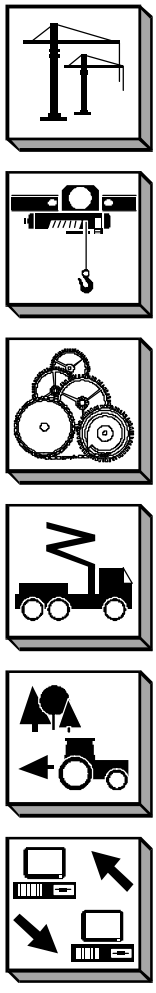
HBC – Radio Controls

CE

Radio Transmitter micron 4

Industrial



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1 Description

The micron 4 transmitter is designed to transmit command instructions for controlling industrial cranes and hoists as well as operating machines and plants.

Depending on the type and version selected, up to 24 control commands plus the integrated STOP commands are available to the operator.

A non-interchangeable system address ensures the functional safety of the radio control system when operating cranes or machines. This feature is particularly important when several cranes or machines are in use, for example in halls and shops. The system address is exclusively allocated to each HBC radio transmitter and its respective receiver.
It is not possible to activate crane or machine functions using a radio control system allocated to another crane or machine.

The radio control system consists of the micron 4 transmitter, two rechargeable NiCd batteries, a battery charger and a receiver with antenna. The receiver housing with integrated antenna is made of ABS plastic.

The micron 4 is a hand-held transmitter. The observance of handling instructions ensures operator and worker safety as well as preventing transmitter wear.

The transmitter is powered by 2 rechargeable batteries. The batteries and memory effect-free battery charger are included.

The transmitter has general telecommunications approvals. It is not necessary to have or to apply for a license to operate the micron 4 transmitter with the respective receiver. The transmitter must be operated in the 433,100 MHz to 434,750 MHz range or 869 MHz to 870 MHz bandwidth. The transmitter is equipped with < 10 mW (average) transmitting power.
Operating the micron 4 using a different frequency range or transmitting power requires the approval of the competent regulative authorities for telecommunication.

The following radio receivers may be used in conjunction with the micron 4 transmitter:

FSE 716 FSE 722 B FSE 735

Note:
The improper use, operation or deployment of the device renders the manufacturer guarantee void of any legal substance!

2 Safety Instructions

2.1 Pictographs

The following pictographs will be used throughout the present operating instructions :

Indicates a possible shock hazard

Contacting components under voltage may lead to death. Housing (e.g. hoods and lids) marked with this symbol may only be opened by qualified electricians after having disconnected the device from the mains supply (supply voltage, operating voltage or input terminal voltage).

Indicates safety relevant passages

You will find this pictograph as an indicator for occupational safety measures. The neglecting of such measures poses a serious hazard.
Always observe the instructions and be particularly attentive and careful.
Avoid any situations that could at any time be a danger to persons or machines.

Indicates important information

This symbol brings your attention to important information on how to secure a long serviceable life of the radio control system.
Pay attention to the comments and instructions given. Ignoring the information provided may permanently impair the reliability and operability of the equipment.

2.2 General Safety Instructions

Radio controls facilitate and increase the operating efficiency of cranes and machines. Nevertheless, the operator must thoroughly understand and be in a position to properly use a radio control system !

- Read the Operating Instructions Manual carefully and thoroughly before working with the transmitter for the first time !
- The operator undertakes to strictly adhere to the instructions and proceedings described in this manual, as well as to follow the general rules and regulations for worker safety and accident prevention. Ignoring any such instructions or regulations could pose a fatal threat to the operator or others.
- Keep this manual on location and readily available at all times!
- Only authorized and properly trained personnel may operate the transmitter.
- Anyone who is under the influence of drugs, alcohol or medication that has a detrimental effect on a person's reactions may at no time commission, operate, maintain or repair the transmitter.
- Before switching the transmitter on ensure that no-one is or can be endangered by the initiated operation.
- With the first signs of any malfunction related to the operative safety and reliability of the device, the operator must immediately shut down or not activate the transmitter. For the purpose of the present manual "shut down" implies :
  - switching OFF the transmitter,
  - storing the transmitter in a safe place and ensuring no unauthorized access,
  - de-energizing the receiver,
  - unplugging the connection cable on the receiver !
- Defects must be repaired and sources of interference must be removed immediately !
- A defective transmitter may only be repaired by qualified and competent personnel. Use only original HBC spare parts. The use of any other spares will render the technical inspectorate approval invalid as well as substantially impede operative safety.
- Observe all periodical tests and inspections that are required by law or recommended in the present operating instructions !
- When using the micron 4 transmitter always observe the regulations and instructions stipulated in the authoritative worker safety and accident prevention regulations (VBG 9)
  - The micron 4 transmitter has been manufactured in accordance with the regulations and guidelines stipulated in the German Trade Association's "Safety and Accident Prevention Regulations for Operating Cranes by Radio Controls" (VBG 9; ZH 1/547) and pr EN 12077-1.
  - The micron 4 transmitter has been tested and approved in accordance with EMC guidelines and complies with the authoritative standards for emitted interference and interference immunity.
- Use the transmitter cautiously and properly. In particular when using a transmitter to radio control a machine or crane for the first time.

2.3 Operator Safety Instructions

- Before beginning crane operation, position yourself so that you have a clear and complete overview of the working radius of the crane or machine.
- To operate, hold the transmitter securely in your hand. Use the optional wrist strap. Follow these instructions to ensure personal safety.
- Depending on your angle or position to the crane or machine, the transmitter control commands “trolley left” and “trolley right” appear to interchange ! It is essential that you take your bearings to the crane or machine into due consideration before operating equipment.
- In case of an emergency or any disturbances within the working range of the crane or machine, switch the transmitter OFF immediately by pressing the STOP pushbutton. Should the transmitter show signs of technical failure or breakdown, disconnect the radio control system immediately !
- Switch the transmitter OFF during breaks and after finishing work to avoid any misoperation of crane or machine by unintended activation of the operator controls.
  – These precautions are particularly important whenever changing your position or climbing over an obstacle.
- Never leave an activated transmitter unattended. The operator undertakes to follow and comply with the authoritative regulations for worker safety and accident prevention (e. g. VBG 9).

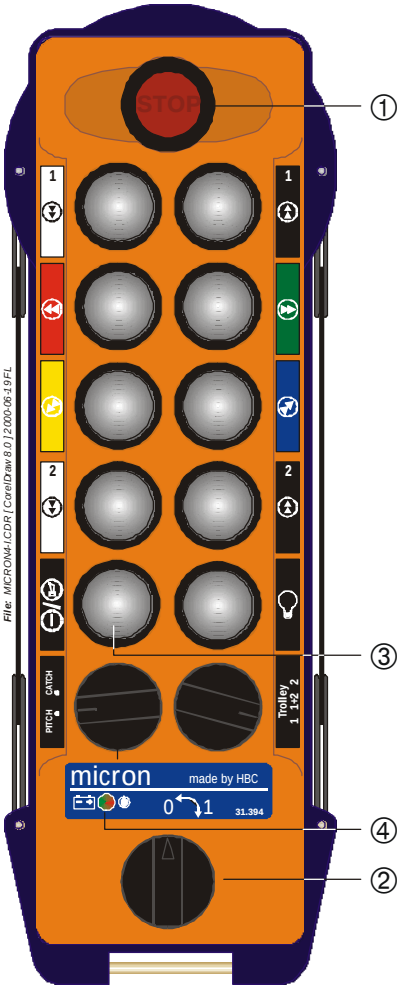
Note :

– In the event of an interruption of the radio link during a working cycle – what can occasionally happen – both transmitter and receiver automatically shut down (so-called "**compulsory switch-off**").
To reactivate the system release all operator controls, such as pushbuttons or momentary contacts, and allow the control elements to return to their zero position. Press the "ON/Horn" pushbutton. The system must be reactivated before the crane or machine can react to control commands ! This feature hinders any uncontrolled or unwanted crane or machine movement, should the radio link be interrupted.

– When operating a crane by means of a radio control system for the first time, you may miss the physical contact to the crane that you were used to in the operating stand. As you are no longer in the crane and can no longer sense the starting of the crane movements as distinctly, crane reactions will appear sluggish or dull.

3 Operation

1. Before commissioning the transmitter or initial operation, insert the FuB 3A battery into battery compartment at the back of the transmitter (inscription must be visible). The battery supplies the necessary working voltage (6 V DC).
2. Pull STOP pushbutton (pos. ①) to unlock.
3. Turn key switch (pos. ②) to the right (position "1").
4. Switch ON transmitter and crane or machine with "ON/Horn" (pos. ③) pushbutton. The **green LED** (pos.④) begins to flash, i.e. the transmitter is operable.



Important Information :

After switching ON the transmitter and before operating the crane or machine you must always :

– trigger the acoustic signal by pressing the button "ON/Horn (pos. ③). This warns all colleagues that the crane or machine is about to move;
– test the operativeness of the STOP pushbutton.

After switching on the transmitter the instrument indicates a successful radio link to the receiver when the red LED "HF/RF/H.F./HF" extinguishes and the green LED "Si" lights up (refer to control light panel on receiver). The radio control system is ready for use. The operator can now issue control commands using the transmitter control elements.

When the battery is nearly empty, the **red LED** (pos. ④) lights up or an acoustic signal sounds. The drained battery must be **immediately** replaced by a fully charged battery and then inserted into the battery charger for recharging (refer to chapter "Battery and Battery Charger" for further details).

Note :

The transmitter will automatically switch OFF within a few minutes if the operator fails to replace the drained battery.

Should the operator – intentionally or unintentionally – switch OFF the transmitter with the STOP pushbutton, proceed as follows to restart the transmitter :

1. Pull STOP pushbutton (pos. ①) to unlock.
2. Switch transmitter ON with the "ON/Horn" pushbutton (pos. ③).

Note :

Always use the key switch (pos. ②) to switch the transmitter ON or OFF. Do **not** use the STOP pushbutton !

For safety reasons we have equipped the transmitter with an automatic switch-OFF. The transmitter is automatically put out of circuit after 15 minutes of non-use.
The automatic switch-OFF also saves battery power.

Note:

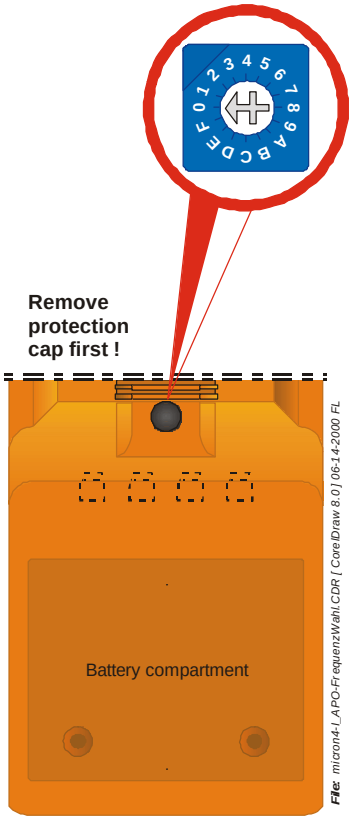
The automatic switch-OFF does not relieve the operator of his responsibility to turn OFF the transmitter when not in use !
The micron 4 can be reactivate by means of the "On/Horn“ pushbutton (refer to illustration on page 8, pos. ③).

Scanner (Frequency Selector)

The transmitter and receiver are equipped with a "Scanner" (frequency selector) operating mode with 4 radio frequencies (refer to wiring diagrams).

In the event that a particular channel is being used by another operator, the transmitter can be programmed to a different channel by means of the rotary selector switch located inside the transmitter. The receiver scanner automatically adjusts the receiver to the selected radio frequency.

0 - 3 = RF channel 1-4 with APO
4 - 7 = RF channel 1-4 without APO
8 - B = RF channel 1-4, customer, with APO
C - F = RF channel 1-4, customer, without APO



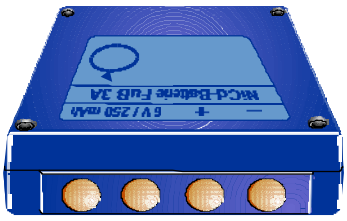
Changing radio control system frequencies :

1. Switch OFF transmitter with "OFF" switch (turn switch to “0” position).
2. Remove protective cap from the back of the transmitter.
3. To select a new frequency, use a screwdriver (size 0) and turn the switch clockwise (one step).
4. Replace protective cap.
5. Switch ON transmitter with "ON/Horn" switch (turn switch to “1” position).

After turning ON the transmitter (do not forget to unlock STOP pushbutton), the receiver automatically resets the system to the new frequency selected in less than a second.

3.1 Battery and Battery Charger

3.1.1 FuB 3A Transmitter Battery



The age and ambient temperature are decisive for the length of the battery application. Older batteries lose capacity over time. Temperatures under zero also have a negative effect on battery charge.

The length of serviceable battery life depends on how the battery is treated. When handled properly the FuB 3A can exceed 500 charging cycles. Do not totally discharge or short-circuit contacts as this can permanently destroy the battery.
We recommend recharging the battery only when it is empty, i.e. when the red LED blinks or an acoustic signal sounds. Always store rechargeable batteries at room temperature.

3.1.2 FLG 105 Battery Charger

Recharging batteries

1. Connect battery charger to mains (refer to nameplate on battery charger for details).
2. Insert the adapter for the FuB 3A battery in the charging compartment of the battery charger.
3. Insert battery with the nameplate facing up into the battery compartment (pos. ②).

Charging indicator (red LED ; pos. ①)

LED lit : ..... battery charging.
LED off or blinking : ..... battery full, i.e. operable.
LED blinks
when inserting battery : ..... battery totally discharged or defective.

Note :

- A discharged FuB 3A battery recharges in approx. 2 hours. Electronics in the battery charger ensure that charging does not exceed 5 hours.
- The quick charging of NiCd batteries should only take place at temperatures between +10 °C and +40 °C (50 °F and 104 °F).
- Protect battery contacts against short circuits. Never store batteries in a tool box or trouser pockets. A bunch of keys is enough to short the battery. Always use the protective cap included.
- Use the charger at room temperature (20 °C or 68 °F) and protect it from extreme heat (direct sun).

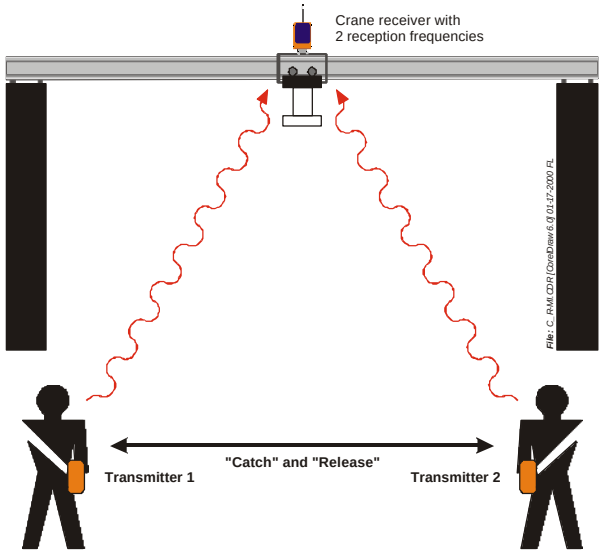
3.2 Special Operating Modes (Optional)

This chapter describes special operating modes that are not available with all crane systems.
If your radio control system is not equipped with the features described, you may ignore the following and continue with the next chapter.

3.2.1 Pitch – Catch

The "Pitch – Catch" operating mode allows two or more crane operators equipped with one transmitter each to independently use the same crane.

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



Releasing the crane ("Pitch")
To release the crane :

1. Turn rotary switch (pos. ②) on transmitter 1 or transmitter 2 to the "Pitch" position.
2. For safety reasons we recommend switching OFF transmitter 1 or transmitter 2 (pos. ①). This will avoid operator errors.

The respective transmitter 1 or transmitter 2 now has no access to the crane control system.

Taking over control of the crane ("Catch")
To take over the control of the crane turn the rotary switch (pos. ②) on transmitter 1 or transmitter 2 to the "Catch" position.
The transmitter with control over the crane retains the access to the receiver (transmitter 1 or transmitter 2) until the operator has issued the "Pitch" statement.

Example :
Transmitter 2 has control over the crane control system. Transmitter 1 is to be given control. The operators must continue as follows :

1. Turn rotary switch (pos. ②) on transmitter 2 to the "Pitch" position.
2. For safety reasons deactivate transmitter 2, i.e. turn the key switch (pos. ①) to the "0 = OFF" position.
3. Activate transmitter 1, i.e. turn the key switch (pos. ①) to the "1 = ON" position.
4. Turn the rotary switch (pos. ②) on transmitter 1 to the "Catch" position.

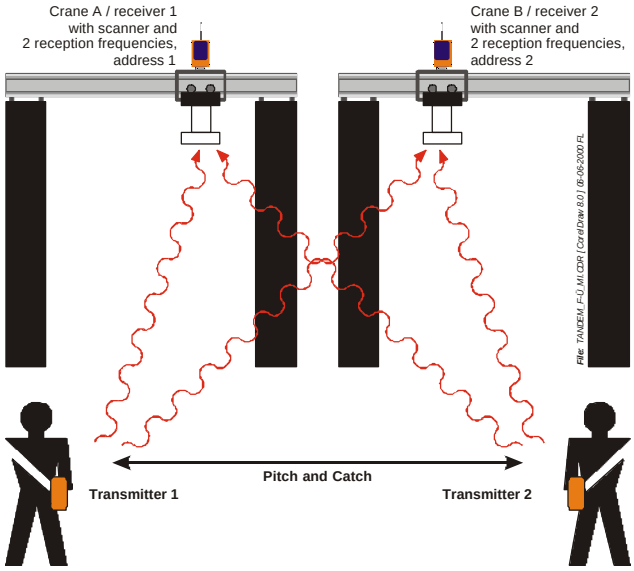
Transmitter 1 now has sole access to all crane functions.

Note :

- A power loss at the receiver-end activates a general reset of the crane system. All transmitters have access to the crane radio controls. This implies that the pitch – catch settings must be readjusted at the transmitter-end.
- Should an operator forget to issue the "pitch" statement and shuts down his transmitter (transmitter shut down using the STOP pushbutton or technical failure) the second transmitter has no access to the crane radio control system. In order to give transmitter 2 access to the radio control system the receiver must be cut OFF from the supply voltage (master switch) and the crane control system reactivated as described above.
- A lamp on the crane-end of the control system (optional) indicates whether the receiver is engaged.

3.2.2 Pitch – Catch – Tandem Mode

The "Pitch – Catch – Tandem Mode" enables two or more crane operators equipped with one transmitter each to independently use several cranes.



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

Releasing the crane ("Pitch")
The crane(s) must be released as follows in order to set the control system to the starting position :

1. Turn rotary switch (pos. ②) on transmitter 1 or transmitter 2 to "0 = Pitch" and hold the switch in this position for at least one second.
   All cranes under control can be accessed by other transmitters.
2. For safety reasons we recommend switching OFF transmitter 1 or transmitter 2 (pos. ①). This will avoid operator errors.
   The respective transmitter 1 or transmitter 2 now has no access to the crane control system.

Taking over control of the crane ("Catch")
To take control over a released crane / the released cranes:

1. Turn rotary switch (pos. ②) on transmitter 1 or transmitter 2 to the respective position ("A" or "B" or "A+B" or "B+A").
2. Actuate the pushbutton "ON / Horn" (pos. ③) to take control over the crane.

   The transmitter with control over the crane retains the access to the receiver (transmitter 1 or transmitter 2) until the operator has issued the "Pitch" statement. (switch position "0").

Example :
Transmitter 2 has control over the crane(s). Transmitter 1 is to be given control over a crane/both cranes. The operators must continue as follows :

1. Turn rotary switch (pos. ②) on transmitter 2 to the "0 = Pitch" position.
2. For safety reasons deactivate transmitter 2, i.e. turn the key switch (pos. ①) to the "0 = OFF" position.
3. Activate transmitter 1, i.e. turn the key switch (pos. ①) to the "1 = ON" position.
4. Turn the rotary switch (pos. ②) on transmitter 1 to the position "A" or "B" or "A+B" or "B+A".

Transmitter 1 now has sole access to all crane functions.

Caution :

Should an operator want control over crane B and crane A (rotary switch position "B+A") and the operator must correct with crane A (switch position "A"), it cannot be guaranteed that the operator retains control over crane B, i.e. if the operator turns the rotary switch from position "B+A" to "B" and leaves the switch in position "0 = Pitch" for longer than one second, he releases crane A.

Note :

– A power loss at the receiver-end activates a general reset of the crane system. All transmitters have access to the crane controls. This implies that the pitch – catch settings must be readjusted at the transmitter-end.

– Should an operator forget to issue the "pitch" statement and shuts down his transmitter (transmitter shut down using the STOP pushbutton or technical failure) the second transmitter has no access to the crane radio control system. In order to give transmitter 2 access to the control system the receiver must be cut OFF from the supply voltage (master switch) and the crane radio control system reactivated as described above.

– A lamp on the crane-end of the radio control system (optional) indicates whether the receiver is engaged.

4 Fault Correction

Note :
Check the transmitter functions using the cabin or cable controls first !

Problem	Possible Cause	Remedy
Transmitter does not react when switched on.	– No power.	– Check the battery contacts for damage or contamination. – Insert a fully charged battery in battery compartment. – Recharge battery
Low-power indicator blinks after minimal operating time, i.e. red LED illuminates.	– Battery contacts are contaminated or damaged. – Battery not charged. – Battery defective.	– Check battery contacts for damage or contamination. – Fully recharge battery. – Ensure that recharging process runs correctly. – Check transmitter functions using a fully charged or replacement battery.

5 Maintenance

The radio control system is virtually maintenance-free. However, the following points should be taken into consideration :

- Ensure that the STOP pushbutton works smoothly.
  Contaminants can reduce or fully block the switch function.
- Charge and discharge transmitter batteries regularly.
- Never use a high-pressure cleaner or steam jet cleaner to "clean" the transmitter.
  Use a soft brush or cloth only !

Note :

Should you have any problems with the radio control system, contact your local distributor or HBC-radiomatic GmbH.

5.1 In the Event of a Fault

Warning :

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

- Never try to repair the transmitter electronics! Opening the transmitter housing terminates the manufacturer guarantee.
  - Send any defective or faulty equipment to you local distributor or to the manufacturer. They are experts and have the necessary know-how and OEM spare parts.
  - Always send both transmitter **and** receiver and enclose a detailed description of the problem.
  - 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 transmitter and receiver, otherwise pack securely. Send the consignment to your distributor or to the following address :

  HBC-radiomatic GmbH
  Haller Strasse 49 – 53
  D-74564 Crailsheim
  GERMANY
- Should you chose to deliver a defective radio control system personally to your distributor or our factory, please call and arrange an appointment.

  HBC-radiomatic GmbH
  – Customer Services/Repair Service –
  Tel.: +49 (0) 79 51 – 3 93 - 816

6 Technical Data

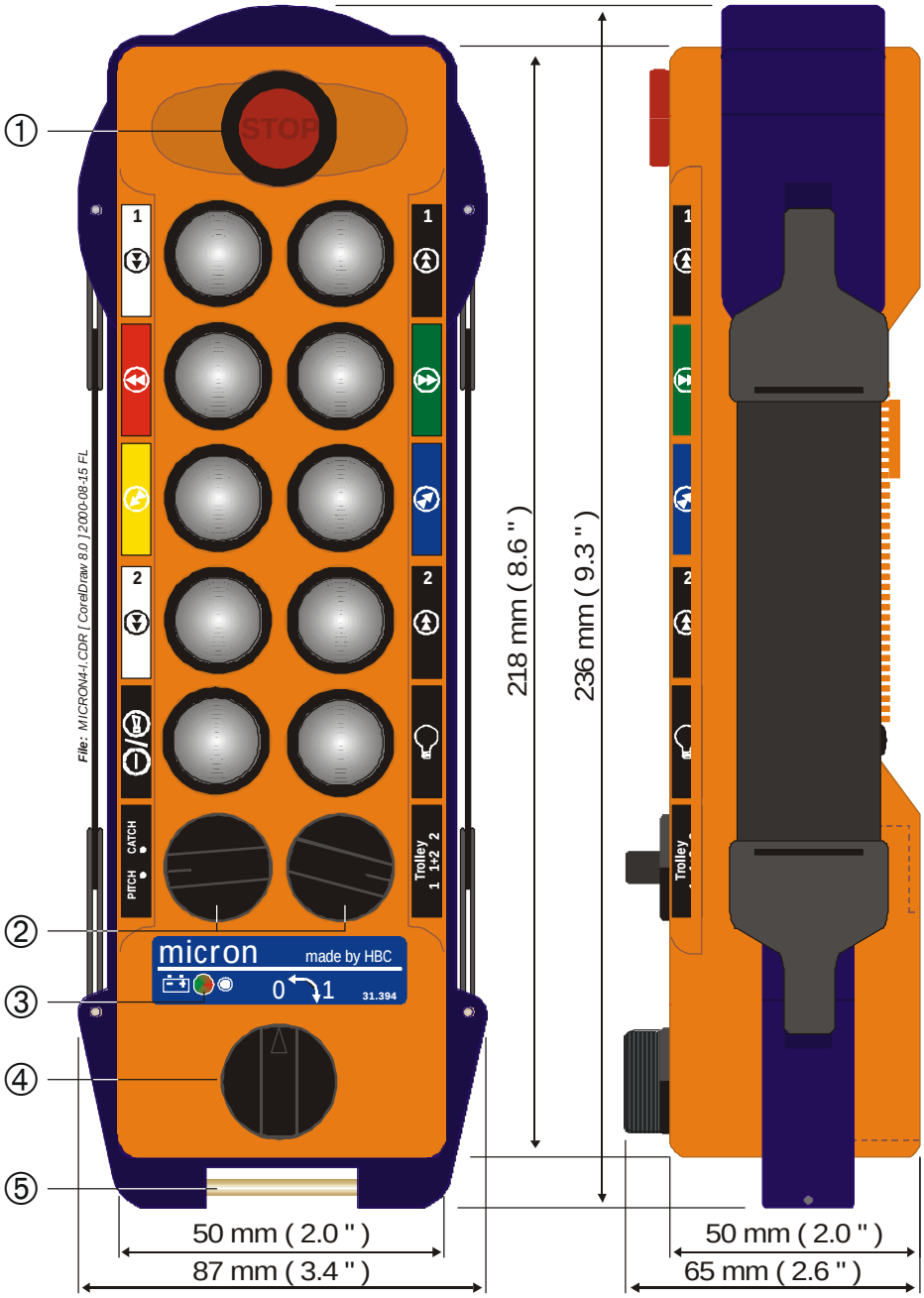
General Technical Data	
System	micron 4
Max. number of control commands	24, digital and STOP
Unique system addresses	over 65,000 combinations
Transmitter-specific Technical Data	
Transmitting power: FuS 671/3	< 10 mW (synthesizer)
Transmitter antenna	internal
Battery type	FuB 3A (blue , NiCd)
Power supply with NiCd battery	6V DC / 250 mAh
Battery charge at 50 % duty cycle *at 100 % duty cycle*	8 hours 4 hours
Operating temperature range	–25 °C to 75 °C (–13 °F to +167 °F)
Housing material	ABS plastic with shock protection
Housing color	orange
Dimensions	236 x 87 x 65 mm (9.3 x 3.4 x 2.6 ")
Weight	approx. 500 g (1.0 lb.)
System of protection	IP 55 (Nema 4)

Accessories

The following accessories are available for the transmitter micron 4 and must be ordered separately :

Description	**Order No.**
Belt clip for micron transmitter (standard accessory)	D-500006
NiCd battery FuB 3A, blue, 6V / 250 mAh	FuB 3A
Adapter for FuB 3A batteries (for battery charger)	D-900064
Battery charger FLG 105 (indicate distribution voltage range !)	FLG 105
Transmitter labels micron 4, sheet 1 [31.397]	G-900212
Transmitter labels micron 4, sheet 2 [31.398]	G-900213
Transmitter labels micron 4, sheet 3 [31.399]	G-900214

6.1 Dimensions and Operator Controls of micron 4



① STOP switch
② 2 rotary switches
③ Dual color LED
– green = "Transmitter ON"
– red = "Charge battery"
④ Key switch
⑤ Rubber shock-protection with belt carrying device