	Lamp 6	-	-
Solenoid Drive Byte 0	Byte 1	The solenoid is energised when the bit is set	Sol Drive	-	-	-	-	-	-	-
Safety Inputs										
Byte 0*	Byte 0*	Bit is reset when the relevant safety signal is broken	Head/ Sol Ch1	Head/ Sol Ch2	Aux Safety Ch 1	Aux Safety Ch 2	E-Stop Ch 1	E-Stop Ch 2	-	-
Byte 1	Byte 1	Bit is reset when the relevant safety signal is invalid (latching)	Head/ Sol QS	Head/ Sol QS	Aux Safety QS	Aux Safety QS	E-Stop QS	E-Stop QS	-	-
Byte 2	Byte 2	Reserved	-	-	-	-	-	-	-	-
Safety Outputs										
Byte 0	Byte 0	Reserved	-	-	-	-	-	-	-	-
Byte 1	Byte 1	Set this bit to reset the relevant QS bit if an invalid state has been experienced	Head/ Sol QR*	-	Aux Safety QR	-	E-Stop QR	-	-	-
Byte 2	Byte 2	Reserved	-	-	-	-	-	-	-	-
*When configured to dual channel safety, the relevant safety input bits (Safety Input Byte 0) will always move synchronously										

\*When configured to dual channel safety, the relevant safety input bits (Safety Input Byte 0) will always move synchronously

**Head Monitor and Solenoid Monitor** – Shows the locking state of the unit via non-safe inputs. These correspond to the LED indication on the front of the Solenoid LOK body. E.g. When the gate is unlocked, solenoid monitor bit is high. When actuator is out or key is turned, head monitor bit is high.

**Solenoid Drive** – When bit is set high solenoid is powered; the type of unit will determine whether the unit unlocks or locks (Power to Lock / Power To Unlock)

**Safety Inputs (Byte 0)** – Provides state of safety channels for solenoid / head of interlock, E-Stops and any external safety devices connected to the unit.

**Safety Inputs (Byte 1)** – These show the state of the 'qualifiers', which indicate the detection of any safety fault the unit's safety processor detects between the two channels (synchronicity and short-circuit detection). Under normal conditions the qualifier bits are high. Where the qualifier is low (passivated), the corresponding safety channels in byte 1 will not go high until the qualifier is reset (high). The qualifiers can be reset by power cycling the units, or by using the Safety Outputs (Byte 1).

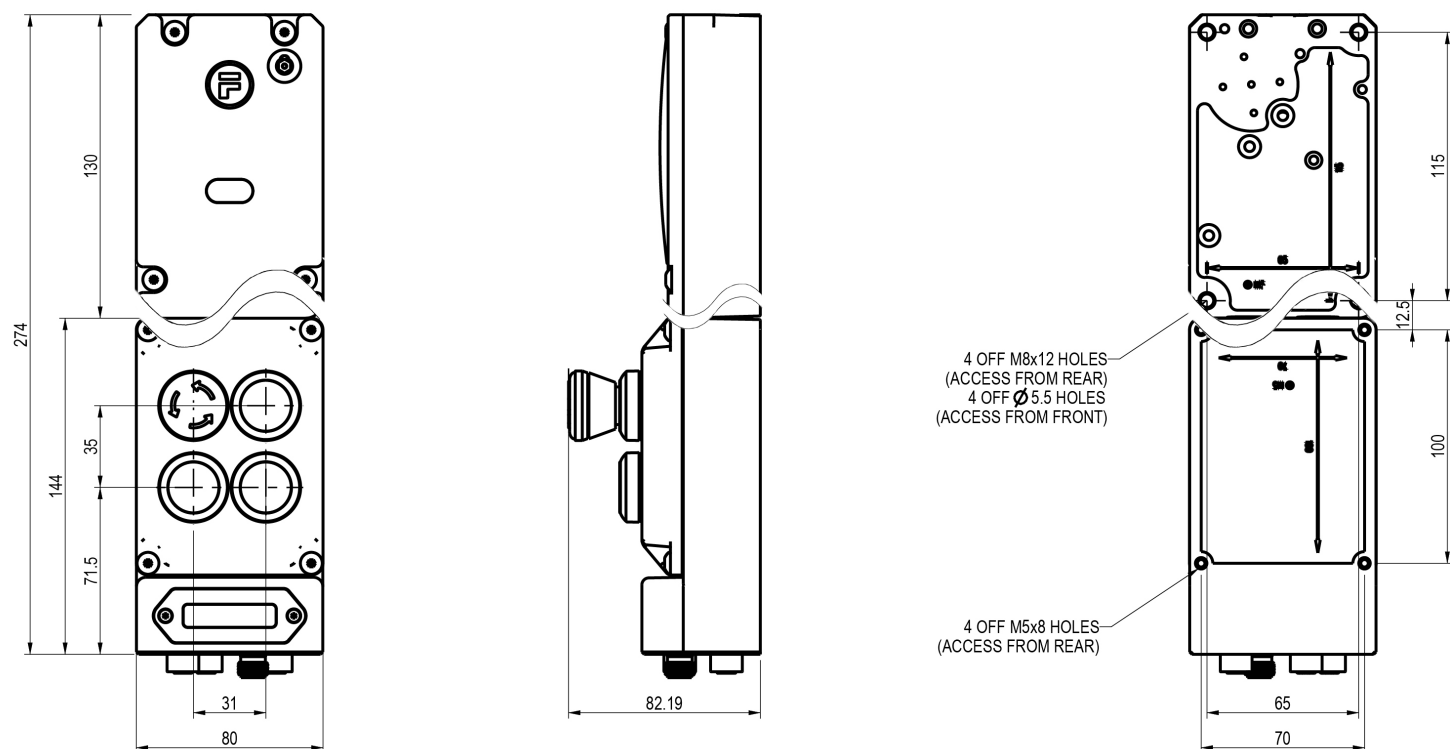
**Safety Outputs (Byte 1)** – Clears a safety fault (rising edge), resetting the qualifiers high and allowing the safety channels to go high again.

# Operating Instructions: Networked Option Pods

## Options & Ordering Information - *proNet* Option Pod

Description	Network	Pushbutton Configuration				Connector Set		
PROFINET with PROFIsafe to suit <i>proLOK</i> module	ND					N	PF	
EtherNet/IP with CIP Safety to suit <i>proLOK</i> module	NH					N	PF	

**Figure 1: Dimensional Drawing**



## Description

### **proNet Control Stations**

Network communications module configured to house or provide connection to I/O whilst communicating to the control system via PROFINET or EtherNet/IP. Safety Inputs can be configured as dual channel inputs (3 maximum) or single channel inputs (6 maximum) and are exchanged using PROFIsafe or CIP Safety fail-safe communications. *proNet* Control Stations can be configured as pushbutton stations, mixed (safe and non-safe) I/O blocks or as a combination of both.

- 3 dual channel safety inputs (or 6 single channel safety inputs) are available to be configured to the application.
- Receptacles can be configured to connect to external safety switches allowing one control station to support up to three gate interlocks, safety switches or light curtains.
- An Emergency Stop, if fitted, uses one dual channel safety input
- Standard I/O is extendable to provide up internal and external non-safe communications.
- To provide additional I/O positions, option pods are added to the control station assembly up to a 3x3 configuration. Each option pod contains 4 pushbutton or lamp positions.
- Receptacles can be configured to connect to external non safe I/O allowing a control stations to support machine mounted stacklights, sounders or beacons.
- An integrated network switch facilitates 'daisy-chain' bus topologies with no additional hardware.

IP address are set via a web interface or the DIP switches. Supply voltage and ethernet connection statistics are also available via the web interface.



## I/O Mapping

In PROFINET/PROFIsafe control systems, GSDML files are available from Fortress to integrate a *proNet* Control Station. Typically applications will require: 'Unsafe I/O Data' 'Safety Module' and 'Extended Switches Data 1'. Custom configurations are application specific so may differ. If installation support is required, please contact Fortress Technical Support (technical.support@fortressinterlocks.com)

In EtherNet/IP CIP Safety control systems, EDS files are available from Fortress to integrate a *proNet* Control Station. Use the I/O mapping supplied in this document as a guide while referencing the part number specific memory map supplied with custom configurations. If installation support is required, please contact Fortress Technical Support (technical.support@fortressinterlocks.com). EtherNet/IP Configuration Instructions are available from Fortress for a step by step walk through. The *proNet* Support Tool is a downloadable application to assist with IP Addressing and Safety Ownership Resetting.

# Operating Instructions: Networked Option Pods

proNet Control Stations										
PROFINET/ PROFIsafe	EtherNet/ IP	Description	Bits							
			0	1	2	3	4	5	6	7
Non Safe Inputs										
IO Switches Byte 0	Byte 0	Bit is set when the switch is pressed	Button 1	Button 2	Button 3	Button 4	Button 5	Button 6	Button 7	Button 8
Extended Switches Byte 0-1	Byte 1-2	Reserved	-	-	-	-	-	-	-	-
Head Monitor Byte 0	Byte 3	Bit is set when the tongue is out of the head	Head Mon*	-	-	-	-	-	-	-
Solenoid Monitor Byte 0	Byte 4	Bit is set when the gate is unlocked	Sol Mon*	-	-	-	-	-	-	-
Non-Safe Outputs										
IO Lamps Byte 0	Byte 0	Lamp is illuminated when bit is set	Lamp 1	Lamp 2	Lamp 3	Lamp 4	Lamp 5	Lamp 6	Lamp 7	Lamp 8
Extended Lamps Byte 0	Byte 1-2	Reserved	-	-	-	-	-	-	-	-
Solenoid Drive Byte 0	Byte 3	The solenoid is energised when the bit is set	Sol Drive*	-	-	-	-	-	-	-
Safety Inputs										
Byte 0**	Byte 0**	Bit is reset when the relevant safety signal is broken	Head/ Sol Ch1*	Head/ Sol Ch2*	Aux Safety Ch 1	Aux Safety Ch 2	E-Stop Ch 1	E-Stop Ch 2	-	-
Byte 1	Byte 1	Bit is reset when the relevant safety signal is invalid (latching)	Head/ Sol QS*	Head/ Sol QS*	Aux Safety QS	Aux Safety QS	E-Stop QS	E-Stop QS	-	-
Byte 2	Byte 2	Reserved	-	-	-	-	-	-	-	-
Safety Outputs										
Byte 0	Byte 0	Reserved	-	-	-	-	-	-	-	-
Byte 1	Byte 1	Set this bit to reset the relevant QS bit if an invalid state has been experienced	Head/ Sol QR*	-	Aux Safety QR	-	E-Stop QR	-	-	-
Byte 2	Byte 2	Reserved	-	-	-	-	-	-	-	-
*Used when receptacle fitted to control station for control of a separate interlock. **When configured to dual channel safety, the relevant safety input bits (Safety Input Byte 0) will always move synchronously.										

**Head Monitor and Solenoid Monitor** – Shows the locking state of the unit via non-safe inputs. These correspond to the LED indication on the front of the Solenoid LOK body. E.g. When the gate is unlocked, solenoid monitor bit is high. When actuator is out or key is turned, head monitor bit is high.

**Solenoid Drive** – When bit is set high solenoid is powered; the type of unit will determine whether the unit unlocks or locks (Power to Lock / Power To Unlock)

**Safety Inputs** (Byte 0) – Provides state of safety channels for solenoid / head of interlock, E-Stops and any external safety devices connected to the unit.

**Safety Inputs** (Byte 1) – These show the state of the 'qualifiers', which indicate the detection of any safety fault the unit's safety processor detects between the two channels (synchronicity and short-circuit detection). Under normal conditions the qualifier bits are high. Where the qualifier is low (passivated), the corresponding safety channels in byte 1 will not go high until the qualifier is reset (high). The qualifiers can be reset by power cycling the units, or by using the Safety Outputs (Byte 1).

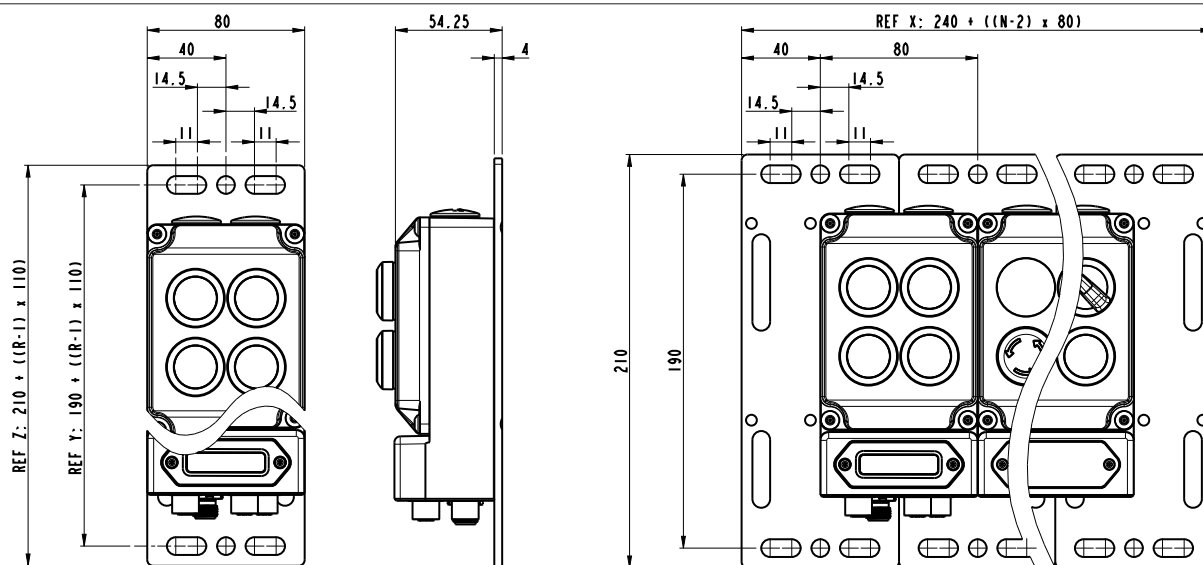
**Safety Outputs** (Byte 1) – Clears a safety fault (rising edge), resetting the qualifiers high and allowing the safety channels to go high again.

## Operating Instructions: Networked Option Pods

Options & Ordering Information - <i>proNet</i> Control Stations														
Button Configuration														
Type	Mounting	Network	Format	Pod 1			Pod 2			...	Cable Entry	External I/O Receptacles	Connector Set	
CON	MPB1												PF	
		ND	Profinet enabled Option Pod							T	Cables should be routed from the TOP			
			Ethernet/IP enabled Option Pod							B	Cables should be routed from the BOTTOM			
			Profinet Non-Safety Option Pod							L	Cables should be routed from the LEFT			
			Ethernet/IP Non-Safety Option Pod							R	Cables should be routed from the RIGHT			
			11	1 Long vs 1 Short sides; Single option pod							00	00	No Top Connectors	
			21	2 Long vs 1 Short sides; Two option pods										
			22	2 Long vs 2 Short sides; Four option pods										
			23	2 Long vs 3 Short sides; Five option pods										
			31	3 Long vs 1 Short sides; Three option pods										
			32	3 Long vs 2 Short sides; Five option pods										
			33	3 Long vs 3 Short sides; Nine option pods										

# Operating Instructions: Networked Option Pods

**Figure 2: Dimensional Drawing**



## Options & Ordering Information - Pushbutton Configuration

Buttons / Lamps / Switches	E-Stops	ET (Twist) Non-Illuminated	EP (Pull) Non-Illuminated	EI (Twist) Illuminated				
	* (Additional monitoring contacts)							
	Pushbuttons	P1 Illuminated	P2 Illuminated	P3 Illuminated	P6 Illuminated	P7 Illuminated	PB Non-Illuminated	
	Lamps	LR	LY	LG	LB	LW		
Illuminated Selector Switch	2E** (Latching 90 Degree)	2F** (Momentary 90 Degree)	2V (Latching Selector Switch Positions at 10 & 2 (1NO 1NC))		K5** (Latching Key Switch (90 Degree))			
Blank	00	Laser Engraving Information						
		Engraving for each button: 2 Lines of 8 Characters						

\*\*2E, 2F & K5 Options can only be fitted in top right or bottom left positions.

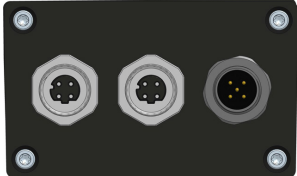
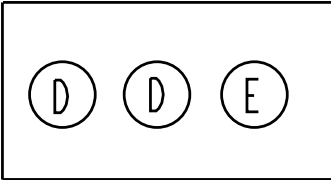



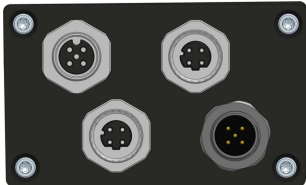
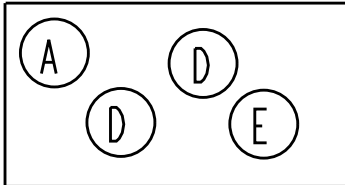




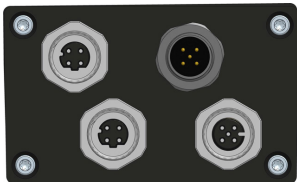
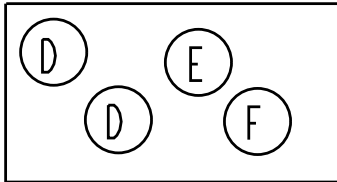




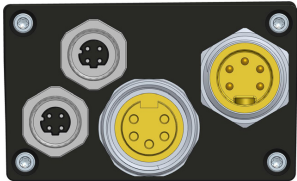
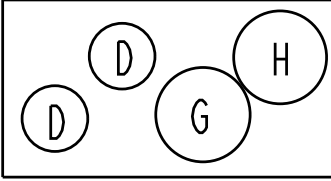




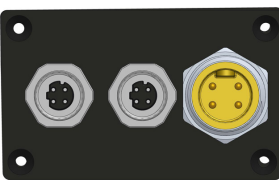
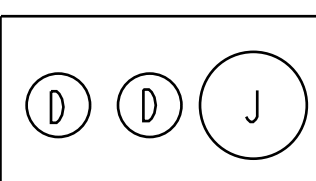



\*\*2E, 2F & K5 Options can only be fitted in top right or bottom left positions.

## Options & Ordering Information - *proNet* Option Pod

Description	Network	Pushbutton Configuration					Connector Set	
PROFINET with PROFI-safe to suit <i>proLOK</i> module	ND					N	PF	
EtherNet/IP with CIP Safety to suit <i>proLOK</i> module	NH					N	PF	



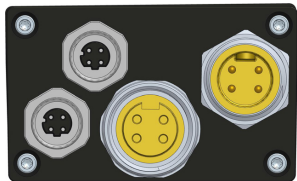
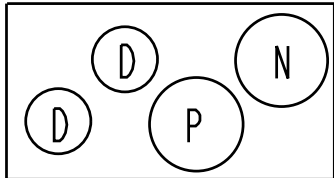




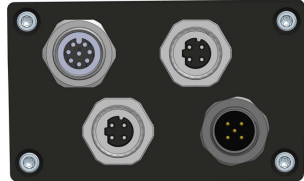
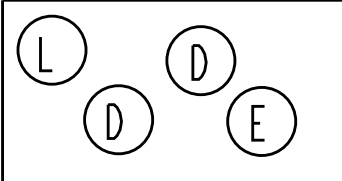




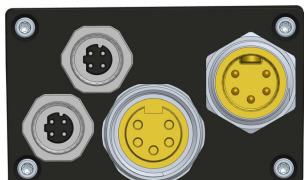
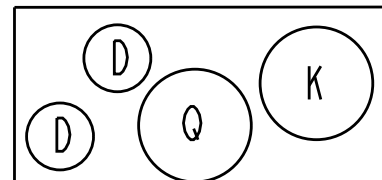




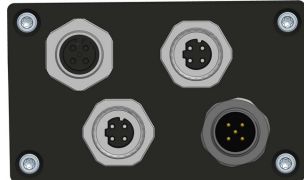
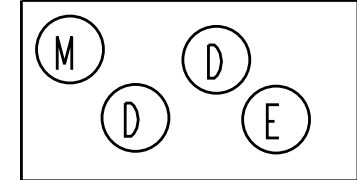




# Operating Instructions: Networked Option Pods

Options & Ordering Information - Connector Set																																																	
Part No.	Description																																																
PF07	<div>LEFT POSITION: 4 PIN M12 FEMALE DATA IN MIDDLE POSITION: 4 PIN M12 FEMALE DATA OUT RIGHT POSITION: 5 PIN M12 MALE DUAL POWER INPUT</div>  	 <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>2 (TX+)</td></tr><tr><td>2</td><td>1 (RX+)</td></tr><tr><td>3</td><td>2 (TX-)</td></tr><tr><td>4</td><td>1 (RX-)</td></tr></table> FEMALE 4PIN DATA OUT M12 CABLE THREAD	OD	TWISTED PAIRS	1	2 (TX+)	2	1 (RX+)	3	2 (TX-)	4	1 (RX-)	 <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>2 (TX+)</td></tr><tr><td>2</td><td>1 (RX+)</td></tr><tr><td>3</td><td>2 (TX-)</td></tr><tr><td>4</td><td>1 (RX-)</td></tr></table> FEMALE 4PIN DATA OUT M12 CABLE THREAD	OD	TWISTED PAIRS	1	2 (TX+)	2	1 (RX+)	3	2 (TX-)	4	1 (RX-)	 <table><tr><th>OD</th><th>INTERNAL CONNECTION</th></tr><tr><td>1</td><td>+24V</td></tr><tr><td>2</td><td>0V</td></tr><tr><td>3</td><td>0V</td></tr><tr><td>4</td><td>+24V</td></tr><tr><td>5</td><td>CASE/EARTH</td></tr></table> MALE 5PIN DUAL POWER IN M12 CABLE THREAD	OD	INTERNAL CONNECTION	1	+24V	2	0V	3	0V	4	+24V	5	CASE/EARTH													
		OD	TWISTED PAIRS																																														
1	2 (TX+)																																																
2	1 (RX+)																																																
3	2 (TX-)																																																
4	1 (RX-)																																																
OD	TWISTED PAIRS																																																
1	2 (TX+)																																																
2	1 (RX+)																																																
3	2 (TX-)																																																
4	1 (RX-)																																																
OD	INTERNAL CONNECTION																																																
1	+24V																																																
2	0V																																																
3	0V																																																
4	+24V																																																
5	CASE/EARTH																																																
PF09	<div>TOP LEFT POSITION: 5 PIN M12 FEMALE EXTERNAL SWITCH FOR EXTERNAL SWITCH INPUTS BOTTOM LEFT POSITION: 4 PIN M12 FEMALE DATA IN TOP RIGHT POSITION: 4 PIN M12 FEMALE DATA OUT BOTTOM RIGHT POSITION: 5 PIN M12 MALE DUAL POWER IN</div>  	 <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>S/C1</td></tr><tr><td>2</td><td>S/C2</td></tr><tr><td>3</td><td>S/C1</td></tr><tr><td>4</td><td>S/C2</td></tr><tr><td>5</td><td>CASE/EARTH</td></tr></table> FEMALE 5 PIN EXT SWITCH FOR SAFETY SWITCH INPUTS M12 CABLE THREAD	OD	TWISTED PAIRS	1	S/C1	2	S/C2	3	S/C1	4	S/C2	5	CASE/EARTH	 <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>2 (TX+)</td></tr><tr><td>2</td><td>1 (RX+)</td></tr><tr><td>3</td><td>2 (TX-)</td></tr><tr><td>4</td><td>1 (RX-)</td></tr></table> FEMALE 4PIN DATA OUT M12 CABLE THREAD	OD	TWISTED PAIRS	1	2 (TX+)	2	1 (RX+)	3	2 (TX-)	4	1 (RX-)	 <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>2 (TX+)</td></tr><tr><td>2</td><td>1 (RX+)</td></tr><tr><td>3</td><td>2 (TX-)</td></tr><tr><td>4</td><td>1 (RX-)</td></tr></table> FEMALE 4PIN DATA OUT M12 CABLE THREAD	OD	TWISTED PAIRS	1	2 (TX+)	2	1 (RX+)	3	2 (TX-)	4	1 (RX-)	 <table><tr><th>OD</th><th>INTERNAL CONNECTION</th></tr><tr><td>1</td><td>+24V</td></tr><tr><td>2</td><td>0V</td></tr><tr><td>3</td><td>0V</td></tr><tr><td>4</td><td>+24V</td></tr><tr><td>5</td><td>CASE/EARTH</td></tr></table> MALE 5PIN DUAL POWER IN M12 CABLE THREAD	OD	INTERNAL CONNECTION	1	+24V	2	0V	3	0V	4	+24V	5	CASE/EARTH
		OD	TWISTED PAIRS																																														
1	S/C1																																																
2	S/C2																																																
3	S/C1																																																
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PF10	<div>TOP LEFT POSITION: 4 PIN M12 FEMALE DATA IN BOTTOM LEFT POSITION: 4 PIN M12 FEMALE DATA OUT TOP RIGHT POSITION: 5 PIN M12 MALE DUAL POWER IN BOTTOM RIGHT POSITION: 5 PIN M12 FEMALE DUAL POWER OUT</div>  	 <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>2 (TX+)</td></tr><tr><td>2</td><td>1 (RX+)</td></tr><tr><td>3</td><td>2 (TX-)</td></tr><tr><td>4</td><td>1 (RX-)</td></tr></table> FEMALE 4PIN DATA OUT M12 CABLE THREAD	OD	TWISTED PAIRS	1	2 (TX+)	2	1 (RX+)	3	2 (TX-)	4	1 (RX-)	 <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>2 (TX+)</td></tr><tr><td>2</td><td>1 (RX+)</td></tr><tr><td>3</td><td>2 (TX-)</td></tr><tr><td>4</td><td>1 (RX-)</td></tr></table> FEMALE 4PIN DATA OUT M12 CABLE THREAD	OD	TWISTED PAIRS	1	2 (TX+)	2	1 (RX+)	3	2 (TX-)	4	1 (RX-)	 <table><tr><th>OD</th><th>INTERNAL CONNECTION</th></tr><tr><td>1</td><td>+24V</td></tr><tr><td>2</td><td>0V</td></tr><tr><td>3</td><td>0V</td></tr><tr><td>4</td><td>+24V</td></tr><tr><td>5</td><td>CASE/EARTH</td></tr></table> MALE 5PIN DUAL POWER IN, M12 CABLE THREAD	OD	INTERNAL CONNECTION	1	+24V	2	0V	3	0V	4	+24V	5	CASE/EARTH	 <table><tr><th>OD</th><th>INTERNAL CONNECTION</th></tr><tr><td>1</td><td>+24V</td></tr><tr><td>2</td><td>0V</td></tr><tr><td>3</td><td>0V</td></tr><tr><td>4</td><td>+24V</td></tr><tr><td>5</td><td>CASE/EARTH</td></tr></table> FEMALE 5PIN DUAL POWER OUT, M12 CABLE THREAD	OD	INTERNAL CONNECTION	1	+24V	2	0V	3	0V	4	+24V	5	CASE/EARTH
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PF13	<div>LEFT POSITION: 4 PIN M12 FEMALE DATA IN MIDDLE POSITION: 4 PIN M12 FEMALE DATA OUT RIGHT POSITION: 4 PIN 7/8 SPECIAL MALE SINGLE POWER</div>  	 <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>2 (TX+)</td></tr><tr><td>2</td><td>1 (RX+)</td></tr><tr><td>3</td><td>2 (TX-)</td></tr><tr><td>4</td><td>1 (RX-)</td></tr></table> FEMALE 4PIN DATA OUT M12 CABLE THREAD	OD	TWISTED PAIRS	1	2 (TX+)	2	1 (RX+)	3	2 (TX-)	4	1 (RX-)	 <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>2 (TX+)</td></tr><tr><td>2</td><td>1 (RX+)</td></tr><tr><td>3</td><td>2 (TX-)</td></tr><tr><td>4</td><td>1 (RX-)</td></tr></table> FEMALE 4PIN DATA OUT M12 CABLE THREAD	OD	TWISTED PAIRS	1	2 (TX+)	2	1 (RX+)	3	2 (TX-)	4	1 (RX-)	 <table><tr><th>OD</th><th>INTERNAL CONNECTION</th></tr><tr><td>1</td><td>-</td></tr><tr><td>2</td><td>+24V</td></tr><tr><td>3</td><td>0V</td></tr><tr><td>4</td><td>-</td></tr></table> MALE 4 PIN SINGLE POWER IN 7/8 CABLE THREAD	OD	INTERNAL CONNECTION	1	-	2	+24V	3	0V	4	-															
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# Operating Instructions: Networked Option Pods

## Options & Ordering Information

Part No.	Description																																																						
PF14	<p>BOTTOM LEFT POSITION: 4 PIN M12 FEMALE DATA IN TOP LEFT POSITION: 4 PIN M12 FEMALE DATA OUT BOTTOM RIGHT POSITION: 4 PIN 7/8 FEMALE DUAL POWER O TOP RIGHT POSITION: 4 PIN 7/8 MALE DUAL POWER IN</p>  	<p>D</p>  <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>2 (TX+)</td></tr><tr><td>2</td><td>1 (RX+)</td></tr><tr><td>3</td><td>2 (TX-)</td></tr><tr><td>4</td><td>1 (RX-)</td></tr></table> <p>FEMALE 4PIN DATA OUT M12 CABLE THREAD</p>	OD	TWISTED PAIRS	1	2 (TX+)	2	1 (RX+)	3	2 (TX-)	4	1 (RX-)	<p>D</p>  <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>2 (TX+)</td></tr><tr><td>2</td><td>1 (RX+)</td></tr><tr><td>3</td><td>2 (TX-)</td></tr><tr><td>4</td><td>1 (RX-)</td></tr></table> <p>FEMALE 4PIN DATA OUT M12 CABLE THREAD</p>	OD	TWISTED PAIRS	1	2 (TX+)	2	1 (RX+)	3	2 (TX-)	4	1 (RX-)	<p>P</p>  <table><tr><th>OD</th><th>INTERNAL CONNECTION</th></tr><tr><td>1</td><td>+24V</td></tr><tr><td>2</td><td>+24V</td></tr><tr><td>3</td><td>0V</td></tr><tr><td>4</td><td>0V</td></tr></table> <p>FEMALE 4 PIN DUAL POWER OUT, 7/8 CABLE THREAD</p>	OD	INTERNAL CONNECTION	1	+24V	2	+24V	3	0V	4	0V	<p>N</p>  <table><tr><th>OD</th><th>INTERNAL CONNECTION</th></tr><tr><td>1</td><td>+24V</td></tr><tr><td>2</td><td>+24V</td></tr><tr><td>3</td><td>0V</td></tr><tr><td>4</td><td>0V</td></tr></table> <p>MALE 4 PIN DUAL POWER IN, 7/8 CABLE THREAD</p>	OD	INTERNAL CONNECTION	1	+24V	2	+24V	3	0V	4	0V										
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PF16	<p>TOP LEFT POSITION: 8 PIN M12 FEMALE TO POWER A STOP BOTTOM LEFT POSITION: 4 PIN M12 FEMALE DATA IN TOP RIGHT POSITION: 4 PIN M12 FEMALE DATA OUT BOTTOM RIGHT POSITION: 5 PIN M12 MALE DUAL POWER IN</p>  	<p>L</p>  <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>S/C1</td></tr><tr><td>2</td><td>24V</td></tr><tr><td>3</td><td>EARTH</td></tr><tr><td>4</td><td>S/C2</td></tr><tr><td>5</td><td>S/C1</td></tr><tr><td>6</td><td>S/C2</td></tr><tr><td>7</td><td>0V</td></tr><tr><td>8</td><td>INPUT</td></tr></table> <p>FEMALE 8 PIN M12 CABLE TO POWER A STOP</p>	OD	TWISTED PAIRS	1	S/C1	2	24V	3	EARTH	4	S/C2	5	S/C1	6	S/C2	7	0V	8	INPUT	<p>D</p>  <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>2 (TX+)</td></tr><tr><td>2</td><td>1 (RX+)</td></tr><tr><td>3</td><td>2 (TX-)</td></tr><tr><td>4</td><td>1 (RX-)</td></tr></table> <p>FEMALE 4PIN DATA OUT M12 CABLE THREAD</p>	OD	TWISTED PAIRS	1	2 (TX+)	2	1 (RX+)	3	2 (TX-)	4	1 (RX-)	<p>D</p>  <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>2 (TX+)</td></tr><tr><td>2</td><td>1 (RX+)</td></tr><tr><td>3</td><td>2 (TX-)</td></tr><tr><td>4</td><td>1 (RX-)</td></tr></table> <p>FEMALE 4PIN DATA OUT M12 CABLE THREAD</p>	OD	TWISTED PAIRS	1	2 (TX+)	2	1 (RX+)	3	2 (TX-)	4	1 (RX-)	<p>E</p>  <table><tr><th>OD</th><th>INTERNAL CONNECTION</th></tr><tr><td>1</td><td>+24V</td></tr><tr><td>2</td><td>0V</td></tr><tr><td>3</td><td>0V</td></tr><tr><td>4</td><td>+24V</td></tr><tr><td>5</td><td>CASE/EARTH</td></tr></table> <p>MALE 5PIN DUAL POWER IN M12 CABLE THREAD</p>	OD	INTERNAL CONNECTION	1	+24V	2	0V	3	0V	4	+24V	5	CASE/EARTH
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PF17	<p>TOP LEFT POSITION: 4 PIN M12 FEMALE DATA IN BOTTOM LEFT POSITION: 4 PIN M12 FEMALE DATA OUT TOP RIGHT POSITION: 5 PIN 7/8 FEMALE SINGLE POWER BOTTOM RIGHT POSITION: 5 PIN 7/8 MALE SINGLE POWER</p>  	<p>D</p>  <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>2 (TX+)</td></tr><tr><td>2</td><td>1 (RX+)</td></tr><tr><td>3</td><td>2 (TX-)</td></tr><tr><td>4</td><td>1 (RX-)</td></tr></table> <p>FEMALE 4PIN DATA OUT M12 CABLE THREAD</p>	OD	TWISTED PAIRS	1	2 (TX+)	2	1 (RX+)	3	2 (TX-)	4	1 (RX-)	<p>D</p>  <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>2 (TX+)</td></tr><tr><td>2</td><td>1 (RX+)</td></tr><tr><td>3</td><td>2 (TX-)</td></tr><tr><td>4</td><td>1 (RX-)</td></tr></table> <p>FEMALE 4PIN DATA OUT M12 CABLE THREAD</p>	OD	TWISTED PAIRS	1	2 (TX+)	2	1 (RX+)	3	2 (TX-)	4	1 (RX-)	<p>Q</p>  <table><tr><th>OD</th><th>INTERNAL CONNECTION</th></tr><tr><td>1</td><td>-</td></tr><tr><td>2</td><td>0V</td></tr><tr><td>3</td><td>CASE/EARTH</td></tr><tr><td>4</td><td>+24V</td></tr><tr><td>5</td><td>-</td></tr></table> <p>FEMALE 5 PIN SINGLE POWER IN, 7/8 CABLE THREAD</p>	OD	INTERNAL CONNECTION	1	-	2	0V	3	CASE/EARTH	4	+24V	5	-	<p>K</p>  <table><tr><th>OD</th><th>INTERNAL CONNECTION</th></tr><tr><td>1</td><td>-</td></tr><tr><td>2</td><td>0V</td></tr><tr><td>3</td><td>CASE/EARTH</td></tr><tr><td>4</td><td>+24V</td></tr><tr><td>5</td><td>-</td></tr></table> <p>MALE 5 PIN SINGLE POWER IN, 7/8 CABLE THREAD</p>	OD	INTERNAL CONNECTION	1	-	2	0V	3	CASE/EARTH	4	+24V	5	-						
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PF19	<p>TOP LEFT POSITION: 5 PIN M12 FEMALE FOR EXTERNAL HARDWIRED SAFETY OUTPUTS BOTTOM LEFT POSITION: 4 PIN M12 FEMALE DATA IN TOP RIGHT POSITION: 4 PIN M12 FEMALE DATA OUT BOTTOM RIGHT POSITION: 5 PIN M12 MALE DUAL POWER IN</p>  	<p>M</p>  <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>SAFETY OUTPUT 1</td></tr><tr><td>2</td><td>GROUND</td></tr><tr><td>3</td><td>SAFETY OUTPUT 2</td></tr><tr><td>4</td><td>GROUND</td></tr><tr><td>5</td><td>CASE/EARTH</td></tr></table> <p>M12 5PIN FOR HARDWIRED SAFETY OUTPUTS</p>	OD	TWISTED PAIRS	1	SAFETY OUTPUT 1	2	GROUND	3	SAFETY OUTPUT 2	4	GROUND	5	CASE/EARTH	<p>D</p>  <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>2 (TX+)</td></tr><tr><td>2</td><td>1 (RX+)</td></tr><tr><td>3</td><td>2 (TX-)</td></tr><tr><td>4</td><td>1 (RX-)</td></tr></table> <p>FEMALE 4PIN DATA OUT M12 CABLE THREAD</p>	OD	TWISTED PAIRS	1	2 (TX+)	2	1 (RX+)	3	2 (TX-)	4	1 (RX-)	<p>D</p>  <table><tr><th>OD</th><th>TWISTED PAIRS</th></tr><tr><td>1</td><td>2 (TX+)</td></tr><tr><td>2</td><td>1 (RX+)</td></tr><tr><td>3</td><td>2 (TX-)</td></tr><tr><td>4</td><td>1 (RX-)</td></tr></table> <p>FEMALE 4PIN DATA OUT M12 CABLE THREAD</p>	OD	TWISTED PAIRS	1	2 (TX+)	2	1 (RX+)	3	2 (TX-)	4	1 (RX-)	<p>E</p>  <table><tr><th>OD</th><th>INTERNAL CONNECTION</th></tr><tr><td>1</td><td>+24V</td></tr><tr><td>2</td><td>0V</td></tr><tr><td>3</td><td>0V</td></tr><tr><td>4</td><td>+24V</td></tr><tr><td>5</td><td>CASE/EARTH</td></tr></table> <p>MALE 5PIN DUAL POWER IN, M12 CABLE THREAD</p>	OD	INTERNAL CONNECTION	1	+24V	2	0V	3	0V	4	+24V	5	CASE/EARTH						
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### 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.**

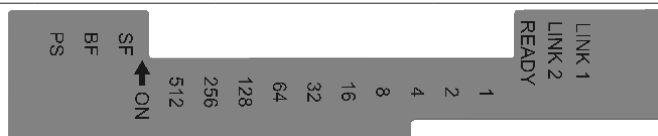
**IF YOU HAVE ANY QUESTIONS OR QUERIES OF ANY NATURE WHATSOEVER PLEASE CONTACT THE SUPPLIER WHO WILL BE PLEASED TO ADVISE AND ASSIST.**

# Operating Instructions: Networked Option Pods

Technical Specification	proNet Option Pod		proNet Control Station	
Housing Materials	Zinc alloy to BS1004A			
Paint Finishes	Gloss powder coat on passivated bodies			
Ingress Protection	IP67 (IP65 with buttons)			
Ambient Temperature	-5°C to + 40°C (23°F to 104°F)			
Supply Voltage	24V DC +/- 10%			
Min Supply Current	150mA @ 24V			
Max Supply Current	400mA + number of external I/O receptacle	2 x 2 Unit	500mA + number of external I/O receptacle	
		3 x 3 Unit	1A + number of external I/O receptacle	
Max Output per External I/O Receptacle	550mA			
Max. Altitude	2000m			
Maximum Relative Humidity	80%@<=31°C; 50%@40°C			
Transient Overvoltages Installation	Category III			
Pollution Degree (IEC 664)	Degree 2			
Vibration	Tested in accordance with: GS-ET-19			
Environment Type	Indoor & Outdoor			

## Functional Safety

Category / Performance Level	Cat 4 / PLe
MTTFd	MTTFd > 100y PFH=2.44 E-9
DC avg	DC = High



## PROFINET

LED	Name	LED Colour	LED State	Comment
PS	PROFIsafe	Green	On	Profisafe OK
			Flashing	Unit requires PROFIsafe integration
		Red	Flashing	Passivation error; qualifier bits need to be reset
BF	Bus Status	Green	Off	No Connection to Profinet controller
			On	Profinet controller connected and is in RUN state
			Flashing	Profinet controller connected and is in STOP state
		Red	On	Fault on network
SF	System Status	Green	Off	Unit not initialised
			On	Unit is in normal operation
			Flash 1 hz	Locate Profinet Device
			1 Flash	Diagnostic event present
		Red	On	Unit in exception state
			1 Flash	Configuration error
			2 Flashes	IP address not set
			3 Flashes	Station name not set
READY		Green	4 Flashes	Internal error
			On	The unit has power on internal 3.3V line
			Off	The unit does not have power on internal 3.3V line
LINK 1		Amber	Off	No Ethernet link present
			On	Ethernet link present
			Flash	Data Transfer
LINK 2		Amber	Off	No Ethernet link present
			On	Ethernet link present
			Flash	Data Transfer

# Operating Instructions: Networked Option Pods



## Ethernet/IP

LED	Colour	Description
LINK 1	OFF	No Ethernet link present
	AMBER	Ethernet link present
	AMBER FLASHING	Ethernet link with communication present
LINK 2	OFF	No Ethernet link present
	AMBER	Ethernet link present
	AMBER FLASHING	Ethernet link with communication present
READY	OFF	No power
	GREEN	The unit has power on internal 3.3V line
MS (Module Status)	OFF	No power
	GREEN	Unit is controlled by a scanner in Run state
	GREEN FLASHING	Unit is not configured, or Scanner in Idle State
	RED	Major Fault
	RED FLASHING	Recoverable fault. Module is configured, but stored parameters differ from currently used parameters.
NS (Network Status)	OFF	Unit does not have power or unit does not have an IP address
	GREEN	Unit is online; one or more connections established (CIP Class 1 or 3)
	GREEN FLASHING	Unit is online; no connections established
	RED	Fault on network
	RED FLASHING	One or more connections timed out (CIP Class 1 or 3)
CS* (CIP Safety)	OFF	CIP-safe communication error OR power off
	GREEN	CIP-safe communication active; safety signals normal
	GREEN FLASHING	Unit requires CIP-safe reintegration
	RED	Fault occurred. Power cycle required
	RED FLASHING	Passivation error

\*Note: LED will pulse amber every 3s

## Electrical Specification

### Max Consumption

750mA - Where an interlock is used (for more than 6 pushbuttons please contact Fortress for variation).

400mA - Where no interlock and up to 8 pushbuttons (including E-Stop is used).

Where additional pushbuttons or external devices are required please contact Fortress for variations.

**DANGER [DSR-1]:** 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. The supplied voltage should be within +/-10% of 24V DC.

**WARNING [DSR-2]:** The vibration and shock limits of the final host device shall not exceed the values given in the environmental section of this document.

**DANGER [DSR-3]:** The integrity of the unit's IP rating must be maintained and the operating environment shall be in the limits of pollution level 2 according to EN 60664.

**WARNING [DSR-4]:** The *proNet* device is designed to be used in the environment of industrial automation or process control systems. The integrator and end-user shall check if the device is allowed to be used within the environment of the final application.

# Operating Instructions: Networked Option Pods

<b>Configuration</b>
<b>DANGER [DSR-5]:</b> The user should test safety connection configurations after they are applied in an originator to confirm the target connection is operating as intended. (Ethernet/IP)
<b>WARNING [DSR-6]:</b> The user should clear any pre-existing configuration from any safety device before installing it onto a safety network. (Ethernet/IP)
<b>ADVISORY [DSR-7]:</b> If you choose to configure safety connections with an SCID=0, you are responsible for ensuring that originators and targets have the correct configurations. (Ethernet/IP)
<b>WARNING [DSR-8]:</b> The user should commission all safety devices with IP address prior to installing it onto a safety network.
<b>WARNING [DSR-9]:</b> When a SIL3 device is configured directly from a workstation, the user should compare the transferred SCID and configuration data with the SCID and configuration data originally viewed in the workstation. (Ethernet/IP)
<b>DANGER [DSR-10]:</b> The configuration software shall assume an ASYNC parameter value of 1.
<b>ADVISORY [DSR-11]:</b> Unconnected digital inputs in dual channel mode will cause the device to signal the inactive safe state for the input pair.
<b>WARNING [DSR-12]:</b> The minimum time between the change of a single safe digital input and the transmission to the Safety Data is 32ms for the Head/Solenoid and E-Stop, and 92ms for the Aux channel. In the case of an input level change at all 6 safe digital inputs at the same time the maximum safe application reaction time is 42ms for Head/Solenoid and E-Stop, and the Aux channel is 102ms.
<b>WARNING [DSR-13]:</b> Configuring an originator with connection data and/or target configuration data must be downloaded to the target so it can be tested and verified. Only then can SCIDs from the target be confirmed. (Ethernet/IP)
<b>DANGER [DSR-14]:</b> Status-Bits reported by the device via CIP Safety messages shall not be used to trigger the safety function of a device or system. (Ethernet/IP)
<b>ADVISORY [DSR-15]:</b> The user should assign SNN numbers for each safety network or safety sub-net that are unique system-wide. (Ethernet/IP)
<b>WARNING [DSR-16]:</b> The safety-related parts of the EDS (Electronic Data Sheet) of the <i>proNet</i> device shall not be altered. (Ethernet/IP)
<b>Functional Testing</b>
<b>ADVISORY [DSR-17]:</b> User testing is the means by which all downloads are validated.
<b>WARNING [DSR-18]:</b> The user should completely test a device's operation before considering the signature (SCID) as being verified. (Ethernet/IP)
<b>DANGER [DSR-19]:</b> To confirm correct installation operate each attached safety interfaces (e.g. E-Stop, enabling device, non-contact switch); ensure that the safety command is received at the appropriate CIP safety controller. (Ethernet/IP)
<b>DANGER [DSR-20]:</b> Note any additional requirements for functional testing from attached equipment.
<b>WARNING [DSR-21]:</b> LEDs are NOT reliable indicators and cannot be guaranteed to provide accurate information. They should ONLY be used for general diagnostics during commissioning or troubleshooting. Do not attempt to use LEDs as operational indicators.
<b>WARNING [DSR-22]:</b> The user should visually verify that all configuration data was downloaded correctly. (Ethernet/IP)
<b>WARNING [DSR-23]:</b> The SCTS shall be a Time/Date stamp making the Time & Date of the configuration creation or change. (Ethernet/IP)
<b>WARNING [DSR-24]:</b> The configuration software shall follow the CIP defined Data and Time format (IEC 1131-3) for setting the signature. (Ethernet/IP)
<b>DANGER [DSR-25]:</b> After detection of a safety critical error, the <i>proNet</i> interface shall not be kept in fail-safe state for more than 1h.
<b>DANGER [DSR-26]:</b> Safety critical failures which do not lead to the safe state shall be reported to Fortress Interlocks immediately.
<b>DANGER [DSR-27]:</b> Replace a malfunctioning <i>proNet</i> interface immediately.
<b>DANGER [DSR-28]:</b> The unit shall not be operated more than 8h in a fault state (outside the EXECUTING/IDLE state), indicated by red or flashing red Module Status LED, in order to make sure that all the relevant tests are executed within the safe reaction time.
<b>DANGER [DSR-29]:</b> If the device is powered on and enters a fault state (does not properly enter the EXECUTING/IDLE state), indicated by red or flashing red Module Status LED, the unit must be restarted via a power-cycle and checked for proper operation.

# Operating Instructions: Networked Option Pods

<b>DANGER [DSR-30]:</b> The maximum operation time (proof-test interval) of the <i>proNet</i> device shall not exceed 20 years. When reaching the proof-test limit the device shall be replaced and put permanently out of order.
<b>DANGER [DSR-31]:</b> Only use officially released and approved firmware files provided by Fortress Interlocks.
<b>WARNING [DSR-32]:</b> After a proper firmware update the safety function shall be checked by the integrator or the end-user and documented properly.
<b>WARNING [DSR-33]:</b> The firmware update of the <i>proNet</i> device shall not be performed during operation in the field.
<b>DANGER [DSR-34]:</b> No repair or modification of the <i>proNet</i> interface is allowed.
<b>WARNING [DSR-35]:</b> The replacement of safety devices requires that the replacement device be configured properly and operation of the replacement device shall be user verified.
<b>Warning [DSR-36]:</b> When turned off (safe-state), the safety output is not pulled actively to 0V.
<b>Warning [DSR-37]:</b> The maximum output current at the safety output pins shall not exceeded 500 mA.
<b>Warning [DSR-38]:</b> The safe state of the safety outputs is "off" (high impedance). Therefore it is not allowed to connect an external safety device or function (like a valve or break) which needs a "High" level to keep the safe state.
<b>Warning [DSR-39]:</b> Safety devices connected to the safety outputs must be robust against the configured output test pulses.
<b>Warning [DSR-40]:</b> The diagnostic test interval for the Safety Outputs is 1hour.
<b>Warning [DSR-41]:</b> The maximum time between the reception of a safety telegram and setting the corresponding safety output is 9 ms.
<b>Danger [DSR-42]:</b> Error-Bits reported by the T100/PS via PROFIsafe shall not be used to trigger the safety function of a device or system (PROFINET).
<b>ATTENTION [DSR-43]:</b> <i>proNet</i> only supports address type 1 (see PROFIsafe Profile Version 2.6.1). As a result, only the F-Destination address match is checked. The F-Source address is transferred but not checked locally on the device (PROFINET).
<b>ATTENTION [DSR-44]:</b> Each safety device shall have a single physical address that is unique on the devices network.
<b>Service and inspection</b>
Regular inspection of the following is necessary to ensure trouble-free, lasting operation: <ul style="list-style-type: none"><li>• Correct operating function</li><li>• Secure mounting of components</li><li>• Debris and wear</li><li>• Sealing of cable entry</li><li>• Loose cable terminals or plug connectors</li><li>• WD40 lubricant or equivalent, should be applied to each mechanical element every 10,000 operations, or sooner, to ensure smooth product operation and function. There are no user serviceable parts in this product. If damage or wear is found with an assembly, please contact your local Fortress channel partner. The complete interlock must be replaced after 1 million switching operations. Note any requirements for service and inspection of attached components. Should you encounter any issues with the <i>proNet</i> interface or related products please contact your supplier. If you need to contact Fortress directly you can do so: <a href="mailto:technical.support@fortressinterlocks.com">technical.support@fortressinterlocks.com</a>.</li></ul>
<b>Disposal</b>
This interlock does not contain any certified hazardous materials so should be disposed of as industrial waste. Electrical items should not be disposed of in general waste and must be appropriately recycled. <ul style="list-style-type: none"><li>• If these instructions are not followed.</li><li>• Non-compliance with safety regulations.</li><li>• Installation and electrical connection not performed by authorised personnel.</li><li>• Non-implementation of functional checks.</li></ul>
<b>Protection Against Environmental Influences</b>
A lasting and correct safety function requires that the device be protected against the ingress of foreign bodies such as swarf, sand, blasting shot, etc. The device 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 Representative, in order to assess the dust type and product style required. Use in Corrosive Environments: Careful product selection is required, which is best performed under the guidance of a Fortress Representative.
<b>The manufacturer reserves the right to modify the design at any time and without notice.</b>
<b>This guide should be retained for future reference.</b>