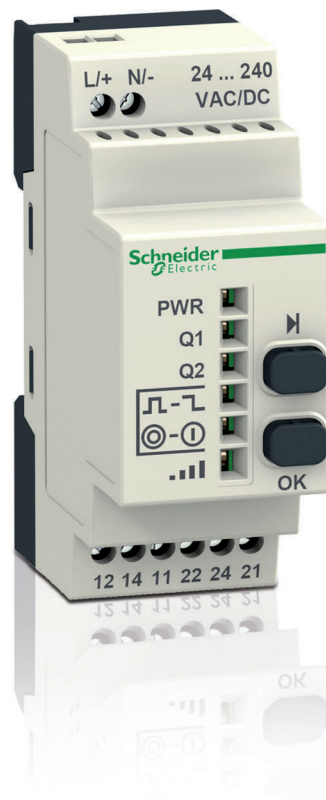
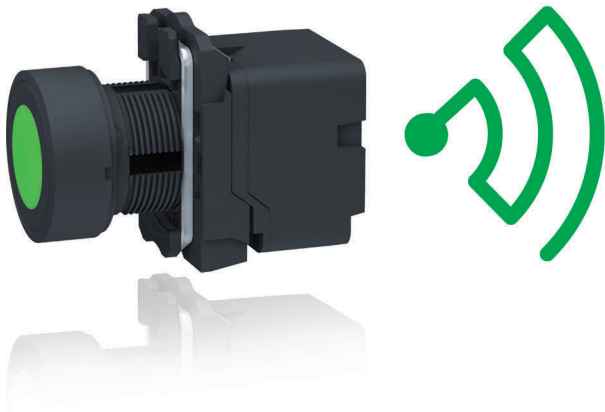


Wireless and batteryless pushbuttons

Harmony[®] XB5R plastic and XB4R metal

Catalog

November 2014



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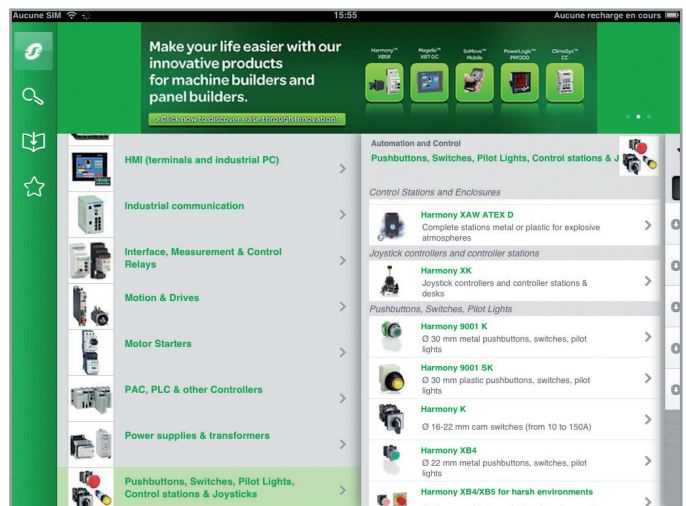
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General presentation and selection guide...	1
XB5R and XB4R wireless & batteryless pushbuttons.....	2
XB5R and XB4R wireless and batteryless pushbuttons for explosive atmospheres....	3
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Control and signaling units Ø 22

Wireless and batteryless pushbuttons

Harmony XB5R and XB4R

General presentation and selection guide

■ **General presentation**

- Installation and maintenance page 1/2
- Performance and integration page 1/3
- Architecture solutions and applications..... page 1/4
- Range of products page 1/5
- Selection guide** page 1/6



Control and signaling units Ø 22

Wireless and batteryless pushbuttons

Harmony XB5R plastic and XB4R metal

1

Installation made easy with Harmony® XB5R plastic and XB4R metal, wireless and batteryless pushbuttons



The Harmony XB5R plastic and XB4R metal range of wireless and batteryless pushbuttons are used for various building utilities (automatic doors, lightings, etc), industrial applications (conveying systems, automotive, MMM, logistics, food and beverage) including explosive atmospheres for mining, dust and gas environments. They are based on 2 types of devices, transmitter and receiver which communicates via 2.4 GHz radio transmission (free worldwide band).

Simplified installation

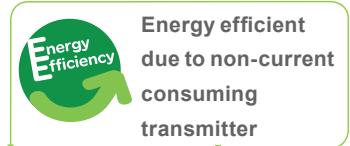
- > Reduction in installation costs and time
- > No set-up needed due to ready-to-use Plug-and-Play package
- > Freedom of mobility around the machine or process
- > Ideal solution when you need to add or move a control function



Enables the end users to considerably reduce installation and maintenance costs

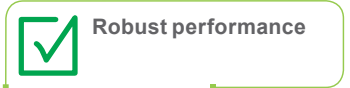
Easy maintenance

- > Requires no battery maintenance and assures permanent availability
- > Maximum availability of control functions
- > Eco-friendly Green technology
- > Minimize post-installation maintenance



Designed for industrial environment with proven robustness

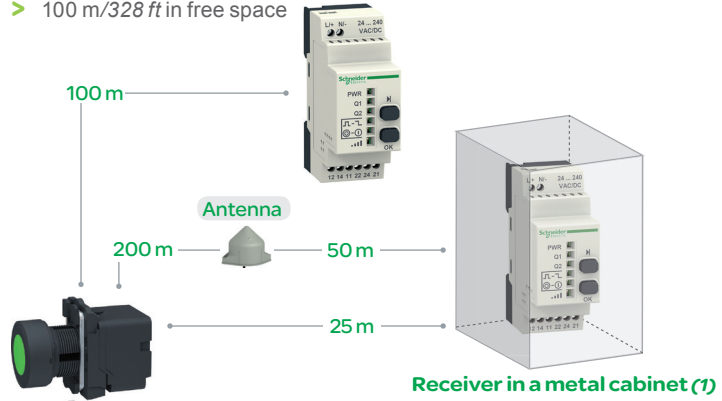
- > High resistance to contamination from dust (no cable entry)
- > No risk of cable damage or loosened screws on the transmitter
- > Ø 22 mm/0.866 in. operating head available in plastic (ZB5) and metal (ZB4) and Ø 40 mm/1.575 in. impulsion mushroom black head allowing operation with gloves
- > For automatic doors, the rope pull switch command can be set anywhere
- > Suitable for the most demanding environments, depending on the model, up to IP 66, for external use from -25 to 70 °C/-13 to 158 °F



Easy integration in to automation products

Assured performance according to distance

- > 25 m/82 ft with the receiver installed in a metal electrical cabinet
- > Boosted to more than 300 m/984 ft with use of external relay antenna with the receiver installed in a metal electrical cabinet
- > 100 m/328 ft in free space



Smooth integration through open protocols

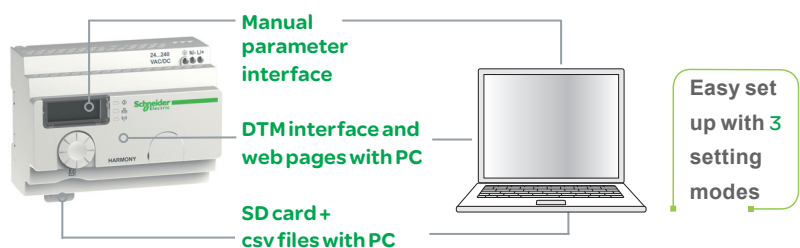
- > Integration into industrial automation via field bus link
- Modbus serial link: as found on all Schneider Electric PLCs
- Modbus/TCP: integrated into the Schneider Electric PLCs and HMIs



Double RJ45 enables network continuity without using hubs or switches



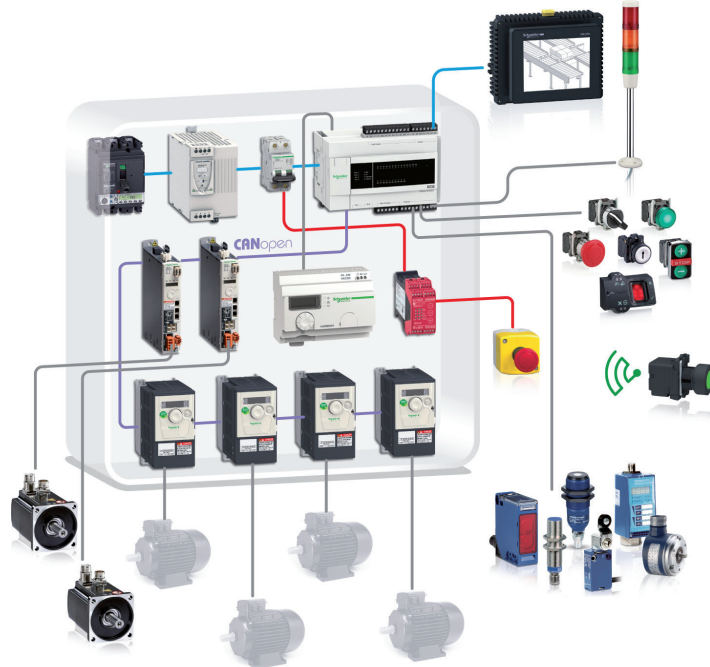
Simple and economic with up to 60 transmitters connected on the same bus



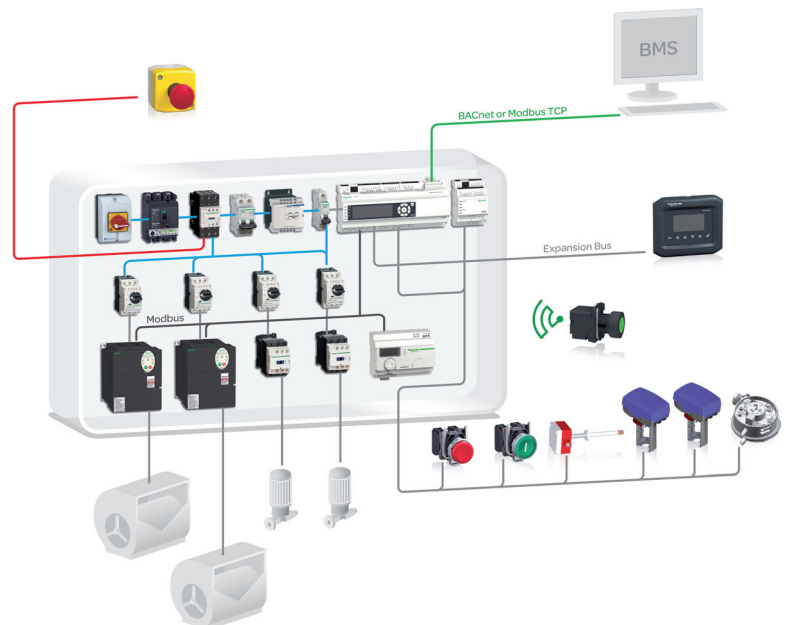
(1) Reduction in distance when the receiver is placed in a metal cabinet

Architecture solutions and applications

- Designed to easily integrate into MachineStruxure™ architectures for OEM machine builders and PlantStruxure™ architectures for process environments.



Example of Machine architecture



Example of HVAC architecture



-20% installation costs compared to a hard-wired solution

A worldwide range

- > From individual products to ready-to-use packs



Wide range of XB5R/XB4R individual products

- > Designed to meet the requirements of the most common applications
- > Simple to order with only one reference number
- > Easy to install with factory pre-programmed transmitter and receiver

(1)

Plastic head
XB5RFB01

Metal head
XB4RFB01

- Transmitter with plastic or metal pushbutton
- Non-configurable receiver, 1 CO relay output

(2)

Plastic head
XB5RFA02

Metal head
XB4RFA02

- Transmitter with plastic or metal pushbutton
- Set of 10 pushbutton caps
- Configurable receiver, 2 CO relay outputs

(1)

Plastic head
XB5RMB03

- Transmitter with plastic pushbutton ZB5R in ergonomic enclosure
- Non-configurable receiver, 1 CO relay output




















(2)

Plastic head
XB5RMA04

- Transmitter with plastic pushbutton ZB5R in ergonomic enclosure
- Set of 10 pushbutton caps
- Configurable receiver, 2 CO relay outputs

(1) Only one transmitter per receiver
(2) Up to 32 transmitters per receiver

 Plug and play package with minimal set up

Type of products	Pilot lights	Pushbuttons, selector switches and pilot lights			Biometric switches	
						
						
						
						
Description of range	<ul style="list-style-type: none"> LED pilot lights 	<ul style="list-style-type: none"> Pushbuttons Multiple-headed pushbuttons Emergency Stop pushbuttons Selector switches and key switches Illuminated pushbuttons Pilot lights 			<ul style="list-style-type: none"> Fingerprint readers 24V ~ Stand-alone biometric switches Stand-alone USB biometric switches USB biometric switches dedicated to Schneider HMI (1) 	
Features	Products	Monolithic, compact, low consumption	Complete units or sub-assemblies (body + head)			Monolithic
	Bezel	Double insulated	Double insulated (3)	Metal, chromium plated or black	Double insulated	Double insulated, dark grey
	Shape of head	Circular	Circular, square or rectangular	Circular	Circular or square	–
Drilling or cut-out for fixing		Ø 8 mm and Ø 12 mm/0.315 in. and 0.472 in.	Ø 16 mm/0.630 in.	Ø 22 mm/0.866 in.		
Degree of protection	Conforming to IEC 60529	IP 40 IP 65 with seal	IP 65	IP 66 IP 69K (Selector switches and key switches, multiple-headed pushbuttons and Emergency Stop pushbuttons with bellows)	IP 65 (control button)	
	Conforming to UL 508 and CSA C22-2 N° 14	–	Enclosure type 4, 4X and 13			Enclosure type 12
Cabling		Tags for 2.8 x 0.5 mm/0.110 x 0.020 in. connectors or threaded connector	Faston connectors Solder pins for printed circuit boards (3) Fast connector socket (4)	Spring clamp terminal connections Screw clamp terminal connections Faston connectors Connector With adaptor for printed circuit board	Cable or connectors	
Mounting	Panel thickness	1...8 mm/0.039...0.315 in.	1...6 mm/0.039...0.236 in.			
Type references		XVLA	XB6, XB6E	XB4	XB5	XB5S

(1) Compatible with Magelis iPC, STU, OT, GXO, GT (except GT1000 series), GK, GH, and GTO models.
 (2) Wireless and batteryless pushbutton and receiver ready-paired at the factory.

Wireless and batteryless pushbuttons	Pushbuttons, selector switches and pilot lights	Joystick controllers	Pushbuttons, selector switches and pilot lights	Cam switches				
								
								
								
								
Description of range	<ul style="list-style-type: none"> Wireless and batteryless pushbuttons and rope pull switch Configurable receivers Access point Relay-antenna Mobile handy box or plastic boxes for wall mounting 	<ul style="list-style-type: none"> Pushbuttons Emergency Stop and Emergency switching off pushbuttons Selector switches and key switches Illuminated pushbuttons Pilot lights 	<ul style="list-style-type: none"> 2 or 4 direction Stay put or spring return 	<ul style="list-style-type: none"> Pushbuttons Emergency Stop buttons Selector switches and key switches Illuminated pushbuttons Pilot lights 	<ul style="list-style-type: none"> Switches Stepping switches Reversing and changeover switches Ammeter switches Voltmeter switches Reversing switches Star-delta and reversing star-delta switches Pole change switches 			
Features	Products	Ready-to-use packs (2) and "components" range	Monolithic	Complete units or sub-assemblies (body + head with lever)	Complete units or sub-assemblies (body + head)	Complete units or sub-assemblies (body + front panel + head)		
	Bezel	Metal, chromium plated or double insulated, black	Double insulated, dark grey (or white for pilot lights)	Metal, chromium plated	Double insulated, black	Metal, chromium plated or double insulated, black		
	Shape of head	Transmitter with circular head	Circular	Circular	Hexagonal	Square		
Drilling or cut-out for fixing		Ø 22 mm/0.866 in.			Ø 30 mm/1.181 in.	Ø 16 or Ø 22 mm/0.630 or 0.866 in.: series K10 Ø 22 mm/0.866 in. and multifixing: series K1/K2 4 holes, 48 or 68 centres: series K30...K150		
Degree of protection	Conforming to IEC 60529	IP 65	IP 65 (control buttons and pilot lights) IP 54 (Emergency switching off pushbuttons)	IP 65	IP 66	IP 65: series K10 IP 40, IP 65 with seal: series K1/K2 IP 40: series K30...K150		
	Conforming to UL 508 and CSA C22-2 N° 14	Enclosure type 12	Enclosure type 3 (pushbuttons and Emergency stop) and 4 (pilot lights)	Enclosure type 4, 4X and 13	Enclosure type 4 and 13 (9001K) Enclosure type 4, 4X, 13 (9001SK)	–		
Cabling		Wireless (transmitter) Through cable (receiver)	Screw and captive clamp terminal connections Faston clip connections (pilot lights)	Screw and captive clamp terminal connections				
Mounting	Panel thickness	1...6 mm/0.039...0.236 in.				0.5...6 mm/0.020...0.236 in. (depending on model)		
Type references		XB5R, XB4R	XB7	XD4PA	XD2GA	XD5PA	9001K, 9001SK	K10, K1, K2, K30, K50, K63, K115, K150

(3) For Harmony XB6 only.
 (4) For Harmony XB6E only.

Control and signaling units Ø 22

Wireless and batteryless pushbuttons

Harmony XB5R and XB4R

XB5R and XB4R wireless and batteryless pushbuttons

- **Presentation**..... page 2/2
- **Description**
 - “Ready-to-use packs” ranges page 2/3
 - “Components” range..... page 2/4
- **References**
 - Ready-to-use packs..... page 2/5
 - Transmitter components for wireless and batteryless pushbuttons..... page 2/6
 - Transmitter components for wireless and batteryless rope pull switch page 2/6
 - Configurable receivers..... page 2/7
 - Accessories page 2/7



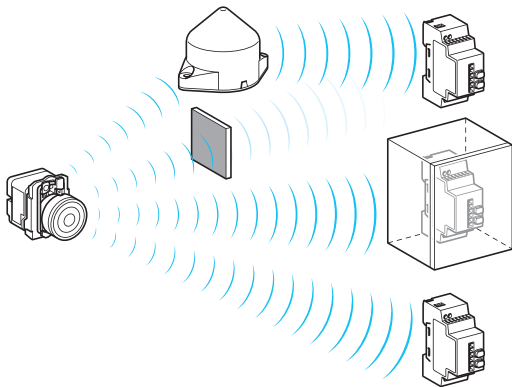


Figure A: radio transmission between 1 transmitter and 3 receivers

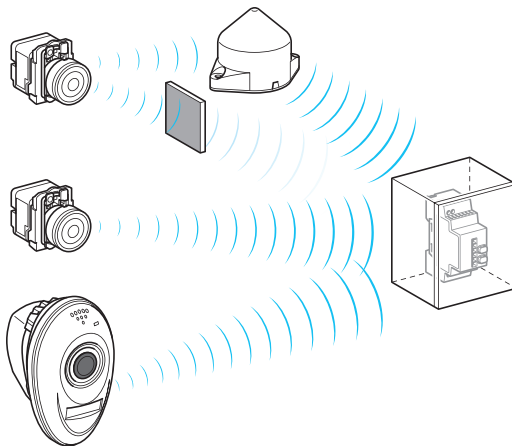


Figure B: radio transmission between 3 transmitters and 1 receiver

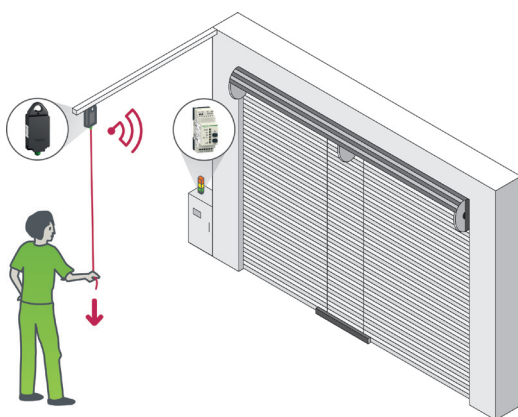


Figure C: rope pull switch for automatic doors

Presentation

The Harmony wireless and batteryless pushbuttons range enables remote control of a relay (receiver) by means of a pushbutton (transmitter). The control is by radio transmission where the transmitter is fitted with a electric generator that converts mechanical energy, produced when the pushbutton is pressed, to electrical energy. A radio-encoded message with a unique ID code is sent as a single pulse to one or more receivers located several dozen metres away (see figure A). A single receiver can also be actuated by up to 32 different transmitters (see figure B).

In order to avoid any conflict of multiple transmission from different transmitters, a minimum time frame of 10ms is required between each radio transmission. Depending on the application, a relay-antenna can be used to get round an obstacle that impedes transmission or to increase the range (see figure A and figure B).

The possible distance (1) between a transmitter and a receiver is approximately:

- 100 m/328 ft where there are no obstacles,
- 25 m/82 ft if the receiver is installed in a metal housing or in a closed metal enclosure,
- 300 m/984 ft if a relay-antenna is located between the transmitter and the receiver (receiver installed in a metal housing or in a closed metal enclosure).

In industrial environments the distance could be drastically reduced (radio perturbations, obstacles, EMC interferences, etc). As a consequence, some radio frames may not be received by the receiver.

The wireless and batteryless pushbutton reduces installation time and cost by eliminating wiring and associated equipment between the transmitters and the control panel.

This technology also allows an operator to be mobile or have a control mounted on-board of a vehicle (trolley, truck, etc.). The pushbutton is always available and requires no maintenance (no battery needed).

The mobile box **ZBRM21** or **ZBRM22** associated with its support function is adapted for static and mobile applications which will be mounted on vehicles.

In association with the pushbuttons, a new wireless and batteryless rope pull switch is designed for easy operation of automatic doors. This switch can be either mounted directly on the panel or between two ropes close to the automatic door. This enables the forklift driver or pedestrian to open or close the door by pulling the rope, where the mechanical energy produced is transmitted as a radio message to the receiver placed in the control panel (see figure C).

This technology (radio-encoded message sent as a single pulse) cannot be used for hoisting applications ("up/down", "right-left" movements, etc) or safety applications (Emergency Stop pushbuttons, etc). For these applications, it is recommended that Harmony XB4 and XB5 wired pushbuttons or the XAC range of pendant control stations be used.

Environment

The performance features of the XB5R range conform to the following specifications:

- International standards and approvals:
 - Wireless and batteryless pushbuttons: EN/IEC 60947-1, EN/IEC 60947-5-1, UL 508, CSA C22-2 N° 14
 - Transmitter/Receiver system: BT 2006/95/EC, CE: R&TTE 1999/5/EC, EMC 2004/108/EC
- International certifications: UL, CSA, C-Tick, GOST, CCC
- Radio agreements: ANATEL (Brazil), SRRCC (China), FCC (USA), RSS (Canada), ICASA (South Africa), ARIB T66 (Japan)

For more technical information, please refer to our website www.schneider-electric.com.

(1) Typical values which can be affected by the application environment.

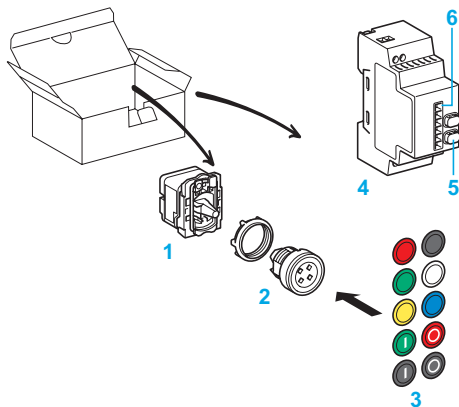


Figure D: pack with transmitter and configurable receiver

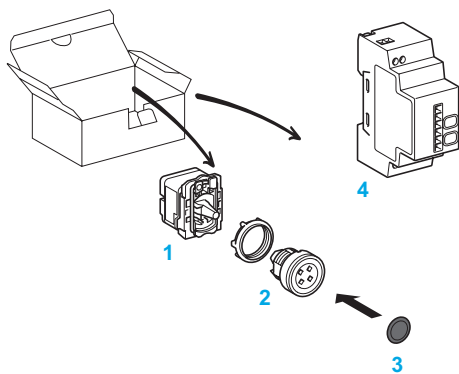


Figure E: pack with transmitter and non-configurable receiver

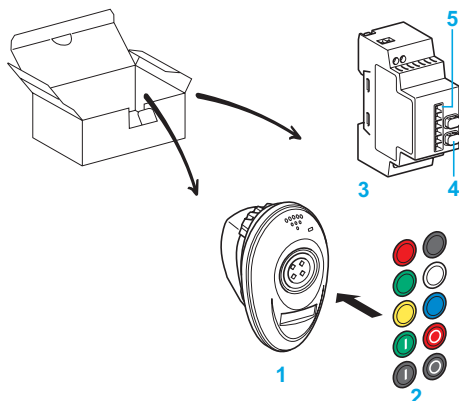


Figure F: pack with transmitter in handy box and configurable receiver

Description of the “Ready-to-use packs” ranges (1)

Pack with Configurable receiver (see figure D)

The pack comprises:

- 1 A transmitter with a fixing collar for assembly with a pushbutton head and mounting in a Ø 22 mm/0.866 in. hole.
- 2 A flush, spring return, plastic or metal pushbutton head.
- 3 A set of 10 different colored caps, which can be clipped onto the pushbutton head.
- 4 A \approx 24...240 V Configurable receiver, 2 relay outputs, with 2 buttons (teach and parameter setting) 5 and 6 indicating LEDs 6.

Pack with Non-configurable receiver (see figure E) (1)

The pack comprises:

- 1 A transmitter with a fixing collar for assembly with a pushbutton head and mounting in a Ø 22 mm/0.866 in. hole.
- 2 A flush, spring return, plastic or metal pushbutton head.
- 3 A Black cap that can be clipped onto the pushbutton head.
- 4 A \approx 24 V Non-configurable receiver, 1 relay output, without indicating LED or button.

Pack with handy box and Configurable receiver (see figure F)

The pack comprises:

- 1 A handy box containing a wireless and batteryless pushbutton with plastic head.
- 2 A set of 10 different colored caps, which can be clipped onto the pushbutton head.
- 3 A \approx 24...240 V Configurable receiver, 2 relay outputs, with 2 buttons (teach and parameter setting) 4 and 6 indicating LEDs 5

(1) Wireless and batteryless pushbutton and the receiver are factory-paired.

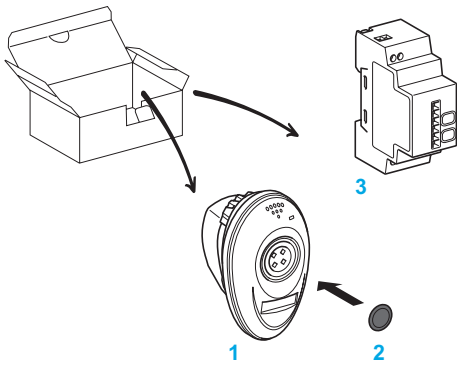


Figure G: pack with transmitter in handy box and non-configurable receiver

Description of the “Ready-to-use packs” ranges (1) (continued)

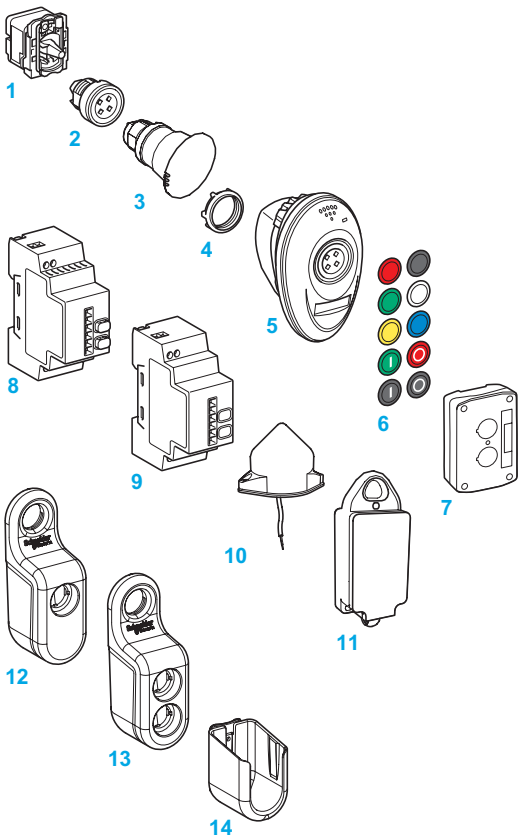
Pack with handy box and Non-configurable receiver (see figure G)

The pack comprises:

- 1 A handy box containing a wireless and batteryless pushbutton with plastic head.
- 2 A Black cap that can be clipped onto the pushbutton head.
- 3 A \approx 24 V Non-configurable receiver, 1 relay output, without indicating LED or button.

Description of the “Components” range

Components are sold separately to allow completion of existing applications or creation of specific applications:



- 1 transmitter for assembly with pushbutton head and mounting in a \varnothing 22 mm / 0.866 in. hole,
- 2 flush, spring return, pushbutton head, metal or plastic version,
- 3 mushroom head, plastic version,
- 4 plastic or metal fixing collar,
- 5 empty handy box,
- 6 set of 10 different colored caps or set of 10 same color caps, that can be clipped onto the pushbutton head,
- 7 empty plastic boxes (1 or 2 cut-outs) for wall mounting or on-board applications,
- 8 \approx 24...240 V Configurable receiver, 2 relay outputs, with 2 buttons (teach and parameter setting) and 6 indicating LEDs,
- 9 \approx 24 V Configurable receiver, 4 PNP outputs, with 2 buttons (teach and parameter setting) and 6 indicating LEDs,
- 10 relay-antenna,
- 11 rope pull switch,
- 12 ZBRM21 mobile box for 1 pushbutton,
- 13 ZBRM22 mobile box for 2 pushbuttons,
- 14 ZBRACS support for mobile box.

(1) Wireless and batteryless pushbutton and the receiver are factory-paired.

Control and signaling units Ø 22

Harmony XB5R plastic and XB4R metal

Wireless and batteryless pushbuttons



Ready-to-use packs (1)

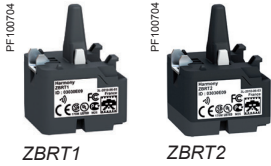
Description	Transmitter type	Voltage receiver V	Receiver type	Reference	Weight kg/lb
Packs comprising: - 1 wireless and batteryless pushbutton assembled on fixing collar, - 1 receiver pushbutton and receiver are factory-paired.	Wireless and batteryless pushbutton + Ø 22 mm/0.866 in. plastic head + 1 set of 10 different colored caps (1 cap to be selected and fitted)	≈ 24...240	Configurable receiver ZBRRA equipped with: - choice of 3 output functions (monostable, bistable, stop/start) - 2 relay outputs type RT 3A (2), - 2 buttons (teach, parameter setting) - 6 indicating LEDs (power ON, function modes, output status, signal strength)	XB5RFA02	0.230/0.507
	Wireless and batteryless pushbutton + Ø 22 mm/0.866 in. metallic head + 1 set of 10 different colored caps (1 cap to be selected and fitted)			XB4RFA02	0.245/0.540
	Wireless and batteryless pushbutton + Ø 22 mm/0.866 in. plastic head + 1 Black cap not fitted	≈ 24	Non-configurable receiver equipped with monostable output function: - 1 relay output type RT 3A - without button - without indicating LED	XB5RFB01	0.230/0.507
	Wireless and batteryless pushbutton + Ø 22 mm/0.866 in. metallic head + 1 Black cap not fitted			XB4RFB01	0.245/0.540
Packs comprising: - 1 wireless and batteryless pushbutton assembled on fixing collar, in handy box (3), - 1 receiver pushbutton and receiver are factory-paired.	Wireless and batteryless pushbutton + Ø 22 mm/0.866 in. plastic head mounted in a handy box + 1 set of 10 different colored caps (1 cap to be selected and fitted)	≈ 24...240	Configurable receiver ZBRRA equipped with: - choice of 3 output functions (monostable, bistable, stop/start) - 2 relay outputs type RT 3A (2), - 2 buttons (teach, parameter setting) - 6 indicating LEDs (power ON, function modes, output status, signal strength)	XB5RMA04	0.250/0.551
	Wireless and batteryless pushbutton + Ø 22 mm/0.866 in. plastic head mounted in a handy box + 1 Black cap not fitted	≈ 24	Non-configurable receiver equipped with monostable output function: - with 1 relay output type RT 3A - without button - without indicating LED	XB5RMB03	0.250/0.551

(1) Wireless and batteryless pushbutton and the receiver are factory-paired.

(2) Receivers supplied are set to monostable output function. The user can configure it to bistable and stop/start functions.

(3) Supplied with a magnet to be stuck on by the customer.

2



Transmitter components for wireless and batteryless pushbuttons						
Description	Type of push	Color	Reference	Weight kg/lb		
Transmitter for wireless and batteryless pushbutton (1) (2)	1 radio frame sent at the push of the button	–	ZBRT1	0.025/0.055		
	1 radio frame sent at the push of the button 1 radio frame sent at the release of the button	–	ZBRT2 (5)	0.025/0.055		
Spring return pushbutton heads for transmitter ZBRT1	Flush (plastic)	Without cap (3)	ZB5RZA0	0.015/0.033		
	Flush (metal)	Without cap (3)	ZB4RZA0	0.030/0.066		
Spring return mushroom head for transmitter ZBRT1	Mushroom 40 mm/1.58 in. (plastic)	Black	ZB5RZC2	0.025/0.055		
Wireless and batteryless pushbutton including: - a transmitter fitted with fixing collar - a spring return mushroom head	Mushroom 40 mm/1.58 in. (plastic)	Black	ZB5RTC2	0.055/0.121		
Wireless and batteryless pushbuttons including: - a transmitter fitted with fixing collar - a spring return pushbutton head with clipped-in cap (4)	Flush (plastic)	White	ZB5RTA1	0.045/0.099		
		Black	ZB5RTA2	0.045/0.099		
		Green	ZB5RTA3	0.045/0.099		
		White I on Green background	ZB5RTA331	0.045/0.099		
		Red	ZB5RTA4	0.045/0.099		
		White O on Red background	ZB5RTA432	0.045/0.099		
		Yellow	ZB5RTA5	0.045/0.099		
		Blue	ZB5RTA6	0.045/0.099		
		Flush (metal)	White	ZB4RTA1	0.085/0.187	
			Black	ZB4RTA2	0.085/0.187	
Green	ZB4RTA3		0.085/0.187			
White I on Green background	ZB4RTA331		0.085/0.187			
Red	ZB4RTA4		0.085/0.187			
White O on Red background	ZB4RTA432		0.085/0.187			
Flush (metal)	Yellow	ZB4RTA5	0.085/0.187			
	Blue	ZB4RTA6	0.085/0.187			

Transmitter components for wireless and batteryless rope pull switch				
Description	Application	Reference	Weight kg/lb	
Rope pull switch with wireless and batteryless transmitter	For automatic doors: The rope pull switch sends a radio message to the receiver placed in the control panel to open and close the door.	ZBRP1	0.150/0.331	

- (1) Fixing collar ZB5AZ009 (plastic) or ZB4BZ009 (metal) to be ordered separately.
- (2) Only heads ZB4RZA0 and ZB5RZA0 are mechanically compatible.
- (3) Cap to be ordered separately. Refer to the "Accessories" table on page 2/7.
- (4) This cap is fitted by Schneider Electric and cannot be removed (risk of damage).
- (5) This transmitter is only compatible with receiver ZBRR● version ≥ 2.0, relay antenna ZBRA1 version ≥ 2.0 and access point ZBRN● version > 1.2.



ZBRRA



ZBA7235



ZBA7331



ZBA7432



ZBA79



ZBRM22



ZBRACS



ZBRM01



XALD02



ZBRA1

Configurable receivers

Description	Output function	Output type	Receiver voltage V	Reference	Weight kg/lb
Configurable receivers (1) equipped with: - 2 buttons (teach and parameter setting) - 6 indicating LEDs (power ON, function modes, output status, signal strength)	Monostable	4 PNP outputs, 200 mA/24 V	~ 24	ZBRRC	0.130/0.287
	Monostable, Bistable	2 relay outputs type RT 3A (2)	~ 24...240	ZBRRD	0.130/0.287
	Monostable, Bistable, Stop/Start	2 relay outputs type RT 3A (2)	~ 24...240	ZBRRA	0.130/0.287

Accessories

Caps for Harmony pushbutton heads ZB5RZA0 and ZB4RZA0

Description	Background color	Marking	Sold in lots of	Unit reference	Weight kg/lb
Sets of 10 different colored caps with identical marking (3)	White	Without	10	ZBA71	0.010/0.022
		"I" (Black)	10	ZBA7131	0.010/0.022
		"↑" (Black)	10	ZBA7134	0.010/0.022
	Black	"+" (Black)	10	ZBA7138	0.010/0.022
		Without	10	ZBA72	0.010/0.022
		"O" (White)	10	ZBA7232	0.010/0.022
	Green	"+" (White)	10	ZBA7233	0.010/0.022
		"⊥" (White)	10	ZBA7235	0.010/0.022
		"I" (White)	10	ZBA7237	0.010/0.022
	Red	Without	10	ZBA73	0.010/0.022
		"I" (White)	10	ZBA7331	0.010/0.022
		"+" (White)	10	ZBA7333	0.010/0.022
	Yellow	"↑" White	10	ZBA7335	0.010/0.022
		"II" (White)	10	ZBA7336	0.010/0.022
		Without	10	ZBA74	0.010/0.022
	Blue	"O" (White)	10	ZBA7432	0.010/0.022
		Without	10	ZBA75	0.010/0.022
		Without	10	ZBA76	0.010/0.022
Set of 10 different colored caps with different markings (3)	White, Black, Green, Red, Yellow, Blue, White "I" on Green background, Black "I" on White background, White "O" on Red background, White "O" on Black background		1	ZBA79	0.010/0.022

Set of 6 different colored caps	White, Black, Green, Red, Yellow, Blue		1	ZBA80	0.010/0.022
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Boxes for wireless and batteryless pushbuttons

Product	Application	Description	Sold in lots of	Unit reference	Weight kg/lb
Mobile box, plastic, empty (4) (8)	For mobile and fix applications with wireless and batteryless pushbuttons	1 cut-out	1	ZBRM21	0.109/0.240
		2 cut-outs	1	ZBRM22	0.110/0.243
		Support for tube or wall specific for ZBRM21 and ZBRM22	1	ZBRACS	0.064/0.141
Handy box, plastic, empty (4) (5) (8)	For mobile wireless and batteryless pushbuttons	1 cut-out	1	ZBRM01	0.040/0.088
Empty plastic boxes for wireless and batteryless pushbuttons (6)	For fixed or on-board wireless and batteryless pushbuttons	1 cut-out	1	XALD01	0.136/0.300
		2 cut-outs	1	XALD02	0.193/0.426
Accessories					
Relay-antenna (7)	Between transmitter and receiver Used to increase the range and/or get round obstacles	~ 24...240 V □ 5 m/16.4 ft cable □ 1 power-ON LED □ 2 LEDs reception/transmission	1	ZBRA1	0.200/0.441
Fixing collar	-	Plastic	10	ZB5AZ009	0.038/0.084
		Metal	10	ZB4BZ009	0.038/0.084
Legend plate, 27 x 8 mm/ 1.06 x 0.32 in., for engraving	For sticking onto handy box ZBRM01, ZBRM21 and ZBRM22	Self-adhesive, blank, Black background	10	ZBY0101T	0.005/0.011

(1) Each receiver can be actuated by up to 32 transmitters.

(2) Receivers supplied are set to monostable output function. The user can configure it to bistable and stop/start functions.

(3) Cap can be clipped-in at 90° steps, through 360°.

(4) Cannot be used for wired contacts (no cable gland outlet)

(5) Supplied with a magnet to be stuck on by the customer.

(6) Box equipped with cable gland outlets, compatible with Harmony ZB5 pushbutton heads.

(7) Not wired to the receiver.

(8) Compatible with ZBRT1 and ZBRT2.

XB5R and XB4R wireless and batteryless pushbuttons for explosive atmospheres

■ **Presentation**

- Explosive atmosphere and ignition sources *page 3/2*
- ATEX categories and zones *page 3/2*
- ATEX certification *page 3/3*
- Marking example on transmitters for GAS zone *page 3/3*
- Environment *page 3/3*

■ **Description**

- ATEX transmitters and receivers in DUST zone *page 1/6*
- ATEX transmitters and receivers in GAS zone *page 3/4*

■ **References**

- Transmitter components for wireless and batteryless pushbuttons *page 3/5*
- Transmitter components for wireless and batteryless rope pull switch *page 3/5*
- Handy boxes for wireless and batteryless pushbuttons *page 3/5*
- Plastic boxes for wireless and batteryless pushbuttons *page 3/5*
- Accessories *page 3/5*



Control and signaling units Ø 22

Harmony XB5R plastic and XB4R metal for explosive atmospheres

Wireless and batteryless pushbuttons



3

Presentation

The Harmony ATEX range of wireless and batteryless pushbuttons are designed for industries where explosive atmospheres can be present. This range can be ideally used for environments where the generation of possible ignition sources can be prevented and controlled.

XB5R IECEx is certified for:

- Dust applications (Group III, D mode) for zone 21 and zone 22
- Gas applications (Group II, G mode) for zone 1 and zone 2
- Mining applications (Group I) for equipment category Mb

Explosive atmosphere and ignition sources

According to the ATEX directive, a potentially explosive atmosphere is the mixture of air with flammable substances in the form of gas, vapor, and/or dust, that when exposed to an ignition source under normal atmospheric conditions can completely or partially catch fire and explode.

The types of ignition sources that can create an explosive atmosphere are:

- Hot surfaces
- Flames and hot gases
- Mechanically produced sparks
- Electrical equipment
- Transient currents
- Static electricity
- Lightning strikes
- Electromagnetic waves
- Optical radiation
- Ultrasound
- Chemical reactions
- People (indirectly)

Explosive atmospheres are found in areas like:

- Metal surface grinding, especially aluminum dust and particles
- Oil refineries, rigs and processing plants
- Gas pipelines and distribution centers
- Printing industries, paper and textiles
- Aircraft refueling and hangars
- Chemical processing plants
- Grain handling and storage
- Sewage treatment plants
- Surface coating industries
- Underground coal mines
- Wood working areas
- Sugar refineries
- Vessels/ships
- Power plants

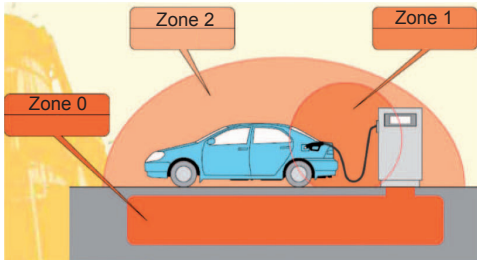


Figure A: example of hazardous gas and vapor zone

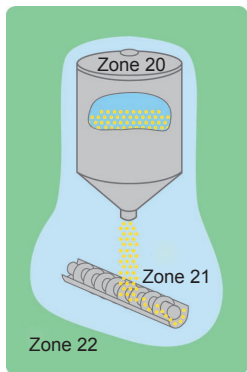


Figure B: example of hazardous dust zone

ATEX categories and zones

Depending on the presence of flammable materials, explosive atmospheres are classified into the following categories and zones:

Category	Group	Level of protection	Zones	Hazardous quantities	Extent of protective measure (Risk)
Mining	Ma	Very high	N/A	Without specific methane concentration	Safe with 2 faults, rare and foreseen
	Mb	High		With specific methane concentration	Safe with 1 fault, foreseen
Gas	Ga	Very high	0	Often/longer periods	Safe with 2 faults, rare and foreseen
	Gb	High	1	Occasionally	Safe with 1 fault, foreseen
	Gc	Enhanced	2	Rear/most likely never	Normal
Dust	Da	Very high	20	Often/longer periods	Safe with 2 faults, rare and foreseen
	Db	High	21	Occasionally	Safe with 1 fault, foreseen
	Dc	Enhanced	22	Rear/most likely never	Normal

Note: In the table, the highlighted rows in green are the targeted areas for the XB5R ATEX offer.

Control and signaling units Ø 22

Harmony XB5R plastic and XB4R metal for explosive atmospheres

Wireless and batteryless pushbuttons

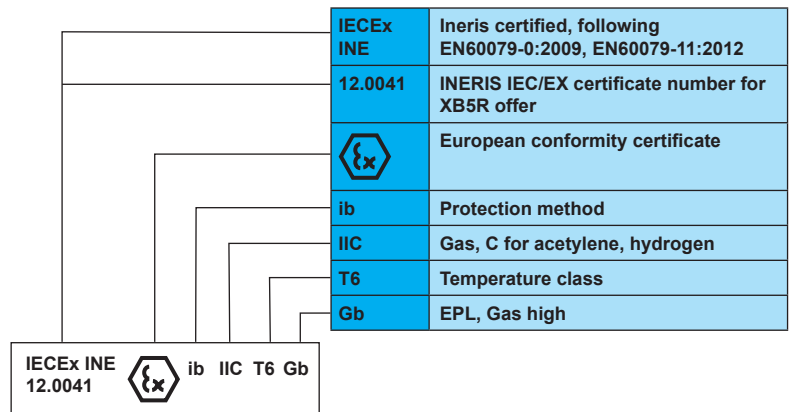
Presentation (continued)

ATEX certification

ATEX IECEx certification has a detailed procedure for testing and inspecting the equipment made for use in potentially hazardous areas. The results obtained after this procedure enable an ATEX certificate to be issued, together with a report confirming and demonstrating that the product can be used safely in potentially explosive atmospheres (in line with the given parameters).

- Based on this certification procedure, the XB5R wireless and batteryless pushbuttons are ATEX certified with the following standards:
 - EN 60079-0: 2009
 - EN 60079-11: 2012
- Certificate numbers are:
 - IECEx INE 12.0041 for transmitters **ZBRM01EX**, **ZBRM01BEX**, **XAWGR100EX**, **XAWGR200EX**, **XAWGR300EX**, **ZB5RTA0EX**, and **ZBRP1EX**
 - IECEx INE 12.0054 for relay antenna **ZBRA1DEX**

Marking example on transmitters for GAS zone



Environment

The performance features of the XB5R range also conforms to the following specifications:

- ATEX certified for IECEx
- International standards and approvals:
 - Wireless and batteryless pushbuttons: EN/IEC 60947-1, EN/IEC 60947-5-1, UL 508, CSA C22-2 N° 14
 - Transmitter/Receiver system: BT 2006/95/EC, CE: R&TTE 1999/5/EC, EMC 2004/108/EC
- International certifications: UL, CSA, C-Tick, GOST, CCC
- Radio agreements: ANATEL (Brazil), SRRC (China), FCC (USA), RSS (Canada), ICASA (South Africa), ARIB T66 (Japan)

Control and signaling units Ø 22

Harmony XB5R plastic and XB4R metal for explosive atmospheres

Wireless and batteryless pushbuttons

3

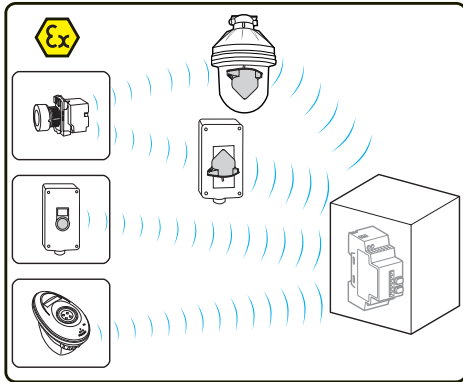


Figure C: receiver in an ATEX certified cabinet placed inside the DUST zone

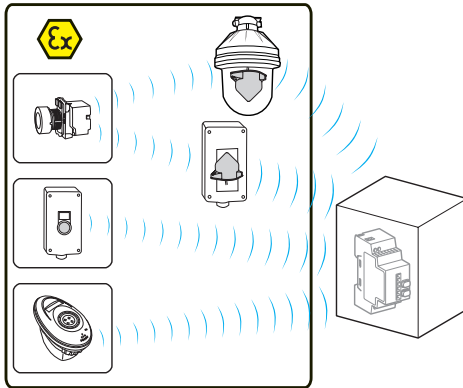


Figure D: receiver in a standard cabinet placed outside the DUST zone

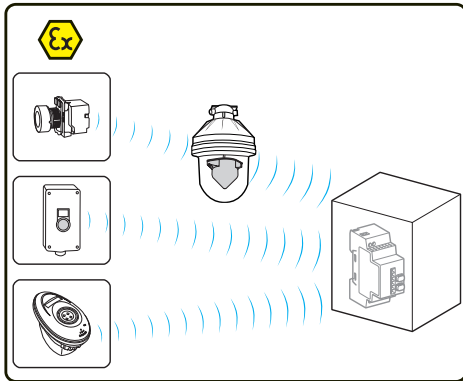


Figure E: receiver in an ATEX certified metal cabinet placed inside the GAS zone

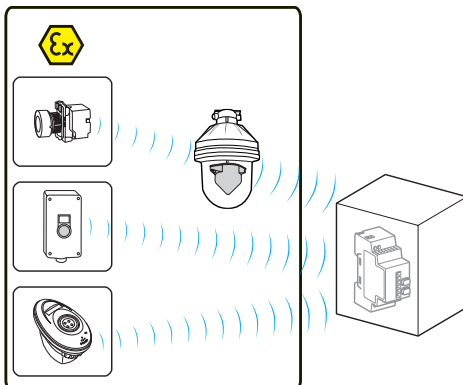


Figure F: receiver in a standard cabinet placed outside the GAS zone

Description

ATEX transmitters and receivers in DUST zone (Group III, D mode)

In the dust zone (zone 21 and zone 22), the receiver can be placed inside or outside the zone as per the requirement. Any one of the two available antennas (**ZBRA1EX** and **ZBRA1DEX**) can be used to improve radio transmission to the receiver that is placed in a plastic or metal cabinet.

In Figure C, the transmitters, relay antennas, and receiver are all placed in the dust zone. The receiver must be placed in an ATEX certified plastic or metal cabinet which provides protection against explosion.

In Figure D, the transmitters and the relay antennas are placed in the dust zone. The receiver is placed outside the dust zone in a standard plastic or metal cabinet.

ATEX transmitters and receivers in GAS zone (Group II, G mode)

In the gas zone (zone 1 and zone 2), the receiver can be placed inside or outside the zone as per the requirement. Only **ZBRA1EX** relay antenna must be used to improve radio transmission to the receiver that is placed in a plastic or metal cabinet.

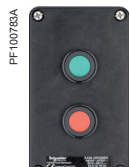
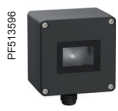
In Figure E, the transmitters, relay antenna and receiver are all placed in the gas zone. The receiver must be placed only in an ATEX certified metal cabinet which provides protection against explosion.

In Figure F, the transmitters and the relay antenna are placed in the gas zone. The receiver is placed outside the gas zone in a standard plastic or metal cabinet.

Control and signaling units Ø 22

Harmony XB5R plastic and XB4R metal for explosive atmospheres

Wireless and batteryless pushbuttons

PF100751
ZB5RTA0EXPF100789A
ZBRP1EXPF100771A
ZBRM01EXPF100771A
ZBRM01BEXPF100781A
XAWGR100EXPF100782A
XAWGR200EXPF100783A
XAWGR300EXPF100774A
ZBRA1EXPF513596
ZBRA1DEX

Transmitter components for wireless and batteryless pushbuttons

Description	Type of category and group	Type of push	Cap	Reference (1) (2)	Weight kg/lb
Spring return pushbutton equipped with transmitter and fixing collar for hazardous locations.	Mining Ex ib I Mb Gas Ex ib IIC T6 Gb Dust Ex ib IIIC T85°C Db IP65	Flush (plastic)	Without cap	ZB5RTA0EX	0.043/0.095
	Mining Ex ib I Mb Gas Ex ib IIC T6 Gb Dust Ex ib IIIC T85°C Db IP65	Flush (metal)	Without cap	ZB4RTA0EX	0.083/0.183

Transmitter components for wireless and batteryless rope pull switch

Description	Type of category and group	Type of push	Reference (1) (2)	Weight kg/lb
Rope pull switch for hazardous locations.	Mining Ex ib I Mb Gas Ex ib IIC T6 Gb Dust Ex ib IIIC T85°C Db IP65	Plastic	ZBRP1EX	0.140/0.309

Handy boxes for wireless and batteryless pushbuttons

Description	Type of category and group	Type and number of pushbuttons	Reference	Weight kg/lb
Mobile Handy box equipped with wireless and batteryless pushbutton, fixing collar, and 1 set of six different colored caps.	Mining Ex ib I Mb Gas Ex ib IIC T6 Gb Dust Ex ib IIIC T85°C Db IP65	1 spring return pushbutton with leather protection	ZBRM01EX	0.150/0.331
	Mining Ex ib I Mb Gas Ex ib IIB T6 Gb Dust Ex ib IIIC T85°C Db IP65	1 spring return pushbutton	ZBRM01BEX	0.100/0.220

Plastic boxes for wireless and batteryless pushbuttons

Description	Type of category and group	Number of pushbuttons	Reference	Weight kg/lb
Plastic box equipped with wireless and batteryless pushbutton and 1 set of six different colored caps. Used with fixed wireless and batteryless pushbutton.	Mining Ex ib I Mb Gas Ex ib IIC T6 Gb Dust Ex ib IIIC T85°C Db IP65	1 plastic spring return pushbutton	XAWGR100EX	0.500/1.102
	Mining Ex ib I Mb Gas Ex ib IIC T6 Gb Dust Ex ib IIIC T85°C Db IP65	2 plastic spring return pushbuttons	XAWGR200EX	0.550/1.213
	Mining Ex ib I Mb Gas Ex ib IIC T6 Gb Dust Ex ib IIIC T85°C Db IP65	3 plastic spring return pushbuttons	XAWGR300EX	0.700/1.543

Accessories

Description	Type of category and group	Function	Reference	Weight kg/lb
Relay antenna equipped with \approx 24...240V connector, 1 power-on LED, and 2 LEDs for reception/transmission in hazardous locations.	Gas Ex d IIC T6 Gb Dust Ex tb IIIC T85°C Db IP65	Placed between transmitter and receiver Used to increase the range and/or get around an obstacle	ZBRA1EX (3)	3.100/6.834
	Dust Ex tb IIIC T85°C Db IP65	Placed between transmitter and receiver Used to increase the range and/or get around an obstacle	ZBRA1DEX	1.000/2.205

(1) For the list of receivers that can be used with the transmitters, see "Configurable receivers" table on page 2/7.

(2) For the list of access points that can be used with the transmitters, see "Configurable access points" table on page 4/3.

(3) **ZBRA1EX** will be IECEx certified by 2nd quarter 2013.

Control and signaling units Ø 22

Wireless and batteryless pushbuttons

Harmony XB5R and XB4R

ZBRN1 and ZBRN2 access points

- Presentation..... page 4/2
- Description..... page 4/2
- References
 - Configurable access points..... page 4/3
 - Communication module..... page 4/3
 - Accessories..... page 4/3

Control and signaling units Ø 22

Harmony XB5R plastic and XB4R metal
ZBRN1 and ZBRN2 access points for wireless and
batteryless pushbuttons

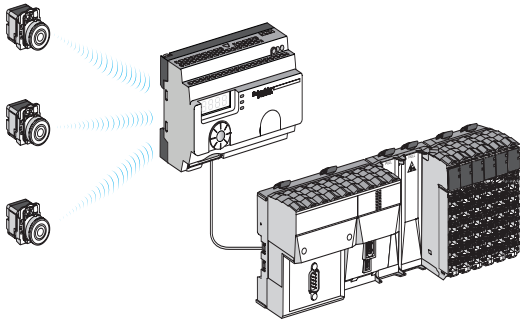


Figure A: radio transmission between 3 transmitters and 1 Access Point

Presentation

The access point of Harmony wireless and batteryless range provides network connectivity openness by operating as an intermediate equipment between the transmitter and the PLC (Programmable Logic Controller). The access point receives radio signals from the transmitters and converts them to communication protocols. Based on the model, it is connected to the PLC using either RS485 Modbus Serial line or Modbus/TCP protocol.

The access point can be used with transmitters such as XB4R and XB5R wireless and batteryless pushbuttons, rope pull switch, mushroom head pushbutton (1), and all PLCs that support Modbus Serial line over RS485 or Modbus/TCP protocols.

Depending on the application, an external or a relay antenna can be used to improve signal reception. An access point can support up to 60 radio transmitters.

The Access point can be configured:

- through jog dial and 7-segment display (configuration and diagnostic modes),
- through web pages for **ZBRN1** (Modbus/TCP communication module),
- through SoMachine, Unity Pro software, or third party FDT container using DTM (Device Type Manager) files (2) (3),
- through SD card and csv files for communication and radio configuration.

The possible distance (4) between a transmitter and an access point is approximately:

- 100 m/328 ft where there are no obstacles,
- 25 m/82 ft if the access point is installed in a metal housing or in a closed metal enclosure,
- 300 m/984 ft if a relay-antenna is located between the transmitter and the access point (installed in a metal housing or in a closed metal enclosure),
- 60 m/197 ft if an external antenna is connected to the access point.

Description

Standard access point with communication module (see figure B)

The access point **ZBRN1** has an empty slot for the **ZBRCETH** communication module to support Modbus/TCP protocol. This communication module has 2 standard Ethernet RJ45 connectors that provide connectivity for daisy chain operation and daisy chain loop operation (when used with Schneider Electric ConneXium Ethernet switches) and thus avoids the use of an external switch or hub.

- 1 **ZBRN1** standard access point (5)
- 2 **ZBRN1** instruction sheet
- 3 **ZBRCETH** Modbus/TCP network communication module
- 4 **ZBRCETH** instruction sheet

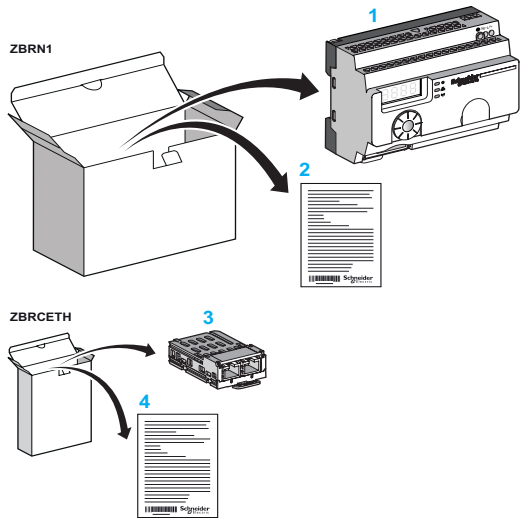


Figure B: standard access point with communication module

(1) Please refer to the References table on Page 2/6 for the compatible list of transmitters.

(2) For more information on SoMachine and Unity Pro software, please refer to our website www.schneider-electric.com.

(3) DTM is a software component file that enables the SoMachine or Unity Pro software to communicate with the connected system.

(4) Typical values which can be affected by the application environment.

(5) **ZBRN1** must be plugged with a communication module, reference **ZBRCETH** for Modbus/TCP protocol.

Control and signaling units Ø 22

Harmony XB5R plastic and XB4R metal
ZBRN1 and ZBRN2 access points for wireless and batteryless pushbuttons

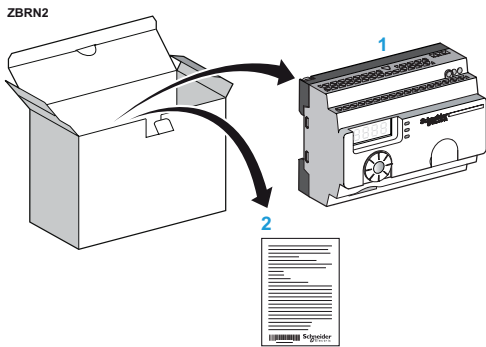


Figure C: access point for Modbus Serial line connection

Description

Access point for Modbus serial line protocol (see figure C)

The access point **ZBRN2** has 2 embedded RS485 connectors that avoid the use of an external hub for RS485 Serial line connection. The supported bps are 1200 bps, 2400 bps, 4800 bps, 9200 bps, 9600 bps, 38,400 bps, and 115,200 bps.

- 1 ZBRN2 access point
- 2 ZBRN2 instruction sheet



ZBRN2



ZBRN1



ZBRCETH



ZBRA2

Configurable access points

Description	Data function	Output type	Receiver voltage V	Reference	Weight kg/lb
Configurable access points equipped with: - 7-segment display - jog dial - 8 indicating LEDs (power ON, functions mode, communication status, signal strength) - external antenna connector and protective plug	Monostable (adjustable from 100 ms to 1 s)	2 RS485 connectors that provides connectivity for Modbus RS485 Serial line	≈ 24...240	ZBRN2	0.270/0.595
	Monostable (adjustable from 100 ms to 1 s)	1 slot for communication module ZBRCETH (should be ordered separately)	≈ 24...240	ZBRN1	0.263/0.580

Communication module

Description	Characteristics	Communication port	Reference	Weight kg/lb
Modbus/TCP network communication module	Modbus/TCP protocol with embedded Web pages in 5 languages for configuration, monitoring and diagnostics	2 RJ45 connectors that provides connectivity for daisy chain and daisy chain loop operation	ZBRCETH	0.044/0.097

Accessories

Product	Application	Description	Reference	Weight kg/lb
External antenna	Connected to the access point (ZBRN1 or ZBRN2)	2 m/6.56 ft cable 1 RF connector Used to increase the distance of transmission	ZBRA2	0.040/0.088

Note: The **ZBRN2** has embedded communication port for Modbus Serial Line, where as **ZBRN1** must be plugged with a communication module to support different protocols.

Control and signaling units Ø 22

Wireless and batteryless pushbuttons

Harmony XB5R and XB4R

Product reference index

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X			
XALD01	2/7	ZBRA1EX	3/5
XALD02	2/7	ZBRA2	4/3
XAWGR100EX	3/5	ZBRACS	2/7
XAWGR200EX	3/5	ZBRCETH	4/3
XAWGR300EX	3/5	ZBRM01	2/7
XB4RFA02	2/5	ZBRM01BEX	3/5
XB4RFB01	2/5	ZBRM01EX	3/5
XB5RFA02	2/5	ZBRM21	2/7
XB5RFB01	2/5	ZBRM22	2/7
XB5RMA04	2/5	ZBRN1	4/3
XB5RMB03	2/5	ZBRN2	4/3
		ZBRP1	2/6
		ZBRP1EX	3/5
		ZBRRRA	2/7
		ZBRRC	2/7
		ZBRRD	2/7
		ZBRT1	2/6
		ZBRT2	2/6
		ZBY0101T	2/7
Z			
ZB4BZ009	2/7		
ZB4RTA0EX	3/5		
ZB4RTA1	2/6		
ZB4RTA2	2/6		
ZB4RTA3	2/6		
ZB4RTA331	2/6		
ZB4RTA4	2/6		
ZB4RTA432	2/6		
ZB4RTA5	2/6		
ZB4RTA6	2/6		
ZB4RZA0	2/6		
ZB5AZ009	2/7		
ZB5RTA0EX	3/5		
ZB5RTA1	2/6		
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ZB5RTC2	2/6		
ZB5RZA0	2/6		
ZB5RZC2	2/6		
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ZBA7331	2/7		
ZBA7333	2/7		
ZBA7335	2/7		
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ZBA7432	2/7		
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ZBA76	2/7		
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Schneider Electric Industries SAS

Head Office
35, rue Joseph Monier
F-92500 Rueil-Malmaison
France

www.schneider-electric.com/control

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