




# Operating Instructions

Original Operating Instructions

**spectrum D**

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Attachments: System specific views, circuit diagrams and / or output wiring.

## Pictographs



Danger due to electrical voltage. Touching live parts inside the unit can be fatal or cause serious injuries.



Instructions for occupational health and safety. Not following these instructions can lead to accidents that can cause damage, serious injuries or even death.



Important information about the operation of the radio system.

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## Safety Instructions

Read these operating instructions carefully before working with the radio system. This applies in particular to the installation, commissioning and maintenance of the radio system.

The operating instructions are a constituent part of the radio control system and must always be kept close at hand for the responsible personnel.

The term 'machine' is used in the operating instructions for the different possible uses of the radio system.

### Intended Use

- The radio system is used for the control of machines and for data transfer. Observe the occupational safety and accident prevention regulations applicable to each application.
- The intended use also includes reading the operating instructions and adhering to all safety information contained therein.
- The radio system must not be used in areas where there is a risk of explosion, nor for the control of machines used to convey persons, unless it is explicitly approved for these uses by the manufacturer.
- Modifications to the radio system may only be carried out by specialist personnel who have been trained and authorized by HBC-radiomatic. All modifications must be documented at the factory in the radio control master file.
- The safety devices of the radio control system must not be modified, removed or bypassed. In particular, modifications to any part of the radio system's complete E-STOP system are not allowed.

### Safety Instructions for Installation and Operation

- The electrical connection according to the enclosed output wiring diagram must be established by a qualified electrician exclusively.
- The receiver may only be opened by trained personnel. Components inside the receiver can be energized at life-threatening voltages. The supply voltage for the machine must be disconnected before the receiver is opened.
- Please also note that, with radio systems, the presence of persons in the danger zone – in particular beneath the load (cranes!) – is prohibited in all cases.
- Select a safe location for radio control, from which you have a good and complete view of the working movements of the machine, the load movements and the surrounding working conditions.
- It is not permissible to leave a radio transmitter unattended when it is activated. Always switch off the radio transmitter when it is not required. This applies in particular if you change location, when working without radio control, during breaks and at the end of work. Always protect the radio transmitter against use by unauthorized persons, for example by locking it away.
- In the event of an emergency and with all faults, switch off the radio transmitter immediately by pressing the STOP switch.
- Only operate the radio system when it is in perfect working order. Faults and defects that could influence safety must be rectified by specialists who have been trained and authorized by HBC-radiomatic before the system is put back into operation.
- Note that the operational directions of the operating elements may appear inverted depending on location and viewing angle to the machine. This applies in particular to rotary cranes if your location changes from inside to outside the radius of the crane. The operator must make himself familiar with the directional markings on the machine before starting to work.
- Repairs may only be carried out by specialist personnel who have been trained and authorized by HBC-radiomatic. Use original replacement parts and accessories (e.g. rechargeable batteries) exclusively; otherwise it is possible that the equipment safety can no longer be guaranteed and our extended warranty will be voided.
- Remain vigilant when working with the radio system and familiarize yourself with its functions. This applies in particular if you are working with it for the first time or if you work with it only occasionally.
- Before starting to work, examine the STOP switch for mechanical ease of motion and electronic function at least once a day:

When you press the STOP switch with the transmitter on, the status LED and the display of the transmitter have to go out. If the status LED and the display don't go out then you have to disable the radio control system immediately.

Remove the battery and the radiomatic® iLOG from the transmitter and inform a service technician.



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## **FC** FCC Notes

### **Modification of Equipment**

Changes or modifications made to this equipment not expressly approved by the party responsible for compliance may void the FCC authorization to operate this equipment.

### **RF Exposure Statement**

This device complies with the RF exposure SAR test exclusion requirements for portable devices. However, the device shall be used in such a manner that the potential for human contact during normal operation is minimized.

## Operation

The transmitter is equipped with an electronic radiomatic® iLOG key. radiomatic® iLOG contains all the data required for operating the transmitter. Operation is not possible without radiomatic® iLOG! Depending on the version the radiomatic® iLOG can also be used for operation of replacement transmitters of identical construction.

When activating the transmitter and if the radio connection is interrupted (e.g. if the connection is lost or the transmission range is exceeded), the transmitter reacts with the so-called enforced zero-position. Release all operating elements so they can return to the zero-position and actuate the start button. The machine will not react if the operating elements are not in zero-position. This prevents uncontrolled machine movements after the radio connection has been interrupted.

### Activating the Transmitter

The steps 3 and 4 need to be carried out within **5 seconds**:

1. Insert a charged battery into the battery compartment.
2. Turn the STOP switch to unlock.
3. Shortly actuate the start button and then release. The transmitter will switch off if the button is pressed for longer than half a second!
4. Actuate the start button again until the status LED flashes green. Then release the button. The transmitter is now ready for operation.
5. Depending on the application, you must actuate the start button again before movement commands can be carried out.




#### Note:

The transmitter switches off if

- the start button is pressed for longer than half a second in step 3 of the start sequence.
- the start sequence (steps 3 and 4) takes over 5 seconds.
- another button is pressed during the start sequence.

You must then repeat steps 3 and 4 or 3 to 5.

### With merlin® TUC

1. Insert a charged battery into the battery compartment.
2. Turn the STOP switch to unlock.
3. Press the start button.  
The status LED flashes green 2 times and red 1 time per second.
4. Hold the merlin® TUC to the position on the transmitter marked with this symbol  (cf. illustration). The transmitter vibrates and an acoustic signal sounds. When the status LED flashes green, the transmitter is ready to operate.
5. Depending on the application, you must actuate the start button again before movement commands can be carried out.



#### Note:

The transmitter can only be activated with a valid merlin® TUC. If you use a card that does not match the respective transmitter or is not approved for this transmitter, the transmitter vibrates 3 times. At the same time an acoustic signal sounds. The transmitter is automatically shut down after 2 seconds. Please contact your superior in such cases.

The transmitter also shuts down if the start sequence is not completed within 10 seconds. In this case press the start button and repeat the procedure!

**Caution:**

Before starting work always trigger the acoustic signal. This warns all colleagues that the machine is about to move.

## Deactivating the Transmitter

Press the STOP switch.

**Note:**

Replace the battery when the battery display illuminates red, an acoustic signal sounds, the status LED flashes red and the transmitter vibrates (option). Otherwise, the transmitter will switch off in a few minutes.

Recharge the empty battery in the respective charger.

## Automatic Power Off (APO) Function

The transmitter is equipped with an automatic power off (APO) function and will automatically shut off approx. 15 min after the last command input.

The automatic power off serves to increase safety and also saves battery power.

After an automatic power off, the transmitter must be reactivated as described in the chapter "Operation".

**Caution:**

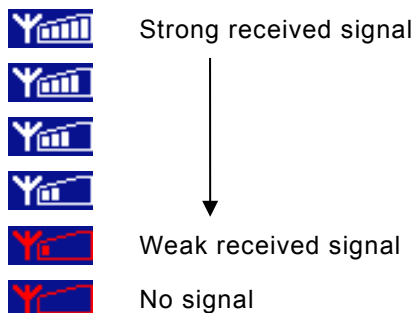
The automatic power off does not relieve the operator of the responsibility to turn off the transmitter with the STOP switch when not in use.

## Display


### Field strength

The field strength indication provides information about the quality of the radio connection. With an optimum connection, all 5 bars are displayed. The field strength indication is always visible when the transmitter is turned on.

Field strength is indicated in the following degrees:



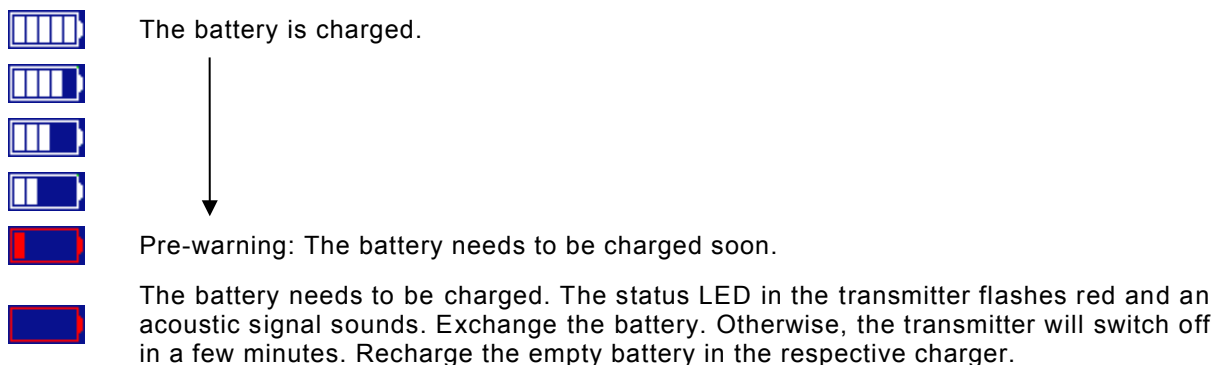
#### Note:

If  symbol is displayed the risk of the radio connection being interrupted is imminent. Ensure that the radio connection is not impaired by an obstacle (e.g. a building) and ensure that you are within the range of the radio system. It may be necessary to change the working position.

### Battery

The battery indication provides information about the current condition of the battery. It is always visible when the transmitter is turned on.

The battery status is displayed in the following degrees:



#### Note:

A detailed description of the display has to be part of the operating manual of the specific machine in use. All instructions the operator has to follow in connection with the feedback information have to be written there as well.

## Battery and Battery Charger

### NiMH Battery

The battery capacity (= amount of electric current that can be stored) and the battery charge (= actual amount of stored current) depend on the age of the battery and the ambient temperature. Older batteries begin to lose their capacity over time. At temperatures below 0 °C (32 °F) and above 40 °C (104 °F), less current can be obtained.

Please observe the following safety instructions in any case. Improper use can lead to injuries.



#### Safety instructions:

- Only use the batteries with the respective intended devices.
- Never use or charge damaged or faulty batteries.
- Do not short-circuit, damage or open batteries or expose them to fire. Always use the enclosed protection cap for storing the batteries.
- Charge the batteries completely before storing them for a longer period. The battery may be deep discharged otherwise. Observe the date on the battery.
- Only charge the batteries with the respective HBC charger.
- Charge the batteries at an ambient temperature of 10 – 40 °C (50 – 104 °F).
- Do not expose the batteries to direct sunlight.
- Recycle or dispose of batteries according to the respective regulations.



#### Notes:

- Completely charge all batteries before initial use. This ensures that the batteries have their full capacity available when used for the first time.
- Charge the battery only when the battery display illuminates red, an acoustic signal sounds, the status LED flashes red and the transmitter vibrates (option).
- Store the batteries at -15 – +35 °C (5 – 95 °F).
- When they are stored, recharge the batteries at intervals not exceeding 6 months.

When handled properly, NiMH batteries by HBC-radiomatic can reach up to 500 charging cycles. Even after that, your batteries can be used for some time with a slightly decreased capacity.



## Battery Charger

Depending on customer selection, an AC or DC charger is available. A connection cable with a suitable power plug is included in the delivery.

Please observe the following safety instructions in any case. Improper use of the charger may result in fire or electric shocks. This can lead to life-threatening injuries, which may be fatal under certain circumstances.



### Safety instructions:

- Only use the charger to charge batteries indicated on the type plate.
- Do not use the charger in hazardous locations or near explosive substances.
- Use the charger only with the supply voltage indicated on the bottom of the charger.
- Only use the charger in vehicles or dry rooms.
- Only use the charger within the indicated temperature range of 10 – 40 °C (50 – 104 °F).
- Protect the charger from overheating, dust and moisture.
- Do not cover the charger during the charging operation.
- If the charger is not being used, disconnect it from the power supply.
- Do not use the charger if there is a fault on the device or the connection cable.
- Do not perform technical alterations on the charger or the connection cable.



### Maintenance and servicing:

- Disconnect the power plug before cleaning the charger.
- Keep the contacts of the charger and the battery free from dirt in order to ensure the perfect functioning of the charger.

## Charging the Battery

1. Connect the charger to the power supply via the connection cable.
2. Insert the battery into the charging slot.

The charging process will start automatically.

### Charging indication:

The current operating status is indicated via three LEDs.

LED **green**: Illuminates when the battery is charged.

LED **orange**: Illuminates when the battery is being charged.

LED **red**: Illuminates when the battery is deep discharged or faulty.



### Note:

When a deep discharged battery is inserted into the charger, the red LED illuminates for some time before the charging process (orange LED illuminates) starts.

Technical Data QA115600 / QD115300	
Operating voltage	100 – 240 V AC (QA115600) 10 – 30 V DC (QD115300)
Charging time	< 5 h
Operating temperature	10 – 40 °C (50 – 104 °F)
Housing material	Plastic
Protection class	II
Charging method	CC

## Options

The availability of the following functions depends on the design and configuration of your radio control system.

### Safety Features

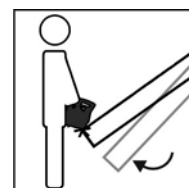
#### radiomatic® shock-off / zero-g / inclination switch

In specific emergency situations, these safety features can prevent unintended movement commands from being given to the machine, protecting the operator as well as other personnel in close proximity to the machine in use.

**radiomatic® shock-off** can react if the transmitter receives a hard impact.

**radiomatic® zero-g** can react if the transmitter is falling down or being thrown.

**radiomatic® inclination switch** can activate if the transmitter exceeds an inclination angle of approx. 45° for a specified time and/or is positioned upside down.



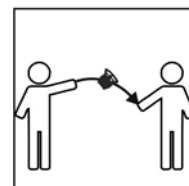
Depending on the ordered version the features can operate in three different ways:

- The complete radio system is shut down.
- Safety-relevant functions are deactivated.
- A previously defined function (e. g. crane horn) is activated.



In addition the symbol SAFETY FEATURE is shown in the display.

To deactivate the features, press the start button until the status-LED flashes green and the symbol SAFETY FEATURE disappears. Then the transmitter is ready to operate again.



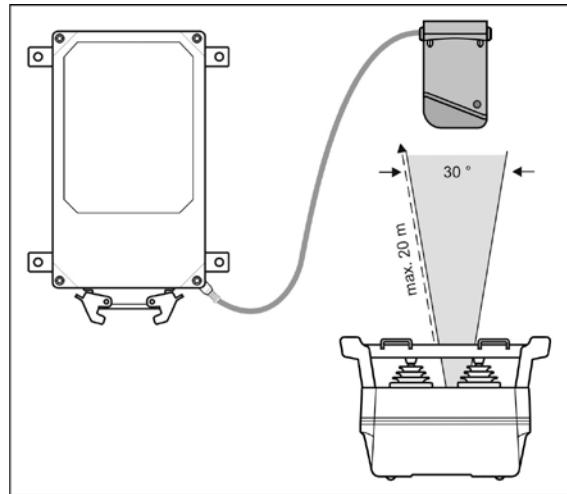
The safety features do not relieve the operator of his responsibility to turn off the transmitter with the STOP switch when not in use.

## radiomatic® infrakey

The radio system can only be activated via an infrared link between the transmitter and the receiver. This increases the safety of operation, i.e. the machine can not become inadvertently enabled.

radiomatic® infrakey operates either with an infrared module in the receiver housing (radiomatic® infrakey internal) or with the offset infrared antenna focus I (radiomatic® infrakey external).

To activate radiomatic® infrakey, actuate the start button on the transmitter.



Function of radiomatic® infrakey with focus I



### Notes:

- The range of the infrared beam is max. 20 m (66 ft).
- The angle of radiation is 30°.
- The front panel of the receiver must be visible (only radiomatic® infrakey internal).

## Joystick with Deadman Function

In order to issue control commands, the button integrated into the joystick must be pressed before the joystick is moved. The function then locks and remains effective until the joystick is back in the zero position. This avoids of potential risks through the unintentional actuation of the joystick.

## radiomatic® report – User Identification

The "user identification" function with the merlin® TUC enables a simple personalization of the radio system as well as the storage of all user profiles in the radio system. Safety relevant functions can be unlocked for authorized personnel only and unauthorized users can be protected from potentially dangerous situations. In addition the radio system can store all operating processes for each individual user as well as the respective operating time of the radio system. This data can be read from the radio system and shows how long the radio system was in use and how the individual operators used the various functions of the radio system.

## Enabling Switch

The two-step enabling switch provides enhanced safety during maintenance and service work on or in the machine as well as for applications with multiple users. In order to transmit control commands to the machine, the operator has to keep the switch pushed into the first step. Only then are the other operating elements activated. If the operator releases the button or pushes it into the second step (e.g. as the result of a cramp), all machine functions are immediately stopped. With this, the operator is protected from dangerous unintended movements of the machine in case he should lose consciousness or no longer has control over the transmitter.

If an application is controlled by more than one operator, movement commands can only be performed if all operators keep the enabling switch pushed into the first step.

## Vibration Alarm

With the vibration alarm, the operator can be informed of an impending need to change the battery and/or potential dangers on the machine through the vibration of the transmitter. This information can be for example pre-warnings for high wind speeds or threatening excess crane loads.

## Front Panel Lighting

With the front panel lighting potential dangers resulting from incorrect operation, based on poor visibility, can be prevented. The operator simply switches on multiple LEDs, which are integrated into the rollover bar, with a switch or button on the transmitter.

## Shut-off on Implausible Control Commands

The automatic shut-off will activate after a sequence of multiple questionable movement commands, for example if the operator moves the joystick successively in different directions in an irregular manner. This function protects the operator and the whole work environment from potential dangers as well as the machine from wear resulting from rapid and erratic movements.

Depending on the ordered version this function can operate in three different ways:

- The complete radio system is shut down.
- Safety-relevant functions are deactivated.
- A previously defined function (e. g. crane horn) is activated.

To deactivate the function, press the start button until the status LED flashes green. Then the transmitter is ready to operate again.

## Micro Drive

With the micro drive function the speed of the machine is limited to a preselected level. Even at full movement of the joystick/linear lever, the operator can not exceed this speed limit. In this manner demanding drive maneuvers can be managed and inexperienced users can be protected from potential dangers that can result from "speeding".

## Orthogonal Drive (Electronic Cross Gate)

With the orthogonal drive function dangerous situations, caused by unintentional diagonal movements are being prevented. The operator will have to return the joystick back to zero position before another directional command can be activated. This function is suitable for example for situations where the operator has to make precision commands in confined areas. Diagonal movements are not possible.

## Frequency Management

### Fixed Frequency

If the identification plate in the battery compartment of the transmitter shows a frequency value (e.g. 433,500 MHz), the transmitter operates with a fixed frequency.

Please contact your service department if the frequency has to be changed because the radio channel is already assigned to another user.

### Manual Frequency Switching

If the identification plate in the battery compartment of the transmitter shows the label **man**, the transmitter features manual frequency switching.

This function can be used to change the radio channel during radio operation.

Actuate the start button until an acoustic signal sounds. Then release the button.

Please contact your service department if all available frequencies are occupied.

### radiomatic® AFS

If the identification plate in the battery compartment of the transmitter shows the label **AFS**, the transmitter is equipped with radiomatic® AFS (Automatic Frequency Selection).

When activating the transmitter radiomatic® AFS will check if the present radio channel is free. If the radio channel is occupied, the system automatically finds and saves a free radio channel.

If the radio channel currently in use is occupied by another radio control system, you must switch the transmitter off and on again in order to allow radiomatic® AFS to switch to a free radio channel.

The radiomatic® AFS option also includes the manual frequency switching function.



#### Note:

If radiomatic® AFS is to perform optimally, all the other radio systems in the immediate working environment (e.g. the factory hall or building site) should be switched on before starting to use the radio system for the first time. This allows radiomatic® AFS to detect automatically which radio channels are already being used in the working area, and thereby to choose a suitable free channel for its own use.

In addition, when switching the radio system on for the first time, the user should make sure that his distance from the radio receiver and from the machine is a realistic reflection of the working situation.

### radiomatic® AFM

If the identification plate in the battery compartment of the transmitter shows the label **AFM** the transmitter is equipped with radiomatic® AFM (Automatic Frequency Management).

radiomatic® AFM detects available radio channels constantly. If the radio channel currently in use is occupied by another radio control system, radiomatic® AFM switches automatically to a free radio channel.

## DECT

DECT technology is an extremely convenient method for an uninterrupted radio control without frequency conflicts. The operator always works on a free radio channel and does not need to make manual settings.

### 2.4 GHz technology

2.4 GHz technology works with automatic frequency coordination and thus ensures interruption-free working in a room with many radio users. Manual frequency coordination is not necessary. With the worldwide frequency band, 2.4 GHz technology can be used all over the world.

## Catch-Release

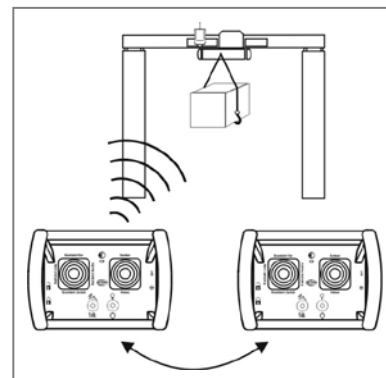
Via the Catch-Release option two or more transmitters can control a machine alternately.

When the receiver is switched on, the machine can initially be controlled via any associated transmitter. Once the receiver is taken over by one transmitter, the other transmitters no longer have access.

### Take over machine

1. Switch the transmitter on.
2. Enter the "Catch" command on the transmitter and actuate the start button.

The access rights for the machine remain with that transmitter until the "Release" command is issued by that transmitter.



### Release machine

1. Enter the "Release" command on the transmitter.
2. Switch the transmitter off.

The access rights for the machine are cancelled. Machine control can be taken over by another transmitter.

### Operating Example:

Transmitter 1 has taken over the machine. Transmitter 2 is to be given control.

1. Enter the "Release" command on transmitter 1.
2. Switch transmitter 1 off.
3. Switch transmitter 2 on.
4. Enter the "Catch" command on transmitter 2 and actuate the start button.

Transmitter 2 now has sole access to all machine functions.



### Notes:

- If a receiver has already been adopted by a transmitter can be displayed via a lamp on the machine.
- If the operating voltage of the receiver is disrupted, the receiver has to be caught by the transmitter again.
- If the transmitter is deactivated without the command "Release" having been issued, the other transmitters have no access to the receiver. In this case, deactivate all transmitters paired with the receiver and shortly disconnect the operating voltage from the receiver. This will reset the system to the starting condition described above.
- Always activate the "catch" command after the radio connection has been disrupted in order to maintain the connection of your radio transmitter to the selected radio receiver(s).

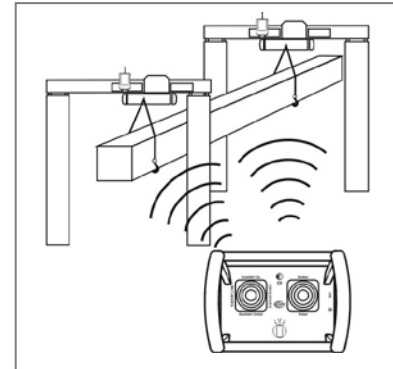
## Tandem Operation

### Tandem Operation T1

The radio system consists of 1 transmitter and 2 receivers for 2 machines. The transmitter can control the machines individually or in parallel.

The machines are selected at the transmitter via a rotary switch:

- A** only machine A
- A+B** machine A + machine B
- B** only machine B



### Tandem Operation T2

The radio system consists of 2 transmitters and 2 receivers for 2 machines. Both transmitters are master transmitters and can control the machines individually or in parallel.

During normal operation transmitter 1 controls machine A and transmitter 2 controls machine B. In order to be able to switch to machine B or A+B at transmitter 1, for example, the key must be removed from transmitter 2 and inserted in transmitter 1.

The machines are selected at the transmitter via a rotary switch:

- A** only machine A
- A+B** machine A + machine B
- B** only machine B

**Operating Example:** Control of machine A + B via transmitter 1.

1. Switch transmitter 1 and 2 off and remove the key from transmitter 2.
2. Insert the key from transmitter 2 in transmitter 1.  
Machine selection via transmitter 1 is activated.
3. Turn the rotary switch of transmitter 1 to A+B.
4. Switch transmitter 1 on and actuate the start button.

The radio system now operates in tandem mode.



#### Warning:

For safety reasons, it is imperatively required that only one key is available for each transmitter. The spare key must be stored at a superior, authoritative position and only be handed out in clarified cases.



## Tandem Operation TM/TS

The radio system consists of 2 transmitters and 2 receivers for 2 machines. One transmitter is a master transmitter and can control the machines individually or in parallel. The other transmitter is a slave transmitter and can only control machine B.

In order to be able to switch to machine B or A+B at the master transmitter, the key must be removed from the slave transmitter and inserted in the master transmitter.

The machines are selected at the transmitter via a rotary switch:

- A** only machine A
- A+B** machine A + machine B
- B** only machine B

**Operating Example:** Control of machine A + B via master transmitter.

1. Switch master and slave transmitter off and remove the key from slave transmitter.
2. Insert the key from slave transmitter in master transmitter.  
Machine selection via master transmitter is activated.
3. Turn the rotary switch of master transmitter to A+B.
4. Switch master transmitter on and actuate the start button.

The radio system now operates in tandem mode.



**Warning:**

For safety reasons, it is imperatively required that only one key is available for each transmitter. The spare key must be stored at a superior, authoritative position and only be handed out in clarified cases.



## Catch-Release-Tandem Operation

With the Catch-Release-Tandem Operation two or more transmitters can control several machines alternately.

Each machine is equipped with a receiver that can receive and monitor all transmitter frequencies. After activating the receivers all transmitters have equal access to the radio control system.

### Take over machine

1. Switch the transmitter on.
2. Turn rotary switch on the transmitter to the respective position.
3. Enter the "Catch" command on the transmitter and actuate the start button.

The transmitter with control over the machine(s) retains the access to the receiver until the operator has issued the "Release" command.

### Release machine

1. Enter the "Release" command on the transmitter.
2. Switch the transmitter off.

The access rights for the machine(s) are cancelled. Machine control can be taken over by another transmitter.

### Operating Example:

Transmitter 1 has taken over machine A. Transmitter 2 is to be given control over machine A+B.

1. Enter the "Release" command on transmitter 1.
2. Switch transmitter 1 off.
3. Switch transmitter 2 on.
4. Turn rotary switch on transmitter 2 to A+B.
5. Enter the "Catch" command on transmitter 2 and actuate the start button.

Transmitter 2 now has sole access to all machine functions.



### Notes:

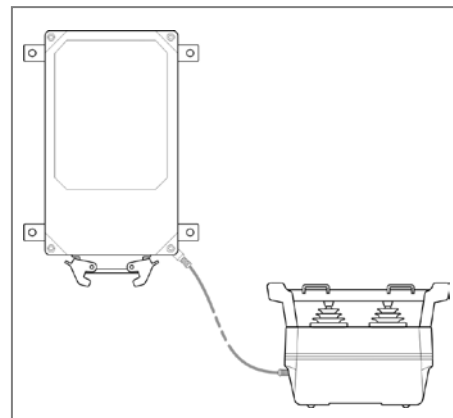
- If a receiver has already been adopted by a transmitter can be displayed via a lamp on the machine.
- If the operating voltage of the receiver is disrupted, the receiver has to be caught by the transmitter again.
- If the transmitter is deactivated without the command "Release" having been issued, the other transmitters have no access to the receiver. In this case, deactivate all transmitters paired with the receiver and shortly disconnect the operating voltage from the receiver. This will reset the system to the starting condition described above.
- Always activate the "catch" command after the radio connection has been disrupted in order to maintain the connection of your radio transmitter to the selected radio receiver(s).

## Cable Control

With a cable you can generate a direct data connection between the transmitter and receiver. The radio transmission is disabled. At the same time, the power supply of the transmitter is provided through the cable, as well.

### Connecting the cable

1. Switch the transmitter off.
2. Remove the screw lock on the transmitter and receiver.
3. Connect the transmitter and the receiver with the cable. Ensure that the connector is locked.
4. Switch the transmitter on.



### Notes:

- If you connect the cable while working with the system, the transmitter will switch off automatically. Activate the transmitter as describe in the chapter “Operation” to switch to cable operation.
- When the system is in cable mode the transmitter will receive the supply voltage from the receiver, i.e. the transmitter can be used without the battery.
- If you disconnect the cable from the transmitter and receiver, the system will switch off automatically. Activate the transmitter as describe in the chapter “Operation” to switch to radio operation.

## RF-amplifier

If the transmitter is equipped with an RF-amplifier, please refer to the transmitter wiring diagram. There you can also find the instructions on how to activate the RF-amplifier.

## Utilization of Button ① as Shift Key

The RPM+ and RPM– buttons have a dual function.

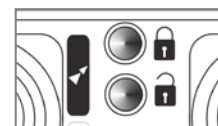
If the button ① is kept pressed and the RPM+ resp. RPM– button is also activated, the Motor Start resp. Motor Stop command will be output.

## Pre-selection of Trolley or Hoist

The operator is able to select the trolley or hoist that he wishes to control. It is also possible to simultaneously control both trolleys/hoists, for example in order to transport particularly long or wide loads.

## Feedback by LED

Using this function, system or machine data can be displayed on the transmitter by LEDs.



## Bank Switch

By switching operating levels via rotary switch or push button, the operator can choose between different operating levels. The number of available commands can be multiplied, even for small transmitters.

## Rotary Switch for Pre-selected Speed

Using the rotary switch it is possible to choose between four maximum machine speeds, which are set in accordance with the customer's requirements.

The symbols for the speed adaptation have the following meanings:



= maximum speed 100 %



= maximum speed, limited to 75 %



= maximum speed, limited to 50 %



= maximum speed, limited to 25 %

## Transmitter Key Up

With the transmitter key up function, radio commands are only transmitted at the touch of a key and the transmitter will automatically be switched off after 7 seconds of non-use. For example, self-monitoring gates can thus be opened or closed by several operators.

During longer breaks the transmitter must be switched off by pressing the STOP switch.

The "transmitter key up" function also saves battery power.



### Caution:

The transmitter key up function does not relieve the operator of his responsibility to turn off the transmitter with the STOP switch when not in use.

## radiomatic® CPS

radiomatic® CPS (= Continuous Power Supply) enables a battery exchange without interrupting power. For this, the transmitter is equipped with two battery compartments or an additional, integrated battery. By means of two LEDs, the operator can at all times see which battery is in use or if a battery needs to be charged. If a battery has to be charged, the process automatically switches to the battery in the second compartment or the integrated battery. The radio system remains active. Thus the feature is perfect for applications where long and continuous crane or machine operations are required.

## radiomatic® iBAR

radiomatic® iBAR stands for a newly developed, intelligent over-roll bar. With this, the function range of the control can be considerably expanded.

radiomatic® iBAR can be configured with diverse additional operating elements, e.g. push buttons.

In addition, LCDs for data indication can be integrated.

## Slewing Gear Release



### Note:

Whenever the command "slewing gear release" is actuated by means of the radio control, it is important that the respective check be made.

Due to the above, a clearly visible indicator lamp should be installed on the machine.

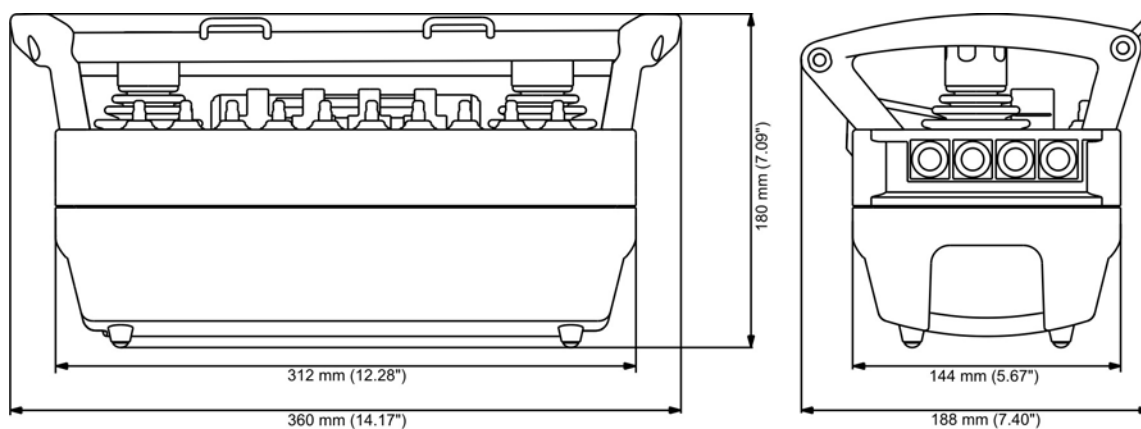
## Technical Data

Max. number of control commands	-
Unique system addresses	Over 1.000.000 combinations
Supply voltage	6 V
Safety function	E-STOP: Performance Level d, category 3 according to EN ISO 13849-1:2015
Frequency ranges <sup>2</sup>	405 – 475 MHz <sup>1</sup> , 865 – 870 MHz, 902 – 928 MHz, 1210 – 1258 MHz <sup>1</sup> 2.4 GHz: 2402 – 2480 MHz DECT: 1790 – 1930 MHz
Channel spacing	12.5 / 20 / 25 / 50 / 250 kHz 2.4 GHz: 1 MHz DECT: 1.728 MHz
Antenna	Internal Option: external
Battery type	BA213020 (NiMH)
Battery capacity	2 x 2100 mAh
Continuous operating time	Approx. 12 h
Operating temperature range	-20 °C ... +70 °C (-4 °F ... +158 °F)
Housing material	Glass-fiber reinforced plastic / PA6 GF30
Dimensions	360 x 188 x 180 mm (14.17 x 7.4 x 7.09 inches)
Weight (incl. battery)	Approx. 3.0 kg (6.61 lbs.)
Protection class	IP65

<sup>1</sup> Not all frequency ranges available.

<sup>2</sup> Some versions are not intended for use in the USA. Please contact Sales at HBC-radiomatic GmbH to find out which version is available for the USA.

## Dimensions



## Troubleshooting



**Note:**

Please check the functions using the cabin or cable controls first!

Problem	Possible Cause	Remedy
Transmitter does not react when switched on.	<ul style="list-style-type: none"> <li>- No power.</li> </ul>	<ul style="list-style-type: none"> <li>- Check battery contacts for damage or contamination.</li> <li>- Insert a fully charged battery into the battery compartment.</li> <li>- Recharge battery.</li> </ul>
Low-power indication after minimal operating time.	<ul style="list-style-type: none"> <li>- Battery contacts are contaminated or damaged.</li> <li>- Battery not charged.</li> <li>- Battery defective.</li> </ul>	<ul style="list-style-type: none"> <li>- Check battery contacts for damage or contamination.</li> <li>- Recharge battery.</li> <li>- Ensure that recharging process runs correctly.</li> <li>- Check transmitter functions using a fully charged or replacement battery.</li> </ul>
The display in the transmitter flashes green but it is not possible to effect control commands.	<ul style="list-style-type: none"> <li>- Receiver has no voltage.</li> <li>- No radio communication.</li> <li>- "Crane On" command has not been given.</li> </ul>	<ul style="list-style-type: none"> <li>- Check the connecting cable to the receiver.</li> <li>- Check the functions via the LEDs in the radio status panel of the receiver.</li> </ul>
Some commands are not carried out.	<ul style="list-style-type: none"> <li>- Receiver defective.</li> <li>- Interruption in the connecting cable to the machine.</li> </ul>	<ul style="list-style-type: none"> <li>- Check if all connecting cables and cable junctions are tight.</li> </ul>

If none of the measures mentioned resolve the problem, then please contact your service technician, distributor or HBC-radiomatic.

## Maintenance

The radio control system is virtually maintenance-free. Please observe the following points:

- Check the STOP switch functionality at regular intervals. Dirt deposits on the switch can hinder the mechanism and impair the function.
- Check the rubber bellows or rubber seals of the operating elements at regular intervals for leak-tightness. Replace immediately if cracks appear since the penetration of dirt and humidity may damage the function of the operating elements.
- Never use a high-pressure cleaner or sharp or pointed objects to clean the transmitter.
- Charge and discharge transmitter batteries regularly.

## In the Event of a Fault



### Warning:

Never operate a machine with a faulty or defective radio control system!

- Never try to repair the electronics of the radio control system! Opening the transmitter or receiver housing terminates the manufacturer warranty.
  - Send any defective or faulty equipment to your local distributor or to the manufacturer. They are experts and have the necessary know-how and OEM spare parts.
  - Always send in the complete radio system (transmitter, receiver, batteries, battery charger, connection cables, and other equipment) and attach a detailed fault description.
  - Do not forget to enclose your address and telephone number so that we can get in touch with you quickly if necessary.
- To avoid damage during transport, use the original packing supplied with the radio control system; otherwise pack securely. Send the consignment to your distributor or to the following address:  
HBC-radiomatic, Inc.  
1017 Petersburg Road  
Hebron, KY 41048, USA  
Telephone: +1 800 410-4562  
Fax: +1 866 266-7227
- Should you decide to personally return a defective radio system to your distributor or HBC-radiomatic, Inc., then please make an appointment first.

**For an overview of our worldwide service and sales contacts, please visit our website [www.hbc-radiomatic.com](http://www.hbc-radiomatic.com) under "Contact".**