

TELE RADIO TIGER G2

INDUSTRIAL RADIO REMOTE CONTROLS

Installation instructions



TG-T14-4, TG-T14-5, TG-T14-6, TG-T14-7, TG-T14-8, TG-T14-9,
TG-T15-4, TG-T15-5, TG-T15-6, TG-T15-7, TG-T15-8, TG-T15-9

TG-R4-26 (TG-RX-MNLCAN), TG-R4-28 (TG-RX-MNRCAN), TG-R4-30 (TG-RX-MNPCAN), TG-R4-41 (TG-RX-MNLJ1939), TG-R4-43 (TG-RX-MNRJ1939), TG-R4-45 (TG-RX-MNPJ1939), TG-R4-36 (TG-RX-MNLANA), TG-R4-38 (TG-RX-MNRANA), TG-R4-40 (TG-RX-MNPANA)

LANGUAGE: English (original)

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CHAPTER 1: CUSTOMER INFORMATION

THANK YOU FOR PURCHASING A TELE RADIO AB PRODUCT

READ ALL INSTRUCTIONS AND WARNINGS CAREFULLY BEFORE MOUNTING, INSTALLING AND CONFIGURATING THE PRODUCTS.

These instructions are published by Tele Radio AB without any guarantee. The instructions may be removed or revised by Tele Radio AB at any time and without further notice. Corrections and additions will be added to the latest version of the instruction.

IMPORTANT! These instructions are directed to installers. There are separate instructions directed towards end users. The instructions that contain information on the installation and configuration of the radio remote control unit on the machine are not intended to be passed on to the end user. Only such information may be passed on to the end user that is needed to operate the machine correctly by radio remote control.

Tele Radio AB products are covered by a guarantee/ warranty against material, construction or manufacturing faults. During the guarantee/ warranty period, Tele Radio AB may replace the product or faulty parts with new. Work under guarantee/ warranty must be carried out by Tele Radio AB or by an authorized service center specified by Tele Radio AB. Contact your Tele Radio AB representative if you need support or service.

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WARNINGS & RESTRICTIONS

WARNING! Tele Radio remote controls are often built into wider applications. We recommend that the system is provided with a wired emergency stop where necessary.

NOTE! We recommend that the functionality of the STOP button is being tested at a regular basis: At a minimum, when used for 200 hours. To test the STOP button: press, twist and pull it out.

INSTALLING, CONNECTING AND MOUNTING

- Allow only licensed or qualified personnel to install the product.
- Switch the power supply off to the receiver before connecting the equipment.
- Check that you have connected the power supply to the correct connection terminal.
- To utilize the safety of the system, use the stop relays in the safety circuitry of the object that you want to control.
- Use undamaged cables. No cables should hang loose.
- Avoid installing in areas affected by strong vibrations.
- Place the receiver well away from wind, damp and water.
- Cable glands and vent plugs must face down to prevent water from seeping in.

THE USER

- Make sure that the user is following the instructions.
- Make sure that the user has reached the certified age of your country to operate the equipment.
- Make sure that the user is not under the influence of drugs, alcohol and medicines.
- Allow only qualified personnel to have access to the transmitter and operate the equipment.
- Make sure that the user does not leave the transmitter unsupervised.
- Make sure that the user always turns the transmitter off when not in use.
- Make sure that the user keeps a good overview of the work area.

MAINTENANCE

- Use the stop button to start and turn off the transmitter as often as possible.
- When error messages are shown, it is very important to find out what caused them.
- If the stop button is mechanically damaged, contact your representative for service immediately.
- Always contact your representative for service and maintenance work on the product.
- Write down the serial numbers/ ID codes of the receivers and transmitters used. This information should be recorded on the “Settings document” for your product (download from our web-site).
- Avoid registering transmitters to receivers where it is not being used.
- Keep the safety instruction for future reference. Always download the configurations instruction from our web site for the latest version available.

CHAPTER 2: SAFETY INFORMATION

APPLICATION AREA FOR THE TIGER SYSTEM

The Tele Radio AB Tiger remote control systems are aimed for remote controlling of lifting or mobile equipment where a high safety level is required.

AUTHORIZATION BY PIN CODE

To prevent from unauthorized users being able to start the transmitter and control the receiver, you can enable PIN codes for start-up protection. 1-10 PIN codes can be stored in the transmitters.

STOP FUNCTION

The transmitters have a stop button that controls the 2 stop relays in the receiver. 2 safety microcontrollers are supervising and controlling the stop relays. A valid signal must be provided from both microcontrollers to activate the stop relays.

SAFETY INFORMATION (IN ENGLISH)

System requirements

The product holds a safety-related stop function that complies with the requirements for SIL3 according to IEC61508:

The stop function deactivates all relays on the receiver when the stop button on the transmitter is pressed. The stop function is available on all Tiger systems. The maximum delay of the stop function is 500 ms. The stop function complies with the requirements for SIL3 according to IEC61508 only when it is a part of a complete end user system that complies with the requirements for SIL3 according to IEC61508.

Connecting and controlling the safety function

The stop function controls the stop relays from the stop button. In order to comply with the requirements for SIL3 according to IEC61508, the safety-related function shall use its corresponding two relay output in an active redundant configuration in a safety-related application.

Measures for probability of hardware failures

Transmitter stop function	
Probability of dangerous failure per hour	PFHd= 8.5 FITs (=λdu)
Fraction of total failure rate with dangerous and detected consequence	λdd= 357 FITs
Diagnostic coverage	DC= 98.3%
Safe failure fraction	SFF= 99.1 %
Common cause failure	0 FIT
Level of hardware fault tolerance	HFT = 1
Proof test interval	10 years
Diagnostic test interval	Continuous

Receiver stop function	
Probability of dangerous failure per hour	PFHd = 30.1 FITs (=λdu)
Fraction of total failure rate with dangerous and detected consequence	λdd = 685.0 FITs
Diagnostic coverage	DC = 96.9 %
Safe failure fraction	SFF = 98.7 %
Common cause failure	8.0 FIT
Level of hardware fault tolerance	HFT = 1
Proof test interval	10 years
Diagnostic test interval	Continuous

Radio communication between transmitter and receiver	
Probability of dangerous failure per hour	PFHd = 3.0 FITs

Stop function for a complete system*	
Probability of dangerous failure per hour	PFHd = 41.6 FITs(=λdu)

* A complete system = transmitter + radio communication + receiver

CHAPTER 3: PRODUCT PAGES

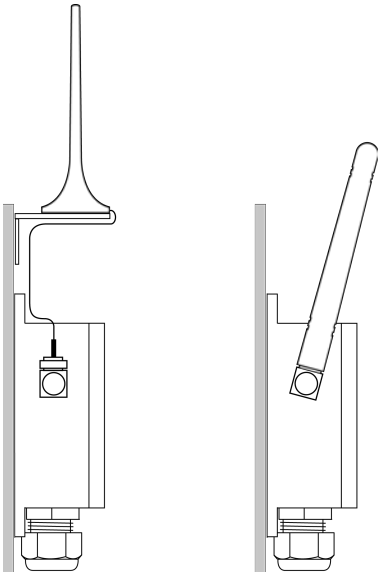
ANTENNA

NOTE! For optimum performance: Place well away from metal objects, such as metal girders, high-voltage cables and other antennas.

NOTE! For optimum performance, place the antennas as far away from each other as possible. The recommended distance is more than 1 meter. We recommend that you test the equipment before mounting the receivers permanently.

Antenna with a cable: The cable makes it possible for the antenna to be positioned freely and high above the ground.

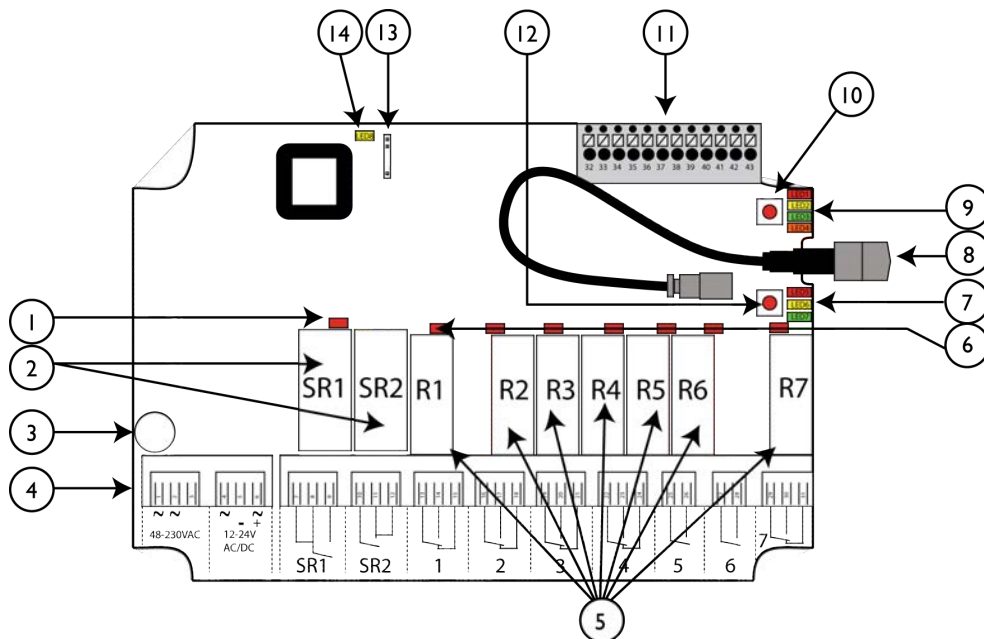
Antenna without a cable: If the receiver is mounted on a wall, the antenna should be angled out from the wall.



TG-RX-MNLANA, TG-RX-MNRANA, TG-RX-MNPANA BASE BOARD RECEIVER WITH AN EXPANSION BOARD

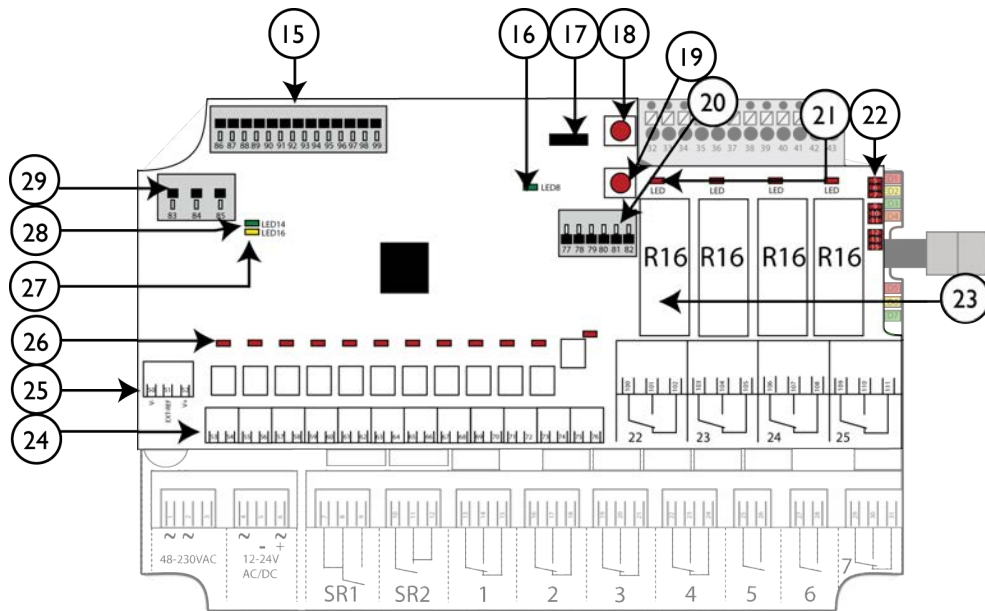
WARNING! The receiver must NOT be opened by any other than a qualified installer. Make sure to turn the electricity off before opening the receiver.

WARNING! Tele Radio remote controls are often built into wider applications. We recommend that the system is provided with a wired emergency stop where necessary.



Base board:

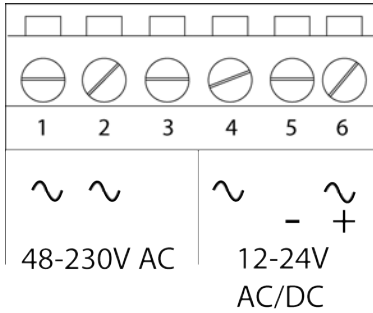
1. LED representing stop relays 1+2 (red)	8. Antenna connector
2. Stop relays 1+2	9. Function LEDs 1-4 (1= red, 2= yellow, 3= green, 4= orange)
3. Obligatory fuse 2A (slow)	10. Function button (Cancel)
4. Terminal block for input power	11. Terminal block for mixed I/O
5. Function relays 1-7	12. Select button (OK)
6. Relay LEDs 1-7 (red)	13. Programming connector
7. Function LEDs 5-7 (5= red, 6= yellow, 7= green)	14. Power LED (yellow)



Expansion board:

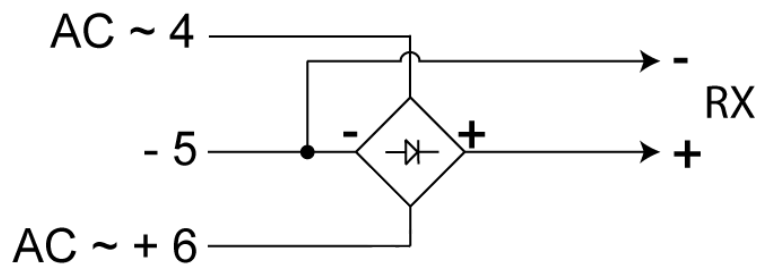
15. Terminal block for analogue outputs	23. Function relays 22-25
16. Indication LED for communication with the base board (green)	24. Terminal block for digital outputs
17. Programming connector	25. Terminal block for external analogue reference and isolated analogue supply
18. Function button (Cancel)	26. Digital outputs LEDs
19. Select button (OK)	27. Indication LED for internal DC/DC converter (yellow)
20. Terminal block for digital inputs	28. Indication LED for communication with the base board (green)
21. Function relay LEDs (red)	29. Terminal block for analogue inputs
22. LEDs representing stop relays 1-2 and function relays 1-7 on the base board	

TERMINAL BLOCK FOR INPUT POWER

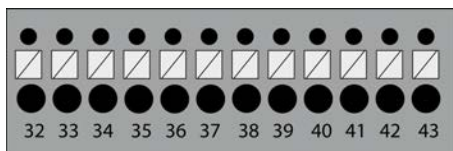


1. 48-230 V AC
2. 48-230 V AC
3. (not used)
4. ~12-24 V AC/DC
5. negative terminal DC voltage*
6. ~+12-24 V AC/DC

* use when digital inputs are connected to receiver



TERMINAL BLOCK FOR MIXED I/O



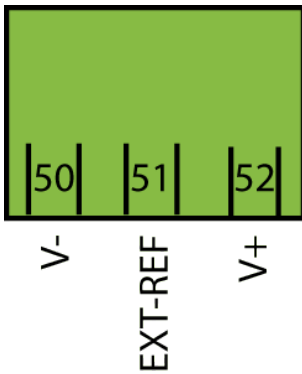
32. +12V DC	38. Digital input 2
33. +5V DC	39. GND
34. GND	40. +3.3V DC
35. GND	41. RS485A-
36. Digital input 1	42. RS485B+
37. Transistor output	43. GND

FUNCTION LEDS INDICATION IN OPERATING MODE

Function LED	Off	On	Indicates...
1 (red)	X		No transmitter is registered
		X	One or more transmitters are registered
2 (yellow)	X		No transmitter is logged in
		X	One transmitter is logged in
3 (green)		X	Receiving correct RS485 data
4 (orange)	X		Settings in the safety CPUs conform to SIL3
		X	Settings in the safety CPUs do NOT conform to SIL3
5 (red)		X	FLASHES: The receiver is frequency scanning
	X		Automatic frequency control processing
		X	Automatic frequency control finetuned
6 (yellow)		X	Receiving correct sync word
7 (green)		X	Receiving correct radio packet

TERMINAL BLOCK FOR EXTERNAL ANALOGUE REFERENCE AND ISOLATED ANALOGUE SUPPLY

How to connect to the terminal block depends on the configurations made to the receiver. Please, contact your Tele Radio representative for further assistance.



0 to +10V analogue output, internal DC/DC converter on:

50. Unconnected
51. Unconnected
52. Unconnected

0 to +10V analogue output, internal DC/DC converter off:

50. Negative supply
51. Unconnected
52. Positive supply

-10 to +10V analogue output, internal DC/DC converter on***:

50. Unconnected
51. External reference*
52. Unconnected

-10 to +10V analogue output, internal DC/DC converter off**:

50. Negative supply
51. External reference*
52. Positive supply

25-75% or 10-90% output****:

50. Negative supply
51. Unconnected
52. Positive supply

* Analogue output reference will follow this voltage. If unconnected, the analogue output reference will be in the middle of the external supply voltage.

** External supply voltage of 22-35V DC is required to achieve full -10 to +10V output.

*** External supply voltage shall not be connected. Guaranteed output range is -5 to +5V.

**** Internal DC/DC converter is always off. The analogue output voltage is 25-75% or 10-90% of the supply voltage, depending on the configurations of the receiver.

TERMINAL BLOCK FOR DIGITAL OUTPUTS

There are 12 digital outputs on the expansion board. The digital outputs can be remapped as with the relays. Maximum input is 50V, 30 mA.



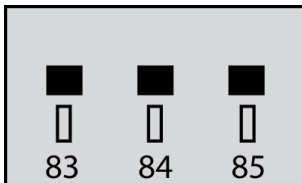
53. Digital output 10	65. Digital output 16
54. Digital output 10 reference	66. Digital output 16 reference
55. Digital output 11	67. Digital output 17
56. Digital output 11 reference	68. Digital output 17 reference
57. Digital output 12	69. Digital output 18
58. Digital output 12 reference	70. Digital output 18 reference
59. Digital output 13	71. Digital output 19
60. Digital output 13 reference	72. Digital output 19 reference
61. Digital output 14	73. Digital output 20
62. Digital output 14 reference	74. Digital output 20 reference
63. Digital output 15	75. Digital output 21
64. Digital output 15 reference	76. Digital output 21 reference

TERMINAL BLOCK FOR DIGITAL INPUTS AND GROUND CONNECTIONS



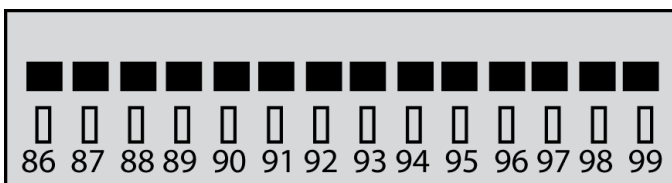
77. Digital input 3	80. GND
78. Digital input 4	81. GND
79. Digital input 5	82. GND

TERMINAL BLOCK FOR ANALOGUE INPUTS



83. Analogue input 1
84. Analogue input 2
85. Analogue GND

TERMINAL BLOCK FOR ANALOGUE OUTPUTS



86. Analogue GND	93. Analogue output 1
87. Analogue GND	94. Analogue output 2
88. Analogue GND	95. Analogue output 3
89. Analogue GND	96. Analogue output 4
90. Analogue GND	97. Analogue output 5
91. Analogue GND	98. Analogue output 6
92. Analogue GND	99. Analogue output 7

BASE BOARD RELAY LEDES

These LEDs light when the corresponding stop and function relays on the base board are activated. See list for corresponding base board relay.

LED1	LED 1 = function relay 1
LED2	LED 2 = function relay 2
LED3	LED 3 = function relay 3
LED4	LED 4 = function relay 4
LED5	LED 5 = function relay 5
LED6	LED 6 = function relay 6
LED7	LED 7 = function relay 7
LED8	LED 8 = (not used)
LED9	LED 9 = stop relays 1 + 2

CURRENT CONSUMPTION

Input power	Min.*	Max.**
12V AC	0.2A	0.5A
24V AC	0.06A	0.2A
48V AC	0.04A	0.2A
115V AC	0.02A	0.06A
230V AC	0.01A	0.04A
12V DC	0.1A	0.5A
24V DC	0.06A	0.2A

* Minimum current consumption= Receiver powered, no radio session established, nothing else activated on the receiver

** Maximum current consumption= All relays activated on the receiver

TECHNICAL DATA

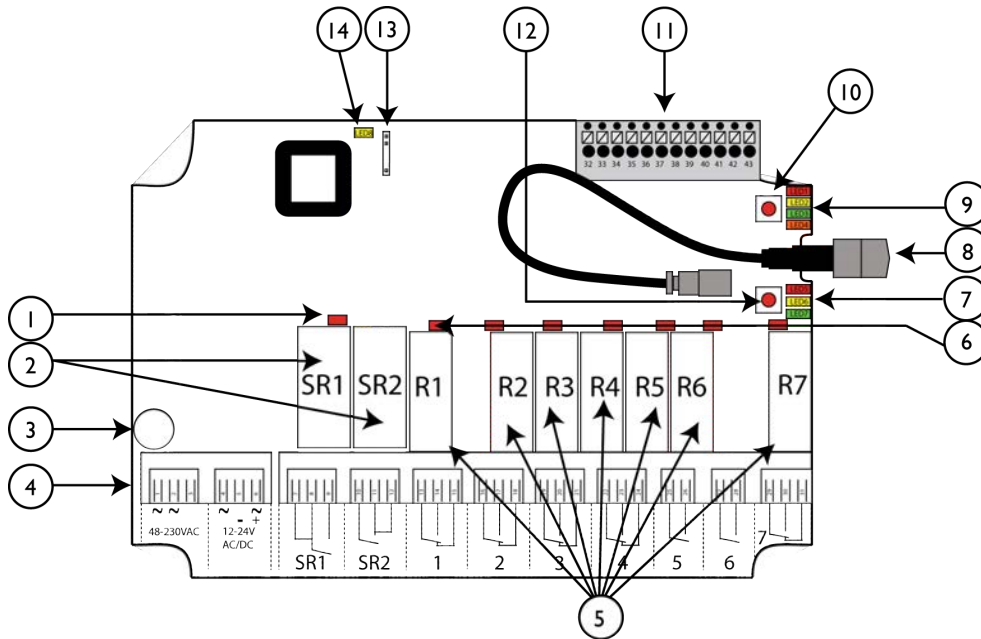
Number of stop relays	2 (potential free*, 16A, 250VAC)
Number of function relays	7 (potential free*, 10A, 250VAC)
Digital inputs	2
Input power	48-230V AC, 12-24V AC/DC
Transistor output	1
Duplex communication	Possible
Max. number of registered transmitters	15 (only one transmitter at a time)
IP class	66
Size	176 x 126 x 75 mm./ 6.9 x 5 x 2.9 in.
Weight	800 g./ 1.8 lbs.
Sensitivity	Better than -110 dBm
Operating temperature	-20- +55°C/ -4-+130°F
Operating frequency	TG-RX-MNLANA: 433.075-434.775 MHz TG-RX-MNRANA: 903.0125-926.9875 MHz TG-RX-MNPANA: 2405-2480 MHz
Number of channels/frequency banks	TG-RX-MNLANA: 69 channels TG-RX-MNRANA: 15 banks TG-RX-MNPANA: 16 channels
Channel separation	TG-RX-MNLANA: 25 kHz TG-RX-MNRANA: 25 kHz TG-RX-MNPANA: 5 MHz
Antenna	TG-RX-MNLANA: 1 external BNC antenna TG-RX-MNRANA: 1 external RPSMA antenna TG-RX-MNPANA: 1 external RPSMA antenna

* potential free means that you have to supply voltage to get voltage out of a relay (e.g. via the included connection comb)

TG-RX-MNLCAN, TG-RX-MNRCAN, TG-RX-MNPCAN, TG-RX-MNLJ1939, TG-RX-MNRJ1939, TG-RX-MNPJ1939 BASE BOARD RECEIVER WITH CAN EXPANSION BOARD

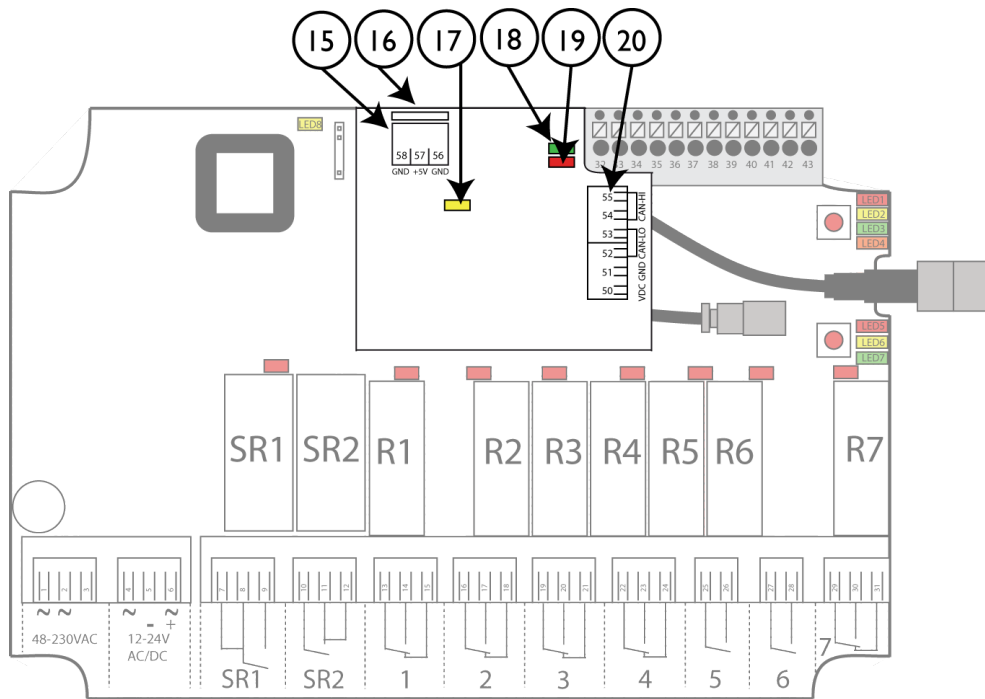
WARNING! The receiver must NOT be opened by any other than a qualified installer. Make sure to turn the electricity off before opening the receiver.

WARNING! Tele Radio remote controls are often built into wider applications. We recommend that the system is provided with a wired emergency stop where necessary.



Base board:

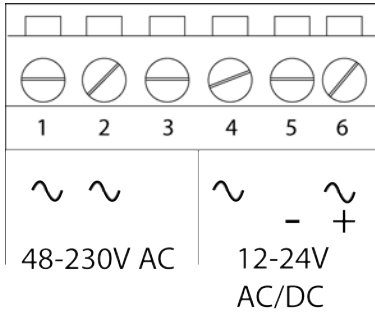
1. LED representing stop relays 1+2 (red)	8. Antenna connector
2. Stop relays 1+2	9. Function LEDs 1-4 (1= red, 2= yellow, 3= green, 4= orange)
3. Obligatory fuse 2A (slow)	10. Function button (Cancel)
4. Terminal block for input power	11. Terminal block for mixed I/O
5. Function relays 1-7	12. Select button (OK)
6. Relay LEDs 1-7 (red)	13. Programming connector
7. Function LEDs 5-7 (5= red, 6= yellow, 7= green)	14. Power LED (yellow)



Expansion board:

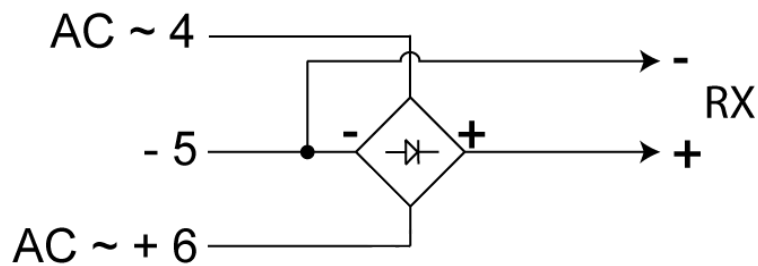
15. Terminal block for internal power supply	18. CAN run LED
16. Programming connector	19. CAN error LED
17. Power LED	20. Terminal block for CAN signals

TERMINAL BLOCK FOR INPUT POWER

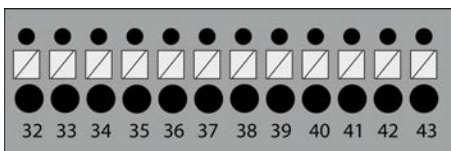


1. 48-230 V AC
2. 48-230 V AC
3. (not used)
4. ~12-24 V AC/DC
5. negative terminal DC voltage*
6. ~+12-24 V AC/DC

* use when digital inputs are connected to receiver



TERMINAL BLOCK FOR MIXED I/O

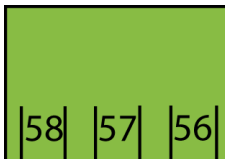


32. +12V DC	38. Digital input 2
33. +5V DC	39. GND
34. GND	40. +3.3V DC
35. GND	41. RS485A-
36. Digital input 1	42. RS485B+
37. Transistor output	43. GND

FUNCTION LEDS INDICATION IN OPERATING MODE

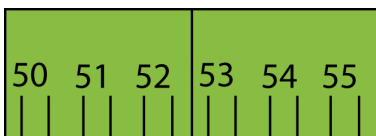
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1 (red)	X		No transmitter is registered
		X	One or more transmitters are registered
2 (yellow)	X		No transmitter is logged in
		X	One transmitter is logged in
3 (green)		X	Receiving correct RS485 data
4 (orange)	X		Settings in the safety CPUs conform to SIL3
		X	Settings in the safety CPUs do NOT conform to SIL3
5 (red)		X	FLASHES: The receiver is frequency scanning
	X		Automatic frequency control processing
		X	Automatic frequency control finetuned
6 (yellow)		X	Receiving correct sync word
7 (green)		X	Receiving correct radio packet

TERMINAL BLOCK FOR INTERNAL POWER SUPPLY



58. GND
57. +5V DC
56. GND

TERMINAL BLOCK FOR CAN SIGNALS



50. Supply voltage 5-24VDC
51. GND
52. CAN Low
53. CAN Low
54. CAN High
55. CAN High

TECHNICAL DATA

Number of stop relays	2 (potential free*, 16A, 250VAC)
Number of function relays	7 (potential free*, 10A, 250VAC)
Digital inputs	2
Input power	48-230V AC, 12-24V AC/DC
Transistor output	1
Duplex communication	Possible
Max. number of registered transmitters	15 (only one transmitter at a time)
IP class	66
Size	176 x 126 x 75 mm./ 6.9 x 5 x 2.9 in.
Weight	800 g./ 1.8 lbs.
Sensitivity	Better than -110 dBm
Operating temperature	-20- +55°C/ -4-+130°F
Operating frequency	TG-RX-MNLCAN, TG-RX-MNLJ1939: 433.075-434.775 MHz TG-RX-MNRCAN, TG-RX-MNRJ1939: 903.0125-926.9875 MHz TG-RX-MNPCAN, TG-RX-MNPJ1939: 2405-2480 MHz
Number of channels/ frequency banks	TG-RX-MNLCAN, TG-RX-MNLJ1939: 69 chan.. TG-RX-MNRCAN, TG-RX-MNRJ1939: 15 banks TG-RX-MNPCAN, TG-RX-MNPJ1939: 16 chan.
Channel separation 25 kHz	TG-RX-MNLCAN, TG-RX-MNLJ1939: 25 kHz TG-RX-MNRCAN, TG-RX-MNRJ1939: 25 kHz TG-RX-MNPCAN, TG-RX-MNPJ1939: 5 MHz
Antenna	TG-RX-MNLCAN, TG-RX-MNLJ1939: 1 external BNC antenna TG-RX-MNRCAN, TG-RX-MNRJ1939: 1 external RPSMA antenna TG-RX-MNPCAN, TG-RX-MNPJ1939: 1 external RPSMA antenna

*potential free means that you have to supply voltage to get voltage out of a relay (e.g. via the included connection comb).

CURRENT CONSUMPTION

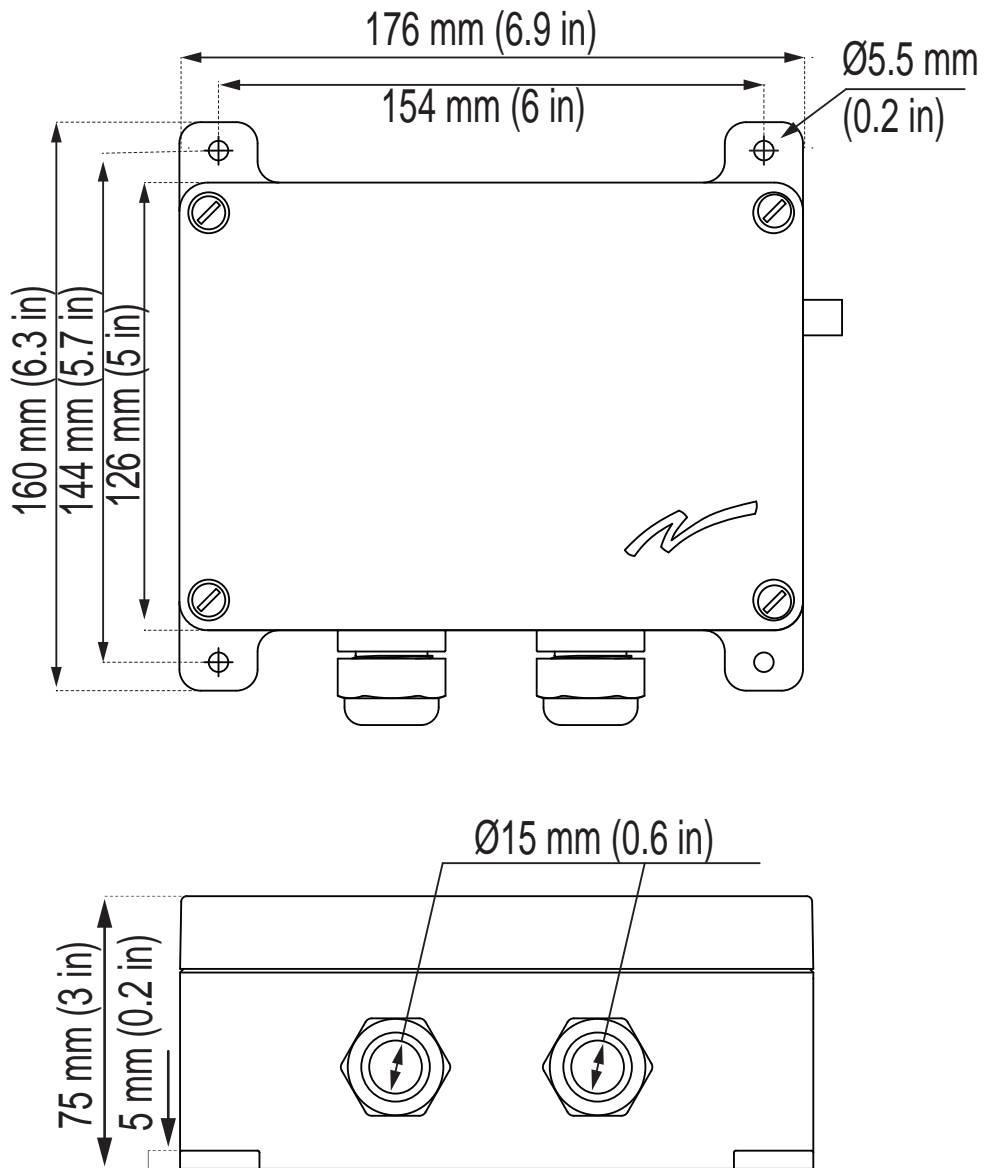
Input power	Min.*	Max.**
12V AC	0.06A	0.4A
24V AC	0.03A	0.2A
48V AC	0.02A	0.09A
115V AC	0.008A	0.04A
230V AC	0.006A	0.03A
12V DC	0.06A	0.3A
24V DC	0.03A	0.2A

* Minimum current consumption= Receiver powered, no radio session established, nothing else activated on the receiver

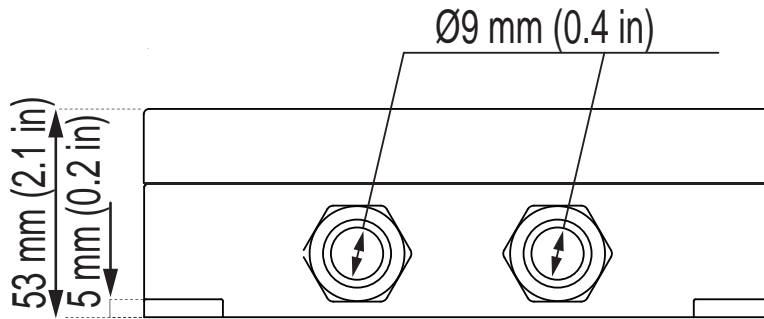
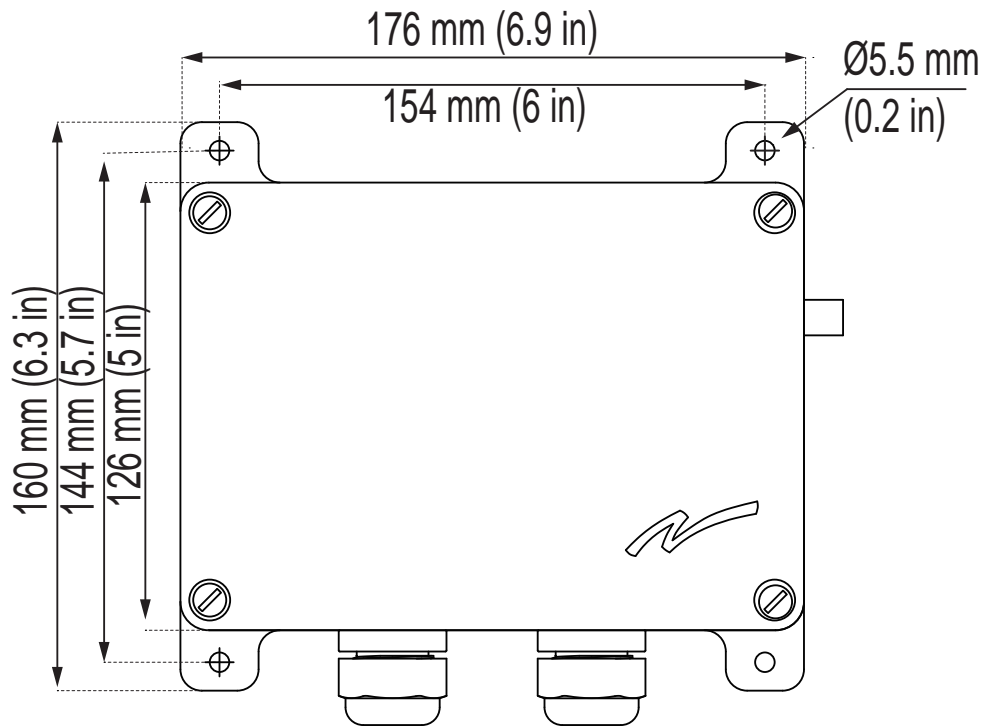
** Maximum current consumption= All relays activated on the receiver

RECEIVER MEASUREMENTS

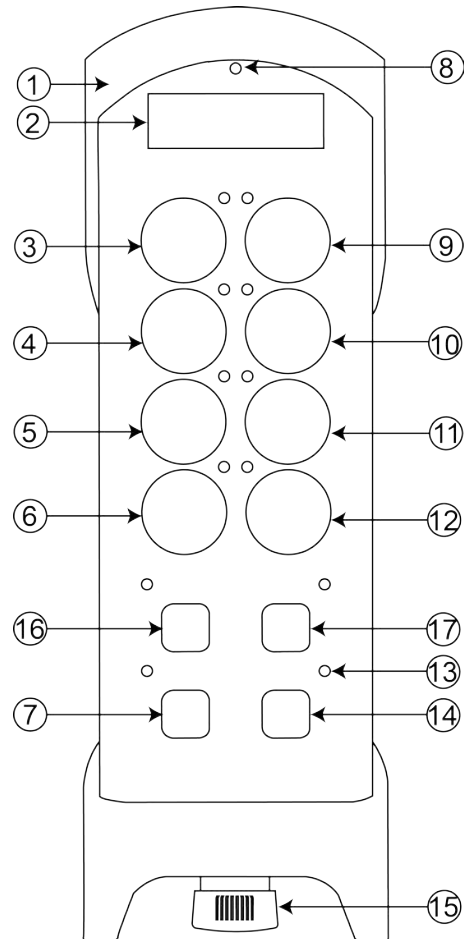
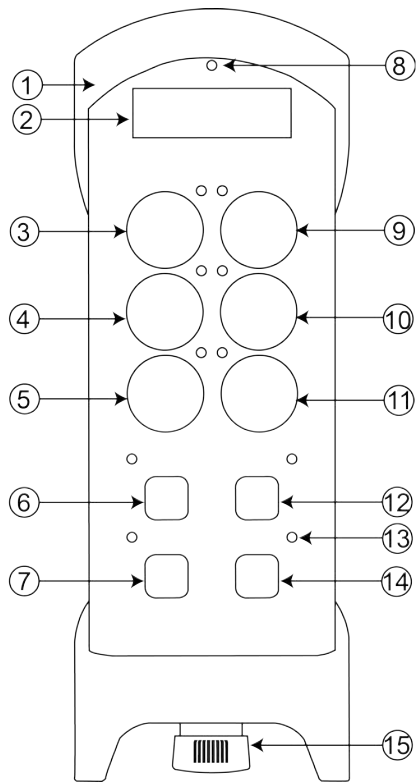
TG-RX-MNLANA, TG-RX-MNRANA, TG-RX-MNPANA



TG-RX-MNLKAN, TG-RX-MNRCAN, TG-RX-MNPCAN, TG-RX-MNLJI939,
TG-RX-MNRJI939, TG-RX-MNPJI939



TG-T14-4, TG-T14-5, TG-T14-6, TG-T14-7, TG-T14-8, TG-T14-9,
 TG-T15-4, TG-T15-5, TG-T15-6, TG-T15-7, TG-T15-8, TG-T15-9
 TRANSMITTER



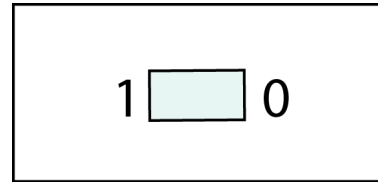
1. Rubber cover	10. Button 4
2. Display	11. Button 6
3. Button 1	12. Button 8 (safe button*)
4. Button 3	13. Button LEDs
5. Button 5	14. Right start button
6. Button 7 (safe button*)	15. Stop button
7. Left start button	16. Button 9 (safe button**)
8. Top led	17. Button 10 (safe button**)
9. Button 2	

* On TG-T14-4, TG-T14-5, TG-T14-6, TG-T14-7, TG-T14-8, TG-T14-9

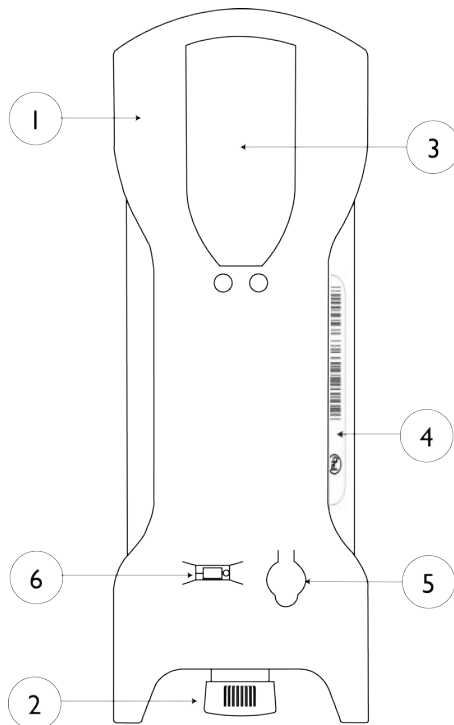
** On TG-T15-4, TG-T15-5, TG-T15-6, TG-T15-7, TG-T15-8, TG-T15-9

ON/OFF SWITCH

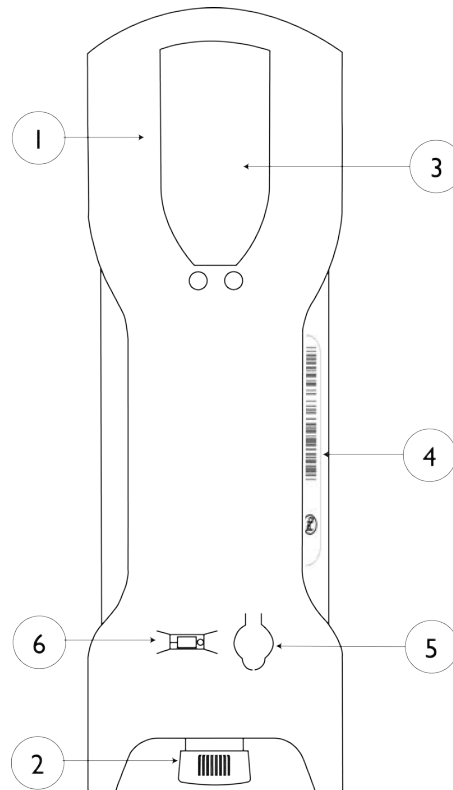
The transmitters have an on/off switch on the backside. The switch breaks the power supply from the battery. When in position 0/off, the transmitter cannot be started unless you connect the charger plug. When the transmitter is transported by airplane, the on/off switch must be in 0/off position. The switch should not be used as an on/off button for the transmitter. To turn the transmitter off, use the stop button.



BUTTON TRANSMITTER BACKSIDE



TG-T14-4
 TG-T14-5
 TG-T14-6
 TG-T14-7
 TG-T14-8
 TG-T14-9



TG-T15-4
 TG-T15-5
 TG-T15-6
 TG-T15-7
 TG-T15-8
 TG-T15-9

1. Rubber cover	4. CE and product label
2. Stop button	5. Battery charger socket
3. Clip	6. On/off switch

TECHNICAL DATA

NO. OF BUTTONS	
TG-TI4-4, TG-TI4-5, TG-TI4-6, TG-TI4-7, TG-TI4-8, TG-TI4-9	4 x 2-step buttons, 6 analogue buttons
TG-TI5-4, TG-TI5-5, TG-TI5-6, TG-TI5-7, TG-TI5-8, TG-TI5-9	4 x 2-step buttons, 8 analogue buttons
BATTERY	
TG-TI4-4, TG-TI4-5, TG-TI4-6, TG-TI4-7, TG-TI4-8, TG-TI4-9, TG-TI5-4, TG-TI5-5, TG-TI5-6, TG-TI5-7, TG-TI5-8, TG-TI5-9	Internal, rechargeable lithium-ion
ON/OFF SWITCH	
TG-TI4-4, TG-TI4-5, TG-TI4-6, TG-TI4-7, TG-TI4-8, TG-TI4-9, TG-TI5-4, TG-TI5-5, TG-TI5-6, TG-TI5-7, TG-TI5-8, TG-TI5-9	Yes
DUPLEX COMMUNICATION	
TG-TI4-4, TG-TI4-5, TG-TI4-6, TG-TI4-7, TG-TI4-8, TG-TI4-9, TG-TI5-4, TG-TI5-5, TG-TI5-6, TG-TI5-7, TG-TI5-8, TG-TI5-9	Possible
MAX. NO OF REGISTERED RECEIVERS	
TG-TI4-4, TG-TI4-5, TG-TI4-6, TG-TI4-7, TG-TI4-8, TG-TI4-9	8
TG-TI5-4, TG-TI5-5, TG-TI5-6, TG-TI5-7, TG-TI5-8, TG-TI5-9	10
SIZE	
TG-TI4-4, TG-TI4-5, TG-TI4-6, TG-TI4-7, TG-TI4-8, TG-TI4-9	220 x 79 x 56 mm./ 8.7 x 3.1 x 2.2 in.
TG-TI5-4, TG-TI5-5, TG-TI5-6, TG-TI5-7, TG-TI5-8, TG-TI5-9	245 x 79 x 56 mm./ 9.6 x 3.1 x 2.2 in.
WEIGHT	
TG-TI4-4, TG-TI4-5, TG-TI4-6, TG-TI4-7, TG-TI4-8, TG-TI4-9	400 g./ 0.9 lbs.
TG-TI5-4, TG-TI5-5, TG-TI5-6, TG-TI5-7, TG-TI5-8, TG-TI5-9	460 g./ 1.0 lbs.
OPERATING FREQUENCY	
TG-TI4-4, TG-TI4-7, TG-TI5-4, TG-TI5-7	433.075-434.775 MHz
TG-TI4-5, TG-TI4-8, TG-TI5-5, TG-TI5-8	903.0125-926.9875 MHz
TG-TI4-6, TG-TI4-9, TG-TI5-6, TG-TI5-9	2405-2480 MHz

NO. OF CHANNELS/FREQUENCY BANKS

TG-T14-4, TG-T14-7, TG-T15-4, TG-T15-7	69 channels
TG-T14-5, TG-T14-8, TG-T15-5, TG-T15-8	15 banks
TG-T14-6, TG-T14-9, TG-T15-6, TG-T15-9	16 channels

CHANNEL SEPARATION

TG-T14-4, TG-T14-7, TG-T15-4, TG-T15-7, TG-T14-5, TG-T14-8, TG-T15-5, TG-T15-8	25 kHz
TG-T14-6, TG-T14-9, TG-T15-6, TG-T15-9	5 MHz

OPERATING TIME (WITH CONTINUOUS USAGE)

TG-T14-4, TG-T14-5, TG-T14-6, TG-T14-7, TG-T14-8, TG-T14-9, TG-T15-4, TG-T15-5, TG-T15-6, TG-T15-7, TG-T15-8, TG-T15-9	16 h.
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IP CLASS

TG-T14-4, TG-T14-5, TG-T14-6, TG-T14-7, TG-T14-8, TG-T14-9, TG-T15-4, TG-T15-5, TG-T15-6, TG-T15-7, TG-T15-8, TG-T15-9	66
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SENSITIVITY

TG-T14-4, TG-T14-5, TG-T14-6, TG-T14-7, TG-T14-8, TG-T14-9, TG-T15-4, TG-T15-5, TG-T15-6, TG-T15-7, TG-T15-8, TG-T15-9	Better than -110 dBm
--	----------------------

OPERATING TEMPERATURE

TG-T14-4, TG-T14-5, TG-T14-6, TG-T14-7, TG-T14-8, TG-T14-9, TG-T15-4, TG-T15-5, TG-T15-6, TG-T15-7, TG-T15-8, TG-T15-9	-20 - +55°C/ -4 - +130°F
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NO. OF PIN CODES POSSIBLE

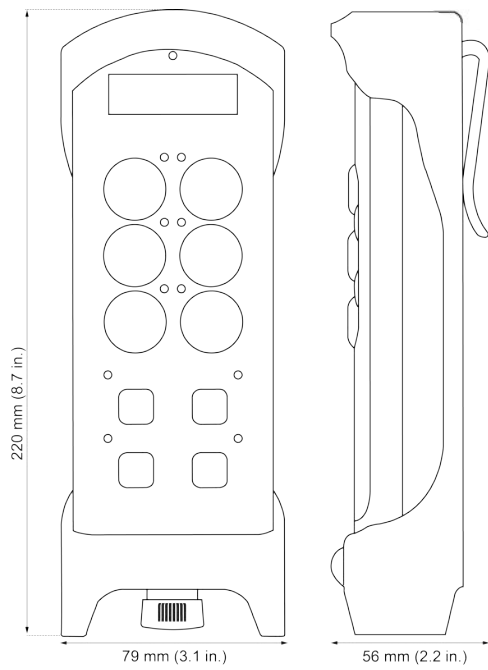
TG-T14-4, TG-T14-5, TG-T14-6, TG-T14-7, TG-T14-8, TG-T14-9, TG-T15-4, TG-T15-5, TG-T15-6, TG-T15-7, TG-T15-8, TG-T15-9	10
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ANTENNA

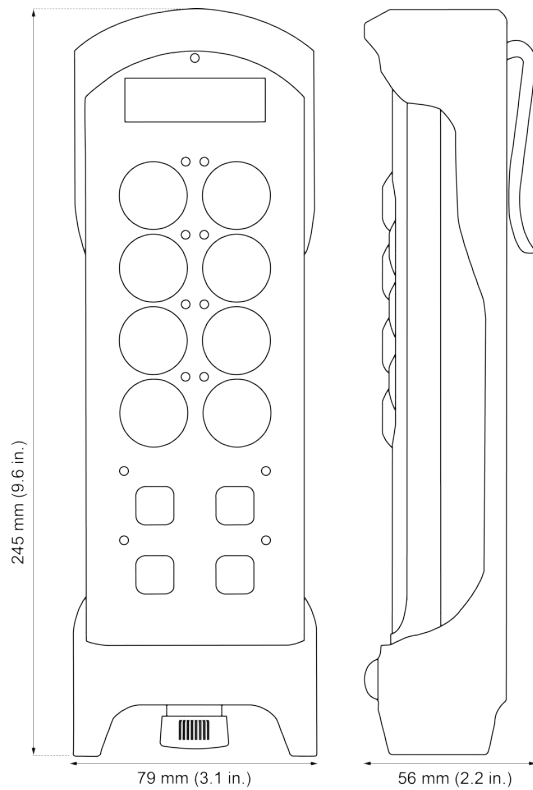
TG-T14-4, TG-T14-5, TG-T14-6, TG-T14-7, TG-T14-8, TG-T14-9, TG-T15-4, TG-T15-5, TG-T15-6, TG-T15-7, TG-T15-8, TG-T15-9	1 internal PCB antenna
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TRANSMITTER MEASUREMENTS

TG-TI4-4, TG-TI4-5, TG-TI4-6, TG-TI4-7, TG-TI4-8, TG-TI4-9



TG-TI5-4, TG-TI5-5, TG-TI5-6, TG-TI5-7, TG-TI5-8, TG-TI5-9



CHAPTER 4: INSTALLERS GUIDE

NAVIGATE IN MENU MODE

To navigate when in menu mode:

Press...	to...
Button 1	Step down
Button 2	Step up
Button 3	Step left/ go back
Button 4	Step right
The left start button	Select/ confirm
The right start button	Exit

ENABLE PIN CODES

1. Make sure that the stop button is pressed.
2. Twist and pull out the stop button.
The top LED lights (green when the battery capacity is good, red when the battery capacity is poor).
3. Press the right start button. Keep pressed.
4. Press the stop button.
5. Release the right start button.
The top LED flashes (green when the battery capacity is good, red when the battery capacity is poor) when in menu mode.
6. Go to [Startup Protect.].
7. Select one or more start-up protection choices by pressing the left start button.

Select...	to...
[Stored PIN]	Only accept PIN codes registered in the transmitter
[Any PIN]	Accept any PIN code
[Allow skip]	Allow to skip any start-up authorization

8. Confirm by pressing the left start button.

CREATE PIN CODES

NOTE! You can store up to 10 PIN codes in the transmitter.

NOTE! '0000' is not a valid PIN code.

1. Make sure that the stop button is pressed.
2. Twist and pull out the stop button.
The top LED lights (green when the battery capacity is good, red when the battery capacity is poor).
3. Press the right start button. Keep pressed.
4. Press the stop button.
5. Release the right start button.
The top LED flashes (green when the battery capacity is good, red when the battery capacity is poor) when in menu mode.
6. Go to [PIN] --> [Enter PIN].
7. Select what position in the list that you want to store the new PIN code in by pressing the left start button.
8. Enter the new PIN code (4 digits) by pressing the buttons 1-4:

Press...	to...
Button 1	Step up
Button 2	Step down
Button 3	Step right
Button 4	Step left

9. Confirm by pressing the left start button.

ERASE PIN CODES

1. Make sure that the stop button is pressed.
2. Twist and pull out the stop button. The LEDs light (green when the battery capacity is good, red when the battery capacity is poor).
3. Press the right start button. Keep pressed.
4. Press the stop button.
5. Release the right start button.
The LEDs light (green when the battery capacity is good, red when the battery capacity is poor) when in menu mode.
6. Go to [PIN] --> [Erase PIN].
7. Scroll the list to select the PIN code that you want to erase.
8. Select by pressing the left start button.
9. Confirm by pressing the left start button.

SHOW REGISTERED PIN CODES

1. Make sure that the stop button is pressed.
2. Twist and pull out the stop button.
The top LED lights (green when the battery capacity is good, red when the battery capacity is poor).
3. Press the right start button. Keep pressed.
4. Press the stop button.
5. Release the right start button.
The top LED flashes (green when the battery capacity is good, red when the battery capacity is poor) when in menu mode.
6. Go to [PIN] --> [Show PIN].
7. The display shows a list of all registered PIN codes.

START THE TRANSMITTER IN OPERATING MODE

1. Make sure that the stop button is pressed
2. Twist and pull out the stop button.
The top LED lights (green when the battery capacity is good, red when the battery capacity is poor).
3. If PIN codes are used for authorization: Go to the next section.
4. WITHIN 3 MINUTES FROM PULLING OUT THE STOP BUTTON:
Press a button to select the receiver(s) that you want to operate.
The receiver(s) that was selected in the last session will be automatically selected, which is indicated by the corresponding LED(s) that light red. If no receiver(s) has been selected, the LEDs for all available receivers will flash red. If a receiver is selected, the LEDs next to the left and the right start buttons flash red. If no receiver(s) are selected, only the LED next to the right start button flashes red.
5. Press both start buttons at the same time.
The buzzer beeps.
6. Release the start buttons.
The buzzer stops beeping. The top LED flashes (green when the battery capacity is good, red when the battery capacity is poor).
7. When radio communication has been established, the top LED lights (green when the battery capacity is good, red when the battery capacity is poor).
If radio communication is not established within 25 seconds, the transmitter turns off.

START THE TRANSMITTER IN OPERATING MODE WITH PIN CODES

1. Make sure that the stop button is pressed.
2. Twist and pull out the stop button.
The top LED lights (green when the battery capacity is good, red when the battery capacity is poor).
3. WITHIN 3 MINUTES : Enter the PIN code (4 digits) by pressing the buttons according to the table.

For digit:	1	2	3	4	5	6	7	8	9	0
TG-T14-4, TG-T14-5, TG-T14-6, TG-T14-7, TG-T14-8, TG-T14-9, PRESS BUTTON:	1	2	3	4	5	6	7	8	-	-
TG-T15-4, TG-T15-5, TG-T15-6, TG-T15-7, TG-T15-8, TG-T15-9, PRESS BUTTON:	1	2	3	4	5	6	7	8	9	10

4. WITHIN 3 MINUTES FROM PULLING OUT THE STOP BUTTON:
Press a button to select the receiver(s) that you want to operate.
The receiver(s) that was selected in the last session will be automatically selected, which is indicated by the corresponding LED(s) that light red. If no receiver(s) has been selected, the LEDs for all available receivers will flash red. If a receiver is selected, the LEDs next to the left and the right start buttons flash red. If no receiver(s) are selected, only the LED next to the right start button flashes red.
5. Press both start buttons at the same time.
The buzzer beeps.
6. Release the start buttons.
The buzzer stops beeping. The top LED flashes (green when the battery capacity is good, red when the battery capacity is poor).
7. When radio communication has been established, the top LED lights (green when the battery capacity is good, red when the battery capacity is poor).
If radio communication is not established within 25 seconds, the transmitter turns off.

TURN THE TRANSMITTER OFF

1. Press the stop button. The transmitter turns off. All relays deactivate.

LOGIN/LOGOUT

NOTE! When the transmitter has established radio communication with one or more receivers, you can make a Quick logout from those receivers. Note that the Quick logout will log the transmitter out from all receivers that are participating in the session.

NOTE! If you need to log out a transmitter that is lost or damaged, it is possible to log out from the receiver. We do not recommend this way of logging out. Contact your representative for assistance.

NOTE! To be able to control a receiver, the transmitter must be registered in the receiver, and logged in to the receiver. If another transmitter is already logged in to the receiver, it has to be logged out before any other transmitter can be logged in. If no transmitter is logged in to a receiver, a registered transmitter will automatically log in when sending radio signals to the receiver. The transmitter will stay logged in until it is manually logged out. More than one transmitter can be registered in the receiver, but only one transmitter can be logged in at a time.

Quick logout

1. Make sure that the transmitter is started in operating mode.

NOTE! The transmitter must have established a radio session with one or more receivers.

2. Press the left start button. Keep pressed.

3. Press the stop button.

4. Release the left start button.

The top LED lights red.

The display shows [Logging out].

The transmitter turns off after logging out.

Logout from menu mode

1. Make sure that the stop button is pressed.
2. Twist and pull out the stop button.
The top LED lights (green when the battery capacity is good, red when the battery capacity is poor).
3. Press the right start button. Keep pressed.
4. Press the stop button.
5. Release the right start button.
The top LED flashes (green when the battery capacity is good, red when the battery capacity is poor) when in menu mode.
6. Go to [Logout].
7. Select by pressing the left start button.
8. Select a receiver to log out from.
9. Confirm by pressing the left start button.
The display shows [Logging out...] while the process is ongoing.
If logout fails, the display shows [FAILED]. The transmitter turns off.
If logout succeeds, the display shows [OK]. The transmitter turns off after logging out.

REGISTER

WARNING! Do not perform this when the receiver is in a session with another transmitter. The radio communication may become disturbed or broken.

NOTE! Before starting to perform these settings, make sure that the stop relays are deactivated!

Register the transmitter in the receiver

1. Press the receiver Function button.
Function LED 1 flashes red.
2. Relay LEDs 1-7 light to show how many transmitters that are already registered in the receiver.
3. Press the receiver Select button until all relay LEDs light red.
The receiver will stay in registering mode for 1 minute or until a transmitter has been registered.
4. On the transmitter: Make sure that the stop button is pressed.
5. Twist and pull out the stop button.
The top LED lights (green when the battery capacity is good, red when the battery capacity is poor).
6. Press the right start button. Keep pressed.
7. Press the stop button.
8. Release the right start button.

The top LED flashes (green when the battery capacity is good, red when the battery capacity is poor) when in menu mode.

9. Go to [Register].

10. Select an empty slot and confirm by pressing the left start button. The display shows [Registering] .

11. When the receiver has found the transmitter, all relay LEDs flash red. The display shows [Confirm on RX].

12. Press the receiver Select button. Function LEDs 1-7 flash 3 times. The relay LEDs go off.

13. All Function LEDs light for approx. 1 second. The transmitter is now registered in the receiver. The transmitter turns off.

14. If registering fails, the display shows [FAILED]. The transmitter turns off.

ERASE

WARNING! If a transmitter is lost or becomes seriously damaged, it is possible to erase it from the receiver. We do not recommend this way. Contact your representative for assistance.

NOTE! If the transmitter already have receivers registered, we recommend that you erase all receivers from the transmitter before starting the replacement. The receiver will automatically be stored in the same position as it was stored in the old transmitter. If this position is not available, the replacement will not take place.

1. Make sure that the stop button is pressed.

2. Twist and pull out the stop button.

The top LED lights (green when the battery capacity is good, red when the battery capacity is poor).

3. Press the right start button. Keep pressed.

4. Press the stop button.

5. Release the right start button.

The top LED flashes (green when the battery capacity is good, red when the battery capacity is poor) when in menu mode.

6. Go to [Erase].

7. Select by pressing the left start button.

8. Select a receiver. Confirm by pressing the left start button. The display shows [Erasing] while the process is ongoing.

If the erasing fails, the display shows [FAILED]. The transmitter turns off.

If the erasing succeeds, the display shows [OK]. The transmitter turns off.

REPLACE

WARNING! Do not perform this when the receiver is in a session with another transmitter. The radio communication may become disturbed or broken.

NOTE! You can replace a registered transmitter with another transmitter without having access to the receiver.

NOTE! If the transmitter that needs to be replaced is registered in more than one receiver, it will only be replaced in one receiver at a time. If you want to replace a transmitter in more than one receiver, you need to perform a replacement for each receiver.

NOTE! If the transmitter already have receivers registered, we recommend that you erase all receivers from the transmitter before starting the replacement. The receiver will automatically be stored in the same position as it was stored in the old transmitter. If this position is not available, the replacement will not take place.

Replace a transmitter with a new transmitter

1. Make sure that the stop button is pressed.
2. Twist and pull out the stop button.
The top LED lights (green when the battery capacity is good, red when the battery capacity is poor).
3. Press the right start button. Keep pressed.
4. Press the stop button.
5. Release the right start button.
The top LED flashes (green when the battery capacity is good, red when the battery capacity is poor) when in menu mode.
6. Go to [Replace].
7. Select by pressing the left start button.
8. Enter the serial number/ID code for the transmitter that you want to replace by pressing the buttons according to the table below:

Press...	to...
Button 1	Count - 1
Button 2	Count + 1
Button 3	Go left
Button 4	Go right

9. Press the left start button.
The display shows [Replacing] while the process is ongoing.
If the replacement fails, the display shows [FAILED]. The transmitter turns off.
If the replacement succeeds, the display shows [OK]. The transmitter turns off.

AUTOMATIC SHUTDOWN

NOTE! Turning on automatic shutdown can save battery capacity by automatically turning the transmitter off when no function has been activated for a set time.

Set the time for automatic shutdown

1. Make sure that the stop button is pressed.
2. Twist and pull out the stop button.
The top LED lights (green when the battery capacity is good, red when the battery capacity is poor).
3. Press the right start button. Keep pressed.
4. Press the stop button.
5. Release the right start button.
The top LED flashes (green when the battery capacity is good, red when the battery capacity is poor) when in menu mode.
6. Go to [Auto Shutdown].
7. Select by pressing the left start button.
8. Select the time that you want for automatic shutdown: 0-255 minutes. If you want to turn off automatic shutdown, select 0.
9. Press the left start button.

FREQUENCIES & CHANNELS

NOTE! If your system is transmitting on the frequency bands 433MHz eller 2.4 GHz, the receiver will automatically detect and switch to the same channel that the transmitter is using. If your system is transmitting on the 915 MHz frequency band, you have to switch bank in the receiver by using the PC program Settings manager. Contact your representative for assistance.

Switch channel on the transmitter

1. Make sure that the stop button is pressed.
2. Twist and pull out the stop button.
The top LED lights (green when the battery capacity is good, red when the battery capacity is poor).
3. Press the right start button. Keep pressed.
4. Press the stop button.
5. Release the right start button.
The top LED flashes (green when the battery capacity is good, red when the battery capacity is poor) when in menu mode.
6. Go to [Channel] or [Bank].
7. Go to the frequency table and select a channel.
8. Press the left start button.

FREQUENCY BAND 433 MHZ

Channel	Frequency	Channel	Frequency
01	433.075	36	433.950
02	433.100	37	433.975
03	433.125	38	434.000
04	433.150	39	434.025
05	433.175	40	434.050
06	433.200	41	434.075
07	433.225	42	434.100
08	433.250	43	434.125
09	433.275	44	434.150
10	433.300	45	434.175
11	433.325	46	434.200
12	433.350	47	434.225
13	433.375	48	434.250
14	433.400	49	434.275
15	433.425	50	434.300
16	433.450	51	434.325
17	433.475	52	434.350
18	433.500	53	434.375
19	433.525	54	434.400
20	433.550	55	434.425
21	433.575	56	434.450
22	433.600	57	434.475
23	433.625	58	434.500
24	433.650	59	434.525
25	433.675	60	434.550
26	433.700	61	434.575
27	433.725	62	434.600
28	433.750	63	434.625
29	433.775	64	434.650
30	433.800	65	434.675
31	433.825	66	434.700
32	433.850	67	434.725
33	433.875	68	434.750
34	433.900	69	434.775
35	433.925		

FREQUENCY BAND 915 MHZ

Frequency-hopping spread spectrum (FHSS) is a method of transmitting radio signals by rapidly switching a carrier among many frequency channels, using a pseudorandom sequence known to both transmitter and receiver. For further information about the frequencies used in this frequency band and about frequency-hopping, please contact your representative.

FREQUENCY BAND 2.4 GHZ

Channel	Frequency
11	2405
12	2410
13	2415
14	2420
15	2425
16	2430
17	2435
18	2440
19	2445
20	2450
21	2455
22	2460
23	2465
24	2470
25	2475
26	2480

RELAY FUNCTIONALITY

NOTE! If Operating mode 0 is selected, you can not make these settings. Contact your representative for assistance.

NOTE! Momentary relay functionality is default. That means that the relay will only be activated when you press a button on the transmitter. When the button is released, the relay deactivates. Setting a relay to latching means that the relay gets activated every time that you press a button, but in this case the relay remains active until the button is pressed again.

NOTE! Before starting to perform these settings, make sure that the stop relays are deactivated!

NOTE! The settings options depend on the selected Operating mode.

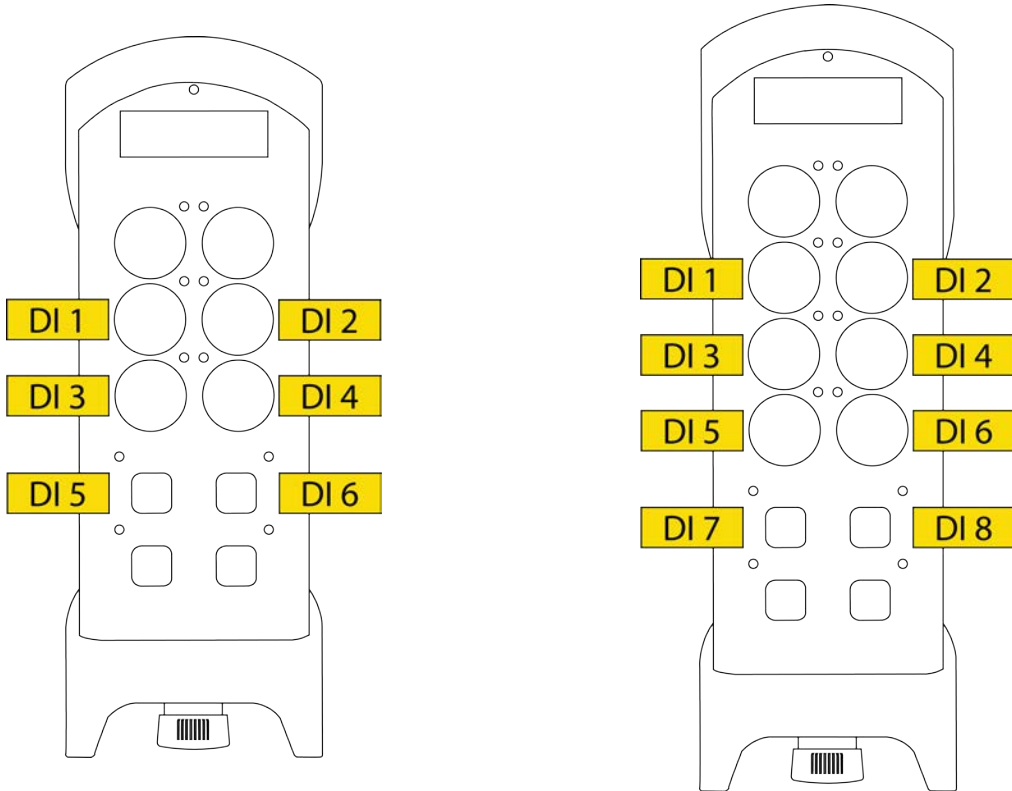
Momentary and latching relay functionality

NOTE! Not available on receivers TG-RX-MNLCAN, TG-RX-MNRCAN, TG-RX-MNPCAN, TG-RX-MNLJI 939, TG-RX-MNRJI 939, TG-RX-MNPJI 939

1. Press the receiver Function button 5 times. Function LED 5 flashes red.
2. Relay LEDs 1-19 light when the corresponding relay has a latching functionality:
Relay LED OFF= momentary relay functionality.
Relay LED ON= latching relay functionality.
3. Press the receiver Select button to switch relay functionality.
4. The relay LED for the first relay available flashes. If that relay is momentary, function LED 5 is off. If that relay is latching, function LED 5 lights.
5. Press the receiver Function button if you want to switch functionality. The status of function LED 5 changes.
6. Press the receiver Select button to step to the next available relay. When you have stepped through all the available relays, the receiver exits the LED menu and restarts.

DIGITAL INPUTS

The digital inputs on the receiver are connected to the transmitter LEDs. If you need to make other settings for the digital inputs indications on the transmitter, please contact your representative for assistance.



CHAPTER 5: OPERATING MODES

SELECT OPERATING MODE

NOTE! All receivers in this manual are intended to be customized. Contact your representative for assistance.

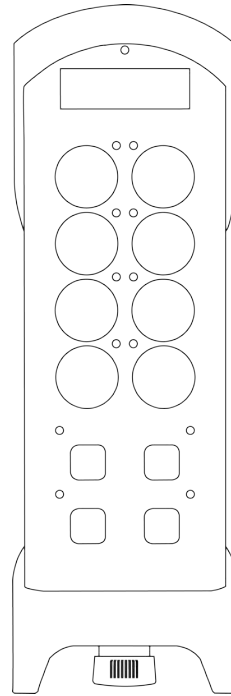
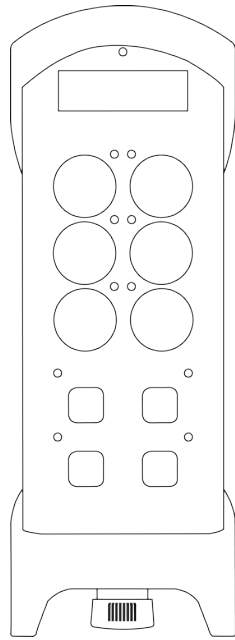
CHAPTER 6: LOAD SELECT MODES

LOAD SELECT MODE

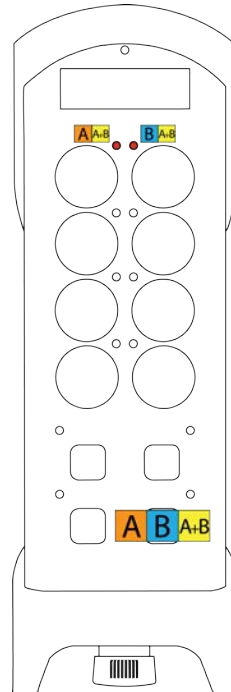
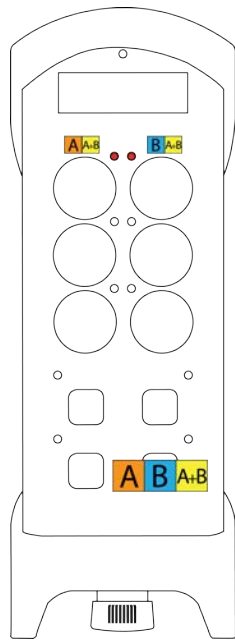
NOTE! Before starting to perform these settings, make sure that the stop relays are deactivated!

1. Make sure that the stop button is pressed.
2. Twist and pull out the stop button.
The top LED lights (green when the battery capacity is good, red when the battery capacity is poor).
3. Press the right start button. Keep pressed.
4. Press the stop button.
5. Release the right start button.
The top LED flashes (green when the battery capacity is good, red when the battery capacity is poor) when in menu mode.
6. Go to [Load select].
7. Select Load select mode and confirm by pressing the left start button.

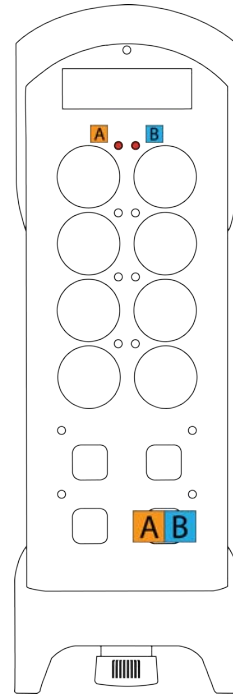
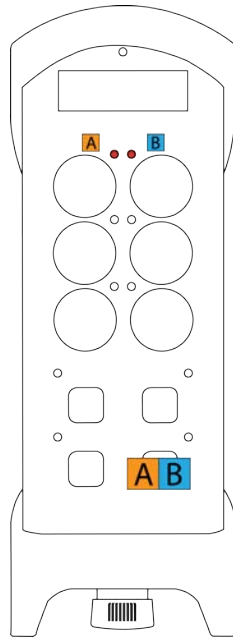
LOAD SELECT MODE 0



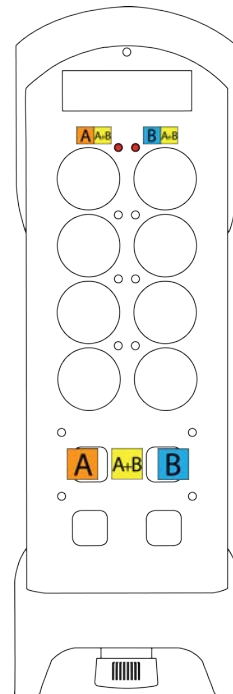
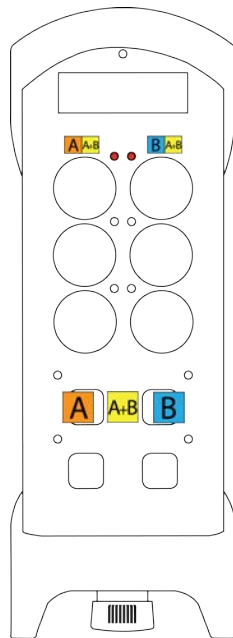
LOAD SELECT MODE 1



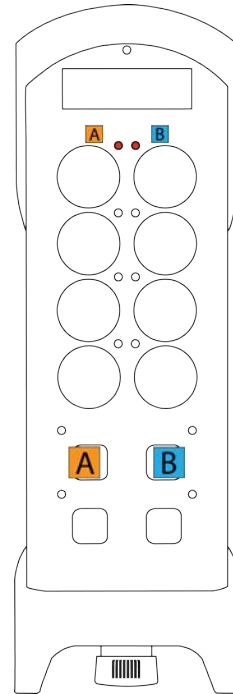
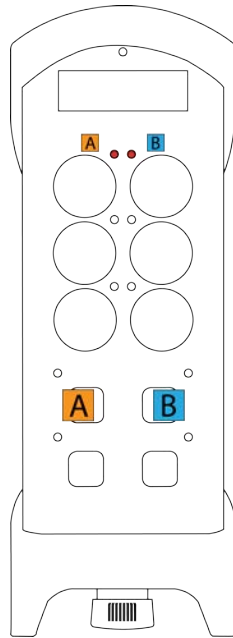
LOAD SELECT MODE 2



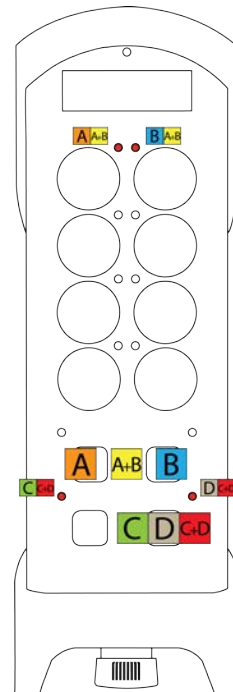
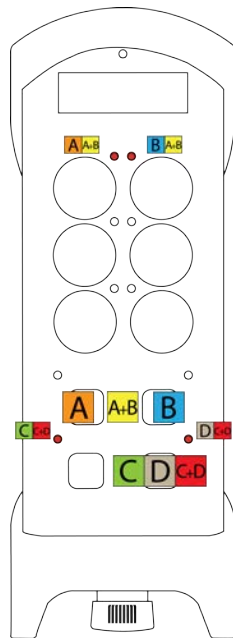
LOAD SELECT MODE 3



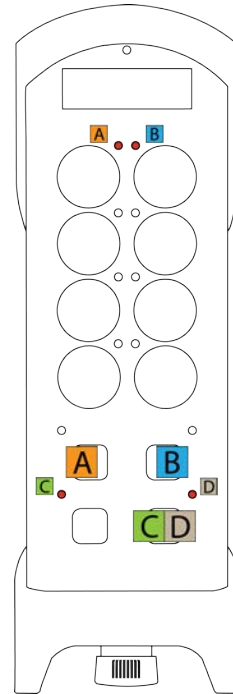
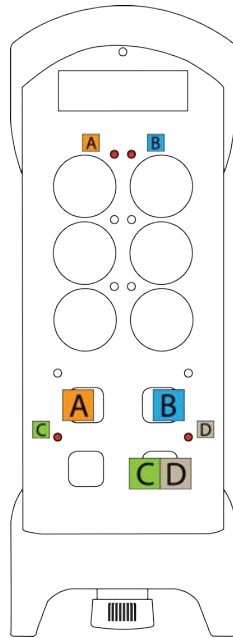
LOAD SELECT MODE 4



LOAD SELECT MODE 5



LOAD SELECT MODE 6



LOAD SELECT MODE 7

The loads are selected in the PC program Settings manager. When you start the transmitter, you cannot switch loads. The LEDs on the transmitter do not indicate which load is activated.

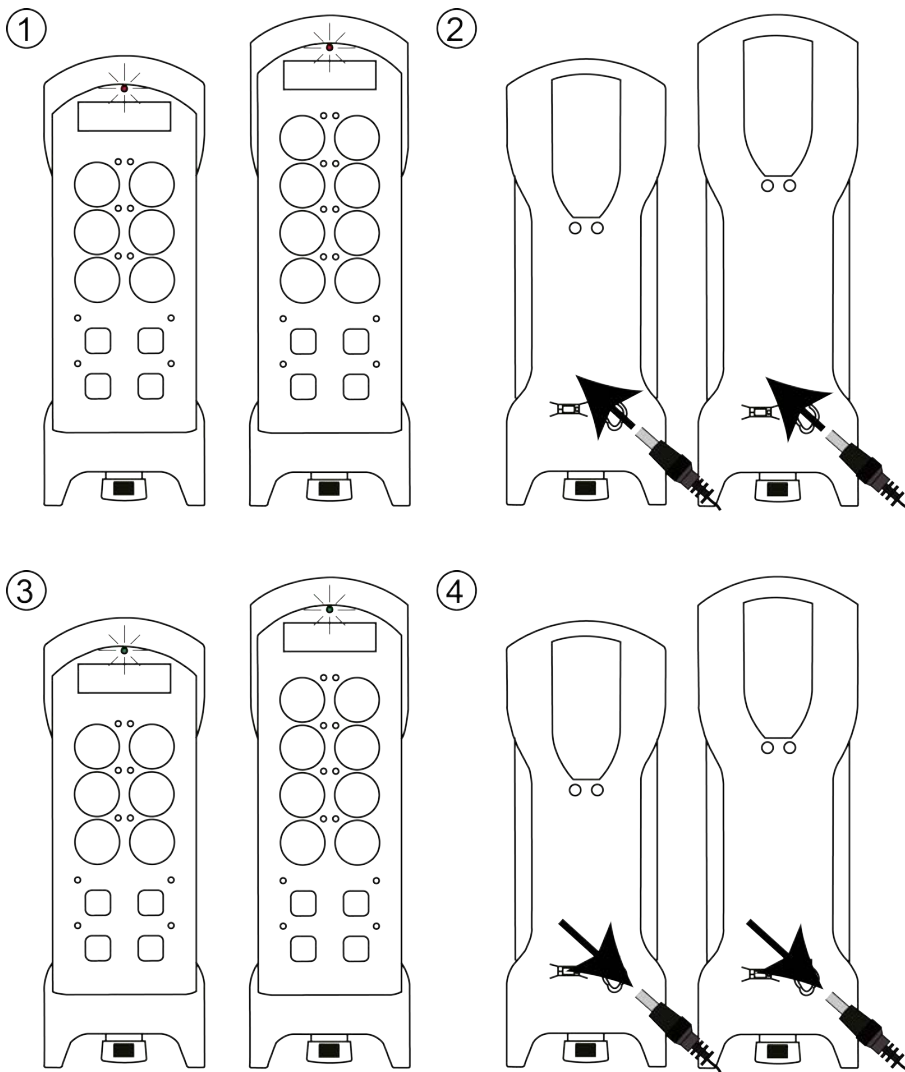
CHAPTER 7: BATTERY GUIDE

BATTERY INFORMATION

TYPE OF BATTERY	
TG-T14-4, TG-T14-5, TG-T14-6, TG-T14-7, TG-T14-8, TG-T14-9, TG-T15-4, TG-T15-5, TG-T15-6, TG-T15-7, TG-T15-8, TG-T15-9	Internal, rechargeable lithium-ion battery
OPERATING TIME	
TG-T14-4, TG-T14-5, TG-T14-6, TG-T14-7, TG-T14-8, TG-T14-9, TG-T15-4, TG-T15-5, TG-T15-6, TG-T15-7, TG-T15-8, TG-T15-9	Approx. 16 h with continuous usage
CHARGE	
TG-T14-4, TG-T14-5, TG-T14-6, TG-T14-7, TG-T14-8, TG-T14-9, TG-T15-4, TG-T15-5, TG-T15-6, TG-T15-7, TG-T15-8, TG-T15-9	With a charger plug in the back of the transmitter (see further description)
CHARGING TEMPERATURE	
TG-T14-4, TG-T14-5, TG-T14-6, TG-T14-7, TG-T14-8, TG-T14-9, TG-T15-4, TG-T15-5, TG-T15-6, TG-T15-7, TG-T15-8, TG-T15-9	0° to 45° / 32° to 113°

CHARGE THE BATTERY

1. When approximately 10 % of the battery capacity remains, the internal buzzer beeps 3 times and the top LED lights red. If the transmitter has a display, the display monitors the battery status.
2. Put the charger plug into the socket in the back of the transmitter. While charging, the top LED flashes in red. If the transmitter has an external battery, you can also remove the battery and charge it in the Tele Radio 5V DC charging unit.
3. When fully charged, the top LED lights green.
4. Remove the charger plug.



BATTERY PRECAUTIONS

Observe the following general battery warnings:

- As batteries contains flammable substances such as lithium or other organic solvents, they may cause heating, rupture or ignition.
- Risk of explosion if battery is replaced with a battery of an incorrect type.
- Do not short circuit, disassemble, deform or heat batteries.
- Never try to charge a visibly damaged or frozen battery.
- Keep batteries out of reach of small children. Should a child swallow a battery, consult a physician immediately.
- Avoid direct soldering to batteries.
- When discarding batteries, insulate the + and - terminals of batteries with insulating/ masking tape. Do not put multiple batteries in the same plastic bag.
- When improperly disposed, lithium batteries may short circuit, causing them to become hot, burst or ignite.
- Store in a cool location. Keep batteries away from direct sunlight, high temperature, and high humidity.
- Do not throw batteries into fire.

REMOVAL/DISPOSAL OF INTERNAL BATTERY

NOTE! Electronics and batteries must be physically separated before disposal. Make sure that electronics or batteries are not thrown in the household waste.

1. Remove the clip. Use a screwdriver to unscrew the screws.
2. Remove the rubber cover by hand.
3. Use a screwdriver to unscrew the screws in the back of the transmitter. Remove the front encapsulation by hand. Turn the transmitter around, so that the buttons face up.
4. Use a screwdriver to unscrew the screw in the middle of the circuit board. Lift the circuit board up by hand.
5. The battery pack is placed behind the circuit board. Remove the battery by hand.

ROHS AND WEEE

In accordance with Directive 2011/65/EU on restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) and Directive 2012/19/EU on waste electrical and electronic equipment (WEEE), Tele Radio AB strives to minimize the use of hazardous materials, promotes reuse and recycling, and reduces emissions to air, soil and water. When a commercially viable alternative is available, Tele Radio AB strives to restrict or eliminate substances and materials that pose an environmental, health or safety risk.

GUARANTEE, SERVICE, REPAIRS AND MAINTENANCE

The Tele Radio AB products are covered by a guarantee/warranty against material, construction and manufacturing faults. During the guarantee/warranty period, Tele Radio AB may replace the product or faulty parts. Work under guarantee/warranty must be carried out by Tele Radio AB or by an authorized service centre specified by Tele Radio AB.

This is not covered by the guarantee/ warranty:

- Faults resulting from normal wear and tear
- Parts of a consumable nature
- Products that have been subject to unauthorized modifications
- Faults resulting from incorrect installation and use
- Damp and water damage

Maintenance:

- Repairs and maintenance must be carried out by qualified personnel
- Use spare parts from Tele Radio AB only
- Contact your representative if you require service or other assistance
- Keep the product in a dry, clean place
- Keep contacts and antennas clean
- Wipe off dust using a slightly damp, clean cloth

WARNING! Never use cleaning solutions or high-pressure water.

CHAPTER 8: CERTIFICATIONS CHAPTER

FCC/IC

FCC STATEMENT

Statement for warning:

To satisfy FCC RF exposure requirements, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation.

To ensure compliance, operations at closer than this distance is not recommended.

Les antennes installées doivent être situées de façon à ce que la population ne puisse y être exposée à une distance de moins de 20 cm. Installer les antennes de façon à ce que le personnel ne puisse approcher à 20 cm ou moins de la position centrale de l'antenne.

La FCC des États-Unis stipule que cet appareil doit être en tout temps éloigné d'au moins 20 cm des personnes pendant son fonctionnement.

Caution: The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Industry Canada licence-exempt RSS standard(s) and Part 15 of the FCC Rules. 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 et la partie 15 des Règles FCC. 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.

This equipment complies with FCC and IC radiation exposure limits set forth for an uncontrolled environment. End user must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet appareil est conforme aux limites d'exposition au rayonnement RF stipulées par la FCC et l'IC pour une utilisation dans un environnement non contrôlé. L'utilisateur final doit suivre les instructions de fonctionnement spécifiques pour le respect d'exposition aux RF. Les émetteurs ne doivent pas être placés près d'autres antennes ou émetteurs ou fonctionner avec ceux-ci.

Note: 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 radio module in this product is labelled with its own FCC ID and IC number. The FCC ID and IC is not visible when the radio module is installed inside another device. Therefore, the outside of the device into which the module is installed must also display a label referring to the radio module. The final end device must be labelled in a visible area with the following:

“Contains FCC ID: ONFCI 104B”

“Contains IC: 4807A-CI 104B”

or

“Contains FCC ID: ONFCI 108A”

“Contains IC: 4807A-CI 108A”

or

“Contains FCC ID: ONFCI 203A”

“Contains IC: 4807A-CI 203A”

or

“Contains FCC ID: ONFCI 203B”

“Contains IC: 4807A-CI 203B”

or

“Contains FCC ID: ONFCI 406A”

“Contains IC: 4807A-CI 406A”

Under Industry Canada regulations, this radio transmitter 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. Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut 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.

This radio transmitter has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Gain of antenna: 3.0dBi max.

Type of antenna: 50ohm, Omni-directional

Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne.

Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Gain d'antenne: 3.0dBi maximal

Type d'antenne: 50 ohm, Omni-directionnel

THE RADIO MODULE

Each radio module is specifically designed to match a Tele Radio product in terms of physical dimensions, connection points, voltage levels, signal interface etc. To use the radio modules in non Tele Radio products is not permitted. The radio modules are designed to interface directly to the main board of the receiver/transmitter unit. They are power supplied by the main board and the radio circuit operates strictly according to instructions from a microprocessor on the main board. The radio circuit configuration is stored in a flash memory on the radio module. A receiver/transmitter unit with a defective/no radio module will give an error message immediately after power up, and it will not be possible to start a radio session.

RADIO MODULE LIST

The products in this instruction contain the radio modules:

D00005-05	TG-RX-MNRCAN, TG-RX-MNRANA, TG-RX-MNRJI939
D00005-06	TG-TI4-8, TG-TI5-8
D00005-07	TG-RX-MNPCAN, TG-RX-MNPANA, TG-RX-MNPJI939
D00005-09	TG-TI4-9, TG-TI5-9
D00007-03	TG-TI4-8, TG-TI5-8, TG-TI4-9, TG-TI5-9

PRODUCT LABEL ON THE RECEIVER

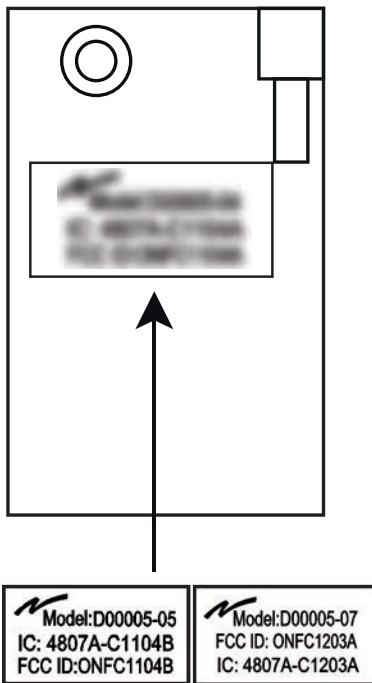
You will find the product label on the outside of the enclosure of the receiver.

FCC/IC LABEL IN THE RECEIVER

The FCC/IC label is placed on the radio module. The radio module is mounted inside the receiver.

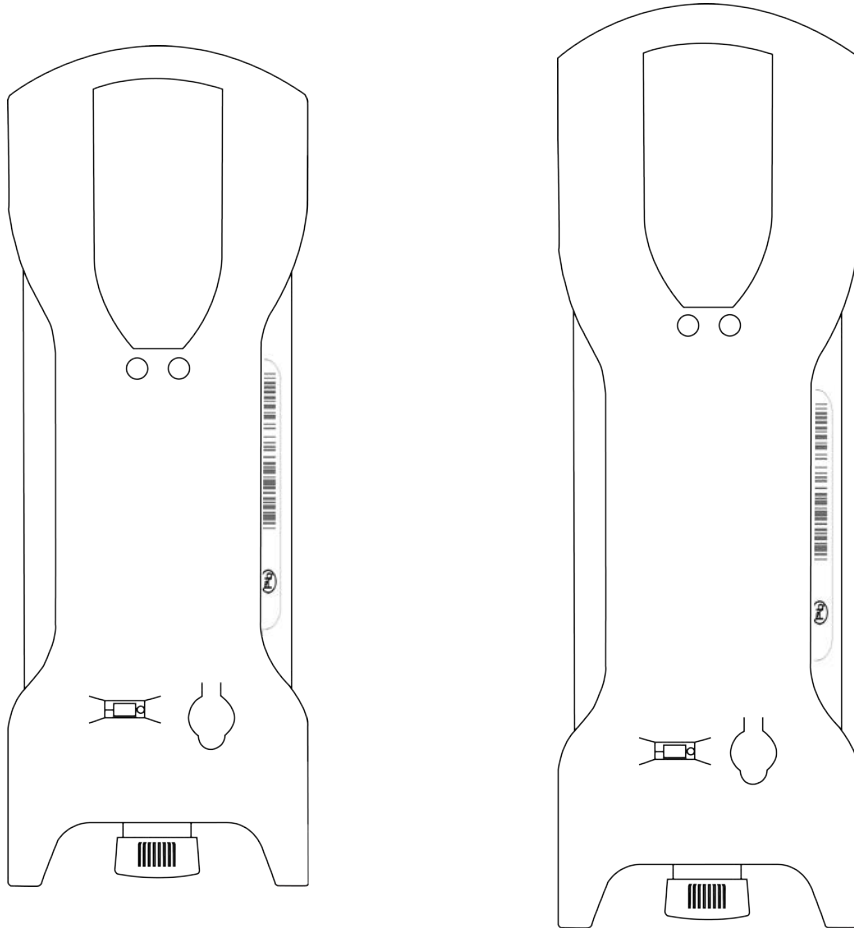
D00005-5: TG-RX-MNRCAN, TG-RX-MNRANA, TG-RX-MNRJ1939

D00005-7: TG-RX-MNPCAN, TG-RX-MNPANA, TG-RX-MNPJ1939



PRODUCT LABEL ON THE TRANSMITTER

You will find the product label in the back of the transmitter.

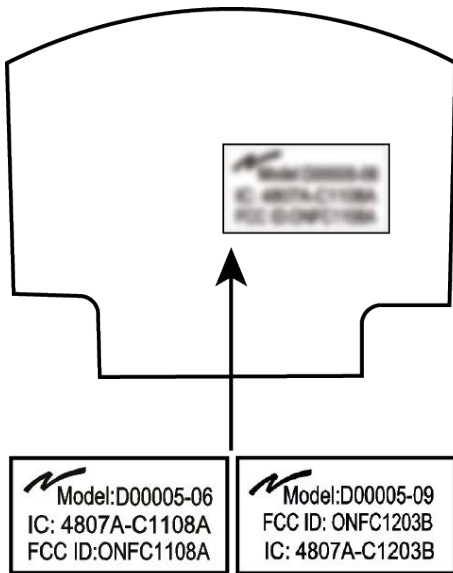


FCC/IC LABEL IN THE TRANSMITTER

The FCC/IC label is placed on the radio module. The radio module is mounted inside the transmitter.

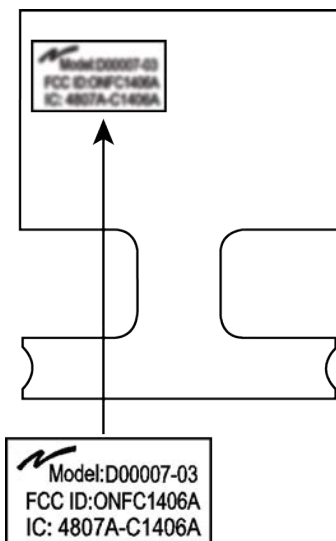
D00005-06:
TG-T14-8, TG-T15-8

D00005-09:
TG-T14-9, TG-T15-9



The FCC/IC label is placed on the main board. The main board is mounted inside the transmitter.

D00007-03:
TG-T14-8, TG-T15-8, TG-T14-9, TG-T15-9



EC/EEA DECLARATION OF CONFORMITY

EC/EEA DECLARATION OF CONFORMITY



The undersigned, representing the following manufacturer:

NAME: Tele Radio AB
 ADDRESS: Datavägen 21, SE-436 32 Askim, SWEDEN
 TELEPHONE NO: 46-31-7485460 TELEFAX NO: 46-31-685464

Herewith declares that the product(s):

RECEIVERS TG-R4-1, TG-R4-6, TG-R4-26, TG-R4-36, TG-R4-41, TG-R4-46, TG-R10-1, TG-R10-2, TG-R9-1, TG-R9-6, TG-R9-11

Is in conformity with the provisions of the following harmonized standards, other standards and directives:

2006/42/EC ¹	Directive 2006/42/EC of the European Parliament and of the Council on machinery	
1999/5/EC	Directive 1999/5/EC of the European Parliament and of the Council on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE)	
2006/95/EC	Directive 2006/95/EC of the European Parliament and of the Council on harmonisation of the laws of the Member states relating to electrical equipment designed for use within certain voltage limits	
2004/108/EC	Directive 2004/108/EC of the European Parliament and of the Council on the approximation of the laws of the Member states relating to electromagnetic compatibility	
2011/65/EC	Directive 2011/65/EC of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment	
EN 50371	Generic Standard to Demonstrate the Compliance of Low-Power Electronic and Electrical Apparatus with the Basic Restrictions Related to Human Exposure to Electromagnetic Fields (10 MHz–300 GHz)—General Public	HEALTH
EN 60950-1	Information technology equipment—SAFETY—Part 1: General requirements	SAFETY/LVD
EN 301489-1/-3	Electromagnetic compatibility and Radio spectrum Matters (ERM): ElectroMagnetic Compatibility (EMC) standard for radio equipment and services: Part 1: Common technical requirements- Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 KHz and 40 GHz	EMC
EN 300 220-1/-2	Electromagnetic compatibility and Radio spectrum Matters (ERM): Short Range Devices (SRD): Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW: Part 1: Technical characteristics and test methods- Part 2: Supplementary parameters not intended for conformity purposes	RADIO
EN 62061 ²	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems	
EN 60204-1/-32 ²	Safety of machinery - Electrical equipment of machines- Part 1: General requirements. Part 32: Requirements for hoisting machines- Cranes - Controls and control stations	
EN 50581	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances	
EN ISO 13849-1	Safety of machinery- Safety-related parts of control systems- Part 1: General principles for design	PL e (Performance Level)
<i>Other standards:</i>		
IEC 61508	Functional safety of electrical/electronic/programmable electronic safety-related systems	SIL3 (Safety Integrity Level)

1) According to Annex IV, paragraph 21 and article 12 (3), option (a).

2) The products fulfill the relevant parts for cableless controls and electrical equipment when mounted and installed correctly.

Authorized to compile technical file:

NAME: Jesper Ribbe
 ADDRESS: Same as manufacturer
 Askim June 13th, 2014

Jesper Ribbe
 Research & Development Manager, Tele Radio AB

CER-TG2-EC002-A07

EC/EEA DECLARATION OF CONFORMITY



The undersigned, representing the following manufacturer:

NAME: Tele Radio AB
ADDRESS: Datavägen 21, SE-436 32 Askim, SWEDEN
TELEPHONE NO: 46-31-7485460 TELEFAX NO: 46-31-685464

Herewith declares that the product(s):

RECEIVERS TG-R4-5, TG-R4-10, TG-R4-30, TG-R4-40, TG-R4-45, TG-R4-50

Is in conformity with the provisions of the following harmonized standards, other standards and directives:

2006/42/EC' 1999/5/EC	Directive 2006/42/EC of the European Parliament and of the Council on machinery Directive 1999/5/EC of the European Parliament and of the Council on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE)	
2006/95/EC	Directive 2006/95/EC of the European Parliament and of the Council on harmonisation of the laws of the Member states relating to electrical equipment designed for use within certain voltage limits	
2004/108/EC	Directive 2004/108/EC of the European Parliament and of the Council on the approximation of the laws of the Member states relating to electromagnetic compatibility	
2011/65/EC	Directive 2011/65/EC of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment	
EN 50371	Generic Standard to Demonstrate the Compliance of Low-Power Electronic and Electrical Apparatus with the Basic Restrictions Related to Human Exposure to Electromagnetic Fields (10 MHz–300 GHz)—General Public	HEALTH
EN 60950-1	Information technology equipment—SAFETY—Part 1: General requirements	SAFETY/LVD
EN 301489-1/-17	Electromagnetic compatibility and Radio spectrum Matters (ERM): ElectroMagnetic Compatibility (EMC) standard for radio equipment and services: Part 1: Common technical requirements- Part 17: Specific conditions for Wideband data and HIPERLAN equipment	EMC
EN 300328-1/-2	Electromagnetic compatibility and Radio spectrum Matters (ERM) - Wideband Transmission systems - Data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques - Part 1: Technical characteristics and test conditions. Part 2: Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive	RADIO
EN 62061 ²	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems	
EN 60204-1/-32 ²	Safety of machinery - Electrical equipment of machines- Part 1: General requirements. Part 32: Requirements for hoisting machines- Cranes - Controls and control stations	
EN 50581	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances	
EN ISO 13849-1	Safety of machinery- Safety-related parts of control systems- Part 1: General principles for design	PL e (Performance Level)
<i>Other standards:</i>		
IEC 61508	Functional safety of electrical/electronic/programmable electronic safety-related systems	SIL3 (Safety Integrity Level)

1) According to Annex IV, paragraph 21 and article 12 (3), option (a).

2) The products fulfill the relevant parts for cableless controls and electrical equipment when mounted and installed correctly.

Authorized to compile technical file:

NAME: Jesper Ribbe
ADDRESS: Same as manufacturer
Askim June 13th, 2014


Jesper Ribbe
Research & Development Manager, Tele Radio AB

CER-TG2-EC005-A02

EC/EEA DECLARATION OF CONFORMITY



The undersigned, representing the following manufacturer:

NAME: Tele Radio AB
 ADDRESS: Datavägen 21, SE-436 32 Askim, SWEDEN
 TELEPHONE NO: 46-31-7485460 TELEFAX NO: 46-31-685464

Herewith declares that the product(s):

TRANSMITTERS TG-T11-4, TG-T11-5, TG-T9-1, TG-T9-2, TG-T12-20, TG-T12-21, TG-T12-22, TG-T12-23, TG-T12-24, TG-T12-25, TG-T14-7, TG-T15-7

Is in conformity with the provisions of the following harmonized standards, other standards and directives:

2006/42/EC ¹	Directive 2006/42/EC of the European Parliament and of the Council on machinery	
1999/5/EC	Directive 1999/5/EC of the European Parliament and of the Council on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE)	
2006/95/EC	Directive 2006/95/EC of the European Parliament and of the Council on harmonisation of the laws of the Member states relating to electrical equipment designed for use within certain voltage limits	
2004/108/EC	Directive 2004/108/EC of the European Parliament and of the Council on the approximation of the laws of the Member states relating to electromagnetic compatibility	
2011/65/EC	Directive 2011/65/EC of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment	
EN 50371	Generic Standard to Demonstrate the Compliance of Low-Power Electronic and Electrical Apparatus with the Basic Restrictions Related to Human Exposure to Electromagnetic Fields (10 MHz–300 GHz)—General Public	HEALTH
EN 60950-1	Information technology equipment—SAFETY—Part 1: General requirements	SAFETY/LVD
EN 301489-1/-3	Electromagnetic compatibility and Radio spectrum Matters (ERM): ElectroMagnetic Compatibility (EMC) standard for radio equipment and services: Part 1: Common technical requirements- Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 KHz and 40 GHz	EMC
EN 300 220-1/-2	Electromagnetic compatibility and Radio spectrum Matters (ERM): Short Range Devices (SRD): Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW: Part 1: Technical characteristics and test methods- Part 2: Supplementary parameters not intended for conformity purposes	RADIO
EN 62061 ²	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems	
EN 60204-1/-32 ²	Safety of machinery - Electrical equipment of machines- Part 1: Part 1: General requirements. Part 32: Requirements for hoisting machines- Cranes - Controls and control stations	
EN 50581	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances	
EN ISO 13849-1	Safety of machinery- Safety-related parts of control systems- Part 1: General principles for design	PL e (Performance Level)
<i>Other standards:</i>		
IEC 61508	Functional safety of electrical/electronic/programmable electronic safety-related systems	SIL3 (Safety Integrity Level)

1) According to Annex IV, paragraph 21 and article 12 (3), option (a).

2) The products fulfill the relevant parts for cableless controls and electrical equipment when mounted and installed correctly.

Authorized to compile technical file:

NAME: Jesper Ribbe
 ADDRESS: Same as manufacturer
 Askim May 27th, 2014

Jesper Ribbe
 Research & Development Manager, Tele Radio AB

CER-TG2-EC004-A04

EC/EEA DECLARATION OF CONFORMITY



The undersigned, representing the following manufacturer:

NAME: Tele Radio AB
 ADDRESS: Datavägen 21, SE-436 32 Askim, SWEDEN
 TELEPHONE NO: 46-31-7485460 TELEFAX NO: 46-31-685464

Herewith declares that the product(s):

TRANSMITTERS TG-T11-24, TG-T9-22, TG-T14-9, TG-T15-9

Is in conformity with the provisions of the following harmonized standards, other standards and directives:

2006/42/EC ¹	Directive 2006/42/EC of the European Parliament and of the Council on machinery	
1999/5/EC	Directive 1999/5/EC of the European Parliament and of the Council on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE)	
2006/95/EC	Directive 2006/95/EC of the European Parliament and of the Council on harmonisation of the laws of the Member states relating to electrical equipment designed for use within certain voltage limits	
2004/108/EC	Directive 2004/108/EC of the European Parliament and of the Council on the approximation of the laws of the Member states relating to electromagnetic compatibility	
2011/65/EC	Directive 2011/65/EC of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment	
EN 50371	Generic Standard to Demonstrate the Compliance of Low-Power Electronic and Electrical Apparatus with the Basic Restrictions Related to Human Exposure to Electromagnetic Fields (10 MHz–300 GHz)—General Public	HEALTH
EN 60950-1	Information technology equipment—SAFETY—Part 1: General requirements	SAFETY/LVD
EN 301489-1/-17	Electromagnetic compatibility and Radio spectrum Matters (ERM): ElectroMagnetic Compatibility (EMC) standard for radio equipment and services: Part 1: Common technical requirements- Part 17: Specific conditions for Wideband data and HIPERLAN equipment	EMC
EN 300328-1/-2	Electromagnetic compatibility and Radio spectrum Matters (ERM) - Wideband Transmission systems - Data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques - Part 1: Technical characteristics and test conditions. Part 2: Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive	RADIO
EN 62061 ²	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems	
EN 60204-1/-32 ²	Safety of machinery - Electrical equipment of machines- Part 1: Part 1: General requirements. Part 32: Requirements for hoisting machines- Cranes - Controls and control stations	
EN 50581	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances	
EN ISO 13849-1	Safety of machinery- Safety-related parts of control systems- Part 1: General principles for design	PL e (Performance Level)
<i>Other standards:</i>		
IEC 61508	Functional safety of electrical/electronic/programmable electronic safety-related systems	SIL3 (Safety Integrity Level)

1) According to Annex IV, paragraph 21 and article 12 (3), option (a).

2) The products fulfill the relevant parts for cableless controls and electrical equipment when mounted and installed correctly.

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 Askim May 27th, 2014

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