USER MANUAL

RX-ES-CAN-HL-DT

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HETRONIC
A METHODE ELECTRONICS COMPANY

User Manual

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1. Safety

1.1 Intended Use

Your Machine Control Unit (MCU) is designed for safe remote command and control of machinery and other industrial equipment alike using secure wireless communication technology. Any modification, reconstruction or extension of the purchased machine control unit without a written consent from Hetronic automatically voids the warranty on the product. Furthermore, Hetronic, as the manufacturer and supplier of the purchased MCU assumes no liability for damages resulting from the non-observance of the safety operating instructions detailed in this user manual. All personnel, working with this MCU must

- Be suitably trained and qualified as required by Operational Health and Safety regulations.
- Strictly comply with the instructions detailed in this user manual.

Before starting the MCU you must have read and fully understood the instructions in this user manual..

1.2 Symbol Notation

The following symbols are used in this user manual. Understand the safety message. It contains important information about personal safety on or near the unit.

	**STOP!** This symbol indicates imminent danger, risk of accident, injury or loss of life, as well as damage if instruction is not followed.
	**ATTENTION!** This symbol indicates possible damage to the MCU or Radio Remote Control system if instruction is not followed.
	**TIP!** This symbol suggests best practices for easy operation as well as prolonged life of the MCU.
	**INFO –** This symbol refers to an easily accessible quick reference note

1.3 Practices and Laws

Practice safe working precautions for the benefit of yourself and others.

Be alert to unsafe conditions and the possibility of minor, moderate, or serious injury or death. Learn applicable rules and laws in your area.

1.4 Mandatory User Training

The original purchaser of this unit received instructions from the supplier of the MCU regarding safe and proper use. If the MCU shall be used by someone other than the original purchaser — whether loaned, rented, or sold — it is imperative to always provide this user manual and all necessary safety training beforehand. Additionally, it is crucial for any new user to thoroughly read and understand the user manual of any machinery or equipment controlled by the MCU.

1.5 Potential Sources of Danger

This MCU is part of a system that makes remote control via wireless radio signals possible. Control commands can be transmitted even around obstacles and without the need for direct line of sight. To prevent accidental start-up and potential injury or damage, please observe the following precautions:

Turn the Operator Control Unit (OCU) ‘OFF’ when not in use.
If the OCU does not have user access control password configured, remove the battery when the unit is placed away from the operator.

Disconnect the power supply from the machine control unit before any assembly, maintenance or repair work is carried out.

PREVENT DAMAGE – Always disconnect the power supply and control wiring from the machine control unit before welding on any part of the machine.

NEVER remove or alter any of the safety features on the OCU.

ALWAYS confirm that the machine and radio remote control Emergency and General Safe Stop functions work as intended **BEFORE** controlling the machinery or equipment remotely.

1.6 Security Features

The system is equipped with electro-mechanical safety features. Control signals from other OCUs cannot be processed, as transmission coding is unique to each OCU.

1.7 STOP in case of EMERGENCY

Push the Emergency Stop button installed on the controlled machinery or the General Safe Stop button installed on the OCU.

1.8 Caring for your Hetronic Product

The enclosure materials used in the Hetronic product have been carefully selected to minimize maintenance requirements.

2. Introduction and Functional Description

We congratulate you on your purchase of the new Hetronic product. You have chosen a high-quality brand. Hetronic recommends you to familiarize yourself with the control unit before using it for the first time. Please carefully read the operating instructions and safety advice provided in this manual. Only use the product as instructed and for its intended field of application. Keep these instructions in a safe place. If you pass the product on to someone else, please ensure that you also provide all corresponding documentation, including a copy of this manual.

2.1 Before Operating Your Wireless Control Unit

Please ensure that all radio remote control system components have been installed correctly before proceeding. Prior to startup, it's crucial to verify that both the machinery and radio remote control 'STOP' functions are in perfect working order.

Familiarize yourself thoroughly with all safety precautions outlined in the manual and review the control functions and operation of both the machinery and radio remote control system.

Always power off the MCU before conducting any maintenance work.

Remember, installation, setup, and servicing should only be carried out by authorized and qualified personnel. At Hetronic, safety and reliability are our top priorities, and we're committed to providing you with the best support every step of the way.

2.2 Product Rating Plate

The product rating plate holds valuable information about your control unit. It's your key to unlocking Hetronic's full service support potential.

1. Compliance Type Approvals such as CE, FCC, IC, etc.
2. `Type of MCU
3. Eleven-digit Production Number
4. Eleven-digit System Number
5. Ingress Protection Rating
6. Frequency information
7. Supply voltage
8. Current rating
9. Country of Manufacture
10. Manufacturer address

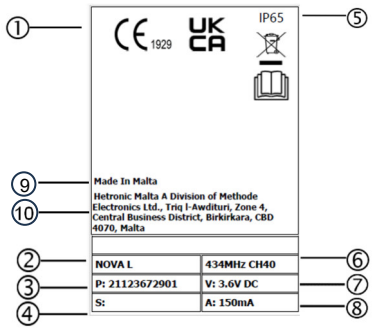


Figure 1. *Product Rating Plate*

2.3 Product Serial Numbers

Our commitment to quality service begins with your convenience! Before reaching out to your Hetronic dealer for service, repairs, or replacement parts, make sure to have the equipment Production and System numbers handy. You can find these numbers conveniently located on the product rating plate, a silver label affixed to your control unit. They're not just a code; it's a legacy of quality craftsmanship from Hetronic. Ensure that this valuable information remains legible throughout the lifetime of your product.

2.3.1 Production Number

The production number, marked by the symbol 'P:', consists of 11 digits. It's not just a number; it's a window into your unit's story. The first digit reveals its manufacturing location, followed by the week and year of production represented by the next four digits. Finally, the trailing six digits offer a unique serial number for your unit.

2.3.2 System Number

The system number, marked by the symbol 'S:', consists of 11 digits. The first digit reveals the manufacturing location at which the unit was uniquely paired with the machine control unit defining it as a complete radio remote control system, followed by the week and year of it was uniquely paired represented by the next four digits. Finally, the trailing six digits offer a unique serial number for your complete radio remote control system.

2.4 User Manual Symbol

The “Read User Manual” symbol on the MCU serves as a gentle reminder for users to thoroughly read through the manual before operating the radio remote control system. Always keep this manual in a safe and easily accessible place for quick reference when needed.

3. MCU Functional Description

3.1 Operation

The RX-ES-CANHL-DT operates as a typical radio decoder. Information transmitted by a Hetronic MCU is received by onboard RF module. Feedback transmission is Full Duplex mode by default. Control and feedback is also possible using CAN Cable Control through the CAN1 port, X1.

The Main Contact (MC) relays provide normally open (NO) or normally close (NC) contacts to the 30-pole connector. When receiving normal control data from a OCU, the contacts will be closed to provide power to the application platform. H-Link communication, system errors, OCU stop commands, and loss of communication with a OCU will cause the MC contacts to open. Each MC relay is controlled by separate microcontrollers which cross-monitor the current MC feedback status. Each microcontroller provides two control signals to provide redundant control switches for its MC relay. The MC may be configured for Static or Dynamic Start modes and provide an adjustable MC Timeout.

The application relay outputs provide SPDT (NO/NC) contacts for general use purposes. Each relay may be independently tied to the DK31 safety switch to prevent operation in stop conditions by closing J11 or J12 and opening J9 or J10. If operation of an application relay is necessary, an unswitched supply is provided by closing J9 or J10 while closing J11 or J12. J9 and J11 must not be closed at the same time. J10 and J12 must also not be closed at the same time. The operation of the relay outputs may otherwise be configured via H-Link.

Connector X2 provides 2 supply pins, 4 digital outputs, 4 analog inputs, and 2 safety control signals for general application use. The positive supply pin provides power for the 4 digital outputs. Close J1 to use the internal 5V supply for the digital outputs or open J1 and connect an external DC supply to the supply pin to use an external supply voltage.

Each digital output uses separate high- and low-side switches. Each output may be individual configured as a push-pull (high- and low-side), open-drain (low-side), or open-source (high-side) switch.

Each analog input uses the internal supply voltage for a reference level supporting 0-5VDC inputs. Using H-Link, it is possible to configure each input to act as a digital comparator with error detection. If digital operation is desired, each analog input supports up to 36VDC inputs.

The 2 safety control signals may be used externally to provide safety switching for the 4 digital outputs. The “DK31” signal is controlled by the internal DK31 signal and represents the “Active Stop” state of the decoder. The “DK32” signal is controlled by the internal DK32 signal and represents the inverted “Passive Stop” state of the decoder.

The RX-ES-CAN-HL provides two independent, isolatable CAN bus interfaces. Each bus interface is fully CANopen compliant and implements the CANopen protocol. Data sent and received from each CAN bus may be configured via H-Link using a large range of possible data sources. Received CAN data may be used for feedback, RF configuration, HDL (analog control mapping and adjustment), RCL (DKs from CAN), generic 8-bit analog inputs, or generic digital 1-bit inputs. CAN message (PDO) IDs, interval or timeout times, message lengths, and other protocol-specific parameters may also be configured via H-Link. CANopen LSS is provided for dynamic adjustment of a CAN bus’s Node ID or baud rate. Additionally, several CANopen objects are accessible via SDO for dynamic system configuration.

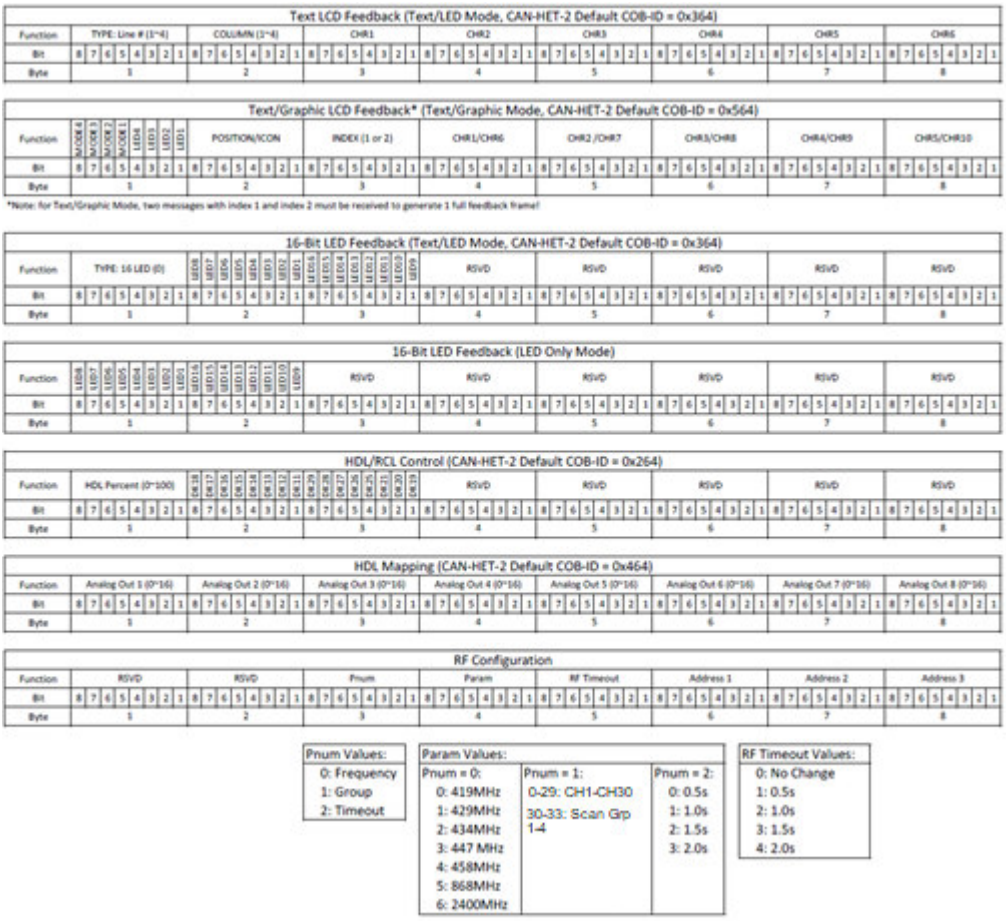
In addition to the standard CANopen features, the RX-ES-CAN-HL provides the ability to enter the Operational state immediately on startup without waiting for NMT commands from a CANopen Master node. It is also possible to select any combination of bits within a transmit message (PDO) to trigger the message transmission upon data change.

RX-ES-CAN-HL provides 12 adjustable logic gates which allow up to 12 inputs each. Each logic gate input may be connected to a large range of internal system data and may be independently inverted. Logic gate outputs may be attached to CAN messages or to digital outputs for expanded use. Supported logic gate types are: AND, NAND, OR, NOR, and XOR.

Six relays can be added to RX-ES-CAN-HL using the REL-6X expansion board mounted in vertical RF module supports. X18 supplies +5 volts to the REL-6X that is enabled by DK31. X17 is a six-pole connector that controls each of the six REL-6X relays and is configured by H-Link

3.2 CAN Message Descriptions

While any transmitted CAN messages may be configured to suit the application, received CAN messages may need to be setup in particular ways for the RX-ES-CAN-HL to use them properly. For more details, please consult the CAN-HET-2 technical documentation for feedback, HDL, and RCL message formats. Brief descriptions of the supported formats are listed below.



CAN Message Descriptions

3.3 CANopen safety

RX-ES_CAN_HL support CANopen safety protocol & user can enable it from the CANopen protocol, TX & RX message setting

4. Pairing OCU to MCU

Standard OCUs can be paired to a different MCU, other than the one they were delivered with from the factory using either a tethered-cable approach or through a secure wireless method.

Some OCUs require the exchange of the ADMO memory key installed on the logic controller inside the OCU with new a ADMO memory pre-programmed with addresses that match those configured on the MCUs to which the OCU will be paired.

4.1 Address Learn via Cable

Installing the control cable as described in section 7.8.1, it is possible to put the OCU in address learn mode for pairing with a new MCU as follows.

1. Press the STOP button on the OCU. Powered ON the OCU with whilst keeping the START button pressed. During this stage the red status LED withsymbol ) starts blinking, confirming that the OCU logic controller is in address learn mode.
2. Release the start button and press it again. At this stage the OCU waits for the MCU to transfer its address information to the OCU. During this process the green LED on the OCU turns solidly ON. Once the logic controller on the OCU validates the received information, the new is saved to the ADMO memory of the OCU. The green LED turns OFF. However, if the received address received is not valid or the process is disrupted, the green LED remains solidly ON. If the event of an error, the OCU must be turned OFF. The pairing procedure outlined above must then be performed again.

4.2 Wireless Pairing

For your convenience and safety, wireless pairing involves a systematic and secure procedure.

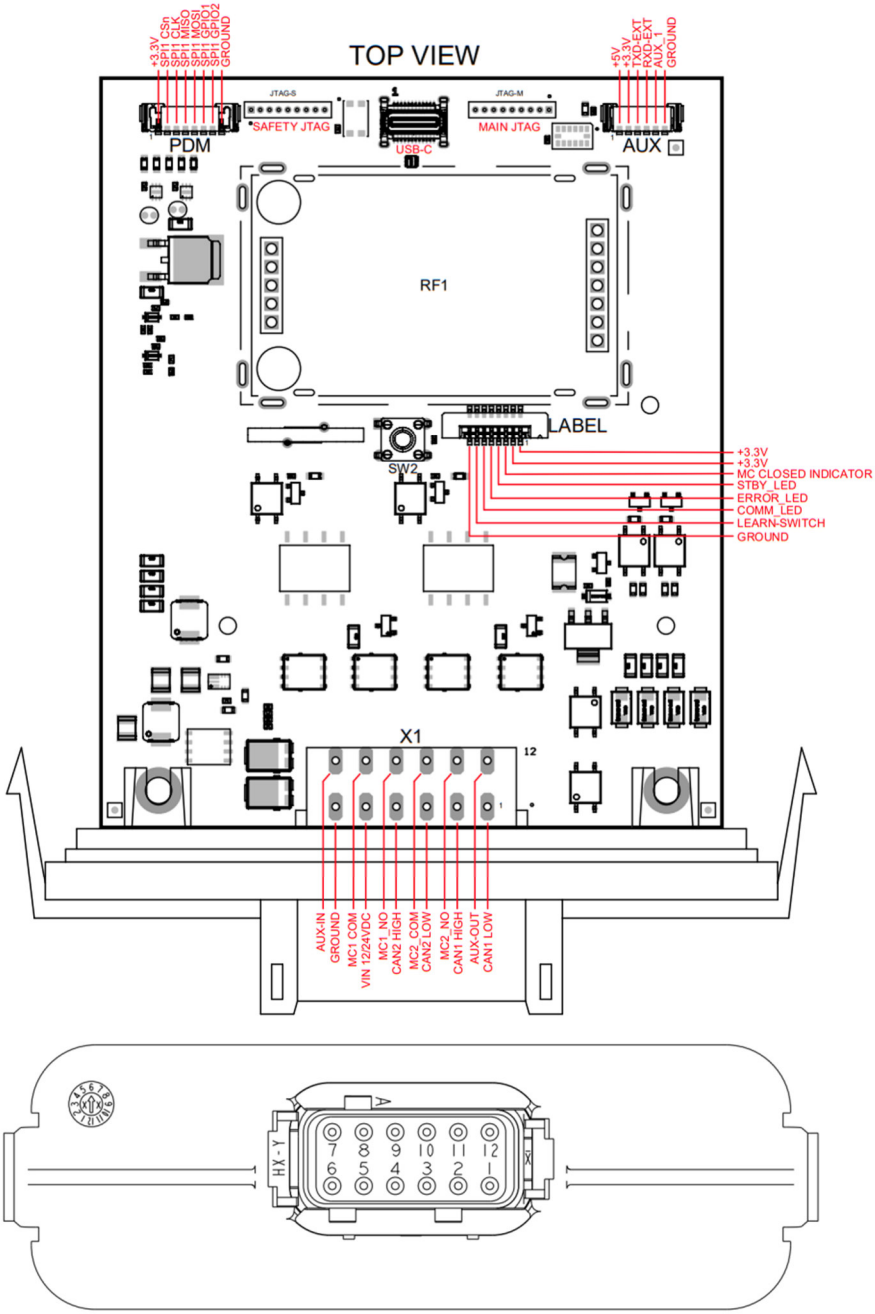
1. Ensure that both the OCU) and MCU are powered ON.
2. Initiate the pairing mode on the OCU by following the manufacturer's instructions, typically involving holding down specific buttons.

Once in pairing mode, the OCU awaits communication from the MCU to transfer its address information. This process is indicated by a visual cue, often a blinking LED. Upon successful reception and validation of the address information by the OCU's logic controller, the pairing is completed. The OCU's memory is updated with the new address, ensuring seamless communication with the MCU. Any disruption or invalid address reception prompts an error indication, necessitating a restart of the pairing procedure. Finally, the paired OCU and MCU are ready for operation, enabling remote control functionality in the industrial environment.

5. Technical Specifications

Storage Temperature	-40 °C to +85 °C
Operating Temperature	-20 °C to +70 °C
Power Supply Voltage	9 to 33Vdc
Standby Current	75 mA @ 12V
CAN Bus	Two channels CAN-FD
Outputs	Two Safety Relays rated at 6.0A / 32Vdc Auxiliary Output 750mA hold / 1.5A trip High-Side
PCB Dimension	103.5mm Length x 85.7mm Width

6. Connection diagram



7. Installing the Radio Remote Control

For a robust and dependable remote-control system, follow these vital recommendations. Entrust the installation of the remote control to skilled professionals exclusively. It's crucial to meticulously adhere to all safety instructions outlined in this manual — never overlook these essential guidelines.

Install the MCU in a strategic spot on the controlled equipment, safeguarding it and its cabling from physical harm. Securely fasten all MCU cables, shielding them against potential mechanical damage. Utilize suitable cable insulation that aligns with the field and environmental demands of your specific application.

In applications prone to significant mechanical shocks or continuous vibrations, it's strongly advised to incorporate rubber dampers or mechanical shock-absorbing buffers. These installation accessories should be integral parts of your machine's preventive maintenance routine checks. It's important to note that for sea water applications, dampers suitable for such environments must be utilized.

Guarantee that the power cable furnishes the MCU with a reliable and regulated voltage. Although the MCU possesses inherent protection against supply line irregularities, it's advantageous to proactively mitigate the risk of excess supply transients. Install surge protectors on the ground lines wherever feasible, particularly for applications operating at significant altitudes above ground level.

Steer clear of installing the MCU or its antenna in close proximity to high-power frequency inverters. It's imperative to guarantee that these inverters are properly grounded using earthing cable with a cross-section recommended by the manufacturer. This precautionary measure helps mitigate potential interference and ensures optimal performance of the MCU.

Position the MCU antenna to ensure constant line-of-sight visibility of the OCU, ensuring optimal performance at all times. This strategic placement facilitates seamless communication between the OCU and the MCU, enhancing overall system efficiency.

Steer clear of installing the antenna inside cabins, in locations with metal shielding or where its radiating element cuts through metal surfaces. Ensure the radiating element remains unobstructed at all times to optimize control range and performance. By maintaining clear visibility and avoiding interference from metal obstructions, you can ensure the best possible performance of your remote control system.

In certain applications, antenna cable extensions may be necessary to enable optimal antenna placement. It's essential to minimize the length of the antenna extension cable whenever feasible. Avoid excessive lengths of antenna extension cable, and under no circumstances should it be coiled up. Opting for the shortest possible extension length ensures optimal signal transmission and minimizes the risk of interference or signal loss.

8. Troubleshooting

If your system fails to operate following a standard start-up procedure, utilize the troubleshooting sequence provided below to identify the issue and implement necessary corrective measures. Should additional assistance be required, do not hesitate to reach out to your nearest Hetronic dealer for further guidance.

PROBLEM	PROBABLE CAUSE	CORRECTION
MCU does not power up	No power to the MCU	Check the diagnostic LEDs in the MCU to ensure power is applied. Ensure the system is properly grounded.
	Incorrect input voltage supplied	Check input voltage. Check requirements on drawings.
	Blown fuse in MCU	Check all fuses and replace if needed.
	Incorrect wiring	Check input voltage connections.
OCU is transmitting (Power LED flashing), but machine will not respond	No power to the MCU	Check the diagnostic LEDs in the MCU to ensure power is applied. Ensure the system is properly grounded.
	OCU/MCU frequency channels do not match	Follow instructions under "Setting Frequency and Channels" or contact your supervisor.
	OCU out of range	Take the OCU back into the range of the MCU, press START.
	MCU power off	Turn on power to MCU.
	Blown fuse in MCU	Check all fuses and replace if needed.
	STOP failure in MCU. Red STOP LED on PC board is illuminated	Contact your supervisor.
All machine motions operate intermittently	MCU antenna connection is loose or missing	Tighten or replace antenna.
	External antenna (if used) has loose connection, poor grounding, or interference	Tighten antenna and ground connection. Contact Hetronic or your dealer for more information.
	Connector inside MCU is loose	Check all connectors, reseat if needed.
	Another frequency may be interfering with the system	Contact your supervisor.
Some machine motions operate intermittently	MCU antenna connections may be loose to those specific machine motions	Check connections from the MCU to the machine motions.
	Connectors inside MCU are loose	Check all connectors, reseat if needed.
	OCU antenna connection is loose or missing	Tighten or replace antenna.
Outputs do not correspond to OCU functions	Incorrect output connections	Check system wiring. Refer to output connection diagram.

Table 3. *Troubleshooting tips*

9. Warranty, Service, Repair and Maintenance

For warranty inquiries, service requests, or technical assistance, please contact our Hetronic service centres on the details provided on our website at https://hetronic.com/service/global-service-care/.Our customer support team is available to assist you.

10.1 Warranty Coverage

This MCU is covered by a limited warranty. Please refer to the warranty card, your purchase agreement or contact your nearest Hetronic dealer for details on warranty coverage, terms, and conditions. The warranty provided with this MCU is subject to limitations and exclusions as outlined therein. Hetronic shall not be liable for damages resulting from improper use, maintenance, or repair of the equipment.

10.2 Service and Repair

For service or repair inquiries, please contact your machine manufacturer or Hetronic's authorized service centers. Attempting repairs by unauthorized personnel may void the warranty and pose safety risks.

10.3 Maintenance and Preventive Care Guidelines

To ensure the continued performance and safety of your remote control system, regular maintenance is recommended. Keep in mind that for your own safety and that of others, repairs and maintenance must always be carried out by qualified personnel.

- Only use original Hetronic spare parts.
- Keep the product in a clean, dry place.
- Wipe off dust using a slightly damp, clean cloth.
- Avoid the use abrasive cleaning solutions or high-pressure water jets exposing the MCU to pressures exceeding the IP rating denoted on the product rating plate.
- Do not use sharp or pointed tools to clean your MCU as these may tear the rubber parts.
- Do not use petroleum-based solvents like unleaded fuel or diesel to clean the unit as these may damage the rubber surfaces and decals on your MCU.

10.4 Troubleshooting Assistance

If you experience any issues with your remote control system, please consult the troubleshooting section in this manual. For further assistance, contact our customer support team.

10.5 Replacement Parts

Genuine replacement parts are available for your remote control system. Contact your nearest Hetronic dealer or any of our authorized local distributors for information on ordering replacement parts or alternatively reach us directly through our web shop on https://shop.hetronic.com.mt/en/home.

10.6 Safety Precautions

When performing maintenance or repairs on the remote control system, observe all safety precautions outlined in this manual. Failure to do so may result in injury or damage to the equipment.

10. Regulatory Information

10.1 Europe

Hetronic products are covered by dedicated CE declaration of conformity documents which are constantly updated to meet updates to European directives. The detailed CE declarations are delivered with the products and can also be downloaded through the Hetronic website www.hetronic.com.

CE Compliant Machine Control Units

Hetronic hereby declares that the safety component “Radio Remote Control Type RX ES-CAN-HL-DT” listed in this manual are in compliance with Directive 2006/42/EU article 2(c) and are designed for installation on machinery or other devices. Furthermore, the listed safety components meet the requirements of Machinery Directive 2023/1230/EC and RED Directive 2014/53/EU relevant directives at the time of delivery from the Hetronic manufacturing facilities.

Compliance to WEEE Directive

This symbol means that inoperative electrical and electronic products must not be mixed with household waste. The European Union has implemented collection and recycling system for which producers are responsible. For proper treatment, recovery, and recycling, please dispose of the product in a designated collection point.

Compliance to REACH Directive

Hetronic confirms that, to the best of its knowledge and continual communication with its respective suppliers, chemical Substances of Very High Concern (SVHC) are not included in our products. Based on the response statements of our suppliers no materials from the ECHA are included on Hetronic products. For the latest version of the complete Declaration of Conformity please visit the Hetronic website at www.hetronic.com.

Compliance to RoHS Directive

As a designer and manufacturer of electrical and electronic products covered by RoHS, RoHS2 and RoHS3, Hetronic confirms that to the best of its knowledge at the date of this statement, none of the products supplied by it contain any of the hazardous substances in excess of permitted levels referred to in the European Directive (EU) 2017/2102. The latest version of the complete Declaration of Conformity is available on the Hetronic website at www.hetronic.com.

1.1 North America

FCC COMPLIANCE NOTIFICATIONS

"Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment."

WARNING: The OEM must ensure that FCC labeling requirements are met. This includes a clearly visible label on the outside of

the OEM enclosure specifying the appropriate Hetronic FCC identifier for this product below:
- "Contains FCC ID: LW9-CSM2400FH"
- "Contains IC: 2119B-CSM2400FH"

California Proposition 65

As a designer and manufacturer of electrical and electronic products, Hetronic confirms that to the best of its knowledge at the date of this statement, none of the products supplied by it contain any of the hazardous chemicals listed on California's Safe Drinking Water & Toxic Enforcement Act of 1986 (commonly known as California Proposition 65).

FCC Recommendations:

This device complies with 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.

To comply with FCC RF exposure compliance requirements, this device and its antenna must not be co-located with, or operating in conjunction with, any other antenna or MCU.

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 when the equipment is operated in a residential environment.

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 MCU.

• Connect the equipment into an outlet on a circuit different from that to which the MCU is connected.

• Consult the dealer or an experienced radio/TV technician for help.

1.2 Industry Canada (IC/ISED) Statement

For Canadian User

CAN ICES-3 (B)/NMB-3(B)

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.

IC RF Exposure Statement

The Hetronic CSM2400FH meets the RF exposure requirement of low-power devices under portable operation. This device should be operated with a minimum distance of 20mm (2 cm) between the antenna and your body. Do not touch or move the antenna while the unit is transmitting or receiving.

"Le Hetronic CSM2400FH répond aux exigences d'exposition aux RF des appareils à faible puissance en fonctionnement portable. Cet appareil doit être utilisé avec une distance minimale de 20 mm (2 cm) entre l'antenne et votre corps. Ne touchez pas et ne déplacez pas l'antenne pendant que l'unité émet ou reçoit."

IC Warning

SED RSS-Gen Notice
"This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device."

"Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage;
2. l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

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Technical information subject to change without notice.

Hetronic reserves the right to discontinue, make changes to, and add improvements upon its standard products at any time without public notice or obligation. Hetronic disclaims liability for any claims or damages, whether regarding property, personal injury or death arising out of the use of unauthorized replacement parts or service.

Appendix A - Definition of terms

The following terms abbreviations are used throughout this user manual.

Term	Definition
ADMO	Address Module – The memory chip inside the OCU storing the OCU configuration
AUTX	Automatic Transmit
Base address	The base address is the Hetronic PC-Link assigned address of the coder
Baud rate	The transmission (rate) speed measured in bits per second.
FCS	Frequency Channel Search
Hamming distance	A measurement of data transmission safety. The amount of failures in the data stream which has to occur during the transmission in order to create a wrong signal
MCU	Machine Control Unit – the logic control unit installed on the controlled equipment that is paired with the OCU
OCU	Operator Control Unit – The portable radio remote control unit
RF	Radio Frequency
Scan-Group	A collection of fixed frequency channels under one group which are used in scan mode

Appendix B – Safety Instructions

B.1 User Safety Precautions

Before starting your shift, you should make sure that the equipment has a current inspection certificate and that the necessary inspections and risk assessment checks have been carried out and are up to date. Also, the equipment must be operated in accordance with the manufacturer's instructions.

Furthermore, it is of utmost importance that you know that **YOU are primarily responsible for YOUR OWN health and safety**. Wear appropriate Personal Protective Equipment and make sure that you have had all the necessary training to operate the equipment. The following basic safety precautions must be adhered to at all times:

1. OCU switches must never be mechanically blocked ON or OFF for any motion. When not in use the OCU must be turned off. A safe and secure storage space should be provided for the OCU unit and the unit should always be placed there when not in use. This precaution will prevent unauthorized people from operating the crane. MCU must be removed from the equipment when it is unlikely that it will be used for a period of time, and properly stored.

2. All defective or missing safety equipment, mechanical or electrical defects must be reported to the supervisor without delay. Operation must not continue until all required repairs are completed. Any changes to the condition of the remote or equipment must be recorded and communicated to or made accessible by the following operators on shift.

3. Ensure that there is nobody in the path of the travel of the equipment. If there is, stop and sound the alarm before proceeding.

4. When leaving the equipment area for any reason, switch off the OCU, remove the key cap and store it in a safe and secure place to prevent unauthorized operation.

5. Do not allow any unauthorized person to operate the OCU at any point.

6. Do not operate the OCU at a distance where the equipment and all surrounding objects are not visible. Make sure that your view is not obstructed.

7. Do not attempt to override any of the safety features built into the Radio Remote Control.

8. Use protective gloves when surface temperature of unit exceeds 58°C (136°F) as per IEC 62368-1:2014.

B.2 Safety Checklist

The following checklist provides general safety guidelines for radio control operation of equipment by fully qualified and tr ained operators. These recommendations do not take precedence over any of the following requirements relating to cranes, hoists, lifting devices or other equipment which use or include Hetronic products:

- Instructions, manuals, and safety warnings of the manufacturers of the equipment where Hetronic products are used,
- Plant safety rules and procedures of the employers and the owners of the facilities where the Hetronic products are being used,
- Occupational Health and Safety Administration (OSHA) regulations,
- Safety standards and practices for the industries in which Hetronic products are used.

OCU Start-up and Safety Checklist		
1	Are screws/bolts fully tightened?	
2	Is the MCU housing free from cracks and damages?	
3	Are the control, connection, and antenna cables free from kinks and damages?	
4	Is the STOP function working as it should be?	
5	Is the antenna properly tightened and placed in the correct position/orientation?	
6	Are the cables inserted correctly and glands/seals tightened enough such that no water ingress is possible?	
7	Is the correct input voltage to be supplied?	
8	Are the wires connected to the correct pin-outs/connections?	
9	Are there any metal structures in the vicinity of the antenna?	