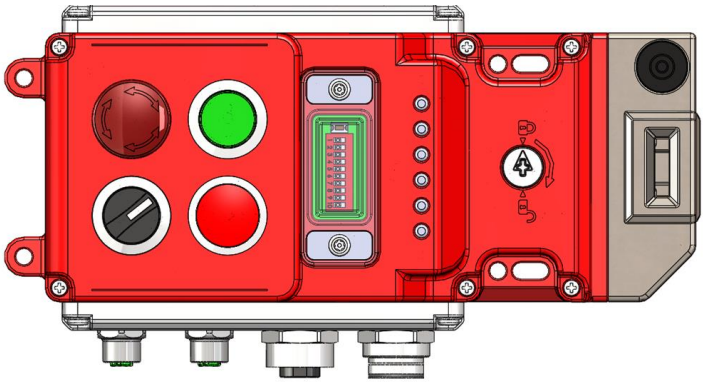
IDEM Safety Switches

UGB-NET-CS

RFID Guard Interlock with Integrated EtherNet/IP with CIP Safety.

Operating Instructions



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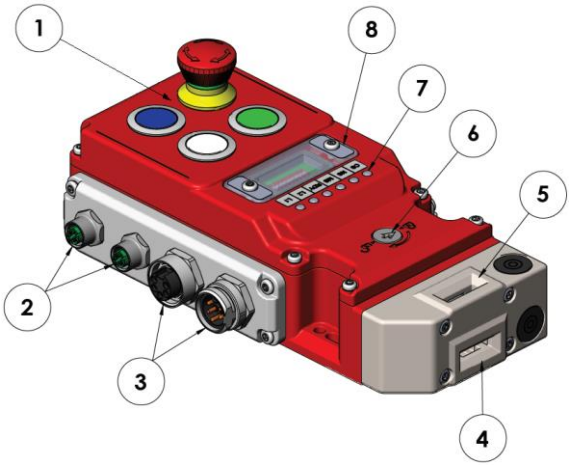
2. System Overview

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

3. 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 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)

4. 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

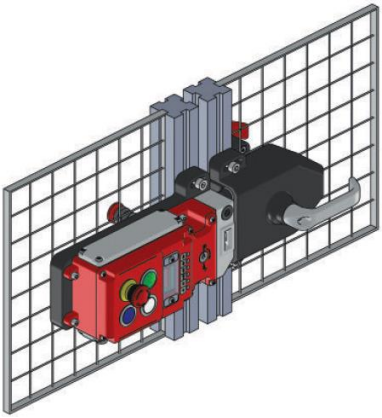
- If fitting rotary or sliding handles ensure the M6 mounting bolts are used to fix the appropriate mounting plates.
- The tightening torque to ensure reliable fixing is 4.0Nm.
- The front and rear rotary handles can be adjusted for desired position by loosening the locking bolt which fixes the handle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

Maintenance Activities

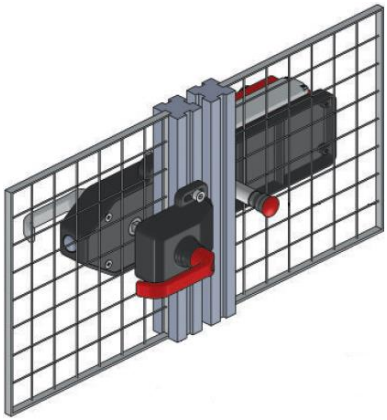
IMPORTANT

- 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

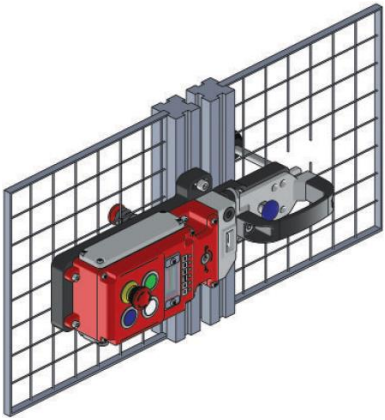


Guard Front

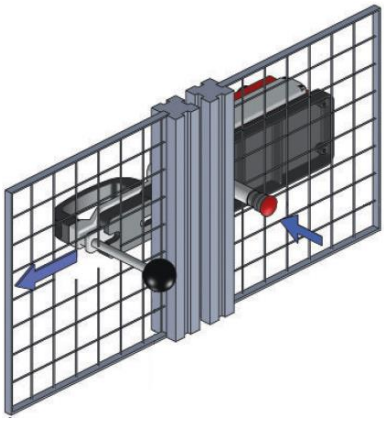


Guard Rear

UGB-NET with Sliding Handle



Guard Front



Guard Rear

5. 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.

6. Protocol Setup

IMPORTANT

- The minimum time between the change of a single safe digital input and the transmission to the CIP Safety is 32ms for the Interlock/Lock and Estop. In the case of an input level change at both safe inputs at the same time the maximum safe application reaction time is 42ms for Interlock/Lock and Estop.
- Clear any pre-existing configuration from any safety device before installing it onto a safety network.
- Commission all safety devices with IP address prior to installing it onto a safety network.
- 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.
- The configuration software shall assume an ASYNC parameter value of 1.
- 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.
- Status-Bits reported by the device via CIP Safety messages shall not be used to trigger the safety function of a device or system.
- The safety-related parts of the EDS (Electronic Data Sheet) of the UGB-NET device shall not be altered.
- Each safety device shall have a single physical address that is unique on the devices segment.
- 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.
- 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

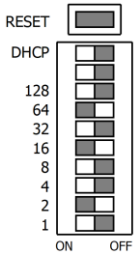
- The device EDS file can be found via the UGB-NET product page of the IDEM website www.idemsafety.com/products or alternatively please contact technical@idemsafety.com

Network Address – Setup/Initial Setting
The UGB-NET IP address can be set via DHCP server or statically via the device DIP switches.

The UGB-NET in its out-of-the-box state will have DHCP enabled (All DIP switches OFF, no IP address set).

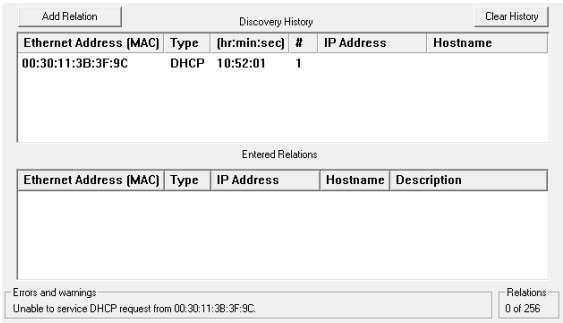
Setting via DIP Switch
To manually assign a static IP the DIP switches located on the lid of the UGB-NET are used. The following steps can be performed with the device powered on or off, note the final step if the device is powered.

1. Locate the DIP switch cover on the UGB-NET body, remove the 2 cover screws and lift the DIP switch cover to gain access to the DIP switches.
2. Using a small tool push the required switches to the 'ON' position to set the corresponding bit.
3. Cycle power to the UGB-NET or press and hold the reset button until the LEDs turn red then release to reset the device. The UGB-NET will restart with the configured IP address and with DHCP disabled.
4. Replace the DIP switch cover and screws ensuring a tight seal to the switch housing.

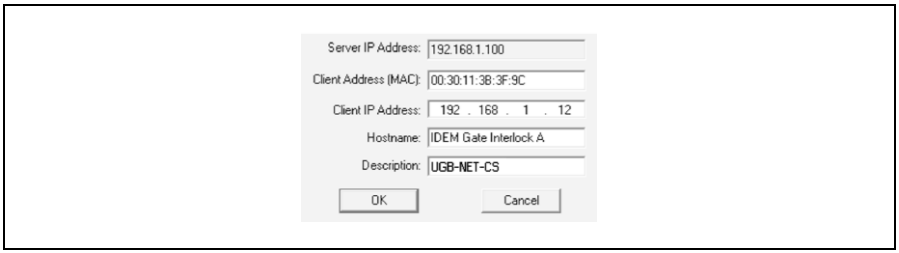


INFORMATION
- The example given in the image above shows only switches 2, 16 and 64 set to the 'ON' position. The resulting IP address is: 192.168.1.**82**

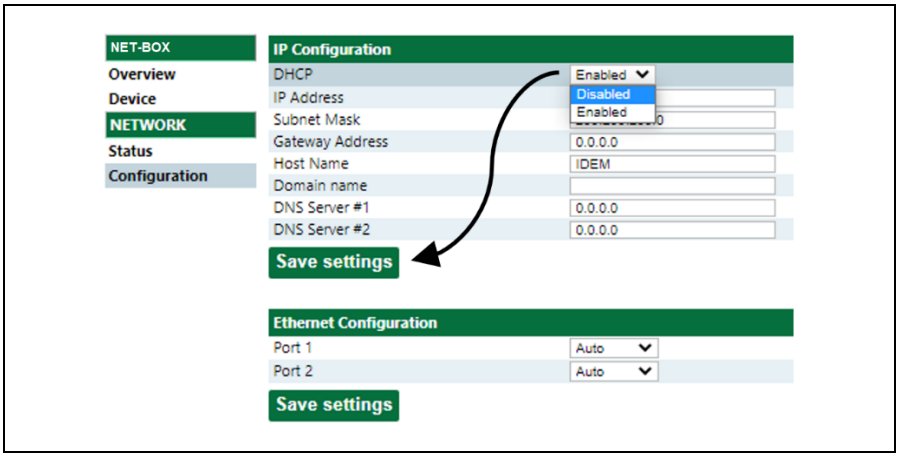
Setting via DHCP
1. Apply power to the UGB-NET, after a start-up period the 'MS' LED should be flashing green.
2. Using a PC station that is configured on the same network as the UGB-NET, run the BOOTP/DHCP tool.
3. Using the MAC address to identify the UGB-NET, select the UGB-NET in the 'Discovery History' window and click 'Add Relation'.



4. Configure the required IP address setting in the pop-up window and click OK.



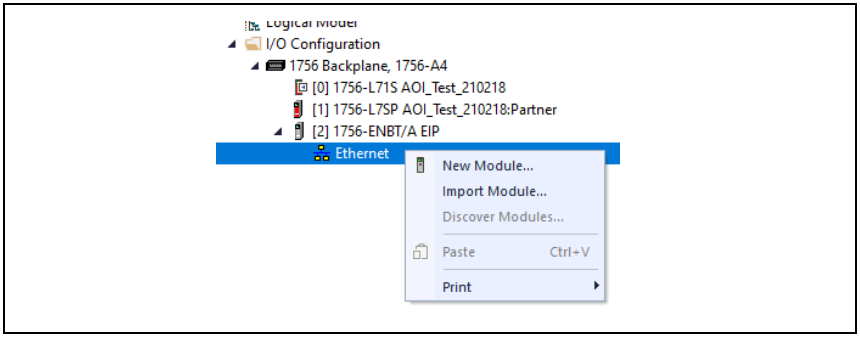
5. Open an internet browser and type in the IP address of the UGB-NET.
6. Navigate to 'Configuration' under the 'NETWORK' menu.
7. Set DHCP to 'Disabled' and click 'Save settings'



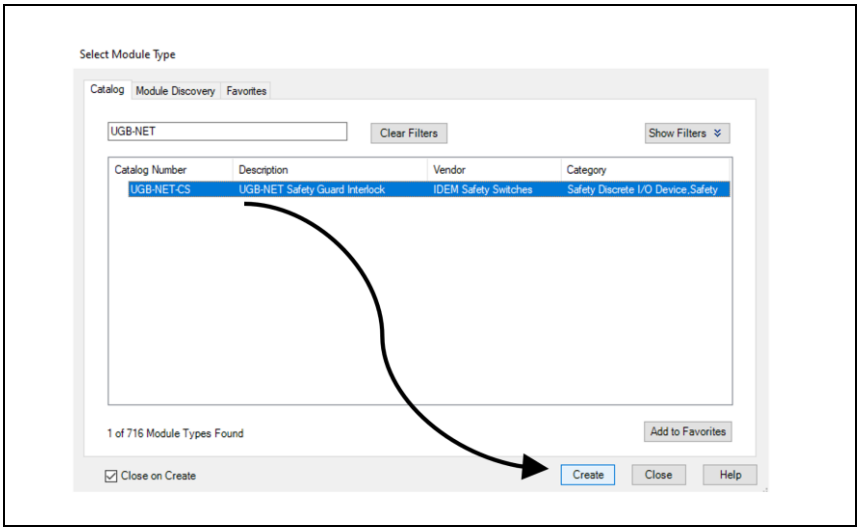
8. Cycle power to the UGB-NET or press and hold the reset button until the LEDs turn red then release to reset the device. The UGB-NET will restart with the configured IP address and with DHCP disabled.

Ethernet/IP Configuration – Studio 5000

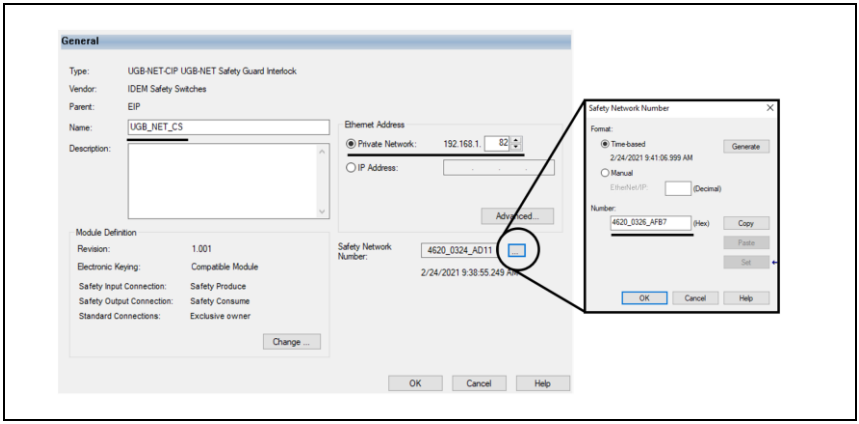
1. Download the EDS file for the UGB-NET and import to application control software.
2. Open or create a project with the PLC CPU, Partner and Ethernet/IP modules added.
3. Right click the Ethernet module and select 'New Module…'



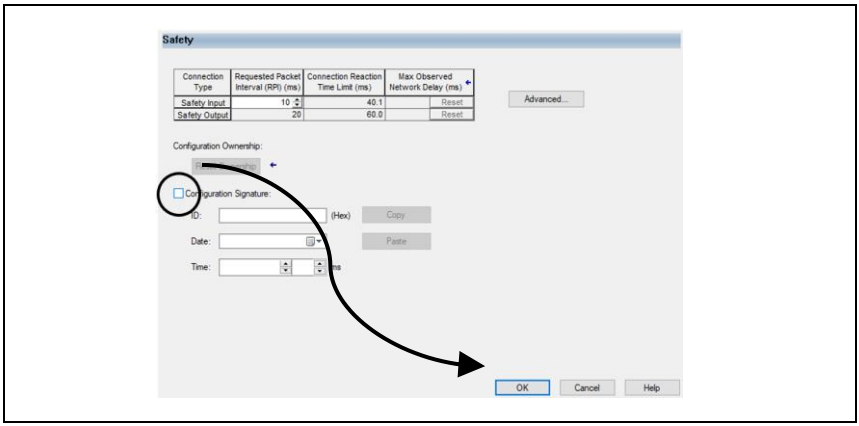
4. Find and select the UGB-NET (will only appear if EDS file imported correctly), click 'Create'.



5. Set the device name (customisable – 'UGB_NET_CS' used as example only) and set the previously configured IP address.
6. Change the Safety Network Number (SNN) to match that of the controller/PLC. Click 'Paste' to paste the PLC SNN then press 'Set' to apply to the UGB-NET.



7. On the 'Safety' tab, uncheck the 'Configuration Signature' box, press OK.



8. The UGB-NET can now be utilised in the PLC program according to the UGB-NET data mapping.

Factory reset – Studio 5000

1. Open UGB-NET Properties, navigate to the Connection Tab, tick 'inhibit connection' and apply
2. Navigate to the Safety tab and click reset ownership
3. When prompted enter the case-sensitive password 'IXXAT_SafeT100CS' press OK.
4. The UGB-NET will perform a device reset.

Studio 5000 may report a device timeout while the UGB-NET restarts.

The UGB-NET will restart with its SNN cleared.

Factory reset - Other

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

Functional Tests

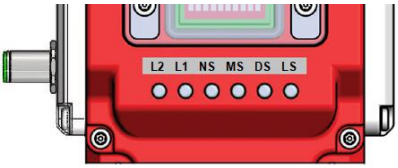
Once the device has been installed and setup within the EtherNet IP / CIP Safety application control software the following checks are necessary to ensure correct operation of the system.

- Expected operation of all control circuits.

7. Data Map

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

8. Diagnostic Indication



LED	Function	Colour
LS	Locking Switch Status	Red/Green
DS	Device Status	Red/Green
PS	Module Status	Red/Green
PN	Network Status	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
MS	Green	Connection to PLC, Run state
	Green Flash	Connection to PLC, Idle state
	Red	Major Fault
	Red Flashing	Recoverable fault, check PLC/UGB-NET configuration
NS	Off	No IP address set
	Green	Online, connection(s) established
	Green flash 1Hz	Online, no connections established
	Red	Network fault
	Red flash	Connection timed out.
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.

9. 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 Bucureşti Oras, Bragadiru, Strada Crişu 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 ISO 13849-1	:2023		
	EN 62061	:2021	(IEC 62061	:2021)
	EN 61508 (Parts 1-7)	:2010		
	EN 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