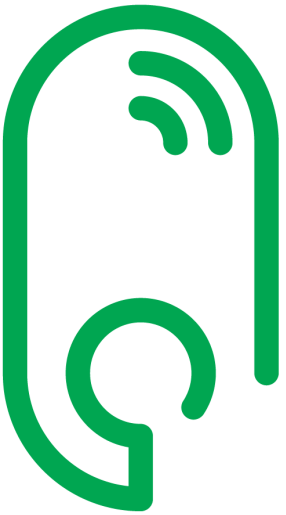
Harmony eXLhoist

Wireless Remote Control System
User Guide

04/2014



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The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

Table of Contents

Safety Information

Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a Danger safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Book

At a Glance

Document Scope

This manuel describes how to use the Wireless Remote Control System.

Validity Note

The technical characteristics of the devices described in this document also appear online. To access this information online:

Step	Action
1	Go to the Schneider Electric home page *www.schneider-electric.com*.
2	In the **Search** box type the reference of a product or the name of a product range. ● Do not include blank spaces in the model number/product range. ● To get information on grouping similar modules, use asterisks (*).
3	If you entered a reference, go to the **Product datasheets** search results and click on the reference that interests you. If you entered the name of a product range, go to the **Product Ranges** search results and click on the product range that interests you.
4	If more than one reference appears in the **Products** search results, click on the reference that interests you.
5	Depending on the size of your screen, you may need to scroll down to see the data sheet.
6	To save or print a data sheet as a .pdf file, click **Download XXX product datasheet**.

The characteristics that are presented in this manual should be the same as those characteristics that appear online. In line with our policy of constant improvement, we may revise content over time to improve clarity and accuracy. If you see a difference between the manual and online information, use the online information as your reference.

Related Documents

Title of Documentation	Reference Number
Instruction Sheet System XARS8L	HRB57247
Instruction Sheet System XARS•D	HRB57248
Instruction Sheet Accessory Charger	HRB57251
Instruction Sheet Accessory Soft & Cables	HRB57273
Instruction Sheet Accessory Shoulder Harness	HRB57274

Title of Documentation	Reference Number
Instruction Sheet Accessory Remote Holder	HRB57277
Instruction Sheet Accessory Rubber Protection	EAV52994
Instruction Sheet Accessory Pad & Trigger	EAV52985
Instruction Sheet Accessory External Antenna	EAV59906

You can download these technical publications and other technical information from our website at www.schneider-electric.com.

Product Related Information

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Disconnect all power from all equipment including connected devices prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, connectors or wires except under the specific conditions specified in this user guide.
- Always use a properly rated voltage sensing device to confirm that the power is off.
- Unplug the power cable from both the equipment and the power supply.
- Replace and secure all covers, accessories, hardware, cables, and wires and confirm that a proper ground connection exists before applying power to the equipment.
- Use only the specified voltage when operating this equipment and any associated products.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Do not open the Remote Device.
- Do not replace internal parts of the Base Station.
- After a Base Station power off, wait until the STATUS LED becomes OFF (around 20 seconds) before removing the cover.
- Always comply with the local requirements regarding installation and use of the hoisting devices.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Only use software approved by Schneider Electric for use with this equipment.
- Update your application program every time you change the hardware configuration.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE:

To increase the system security, it is recommended to use Configuration File transfer password.

Battery Warning Notes

Carefully read all instructions in this user guide, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it.

For more information, contact us at *www.schneider-electric.com* or contact your local reseller.

⚠ WARNING

EXPLOSION, FIRE, OR CHEMICAL HAZARD

- Electric devices that have reached the end of their life must be collected separately and returned to an environmentally compatible recycling facility in accordance with national law.
- In case of electrolyte leak from battery, use adapted safety equipment and put the device in a sealed package.
- If you come into contact with electrolyte, immediately thoroughly wash the involved parts with clear water and call medical assistance.
- Do not incinerate the device.
- Do not drop or hit the device.
- Do not use a damaged device.
- The Remote Device battery is a 1Ah LiFePO4 battery. Do not replace it by yourself. In case of Remote Device battery malfunction or for any maintenance, contact us at *www.schneider-electric.com* or contact your local reseller.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: Advice to improve battery life:

- Charge the battery before device requires it.
- Charge the battery with room temperature within 10…40 °C (50…104 °F).
- Charge the battery once in every six months if you do not use it for a long time.

Chapter 1
Wireless Remote Control System

What Is in This Chapter?

This chapter contains the following topics:

Wireless Remote Control System Overview

Overview

The Harmony™ eXLhoist range of wireless remote control systems is an operator control station used in hoisting and material handling applications.

The Wireless Remote Control System is based on 2 types of devices:

- Remote Device (or transmitter), which is the operator command device to interface with the machine.
- Base Station (or receiver), which is hardwired to the machine. It receives control commands from the Remote Device and transmits information to the operator.

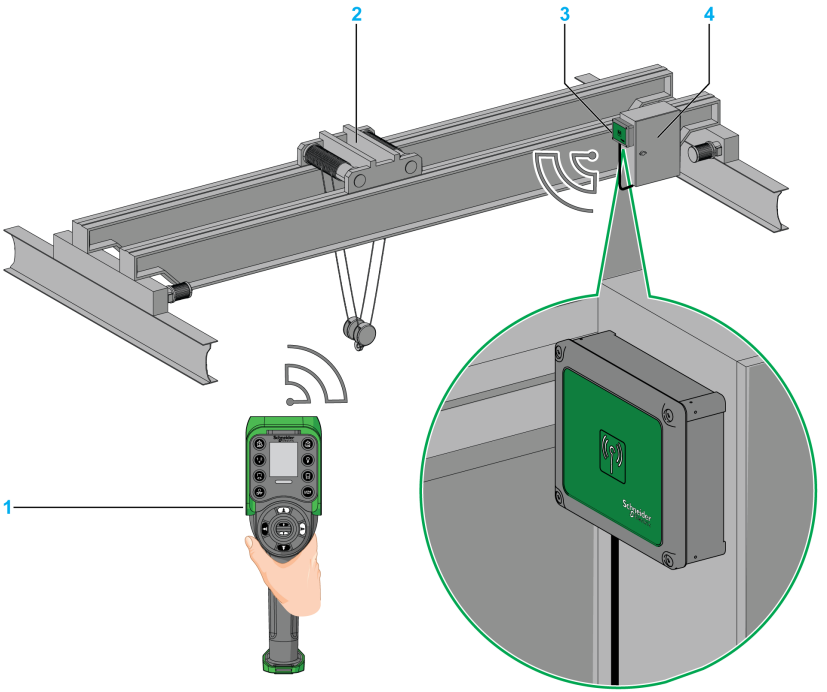
The Wireless Remote Control System is a combination of these devices which communicate by radio transmission.

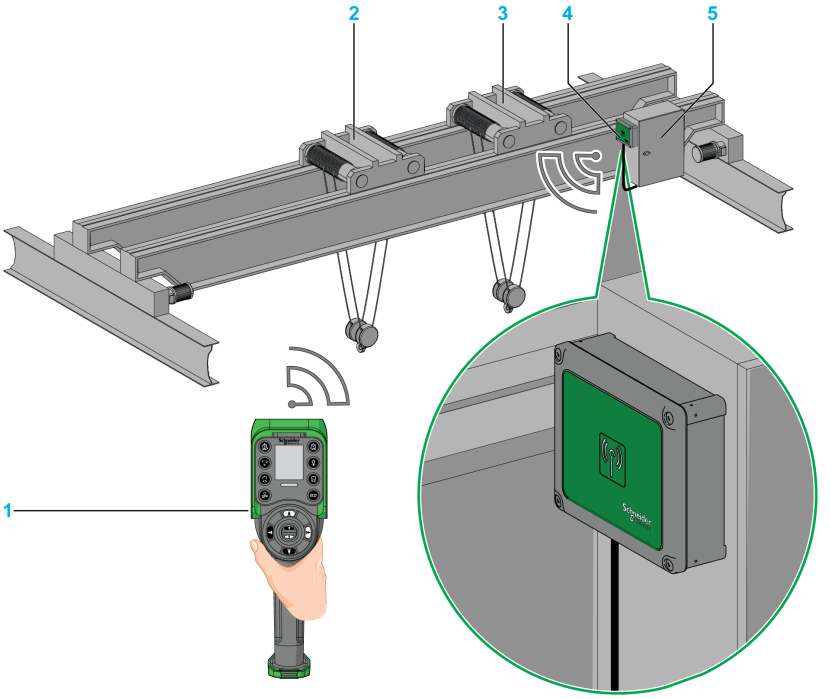
Radio Communication

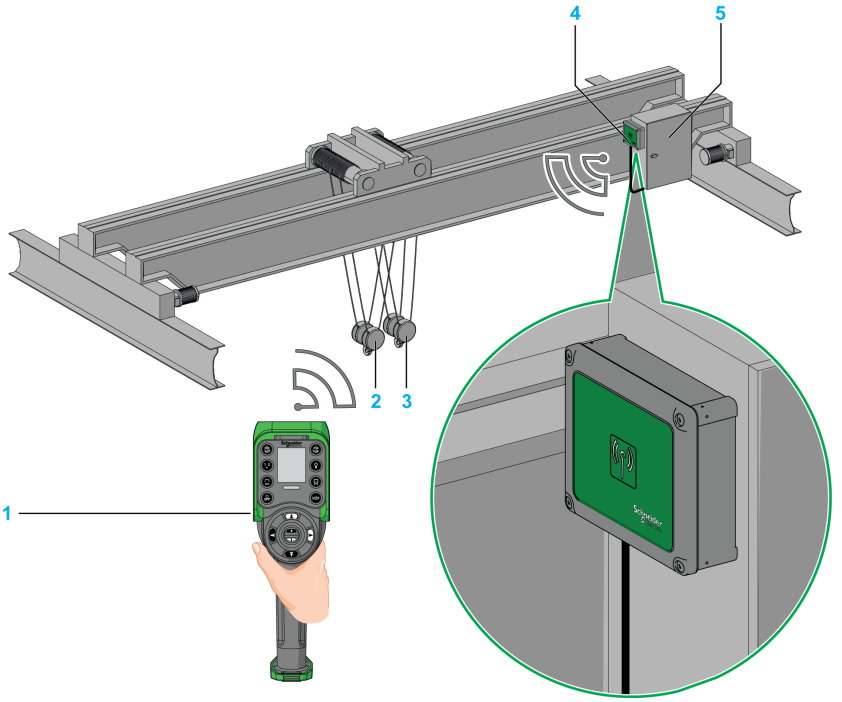
Each Base Station have a unique ID managed by Schneider Electric. It permits up to 50 single systems working at same time without perturbation in a 100 x 100 meter area.

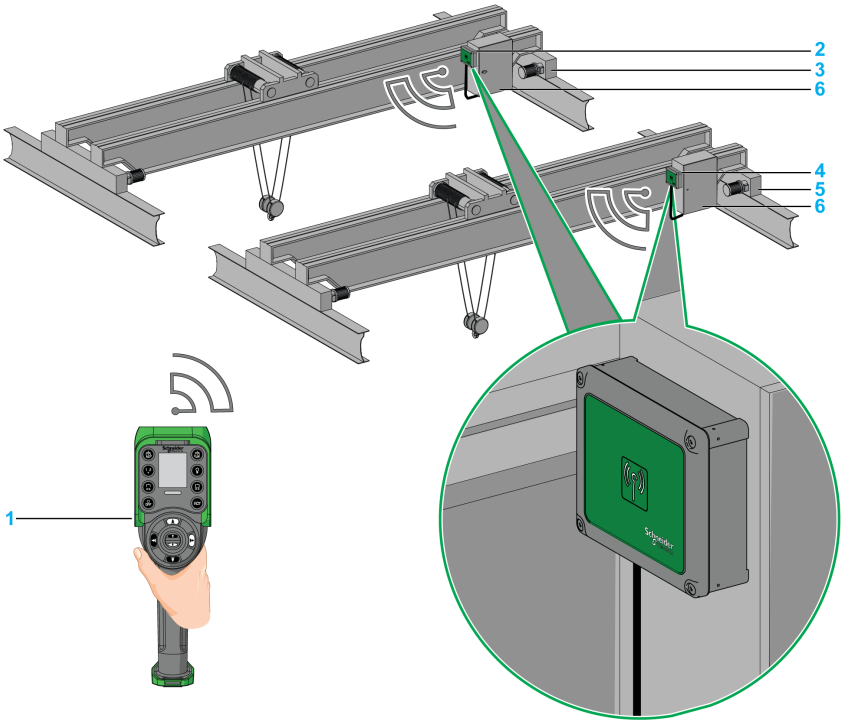
Main Applications

Example of overhead traveling crane:

Type	Description
SINGLE With 1 trolley	The Remote Device controls one trolley.  **1** Remote Device **2** Trolley **3** Base Station **4** Electrical cabinet

Type	Description
SINGLE With 2 trolleys	By using the selector button, the Remote Device separately controls the trolley 1, trolley 1+2 or the trolley 2.  **1** Remote Device **2** Trolley 1 **3** Trolley 2 **4** Base Station **5** Electrical cabinet

Type	Description
SINGLE With 2 hooks	By using the selector button, the Remote Device separately controls the hook 1 or the hook 2.  **1** Remote Device **2** Hook 1 **3** Hook 2 **4** Base Station **5** Electrical cabinet

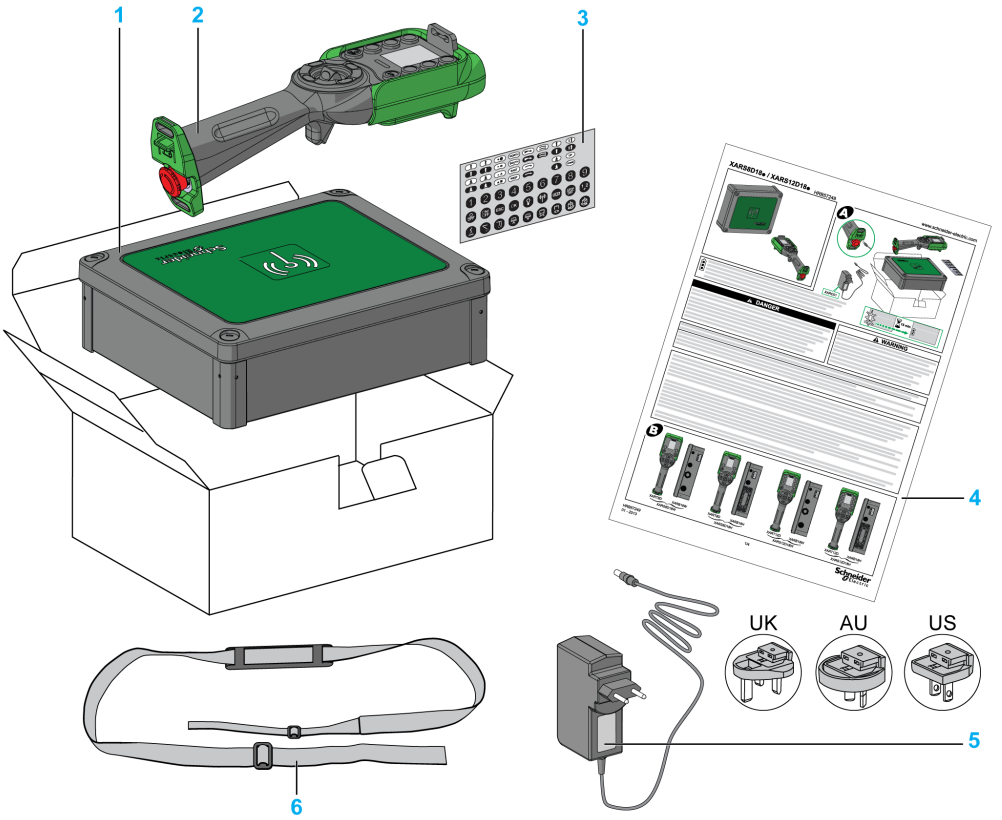
Type	Description
TANDEM*	By using the selector button, the Remote Device separately controls the bridge 1, bridge 1+2 or the bridge 2.  **1** Remote Device **2** Base Station 1 **3** Bridge 1 **4** Base Station 2 **5** Bridge 2 **6** Electrical cabinets

*: TANDEM mode will be available on Q4 2014

Package Contents

Overview

Applicable items included in the package:



1 Base Station
2 Remote Device
3 Set of labels to customize the Remote Device buttons
4 Instruction Sheet
5 Charger of the Remote Device battery (only in starting kits)
6 Shoulder belt for the Remote Device (only in starting kits)

Parts Identification and Main Features

Wireless Remote Control System Overview

The Wireless Remote Control System is a combination of 2 kinds of devices:

Base Station:

References	ZARB12W	ZARB12H	ZARB18W	ZARB18H
Connectors	Cable gland for wires	Industrial plug type	Cable gland for wires	Industrial plug type
No. of inputs	0		18	
No. of relays	12		18	

Remote Device:

Features	ZART8L	ZART8D	ZART12D
Number of configurable buttons	8	8	12
Operator interface	LEDs	Display	Display

Therefore, 3 levels of complexity for Wireless Remote Control System:

Complexity level description	Reference		
	Wireless Remote Control System	Remote Device	Base Station
Basic system: For simple applications, which include up to 2 auxiliary buttons	XARS8L12W	ZART8L	ZARB12W
	XARS8L12H	ZART8L	ZARB12H
Extended system: For adapted applications which include up to 2 auxiliary buttons	XARS8D18W	ZART8D	ZARB18W
	XARS8D18H	ZART8D	ZARB18H
Complex system: For complex applications which include up to 6 auxiliary buttons	XARS12D18W	ZART12D	ZARB18W
	XARS12D18H	ZART12D	ZARB18H

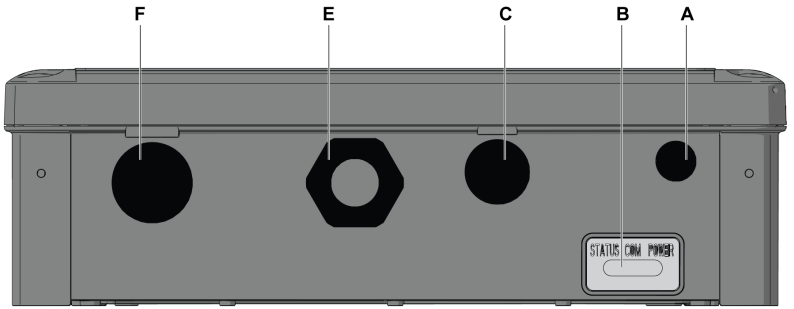
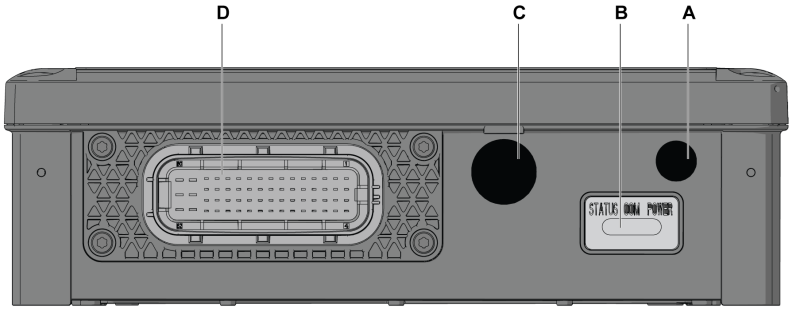
NOTE: Extended and complex systems (XARS•D) can support TANDEM mode *(see page 15)*.

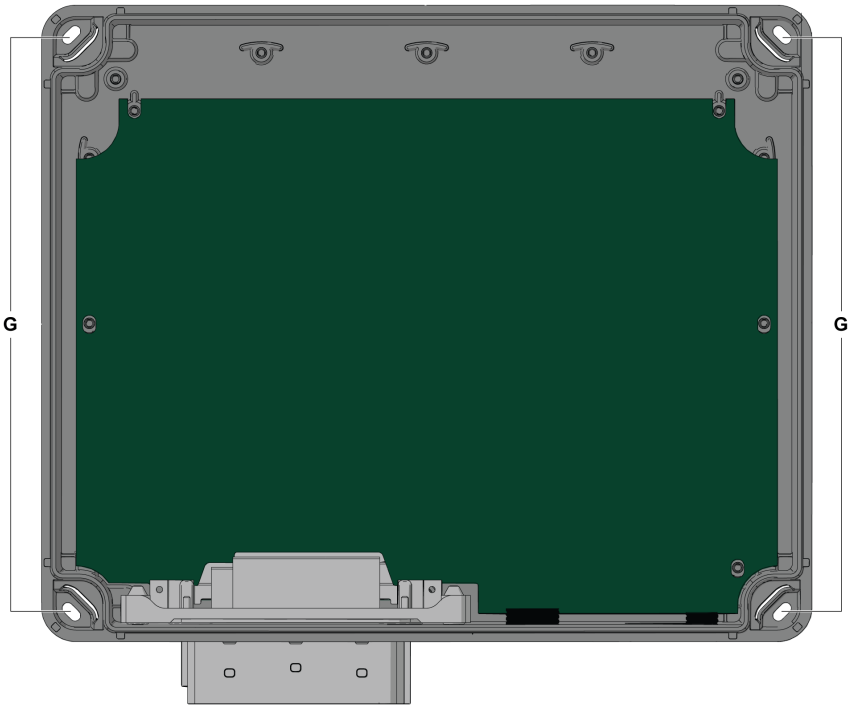
Starting kits:

Reference		
Starting Kit	System	Accessories
XARSK8L12W	XARS8L12W	ZARC01 + ZARC02
XARS8KL12H	XARS8L12H	ZARC01 + ZARC02
XARS8KD18W	XARS8D18W	ZARC01 + ZARC02

Reference		
Starting Kit	**System**	**Accessories**
XARS8KD18H	XARS8D18H	ZARC01 + ZARC02
XARSK12D18W	XARS12D18W	ZARC01 + ZARC02
XARSK12D18H	XARS12D18H	ZARC01 + ZARC02

Base Station Parts Identification

Side	Description
Front ZARB•W	
Front ZARB•H	

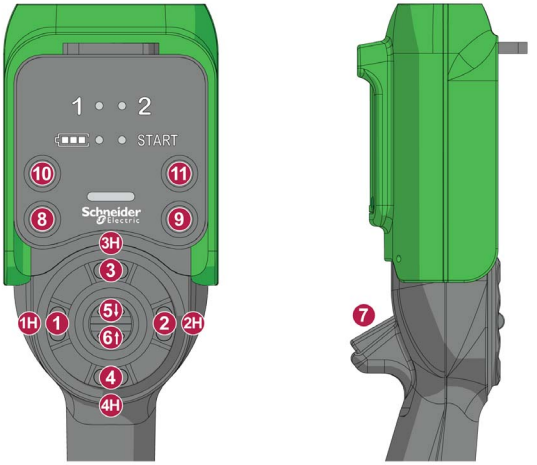
Side	Description
Rear without the cover	

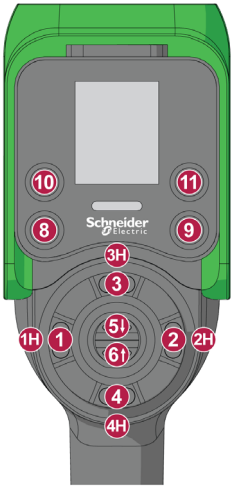
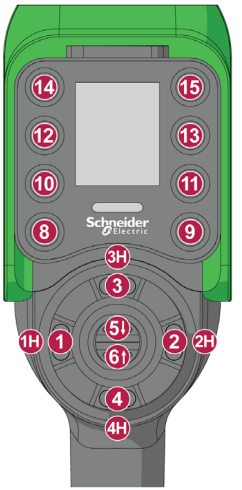
Part	Description
A	M12 for external antenna (covered by cap)
B	Status LEDs
C	M20 for the safeguarding function input wires (covered by cap)
D	62 pins connector (covered by cap)
E	M25 for output wires (covered by cable gland)
F	M25 for detected applicative alarms input wires (covered by cap)
G	4 holes for standard mounting on support (covered by cap)

Base Station Main Features

References	ZARB12W	ZARB12H	ZARB18W	ZARB18H
Radio communication	Yes			
External antenna connector	Yes			
Connectors	Cable gland for wires	Industrial plug type	Cable gland for wires	Industrial plug type
Q0 safety relays outputs	2 (Q0_A, Q0_B)			
IN0 / S2_S3 feedback loop terminals for mirror contacts from safety actuator	1			
Configurable inputs for detected applicative alarms	0		6 (IN1…IN6)	
Inputs dedicated for safeguarding function	0		12 (IN7…IN18)	
Motion & auxiliary standard relays	12 (Q1…Q12)		18 (Q1…Q18)	
Power supply	24…240 V ac/dc	24…48 V ac/dc	24…240 V ac/dc	24…48 V ac/dc
Current consumption	AC: 535…250 mA, 50/60 Hz DC: 328…44 mA	AC: 535…312 mA, 50/60 Hz DC: 328…155 mA	AC: 535…250 mA, 50/60 Hz DC: 328…44 mA	AC: 535…312 mA, 50/60 Hz DC: 328…155 mA
System earthing	TN, TT, IT			
Q0_A contact voltage	24…240 V ac/dc	24…48 V ac/dc	24…240 V ac/dc	24…48 V ac/dc
Q0_B contact voltage				
Motion / auxiliary contact voltage used by group				
Motion / auxiliary contact group	• Q1…Q3 • Q4…Q6 • Q7…Q9 • Q10…Q12		• Q1…Q3 • Q4…Q6 • Q7…Q9 • Q10…Q12 • Q13…Q16	
Motion / auxiliary relay in NO+NC type	-		Q17, Q18	

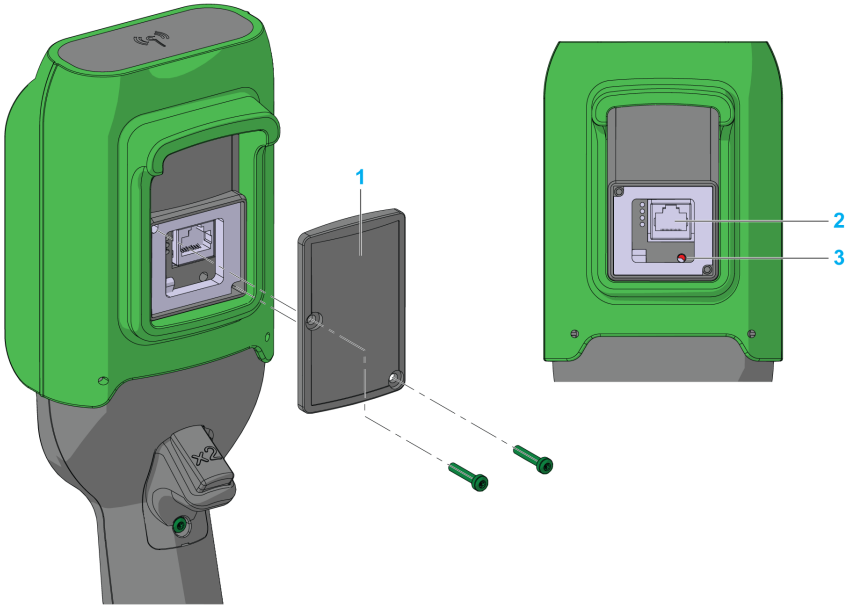
Remote Device Front View Parts Identification

ZART8L


ZART8D	ZART12D
	

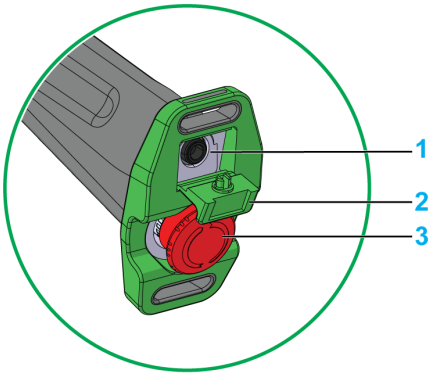
Part	Description
1, 1H, 2, 2H, 3, 3H, 4, 4H, 5, 6	Motion buttons
7	Trigger button
8	OFF/STOP button
9	ON/START/Horn button
10,11,12,13,14,15	Auxiliary buttons

Remote Device Rear View Parts Identification



1 Cover
2 RJ45 connector
3 Reset button

Remote Device Bottom Display Parts Identification



1 Remote Device battery charge connector
2 Protective plug
3 E-STOP button

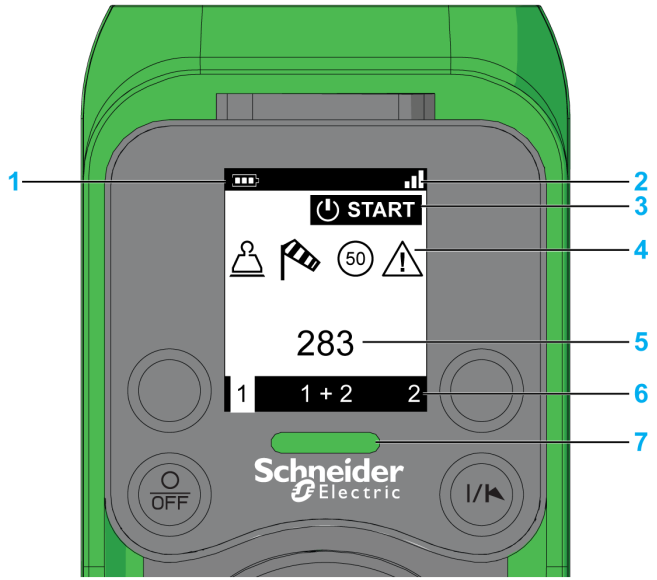
⚠ DANGER

OBSTRUCTED PUSH-BUTTON MOTION

Ensure push-button will fully operate.

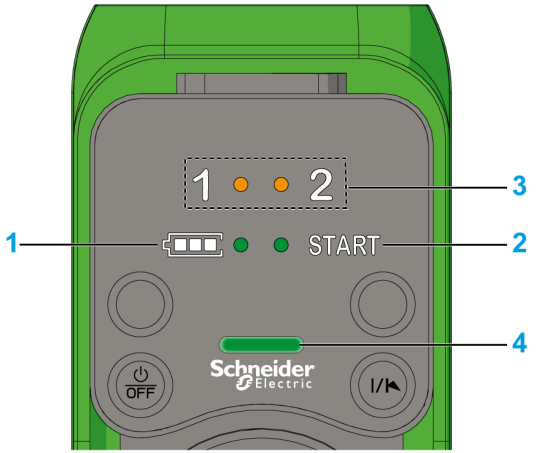
Failure to follow these instructions will result in death or serious injury.

ZART•D Display Parts Identification



1 Battery level
2 Radio communication level
3 Operating status
4 Bridge label
5 Detected applicative alarms
6 Selector status
7 E-STOP LED

ZART8L Display Parts Identification



1 Battery level LED
2 START LED
3 Selector LEDs
4 E-STOP LED

Remote Device Functionalities

Description	ZART8L	ZART8D	ZART12D
Number of configurable buttons	8	8	12
OFF/STOP button	Yes		
ON/START/Horn button	Yes		
Motion & Stop function	Yes		
Selector 2 or 3 positions (1, 1+2, 2)	Yes		
E-STOP function	Yes		
Optional E-STOP reset code sequence	Yes		
Optional START code sequence	Yes		
Optional automatic STOP function after a time-out	Yes		
Optional automatic Power OFF function after a time-out	Yes		
Information LEDs	Yes	No	
Display function	No	Yes	
Vibrate facility function in case of detected applicative alarms	No	Yes	
Embedded accelerometer	Yes		

Certifications and Standards

Environment

The Wireless Remote Control System devices are compliant with:

- WEEE, directive 2002/96/EC
- REACH, regulation 1907/2006
- RoHS, directive 2011/65/EU

Overall Standards

Criteria	Level
Principles of design for safety	EN IEC 60204-1 EN ISO 13849-1 EN ISO 13849-2 EN IEC 62061 EN IEC 61508 EN ISO 13850
Specific standards for hoisting applications	EN IEC 60204-32 EN 13557
Low voltage equipment	EN IEC 61010-1 EN IEC 60947-5-1 EN IEC 60947-5-4 EN IEC 60947-5-5
Electromagnetic compatibility	IEC 61000-6-2
Transmission frame format	EN 60870-5-1

Local Standards and Certifications

Schneider Electric submitted this product for independent testing and qualification by third party listing agencies.

Criteria	Description
CE marking	Machinery directive 2006/42/EC Low voltage directive 2006/95/EC EMC directive 2004/108/EC R&TTE directive 1999/05/EC
Low voltage equipment	EN 50178
European specific standards for hoisting applications	EN 13557 EN 12077-2 EN 15011
European specific standards for hoisting machines	EN 15011 (overhead traveling cranes) EN 14439 (tower cranes) EN 14492 (block hoists and winches)

Criteria	Description
Countries certifications (electrical devices)	CCC UL508 for base + UL functional safety CSA C22-2 n° 14 Gost C-tick KC
US-specific standards for safety	UL 1998 (Covered by IEC 61508) UL 991
Canadian specific standards for safety	CSA 22.2 N° 0.8 (Covered by UL 991)
Standards for radio frequencies	ETSI EN 301 489 -1 ETSI EN 301 489 -3 ETSI EN 301 489-17 ETSI EN 300 440-2 ETSI EN 300 328 FCC part 15 RSS GEN issue 3 RSS 210 issue 8 ARIB STD-T81

Radio Frequencies Certification

The eXLhoist devices have obtained, or in the process of obtaining, the radio frequency conformity delivered by the following certification organisms:

Certification organism	Certification organism country	Certification marks
CNC	Argentine	**Trademark:** **xxx** **Model (Type designation):** **xxx** **Registration number:** **(Example: 51-2970)** **Serial number:** **xxx**
RCM	Australia/New-Zealand	See on the device
ANATEL	Brazil	See on www.schneider-electric.com.
IC	Canada	See on the device
SUBTEL	Chili	See on the device

Certification organism	Certification organism country	Certification marks
SRRC	China SRRC	See on the device
SDPPI	Indonesia	
Technical Conformity Mark	Japan	See on the device
SIRIM	Malaysia	See on the device
COFETEL	Mexico	See on the device
ictQATAR	Qatar	
EAC	Russia	See on the device
IDA	Singapore	
ICASA	South Africa	See on the device
KCC	South Korea	See on the device
NCC	Taiwan	See on the device
NTC SDoC	Thailand	See on *www.schneider-electric.com*.

Certification organism	Certification organism country	Certification marks
TRA	United Arab Emirates	
FCC	USA	See on the device

Accessories

Base Station Accessories

Reference	Description
ZARC03	External antenna for Base Station: The use of this accessory allows an increase of the radio range in severe environment conditions.
ZARC05	Connector plug female with cable 1.5 m (4.92 ft) for ZARB•H
ZARC06	Cable gland kit with wire grommets
ZARC09	Kit silent bloc: Use this accessory in case of applications with severe vibration constraints.
NSYAEFTB	Optional mounting: Use this accessory for external mounting on support (x4). To be assembled on box before mounting on support.
ZARC12	Connector plug female with cable 3 m (9.84 ft) for ZARB•H
ZARC18	Connector plug female with cable 5 m (16.4 ft) for ZARB•H

Remote Device Accessories

Reference	Description
ZARC01	Charger
ZARC02	Shoulder belt
ZARC04	Holder
ZARC07	Kit of adhesive labels in B/W for Remote Device
ZARC08	Kit of adhesive labels in color for Remote Device and hoisting system
ZARC20	Kit of pad and trigger
ZARC21	Rubber protection

Chapter 2
Specifications

What Is in This Chapter?

This chapter contains the following sections:

Section 2.1
Base Station Specifications

What Is in This Section?

This section contains the following topics:

Base Station Specifications

Environment

The Base Station specifications are described in the table:

Specifications	Details	Value	
		ZARB•H	ZARB•W
Product certifications	-	CE, UL/CSA, CCC, Gost	
Environment	-	RoHS compliant	
Life time	-	10 years	
Degree of protection	-	IP65	
Degree of pollution	-	3	
Operating temperature	For 24…48 V ac/dc power supply	-25…70 °C (-13…158 °F)	
	For 48…130 V ac/dc power supply	-	-25…70 °C (-13…158 °F)
	For 130…240 V ac/dc power supply	-	-25…50 °C (-13…122 °F)
Storage temperature (for 1 year)	-	-40…70 °C (-40…158 °F)	
Corrosive atmosphere withstands	IEC-60721-3-3	Level 3C2 on H_2S / SO_2 / NO_2 / Cl_2	
Fire withstands	Power on parts	960 °C 30s / 30s according to IEC 60695-2-10 and IEC-60695-2-11	
	Other parts	650 °C 30s / 30s according to IEC 60695-2-10 and IEC-60695-2-11	
Salt mist	IEC 60068.2.52	Severity 2	
Operating humidity range	-	0...97%	
Storage humidity range	-	0...97%	
Altitude	Operation Storage	0...2000 m (0...6561.7 ft) 0...3000 m (0...9842.5 ft)	
Vibration resistance	IEC-60068-2-6 Use NSYAEFTB silent bloc in case of applications with severe vibration constraints	10…55 Hz, amplitude 0.75 mm, Acceleration 9.8 m/s² (1 gn)	
Shock resistance	According to IEC 60068-2-27	147 m/s² (15 gn), for 11 ms	
Power supply Over voltage category	-	OVC 2	
Voltage dips	IEC-61000-4-11	10 ms	
Resistance to electrostatic discharges	IEC 61000-4-2	4 kV on contact 8 kV in air	

Specifications	Details	Value	
		ZARB•H	ZARB•W
Resistance to radiated fields	IEC 61000-4-3	10 V/m	
Immunity to fast transient	IEC 61000-4-4	Power line: 4 kV (direct) Outputs: 4 kV (direct) Inputs: 2 kV (coupling)	
Surge immunity	IEC 61000-4-5 between the ground and power supply wires (Common mode)	2 kV	
	IEC 61000-4-5 between the power supply wires (Differential mode)	1 kV	
Immunity to conducted magnetic fields	Conforming to IEC-61000-4-6	10 V from 150 kHz to 80 MHz	
Emission disturbances	Conducted & radiated disturbances	Class B	

Safety Specifications

The main safety specifications are described in the table:

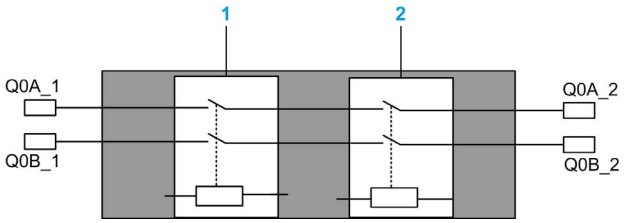
Specifications	Details	Value
Safety relays function Safety specifications	According to IEC 61508 Ed2	Up to SIL3 capability
	According to IEC 62061 Ed1	Up to SIL3 CL capability
	EN ISO 13849-1	Up to performance level “e” Up to category 4
	Stop category according to IEC 60204-32	Category 0
Motion relays function Safety specifications	According to IEC 61508 Ed2	SIL1 capability
	According to IEC 62061 Ed 1	SIL1 CL capability
	EN ISO 13849-1	Performance level “c” Category 1
	Stop category according to IEC 60204-32	Category 0 or 1
IN7...IN18 safeguarding inputs	According to IEC 61508 Ed2	SIL1 capability
	According to IEC 62061 Ed 1	SIL1 CL capability
	EN ISO 13849-1	Performance level “c” Category 1
	Stop category according to IEC 60204-32	Category 0 or 1

Safety Relays

The safety relays specifications are described in the table:

Specifications	Details	Value	
		ZARB•H	ZARB•W
Number of contacts	The Base Station internally implements 2 safety relays in serial. Each safety relay has 2 contacts.	2	
Logical type	-	NO	
Insulation between Q0A and Q0B	-	SELV insulation between (Q0A1, Q0A2) and (Q0B1, Q0B2) for voltage up to 240 Vac	
Q0A voltages	-	Up to 48 Vac	24...240 Vac
Q0B voltages	-		
Q0A, Q0B Maximum Ie current 24...240 Vac	-	4 A	6 A
Relay type according to EN/IEC 60947-5-1	AC15	C300	B300
	DC13	-	R300
Maximum making and breaking capacities (100.000 cycles) AC15 / AC current according to EN/IEC 60947-5-1	24 Vac	0.75 A	
	48 Vac	0.38 A	
	120 Vac	-	0.15 A
	240 Vac	-	0.08 A
	Inrush	450 VA	
	Maintained	45 VA	
Maximum making and breaking capacities (100.000 cycles) DC13 / DC current according to EN/IEC 60947-5-1	24 Vdc	0.6 A	
	48 Vdc	0.3 A	
	120 Vdc	-	0.12 A
	240 Vdc	-	0.06 A
	Make	14.4 VA	
	Break		
Minimum output current	The minimum current is compatible with the STO Schneider Electric drive input impedance of 1.5 kΩ which means a current of 24 V/1.5 kΩ = 16 mA.	10 mA / 24 Vdc	

Safety relays internal wiring:



1 Safety relay 1
2 Safety relay 2

Motion/Auxiliary Relays

The motion/auxiliary relay specifications are described in the table:

Specifications	Details	Value			
		ZARB12H	ZARB12W	ZARB18H	ZARB18W
Number of motion/auxiliary relays	-	12		18	
Normally open (N0) relays	-	12 (Q1…Q12)		16 (Q1…Q16)	
Normally open + normally closed (N0+NC) relays	-	0		2 (Q17, Q18)	
Nominal output voltage	-	24…48 V ac/dc ±20%	24…240 V ac/dc ±20%	24…48 V ac/dc ±20%	24…240 V ac/dc ±20%
Relay type according to EN/IEC 60947-5-1	AC15	B300			
	DC13	R300			
Maximum making and breaking capacities 1 000 000 cycles for NO contacts 500 000 cycles for NC contacts AC15 / AC current according to EN/IEC 60947-5-1	24 Vac	1.08 A			
	48 Vac	0.54 A			
	120 Vac	-	0.22 A	-	0.22 A
	240 Vac	-	0.11 A	-	0.11 A
	Inrush	260 VA			
	Maintained	26 VA			
Maximum making and breaking capacities 1 000 000 cycles for NO contacts 500 000 cycles for NC contacts DC13 / DC current according to EN/IEC 60947-5-1	24 Vdc	0.1 A			
	48 Vdc	0.05 A			
	120 Vdc	-	0.02 A	-	0.02 A
	240 Vdc	-	0.01 A	-	0.01 A
	Make	5 VA			
	Break	5 VA			
Minimum output current	6.8 mA with 24 Vdc voltage	6.8 mA			
Maximum operating rate	-	2 Hz			

Specifications	Details	Value			
		ZARB12H	ZARB12W	ZARB18H	ZARB18W
Maximum operating rate	-	2 Hz			
Weight	-	1340 kg (2954 lb.)	1360 kg (3644 lb.)	1430 kg (3831 lb.)	1450 kg (3885 lb.)

Power Supply

NOTICE

INOPERABLE EQUIPMENT

The ZARB•H Base Station must be powered with a voltage:

- From 24 Vac -15% to 48 Vac +10% with frequency of 50 Hz -6%/+4% and frequency of 60 Hz -6%/+4%.
- From 24 Vdc -15% to 48 Vdc +20%.

The ZARB•W Base Station must be powered with a voltage:

- From 24 Vac -15% to 240 Vac +10% with frequency of 50 Hz -6%/+4% and frequency of 60 Hz -6%/+4%.
- From 24 Vdc -15% to 240 Vdc +20%.

Failure to follow these instructions can result in equipment damage.

Protective Earth Ground

The PE must be connected to the machine to protect against maloperation due to earth faults (IEC 60204-1, Protection against maloperation due to earth faults).

The PE must be connected to the machine ground (IEC 60204-1, protection against electric shock). If not then the Base Station inputs voltage (IN_COM, S2_S3, IN0…IN18) could increase to a dangerous voltage because of the possible static electricity induced by the machine motions.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Connect the Base Station protective earth ground connection to the machine ground.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

IN0

The IN0 input specifications are:

- Static input type
- Current source logic
- Compatible only with 2 wiring:
  - Connection of IN0 to one side to the auxiliary contact of the main contactor and connection of S2_S3 output port to the other side of the auxiliary contact of the main contactor.
  - Direct connection to the S2_S3 output.
- 20 mA typical pulsed input current

IN1…IN18

The IN1 to IN18 input specifications are:

- Static input type
- Current source logic
- Compatible only with 2 wiring:
  - Connection of INi (i=1…18) in one side of a dry contact and connection of IN_COM output to the other side of the dry contact.
  - No INi (i=1…18) connection.
- 20 mA typical pulsed input current

Response Time

Input/Output	Maximum response time (ms)
E-STOP	300
STOP	300
Motion/Auxiliary	300
Selector	300
Input	300

You shall choose the contactors/drives in such way that the process safety time shall be less than 550 ms maximum to be in accordance with the IEC 60204-32.

RADIO Specification

RADIO Specification

Specification	Details	Value
Frequency of radio communication	International frequency range	2.4 GHz
Number of working systems in the same area	-	Up to 50 systems in a 100 x 100 meter area
Radio range	In free field	Up to 100 m (328 ft)
	In industrial environment	Up to 50 m (164 ft) typical
Antenna	(Possible ZARC03 external antenna use)	Internal
Working channel selection	No impact for the customer (during installation, use and maintenance)	Up to 40 channels
ID	-	MAC address reserved by Schneider Electric

FCC USA and IC Canada Compliance Statement

This device complies with part 15 of the FCC Rules and Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

1) This device may not cause harmful interference, and

2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1) *l'appareil ne doit pas produire de brouillage, et*

2) *l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The base complies with FCC's radiation exposure limits set forth for an uncontrolled environment under the following conditions:

1) This equipment should be installed and operated such that a minimum separation distance of 20 cm is maintained between the radiator (antenna) and user's/nearby person's body at all times.

2) This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The remote device with it's antenna complies with FCC's radiation exposure limits set forth for an uncontrolled environment. To maintain compliance, follow the instructions below:

1) This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

2) Avoid direct contact to the antenna, or keep contact to a minimum while using this equipment.

Under Industry Canada regulations, these radio transmitters may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. These radio transmitters (IC:7002CZARB and IC:7002CZART) have been approved by Industry Canada to operate with the antenna type ZARC03 with the maximum permissible gain and required antenna impedance. Any other antenna types having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Conformément à la réglementation d'Industrie Canada, les présents émetteurs radio peuvent fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. Les présents émetteurs radio (identifier IC:7002CZARBo and IC:7002CZARTo) ont été approuvé par Industrie Canada pour fonctionner avec le type d'antenne ZARC03 ayant un gain admissible maximal et l'impédance requise. D'autres types d'antenne non dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Product reference	Maximum gain of internal antenna (dB)	Maximum gain of external antenna (dB) (including cable)	Allowed impedance (Ω)
ZART8L	4.5	–	50
ZATL8D	5.5		
ZART12D			
ZARB12H	4.5	1	
ZARB12W			
ZARB18H			
ZARB18W			

Any changes or modifications not expressly approved by Schneider Electric could void the user's authority to operate the equipment.

Section 2.2
Remote Device Specifications

What Is in This Section?

This section contains the following topics:

Remote Device Specifications

Environment

Specification	Details	Value
Product certifications	-	CE, UL/CSA, CCC, Gost
Safety certification	-	TÜV, UL safety
Battery life time	Conforming to IEC-62133	> 2 years
Battery type	-	LiFePO4 3.3 V / 1 Ah
Mechanical life	Motion buttons	5 000 000 cycles
Mechanical life	Auxiliary buttons	5 000 000 cycles
Temperature	Storage (for 1 year)	-20…45 °C (-4…113 °F)
	Operating	-20…60 °C (-4…140 °F)
Relative humidity	Operating/Storage	-25…60 °C (-13…140 °F), 0%...95%, without condensation
Corrosive atmospheres resistance	IEC 60721-3-3	Level of 3C2 on H_2S / SO_2 / NO_2 / Cl_2
Degree of protection	-	IP65 and NEMA type 4
Altitude	Operation Storage	0...2000 m (0...6561.7 ft) 0...3000 m (0...9842.5 ft)
Vibration resistance	Conforming to IEC 60068-2-6	10…55 Hz, amplitude 0.75 mm, acceleration 15 gn
Shock resistance	Conforming to IEC 60068-2-27	100 gn
Mechanical protection	-	Bumper
Resistance to electrostatic discharges	Conforming to IEC 61000-4-2	4 kV on contact 8 kV in air
Resistance to radiated fields	Conforming to IEC 61000-4-3	10 V/m
Immunity to fast transient	Conforming to IEC 61000-4-4	1 kV, on power supply
Immunity to power frequency magnetic field	-	30 A/m minimum
Mechanical materials	-	Bumper in onflex material
Housing visibility	-	Green color
Weight	-	594 g (21 oz)

Remote Device Charger Specification

Environment

Specification	Value
Location to be used	Residential, commercial, and light-industrial environment (IEC 61000-6-3)
Product certifications	CE, UL/CSA, CCC, Gost
Degree of protection	IP2x
Degree of pollution	2
Operating temperature	10…40 °C (50…104 °F)
Storage temperature (for 1 year)	-20…60 °C (-4…140 °F)
Primary supply voltage	240 Vac +/-20% 110 Vac +/-20%
Secondary output voltage	12 V, SELV voltage
Secondary output power	30 W minimum

Section 2.3
Dimensions

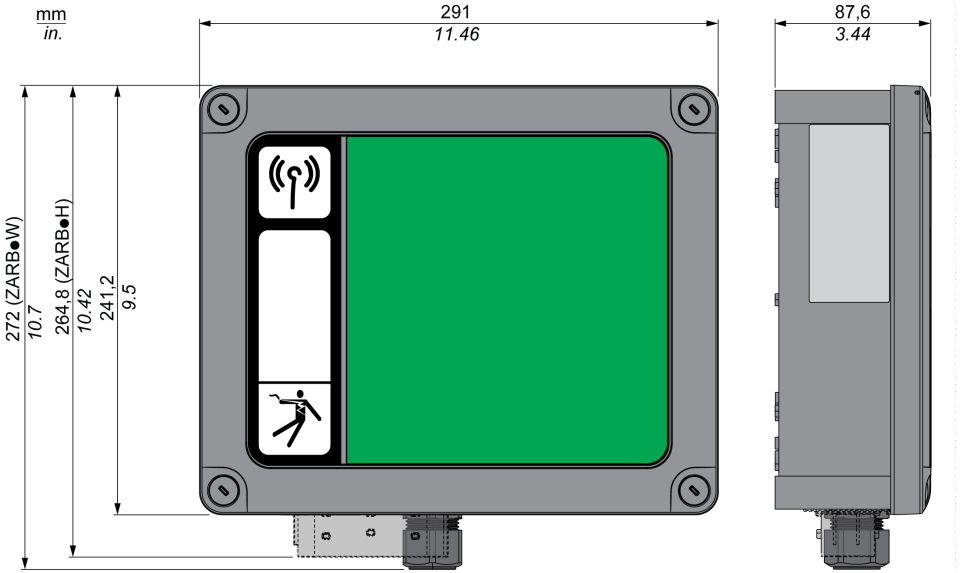
What Is in This Section?

This section contains the following topics:

Base Station Dimensions

Dimensions

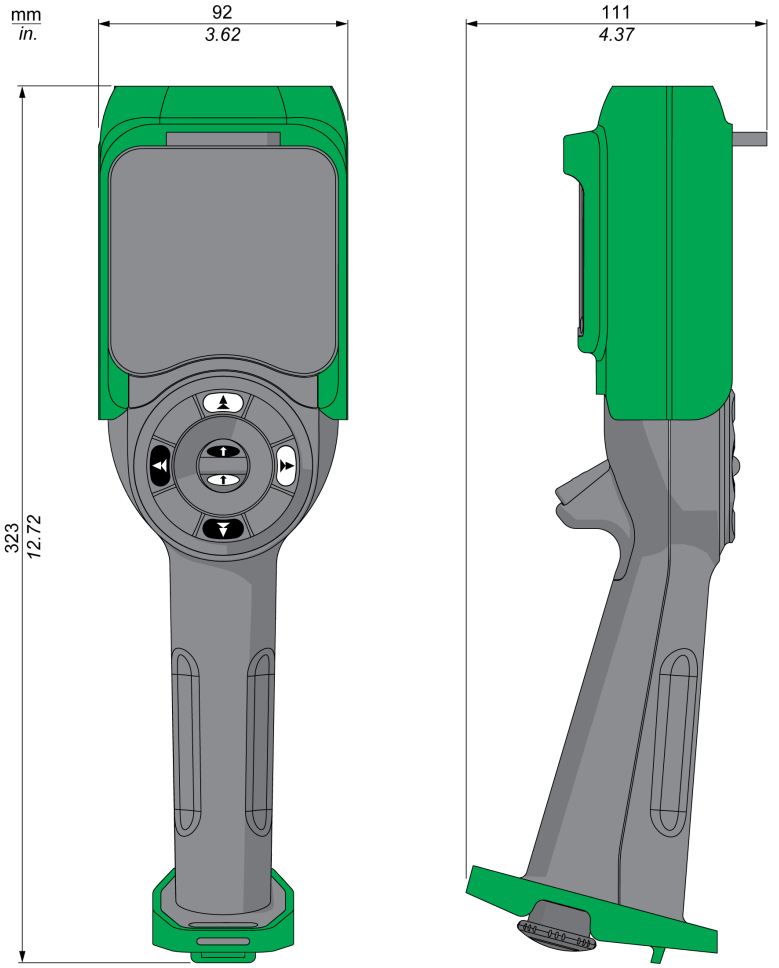
The following figure shows the Base Station dimensions:



Remote Device Dimensions

Dimensions

The following figure shows the Remote Device dimensions:



Chapter 3
Safety

What Is in This Chapter?

This chapter contains the following sections:

Section 3.1
Generalities

What Is in This Section?

This section contains the following topics:

Introduction

Overview

The safety functions incorporated in eXLhoist allow you to develop applications oriented towards protection of people and machinery.

Some safety functions are configured with eXLhoist Configuration Software.

Integrated safety functions provide the following benefits:

- Additional standards-compliant safety functions
- No need for external safety devices
- Reduced wiring effort and space requirements
- Reduced costs

The eXLhoist is compliant with the requirements of the standards in terms of implementation of safety functions.

Standards and Terminology

Overview

The technical terms, terminology, and the corresponding descriptions in this manual normally use the terms or definitions in the relevant standards.

In the field of Wireless Remote Control System, this includes, but is not limited to, terms such as safety function, safe state, fault, fault reset, failure, error, error message, warning, warning message, and so on.

These standards include:

- IEC 61508 Ed.2 series: Functional safety of electrical/electronic/programmable electronic safety-related systems
- IEC 62061 Ed.1.0: Safety of machinery - Functional safety of safety-related electrical, electronic, and programmable electronic control systems
- EN ISO 13849-1 & 2 Safety of machinery - Safety related parts of control systems

EC Declaration of Conformity

The EC declaration of conformity for the machine directive 2006/42/EC can be obtained on www.schneider-electric.com.

Functional Safety Certification

The integrated safety functions are compatible with:

- EN 15011: 2011
- EN 14492-2: 2009
- EN 14439: 2009
- EN 13557: 2008
- IEC 60204-1: 2009
- IEC 60204-32: 2008

The listed standards set out safety-related considerations of Wireless Remote Control System safety related in terms of the framework of the ISO13849-1 and ISO13849-2 standards.

The defined safety functions are:

- SIL1, SIL2, and SIL3 capability in compliance with the IEC 61508 Ed.2 series.
- Performance Level c, d, and e in compliance with ISO 13849-1.
- Compliant with category 2, 3, and 4 of European standard ISO 13849-1.

Also refer to Safety Function Capability *(see page 61)*.

The safety demand operating mode is considered to be high demand or continuous mode of operation according to the IEC 61508-1 standard.

The functional safety certificate is accessible on www.schneider-electric.com.

Basics

Functional Safety

Automation and safety engineering are 2 areas that were separate in the past but have recently become more and more integrated.

The engineering and installation of complex automation solutions are greatly simplified by integrated safety functions.

Usually, the safety engineering requirements depend on the application.

The level of requirement results from the risk and the hazard potential arising from the specific application.

IEC 61508 Standard

The standard IEC 61508 functional safety of electrical/electronic/programmable electronic safety-related systems covers the safety-related function.

Instead of a single component, an entire function chain (for example, from a sensor through the logical processing units to the actuator) is considered as a unit.

This function chain must meet the requirements of the specific safety integrity level as a whole.

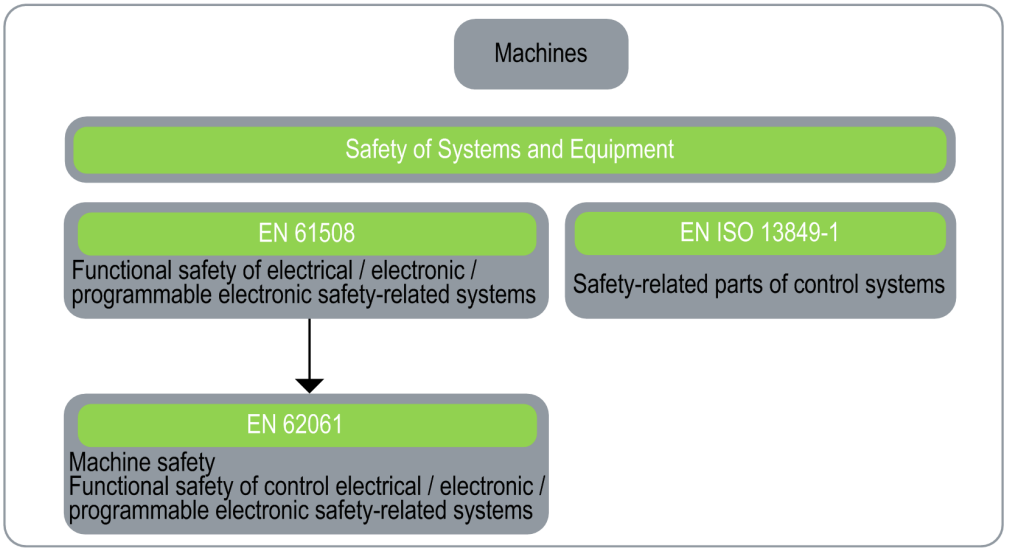
Systems and components that can be used in various applications for safety tasks with comparable risk levels can be developed on this basis.

ISO13849 Standard or IEC62061 Standard

Designers can follow either EN ISO 13849-1 or EN 62061 to demonstrate conformity with the Directive 2006/42/EC on machinery. These 2 new standards consider not only whether a fault will occur, but also how likely it is to occur.

This means that there is a quantifiable, probabilistic element in compliance: machine builders must be able to determine whether their safety circuit meets the required Safety Integrity Level (SIL) or Performance Level (PL). Panel builders and designers should be aware that manufacturers of the components used in safety circuits (such as safety detection components, safety logic solvers, and output devices like contactors) must provide detailed data on their products.

Safety standards:



SIL - Safety Integrity Level

The standard IEC 61508 defines 4 Safety Integrity Levels (SIL) for safety functions.

SIL1 is the lowest level and SIL4 is the highest level.

A hazard and risk analysis serves as a basis for determining the required SIL.

This is used to decide whether the relevant function chain is to be considered as a safety function and which hazard potential it must cover.

PF - Probability of Failure

The standard IEC 61508 defines SIL using requirements grouped into 2 broad categories: hardware safety integrity and systematic safety integrity. A device or system must meet the requirements for both categories to achieve a given SIL.

The SIL requirements for hardware safety integrity are based on a probabilistic analysis of the device. To achieve a given SIL, the device must meet targets for the maximum probability of dangerous failure and a minimum Safe Failure Fraction. The concept of “dangerous failure” must be rigorously defined for the system in question, normally in the form of requirement constraints whose integrity is verified throughout system development. The actual targets required vary depending on the likelihood of a demand, the complexity of the devices, and types of redundancy used.

The Probability of Failure on Demand (PFD) of low demand operation for different SILs are defined in IEC 61508 are as follows:

SIL	Average Probability of a Dangerous Failure on Demand of the safety function PFD
SIL4	$< 10^{-4}$
SIL3	$\geq 10^{-4}$ to $< 10^{-3}$
SIL2	$\geq 10^{-3}$ to $< 10^{-2}$
SIL1	$\geq 10^{-2}$ to $< 10^{-1}$

In continuous operation, these changes to the following:

SIL	Average Frequency of a Dangerous Failure on Demand of the safety function (h^{-1}) PFH
SIL4	$\geq 10^{-9}$ to $< 10^{-8}$
SIL3	$\geq 10^{-8}$ to $< 10^{-7}$
SIL2	$\geq 10^{-7}$ to $< 10^{-6}$
SIL1	$\geq 10^{-6}$ to $< 10^{-5}$

A function is considered as "on demand" if the demand rate is lower than one activation per year. Otherwise, the function is considered as "High demand or continuous operation".

The hazards of a control system must be identified then analyzed in a risk analysis. These risks are gradually mitigated until their overall contribution to the hazard is deemed to be acceptable. The tolerable level of these risks is specified as a safety requirement in the form of a target probability of a dangerous failure over a given period, stated as a discrete SIL level.

PL - Performance Level

The standard IEC 13849-1 defines 5 Performance Levels (PL) for safety functions.

"a" is the lowest level and "e" is the highest level.

5 levels (a, b, c, d, and e) correspond to different values of average probability of dangerous failure per hour.

PL	Probability of a Dangerous Hardware Failure Per Hour
e	$\geq 10^{-8}$ to $< 10^{-7}$
d	$\geq 10^{-7}$ to $< 10^{-6}$
c	$\geq 10^{-6}$ to $< 3*10^{-6}$

PL	Probability of a Dangerous Hardware Failure Per Hour
b	$\geq 3*10^{-6}$ to $< 10^{-5}$
a	$\geq 10^{-5}$ to $< 10^{-4}$

HFT - Hardware Fault Tolerance and SFF - Safe Failure Fraction

Depending on the SIL for the safety system, the IEC 61508 standard requires a specific HFT in connection with a specific proportion of safe failures SFF.

The HFT is the ability of a system to execute the required safety function in spite of the presence of one or more hardware faults.

The SFF of a system is defined as the ratio of the rate of safe failures to the total failure rate of the system.

According to IEC 61508, the maximum achievable SIL of a system is partly determined by the HFT and the SFF of the system.

IEC 61508 distinguishes 2 types of subsystem (type A subsystem, type B subsystem).

These types are specified on the basis of criteria which the standard defines for the safety-relevant components.

SFF	HTF					
	Type A subsystem			Type B subsystem		
	0	1	2	0	1	2
< 60%	SIL1	SIL2	SIL3	----	SIL1	SIL2
60% ... < 90%	SIL2	SIL3	SIL4	SIL1	SIL2	SIL3
90% ... < 99%	SIL3	SIL4	SIL4	SIL2	SIL3	SIL4
≥ 99%	SIL3	SIL4	SIL4	SIL3	SIL4	SIL4

Systematic Safety Integrity & Detect Fault Avoidance Measures

Systematic errors in the specifications, in the hardware and the software, usage faults and maintenance faults in the safety system must be avoided to the maximum degree possible. To reach these requirements, IEC 61508 specifies a number of measures for fault avoidance that must be implemented depending on the required SIL. These measures for fault avoidance must cover the entire life cycle of the safety system, that is, from design to decommissioning of the system.

Section 3.2
Description and Safety Function Capability

What Is in This Section?

This section contains the following topics:

Wireless Remote Control System Safety Functions Are Part of an Overall System

Overview

The qualitative and quantitative safety objectives determined by the final application require some adjustments to ensure safe use of the safety functions. The integrator of the Wireless Remote Control System is responsible for these additional changes (for example, managing the mechanical brake on the motor).

Getting and Operating the Safety Function

Overview

The SISTEMA software allows machine developers and testers of safety-related machine controls to evaluate the safety standard or level of their machine in the context of ISO 13849-1. The tool allows you to model the structure of safety-related control components based on the designated architectures, allowing automated calculation of the reliability standards with various levels of detail, including that of the Performance Level (PL).

The eXLhoist libraries are available from *www.schneider-electric.com*.

E-STOP

Overview

For general descriptions, refer to E-STOP function *(see page 121)*.

The E-STOP is not configurable.

The undesired event of the E-STOP function is masking of E-STOP activation.

The safe state of the E-STOP function is to open safety relays.

Function	Installation	IEC 60204-32	IEC 61508	IEC 62061	ISO 13849	
		STOP category	**SIL**	**SIL CL**	**Safety category**	**PL**
E-STOP	With auxiliary contact loop between S2_S3 and IN0	Category	SIL3	SIL3 CL	Safety category	PL e
	Without auxiliary contact loop between S2_S3 and IN0		SIL2	SIL2 CL	Safety category	PL d

For a SIL3 PLe E-STOP, auxiliary contact of contactors must be mechanically linked. Contactors shall be compliant with:

- EN 60947-4-1:2010 Annex F (preferred) - Requirements for auxiliary contact linked to power contact (mirror contact), or
- EN 60947-5-1:2004 Annex L - Special prescription for elements with contact mechanically linked.

In order to be compliant with the Common Cause of Failure (CCF), wiring of redundant contactors or drives must be by different path.

The standard E-STOP function of eXLhoist is limited to a stop category 0 according to IEC 60204-32. If some applications require an E-STOP function with a stop category 1, then a safety relay type Preventa XPS ATE or XPS AV or similar must be used.

In order to justify of the safety category 4 according to ISO13849-1, an automatic diagnostic is realized on IN0 terminal thanks to the S2_S3 terminal (Pulsed 12 V). An external supply of IN0 input cannot be used.

E-STOP function is a passive stop (function activated when an invalid frame is detected).

STOP Function

Overview

For general descriptions, refer to STOP function *(see page 123)*.

The undesired event of the STOP function is masking of STOP activation.

The safe state of the STOP function is to open safety relays.

Function	Installation	IEC 60204-32	IEC 61508	IEC 62061	ISO 13849	
		STOP category	**SIL**	**SIL CL**	**Safety category**	**PL**
STOP	No UOC	Category 0	SIL2	SIL2 CL	Safety category 3	PL d
	With UOC	Category 1				

STOP function is a passive stop (function activated when an invalid frame is detected).

Standard Motion & Auxiliary Functions

Overview

For general descriptions, refer to Standard Motion *(see page 131)* and Auxiliary functions *(see page 133)*.

A relay assignment can be done for the Remote Device motion buttons with the eXLhoist Configuration Software. An UOC relay *(see page 105)* can be associated to a motion axis (and its motion relays) thanks to the eXLhoist Configuration Software.

Auxiliary functions can be assigned to auxiliary buttons and relays thanks to the eXLhoist Configuration Software.

The undesired event of standard motion & auxiliary functions is the unintended standard motion or auxiliary function activation.

The safe state of the standard motion & auxiliary function is to open safety relays.

Function	Installation	IEC 60204-32	IEC 61508	IEC 62061	ISO 13849	
		STOP category	SIL	SIL CL	Safety category	PL
Standard motion & auxiliary functions	No UOC	Category 1	SIL1	SIL1 CL	Category 2 for electronic parts Category 1 for electromechanical parts	PL c
	With UOC					

In order to justify of the safety category 2, an automatic diagnostic is realized on buttons of the Remote Device when the Remote Device is switched ON and during a START of the machine. So during these 2 phases, the operator must not push any motion or auxiliary buttons.

Standard motion & auxiliary functions are passive stop functions (functions activated when an input signal is detected).

Safeguarding

Overview

For general description, refer to Safeguarding function *(see page 107)*.

Safeguarding can be assigned to a motion direction thanks to the eXLhoist Configuration Software.

The undesired event of Safeguarding function is the no disabling of motion buttons.

Safeguarding limit switches contacts must be NC contacts.

The safe state of the Safeguarding function is to open safety relays.

Function	Installation	IEC 60204-32	IEC 61508	IEC 62061	ISO 13849	
		STOP category	SIL	SIL CL	Safety category	PL
Safeguarding	NC	Category 2 on the motion direction	SIL1	SIL1 CL	Category 2 for electronic parts Category 1 for electromechanical parts	PL c

Safeguarding input signal:

Input signals limit switch	Units	Value
Logic 0 (Ulow)	V	< 1
Logic 1 (Uhigh)	V	> 2
Impedance	kΩ	1.5
Debounce time	ms	1
Response time of safety function	ms	< 300

In order to justify of the safety category 2, an automatic diagnostic is realized on the Safeguarding inputs thanks to the IN_COM output port. An external power supply of Safeguarding inputs cannot be used.

Safeguarding is a passive stop function (function activated when an input signal is detected).

Priority of Safety Functions

Overview

Priority of safety functions	Safety functions
1	E-STOP
2	STOP
3	Safeguarding
4	Standard motion & auxiliary functions

Safe State of the Wireless Remote Control System

Overview

Safe states of the Base Station are:

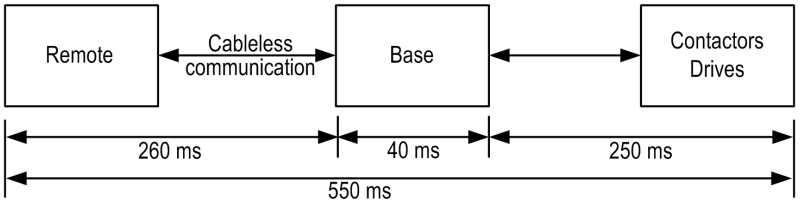
- SAFE-STOP failure: if a failure is detected by the Base Station, the Base Station opens safety relays with a stop category 0 and stops the radio communication with the Remote Device.
- SAFE-STOP radio: if the Base Station looses the communication with the Remote Device, the Base Station opens the safety relays in stop category 0 or stop category 1 according to the commissioning.

The Safe state position of the Remote Device is no communication with the base station: if a failure is detected in the Remote Device, the Remote Device stops the radio communication. So the Base Station goes to SAFE-STOP radio mode and opens the safety relays in stop category 0 or stop category 1 according to the commissioning.

Response Time and Process Safety Time (PST)

Overview

The maximum Process Safety Time (PST) of STOP function is 550 ms according to IEC 60204-32 Ed.2 §9.2.7.3. This PST of 550 ms is taken into account for all safety functions. The PST allocation is:



So 250 ms are allocated for contactors / drives of the hoisting system. The rest (300 ms) is allocated for Wireless Remote Control System. In consequences, the maximum response time of the Wireless Remote Control System is 300 ms for all safety functions in any configurations.

Legal RFU (Recommendation for Use)

Overview

According to the machinery directive 2006/42/EC and the amendment - RECOMMENDATION FOR USE n° CNB/M/11.050 rev02, functional test (automatic or manual) shall be performed within the following test intervals:

- At least every month for PL e with category 3 or category 4 (according to EN ISO 13849-1) or SIL3 with HFT = 1 (according to EN 62061);
- At least every 12 months for PL d with category 3 (according to EN ISO 13849-1) or SIL2 with HFT = 1 (according to EN 62061).

Summary of the Reliability Study

Synthesis of Reliability Study in Configuration 1 Remote Device & 1 Base Station

Standard	Safety features	E-STOP	STOP		Standard motion & auxiliary functions		Limit switch
		With auxiliary contact	Without UOC	UOC	Without UOC	UOC	NC contact
IEC 61508 Ed 2	SFF per channel	97.8 %	85 %	84.8 %	90.1 %		95 %
	PFH (10^{-9} h^{-1})	7.32	7.54	7.57	52.3	51.8	17.9
	Type	B					
	HFT	1			0		
	Diagnostic Coverage per channel	91.4 %	41.7 %	41.8 %	73.8 %		90 %
	SIL capability	3	2		1		
IEC 62061 (1)	SIL CL capability	3	2		1		
ISO 13849-1 2008	PL	e	d		c		
	Safety category	4	3		2		
	MTTF in years	15584	15130	15070	2183	2202	6380
Proof test interval (manual functional test)		Once per month	Once per year				
Maximum response time		300 ms					

(1) IEC 62061 standard concerns integration. This standard distinguishes the overall safety function (classified SIL1, SIL2, or SIL3 according to diagrams in §1.4) from components which constitute the safety function (classified SIL1 CL, SIL2 CL or SIL3 for eXLhoist).

NOTE: The table above is not sufficient to evaluate the PL of the hoisting system. The PL evaluation has to be done at the system level. The fitter of the integrator of the eXLhoist has to do the PL evaluation by including sensors and actuators data numbers from the table above. SISTEMA software can evaluate the PL of the system.

NOTE: The radio communication of the Wireless Remote Control System is compliant with IEC 61784-3 Ed2 2010.

Synthesis of Reliability Study in Configuration TANDEM 1 Remote Device & 2 Base Station

TANDEM mode will be available on Q4 2014

Section 3.3
Functional Safety Function Commissioning

What Is in This Section?

This section contains the following topics:

Safety Parameters and Steps to Configure the Safety Functions

Commissioning of Safety Functions

The commissioning type of safety function is:

Functions	UOC delay time	Relay assignment	Remarks
E-STOP	-	-	No commissioning
STOP	Yes	-	Safety relays cannot be commissioned
Motion & auxiliary functions	Yes	Yes	-
Safeguarding	-	Yes	-

Some passwords/codes can be configured on the eXLhoist Configuration Software:

- E-STOP code sequence on the Remote Device
- Start code sequence on the Remote Device
- Transfer password:
  - For the read of the Configuration File in a Remote Device
  - For the transfer of the Configuration File between a Remote Device and a Base Station.

Passwords/codes	Default value
E-STOP code sequence	-
Start code sequence	5, 6, 5, 6
Transfer password	5, 6, 5, 6

Machine Signature

Overview

The acceptance test for systems with safety integrated functions focuses on validating the functionality of safety integrated monitoring and stop functions configured in the Wireless Remote Control System.

The purpose of the test is to verify proper configuration of the defined safety functions and test mechanisms and to examine the response of dedicated monitoring functions to explicit input of values outside the tolerance limits.

The test must cover all Wireless Remote Control System-specific safety configured monitoring functions and global safety integrated functionality in eXLhoist.

Condition Prior to Acceptance Test

- The machine is wired up correctly.
- All safety devices such as limit switches, overload sensors, and emergency stop switches are connected and ready for operation.
- All commissioning parameters must be correctly set on the Wireless Remote Control System.

Acceptance Test Process

Step	Action	Comment
1	Select the Base Station and the Remote Device	With the eXLhoist Configuration Software
2	Configure the relay assignments by functions.	
3	Configure the interlocking assignments (optional)	
4	Define passwords (optional): ● E-STOP ● STOP ● Configuration Configure: ● Timeout ● UOC delay ● Motion enable / limit switch	
5	Select the Microsoft® Excel acceptance test template file in *www.schneider-electric.com*. Complete the acceptance test template according to the system specificities. Mark down the configuration signature thanks to the eXLhoist Configuration Software.	With Microsoft® Excel The acceptance test template is a generic acceptance test for generic application. The acceptance report must be updated according to the system application. The signature allows you to compare the checksum value with the one displayed in the identification menu on the graphic display.

Step	Action	Comment
6	Test the system according to the acceptance test Notify the result of the test in the acceptance result.	The acceptance test list becomes the acceptance result once it fulfills with test results.
7	Print, save, and sign the acceptance report.	-

Acceptance Report

eXLhoist Configuration Software and Microsoft® Excel are required to create the acceptance report.

The acceptance report is the safety signature of the Wireless Remote Control System. The acceptance report provides a final private report when the Wireless Remote Control System has been configured as Safe and declared Safe during operation. This report is deemed to be a machine signature and certifies that all the safety functions are operational.

If the system configuration is modified, you must repeat the acceptance test.

Section 3.4
Functional Safety Requirements for Maintenance

What Is in This Section?

This section contains the following topics:

Maintenance

E-STOP

By way of preventive maintenance and according to the Recommendation For Use *(see page 71)*, the E-STOP and the STOP function must be activated at least once a month. The Remote Device and the Base Station must be turned off and then on again before carrying out this preventive maintenance.

Others Safety Functions

By way of preventive maintenance and according to the Recommendation For Use *(see page 71)*, the STOP, motion, auxiliary, limit switch functions must be activated at least once a year. The Remote Device and the Base Station must be turned off and then on again before carrying out this preventive maintenance.

Base Station or Remote Device Replacement

Overview

You can replace the Base Station part and the Remote Device part.

If you replace the Base Station or the Remote Device configured in Single, you will not lose your safety configuration thanks to the maintenance / device replacement procedure but you need to repeat the acceptance test to avoid incorrect wiring or incorrect behavior of the safety function.

If you replace the Base Station or the Remote Device configured in Tandem, you will lose your safety configuration. You need to reinstall your configuration on the new Base Station or Remote Device and then repeat the acceptance test to avoid incorrect wiring or incorrect behavior of the safety function.

NOTE: For more product information, see the Maintenance / Device Replacement *(see page 201)*.

Changing Machine Equipment

Overview

If you need to change any part of the hoisting system (contactor, drive, …) you must repeat the acceptance test.

NOTE: For more product information, see the installation part *(see page 81)*.

Chapter 4
Installation and Wiring

What Is in This Chapter?

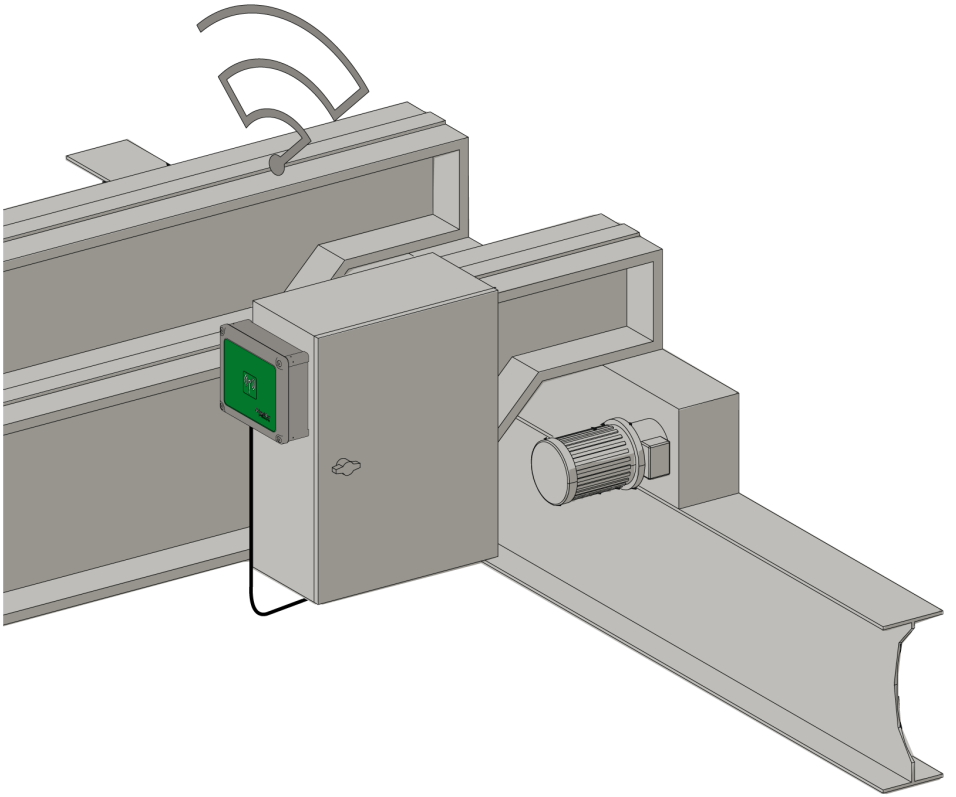
This chapter contains the following sections:

Section 4.1
Base Station Installation

Base Station Installation Precaution

Installation Precaution

Example of a recommended Base Station location:



Base Station location:

The Base Station must be installed vertical, with the cable at the bottom.

Consider the wiring limitation and the radio communication limitation to choose the Base Station location.

Do not create obstacle between the Base Station and the Remote Device to optimize the radio communication level.

The Base Station must not be installed inside closed metal containers.

To prevent communication perturbation:
- Do not place cables or metallic parts in front of the Base Station cover.
- Do not place obstacles between the Base Station and the Remote Device.

According to IEC 61010-1, it is recommended to install the power switch of the Base Station close to the Base Station.

To be compliant with IEC 61508, EN 62061 and EN ISO 13849, terminal ferrule must be used for the output wiring of the ZARB•W

⚠ DANGER

HEAVY LOAD MOVING HAZARD

The working range must be free of people when the hoisting system is operating.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Install and operate this equipment according to the environmental conditions described in the operating limits.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

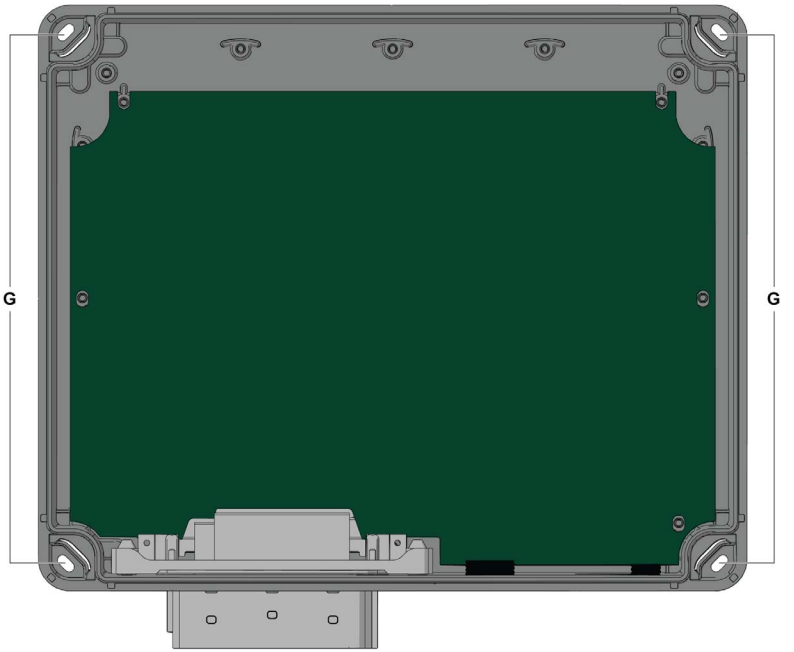
UNINTENDED EQUIPMENT OPERATION

- Use appropriate safety interlocks where personnel and/or equipment hazards exist.
- Use the sensor and actuator power supplies only for supplying power to the sensors or actuators connected to the device.
- Power line must be wired and protected with fuse or thermal magnetic switch (ex: Schneider-Electric GV2) in compliance with local and national regulatory requirements for the rated current and voltage of the particular equipment.
- Do not disassemble, repair, or modify this equipment.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Installation

Step	Action
1	Unscrew the 4 screws at the bottom of the Base Station.
2	Remove the cover.

Step	Action
3	Introduce the 4 screws in the dedicated holes (legend G): 
4	Screw the 4 mounting screws.
5	Install the Base Station cover.
6	Screw the 4 screws to fasten the Base Station cover.

Use the ZARC09 silent blocs in case of applications with severe vibration constraints.

Section 4.2
Base Station Wiring

What Is in This Section?

This section contains the following topics:

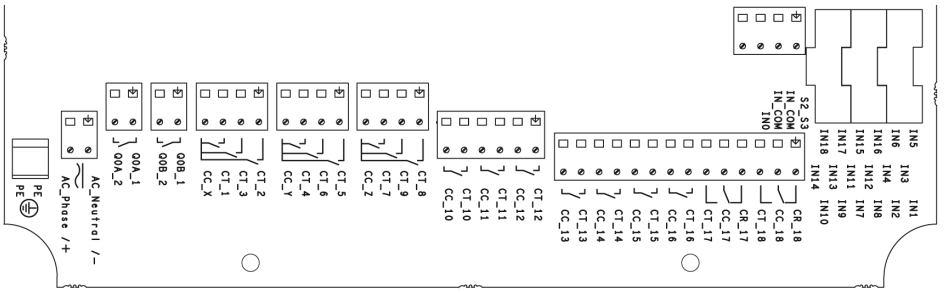
Base Station Wiring

ZARB•W

Wiring procedure:

Step	Action
1	Unscrew the 4 screws at the bottom of the Base Station.
2	Remove the cover and insert a cable gland.
3	Remove the caps.
4	Introduce the cable through the Base Station dedicated hole.
5	Connect the wires in the dedicated connectors.
6	Screw the cable gland.
7	Install the Base Station cover.
8	Screw the 4 screws to fasten the Base Station cover.

ZARB18 terminals:



Insulation:

The group of relays (Q1…Q3), (Q4…Q6), (Q7…Q9), (Q10…Q12) and (Q13…Q18), as well as the group of inputs (IN0…IN18) and the group of power supply (AC_Phase/+, AC_Neutral/-) respect a SELV insulation between each other.

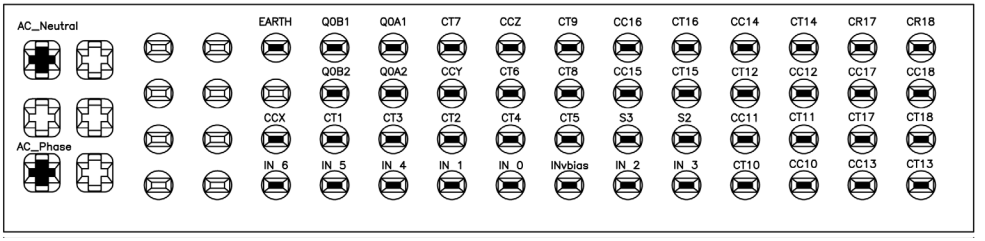
A single 240 V insulation shall be respected inside each of the following groups: (AC_Phase/+, AC_Neutral/-),(Q1…Q3), (Q4…Q6), (Q7…Q9), (Q10…Q12) and (Q13…Q18).

A single 24 V insulation shall be respected inside the (IN0…IN18) group.

ZARB•H

The input/output are wired to the connector (except the safeguarding inputs).

To connect the Base Station, respect the connector description:



If the ZARC03 external antenna is used, refer to the dedicated Instruction Sheet *(see page 9)*.

Safeguarding Inputs

Safeguarding inputs wiring procedure:

Step	Action
1	Unscrew the 4 screws at the bottom of the Base Station.
2	Remove the cover and insert a cable gland.
3	Remove the caps of cable gland.
4	Introduce the cable through the Base Station dedicated hole.
5	Connect the wires in the dedicated terminals.
6	Screw the cable gland.
7	Install the Base Station cover.
8	Screw the 4 screws to fasten the Base Station cover.

Input/Output Possible Uses

Input/Output	Possible uses (Depending of the configuration)
IN0	Safety loop input *(see page 111)*
IN1…IN6	Detected Applicative Alarm *(see page 103)*
IN7…IN18	Safeguarding *(see page 107)*
S2_S3	Terminals for SIL2 / SIL3 E-STOP Configuration *(see page 111)*
Q0A, Q0B	Safety relay *(see page 111)*
Q1…Q9	Motion relays *(see page 99)*

Input/Output	Possible uses (Depending of the configuration)
Q10…Q16 (NO type) Q17, Q18 (NO+NC type)	Auxiliary relays *(see page 99)* Selector *(see page 102)* UOC *(see page 105)* Specific relays *(see page 109)*

Power Supply

NOTICE

INOPERABLE EQUIPMENT

The ZARB•H Base Station must be powered with a voltage:

- From 24 Vac -15% to 48 Vac +10% with frequency of 50 Hz -6%/+4% and frequency of 60 Hz -6%/+4%.
- From 24 Vdc -15% to 48 Vdc +20%.

The ZARB•W Base Station must be powered with a voltage:

- From 24 Vac -15% to 240 Vac +10% with frequency of 50 Hz -6%/+4% and frequency of 60 Hz -6%/+4%.
- From 24 Vdc -15% to 240 Vdc +20%.

Failure to follow these instructions can result in equipment damage.

Protective Earth Ground

The electrical isolation of the Base Station power supply from machine ground could cause static electricity damages. The limit switch could unintended operates in case of ground fault.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Connect the Base Station protective earth ground connection to the machine ground.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The equipment could non-stop in case of ground fault detections on any control circuits.

Factory Setting

For details on factory setting (wiring and configuration), refer to factory setting description *(see page 94)*.

General Wiring Rules

The I/O and power supply cables should be AWG 16 (cross-sectional conductor area = 1.3 mm^2).

The I/O and power supply cable lengths should not exceed 20 m (65.6 ft).

For more details, refer to Wiring Best Practices *(see page 91)*.

Wiring Best Practices

Overview

This section describes the wiring guidelines and associated best practices to be respected when using the system.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Disconnect all power from all equipment including connected devices prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires except under the specific conditions specified in the appropriate hardware guide for this equipment.
- Always use a properly rated voltage sensing device to confirm that the power is off where and when indicated.
- Replace and secure all covers, accessories, hardware, cables, and wires and confirm that a proper ground connection exists before applying power to the unit.
- Use only the specified voltage when operating this equipment and any associated products.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

LOSS OF CONTROL

- The designer of any control wiring diagram must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and overtravel stop, power outage and restart.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.
- Observe all accident prevention regulations and local safety guidelines.[1]
- Each implementation of this equipment must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

[1] For additional information, refer to NEMA ICS 1.1 (latest edition), "Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control" and to NEMA ICS 7.1 (latest edition), "Safety Standards for Construction and Guide for Selection, Installation, and Operation of Adjustable-Speed Drive Systems" or their equivalent governing your particular location.

Protective Ground (PE) on the Backplane

The protective ground (PE) is connected to the conductive backplane by a heavy-duty wire, usually a braided copper cable with the maximum allowable cable section.

⚠ WARNING

IMPROPER GROUNDING CAN CAUSE UNINTENDED EQUIPMENT OPERATION

- Use cables with insulated shielded jackets for I/O signals.
- Ground shielded cables for I/O signals at a single point [1].
- Always comply with local wiring requirements regarding grounding of cable shields.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

[1]Multipoint grounding is permissible if connections are made to an equipotential ground plane dimensioned to help avoid cable shield damage in the event of power system short-circuit currents

Wiring Guidelines

The following rules must be applied when wiring the system:

- I/O wiring must be kept separate from the power wiring. Route these 2 types of wiring in separate cable ducting.
- Verify that the operating conditions and environment are within the specification values.
- Use proper wire sizes to meet voltage and current requirements.
- Use copper conductors (highly recommended).
- Use twisted pair, shielded cables.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Use shielded cables wherever specified for inputs and outputs connections.
- Properly ground the cable shields as indicated in the related documentation.
- Route I/O cables separately from power cables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Power line must be wired and protected with fuse or thermal magnetic switch (ex: Schneider-Electric GV2) in compliance with local and national regulatory requirements for the rated current and voltage of the particular equipment.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Rules for Screw Terminal Block

The following tables show the cable types and wire sizes for a **5.08 mm pitch** screw terminal block:

mm / in. 7 / 0.28								
mm^2	0.2…2.5	0.2…2.5	0.25…2.5	0.25…2.5	2 x 0.2…1	2 x 0.2…1.5	2 x 0.25…1	2 x 0.5...1.5
AWG	*24…14*	*24…14*	*23...14*	*23...14*	*2 x 24…17*	*2 x 24…16*	*2 x 23…17*	*2 x 20...16*

Ø 3,5 mm (*0.14 in.*)	C	N•m	0.5...0.6
		lb-in	*4.42...5.31*

The use of copper conductors is required.

The use of cable ends is required.

⚠ DANGER

FIRE HAZARD

Use only the recommended wire sizes for I/O channels and power supplies.

Failure to follow these instructions will result in death or serious injury.

NOTICE

INOPERABLE EQUIPMENT

Do not tighten screw terminals beyond the specified maximum torque (Nm / lb-in.).

Failure to follow these instructions can result in equipment damage.

Factory Setting Description

General Parameters

General	Label	Factory setting value
Parameter	Start access sequence *(see page 192)*	Enable: 5, 6, 5, 6
	E-STOP RESET sequence *(see page 192)*	Disable
	Standby Time-out *(see page 193)*	15 minutes
	Power saving Time-out *(see page 193)*	15 minutes
	Horn duration *(see page 193)*	2 seconds
Protection	Configuration File Transfer Password *(see page 183)*	Enable: 5, 6, 5, 6

Detected Applicative Alarms

Base Station wiring:

Label	Wiring description	Factory setting description
IN1	Sensor input	Overload pre-alarm
IN2	Sensor input	Overload alarm
IN3	Sensor input	Over wind pre-alarm
IN4	Sensor input	Over wind alarm
IN5	Sensor input	Over speed alarm
IN6	Sensor input	Generic alarm
IN_COM	Common output port (to be connected to the other side of the dry contact connected to the IN1…IN6 inputs)	-

Safeguarding function (only for ZARB18•)

Base Station wiring:

Label	Wiring description	Factory setting description
IN7	Limit switch input (for button 1)	When IN7 is activated, the relay 1 is OFF
IN8	Limit switch input (for button 1H)	When IN8 is activated, the relays 1 and 3 are OFF
IN9	Limit switch input (for button 2)	When IN9 is activated, the relay 2 is OFF
IN10	Limit switch input (for button 2H)	When IN10 is activated, the relays 2 and 3 are OFF
IN11	Limit switch input (for button 3)	When IN11 is activated, the relay 4 is OFF
IN12	Limit switch input (for button 3H)	When IN12 is activated, the relays 4 and 6 are OFF
IN13	Limit switch input (for button 4)	When IN13 is activated, the relay 5 is OFF
IN14	Limit switch input (for button 4H)	When IN14 is activated, the relays 5 and 6 are OFF

Label	Wiring description	Factory setting description
IN15	Limit switch input (for button 5)	When IN15 is activated, the relay 7 is OFF
IN16	Limit switch input (for button 5 +7)	When IN16 is activated, the relays 7 and 9 are OFF
IN17	Limit switch input (for button 6)	When IN17 is ON, the relay 8 is OFF
IN18	Limit switch input (for button 6 +7)	When IN18 is ON, the relays 8 and 9 are OFF
IN_COM	Common output port (to be connected to the other side of the dry contact connected to the IN7…IN18 inputs)	-

Motion Relays

Base Station wiring:

Label	Wiring description	Factory setting description
Motion relays (for motor axis X)		
CC_X	Common for relays 1…3	-
CT_1	Output of motion relay 1	Command for motion direction 1 Relay is ON when button 1 or 1H is pressed
CT_2	Output of motion relay 2	Command for motion direction 2 Relay is ON when button 2 or 2H is pressed
CT_3	Output of motion relay 3	Command for high speed Relay is ON when button 1H or 2H is pressed
Motion relays (for motor axis Y)		
CC_Y	Common for relays 4…6	-
CT_4	Output of motion relay 4	Command for motion direction 1 Relay is ON when button 3 or 3H is pressed
CT_5	Output of motion relay 5	Command for motion direction 2 Relay is ON when button 4 or 4H is pressed
CT_6	Output of motion relay 6	Command for high speed Relay is ON when button 3H or 4H is pressed
Motion relays (for motor axis Z)		
CC_Z	Common for relays 7…9	-
CT_7	Output of motion relay 7	Command for motion direction 1 Relay is ON when button 5 or 5+7 is pressed
CT_8	Output of motion relay 8	Command for motion direction 2 Relay is ON when button 6 or 6+7 is pressed
CT_9	Output of motion relay 9	Command for high speed Relay is ON when button 5+7 or 6+7 is pressed

Auxiliary Relays

Base Station wiring:

General	Label	Wiring description	Factory setting description
Auxiliary relay 10	CC_10	Common	Selector Relay 10 is ON when the Selector (button 10) is in position 1 or 1+2 Relay 11 is ON when the Selector (button 10) is in position 2 or 1+2
	CT_10	Output (NO type)	
Auxiliary relay 11	CC_11	Common	
	CT_11	Output (NO type)	
Auxiliary relay 12	CC_12	Common	“Horn” relay Relay is ON during the start procedure, and for a configurable duration. In START mode, the relay is ON as long as the ON/START/Horn button is pressed.
	CT_12	Output (NO type)	
Auxiliary relay 13	CC_13	Common	“Radio link” relay Relay 13 is ON as long as the radio communication is achieved between the Base Station and its Remote Device.
	CT_13	Output (NO type)	
Auxiliary relay 14	CC_14	Common	Relay 14 is ON when button 11 is pressed
	CT_14	Output (NO type)	
Auxiliary relay 15	CC_15	Common	Relay 15 is ON when button 12 is pressed
	CT_15	Output (NO type)	
Auxiliary relay 16	CC_16	Common	Relay 16 is ON when button 13 is pressed
	CT_16	Output (NO type)	
Auxiliary relay 17	CC_17	Common	Relay 17 is ON when button 14 is pressed
	CT_17	Output (NO type)	
	CR_17	Output (NC type)	
Auxiliary relay 18	CC_18	Common	Relay 18 is ON when button 15 is pressed
	CT_18	Output (NO type)	
	CR_18	Output (NC type)	

The description of the relays 13 to 18 depends on the Base Station and Remote Device;

Base Station:

References	ZARB12•	ZARB18•
Motion & auxiliary standard relays	12 (Q1…Q12)	18 (Q1…Q18)

Remote Device:

References	ZART8L	ZART8D	ZARB12•
Number of buttons	11 (8 configurable)	11 (8 configurable)	15 (12 configurable)

Power Supply and PE

Base Station wiring:

Label	Wiring description	Factory setting description
PE	Protected earth ground	-
AC_Neutral /-	Base Station power supply	-
AC_Phase /+		

Safety

Base Station wiring:

Label	Wiring description	Factory setting description
Q0A_1	Safety relay 1	-
Q0A_2		
Q0B_1	Safety relay 2	
Q0B_2		
IN0	Safety loop	-
S2_S3		

Section 4.3
Functionalities Description

What Is in This Section?

This section contains the following topics:

Motion/Auxiliary Relays

Description

The motion/auxiliary relays are switched ON as long as the associated button is pressed.

Only up to 6 motion/auxiliary relays activation occurs at the same time.

If more than 6 motion/auxiliary relays switching are requested at the same time, then they are actuated in successive switching every 20 ms (except for UOC relays).

You can configure the motion/auxiliary relays with the eXLhoist Configuration Software *(see page 194)*.

General Wiring Rules

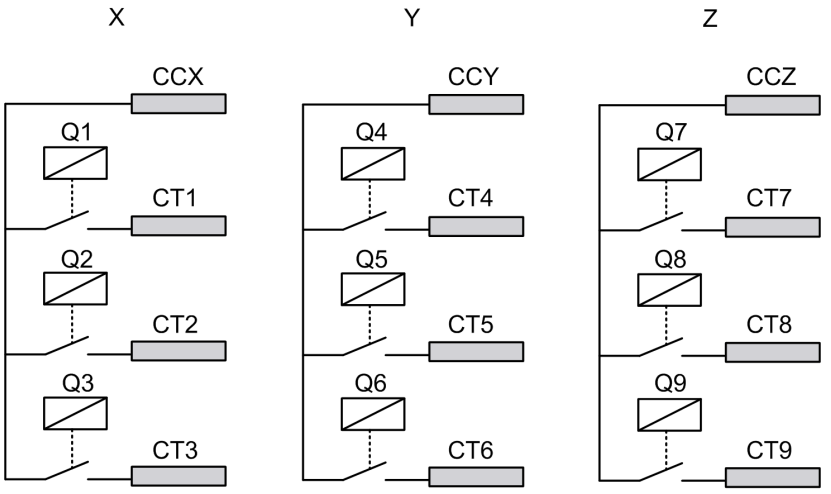
The I/O and power supply cables should be AWG 16 (cross-sectional conductor area = 1.3 mm^2).

The I/O and power supply cable lengths should not exceed 20 m (65.6 ft).

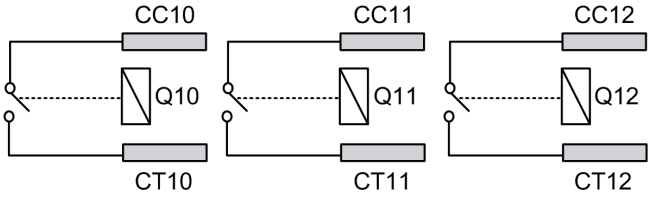
For more details, refer to Wiring Best Practices *(see page 91)*.

Wiring

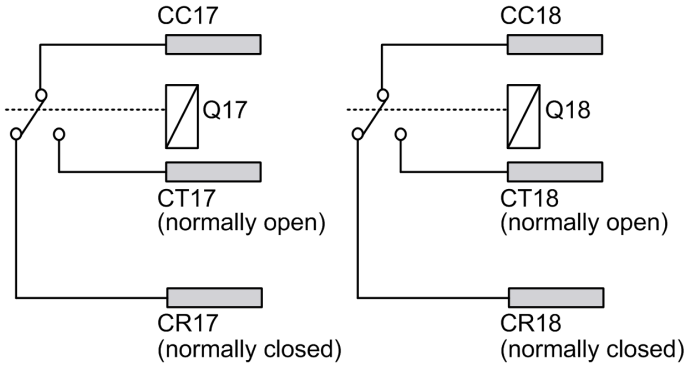
Q1…Q9 motion relay internal wiring (NO type):



Q10…Q16 motion/auxiliary relay wiring (NO type only)



Q17, Q18 auxiliary relay wiring (NO+NC type)



⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Power line must be wired and protected with fuse or thermal magnetic switch (ex: Schneider-Electric GV2) in compliance with local and national regulatory requirements for the rated current and voltage of the particular equipment.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Motion Wiring

For wiring examples, refer to the Architecture examples *(see page 216)*.

The motion/auxiliary relays output cable length should not exceed 20 m (65.6 ft).

Auxiliary Wiring

The auxiliary buttons can be used, for example, to manage a:

- Vacuum/magnetic function *(see page 221)*
- Room lighting function *(see page 224)*
- Selector switch function *(see page 102)*
- Supplementary motion

The motion/auxiliary relays output cable length should not exceed 20 m (65.6 ft).

Factory Setting

For details on factory setting (wiring and configuration), refer to factory setting description *(see page 94)*.

Selector

Description

In SINGLE configuration, the Selector button is associated to 2 relays.

With an adapted wiring, these relays enable/disable the motions of the selected device (hook/trolleys).

In TANDEM configuration, no relays are associated with the selector button. The button is used to select directly which Base Station are piloted.

You can configure the selector with the eXLhoist Configuration Software *(see page 194)*.

General Wiring Rules

The I/O and power supply cables should be AWG 16 (cross-sectional conductor area = 1.3 mm^2).

The I/O and power supply cable lengths should not exceed 20 m (65.6 ft).

For more details, refer to Wiring Best Practices *(see page 91)*.

Detected Applicative Alarm

Overview

The ZARB18• Base Station implements 6 inputs: IN1…IN6.

Different sensors can be connected to these inputs.

These inputs are dedicated for applicative alarms.

Description

The detected applicative alarms are only displayed on the ZART•D Remote Device.

Factory settings:

Input	Description
IN1	Overload pre-alarm
IN2	Overload alarm
IN3	Over wind pre-alarm
IN4	Over wind alarm
IN5	Over speed alarm
IN6	Generic alarm

You can configure the detected applicative alarm inputs with the eXLhoist Configuration Software *(see page 199)*.

General Wiring Rules

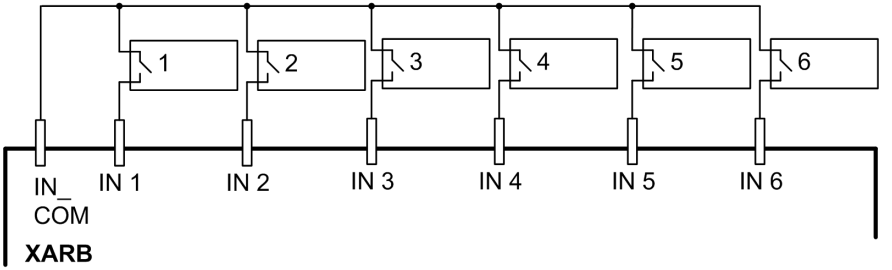
The I/O and power supply cables should be AWG 16 (cross-sectional conductor area = 1.3 mm^2).

The I/O and power supply cable lengths should not exceed 20 m (65.6 ft).

For more details, refer to Wiring Best Practices *(see page 91)*.

Wiring

Wiring diagram for the detected applicative alarm devices:



1-6 Detected applicative alarm sensors

Unintended Operating Control (UOC) Function

Overview

The Base Station can manage 3 UOC functions.

These relays have temporization that shall correspond to the decelerating time ramp of the drive. After this time, the UOC relay will switch OFF to enable the Safe Torque Off (STO according to EN IEC 61500-5-2) input on the drive.

The UOC function allows the Wireless Remote Control System to get a STOP category 1 according to EN60204.

Description

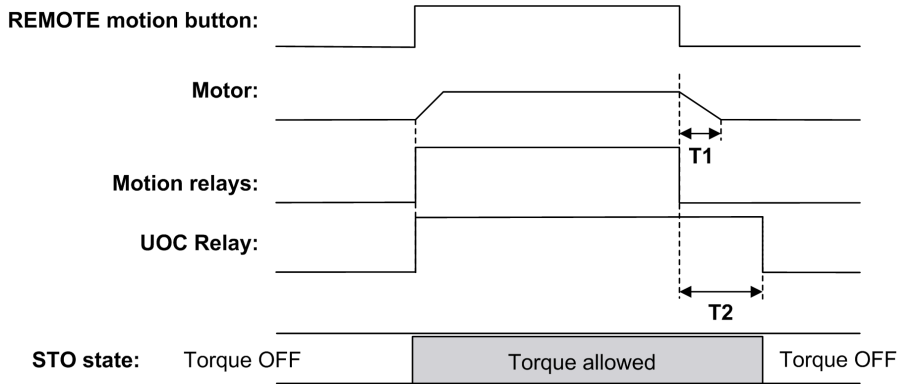
A UOC relay is associated to one motion axis (4 motion buttons).

Once a motion button is pressed, the associated UOC relay is switched ON.

When all motion buttons are released, the UOC delay time starts.

The UOC relay is switched OFF after the UOC pre-defined delay.

UOC function diagram with a drive (the UOC relay is normally open (NO)):



T1 Drive deceleration time.
T2 UOC delay time.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

The UOC delay time must be longer than the drive deceleration time.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

You can configure the UOC with the eXLhoist Configuration Software *(see page 194)*.

General Wiring Rules

The I/O and power supply cables should be AWG 16 (cross-sectional conductor area = 1.3 mm^2).

The I/O and power supply cable lengths should not exceed 20 m (65.6 ft).

For more details, refer to Wiring Best Practices *(see page 91)*.

Wiring

Depending on the DRIVE functionality and its application schematic, the UOC relay can be directly connected to the DRIVE Safe Torque Off (STO according to EN/IEC 61500-5-2) input or in serial with a contactor coil.

For wiring examples, refer to the Architecture examples *(see page 216)*.

Safeguarding Function

Overview

The ZARB18• Base Station implement 12 inputs IN7…IN18.

These inputs are dedicated for limit switches to provide a protection to the hoist system.

Description

There are 4 limit switches per axis that allow to:

- Stop the motion at minimum mechanical position.
- Disable the high speed of the direction when the hoist system is near the minimum position.
- Stop the motion at maximum mechanical position.
- Disable the high speed of the direction when the hoist system is near the maximum position.

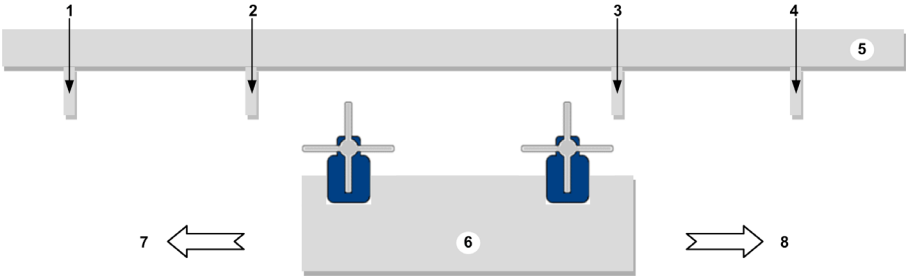
These inputs are associated to motion buttons.

Once a limit switch is opened, the associated motion relay(s) is(are) switched OFF.

You can configure the limit switches with the eXLhoist Configuration Software *(see page 194)*.

Installation Principle

Principle of safeguarding function installation for 1 axis:



1 Mechanical target for limit switch triggering for **stopping** the motion direction
2 Mechanical target for limit switch triggering for **slowing** the motion direction
3 Mechanical target for limit switch triggering for **slowing** the motion direction
4 Mechanical target for limit switch triggering for **stopping** the motion direction
5 Stationary part
6 Mobil part
7 Motion (example: button 1 or 1H)
8 Motion (example: button 2 or 2H)

General Wiring Rules

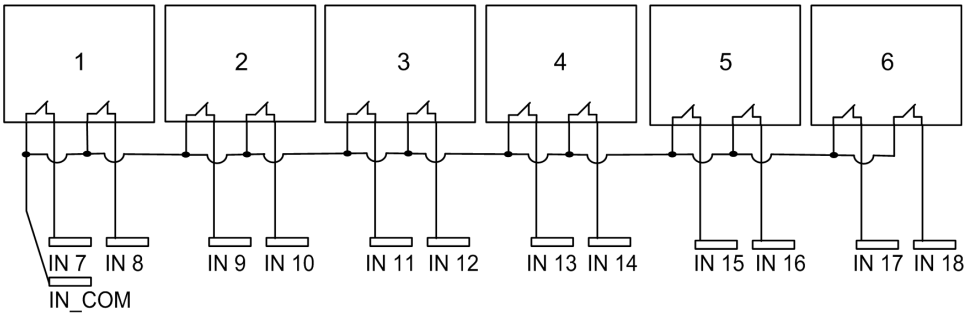
The I/O and power supply cables should be AWG 16 (cross-sectional conductor area = 1.3 mm^2).

The I/O and power supply cable lengths should not exceed 20 m (65.6 ft).

For more details, refer to Wiring Best Practices *(see page 91)*.

Wiring

Wiring diagram for the detected safeguarding devices:



1-**6** Limit switches

Factory Setting

For details on factory setting (wiring and configuration), refer to factory setting description *(see page 94)*.

Special Functions

Description

The Wireless Remote Control System manages 4 specific relays:

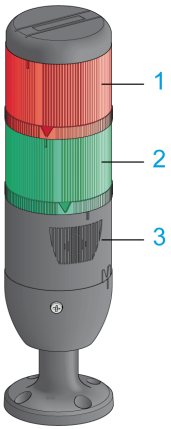
Relay	Description
Horn	This relay is switched ON during the start procedure, and for a configurable duration. This relay is also switched ON, in START mode, as long as the ON/START/Horn is pressed.
Radio link	This relay is switched ON as long as a RADIO communication is achieved between the Base Station and its Remote Device.
Safety relay image	This relay is switched ON as long as the 2 safety relays are ON. It occurs only in START mode and if all the safety conditions are fulfilled. It can indicate when the motions are enabled.
Tandem 1+2	This relay is switched ON only in TANDEM configuration and only when the 2 Base stations are selected. This relay can be used in case of inhibition of anticollision in TANDEM configuration.

You can configure the specific relays with the eXLhoist Configuration Software *(see page 194)*.

Application Example

A “Radio link” indication shall inform operator about the system communication status according to EN 15011 standard.

It is recommended to use a Schneider Electric beacon:



1 Light wired to the “Radio link” relay
2 Light wired to the “Safety relay image” relay
3 Buzzer wired to the “Horn” relay (an additional flash light can be wired to this relay)

The beacon operating is described in the START mode description *(see page 125)*.

General Wiring Rules

The I/O and power supply cables should be AWG 16 (cross-sectional conductor area = 1.3 mm^2).

The I/O and power supply cable lengths should not exceed 20 m (65.6 ft).

For more details, refer to Wiring Best Practices *(see page 91)*.

Factory Setting

For details on factory setting (wiring and configuration), refer to factory setting description *(see page 94)*.

Safety Relay

IN0 Safety Loop Input

The IN0 input is dedicated to check the correct actuator functionality with the auxiliary contact state.

The E-STOP function can reach up to SIL 3 level only if all the relevant auxiliary contacts are connected between the IN0 input and the S2_S3 port terminal.

The I/O and power supply cable lengths should not exceed 20 m (65.6 ft).

Q0A/Q0B Safety Relays

The safety relays are switched ON when ON/START/Horn button is activated and all the safety conditions are fulfilled.

The safety relay output cable length should not exceed 20 m (65.6 ft).

General Wiring Rules

The I/O and power supply cables should be AWG 16 (cross-sectional conductor area = 1.3 mm^2).

The I/O and power supply cable lengths should not exceed 20 m (65.6 ft).

For more details, refer to Wiring Best Practices *(see page 91)*.

Wiring

For wiring examples, refer to the Architecture examples *(see page 216)*.

Safety Details

For more details about safety, refer to Safety chapter *(see page 53)*.

Section 4.4
Remote Device Installation

What Is in This Section?

This section contains the following topics:

Customize The Remote Device

Overview

The Wireless Remote Control System is delivered with a factory configuration.

Use the label set to customize the remote buttons in accordance with the motion/auxiliary configuration.

For details on factory setting (wiring and configuration), refer to factory setting description *(see page 94)*.

You can also stick an empty label above the top side of the Remote Device, and write on it the label of the hoisting system driven by it.

First Commissioning

Overview

The following procedures describe the first commissioning of a Wireless Remote Control System from a pack (Base Station + Remote Device).

The installation must be in accordance to the factory setting *(see page 94)*.

In other case, refer to eXLhoist Configuration Software *(see page 201)* and the Discovery procedure description *(see page 137)*.

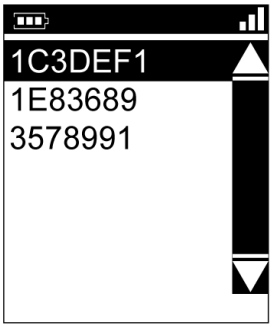
First Commissioning with 1 Base Station and the ZART8L

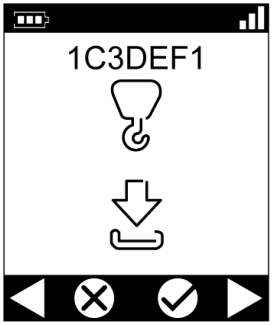
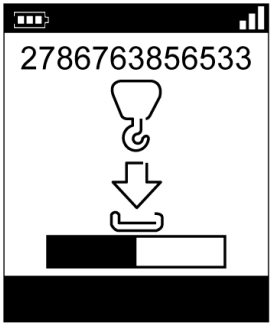
Step	Action
1	Charge the Remote Device for more than 20 minutes.
2	Install the Base Station.
3	Power ON the Base Station.
4	Place yourself to an appropriate distance from the Base Station (around 10 m (32.8 ft)).
5	Press only the ON/START/Horn button more or equal than 1 s.
6	Wait for the E-STOP LED to be permanently ON.

Result: The Wireless Remote Control System is in STOP mode *(see page 123)*.

First Commissioning with 1 Base Station and the ZART•D

Step	Action
1	Charge the Remote Device for more than 20 minutes.
2	Install the Base Station.
3	Power ON the Base Station.
4	Place yourself to an appropriate distance from the Base Station (around 10 m (32.8 ft)).

Step	Action
5	Press only the ON/START/Horn button more or equal than 1 s. **Result:** The Remote Device displays the ID list of detected Base Station: 
6	Selects the ID of the new Base Station with buttons 5 and 6.
7	Press the button 7 (trigger) to validate. **Result:** 
8	Select the validation cell (check symbol) with buttons 1 and 2.

Step	Action
9	Press the button 7 (trigger) to validate. **Result:** The Remote Device proposes to load the Configuration File from the Base Station to the Remote Device. 
10	Select the validation cell (check symbol) with buttons 1 and 2.
11	Press the button 7 (trigger) to validate. **Result:** The Remote Device loads the Configuration File from the Base Station to the Remote Device. 
12	Wait for the end of the Configuration File load.

Result: The Wireless Remote Control System is in STOP mode *(see page 123)*.

Chapter 5
Using The Wireless Remote Control System

What Is in This Chapter?

This chapter contains the following sections:

Section 5.1
Basic Uses

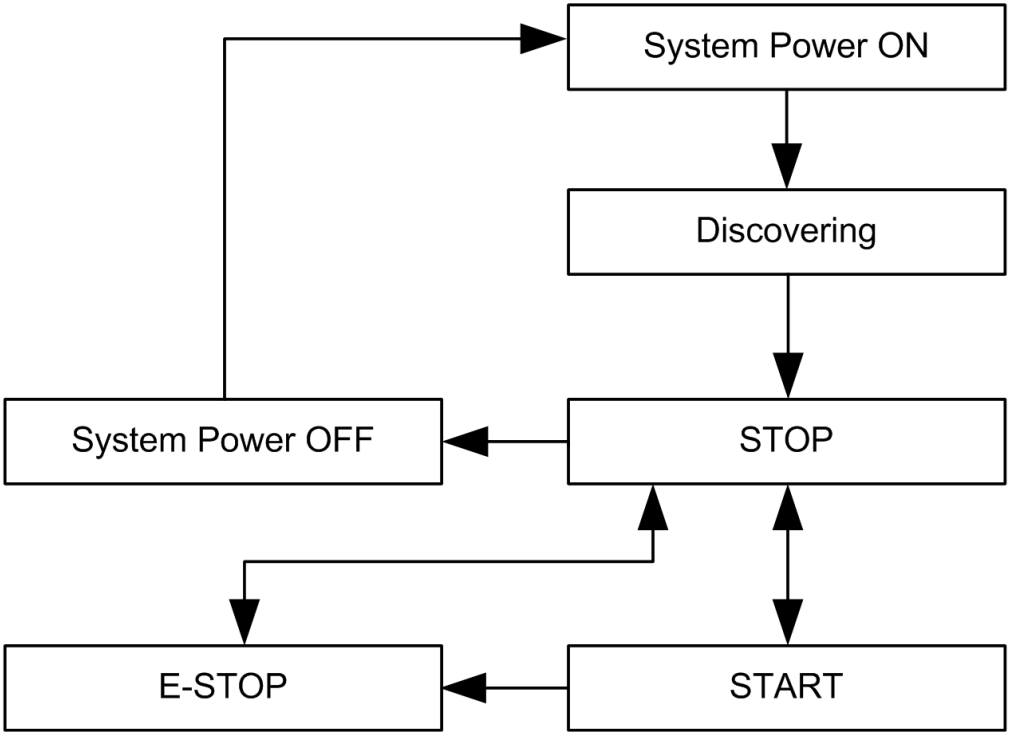
What Is in This Section?

This section contains the following topics:

Main Modes Diagram

Main Modes Diagram

The following diagram presents the main modes of the Wireless Remote Control System:



Power ON

Overview

The aim is to describe how to power ON the Wireless Remote Control System.

Triggering Procedure

Step	Action
1	Check that the Remote Device is powered OFF.
2	Power ON the Base Station.
3	Press only the ON/START/Horn button more or equal than 1 s.

Result: The Remote Device is powered ON.

The discovery procedure is automatically launched. If the Wireless Remote Control System has been installed correctly, the Wireless Remote Control System goes automatically in STOP mode *(see page 123)*.

In other case, refer to the discovery description *(see page 137)*.

Release

The Remote Device is powered OFF:

- By the Power OFF procedure *(see page 128)*.
- Automatically when the Remote Device battery level is too low.
- Automatically after the Power-saving time-out. You can configure the Power-saving time-out in the XAR Configuration software *(see page 193)*.

E-STOP

Overview

The E-STOP function leads to go to the safe position of the Wireless Remote Control System when the operator presses the E-STOP red mushroom button.

In E-STOP mode, the motion/auxiliary relays and the safety relays are OFF.

NOTE: The Remote Device cannot go to the E-STOP mode while the E-STOP function is not operational (E-STOP LED is OFF).

Triggering Procedure

Step	Action
1	Press the E-STOP button.

Wireless Remote Control System In E-STOP Mode

Remote Device:

Reference	Description
ZART8L	• The START LED is OFF. • The E-STOP LED is blinking at a frequency of 1 Hz.
ZART•D   	• The STOP mode symbol is displayed. • The E-STOP symbol is permanently displayed. • The E-STOP LED is blinking at a frequency of 1 Hz. • The Remote Device generate a vibration for 3 seconds and generate the same thing every 10 min until the E-STOP mode is released.

Base Station:

Reference	Description
Relays	• The safety relays are OFF. • The motion/auxiliary relays are OFF. • The “Safety relay image” relay is OFF.
LEDs	• The **STATUS** LED is blinking. • The **POWER** LED is ON. • The **COM** LED is blinking.

Release

Release procedure:

Step	Action
1	Verify that there is no more risk conditions.
2	Release the E-STOP button.
3	If an E-STOP restart code sequence is configured: ● Type the E-STOP restart code sequence with the motion buttons 1…6. ● Press the button 7 (trigger).

Result: The Wireless Remote Control System is in STOP mode *(see page 123)*.

Specifics Information

You can configure the E-STOP restart code sequence in the eXLhoist Configuration Software *(see page 191)*.

STOP

Overview

In STOP mode, the motion/auxiliary relays are disabled and the safety relays are OFF.

Triggering Procedure

The STOP mode is reached in the following cases:

- The OFF/STOP button is pressed (the Wireless Remote Control System was previously in START mode).
- No button pressed for more than the configured time-out (Standby time-out) configured in eXLhoist Configuration Software *(see page 191)*.
- Wireless connection lost (out of range for example).
- Remote Device accelerometer triggering due to:
  - A shock on the Remote Device
  - The Remote Device fall

Triggering procedure when the Wireless Remote Control System is in START mode:

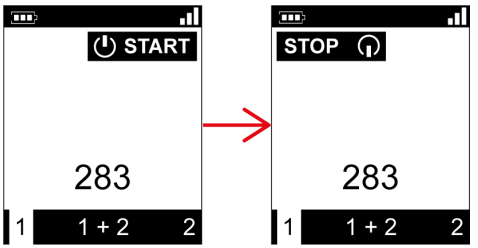
Step	Action
1	Check that the Wireless Remote Control System is in START mode.
2	Press the OFF/STOP button.

Wireless Remote Control System In STOP Mode

Remote Device:

Reference	Description
ZART8L	• The START LED is OFF. • The E-STOP LED is ON.
ZART•D STOP	• The STOP mode symbol is displayed. • The E-STOP LED is ON.

ZART•D display from START mode to STOP mode:



The Base Station execute the following steps:
1. The motion/auxiliary relays are OFF.
2. If configured, the UOC relays are OFF after a pre-configured time delay.
3. The safety relays are OFF.

Base Station:

Element	Description
Relays	● The safety relays are OFF. ● The motion/auxiliary relays are OFF. ● The “Radio link” relay is ON. ● The “Safety relay image” relay is ON.
LEDs	● The **STATUS** LED is blinking. ● The **POWER** LED is ON. ● The **COM** LED is blinking.

Release

From this mode, you can:
- Charge the Remote Device battery *(see page 143)*.
- Power OFF the Remote Device *(see page 128)*.
- Go to START mode *(see page 125)*.

Specifics Information

You can configure the Time-Out Auto-Standby duration in the eXLhoist Configuration Software *(see page 191)*.

START

Overview

The START mode is the only mode in which:

- You can command the motions *(see page 131)*.
- You can command the auxiliary function *(see page 133)*.
- You can command the horn *(see page 136)*.
- The safety relays are switched ON.

Triggering Procedure

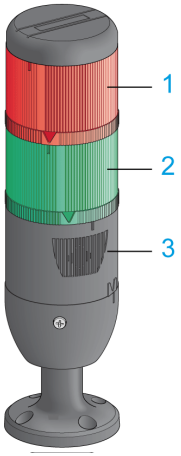
Required conditions: The Wireless Remote Control System must be in STOP mode.

Triggering procedure:

Step	Action
1	If a START code sequence is configured: ● Type the START code sequence with the motion buttons 1, 2, 3, 4, 5, 6. The default START code sequence is 5, 6, 5, 6. ● Press the button 7 (trigger) to validate.
2	Press only the ON/START/Horn button more or equal than 1 s.
3	Wait during the START warning time (ZART•D vibrations, “Horn” relay ON).

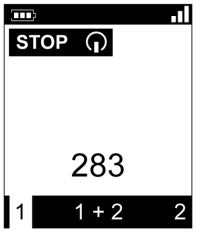
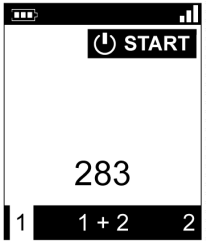
START Details

It is recommended to use a Schneider Electric beacon:



1 Light wired to the “Radio link” relay
2 Light wired to the “Safety relay image” relay
3 Buzzer wired to the “Horn” relay (an additional flash light can be wired to this relay)

Beacon description in the operating modes: (example with ZART•D)

Step	Hoisting system signaling	ZART•D
Before Power ON		-
STOP mode The motions are not enabled yet.		
Between STOP mode and START mode: ● The ZART•D vibrate facility is activated. ● The Horn sounds for the configured time. ● The motions are not enabled yet.		
START mode The motions are enabled.		

Wireless Remote Control System In START Mode

Remote Device:

Reference	Description
ZART8L	• The START LED is ON. • The E-STOP LED is ON.
ZART•D START	• The START mode symbol is displayed. • The E-STOP LED is ON.

Base Station:

Element	Description
Relays	• The safety relays are ON. • The motion/auxiliary relays are enabled. • The “Radio link” relay is ON. • The “Safety relay image” relay is ON.
LEDs	• The **STATUS** LED is blinking. • The **POWER** LED is ON. • The **COM** LED is blinking.

Release

To leave the START mode:

- You can go to STOP mode *(see page 123)*.
- You can go to E-STOP mode *(see page 121)*.
- The Wireless Remote Control System goes automatically to STOP mode when no button pressed for more than the configured time-out (standby time-out).

Specifics Information

You can configure the optional start sequence and the Horn duration during start in the eXLhoist Configuration Software *(see page 191)*.

Power OFF

Overview

This function switches OFF the Remote Device.

Triggering Procedure

Required conditions: The Wireless Remote Control System must be in STOP mode.

The "Power OFF function" is triggered in the following cases:

- The OFF/STOP button is pressed.
- No button pressed for more than the configured time-out: Auto Standby + Auto-OFF duration time.
- The Remote Device battery level is low.

Triggering procedure when the Wireless Remote Control System is in STOP mode:

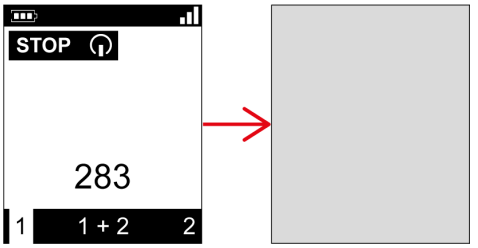
Step	Action
1	Check that the Wireless Remote Control System is in STOP mode
2	Press only the OFF/STOP button more or equal than 2 s

Wireless Remote Control System In Power OFF Mode

Remote Device:

Reference	Description
ZART8L	• All the LEDs are OFF.
ZART•D	• The display is inactive. • The E-STOP LED is OFF.

ZART•D display from STOP mode to Power OFF:



Base Station:

Element	Description
Relays	● The safety relays are OFF. ● The motion/auxiliary relays are OFF. ● The “Radio link” relay is OFF. ● The “Safety relay image” relay is OFF.
LEDs	● The **STATUS** LED is OFF. ● The **POWER** LED is ON. ● The **COM** LED is OFF.

Release

From this mode, you can:

- Power ON the Remote Device *(see page 120)*.
- Charge the Remote Device battery *(see page 143)*.

Specifics Information

You can configure the Power-saving time out in the eXLhoist Configuration Software *(see page 191)*.

Section 5.2
Functionalities

What Is in This Section?

This section contains the following topics:

Standard Motion

Overview

In START mode, the motion buttons activate the associated motion relays that command the hoisting system movements.

Triggering Procedure

Required conditions: The Wireless Remote Control System must be in START mode *(see page 125)*.

Triggering procedure:

Step	Action
1	Check that the Wireless Remote Control System is in START mode.
2	Press a motion button 1, 1H, 2, 2H, 3, 3H, 4, 4H, 5, 5+7, 6, 6+7 *(see page 24)*.

Result: The associated relays are switched ON as long as the motion button is pressed.

The Remote Device has no specific result.

Release

Release procedure:

Step	Action
1	Release the motion button.

Result: The associated relays are switched OFF.

Restrictions for Motion/Auxiliary Use

Type	Description
Number of simultaneous motions	Only up to 6 motion/auxiliary relays can be activated at the same time (excluding the UOC relays). If more than 6 motion/auxiliary relays are requested (excluding the UOC relays), then the last motion relay request is not take into account.
Interlocking	If 2 buttons dedicated to same motion axis are pressed in opposite sense (interlocking), then the motion is stopped in these both directions.
Buttons 5 and 6	The button 7 must be released to activate the button 5 or 6.

Specifics Information

In the eXLhoist Configuration Software, you can configure:

- Motion/auxiliary buttons associated to relays *(see page 194)*.
- Motion/auxiliary buttons interlocking *(see page 198)*.

Auxiliary Function

Overview

In START mode, the auxiliary buttons activate the associated relays to command auxiliary action (for example to command open and close grab).

Triggering Procedure

Required conditions: The Wireless Remote Control System must be in START mode *(see page 125)*.

Triggering procedure:

Step	Action
1	Check that the Wireless Remote Control System is in START mode.
2	Press an auxiliary button (10, 10+7, 11, 11+7, 12, 12+7, 13, 13+7, 14, 14+7, 15, 15+7) *(see page 24)*.

Result: The associated relays are switched ON as long as the auxiliary button is pressed.

The Remote Device has no specific result.

Release

Release procedure:

Step	Action
1	Release the auxiliary button.

Result: The associated relays are switched OFF.

Specifics Information

In the eXLhoist Configuration Software, you can configure:

- Motion/auxiliary buttons associated to relays *(see page 194)*.
- Motion/auxiliary buttons interlocking *(see page 198)*.

Selector

Description

There are 3 different configurations to use the selector auxiliary button:

- Bridge selector (3 positions) in TANDEM configuration: to manage 2 bridges by using 2 Base stations.
- Trolley selector (2 or 3 positions): to manage 2 trolleys with one Base Station.
- Hook selector (2 positions): to manage 2 hooks with one Base Station.

Triggering Procedure

Required conditions: The Wireless Remote Control System must be in STOP mode *(see page 123)*.

Triggering procedure:

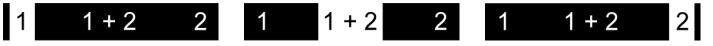
Step	Action
1	Check that the Wireless Remote Control System is in STOP mode.
2	Press the Selector button more or equal than 1 s to loop between the several positions.

Wireless Remote Control System Result

Remote Device:

For the ZART8L: the Selector LEDs are activated depending on the selection done.

For the ZART•D display: the Selector symbol indicates which bridge(s)/trolley(s)/hook(s) is(are) selected:

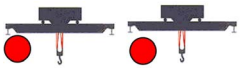
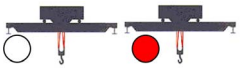
Nb of position	Description
2	
3	

Base Station relays:

The associated relay(s) is(are) switched ON.

In TANDEM configuration, when the Base stations 1 and 2 are selected, the motions asked with the Remote Device are realized simultaneously by the 2 Base stations.

In TANDEM configuration, the “Radio link” relay of the selected Base Station switches ON:

Relay	Selector position 1		Selector position 1+2		Selector position 2	
RADIO link	Bridge 1	Bridge 2	Bridge 1	Bridge 2	Bridge 1	Bridge 2
						

Specifics Information

At the first Power ON, the Selector position is 1. For further Power ON, the Selector position is the last known Selector position.

You can configure the Selector in the eXLhoist Configuration Software *(see page 194)*.

Horn

Overview

From STOP mode to START mode, the “Horn” relay is switched ON for a predefined duration time.

In START mode, as long as you press the ON/START/Horn button, the “Horn” relay is switched ON.

Triggering Procedure

Triggering procedure:

Step	Action
1	Check that the Wireless Remote Control System is in START mode.
2	Press the ON/START/Horn button.

Result: The “Horn” relay is switched ON as long as the ON/START/Horn button is pressed.

The Remote Device has no specific result.

Release

Release procedure:

Step	Action
1	Release the ON/START/Horn button.

Result: The “Horn” relay is switched OFF.

Specifics Information

The Horn duration during start can be configured in the eXLhoist Configuration Software *(see page 193)*.

Section 5.3
Discovering

Discovering

Overview

The discovering function is developed to be as automatic as possible.

This function manages 2 different tasks:

- The pairing of the system: association between a Remote Device and a Base Station
- The Configuration File Upload/Download: this file contains the Wireless Remote Control System configuration information.

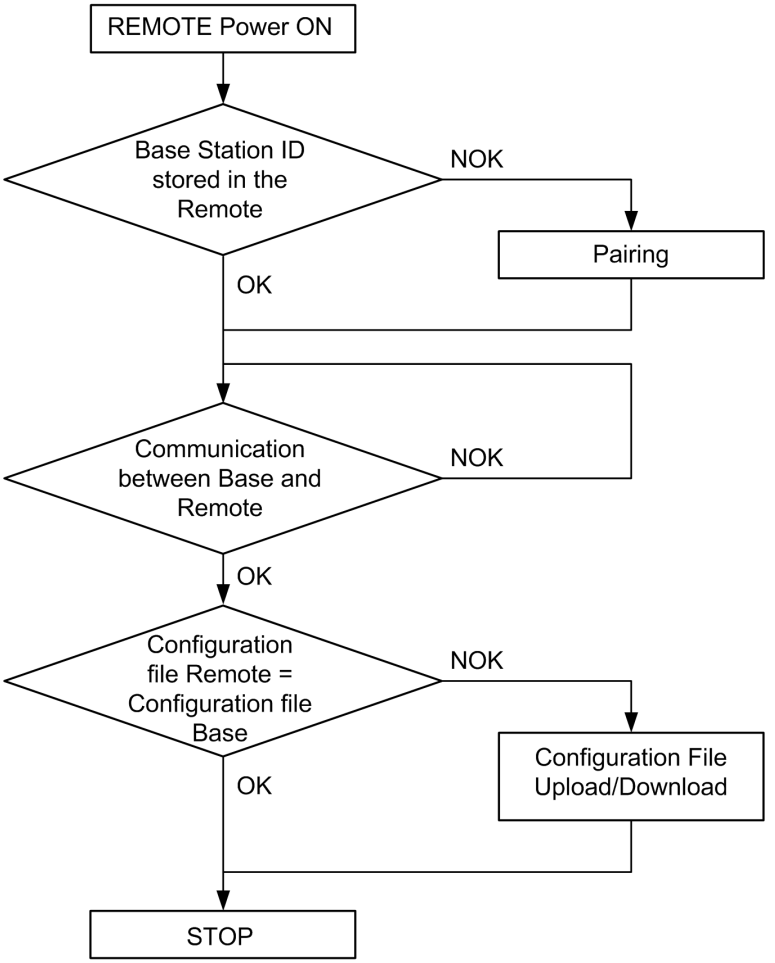
This function is launched at each Remote Device Power ON. In normal use, this function is automatic. You have to realize intermediate operations during:

- A device replacement *(see page 203)*
- The first commissioning *(see page 114)*

NOTE: This function is only applicable to ZAR•D Remote Device.

Discovering Diagram

The following diagram presents the detailed Discovering function:



Pairing

The pairing is the action to associate a Base Station with a Remote Device.

Each Base Station have a unique ID.

The pairing test is launched at each Remote Device power ON.

As long as the pairing test is OK, the validation procedure is not requested to the operator.

Configuration File

The Configuration File is stored in the Remote Device and in the Base Station.

The Configuration File can be created or modified in the eXLhoist Configuration Software *(see page 161)*.

It contains:

- The Remote Device reference
- The Base Station ID
- The Base Station reference
- The button/relay associations
- The UOC relay assignment and time delay defined
- The detected applicative alarm configuration
- The safeguarding configuration
- The standby time-out and power-saving time-out

Section 5.4
How to Modify the Configuration

How to Modify a Configuration

Configuration Modification

The following procedure describes how to modify the system configuration:

Step	Action
1	Connect the Remote Device to a PC *(see page 165)*.
2	Start the eXLhoist Configuration Software *(see page 178)*.
3	Create a project *(see page 179)*.
4	Modify the configuration of the project *(see page 188)*
5	Select **Communication →Store to Device**.
6	Wait for the end of the Configuration File load in the Remote Device.
7	Disconnect the Remote Device to the PC.
8	Power ON the Base Station.
9	The Configuration File must be loaded from the Remote Device to the Base Station. Refer to: ● Configuration File load With a ZART8L *(see page 140)*. ● Configuration File load With a ZART•D *(see page 141)*.

Result: The Remote Device goes to STOP mode *(see page 123)*.

It is recommended to redo an Acceptance Test *(see page 75)*.

Configuration File load With a ZART8L

After the modification of the configuration with the eXLhoist Configuration Software:

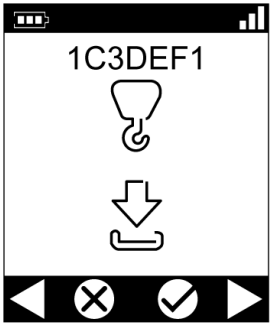
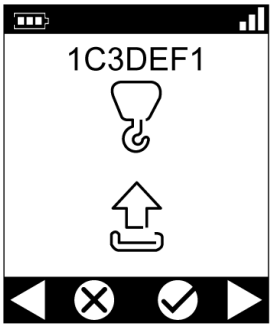
Step	Action
1	Power ON the Remote Device.
2	The Configuration File is automatically loaded from the Remote Device to the Base Station. During the load, the START LED and “2” LED are flashing *(see page 157)* . Wait for the end of the Configuration File load.

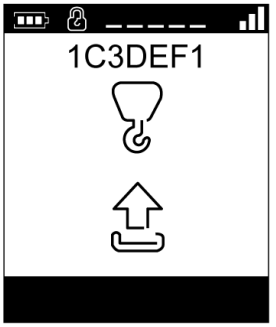
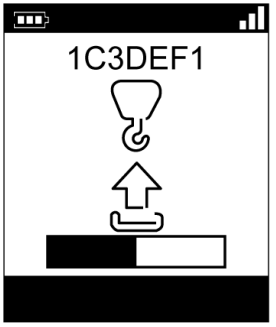
Result: The Remote Device goes to STOP mode *(see page 123)*.

It is recommended to redo an Acceptance Test *(see page 75)*.

Configuration File load With a ZART•D

After the modification of the configuration with the eXLhoist Configuration Software:

Step	Action
1	Power ON the Remote Device. **Result:** The Remote Device propose to load the Configuration File from the Base Station to the Remote Device. 
2	Select the cancel cell (X) with buttons 1 and 2.
3	Press the button 7 (trigger) to validate.
4	The Remote Device propose to load the Configuration File from the Remote Device to the Base Station.  Select the validation cell (check symbol) with buttons 1 and 2.

Step	Action
5	If the Configuration File has a transfer password, a padlock is displayed:  Enter the Configuration File transfer code with the buttons 1 to 6. The default transfer password is 5, 6, 5, 6.
6	Press the button 7 (trigger) to validate. **Result:** The Remote Device loads the Configuration File from the Remote Device to the Base Station. 
7	Wait for the end of the Configuration File load.

Result: The Remote Device goes to STOP mode *(see page 123)*.

It is recommended to redo an Acceptance Test *(see page 75)*.

Section 5.5
Remote Device Charge

Remote Device Charge

Required Conditions

- The Remote Device must only be charged indoor with the ZARC01 charger.
- The Remote Device must be in STOP mode or Power OFF.
- The Remote Device temperature range must be 10…60 °C (50…140 °F) in case of battery charge.

NOTE: At the first commissioning, you must charge the Remote Device for 30 minutes.

NOTE: The Remote Device charge time is 15 minutes long at the maximum if the temperature range is 10…35 °C (50…95 °F), and is longer if the temperature is higher than 35 °C (95 °F).

⚠ WARNING

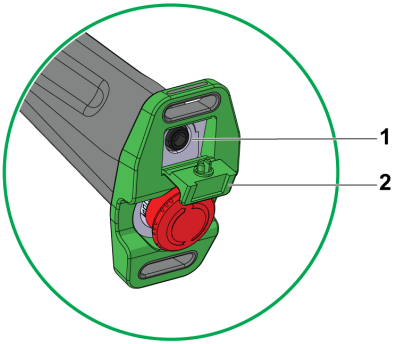
BATTERY LIFESPAN, RISK OF EXPLOSION AND FIRE

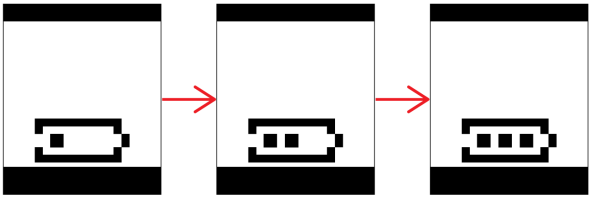
Do not dispose of electric tools together with household waste material.

In observance of european directive 2002/96/EC on wasted electrical and electronic equipment and its implementation in accordance with national law, electric tools that have reached the end of their life must be collected separately and returned to an environmentally compatible recycling facility.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Procedure

Step	Action
1	Power OFF the Remote Device.
2	On the bottom of the Remote Device, remove the protective cap.  **1** Remote Device battery charge connector **2** Protective cap
3	Connect the charger to the Remote Device battery charge connector.
4	Plug the charger to the dedicated power source.

Step	Action
5	Wait for around 15 minutes. During the charge: ● ZART8L: the battery LED is flashing. ● ZART•D: the blinking battery symbol indicates the battery level:  The battery is fully charged when: ● ZART8L: the battery LED is permanently ON. ● ZART•D: the battery symbol is permanently displayed. For more details, refer to Diagnostic *(see page 153)*. **NOTE:** The time duration for charge or the Remote Device depends on the ambient temperature.
6	Unplug the charger to the dedicated power source.
7	Unconnect the charger to the Remote Device battery recharge connector.
8	On the bottom of the Remote Device, place back the protective cap.

NOTE: If the system is in START mode, it goes automatically in STOP mode at the connection of the charger.

Chapter 6
Diagnostic

What Is in This Chapter?

This chapter contains the following sections:

Section 6.1
Base Station Diagnostic

Diagnostic

Description

The Base Station have 3 LED indicators:

LED	Color	State	Description
STATUS	Green	Blinking	The Wireless Remote Control System is working properly.
		OFF	Base Station Power OFF or internal fault detected.
COM	Yellow	OFF	No communication between the Base Station and the Remote Device.
		Blinking	The communication is established between the Base Station and the Remote Device.
POWER	White	OFF	Base Station powered OFF.
		ON	Base Station powered ON.

Section 6.2
ZART•D Diagnostic

What Is in This Section?

This section contains the following topics:

Diagnostic Mode

Overview

To test the Wireless Remote Control System configuration, the ZART•D has a specific diagnostic mode display.

Procedure to Activate the Diagnostic Mode

The diagnostic mode on the ZART•D indicates the inputs and relays states of the Base Station.

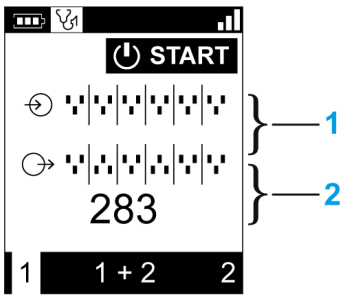
Step	Action
1	Go to STOP mode *(see page 123)*.
2	Simultaneously press the buttons 1 and 2, and release immediately.
3	Less than 5 seconds later, simultaneously press the buttons 3 and 4.
4	Release the buttons 3 and 4.

Diagnostic Display Description

In STOP mode, use the buttons 5 and 6 to alternate between the 3 screens:

- Base Station information:
  - ID
  - Hardware version
  - Firmware version
- Remote Device information:
  - ID
  - Hardware version
  - Firmware version
- Remote Device battery information (only for Schneider-Electric use).

In START mode, the Remote Device displays dynamically the I/O status:



1 IN1...IN18 states: up for input = 1, down for input = 0
2 Relays 1...18 states: up for output = 1, down for output = 0

Procedure to Leave the Diagnostic Mode

Step	Action
1	Power OFF the Remote Device

Radio Communication Indicator

ZART•D

Display	ZART•D radio communication level with the Base Station
	High
	Medium
	Low
	No radio communication

Battery Level of the Remote Device

ZART•D

Display	Description
	Battery charge level is high
	Battery charge level is medium
	Battery charge level is low
	This display occurs at least 10 minutes before the Remote Device cannot properly work. In addition, the Remote Device vibrate facility is activated for 1 second.

E-STOP LED

Description

E-STOP LED	Description
Permanently ON	E-STOP is operational and not triggered.
Blinking at a frequency of 1 Hz.	E-STOP is operational and triggered.
Permanently OFF	E-STOP is not operational.

Applicative Alarms Signals

Overview

Some devices can be connected to the ZARB18• Base Station to provide detected applicative alarms signals that can be displayed in the ZART•D.

ZART•D

When applicative alarms signals come from ZARB18• Base Station, the ZART•D Remote Device involves a symbol display and 3 seconds of vibration every 10 minutes as long as the alarm signal is active.

The Remote Device displays the following symbols:

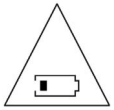
Display	Status	Description
	Permanently ON	Overload pre-alarm
	Blinking at a frequency of 1 Hz	Overload alarm
	Permanently ON	Over wind pre-alarm
	Blinking at a frequency of 1 Hz	Over wind alarm
	Blinking at a frequency of 1 Hz	Over speed alarm
	Blinking at a frequency of 1 Hz	Generic alarm

NOTE: The applicative alarms are only information, the Wireless Remote Control System does not change its functional mode.

Detected Failure Displays

ZART•D

The ZART•D Remote Device can display the following symbols:

Display	Status	Description
	Blinking	Configuration File download failure detected
	Blinking	Configuration File upload failure detected
	Blinking	Remote Device failure detected
	Blinking	Remote Device battery charge failure detected

Section 6.3
ZART8L Diagnostic

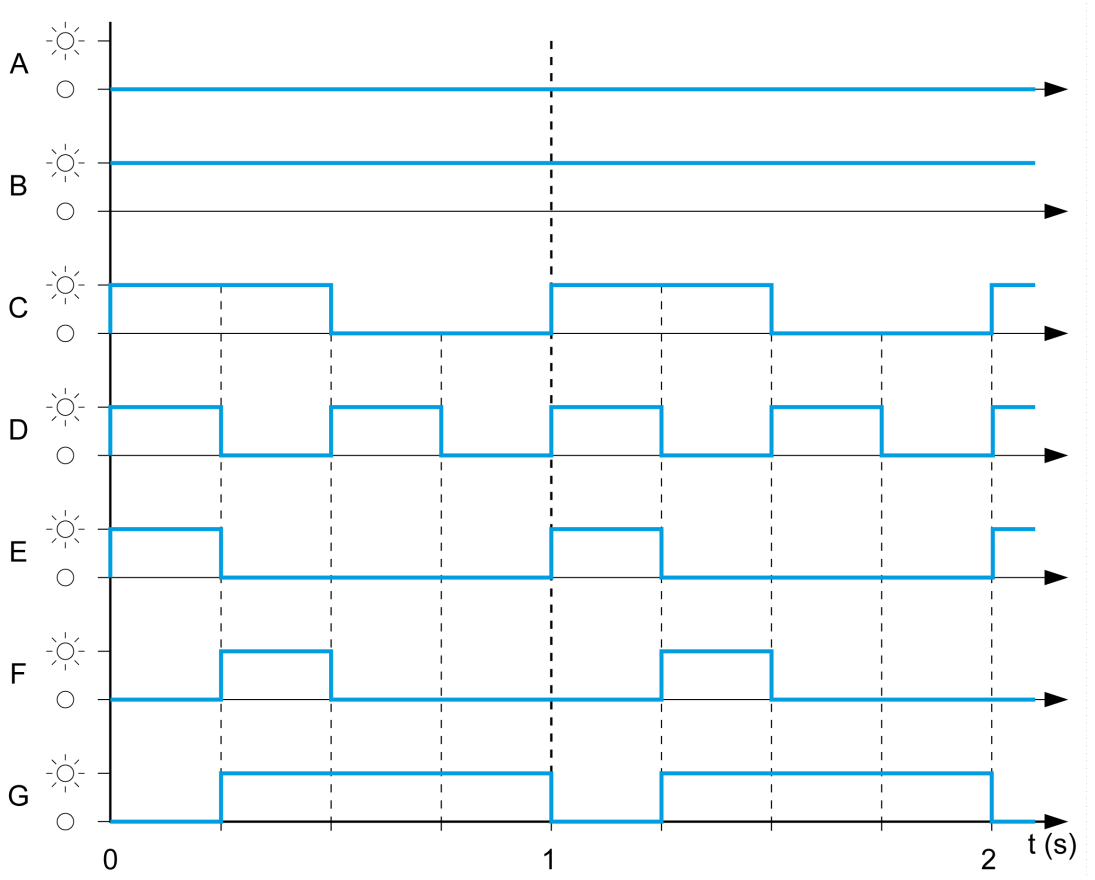
ZART8L LED Diagnostic

Overview

This section describes the ZART8L Display LEDs *(see page 28)*.

LED Status Chronogram

The following diagram presents the different status of the ZART8L LEDs:



Label	Status
A	OFF
B	ON
C	Normal blink
D	Fast blink
E	Flash step 1
F	Flash step 2
G	Reverse flash step 1

Start LED

Label	Status	Description
B	ON	The system is in START mode with radio operational
C	Normal blink	Radio not established or START mode not yet confirmed
F	Reverse flash step 1	A password has not yet been provided & validated (either for before START, or after unlocking the E-Stop before START)
D	Fast blink	Wrong Configuration File
E	Flash step 1	The Remote Device is connected to a PC.
A	OFF	To represent other states than the previous ones

Battery LED

Charger ZARC01 not connected

Label	Status	Description
B	ON	Battery charge level is high Battery charge level is medium
C	Normal blink	Battery charge level is low
D	Fast blink	Battery charge level is very low The battery capacity just allows 10 minutes of normal operation.
A	OFF	The battery is fully discharged or the Remote Device is Power OFF.

Charger ZARC01 connected

Once the Remote Device is connected to the battery charger, the battery LED flashes 3 times (E label = FLASH_STEP_1). After the 3 flash, the battery LED status changes to the following ones:

Label	Status	Description
B	ON	Battery charge level is full (No need to charge or end of charge)
E	Flash step 1	Battery charge in progress
C	Normal blink	Impossible to charge (charger failure detected) or temperature out of the allowed boundaries
A	OFF	Impossible to charge (battery too low to be charged)

Selector LEDs

The “1” LED:

Label	Status	Description
B	ON	The “1” or the “1+2” selector position is selected and confirmed
C	Normal blink	The “1” or the “1+2” selector position is required but not yet confirmed
A	OFF	The selector position “1” is NOT selected

The “2” LED:

Label	Status	Description
B	ON	The “1+2” or the “2” selector position is selected and confirmed
C	Normal blink	The “1+2” or the “2” selector position is required but not yet confirmed
A	OFF	The selector position “2” is NOT selected

Set of LEDs

Power ON - Check LEDs:

At Remote Device Power ON, the 4 LEDs (START, Battery, 1, and 2) flash one time (status E = Flash step 1).

Remote failure detected:

If a remote internal failure is detected, the 4 LEDs go in the following status:

- The START LED is in status E = Flash step 1
- The BATTERY LED is in status E = Flash step 1
- The “1” LED is in status E = Flash step 1
- The “2” LED is in status E = Flash step 1

Configuration file download:

During the transfer of a Configuration File (from the Remote Device to the Base Station):

- The START LED is in status E = Flash step 1
- The “2” LED is in status F = Flash step 2

Remote device reset:

When you press the reset button : until the “1” and “2” LED comes in the following status:

- The “1” LED is in status E = Flash step 1
- The “2” LED is in status A = OFF

E-STOP LED

Label	Status	Description
B	ON	E-STOP is operational and not triggered.
C	Normal blink	E-STOP is operational and triggered.
A	OFF	E-STOP is not operational.

Chapter 7
eXLhoist Configuration Software

What Is in This Chapter?

This chapter contains the following sections:

Section 7.1
Introduction to eXLhoist Configuration Software

What Is in This Section?

This section contains the following topics:

What is eXLhoist Configuration Software?

Introduction

eXLhoist Configuration Software is a graphic user interface allowing you to manage the configuration of the Wireless Remote Control System.

Software Features

Main software features of eXLhoist Configuration Software:

- Standard Windows® interface
- Application browser and multiple window views
- Programming and configuration support
- Communication with controller

Standard Windows® Interface

Key standard Windows® features:

- Easy use of keyboard or mouse
- Dockable windows
- Standard menu organization
- Tooltips, status bar, and shortcut menus
- Online help including context-sensitive help

Controller Communication and Control

Main eXLhoist Configuration Software features for remote support:

- Connecting and disconnecting a remote
- Downloading and uploading remote configuration files

Additional Information

Refer to the following for additional information:

- For information on standard Windows® interface features, refer to Microsoft Windows® documentation and help files.
- For context-sensitive help, first click in the main window and then press **F1** or click the **help** buttons in dialog boxes.

Conventions

The following typographic conventions are used in this operation guide.

Format	Represents
Bold	For user input, enter words or phrases shown in **bold** as they appear. Menu names and options, commands and toolbar names, and dialog box names and options are also shown in **bold** type.
UPPER CASE	Keyboard names, combinations, and sequences are shown in all uppercase letters. For example, the keyboard shortcut for creating a new application is CTRL+N. To perform this shortcut, press and hold the CTRL key and then press the N key.
File →Open	The arrow indicates a menu selection. In this instance, go to the **File** menu to select the **Open** command.

Connect a Remote Device to the PC

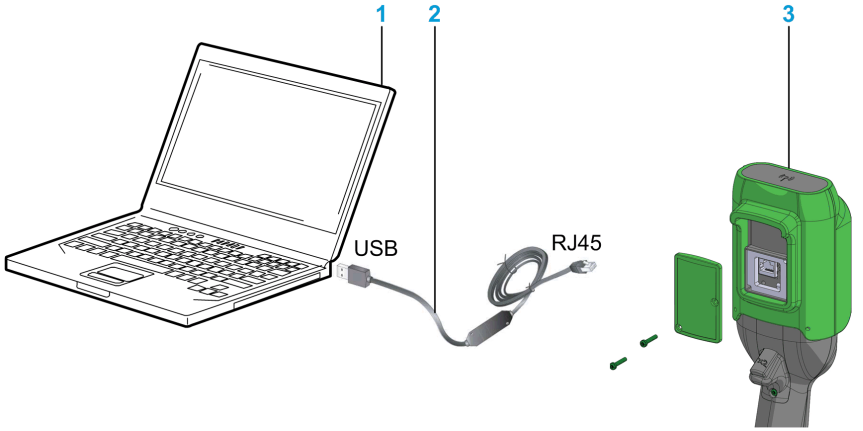
Introduction

The connection is made using the RJ45 to USB converter cable.

It is recommended to Power OFF the Remote Device before connecting it to the PC

Description

The figure illustrates the connection to a personal computer:



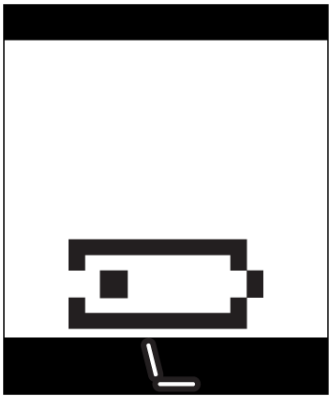
1 Personal computer
2 USB to RJ45 converter cable: TCSMCNAM3M002P
3 Remote Device

NOTICE
INOPERABLE EQUIPMENT ● Always connect the communication cable to the PC before connecting it to the device. ● Only use the Schneider Electric cable TCSMCNAM3M002P. **Failure to follow these instructions can result in equipment damage.**

The PC does not supply the Remote Device. As long as the Remote Device is connected to the PC, it is recommended to charge the remote *(see page 143)*.

As long as the Remote Device is connected to the PC:

ZART•D: a dedicated screen is displayed



ZAR8L: The Start LED is flashing.

Installation

Introduction

The software can be downloaded from *www.schneider-electric.com*.

It must be installed via an administrator account.

Prerequisites

eXLhoist Configuration Software requires the following minimal configuration:

- Dual core processor
- RAM: 2 GB
- Required disk space: 2 GB
- Windows® XP SP3 32 bits / 7 Pro 32 bits

Installation Process

To install eXLhoist Configuration Software, follow the steps below:

Step	Action
1	Double-click the program file (setup.exe).
2	If the .NET® framework 3.5 SP1 is not already installed, the installer automatically installs it.
3	Follow all the steps.

Section 7.2
User Interface

What Is in This Section?

This section contains the following topics:

Starting Screen

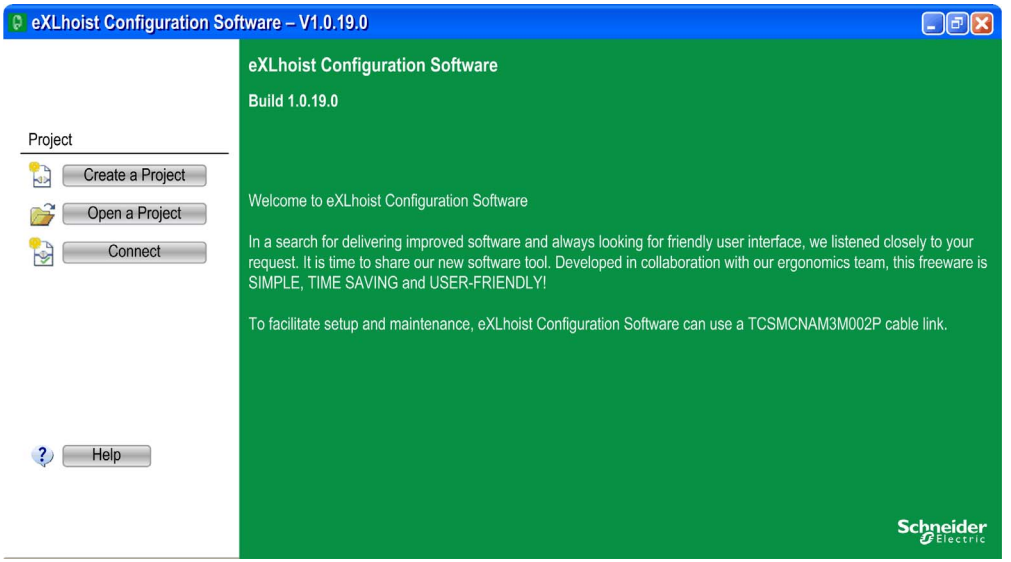
Introduction

The eXLhoist Configuration Software starting window is displayed at software launching. It provides easy access to the main functions:

- Create a new project.
- Open an existing project.
- Connect a Remote Device.

Description

The illustration shows the eXLhoist Configuration Software starting screen:



Button	Description
Create a Project	Allows you to create a new project with default values.
Open a Project	Allows you to open an existing project. Project files have the “xpf” extension.
Connect	Allows you to create a project with the data stored in a Remote Device. The data are uploaded from the Remote Device to the PC.

For more details, refer to Create a project *(see page 179)*.

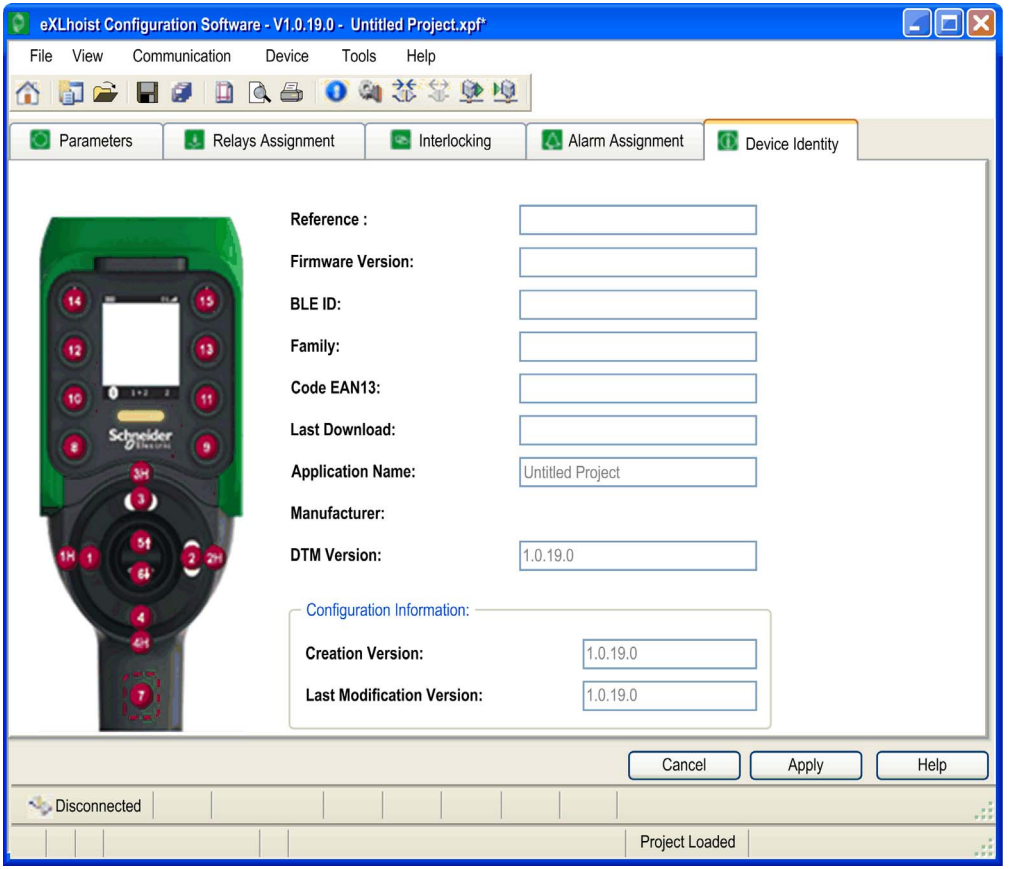
Main Window

Introduction

The eXLhoist Configuration Software main window provides access to menus and commands, windows and toolbars, and views of an application.

Description

The illustration shows the eXLhoist Configuration Software main window:



Status Bar

Introduction

The status bar is a panel at the bottom of the main window that displays information about the application and the connected device. The status bar can be turned on or off by selecting **View** → **Status Bar** from the menu bar.

Description

The status bar displays:

- Status messages and prompts
- Project status

Toolbar

Introduction

The toolbar is a panel at the top of the main window which provides access to the main commands using icons.

The toolbar can be turned on or off by selecting **View** →**Toolbar** from the menu bar.

Description

The illustration shows the eXLhoist Configuration Software toolbar:

Element	Description
1	**Go to Start Page**: Displays the start page, any opened project must be closed. If the project is not saved, a dialog box asks to save the project.
2	**New Project**: Creates new project, any opened project must be closed. If the project is not saved, a dialog box asks to save the project.
3	**Open Project**: Opens a project saved on your computer.
4	**Save**: Saves modifications to an existing project.
5	**Save As**: Saves an open project under a name and/or in a new location.
6	**Page Setup**: Ables to configure the printing page setup.
7	**Print Preview**: Displays the print preview.
8	**Print**: Prints the project.
9	**Identify Device** *(see page 189)*
10	**Edit Connection** *(see page 182)*.
11	**Connect to Device**: Establishes the connection between the remote and the software.
12	**Disconnect from Device**: Disconnects the connection between the remote and the software.
13	**Load From Device**: Loads the parameters from the connected remote to the project file. If no project is opened, this command loads the remote information to the project file. If a project is opened, this command loads the remote configuration to the project. Project data are overwritten.
14	**Store to Device**: Transfer configuration from project to the remote. If no project is opened, this command downloads the existing project file information to the remote. If a project is opened, this command transfers the project information to the remote.

Menu Bar

Introduction

The menu bar is a panel at the top of the main window which provides access to the command menus.

Description

The illustration shows the eXLhoist Configuration Software menu bar:

Menu	Description
File	Available to launch file related operations (**New**, **Open**, **Export**, **Print**, **Save**, **Close**, and so on).
View	Available to toggle the toolbar and status bar visibility.
Communication	Available to manage the communication-related operation.
Device	Available to manage the Transfer Configuration File Password *(see page 183)*.
Tools	Available to switch the language of the eXLhoist Configuration Software.
Help	Available to manage the **Help** and **About** of the eXLhoist Configuration Software.

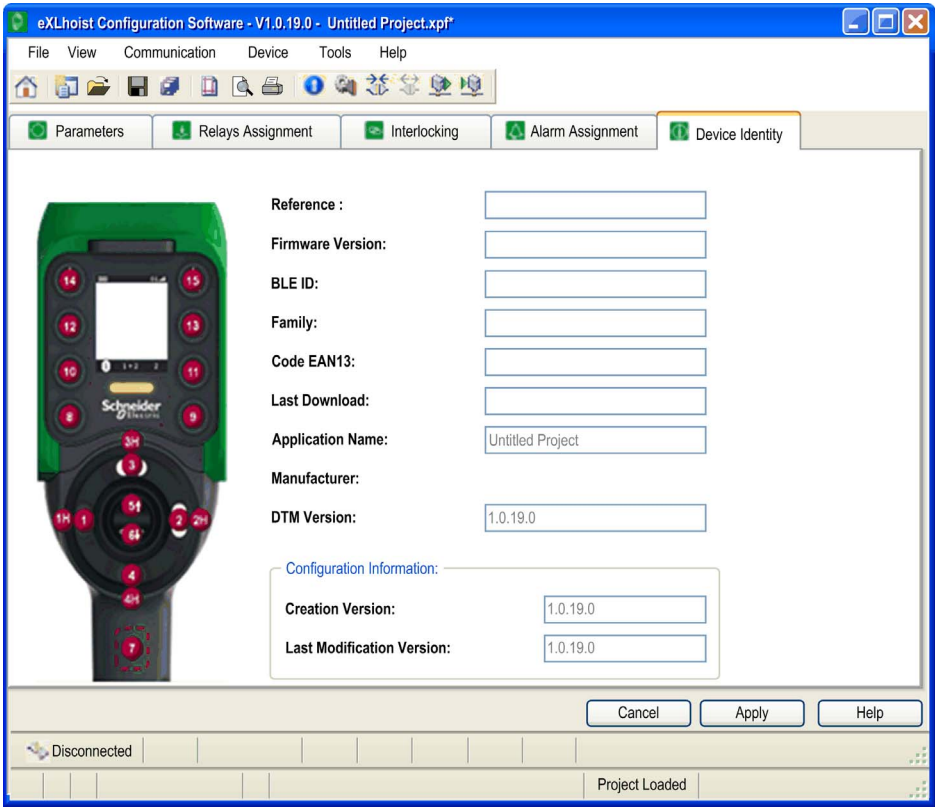
Workspace

Introduction

The eXLhoist Configuration Software workspace provides access to the connected remote parameters.

Description

The illustration shows the eXLhoist Configuration Software workspace:



The following tabs are available from the workspace:

- Parameters *(see page 191)*
- Relays Assignment *(see page 194)*
- Interlocking *(see page 198)*
- Alarm Assignment *(see page 199)*
- Device Identity *(see page 189)*

Section 7.3
Project Management

What Is in This Section?

This section contains the following topics:

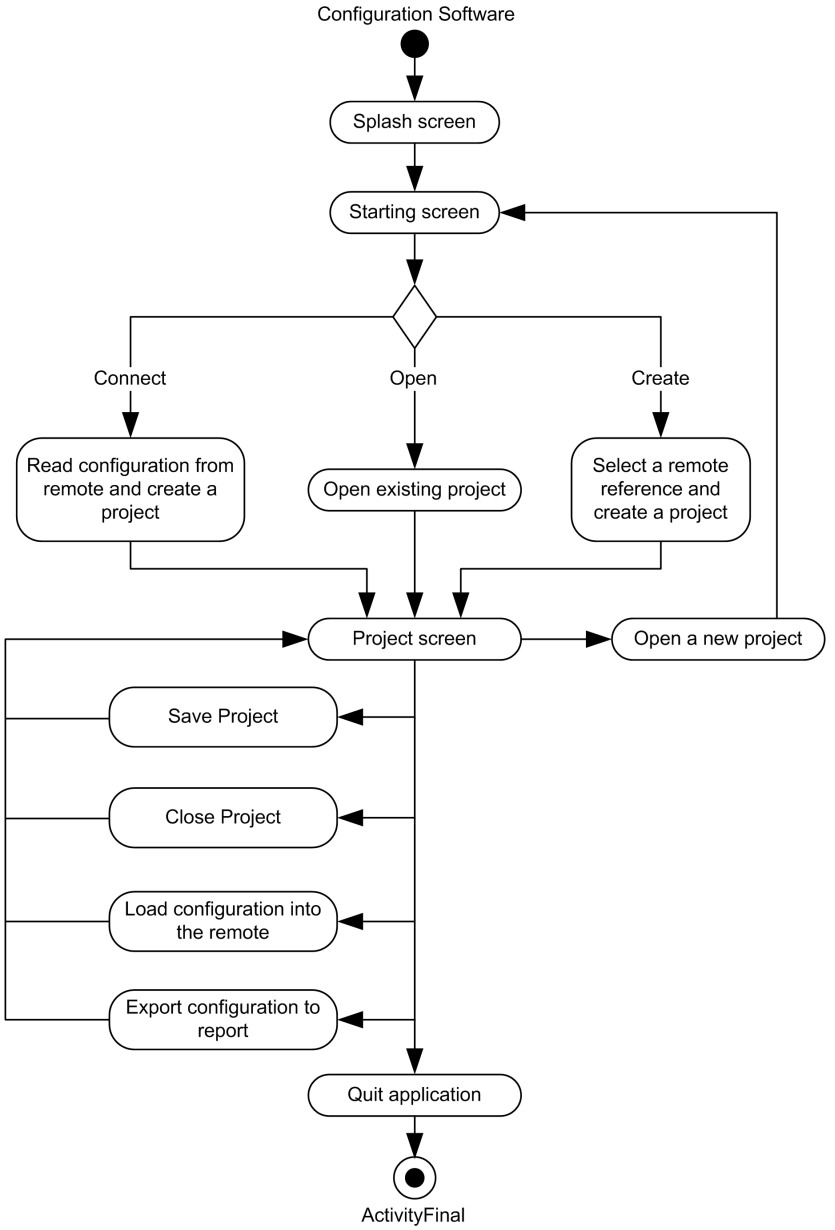
Diagram

Uses Cases

The main use cases of the eXLhoist Configuration Software are:

- Create a project.
- Open an existing project.
- Open a new project using data from remote connected.
- Save project.
- Close project.
- Generate the configuration documentation to export in “.pdf” file.
- Transfer configuration from PC to Remote Device.

The diagram illustrates the use cases:



Starting and Exiting eXLhoist Configuration Software

Starting eXLhoist Configuration Software

The installation procedure for eXLhoist Configuration Software creates one or more of the following options for starting the software, depending on selections made during installation.

Select one of the following options to start eXLhoist Configuration Software:

- Double-click the eXLhoist Configuration Software icon on the Windows® desktop.
- Select the eXLhoist Configuration Software entry from the Windows® programs menu.
- Select **Run** from the Windows® start menu and browse for the eXLhoist Configuration Software program.

eXLhoist Configuration Software starts and the starting screen is displayed.

Exiting eXLhoist Configuration Software

To exit eXLhoist Configuration Software:

Step	Action
1	Select **File** →**Exit** from the main menu. If there is no change, the application closes and eXLhoist Configuration Software exits to the Windows® desktop. If there are changes, an exit dialog box is displayed prompting you to save changes.
2	Select **Yes** to save changes and exit eXLhoist Configuration Software. Select **No** to discard changes and exit. Select **Cancel** to return to eXLhoist Configuration Software with changes intact.

Creating a Project

Overview

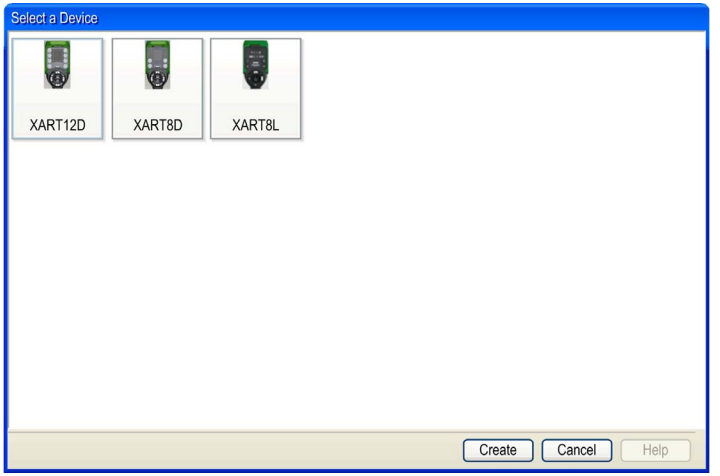
As shown in the eXLhoist Configuration Software diagram, there are 3 ways to start a project:

- Create a new project with default values *(see page 179)*.
- Open an existing project *(see page 180)*.
- Create a new project with the configuration stored in a connected Remote Device *(see page 180)*.

These 3 ways can be realized form the starting screen but also from the main menu.

Create a New Project with Default Values

Follow the procedure to create a new project with default values.

Step	Action
1	From the starting screen, click **Create a project** button. Note: From the main menu, select **File** →**New**.
2	A device selection window is displayed:  Select the appropriate device.
3	Click **Create** button. Result: The project window is activated.

Open an Existing Project

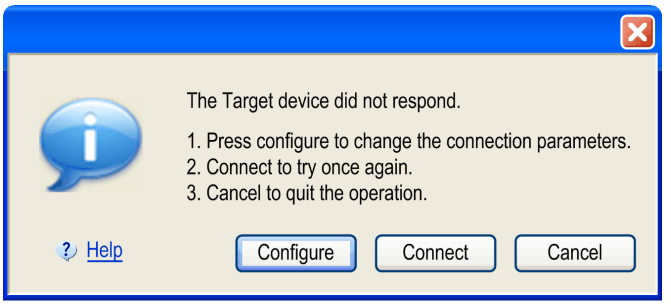
Follow the procedure to open an existing project from your PC:

Step	Action
1	From the starting screen, click **Open a project** button. Note: From the main menu, select **File** →**Open**.
2	A browser window is displayed. Select the project file (".xpf").
3	Click **Open**.
4	If the project file is locked, a window is displayed. Enter the project password *(see page 184)*. Click **Enter**. The project window is activated.

Note: If you do not enter the correct project password, the project is nevertheless opened but in "Locked" mode. In this mode, only the **Device Identity** tab content is displayed.

Create a New Project with the Configuration Stored in a Remote Device

Follow the procedure to create a new project with the configuration stored in a connected Remote Device:

Step	Action
1	Connect a Remote Device to the PC *(see page 165)*.
2	From the starting screen, click **Connect** button.
3	If the communication between the PC and the Remote Device is not established, a window is displayed:  Click **Configure** to display the Edit Connection windows *(see page 182)*. Click **Connect** to retry the connection. Click **Cancel** to cancel the connect procedure.

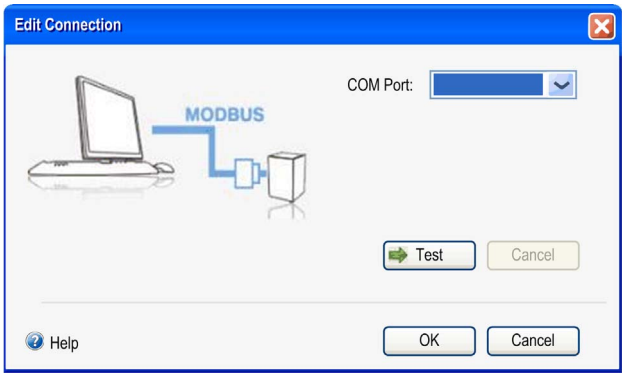
Step	Action
4	If the configuration in the Remote Device has a transfer Configuration File password, a window is displayed. Enter the Transfer Password *(see page 183)* with the keyboard of the PC. Click **Enter**.
5	Wait during the transfer. Note: A progress bar is displayed during the transfer.
6	If the project file is locked, a window is displayed. Enter the project password *(see page 184)*. Click **Enter**. The project window is activated.

NOTE: If you do not enter the correct project password, the project is nevertheless opened in “Locked” mode. In this mode, only the **Device Identity** tab content is displayed.

Edit a Connection

Overview

Follow the procedure to modify the communication settings for the connected device:

Step	Action
1	Connect a Remote Device to the PC *(see page 165)*.
2	From the main menu, select **Communication** →**Edit Connection**.
3	A window is displayed:  Select the **COM Port**.
4	Click **Test**.
5	If the communication is not established with the Remote Device, click **Cancel** and modify the Modbus protocol settings. Modbus Driver setting available: ● Baud rate: 19200 bauds ● Mode (Data Bits): RTU (8 bits) ● Even Parity ● One Stop bit
6	Click **OK** to validate and close the window. Click **Cancel** to close the window.

Project Passwords Management

Overview

You can configure 2 passwords to the project:

- The transfer password of the Configuration File
- The project password

Transfer Password

The transfer password is asked before each Configuration File transfer.

- After a modification of the system configuration *(see page 140)*
- During a remote replacement *(see page 207)*

Follow the procedure to create or modified the transfer password:

Step	Action
1	From the main menu, select **Device** →**Transfer Password** →**Create Password**. Result: A window is displayed. The default transfer password is: 5, 6, 5, 6
2	To modify an existing password, enter the previous password in the **Old Password** fields.
3	Enter the new transfer Configuration File password in the **New Password** and in the **Confirm Password** fields. **NOTE:** Password must be 2 digits up to 6 digits. Digits allowed are 1, 2, 3, 4, 5 and 6.
4	Click **OK**.

The transfer password is stored in the project and in the Configuration File.

During configuration, use the keyboard of the PC to enter the transfer password.

In normal use (not connected to a PC), use the motion buttons 1...6 of the Remote Device to enter the transfer password.

Project Password

The project password is asked before opening a locked project.

Follow the procedure to create or modified the project password:

Step	Action
1	From the main menu, select **File →Password →Project Password**. Result: A window is displayed.
2	To modify an existing password, enter the previous password in the **Old Password** fields.
3	Enter the new project password in the **New Password** and in the **Confirm Password** fields. **NOTE:** Password can contain from 1 to 20 characters. Characters allowed are a…z, A…Z, and 0…9. All other characters are non-allowed (+ ° _ - % ’ .).
4	Click **OK**.

If the project password is not entered at the opening project, select **File →Password →Unlock Project**.

Load the Configuration into the Remote Device

How To ...

Follow the procedure to load the configuration from the PC to the Remote Device:

Step	Action
1	Connect a Remote Device to the PC *(see page 165)*.
2	Create or open a project.
3	From the main menu, select **Communication** →**Store to device**.
4	If asked, enter the transfer password.
5	Wait during the transfer.

Save a Project

How To ...

Follow the procedure to save the project file on the PC:

Step	Action
1	From the main menu, select **File** →**Save**. Result: A browser window is displayed.
2	Choose the directory.
3	Click **Save**.

It is possible to change the name of the project file by selecting **File** →**Save as**.

Export to PDF

How To ...

Follow the procedure to export the configuration to a PDF file:

Step	Action
1	From the main menu, select **File** →**Export** →**Export to PDF**. Result: A browser window is displayed.
2	Choose the directory and the name of the export file.
3	Click **Export**. Result: The export file is created.
4	A question window asks you to open or not the export file. Click **Yes** to open the export file. Click **No** to go back to the project workspace.

Section 7.4
Configuration

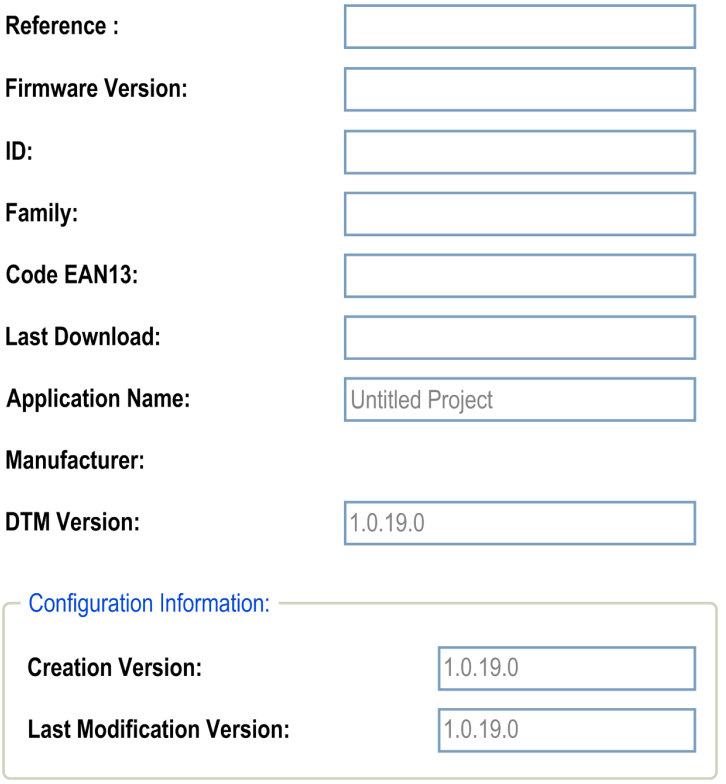
What Is in This Section?

This section contains the following topics:

Device Identity

Overview

From this tab, you can read generic information from the Remote Device:



Description

At the activation, the fields are clear.

Click the **Read** button to display generic information coming from the connected Remote Device. If there is no Remote Device connected, you are informed by a popup and all fields are cleared.

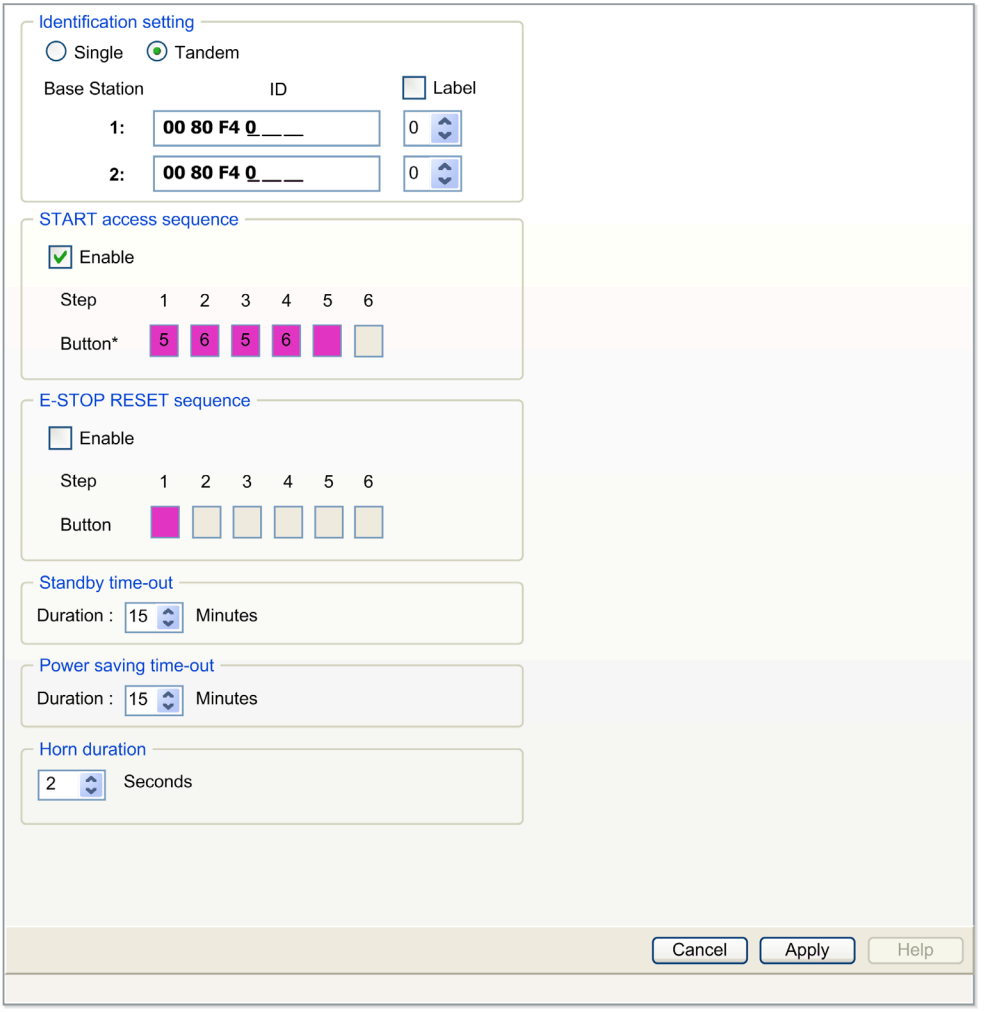
Field	Description
Reference	Remote Device reference.
Firmware Version	Firmware version of the Remote Device. Format xxx.yyy (where xxx is major version and yyy is minor version).
ID	ID of the Remote Device
Family	eXLhoist
Code EAN13	Code EAN13 of the Remote Device. ZART8L: 3606480610356 ZART8D: 3606480610363 ZART12D: 3606480610370
Last Download	Date of the last load of a Configuration File in the Remote Device.
Application name	Name of the project file (Last 30 characters).
Manufacturer	www.schneider-electric.com
DTM Version	Version of the DTM.
Configuration Information Creation Version	Version of the eXLhoist Configuration Software used at the project creation time (Never change after).
Configuration Information Last Modification Version	Version of the eXLhoist Configuration Software used at the last project modification time.

These information are updated and stored in the Remote Device after a download Configuration File from PC.

Parameters

Overview

In this tab, you can configure the Wireless Remote Control System parameters.



Identification Setting

You can select the Wireless Remote Control System configuration between:

- SINGLE
- TANDEM

You must enter the Base Station ID:

Format: 00 80 F4 0X XX XX (0X XX XX is an hexadecimal value from 0 00 00 to 3 FF FF).

This ID can be read on the Base Station.

Click **Label** checkbox to enable the label management. Select in the listbox a label number (0…999). This label number is displayed on the ZART•D to identify the selected Base Station/Bridge.

Start Access Sequence

The START access sequence is optional.

When START access sequence is enabled, the operator MUST enter this sequence to go in START mode.

The START access sequence is enabled by default.

The default START access sequence is: 5, 6, 5, 6.

Click **Enable** checkbox to enable/disable it.

The allowed buttons for this sequence are 1, 2, 3, 4, 5, 6.

The sequence can have 1 to 6 steps.

Access sequence can use same button several times. For example: step 1 = 3 and step 4 = 3.

E-STOP RESET Sequence

The E-STOP RESET sequence is optional.

E-STOP RESET sequence is asked to the operator to reset the Remote Device after an E-STOP. If reset sequence is empty or disable, the operator has to press the button 7 (trigger).

Click **Enable** checkbox to enable/disable it.

The allowed buttons for this sequence are 1, 2, 3, 4, 5, 6.

The sequence can have 1 to 6 steps.

E-STOP RESET sequence can use same button several times.

For example: step 1 = 3 and step 4 = 3.

Standby Time-out

The Remote Device goes automatically from START mode to STOP mode if no buttons are pressed during the Standby Time-out delay.

You can modify the duration: 1…60 minutes.

The factory setting value is 15 minutes.

Power saving Time-out

When the Wireless Remote Control System is in STOP mode due to Standby Time-out, if no button is pressed during this Power saving Time-out, the Remote Device automatically power OFF.

You can modify the duration: 1…300 minutes.

The factory setting value is 15 minutes.

Horn duration

This value is the Horn duration activation during the Start procedure.

You can modify the duration: 1…60 seconds.

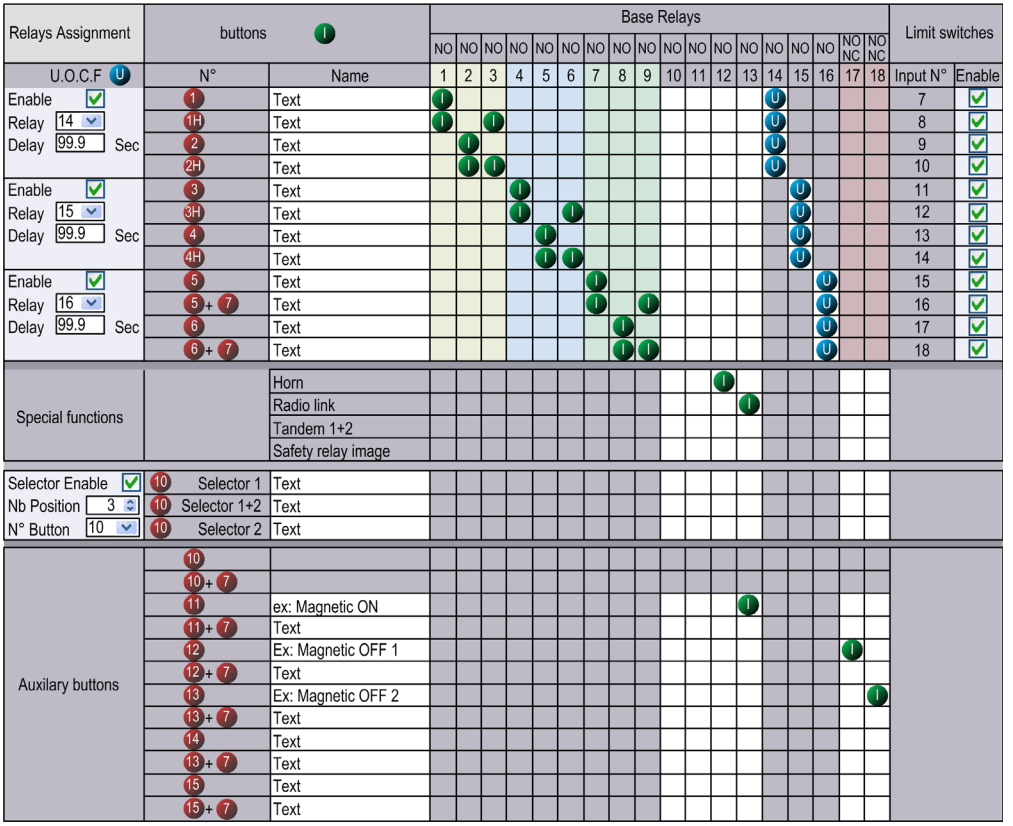
The factory setting value is 2 seconds.

Relay Assignment

Overview

In this tab, you can:

- Configure the motion buttons.
- Configure a selector.
- Configure the auxiliary buttons.
- Configure UOC function.
- Configure the limit switches.
- Configure the special functions.



Restriction Due To Remote Device

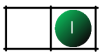
This tab is automatically modified according to the selected/connected Remote Device:

Reference	Disable relay column	Disable limit switches group	Disable buttons rows
ZART8L	13...18	Yes	12…15+7
ZART8D	-	-	12…15+7
ZART12D	-	-	-

Generic Description

The main use of this tab is to configure the association between the buttons and the relays.

To associate a button to a relay:

Step	Action
1	Click a cell to associate a button to a relay. **Result:** The empty cell has now an associated symbol 
2	To be more explicit, you can click in the **Name** text zone of a button to modify it (24 characters maximum).

As long as the button is pressed, the associated relay(s) is(are) activated.

The cells in gray cannot be assigned.

4 relays maximum can be associated with the motion buttons (1…6+7).

Selector Configuration

The Selector configuration consists in:

In SINGLE configuration:

The selector is used to manage relays that are able to switch for example between 2 hooks or 2 trolleys

Step	Action
1	Check the **Selector Enable** checkbox.
2	Select in the **N° Button** listbox the button to be used as selector. For ZART8: it is possible to assign button 10...11 to the selector. For ZART12: it is possible to assign button 10...15 to the selector.
3	Select 2 or 3 in the **Nb Position** combobox.
4	Click a cell to associate a relay to a selector position.

In TANDEM configuration:

In this configuration, no any relays are used.

The selector is used to select Base Station to be piloted.

Step	Action
1	Select, in the **N°** **Button** combobox, the button to be used as selector.

The **Use a Selector** checkbox is checked and not modifiable.

The **Number of position** field is set to 3 and is not modifiable.

The relay assignment is the same for the 2 Base stations.

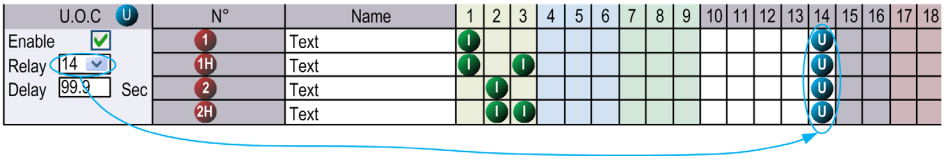
UOC Configuration

The UOC configuration consists in associate a motion axis to a relay.

This relay can be wired to the DRIVE Safe Torque Off (STO) or in serial with a contactor coil.

Step	Action
1	Click the **UOC Enable** checkbox. Note: There is an UOC function for the 3 axis.
2	Select the associated relay in the **Relay** combobox. Result: Corresponding cells are automatically filled by a (U) symbol.
3	Enter the UOC delay (0…99.9 seconds).

For example:



The relay 14 is ON when one or more of relays 1, 2, 3 is ON.

When relays 1, 2 and 3 are OFF, the UOC delay starts.

The relay 14 goes OFF when the UOC delay is expired.

For more details, refer to UOC description *(see page 105)*.

NOTE: This functionality is available in the complete version of the eXLhoist Configuration Software.

Safeguarding Function Configuration

The Safeguarding function configuration consists in enable/disable the limit switches.

The association between motion buttons and limit switch inputs are unmodifiable:

Motion button	1	1H	2	2H	3	3H	4	4H	5	5+7	6	6+7
Limit switch input	IN7	IN8	IN9	IN10	IN11	IN12	IN13	IN14	IN15	IN16	IN17	IN18

When the limit switch is activated, the associated motion button is considered as unpressed and the associated relays are switched OFF.

Step	Action
1	Check the **Enable** checkbox of an input N° (Input 7...input 18).

For more details, refer to limit switches description *(see page 107)*.

NOTE: This functionality is available in the complete version of the eXLhoist Configuration Software.

Special Functions Configuration

The special functions configuration consists in associate a special function to a relay.

Step	Action
1	For each of the 4 special functions, click a cell to associate a relay.

The 4 special functions are:

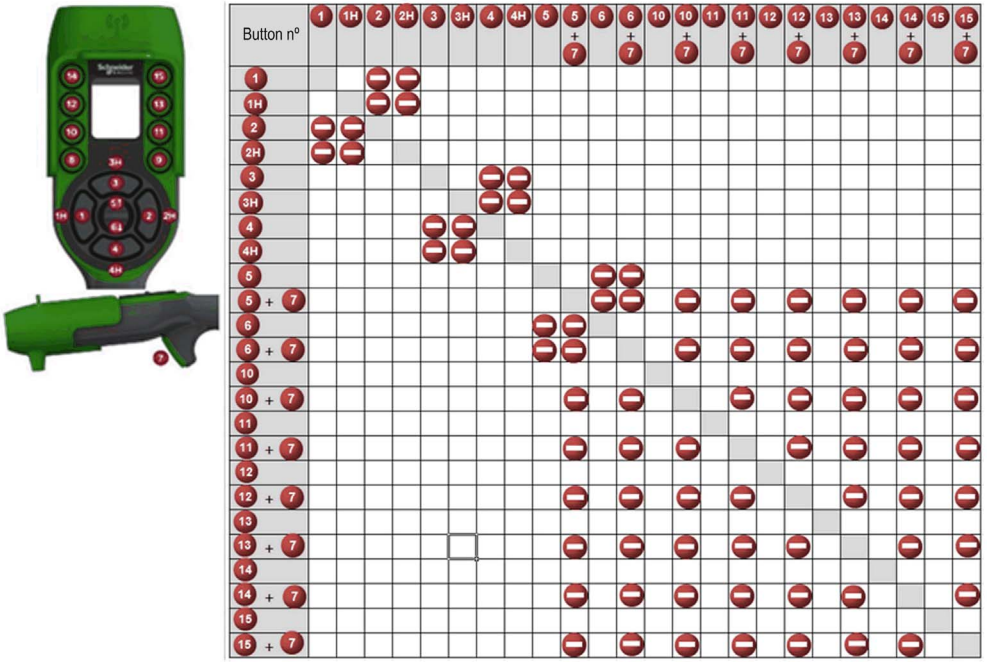
- Horn
- Radio link
- TANDEM 1+2
- Safety relay image

For more information, refer to special functions description *(see page 109)*.

Interlocking

Overview

In this tab, you can configure the buttons combinations that cannot operate simultaneously.



Step	Action
1	Click a cell to interlock (or not) 2 buttons (or buttons combinations). Result: When the buttons are interlocked, the empty cell has now an associated symbol  .

Example of the factory setting:

The button 1 and 2 are associated to the same axis, for the opposites directions.

The button 1 must not operate while the button 2 is pressed.

The button 2 must not operate while the button 1 is pressed.

If the buttons are pressed simultaneously, the movement is stopped.

Detected Applicative Alarms

Overview

In this tab, you can configure the Applicative Alarm states.

Alarm Assignment		Base inputs					
		1	2	3	4	5	6
Pre alarm over-load		I					
Pre alarm over-wind			I				
Alarm over-load				I			
Alarm over-wind					I		
Alarm over-speed	50					I	
Custom	⚠						I
Active State	High	⊙	⊙	⊙	⊙	⊙	⊙
	Low	○	○	○	○	○	○

The Base Station can provide detected alarms information to the ZART•D.

Voltage free sensors can be connected to Base Station.

Step	Action
1	Click **High** or **Low** to select the active state of each alarm. With a NO type switch, select **High**.

For more information, refer to Special functions description *(see page 103)*.

Chapter 8
Maintenance / Device Replacement

What Is in This Chapter?

This chapter contains the following sections:

Section 8.1
Maintenance

Regular Cleaning

Remote Device Cleaning

When the surface or the frame of the display gets dirty, soak a soft cloth in water with a neutral detergent, wring the cloth tightly, and wipe the display.

NOTICE
EQUIPMENT DAMAGE Do not use paint thinner, organic solvents, or a strong acid compound to clean the equipment. **Failure to follow these instructions can result in equipment damage.**

Periodic Check Points

Annual check point for the ZARB•W Base Station: check the good terminal block tightening.

For more information, refer to the Safety chapter *(see page 53)*.

Section 8.2
Device Replacement

Overview

The Configuration File management allows some device replacement, without tool.

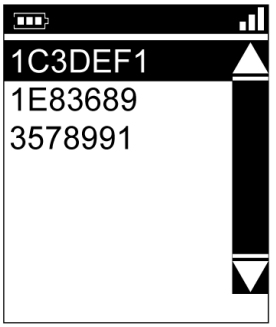
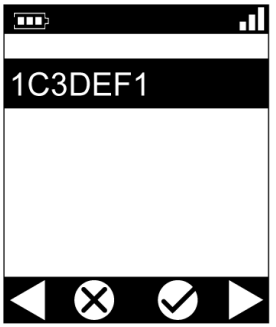
What Is in This Section?

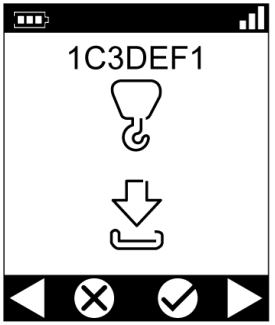
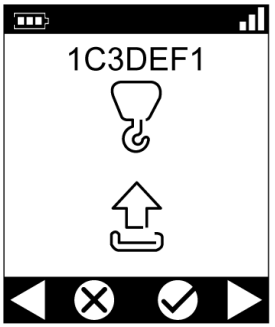
This section contains the following topics:

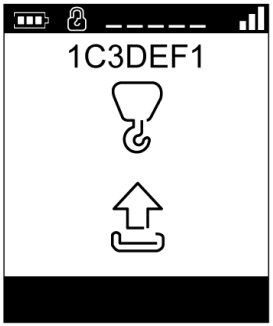
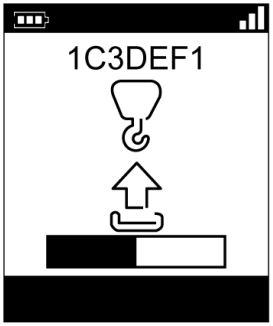
Base Station Replacement

New Base Station Replacement

Follow the procedure to replace a Base Station by a new one:

Step	Action
1	Execute a Remote Pairing Reset *(see page 211)*.
2	Install the new Base Station.
3	Power ON the new Base Station.
4	Place yourself with the Remote Device to an appropriate distance from the Base Station (around 10 m (32.8 ft)).
5	Press only the ON/START/Horn button on the Remote Device more or equal than 1 s. **Result:** The Remote Device displays the ID list of detected Base Station: 
6	Selects the ID of the new Base Station with buttons 5 and 6.
7	Press the button 7 (trigger) to validate. **Result:** 
8	Select the validation cell (check symbol) with buttons 1 and 2.

Step	Action
9	Press the button 7 (trigger) to validate. **Result:** The Remote Device propose to load the Configuration File from the Base Station to the Remote Device. 
10	Select the cancel cell (X) with buttons 1 and 2.
11	Press the button 7 (trigger) to validate.
12	The Remote Device propose to load the Configuration File from the Remote Device to the Base Station.  Select the validation cell (check symbol) with buttons 1 and 2.

Step	Action
13	If the Configuration File has a transfer password, a padlock is displayed:  Enter the Configuration File transfer code with the buttons 1 to 6. The default transfer password is 5, 6, 5, 6.
14	Press the button 7 (trigger) to validate. **Result:** The Remote Device loads the Configuration File from the Remote Device to the Base Station. 
15	Wait for the end of the Configuration File load.

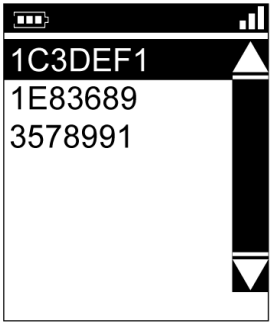
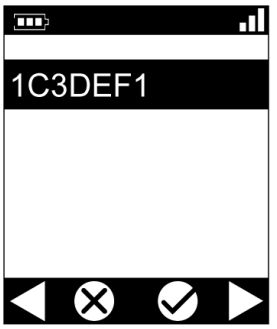
Result: The Wireless Remote Control System is in STOP mode *(see page 123)*.

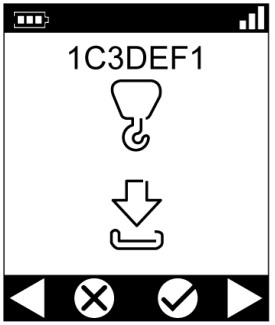
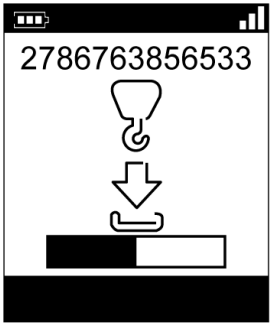
It is recommended to do again an Acceptance Test *(see page 75)*.

ZART•D Replacement

Replacement of a ZART•D by an out-of-the-box One

Procedure to replace an out of work ZART•D by an out-of-the-box one:

Step	Action
1	Power ON the Base Station.
2	Place yourself with the Remote Device to an appropriate distance from the Base Station (around 10 m (32.8 ft)).
3	Press only the ON/START/Horn button on the Remote Device more or equal than 1 s. **Result:** The Remote Device displays the ID list of detected Base Station: 
4	Selects the ID of the appropriate Base Station with buttons 5 and 6.
5	Press the button 7 (trigger) to validate. **Result:** 
6	Select the validation cell (check symbol) with buttons 1 and 2.

Step	Action
7	Press the button 7 (trigger) to validate. **Result:** The Remote Device propose to load the Configuration File from the Base Station to the Remote Device. 
8	Select the validation cell (check symbol) with buttons 1 and 2.
9	Press the button 7 (trigger) to validate. **Result:** The Remote Device loads the Configuration File from the Base Station to the Remote Device. 
10	Wait for the end of the Configuration File load.

Result: The Wireless Remote Control System is in Stop mode *(see page 123)*.

It is recommended to do again an Acceptance Test *(see page 75)*.

Replacement of a ZART•D by an Already Configured One

Replacement of an out of work ZART•D by an already configured one:

Step	Action
1	Do a Remote Factory Reset *(see page 211)*.
2	Execute the procedure Replacement of an out of Work ZART•D by a New One *(see page 207)*.

ZART8L Device Replacement

Replacement of an ZART8L

Procedure to replace an out of work ZART8L:

Step	Action
1	Connect the Remote Device to a PC *(see page 165)*.
2	Start the eXLhoist Configuration Software *(see page 178)*.
3	Open an existing project *(see page 180)*.
4	Select **Communication →Store to Device**.
5	Wait for the end of the Configuration File load in the Remote Device.
6	Disconnect the Remote Device to the PC.
7	Power ON the Base Station.
8	Power ON the Remote Device.
9	The Configuration File is automatically loaded from the Remote Device to the Base Station. During the load, the START LED and “2” LED are flashing. Wait for the end of the Configuration File load.

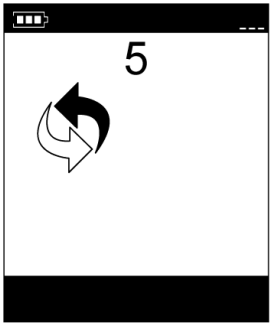
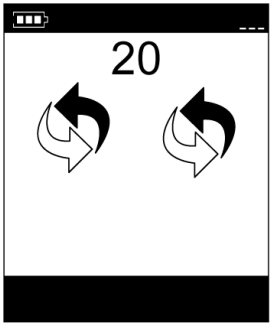
Result: The Remote Device goes to STOP mode *(see page 123)*.

It is recommended to redo an Acceptance Test *(see page 75)*.

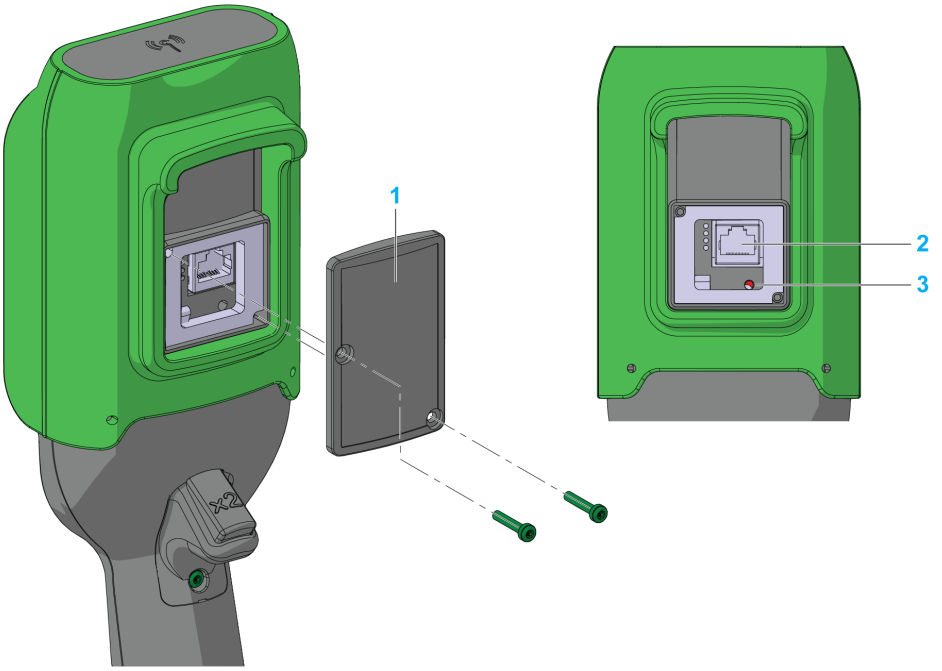
Section 8.3
Remote Device Resets

Remote Device Resets

Procedure

Step	Action	
1	Power ON the Remote Device.	
2	On the rear of the Remote Device, unscrew the 2 screws.	
3	Remove the cover.	
4	Press and maintain the reset button for the appropriate duration *(see page 212)*. For the ZAR•D:	
	When the first delay is reached (for Pairing reset), the remote displays: 	When the second delay is reached (for Factory reset), the remote displays: 
5	Release the reset button.	
5	Place back the cover.	
6	Screw the 2 screws to mount the cover.	

Remote Device rear view:



1 Cover
2 RJ45 connector
3 Reset button

Reset Information

Title	t = Reset button duration press	Remote Device reaction
Simple reset	t < 5 s	• Remote Device reboot.
Pairing reset	5 s ≤ t < 20 s	• Remote Device reboot. • Erase in the remote memory the stored Base Station ID. The remote is no more paired with Base Station.
Factory reset	t > 20 s	• Remote Device reboot. • Erase in the remote memory the stored Base Station ID. The remote is no more paired with Base Station. • Delete the Configuration File. The Remote Device goes back to factory settings.

Appendices

Appendix A
Architecture Examples

What Is in This Chapter?

This chapter contains the following topics:

Tested Architectures

Overview

Schneider Electric provides the basis of tested architecture. You can adapt these architectures to your individual requirements. NOTE: the architectures specified have been tested under actual service conditions. Your specific application requirements may be different from those assumed for these projects. In that case, you have to adapt the architecture to your particular needs. To do so, you need to consult the specific product documentation that you may find necessary to modify or adapt. Pay particular attention and conform to any safety information, different electrical requirements, and normative standards that would apply to your modifications and/or adaptations. Some or all of the architectures may contain recommendations of products that are not available in your country or locality, or may imply or recommend wiring, products, procedures, or controller logic and/or functions that are in conflict with your local, regional, or national electrical or safety codes and/or normative standards.

⚠ WARNING

REGULATORY INCOMPATIBILITY

Be sure that all equipment applied and systems designed comply with and conform to all applicable local, regional, and national regulations and standards.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The use and application of the architectures require expertise in the design of control systems. Only you, the designer or integrator, can be aware of all the conditions and factors present during installation and setup, operation, and maintenance of the machine or process, and can therefore determine the associated equipment, the functions, the related safety provisions and interlocks which can be effectively and properly used. When selecting control equipment, and any other related equipment or software for a particular application, you must also consider any applicable local, regional, or national standards and/or regulations.

Description

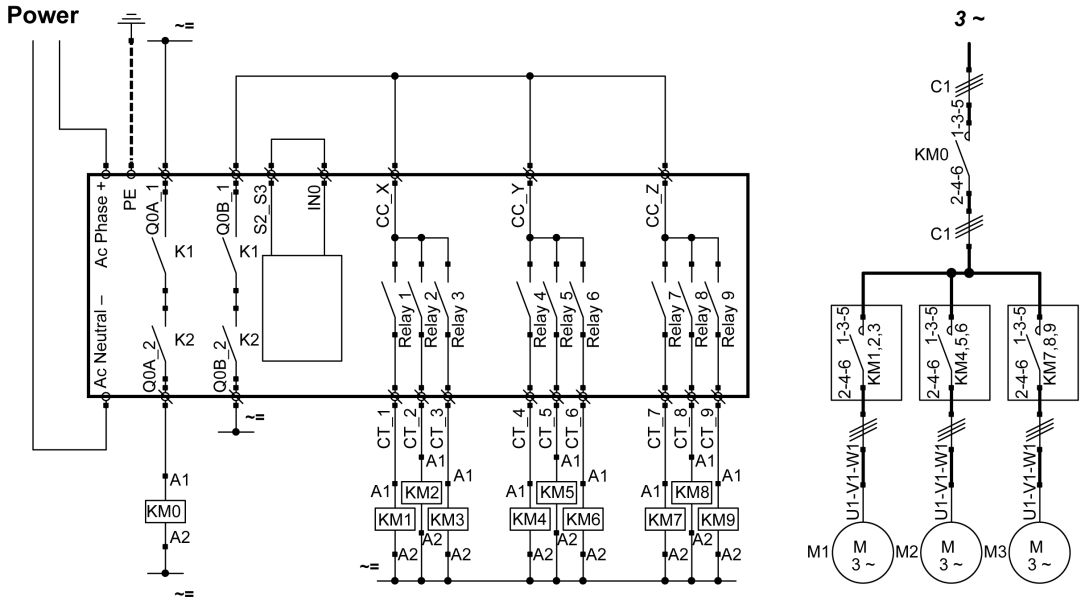
Schneider Electric has tested some possible architectures:

No.	Hoisting	Trolley	Translation	E-STOP STOP	Motion	Stop category
				According To		
				EN 61508 EN 13849	EN 61508 EN 13849	EN60204
1	Contactor	Contactor	Contactor	SIL2/Cat 3	SIL1/Cat 2	Cat 0
2		ATV32	ATV32	SIL3/Cat 4		
3	ATV71			SIL3/Cat 4		Cat 1
4				SIL3/Cat 4		

Stop category depends on the UOC function/wiring *(see page 105)*.

E-Stop and Stop SIL level depends on the IN0 and S2_S3 wiring *(see page 111)*.

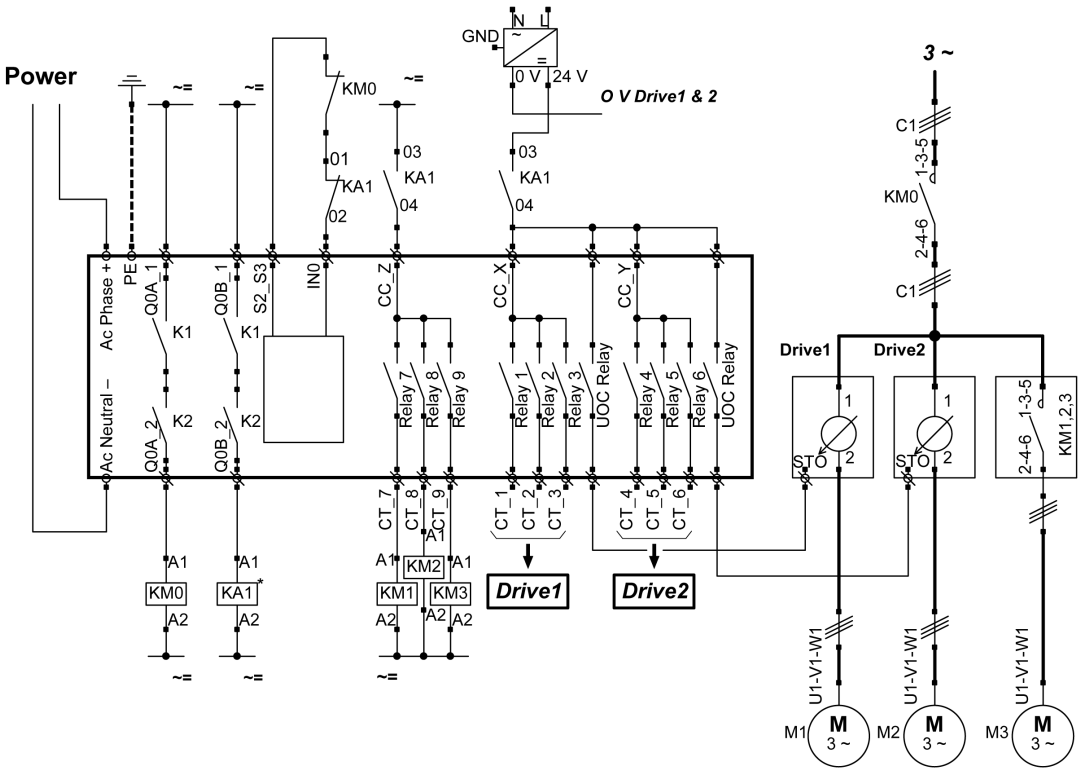
Safety Case 1



S1 is a wired E-STOP SIL2;

The E-STOP of the Remote Device is SIL2.

Safety Case 2

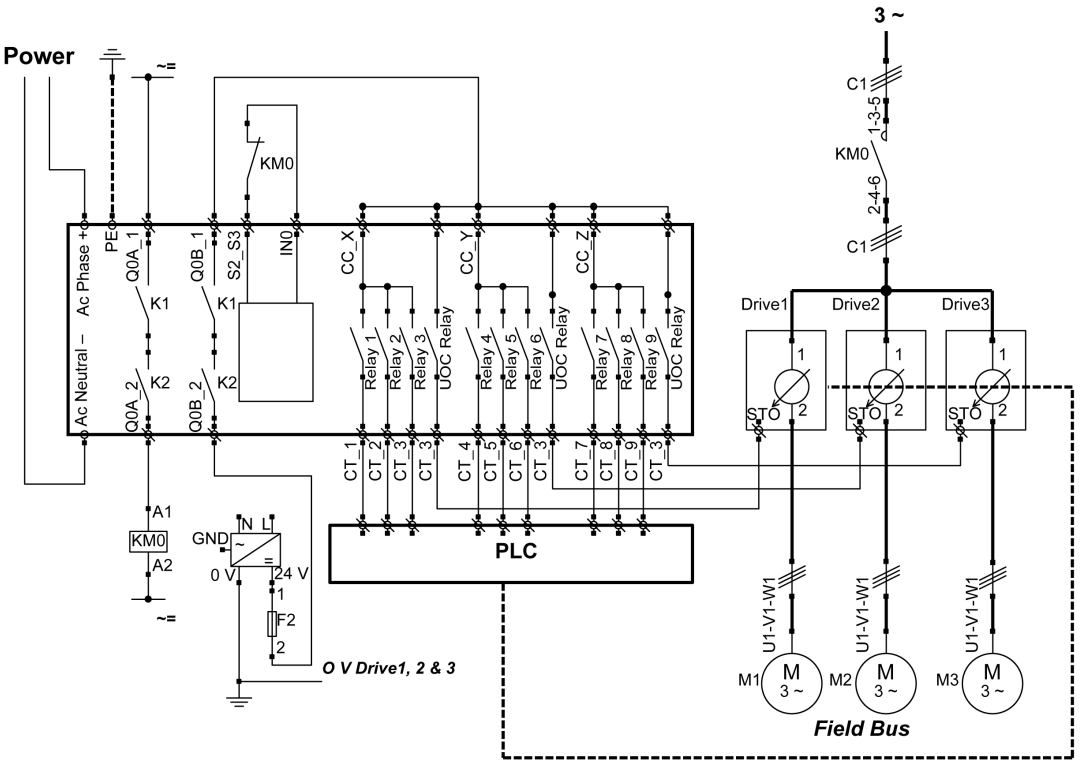


S1 is a wired E-STOP SIL2;

The E-STOP of the Remote Device is SIL3.

Drive1 and Drive2 are motor drives

Safety Case 3

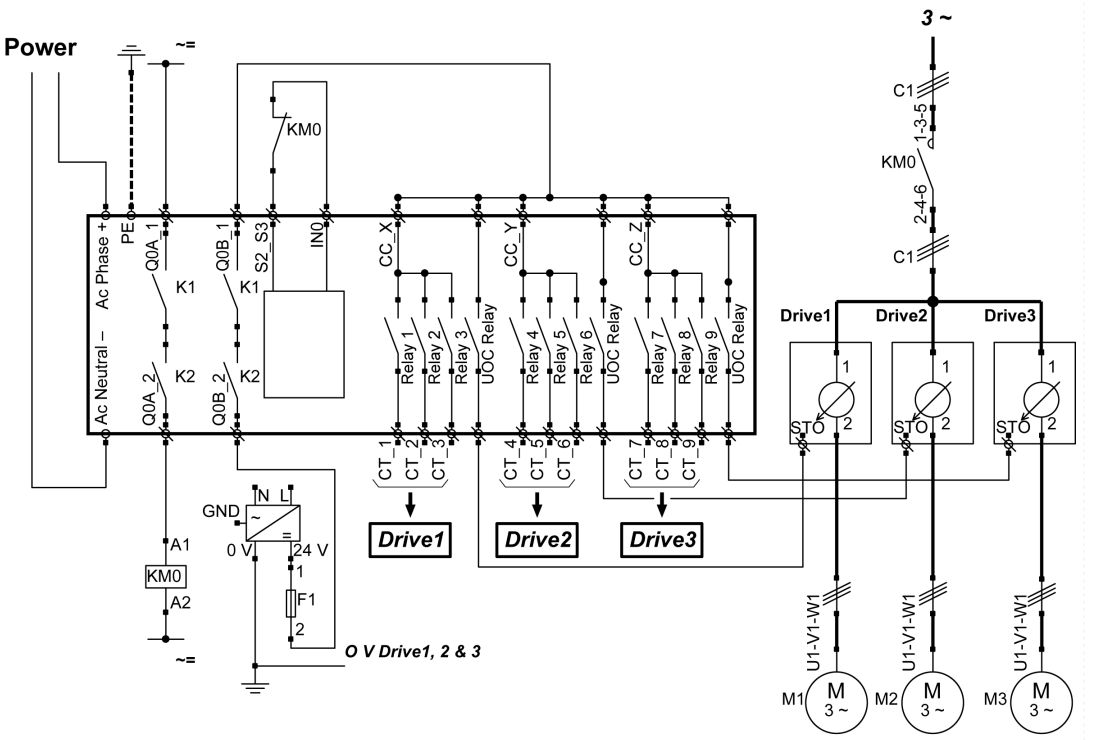


S1 is a wired E-STOP SIL2;

The E-STOP of the Remote Device is SIL3.

Drive1, Drive2, and Drive3 are motor drives

Safety Case 4



S1 is a wired E-STOP SIL2;

The E-STOP of the Remote Device is SIL3.

Drive1, Drive2, and Drive3 are motor drives

Vacuum/Magnetic Application Example

Description

A possible use of auxiliary buttons is a Vacuum/Magnetic function.

Vacuum/Magnetic	Description
Triggering	“Vacuum/Magnetic ON“ button is assigned to 1 relay. When the operator presses the “Vacuum/Magnetic ON” button, the magnetic is activated through the associated relay.
Releasing	To release the load, simultaneously press ”Vacuum/Magnetic OFF 1” and “Vacuum/Magnetic OFF 2” buttons. “Vacuum/Magnetic OFF 1” button should be assigned to 1 NO+NC relay. “Vacuum/Magnetic OFF 2” button should be assigned to 1 different NO+NC relay.

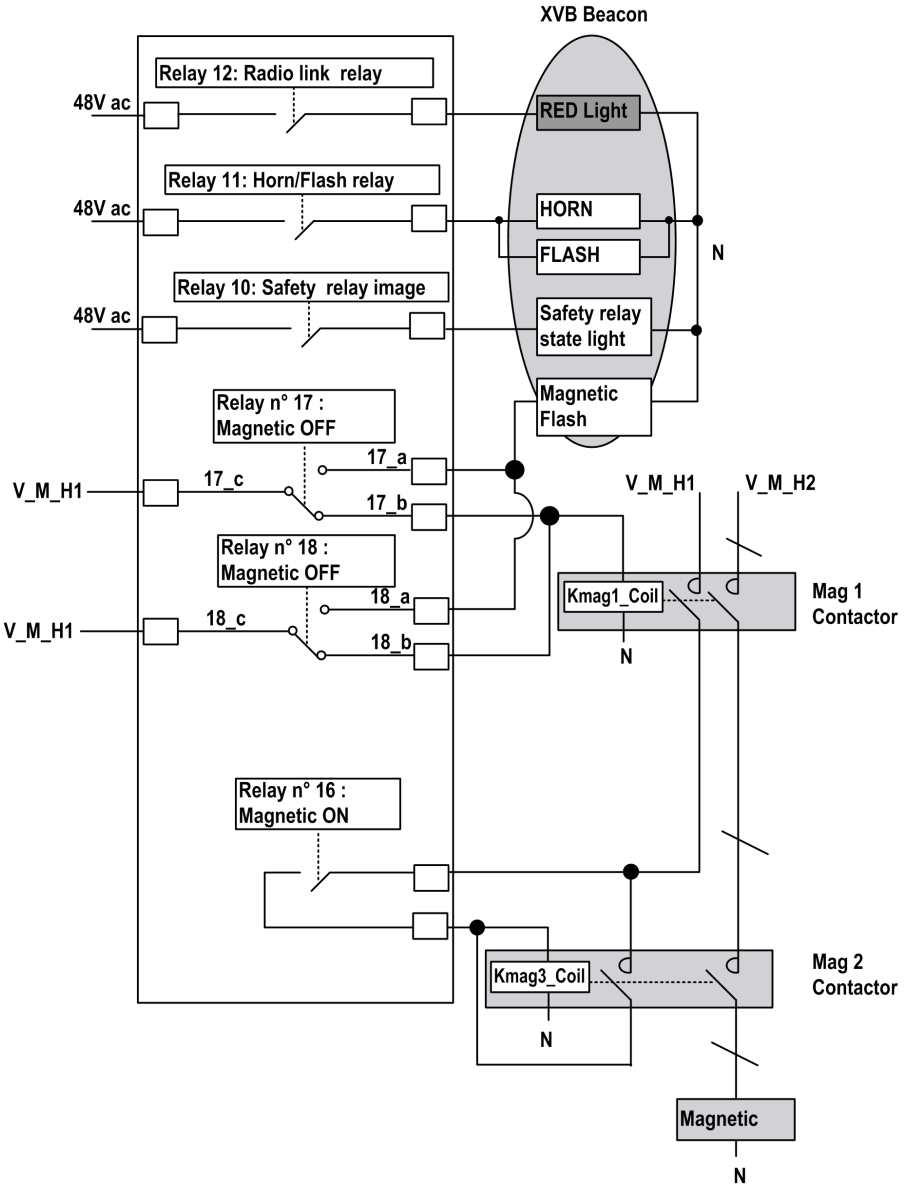
Configuration

Example of system configuration

Topic	Configured button	Associated relay
Vacuum/Magnetic ON	13	Q16
Vacuum/Magnetic OFF 1	14	Q17
Vacuum/Magnetic OFF 1	15	Q18

As already done in the factory setting, it is recommanded to use buttons at different sides of Remote Device for load release function (operator uses both hands).

Wiring Example



V_M_H1 V hold command magnetic 48…230 Vac
V_M_H2 V hold power magnetic 48…230 Vac

NOTE:

The Magnetic OFF flash is ON only in the 2 following cases:

- When the operator presses at least one of the Magnetic OFF buttons.
- If one the Magnetic OFF relay is welded. In this case, a maintenance action shall be done (Otherwise it is enough to press the other Magnetic OFF button for releasing the load).

The power supply choice is the OEM responsibility. It depends on the risk analysis.

Room Lighting Application Example

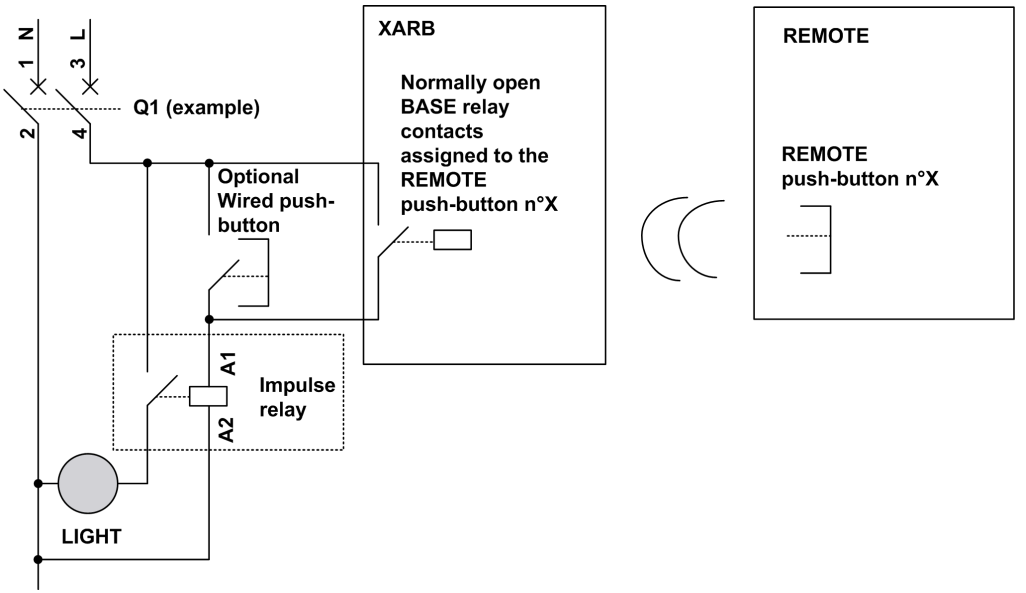
Description

It is possible to manage room lighting applications. An auxiliary button commands an impulse relay on the room lighting circuit.

Configuration

There is no specific configuration needed. You have to associate an auxiliary button to a relay.

Wiring Example



NOTE: Schneider Electric offers modular impulse relays which are bistable switches designed to control load power mainly for lighting applications.

Glossary

A

AWG

(American wire gauge) The standard that specifies wire section sizes in North America

C

CCF

(Common Cause of Failure)

CSA

(Canadian standards association) The Canadian standard for industrial electronic equipment in hazardous environments.

D

DTM

(*Device Type Manager*) Classified into 2 categories:

- Device DTMs connect to the field device configuration components.
- CommDTMs connect to the software communication components.

The DTM provides a unified structure for accessing device parameters and configuring, operating, and diagnosing the devices. DTMs can range from a simple graphical user interface for setting device parameters to a highly sophisticated application capable of performing complex real-time calculations for diagnosis and maintenance purposes.

E

E-STOP

Emergency stop (according to EN ISO13850:2008) function that is intended to:

- avert arising, or reduce existing, hazards to persons, damage to machinery or to work in progress,
- be initiated by a single human action.

EMC

ElectroMagnetic Compatibility

EN

EN identifies 1 of many European standards maintained by CEN *(European Committee for Standardization)*, CENELEC *(European Committee for Electrotechnical Standardization)*, or ETSI *(European Telecommunications Standards Institute)*.

F

FE

(Functional Earth) A common grounding connection to enhance or otherwise allow normal operation of electrically sensitive equipment (also referred to as functional ground in North America).

In contrast to a protective Earth (protective ground), a functional earth connection serves a purpose other than shock protection, and may normally carry current. Examples of devices that use functional earth connections include surge suppressors and electromagnetic interference filters, certain antennas, and measurement instruments.

Firmware

The operating system (OS) of a device

H

hex

(hexadecimal)

HFT

(Hardware Fault Tolerance)

I

IEC

(International Electrotechnical Commission) A non-profit and non-governmental international standards organization that prepares and publishes international standards for electrical, electronic, and related technologies.

IP

(Ingress Protection) The protection classification according to IEC 60529.

L

LED

(Light Emitting Diode) An indicator that illuminates under a low-level electrical charge.

M

MAC address

(Media Access Control address) A unique 48-bit number associated with a specific piece of hardware. The MAC address is programmed into each network card or device when it is manufactured.

MTTF

(Mean TIme To Failure)

N

NC

(Normally Closed) A contact pair that closes when the actuator is de-energized (no power is applied) and opens when the actuator is energized (power is applied).

NEMA

(National Electrical Manufacturers Association) The standard for the performance of various classes of electrical enclosures. The NEMA standards cover corrosion resistance, ability to help protect from rain, submersion, and so on. For IEC member countries, the IEC 60529 standard classifies the ingress protection rating for enclosures.

NO

(Normally Open) A contact pair that opens when the actuator is de-energized (no power is applied) and closes when the actuator is energized (power is applied).

P

PC

(Personal Computer)

PELV

(Protective Extra Low Voltage)

PFD

(Probability of Failure on Demand)

PL

(Performance Level)

PST

(Process Safety Time)

R

RJ45

A standard type of 8-pin connector for network cables.

S

SELV

(Safety Extra Low Voltage) A system that follows IEC 61140 guidelines for power supplies is protected in such a way that voltage between any 2 accessible parts (or between 1 accessible part and the PE terminal for class 1 equipment) does not exceed a specified value under normal conditions or under inoperable conditions.

SFF

(Safe Failure Fraction)

SIL

(Safety Integrity Level) (according to IEC 61508)

START warning time

Time between the STOP mode and START mode. During this time, the Horn is activated, the motion and auxiliary function are not enabled.

STO

(Safe Torque Off).

U

UL

(Underwriters Laboratories) A US organization for product testing and safety certification.

UOC

(Unintended Operating Control) The UOC function allows control of a drive STO input.