



Manitowoc Boom Trucks

Radio Remote Controls - BMS GA610

For C & S Series Cranes

• Operator Manual

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Operating Manual

**For Radio Remote Controls
On Crane Systems**

BMS
System GA 610



CE

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Please place serial number here !
Please keep for future reference !

Date of Issue:

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1. Safety Requirement

1.1. Safety

1.1.1. Safety of the Radio Remote Control System

This radio remote control system is equipped with electronic and mechanical safety features. Processing of control signals transmitted from other transmitters is not possible, since transmission coding is set only once.

Risks can occur from improper operation or use, and these may include:

- Personal injury or death of the operator or other persons.
- Damage to the machine, other equipment or material assets.

All operators of this equipment must be qualified, trained and must follow precisely the operating instructions of this manual.

1.1.2. Safety Information

The following notes are used in this manual:

WARNING!

This warns of the imminent danger of life threatening accidents and serious injuries which may result if operating instructions are ignored or disobeyed.

ATTENTION!

This warns of possible damage to the machine which may result if operating instructions are ignored or disobeyed (which can also result in loss of any warranty).

IMPORTANT!

This draws attention to features or information which will allow for easier operation.

1.1.3. Possible Sources of Danger

This System makes remote control via radio signals possible. The transmission of control commands, however, can take place around obstacles and out of direct sight of operators. Therefore:

1. Switch "off!" the transmitter and remove the key if the unit is placed any distance away from the operator. The key has to be switched "off" (to the "0" position).
2. Disconnect the power supply before any assembly, maintenance or repair work is done.
3. Never remove or in any way alter any of the safety features of this system.

1.1.4. Authorised Operators

Always review the operating manual of any machine to be controlled by radio remote control!

The key must be removed from the transmitter when the transmitter is placed any distance away from the operator in order to reduce the potential for unauthorised operation.

The operating authority, owner or management must make the manual accessible for the operator and has to ensure that the operator has carefully read and fully understood each section of this manual.

1.1.5. Safety Measures to be Taken in the Work Area

The operator must ensure that the work area in which the radio remote control unit will be operated is free from trip - hazards or other potential safety hazards (i.e. ensure work area is a "non - slip" area).

Operate the transmitter only with the accompanying carrying belt.

1.1.6. Protective Features

The machine functions can be stopped either by:

1. Pushing the emergency stop button on the transmitter control panel (EMERGENCY STOP!).
2. Turning the transmitter key switch to the "off" position (machine function will stop approximately 0.5 seconds (450 ms) after the switch is turned to the "off" position).

Additional safety features include the protective guard around the upper section of the transmitter housing. This guard helps to protect against accidental activation of controls and unintentional operation.

These safety features are included for the operator's as well as other person's protection within the work area.

WARNING! Safety features must not be removed or modified in any way.

1.1.7. Reaction in Emergency Situations

1. If there is an emergency, press immediately the red emergency stop (EMERGENCY STOP!) push - button (see picture).
2. After the emergency stop push - button has been pressed, follow carefully the instructions in the machine's operating manual.

Type GL



Type Nova 6



EMERGENCY – STOP – PUSH - BUTTON

2. Operating Instructions

WARNING! Operators are strictly forbidden to use the radio remote control unit unless they have carefully read and fully understood this operating manual. Special attention must be given to the safety instructions in this manual!

2.1. Battery Handling

Each HETRONIC radio remote control system will be delivered with two fully charged batteries. One of them will be inserted into the battery compartment located on the bottom of the transmitter. The operating time of one charged battery is approximately 8 hours.

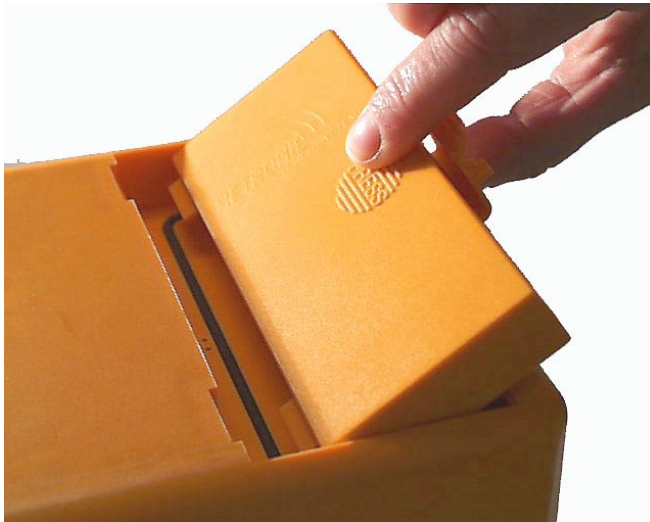
2.1.1. Inserting the Battery

Ensure that the battery compartment is completely clean, as dirt might cause contact problems. Insert the battery with both guide pins in the corresponding guide bars of the battery compartment. Now press the battery on the marked spot until it latches into its compartment.

Type Nova:

Insert the battery with both guide bars on the lower side of the battery in the corresponding guide slots of the battery compartment. Now press the battery until it latches into its compartment.

Type GL



Type Nova



2.1.2. Changing the Battery

The battery voltage will be controlled continuously by the transmitter's electronic.

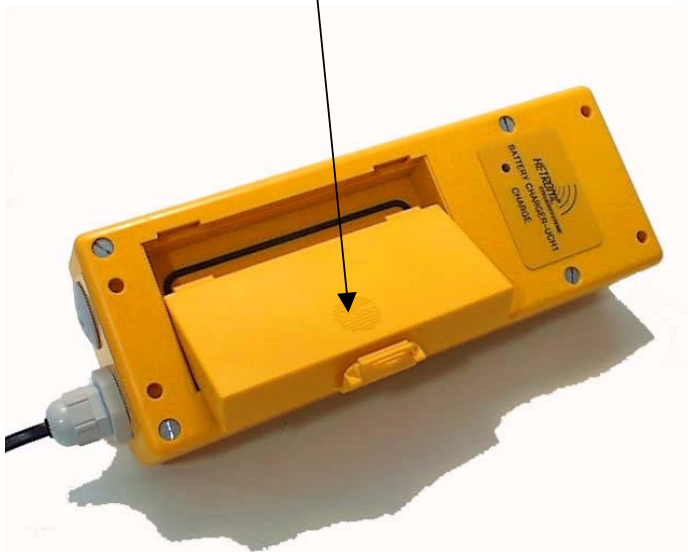
An acoustic interval signal will be heard in the transmitter when the capacity of the transmitter battery is nearly exhausted. When the signal is heard the following steps must be immediately taken:

- Position the machine into a safe place or safe condition within 30 seconds after hearing the signal.

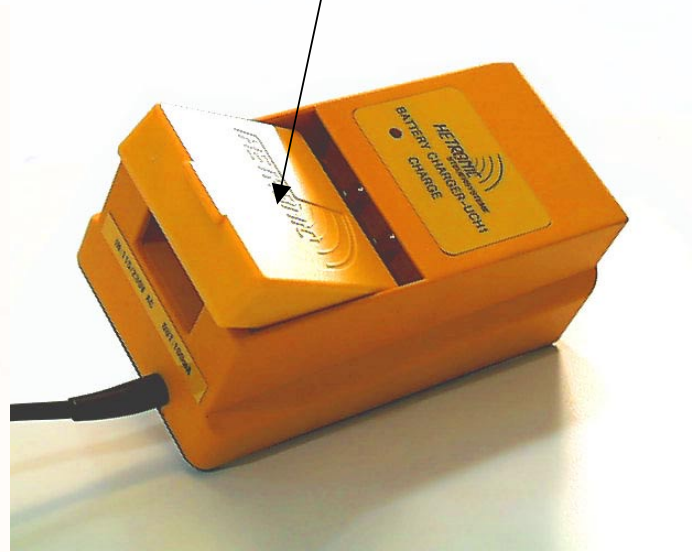
WARNING! The transmitter will switch to the Emergency Stop condition after 30 seconds!

- Switch the transmitter "off" by turning the key switch to the "0" position.
- Remove the discharged battery by pushing it slightly forward and lifting it up and out of the battery compartment.
- Insert a fully charged battery.
- Continue like described in point 2.2.2. "starting the radio remote control".
- The radio remote control is again ready for operation.

Battery – type GL



Battery – type Nova



2.1.3. Charging the Battery

WARNING!

Danger of Explosion!

Use only HETRONIC original parts. If no original HETRONIC parts are used there could be a danger of explosion!

An explosion may result in the release of harmful gases or fumes and / or flying debris. This may result in injury or death of the operator or others present within the work area.

Your HETRONIC radio remote control system will be delivered with fully charged batteries, that means your radio remote control system is immediately ready for operation.

Battery Charging Instructions:

- Type GL: Insert the battery with both guide pins in the corresponding guide bars in the battery compartment of the battery charger.
Type Nova:
Place the battery with both guide bars on the lower side of the battery in the corresponding grooves of the battery charger's battery compartment.
- Now press the battery on the marked spot until it latches into its compartment.
- The green LED on the charger stays lit during the charging process.
- When the battery is fully charged, the LED starts flashing.
- Insert the second battery into the battery charger to ensure that there is always a fully charged battery available.

2.1.4. The Battery Charger

The battery charger operates with an operating voltage of 12 VDC / 24 VDC. A green LED indicates the beginning of the charging process. After a charging time of approximately 3,5 hours (type Nova), 6 hours (type GL) the flashing green LED indicates that the charging process is finished. The charger recognises automatically when the battery is fully charged. When it is fully charged, the charger switches to a "trickle" charging condition. It does not matter whether the battery is discharged or partially charged, as the battery charger automatically regulates the charging process.

To reach a long operating time of the batteries, you should charge the battery only when an acoustic interval signal is heard from the transmitter, which indicates that the capacity of the transmitter is nearly exhausted.

IMPORTANT!

Rechargeable accumulators are hazardous waste!

Contact an expert company for the waste disposal and exploitation. Defective accumulators can be disposed by HETRONIC.

2.1.5. Indication for the Battery Charger's Installation

The charging unit should be installed in the vehicle and connected directly to the battery via a fuse. This means that it should also be operational when the ignition is switched off. The charging unit's current consumption is so slight that effects on the vehicle's battery are minimal. The system is protected against polarity reversal. Ensure that the charging unit will be operated on dry places only.

2.2. To Begin Operation

The safety check as described in the following paragraphs 2.2.1. and 2.2.2. has to be completed before the radio remote control system is activated. The safety check must be performed at least once a day, before the start of any operation and at all shift changes.

IMPORTANT!

A transmitter drawing is enclosed to this operating manual. Transmitter layout and inscription vary according to the customer's requests. In most cases, however, they are identical to the inscription of the present control. The only difference is that the machine is controlled without a cable control. Consult the machine manufacturer's manual and the transmitter drawing additional to inform about the arrangement of the transmitter's operating elements and their corresponding functions. The following description refers to the control elements and peculiarities of the radio remote control.

WARNING!

**Danger to personnel and property! The operator must read and fully understand the emergency stop function outlined in the machine manufacturer's operating manual before beginning any operation!
Test the EMERGENCY STOP function as described in the machine manufacturer's operating manual before beginning any operation!**

2.2.1. Optical Check-up

Always check the transmitter for any physical damages before any operation.

- Do all safety features exist and are they in a good condition?
- No broken parts anywhere?
- All rubber cuffs and push button caps without rips?

**Never operate a transmitter which has such damages!
Eliminate the faults immediately!**

2.2.2. Safety Check-Up and Starting the Radio Remote Control

Check list for the first start of operation (this checklist must be carefully followed before beginning any operation!)

- Keyswitch on the transmitter in position "0" (off), emergency stop push - button in position "0" (off), (pull it out – type GL), (turn it right – type Nova).
- Insert a charged battery into the battery compartment located on the bottom of the transmitter (see section 2.1.1.).
- Switch the transmitter on by turning the keyswitch to the position "I" (on) and a short acoustic signal will be heard.
- Wait for the second acoustic signal (approx. 3 seconds).
- The LED on the transmitters control panel will begin to flash.
- Now push the green push button "S1" on the transmitter.
- Check the deflection of the control elements. Do the machine functions correspond with the transmitter functions?
- Now check the EMERGENCY STOP function as described in the machine manufacturer's manual. However use the EMERGENCY STOP push - button on the transmitter instead of the EMERGENCY STOP switch on the machine.
- Push the EMERGENCY STOP now. Make sure that no function can be controlled after pushing the EMERGENCY STOP push - button.
- Is the safety check successful and the EMERGENCY STOP function operates perfectly?
- Pull out the EMERGENCY STOP push - button.
- Push the green push - button "S1" (start) on the transmitter.
- Both the radio remote control and the machine are now ready for operation.

WARNING!

Switch the machine "off" immediately should there be a fault or any problems with the safety check. Inform your dealer at once to repair the system. Never operate a machine when the EMERGENCY STOP function does not operate properly. Danger to personnel and property by non - observance of this regulation. All measures which do not confirm with this regulation can lead to the loss of the operating permission and your warranty.



Type GL



Type Nova

Starter – Push – Button “S1”

2.3. Speed Control

The Radio Remote Control System BMS is equipped with a twofold speed control. It is possible to select a speed range via a switch. You can choose between a maximum adjustable power with switch position “rabbit” and a lower one with <70% “snail”.



Type GL



Type Nova

Speed Control

2.4. Proportional Functions

The proportional functions and speed ranges are pre-adjusted according to the valve - types by HETRONIC.

Your dealer can refer to the basic adjustments at any time.

Only the crane manufacturer, his dealer or his service is allowed to make an individual adjustment of each function and direction as well as each speed range.

Attention!

All relay and proportional outputs are accessible on the connection plug. Therefore it is not necessary to open the receiver! Any unauthorised opening of the receiver will lead to the loss of the manufacturer's warranty.

2.5. Optical Displays and Acoustic Signals

Your system has some different optical displays and acoustic signals, which show the current working status of your radio remote control system.

2.5.1. Transmitter

Switch on the transmitter by turning the key-switch. After a self test routine, the green Signal-LED on the transmitter's control panel starts to flash and two short acoustic signals sound.

An acoustic-interval signal indicates that the battery is nearly discharged (see 2.1.2. changing the battery).

2.5.2. Receiver

There are four LEDs on the right side of the receiver. They indicate whether the system works properly or whether there are any malfunctions.

The green "Signal" LED starts flashing when the transmitter is turned "on" and valid data are received.

The yellow "Normal" LED starts flashing simultaneously with the green LED.

The red "Error" LED starts flashing when the receiver is in an EMERGENCY-STOP condition. This can be caused by wrong start-procedure, defective parts in the self-monitoring EMERGENCY-STOP circuitry a.s.o..

The yellow "Operation" LED starts flashing approximately 3 seconds after supplying the receiver with power.

The red "Error" LED has to flash in the same intervals as the "Operation" LED.

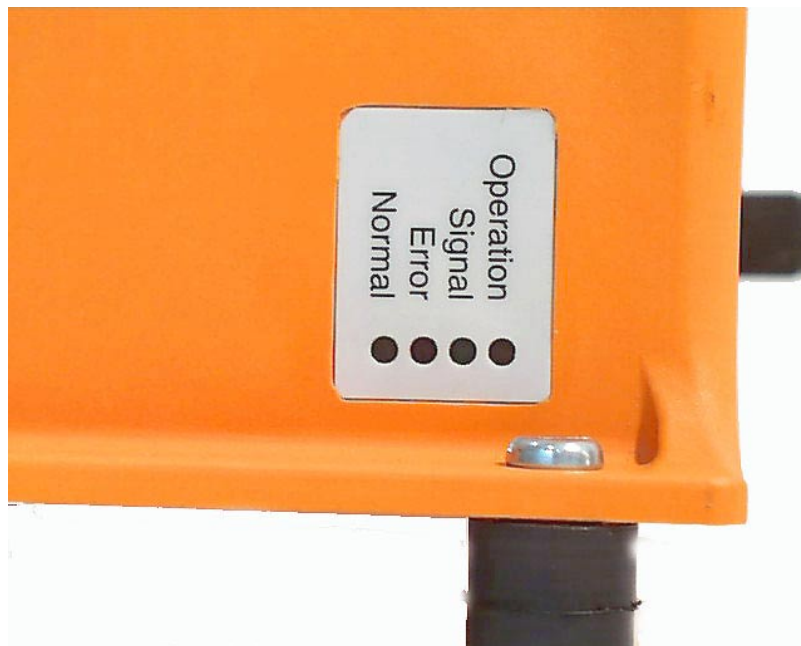
The red "Error" LED must stop flashing after the start-procedure and the yellow "Normal" LED must begin to flash.

Attention!

After pressing the start-button for approximately 1 second, the red "Error" LED should stop flashing or not stay lit; if not, there is a malfunction in the system.

In this case inform your dealer or his service.

Do not open the receiver without permission – you might lose your warranty!



2.6. Frequencies and Addresses

According to the type, each HETRONIC radio remote control system contains a registration – free RF – unit CS 434 or CS 458, that consist of a transmitter RF – unit and a receiver RF – unit.

Attention!

Operation of the RF – units CS 434 and CS 458 is registration – free and there are no licensing requirements. The final stage of the RF – module could be destroyed by operating the transmitter without antenna.

It's not allowed to change the frequency or the 16 - bit address, it is presetted by HETRONIC ex works, because there exist any risks and danger of personal- and material damages about transmission influence. All measures which act contrary to this guideline can lead to the loss of your warranty and your operating permission.

3. Maintenance

The business owner has to make sure that the devices for wireless transmission of control signals are examined regularly by an expert, but at least once a year.

Attention!

An expert is a person who has, due to his professional training and experience, a sufficient knowledge in the field of wireless transmission of control signals. He/she is familiar with the normal regulation for safe working conditions, accident preventions, guidelines and general regulations of technology of the respective country (CE – regulations, technical regulations of the other members of the European Community or other countries of the agreement of the European Economic Area) in a way that he can judge about the safety working condition of wireless transmission of control signals.

4. Disposal

Important!

Avoid environmental pollution! Electronic equipments and parts of them are hazardous waste. This counts for rechargeable accumulator – packs especially. Commission a professional venture with the utilization and the disposal.

Defective accumulator – packs can be disposed by HETRONIC directly.

5. Technical Specifications

Model: (Base Board Modul System) BMS
System: GA 610

1. General Data

Frequency: 70cm Band
Range: ca. 100m (approx. 330ft.)
Address: 16 – Bit 65,536 possibilities
Operating temperature: -20° to +70°C -4F to 158F
Transmission rate: 4800 Baud
Hamming distance: 4

2. Receiver

Protection type: IP65
System: Synthesizer technology
Operating voltage: 12 to 24 VDC (-50% - +20%)
Decoding: Multiple bit scanning, self monitoring
Fuses: 7,5 Amp. / 80V car fuse.
Output: Intrinsically safe emergency stop with
two MOS – FET – Transistors, 12 digital-
outputs, potential free 250V / 8 A, 6
analogue-outputs,
2 speed ranges,
Static current: 260mA, Stand by
Antenna connection: TNC – socket
Measurements (approx. with
rubber buffer L x B x H): 265mm x 161mm x 111mm
Weight: 2,5Kg

3. Transmitter

Protection type: IP 65
Accumulator – Pack:
Type GL: 9,6V/700mAh (NiCd)
Type Nova 6L / 4K: 9,6V/300mAh (NiCd)
As option for Nova 6L / 4K: 9,6V/700mAh (NiMh)
Operating Time: Type GL: approx. 8h
Type Nova 6L/4K: approx. 4h
Transmitting Power: <10mW
Current rating, Self Test: approx. 75mA
Current rating, Transmission: approx. 83mA

Type GL:

| | |
|--|-----------------------|
| Measurements (with protection frame against accidental contact): | 300mm X 180mm x 180mm |
| Weight (incl. accumulator and belt): | 2,4Kg |

Type Nova:

| | |
|--|-----------------------|
| Measurements (with protection frame against accidental contact): | 230mm x 170mm x 106mm |
| Weight (incl. accumulator and belt): | 1,8Kg |

4. Battery Charger

| | |
|---------------------------|-----------|
| Operating Voltage: | 12 /24VDC |
| Charging Current: | |
| Type GL: | 200mA |
| Type Nova 6L and Nova 4K: | 100mA |
| Open-Circuit Voltage: | 15 – 22V |

6. Exhibit A

Explanation of Installation and Safety Test

IMPORTANT!

This form has to be amended and signed by the person who is responsible for installation.

HETRONIC takes on not any ensuring for the correct installation of the radio remote control system. The operator must ensure that the radio remote control system and the crane / machine operate together and that measures and safety regulations will be kept (see section 1. and 2.).

Crane data:

Manufacturer:
Model Number:
Serial number:
Year of production:

Radio remote control data:

| | |
|----------------|----------|
| Manufacturer: | HETRONIC |
| Model: | BMS |
| System type: | GA 610 |
| Serial Number: | |

I / We installed the radio remote control system, performed the safety test and inspected the crane / machine. The appropriate instructions and rules of this machine type are followed

Place:
Date:
Company:
.....
.....
.....
.....

Name of the installation technician:.....

Signature:

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allowed with the express permission of HETRONIC.

Technical information subject to change.

Compiled by: Thomas Mende
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