ExRemote

User Manual

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Version
1.0 Initial Release

1. Introduction

ExRemote remote and receiver systems are developed using actuators of the highest quality and parts for best durability and longevity. The compact housing of the receiver makes it easy to integrate and the bus systems make wiring much less complex than conventional receivers. This system is a safe choice for switch-safety critical systems when combined with a safety relay and monitored output switches. The system is designed for use in industrial applications in environments with potential explosion hazards.

This document describes how to properly install, use, maintain and dispose of a remote / receiver combination and its parts. It assumes the user has minimal knowledge of electronics and hardware. However, only a properly trained technician should perform installation and wiring, and only trained personnel should operate machines controlled with this device.

The following symbols are used throughout the manual:

Danger: Give special attention to the advice given to avoid dangerous situations.

Note: Highlights important information.

Contents

2. Safety

The remote can be used to operate heavy machinery. Despite the safety mechanisms built in the system an operator should be aware of the risks of actuating motors, pumps, valves or other actuators at all time. It is advisable and, in some cases, enforced by law that an operator should be in possession of a valid safety certificate when carrying out potentially dangerous work.

Installation of the receiver as described in chapter 4 should happen by adequately trained personnel that are aware of the safety requirements that come with building control cabinets for machines according to Directive 2006/42/EC. Prior to usage, each complete installation needs a proper risk assessment. All necessary precautionary measures should be taken to prevent harm or damage.

This remote / receiver system should not be used to control machines that can cause injury or damage when stopped due to an interruption of the wireless signal between the remote and receiver. A system developer needs to take this possibility into account, together with the required start procedure after a stop, when deciding to use a remote / receiver system.

This document is to stay together with the remote / receiver system for reference.

Disclaimer: The manufacturer is not responsible for any injury, damages or fines for not complying with regulations of local authorities or this document.

3. Specifications

3.1. Environmental

Parameter	Typical	Min	Max
Temperature:		-20 °C [-4 °F]	60 °C [140 °F]
storage	20 °C [68 °F]		
Relative Humidity:		0 %	100 %
Protection:	 II 3G Ex i IIB T6 Gc II 3D Ex t IIIC T85°C Dc IP65 IK10+		

3.2. Mechanical properties remote

Parameter	Value
Weight:	1.15 kg (depending on configuration)
Dimensions:	

3.3. Electrical specifications remote

Parameter	Value
Operating voltage:	3.3 VDC
Power Consumption:	45 mA during operation 1.7 mA during sleep
Redundant version	65 mA during operation 2 mA during sleep
Battery:	3.7 V 2500 mAh LiPo
Charging	Inductive 5 V 500 mA for 5 to 10 hours
Charger	Any Qi compatible charger @ 5 V 800 mA minimum
Standby time	61 days (52 days for redundant version)
Operating time	55 hours (38 hours for redundant version)
Lifetime	5 years minimum when stored at 20 °C [68 °F]

3.4. Electrical specifications receiver

Parameter	Typical	Min	Max
Power Supply (U_{in}):	24 VDC	20 VDC	28 VDC
Consumption:	Typical 50 mA or 80 mA when redundant		
Bus operation voltage:	5 VDC		
RS485 bitrate			250 kbps
CAN bus bitrate			1 Mbps
Digital Output:	U_{in} – 0.7V (Opto-coupler output)		
Digital Output Current[1]:			80 mA
Switching Capacity[1]:			
Resistive 30 VDC Max			8 A
Resistive 230 VAC Max			5 A
Inductive 230 VAC Max			2 A
Lifetime	100 000 Operations minimum		

1. Absolute maximum rating per channel, not limited.

3.5. Wireless specifications

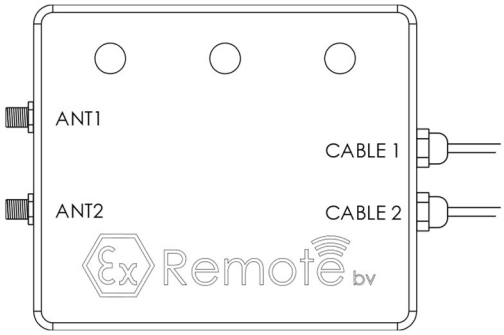
Parameter	Typical	Min	Max
Frequency bands:	869 MHz, 915 MHz		
Output power:		2 dBm [1.6 mW]	14 dBm [25.1 mW]
Range:			
Line of sight:			300 m
With obstacles[1]:	50 m		

1. Your millage my vary depending on atmospheric circumstances and the size and material of obstacles.

4. Installation

4.1. Wiring

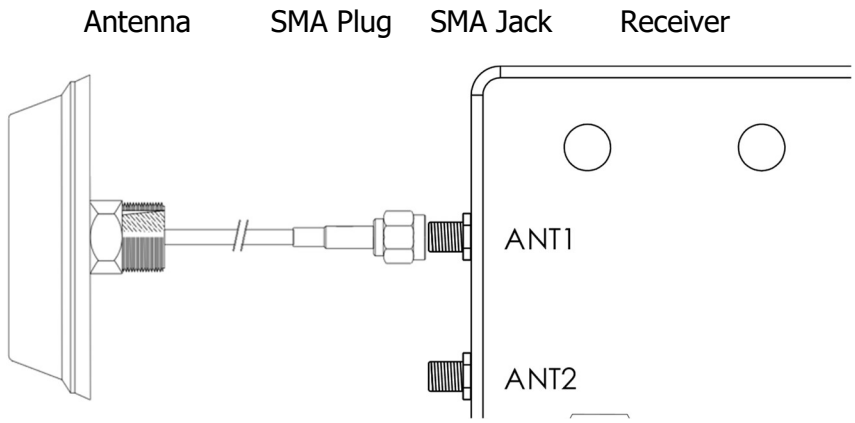
The receiver can have up to two SMA connectors for antennas and two multi-core cables for power, bus and I/O. Available connections depend on the product model.



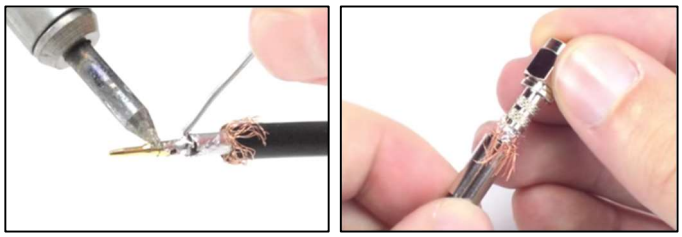
Connector	Function
ANT1	Antenna connector for main receiver
ANT2	Antenna connector for redundant receiver (option)

Cable	Core	Function	
1	1 BLACK	GND	
	2 RED	24V DC IN	
	3 GREEN_THICK	RELAY 1 NO	
	4 YELLOW_THICK	RELAY 1 COM	
	5 BLUE_THICK	RELAY 1 NC	
	6 GREEN_THIN	RELAY 2 NO	
	7 YELLOW_THIN	RELAY 2 COM	
	8 BLUE_THIN	RELAY 2 NC	
2	1 BLACK	RS485: GND	
	2 WHITE	RS485: B	
	3 GREEN_THIN	RS485: A	
	4 YELLOW_THIN	CANBUS: CANH	
	5 BLUE_THIN	CANBUS: CANL	
	6 GREEN_THICK	24V OUT 1 (50 mA)	E-STOP: SAFE 1
	7 YELLOW_THICK	24V OUT 2 (50 mA)	E-STOP: SAFE 2
	8 BLUE_THICK	24V OUT 3 (50 mA)	E-STOP: START/RESET

4.2. Antenna Cable

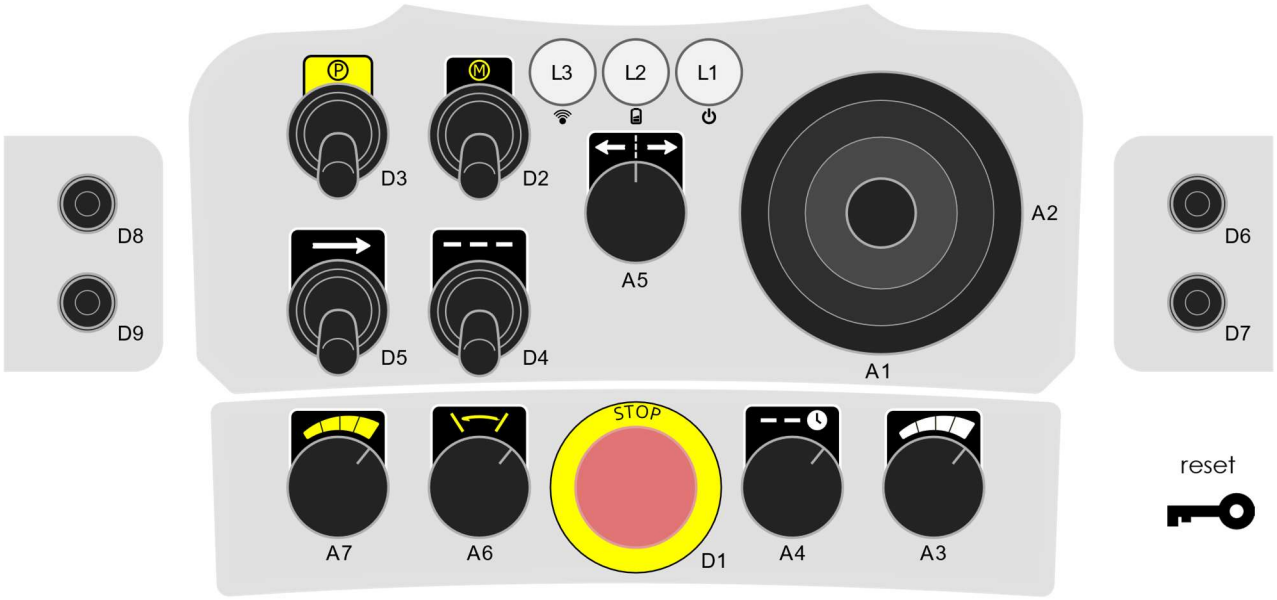


The cable connected to the antenna needs to be cut to a manageable length of 15 cm [6 inch] and a SMA Plug needs to be soldered and crimped. The core has to be soldered to the pin. Then slide the metal sleeve with the cable's shield over the back of the connector and crimp them together. Measure between the pin and the shield to make sure they are isolated from each other (i.e. not electrically connected).



5. Operation

The function of each control and indicator on the remote can be programmed according to the customer's demands. The configuration of controls can be customized, but a few controls and indicators retain their function.



Control	Function
D1	(Emergency) Stop button. Sends multiple stop signals to the receiver and puts the device in sleep mode. Wake the device by pulling or rotating it.
D6	Reset button. If the device has been completely discharged, it needs to be recharged by placing it on the charging dock. After several minutes this button has to be used to restart the device.
D7	Start button. Required to press before any other actuators after waking up. Will not respond as long as actuators are on.

Indicator	Description
L1	Power or status light. Green means powered on. Blinks red rapidly when an actuator is used before the start button is pressed. Blinks green rapidly when an actuator is used after the start button is pressed. Color can be programmed to depict a situation (e.g. purple in autonomy mode, orange for warning).
L2	Battery light. Breathing white when charging (fading in and out). Constantly white when fully charged. Red when battery low. Blinking red to warn for auto shutdown.
L3	Signal or pair light. Breathing blue when looking for a receiver (fading in and out). Constantly blue when connected. Blinks red rapidly when sending stop messages.

There are three ways to turn on the device:

1. Press and release the emergency stop button
2. Press the reset button (D6) or
3. Remove and insert the key

If none of the indicators switch on, the battery may be fully depleted. In this case charge the remote for at least 5 minutes prior to turning the device "ON" again.

If the battery is completely depleted the battery LED will not start breathing immediately when charging (fading in and out). Some charge pads have a charging indicator.

When the battery LED is blinking red the battery is low. When the battery LED is red constantly the device will shut down in 10 minutes. Above start procedure can be performed to use the device for an additional 10 minutes. If the battery is depleted too much, the lights will go off and the device will stop working.

To charge the device place the bottom of the remote on a powered wireless charging pad. Make sure to align the wireless charging coils. The battery LED will start breathing in in white (fading in and switching off) to indicate the remote is placed correctly and it is charging. The battery LED will remain ON and white to indicate a full or fully charged battery.

The device switches off automatically in these two scenarios':

1. The STOP button is pressed and all STOP messages have been sent to the receiver.
2. The remote has not been connected to a receiver for 5 minutes.

6. Maintenance

For optimum performance the Battery to be replaced every year.

Because of the degeneration of soft plastic all rubbers are to be replaced every year of both the remote and the receiver.

The remote is programmed in such a way that it will only unlock when both contacts of the emergency stop button have been active and both have been released. In case one of the contacts fails to toggle, the status indicator will remain blinking red. In this case you can press the stop button and D6 once briefly to turn the device to sleep. Contact your distributor for a repair or replacement.

Regularly remove dust from the remote using a damp cloth to prevent wear and potential hazardous situations. Do NOT use solvents.

7. Disposal

The symbol of the crossed-out waste container on the device means that it must be handled separately from normal waste. Once it is no longer in use, the radio remote control should be handed over to the local waste disposal service. Exhausted batteries should be disposed of at the specific points of collection, as required by law.

Waste separation contributes to protecting the environment and facilitates recycling. The owner is responsible for handing over scrapped equipment to the designated points of collection for the recycling of electric or electronic waste material. Illegal disposal of the product is punished by the penalties implementing European Directive 2012/19/EU.

8. Declaration of conformity

Document No.:
EXDECO001

Product model/product (product, type, batch or serial number):
Remote EXREM01 serial 20-0001 and Receiver EXRCV01 serial 20-0001

Name and address of the manufacturer and, where applicable, his authorized representative:

ExRemote (Manufacturer)
Welysestraat 5
6669DG Dodewaard NL

WBHandel (Reseller)
Industrieweg 20
4794 SX Heijningen NL

Please visit www.exremote.com for the most current address.

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Object of the declaration:

The object of the declaration described above is in conformity with the relevant Union harmonization legislation:

Machinery directive	(2006/42/EG)
ATEX directive	(2014/34/EU)
EMC directive	(2014/30/EU)
RED directive	(2014/53/EU)

References to the relevant harmonized standards used or references to the other technical specifications in relation to which conformity is declared:

EN-IEC 60950-1:2015/A2:2013	EN 62311:2020	EN 301 489-3 V2.1.1
EN-IEC 60079-15:2019	EN 62368-1:2014+A11:2017	EN 300 220-1 V3.1.1
EN-IEC 60079-0:2018/AC:2020	EN 301 489-1 V2.2.3	EN 300 220-2 V3.1.1

Where applicable, the notified body … (name, number) performed … (description of intervention) and issued the certificate:
RED (2014/53/EU) Certification by MicomLabs NoBo 2280, Certificate ABX00029

Signed for and on behalf of:	ExRemote BV
Place and date of issue:	Arnhem 15-9-2020
Name, function:	Peter van Geenen, Director