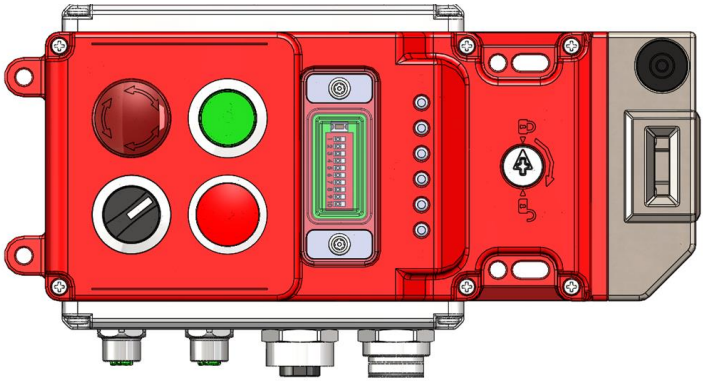
IDEM Safety Switches

UGB-NET-PS

RFID Guard Interlock with Integrated PROFINET and PROFIsafe.

Operating Instructions



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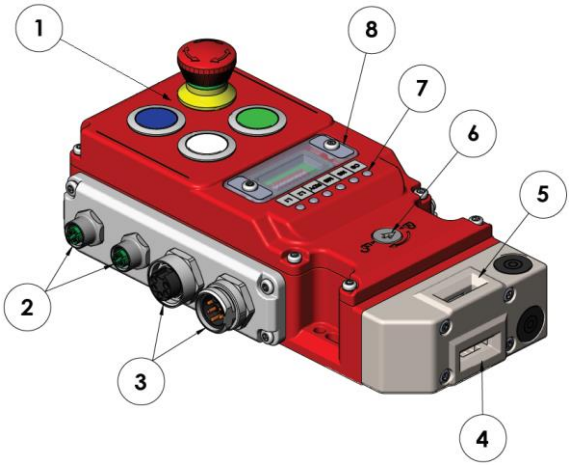
1. System Overview

UGB-NET Switch Body



Key
1 – Pilot Devices
2 – Data Ports
3 – Power Ports
4 – Head End Entry
5 – Head Front Entry
6 – Manual Release
7 – Indication LEDs
8 – DIP Switch Cover

2. Safety Functions

IMPORTANT
- It is the responsibility of the user to ensure the correct overall functionality of its systems and machines. IDEM its subsidiaries and affiliates are not in a position to guarantee all of the characteristics of a given system or product not design by IDEM.
- All relevant safety regulations and standards are to be observed.

The UGB-NET-PS complies with the requirements of Cat. 4 / PL e and SIL 3 in accordance with ISO 13849-1, IEC 62061 and IEC 61508. The device implements the following safety functions:

- **Guard interlocking** that complies with the requirements of IEC 60947-5-3 and is classified as a type 4 device with high coding in accordance with the application standard ISO 14119.
- **Guard locking with lock monitoring** for person protection.
- **Emergency stop** function (optional, see part number options)

3. Installation & Maintenance

Principle

The UGB-NET switch is mounted to the fixed frame of the guard or machine, the handle and actuator are fitted to the moving guard with the actuator tongue aligned to the aperture of the switch head. The mechanical tongue actuator profile is designed to match a cam mechanism within the switch head, the cam and tongue together realise the specified holding force.

WARNING
DO NOT DEFEAT, TAMPER, OR BYPASS THE SAFETY FUNCTION.
FAILURE TO DO SO CAN RESULT IN DEATH OR SERIOUS INJURY.

NE PAS DESACTIVER, MODIFIER, RETIRER, OU CONTOURNER CETI, INTERVERROUILLAGE
IL PEUT EN RESULTER DES BLESSURES GRAVES DU PERSONNEL UTILISATEUR.

- Observe the county-specific regulations when installing the device.
- Repair or modification of the UGB-NET is not allowed unless authorised by IDEM and carried out according to operating guidelines.
- Safety critical failures which do not lead to the safe state shall be reported to IDEM immediately.
- Replace a malfunctioning UGB-NET immediately.

IMPORTANT
- Ensure that the static forces applied during normal operation do not exceed the holding force (Fzh).
- Ensure that dynamic forces acting on the switch caused by bouncing of the guard do not create an impact reaction force which exceeds the holding force (Fzh).

NOTES REGARDING c UL us **:**
- Maximum Temperature 40°C

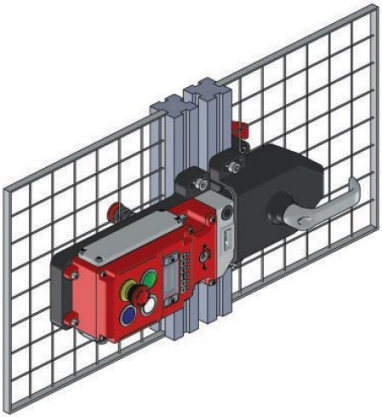
Fastening

IMPORTANT
- If fitting rotary or sliding handles ensure the M6 mounting bolts are used to fix the appropriate mounting plates.
- The tightening torque to ensure reliable fixing is 4.0Nm.
- The front and rear rotary handles can be adjusted for desired position by loosening the locking bolt which fixes the handle to the switch body.

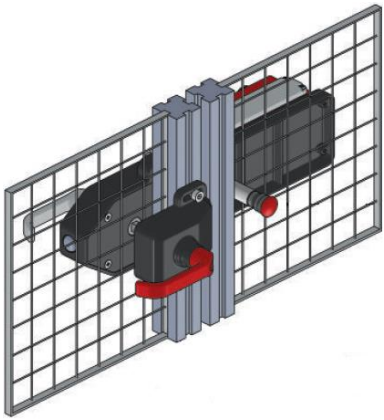
Maintenance Activities

IMPORTANT
- To achieve the target safety level, it is required to routinely check the safety functions are operating correctly. For applications targeting PLe a check should take place once per month, for PLd applications a check should take place once per year.
- If any part of the UGB-NET displays mechanical damage then remove and replace.
- IDEM will not accept responsibility for failure of the switch functions if the installation and maintenance requirements shown in this document are not implemented.

UGB-NET with Rotary Handle

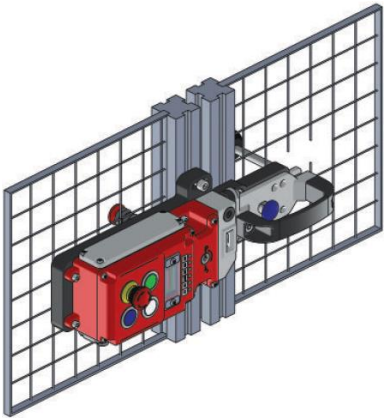


Guard Front

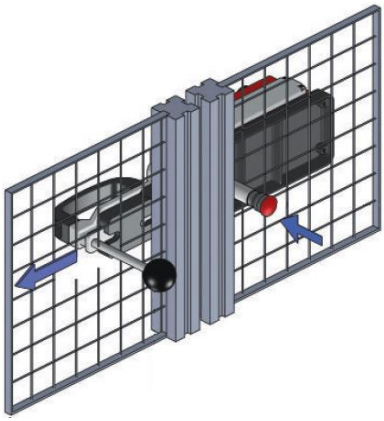


Guard Rear

UGB-NET with Sliding Handle



Guard Front



Guard Rear

4. Electrical Connection

WARNING
- The device shall be supplied by a 24V SELV/PELV power supply acc. to IEC 61131-2 which limits the maximum voltage in case of failure to 60V.
- Function Earth must be connected.

NOTES REGARDING $^{c}(UL)_{us}$ **:**
- To meet the requirements for UL a class 2 power supply must be used.

INFORMATION
- When multiple devices are used in a daisy-chain arrangement the power bus may be forwarded via the UGB-NET device. Please see technical specification and ensure the total current through each device does not exceed the specified maximum current.

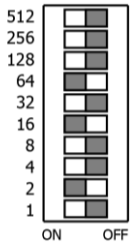
INFORMATION
- Not all connections are required for all applications, the minimum requirement to operate the device is one data connection and one power connection. All 4 ports are utilised when the UGB-NET is used a 'daisy chain' configuration.

5. Protocol Setup

PROFIsafe F-Address assignment using DIP Switch

To adjust the device PROFIsafe 'F-Address' the DIP switches located on the lid of the UGB-NET are used. The following steps can be performed with the device powered on or off, note the final step if the device is powered.

- Locate the DIP switch cover on the UGB-NET body, remove the 2 cover screws to gain access to the DIP switches.
- Using a small tool push the required switches to the 'ON' position to set the corresponding bit.
- The address is given by adding the values of the DIP switches in the ON position.
- The device will accept the new address at next power on or if the switch is powered during these steps, press and hold the reset button until the LEDs turn red then release to reset the device.



INFORMATION
- The example given in the image above shows only switches 2, 16 and 64 set to the 'ON' position. When adding these numbers up the resulting F-Address is 82.

	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. 2 ms processing time per changed input). • The maximum operation time (proof-test interval) of the UGB-NET shall not exceed 20 years. When reaching the proof test interval the UGB-NET shall be replaced and put permanently out of order. • Error bits reported by the UGB-NET via PROFIsafe shall not be used to trigger the safety function of a device or system. • Only use configuration files provided directly by IDEM. • After the detection of a safety critical error, the UGB-NET shall not be kept in fail-safe state for more than 1 hour.
	INFORMATION • The device GSDML file can be found via the UGB-NET product page of the IDEM website www.idemsafety.com/products or alternatively please contact technical@idemsafety.com

PROFINET/PROFIsafe Configuration
Download the GSDML file for the UGB-NET and import into the application control software.

The UGB-NET, once connected, will be discoverable on the network. The device name can be set, allowing the control software to integrate the UGB-NET into the system. Ensure the PROFIsafe F-Address set on the UGB-NET DIP switches matches the configured F-Address setting for the specific UGB-NET device in the control system.

Device replacement
If the topology of the devices within the PROFINET system is defined by the control system, automatic device replacement may be possible:

1. Remove the existing device, taking note of the DIP switch positions.
2. Copy the DIP switch settings to the new device.
3. Ensure the new device has been factory reset (See 5.3.) and does not contain a device name (new devices are delivered in this state).
4. Connect the replacement device to the same port as its predecessor.
5. Wait while the PROFINET systems finds and configures the replacement device before normal operation is resumed.

To manually replace a UGB-NET device:

1. Record the device name of the UGB-NET to be replaced.
2. Remove the existing device, taking note of the DIP switch positions.
3. Copy the DIP switch setting to the new UGB-NET.
4. Fit the new device in place, install power, and network connections then apply power.
5. Using the control software, find the new UGB-NET device on the network and assign the same device name as the replaced device.
6. Wait while the PROFINET systems finds and configures the replacement device before normal operation is resumed.

Factory reset
Please consult the instruction manual of the application control software or for further assistance please contact technical@idemsafety.com

Functional Tests
Once the device has been installed and setup within the PROFINET/PROFIsafe application control software the following checks are necessary to ensure correct operation of the system.

- Secure mounting of UGB-NET switch and handle.
- Expected operation of all control circuits.
- Guard interlocking, locking and rear escape functions.

6. Data Map

See technical datasheet supplied with product. For assistance please contact:
technical@idemsafety.com

7. Diagnostic Indication

LED	Function	Colour
LS	Locking switch state	Red/Green
DS	Device state	Red/Green
PS	PROFIsafe	Red/Green
PN	PROFINET/Network	Red/Green
L1	Link 1	Amber/Green
L2	Link 2	Amber/Green

LED	LED State	Comment
LS	Off	Locking switch inactive, waiting for data connection
	Green	Guard is closed and locked
	Green flash	Guard is closed and unlocked
	Red	Internal fault detected, reset required.
	Red flash	Missing or incorrect RFID tag
	Red double flash	Guard forced open, reset required.
	Red/Green alternate	Reset in progress
DS	Green	Device running
	Red	Internal fault detected
PS	Green	PROFIsafe OK
	Green Flash	PROFIsafe Integration required
	Red	Safe input fault detected, reset qualifier bits
PN	Off	Not initialised
	Green	Normal operation
	Green flash 1Hz	Locate PROFINET device
	Green 1 flash	Diagnostic event present
	Red	Exception
	Red 1 flash	Configuration error
	Red 2 flashes	IP address not set
	Red 3 flashes	Station name not set
	Red 4 flashes	Internal error
L1/L2	Off	No Ethernet link detected
	Amber	Ethernet link detected
	Amber flash	Ethernet data transfer

- Diagnostic LED's 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.

8. Technical

Device Characteristics

Actuator coding level	Type 4 (RFID), High (acc. to ISO 14119)
Assured sensing distance on (Sao)	10 mm
Assured sensing distance off (Sar)	20 mm
Assured locking distance	5 mm
Response time (E Stop)	36 ms max. (E-stop -> transmission to field bus)
Response time (Guard Interlock)	36 ms max. (Guard/Lock -> transmission to field bus)

Electrical Data

Operating voltage	24 V DC +10%/-15% (SELV/PELV)
Power Supply UL Requirements	Class 2 power supply must be used.
Current consumption, max.	600 mA (Lock solenoid enabled)
Allowed through current (daisy-chain)	5 A

Mechanical Data

Maximum holding force (F1)	3000 N
Rated holding force (Fzh)	2307 N
Body material	Die cast Aluminium
Head material	Stainless steel 316

Environmental Data

Operating temperature	-5 °C to 40 °C
Enclosure Protection	IP 65
Maximum operating altitude	2000 m
Shock and Vibration	Tested in accordance with: IEC 60068-2-6 and IEC 60068-2-27
Pollution Degree (Storage and Operation)	Degree 2 (EN 60664)

Reliability / Safety Data (EN ISO 13849-1)

Category	4
Performance Level	e
MTTFd	High
DC	99%

Reliability / Safety Data (EN 62061 / IEC 61508)

Mission Time	20 years
SIL CL	SIL 3
PFHd (Guard Interlocking / Lock Monitoring)	7.3E-10
PFHd (Emergency Stop Function)	2.3E-9

NOTES

EC / EU Declaration of Conformity

	MANUFACTURER:	EU REPRESENTITIVE:
ADDRESSES:	IDEM SAFETY SWITCHES LIMITED Hindley Industrial Estate Hindley Green Wigan Lancashire WN2 4HR United Kingdom	IDEM SAFETY ROMANIA S.R.L București Oras, Bragadiru, Strada Crișu Repede, nr. 113-115B, Camera 1, Judet Ilfov, Romania

DEVICE(s): UGB-NET

THE LISTED DEVICES CONFORM TO THE ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF THE FOLLOWING EUROPEAN DIRECTIVES AND STANDARDS

DIRECTIVES:	Machinery Directive	2006/42/EC		
	EMC Directive	2014/30/EU		
STANDARDS:	EN 13849-1	:2023		
	EN 62061	:2021	(IEC 62061	:2021)
	EN 61508 (Parts 1-7)	:2010		
	IEC 60947-5-3	:2013	(IEC 60947-5-3	:2013)
	EN ISO 14119	:2024		

THIRD PARTY APPROVALS:

TUV Rheinland Industrie Service GmbH
Am Grauen Stein
51105 Köln / Germany

(Notified Body for Machinery, NB 0035)

Material used in the manufacture of these devices (or any of their associated accessories) are compliant in accordance with directives:

2015/863 (RoHS3)

STANDARDS (Plus amendments):

EN IES 63000 :2018

M.Mohtasham **Managing Director**
Mar 2025