USER'S MANUAL

ERGO F Operator Control Units

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HETRONIC
A METHODE ELECTRONICS COMPANY

User Manual

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1. Safety

1.1 Intended Use

Your radio remote control 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 operator 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 Operator Control Unit (OCU) 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 OCU 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 OCU you must have read and fully understood the instructions in this user manual. The Safety Checklist included in Appendix B to this user manual must be followed each time before the OCU is powered up for use.

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 OCU 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 OCU.
	**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 OCU regarding safe and proper use. If the OCU 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 OCU.

1.5 Potential Sources of Danger

This OCU 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 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 (MCU)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.

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 OCU 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 ERGO Product

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

Always use genuine Hetronic chargers and accessories. Cheaper alternatives that are not compatible or specifically designed for use with your OCU can potentially damage the unit or shorten its lifespan.

Do not store your OCU in a closed container for extended periods unless it is powered off and the battery is removed. Charging the battery in a closed container poses a potential fire hazard and may shorten its lifespan. Batteries generate heat when charging and discharging. Aim to maintain your battery state of charge between 30-80% for longer battery life depending on the battery chemistry. Refer to the respective sections of this manual covering battery care and maintenance for further details.

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Clean your OCU regularly. Use damp cloth or alcohol wipes to clean the unit’s exterior surfaces. Do not use aggressive cleaning agents that may inadvertently damage it.

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 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.

Note: This manual does not cover the EX-versions of ERGO OCUs for hazardous environments, despite the similarity of the products with those described in 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. When not in use, remember to power off the OCU and store it in a secure location to prevent unauthorized access.

Keep the USB Dongle, which serves as a security key for programming the OCU, in a separate, secure place. If the controller equipment doesn't respond as expected, cease operation immediately. Turn off the OCU and report the issue to your supervisor.

Always power off the OCU before conducting any maintenance work. Ensure you have fresh batteries on hand or consider an optional rechargeable battery pack to guarantee a fully charged battery is always available.

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' full service support potential.

1. Compliance Type Approvals such as CE, FCC, IC, etc.
2. Type of OCU
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

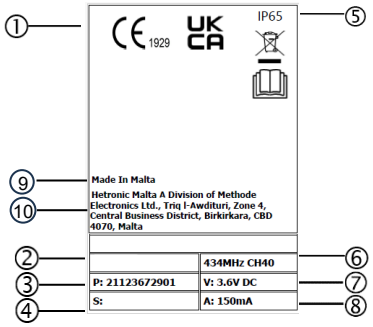

Figure 1 Product Rating Plate

A

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 OCU 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. Your ERGO OCU

3.1 ERGO General Description

The Ergo F is an ergonomically designed, programmable radio control OCU capable of transmitting up to 32 on/off functions to control a machine. A Diagnostic LED Status Light on the face of the unit provides continuous operating status information:

• Green (flashing) - transmitting telegram

• Red (flashing) - transmitting STOP telegram

• Red (steady) - Low Battery

• Red/Green (slow pulsing) – Configuration Mode

• Red/Green (flashing) - Invalid Memory Key

Your OCU is encased in a rugged IP65 rated housing, is battery-powered, and comes equipped with built-in low battery detection. Standard equipment includes a battery adapter case for 3 AA size alkaline batteries. For your convenience, there are optional rechargeable battery systems available.

3.2 ERGO F Basic Features

ERGO F products are equipped with highly specialized embedded technology that meets the demanding requirements of harsh industrial environments.

• Fully programmable via H-Link
• Memory Key
• LCD graphic display capable of displaying up to four feedback messages and welcome note/logo upon OCU power up.
• 12 pushbuttons with up to two detents
• One 3-position maintained toggle switch
• Up to 100 m (300 ft.) Range
• Internal Antenna
• Wrist Strap
• Hand Strap
• Auto power off feature
• Normal or advanced low battery detection with battery icon
• Transmission Icon
• Pushbutton Activation Icon
• Diagnostic LED

3.3 Standard ERGO F Series OCUs

Your Ergo F OCU is factory programmed to one of the following configurations:

ERGO F-V1A

- 11 Single detent pushbutton
- 1 Single detent START pushbutton
- 1 three-position maintained toggle switch
- 1 Memory Key

ERGO F-V2A

- 8 two detent pushbutton
- 3 Single detent START pushbutton
- 1 Single detent START pushbutton
- 1 three-position maintained toggle switch
- 1 Memory Key

4. Product Description

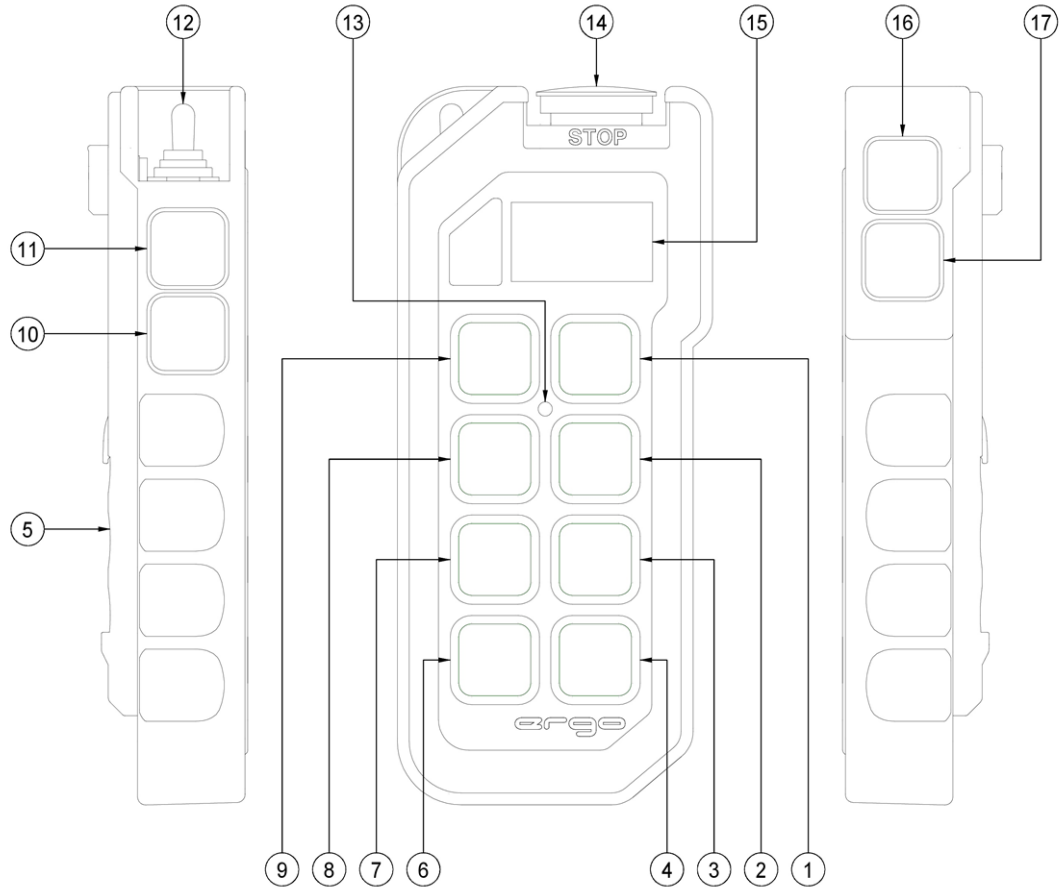

Figure 2 Generic OCU Console view and Side View

1-4	Up to 2 Detent Momentary Pushbutton (S2,S4,S6,S8)
5	Battery Compartment (located in the back)
6-9	Up to 2 Detent Momentary Pushbutton (S1,S3,S5,S7)
10-11	Single Detent Momentary Pushbutton (S12-13)
12	Three Position Maintained Toggle Switch, S13 Left and S14 Right
13	Diagnostic LED
14	Memory Key / STOP Pushbutton (S0)
15	Graphic Display (LCD)
16	Single Detent Momentary START Pushbutton (S9)
17	Single Detent Momentary Pushbutton (S10)

Table 1 ERGO F OCU Generic Features

Standard ERGO F OCUs come with a variety of basic features, including toggle switch, pushbutton controls, a generic safe ISO13849, EN62745 compliant STOP button, and a status LED indicator. They also offer optional LCD, as well as optional half duplex feedback, and feedback LEDs.

The optional graphical display provides real-time visual information during operation, allowing users to change configuration settings, and receive feedback from controlled machinery. Real time OCU diagnostic information such as battery life, signal strength, and button status are also possible. Status LEDs typically feature bi-color (green/red) options, while feedback LEDs can be white, yellow, blue, green, or red. High brightness, highly visible LEDs are available as a standard feature.

5. Getting Your OCU to work

Get ready to embark on your control adventure!

5.1 Holding the OCU

Hold the OCU upright, with the control console facing you. Take a moment to ensure that you can easily read and understand any operation text or symbols - it's your roadmap to safely controlling your equipment remotely.

Now, let's dive into the daily routine. Complete the following procedures once a day, before kicking off your operation, and during all shift changes. With these steps, you'll navigate through your control tasks efficiently but most above all safely.

5.2 Visually checking the OCU

Before diving into action, it's time for a quick gear check! Take a moment to inspect your OCU, batteries, and accessories for any signs of wear and tear. Look out for physical damage like scratches, cracks, or any other mishaps. Next up, give your equipment a once-over, making sure there's no wear or damage that could compromise your safety. And don't forget to double-check the safety warning labels - they're your trusty guides to a smooth control operation.

Remember, safety comes first! Never fire up an OCU with worn-out or damaged parts. Keep your gear in tip-top shape for smooth control ahead!

5.3 Powering ON and starting the OCU

Quick reminder: when the OCU isn't in action, keep it in a safe place. Now, let's prep for action with these easy steps:

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1. Confirm that all safety measures required by the equipment manufacturer have been followed.
2. Insert a fully charged battery into the battery compartment of the OCU.
3. Press and release START (S1) to turn ON the OCU.
4. After the green LED starts blinking, press START (S1) again.

The results quickly appear as shown in Table 2

Result	Meaning
Diagnostic LEDs turn ON	Checking for Memory Key
All LCD segments flash ON and OFF	LCD screen is working
LEDs turn OFF	Memory Key check is complete
Green LED starts blinking, and Settings Screen appears.	OCU data is being transmitted
NOTE: If the user display is activated, a welcome screen appears, and then the Settings Screen appears.	
Operation screen appears	OCU is operational
NOTE: If Feedback is enabled, feedback status messages also appear on the screen.	

Table 2 OCU Results and Meanings

Ensuring proper familiarity with the OCU's functions is crucial for safe operation. Let's proceed with caution and adhere to recommended procedures.

5.4 Stopping control of your remote machinery

To manually stop control of your remote machinery, press the STOP button. Upon activation, the text 'STOP' will appear on OCU if equipped with a display, accompanied by a rapidly blinking RED status LED. The OCU automatically transmits stop telegram to the MCU, forcing it into a safe state, promptly deactivating OCU control and machine movement.

WARNING: Holding the OCU improperly while operating your machine could result in unexpected machine behavior.

WARNING: Test the STOP function as described in the manufacturer's operator manual for the controlled machinery before beginning any operation.

WARNING: To avoid accidental start-up, always press the STOP button when OCU is not in use. Turn OFF the controlled machinery in the event of a fault or an issue with the safety check. Never operate the machine with a faulty STOP function.

WARNING: Improper operation, maintenance or adjustment may cause serious injury or damage to equipment and may also void the OCU's manufacturer's warranty.

5.5 Battery 'State of Charge' Indicator

Unless the OCU is equipped with a display, in which case the battery level is also displayed on the status bar, the OCU uses two different warning signs to show the user that the battery needs replacement.

When the low battery level warning is triggered, the RED status LED blinks at a slower rate. The GREEN status LED will still blink at the same rate. The low battery detection threshold can be configured through the 'Low Batt Warning' field in the 'RF' tab on Hetronic PC-Link (refer to Service and Programming Manual for instructions).

In addition to the low battery warning, a non-user programmable critical battery state of charge voltage level is also monitored. When this critical battery terminal voltage is reached, the RED Status LED blinks faster. The OCU logic controller automatically transmits a STOP command to the MCU installed on the controlled machinery for about two seconds until it automatically powers off completely.

5.6 LED Behavior and Meanings

All OCU units are equipped with an LED that defines the OCU status, the charge status of the battery level and fault events.

GRN LED Behavior	RED LED Behavior	Meaning
Off	Off	Power OFF
On	On	Power ON initialization
Off	Blinking	Startup process
Blinking	Off	Start of Normal Operation GRN LED is toggled every telegram frame transmitted
Blinking	On	Low Battery Warning
Off	Fast Blinking	Critical Battery Warning
Blinking	Blinking Randomly	Hetronic PC-Link communication

Table 2. *LED and Buzzer Behavior*

5.7 Powering OFF the OCU

It is recommended to manually activate the STOP switch on the OCU to put the remote MCU and controlled machinery into a safe state through an 'Active Stop' command when powering off the OCU. The OCU shuts off in about 2 seconds.

In the event of an error, such as the OCU being out of range, the STOP function is automatically triggered through a 'Passive Stop' command. No action is needed from the operator.

Always remove the battery from the OCU when it is not in use and store it safely following the care recommendations provided in this manual.

To preserve OCU battery, it is recommended to have the OCU configured such that if no operator control activity is detected the OCU logic controller powers itself OFF automatically. Reach out to your Hetronic dealer for more details.

When the OCU battery voltage reaches a critical level, the OCU shuts down automatically.

6. OCU Functional Description

Your ERGO F OCU works with a MCU (Machine Control Unit) to transfer machine control commands via radio frequency to your machine. The OCU electronically generates a carrier frequency that allows it to communicate with the MCU without the use of cables or wires. The MCU then converts the carrier frequency information into discrete machine control outputs that interface with your machine's controls. Each OCU and MCU that comprises a system is programmed with a unique address code. This code ensures that machine operations are safe, and that other remote control equipment cannot unintentionally control your machine. The MCU only accepts commands from the OCU with the same address code. The OCU and MCU have the address code set at the factory.

6.1 "STOP" Function

The pivotal feature of the radio remote control system is the STOP function. The OCU transmits the stop status signal alongside other commands in the wireless telegram, ensuring the safety of ongoing operations. When the stop pushbutton is pressed (Active STOP), the stop circuitry in the MCU halts all machinery functions, and the remote MCU transitions into a safe state.

The Stop command logic responds faster than any other control logic. When the Stop button is pressed, the OCU logic automatically blocks any other command logic from the operator.

The Stop function is supported by self-monitoring redundant hardware and logic on both the OCU and the MCU. The system Automated self-test is constantly running in the background to ensure the stop circuit is always in good working order. If an error is detected, the whole radio remote control system is automatically put in a safe state.

When the OCU is powered ON, it performs a self-test to ensure that all control logic is within the designated parameters. If an error is detected, the OCU is forced into a safe stop state. No control command transmission occurs in this state. When the safe stop state is active without the STOP button being pressed, the system enters Passive STOP mode. In this state, although the stop button remains disengaged, the relays in the MCU open to prevent any operations from taking place. Possible triggers for Passive STOP (Safe Stop state) are:

1. OCU auto shutdown is engaged after a period of inactivity.
2. Interference to the wireless communication link.
3. OCU and MCU out of transmission range.
4. Low battery state of charge.

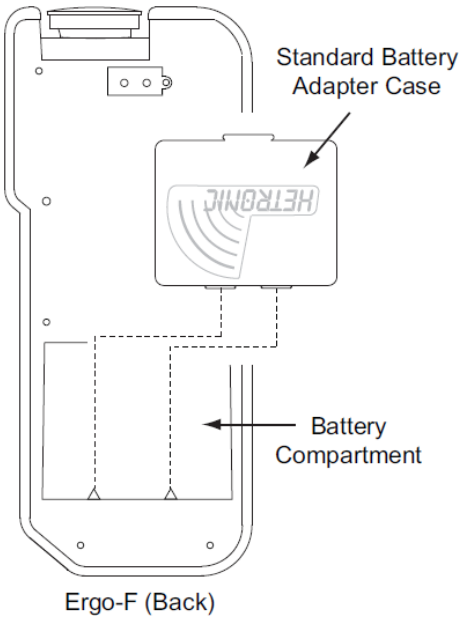
Although it's effectively safeguarded against accidental activation, the STOP button remains easily accessible, allowing for swift operation with top priority.

The STOP button on the OCU is compliant to EN62745 and functions solely as a generic safe stop. Unlike a fixed Emergency STOP installation on the controlled machinery, it only operates when the OCU is powered up.

Pressing the STOP pushbutton does not guarantee that the machine will come to a complete stop. The functionality of the STOP button depends on how the MCU STOP relays are wired to the machine's emergency stop circuit and controlled machine logic.

Always test the STOP function at the beginning of every remote control session or when there is change of work-shift.

7. ERGO F Battery



You may power your OCU with disposable or rechargeable batteries. Both types use adapter cases that are inserted into the back of the OCU. Follow the instructions below for your battery type.

7.1 Disposable Batteries

1. Insert 3 AA batteries into the back of the Standard Battery Adapter Case.

NOTE: Battery positions are shown in the battery slots on the back of the Standard Battery Adapter Case housing.

2. Slide the loaded Standard Battery Adapter Case into the battery compartment on the back of the OCU housing and snap into place.

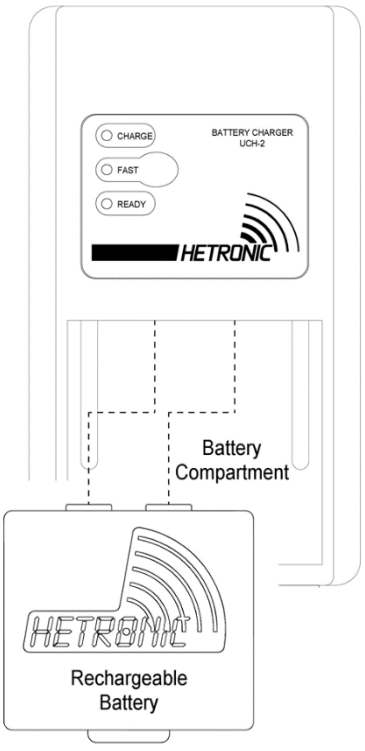
7.2 Rechargeable Batteries

1. Confirm that your batteries are fully charged. See “Recharging Your Batteries” below.

2. Slide a fully charged battery into the battery compartment on the back of the OCU as shown, and snap it into place

EXPLOSIVE GASES AND FLYING DEBRIS can cause death or serious injury. Use only Hetronic replacement rechargeable batteries. Use of unauthorized replacement batteries could cause a battery explosion resulting in injury or death of the operator or other people in the work area.

7.3 Recharging your Batteries



The ERGO F batteries can be charged as follows:

Insert the spent optional rechargeable battery adapter case into the battery charger and snap into place as shown. The LED labeled “CHARGE” flashes for two seconds, then stays lit during the charging process. When the battery is fully charged, the “READY” LED lights up and the “CHARGE” LED goes off. NOTE: Charging time could take up to 8 hours, depending on the condition of the battery. Leave the battery in the charger until it is needed. The charger supplies a “trickle” charge but will not over-charge the battery.

7.4 Fast Charge

Insert the battery into the charger as described above. The LED labeled “CHARGE” flashes for two seconds, then stays lit. Press the “FAST CHARGE” button. The FAST CHARGE LED lights also and stays lit during the charge process. When the battery is fully charged, the “READY” LED lights up and the “CHARGE” and “FAST CHARGE” LEDs turn off.

7.5 Battery Disposal

AVOID ENVIRONMENTAL POLLUTION. Recycle your rechargeable batteries according to local recycling rules and regulations. If you have questions or problems operating your

battery charger, please contact your dealer or Hetronic. Standard Hetronic rechargeable batteries are the nickel metal hydride type. These batteries have no “memory effect” when charging a battery that is not fully discharged.

7.6 Prolonged Battery Life

Avoid battery misuse, over charging, overheating or regular dropping. This can cause permanent damage to the cells.

Never keep a fully charged battery at elevated temperatures. Battery pack does not die suddenly but the runtime gradually shortens as the capacity fades.

Keeping the charge in the 40% to 80% range will prolong battery life. Unfortunately, there is no avoiding fact that battery has a finite life, after which they will certainly degrade. Following these basic tips can help delay the inevitable.

8. Configuring your ERGO F OCU

The following configuration instructions are aimed at guiding the end user with very simple OCU configurations. More extensive and detailed information on how to go about configuring the ERGO F OCU as a trained and authorized technician is available on the ERGO F Service and Programming Manual.

Do not alter any OCU configurations unless you are a trained professional. Certain changes may lead to fatal machine behavior. Consult the machine manufacturer or your nearest Hetronic dealer for assistance.

8.1 Logic Controller

8.1.1 ADMO Address

The ADMO address serves as a unique code identifier for your ERGO F OCU. This address is essential for linking the OCU to the MCU. It is crucial that the OCU maintains the address assigned to it at the factory. You can find the address listed on the manufacturing datasheet provided with the radio remote control.

Tampering with the address may lead to communication failure between the OCU and MCU. In rare cases, it could result in unintended communication with other logic controllers nearby that share the same address. Consult your nearest Hetronic dealer if necessary.

8.2 Wireless Communication

8.2.1 Frequency Channel and Scan-Group Configuration

The ERGO F logic controller is designed to accommodate the connection of two RF modules onboard, operating either in the sub-1GHz range or 2.4GHz.

When the RF module is directly plugged onto the logic controller, the transmission frequency channel or frequency scan-group can be configured using the PC H-Link tool.

1.Turn ON the OCU. During the power up cycle the following screen appears with your settings:

```
ADD 193756
RFM 434TR
GRP 1 ch0
SN 000123
```

2. Press and hold the STOP pushbutton.

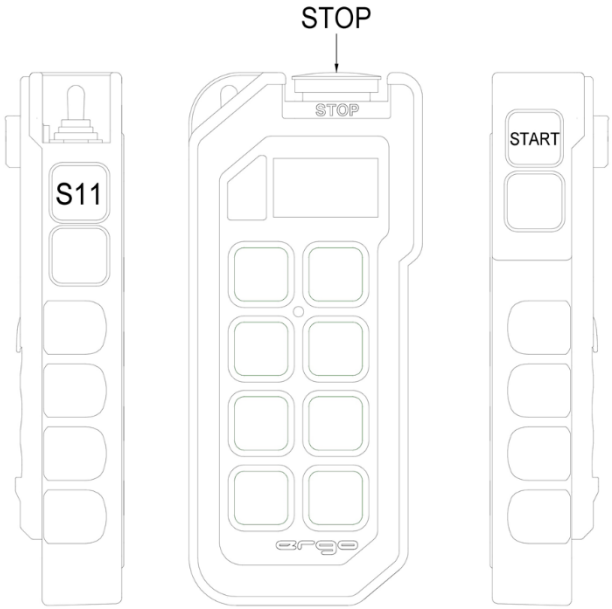
NOTE: Do not release the STOP pushbutton.

3. Press and hold the S11 pushbutton for approximately 3 seconds.

   The following screen appears indicating that the frequency channel has been incrementally changed.

4. NOTE: The screens shown are representative only. The frequency channels available in your group will vary.

```
ADD 193756
RFM 434TR
GRP 1 ch1
SN 000123
```



8.2.2 Auto-OFF Function

An OCU Auto-OFF timer feature allows users to set a timer that powers down the logic controller if the OCU remains idle for a predefined duration. Alternatively, users can disable the Auto-OFF timer, keeping the logic controller continuously powered until either manually switched off or automatically shut down when the critical battery voltage level is reached.

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8.3 DK Configuration

The logic controllers on standard ERGO F OCUs support up to 32 digital channels (DK). The 32 DKs have fixed assignments corresponding to the logic channels DK1 to DK32 and cannot be modified. The assignment of DKs to each digital control element is however hardware configurable.

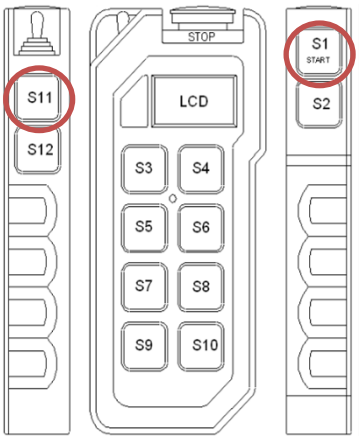
8.4 Adapting a Different RFID Key

The RFID key contains transmitter configurations and must be paired with a OCU. If a different RFID key is used other than the paired one, the OCU will not enter normal operation. It is possible to use a different RFID Key from another OCU. Shown below are 2 OCUs, Tx1 paired with RFID Key A and Tx2 paired with RFID Key B. If RFID Key B is used for Tx1, a message "Adapt KEY?" and "<Confirm>" will be displayed. At the same time, the Red. Green LEDs will be blinking.

To adapt KEY:

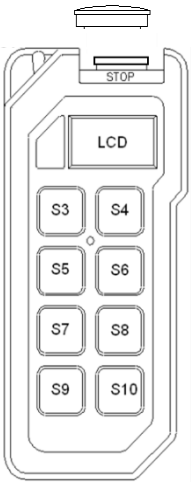
- Press and hold S11(Side SW) and S1(START) for 3secs or more.
- When the message "Are you sure?" is displayed, press S15 (STOP) while keeping S11 and S1 pressed. Keep pressing the buttons while the message "Updating" appears on display and until the unit turns OFF.
- Release the switches and press S1 (START) again to turn ON the OCU.

RFID Key A



Tx1

RFID Key B



Tx2

Note:

After pairing new RFID Key to an OCU, the old RFID Key will not work unless it is paired again to the OCU following above procedure.

ERGO+ RFID Key is not compatible with ERGO21 RFID Key. Thus, it is not possible to adapt a RFID Key of ERGO21 to ERGO+ or ERGO+ to ERGO21.

8.5 Using fresh RFID Key

The RFID key contains OCU configurations and must be paired with an OCU. If a fresh RFID key is used without initializing to Hetronic data format, the OCU will display

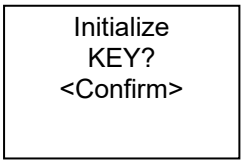
!! Error !! KEY is not recognized!

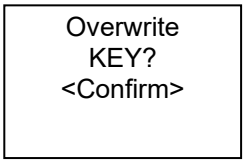
Place E-Stop into position.

- With OCU still off, Press S12(Side SW) and S2(Side SW) simultaneously.

- Press S1(START). "Error - KEY not recognized!" will appear on display.
- (S12(Side SW) and S2(Side SW) still pressed) press E-Stop for approx 5 seconds. Initialize key? <Confirm> will be appear on display.
- Release S12(Side SW) and S2(Side SW) and E-Stop.
- Press and hold S11(Side SW) and S1(START) for 3secs or more.
- When the message "Are you sure?" is displayed, press S15 (STOP) while keeping S11 and S1 pressed. "Updating" is displayed. Keep pressed until OCU/display switches off.
- Press S1(START). "Set address by H-Link" appears on display.
- Connect OCU to H-Link. Set address, RF module and RF channel. Transfer - Save settings to device.
- Restart OCU.

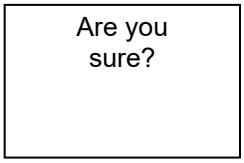
If a configured RFID key is initially used, the transmitter will display either of the below:



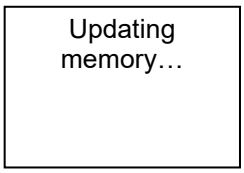


To confirm RFID Initialize KEY / Overwite KEY,

- Press and hold S11(Side SW) and S1(START) for 3secs or more.
- When the message "Are you sure?" is displayed, press S15 (STOP) while keeping S11 and S1 pressed.



- Keep pressing the buttons while the message "Updating" appears on display and until the unit turns OFF.



- Release the switches and press S1 (START) again to turn ON the OCU.

Note:

After initializing the RFID key, the settings of coder board will be saved on the key. If the saved address is 000000, it must be reconfigured via H-Link to have a valid address.

9. Specifications

OCU	
Housing	Ergonomically designed PC-ABS blend housing, one-hand operation
Environmental Protection	IP 65 (Exceeds Nema 12/13)
Weight	Up to 400g (4.2 oz) including battery
Dimensions	Height: 186 mm (7.3 in.)
	Width: 82 mm (3.2 in.)
	Depth: 33 mm (1.3 in.)
Antenna	Internal
Power Supply Voltage Range	3 AA batteries (3 Mignon LR6-AA 1.5V) Optional 3.6V NiMH rechargeable battery
Diagnostics	Status LED for operation and standard/advanced low battery detection
Operation Time	Up to 20 hrs continuous transmission*
Control Configuration	V1 - 11 Single detent push buttons, 1 three position maintained toggle switch, start + stop
	V2 - 8 Two detent push buttons, 3 single detent push buttons, 1 three position maintained toggle switch, start + stop
Frequency Range	419 MHz, 429 MHz, 434 MHz, 447 MHz, 458 MHz, 480 MHz, 868 MHz 1216 MHz and 2.4 GHz
Power (RF Output)	Typically ≤ 10 mW E.I.R.P; depends on country legislation
Typical Operating Range	Typically 100 m
Safety	20-bit programmable address concept with up to 1,000,000 combinations
	Hamming Distance 3
Operating Temperature Range	-20℃ . . . 70℃ (-4℉ . . . 158℉)
Humidity Range	0 - 97% maximum non-condensing
Response Time	Approx. 100 msec.
Standard Features	Fully programmable via Hetronic PC-Link
	Integrated LCD graphics display with feedback capability
	Combination stop/Memory Key cap that stores configuration settings
	Cable back-up ready
	Push button monitoring
	Hand and wrist strap

*assuming brand new, fully charged battery at 20°C temperature

** for full Channel Lists refer to Frequency Bands Radio Modules Charts

Table 3 OCU Technical Specification

10. 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.

11. Troubleshooting

If your ERGO F OCU 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
OCU won't start	Missing Memory Key	Insert Memory key
	Battery fully discharged	Replace with fully charged battery if needed
The OCU is turned on, but does not transmit (Power LED not flashing)	Battery is discharged	Replace battery with a fully charged battery
	Component failure	Contact your supervisor or nearest Hetronic Service Centre
OCU is transmitting (Power LED flashing), but machine will not respond	No power to the MCU	Check the diagnostic LEDs in the MCU to be sure power is applied. Ensure that the system is properly grounded
	OCU/MCU frequency channels do not match	Follow instructions under "Changing the Frequency Channel" 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
	Control wiring too close to high power machine wiring	Contact your supervisor
	Connector inside MCU is loose	Check all connectors, reseat if needed
	Another frequency may be interfering with the system	Contact your supervisor

Table 4 Troubleshooting Tips

12. 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 OCU 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 OCU 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.
- Keep battery contacts clean.
- Wipe off dust using a slightly damp, clean cloth.
- Remove dust from inside gaps, docking recesses and battery contacts using a vacuum. Special care must be taken when cleaning the battery compartment of the OCU as detachment of the pressure balance element may lead to ingress protection issues.
- Avoid the use abrasive cleaning solutions or high-pressure water jets exposing the OCU to pressures exceeding the IP rating denoted on the product rating plate.
- Do not use sharp or pointed tools to clean your OCU 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 OCU.

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.

13. Regulatory Information

For regulatory information, please refer to the Regulation Booklet.

www.hetronic.com

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 ERGO F OCU
OCU	Operator Control Unit – The portable ERGO F 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. MCUs 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. Put rechargeable batteries on charge at the end of each shift. Chargers are not intended for outdoor use. Use only indoors.

9. Non-rechargeable batteries must NOT be used to power the OCUs. Use ONLY Hetronic rechargeable batteries.

10. 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 trained 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.

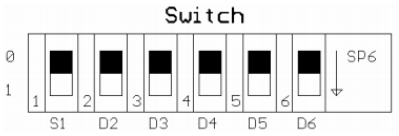
OCU Start-up and Safety Checklist		
1	Are batteries fully charged?	
2	Are all switch decal symbols clear and legible?	
3	Is the OCU enclosure free from cracks and other damage compromising ingress protection?	
4	Are the battery enclosures free from cracks and other damage?	
5	Is the STOP function working as it should be?	
6	Is the correct key cap being used?	
7	Has each function of the OCU been tested independently to ensure the equipment is responding correctly?	
8	Is the TFT (where applicable) free from cracks and other damage making it hard to read?	
9	Are the switches/rubber caps free from damage/tear?	
10	Are all LEDs on the OCU working and clearly visible?	
11	Are the battery charger and power cord in good working condition?	
12	Is the control cable (where applicable) free from kinks and other damage?	
13	Do you hear any rattling components inside the OCU? Consult your supervisor if so and refrain from using the unit until it is serviced.	

Appendix C - Frequency Configuration

Please refer to the provided frequency lists corresponding to the specific radio modules equipped on your OCU when configuring frequency channels and scan-groups. It is essential to ensure prior knowledge of the radio module installed on your OCU to facilitate accurate configuration. Additionally, ensure that any changes made to the frequency configuration on the OCU are also updated on the MCU. Ensure you always adhere to compliance requirements for the country or region in which you are operating in to ensure regulatory compliance and optimal system performance.

C1 Switch Definition

Depending on the purchased configuration, some OCU may be equipped with radio modules including a switch array that enables manual configuration of the frequency channel over which the OCU communicates with the MCU. The same switch array allows for frequency scan-group selection.



C1.1 Fixed Frequency Configuration

Set S1 to 0 position and configure switches D4 to D6 as denoted by the tables for the respective frequency bands in the following sections.

C1.2 Automatic Frequency Configuration

Set S1 to 1 position and configure switches D4 to D6 as denoted by the FCS/AUTX/Scan tables for the respective frequency bands in the following sections.

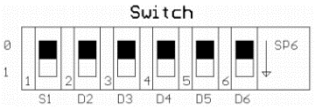
If FCS is selected, on start-up the TX module will listen for noise on the first channel of the scan group. If the noise level is too high, it will move onto the next channel and try again. If all channels are noisy, the TX module will transmit on the channel with the least noise.

In AUTX mode, the TX module will remember the last frequency and then it will automatically decrement the channel every time it is powered On.

In both AUTX and FCS mode, decrement switch button is always active, such that user can change frequency by pushing the button.

C2 419MHz Fixed Frequency Channel Table

D2	D3	D4	D5	D6	Frequency (MHz)	Channel No.
0	0	0	0	0	418.9500	9
0	0	0	0	1	418.9750	10
0	0	0	1	0	419.0000	11
0	0	0	1	1	419.0250	12
0	0	1	0	0	419.0500	13
0	0	1	0	1	419.0750	14
0	0	1	1	0	419.1000	15
0	0	1	1	1	419.1250	16
0	1	0	0	0	419.1500	17
0	1	0	0	1	419.1750	18
0	1	0	1	0	419.2000	19
0	1	0	1	1	419.2500	21
0	1	1	0	0	419.2250	20
0	1	1	0	1	418.7250	0
0	1	1	1	0	418.7500	1
0	1	1	1	1	418.7750	2
1	0	0	0	0	418.8000	3
1	0	0	0	1	418.8250	4
1	0	0	1	0	418.8500	5
1	0	0	1	1	418.8750	6
1	0	1	0	0	418.9000	7
1	0	1	0	1	418.9250	8
1	0	1	1	0	419.2750	22
1	0	1	1	1	419.3000	23
1	1	0	0	0	419.3250	24
1	1	0	0	1	419.3500	25
1	1	0	1	0	419.3750	26
1	1	0	1	1	419.4000	27
1	1	1	0	0	419.4250	28
1	1	1	0	1	418.7250	0
1	1	1	1	0	418.7500	1
1	1	1	1	1	418.7750	2



S1 = 0 : Manual/Fixed Channel

S1 = 1 : Automatic Channel

D2 = 1 : FCS TX and Scan-RX

D3 = 1 : AUTX and Scan-RX

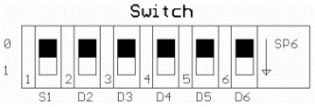
Highlighted channels are for China

C2.1 419MHz Automatic Frequency Channel Table

D4	D5	D6	Channel No. within Scan-Group	Scan-Group No.
0	0	0	21, 19, 15, 10	1
0	0	1	18, 14, 11, 9	2
0	1	0	21, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9	3
0	1	1	28, 26, 23, 19, 13, 5	4
1	0	0	25, 23, 20, 16, 10, 2	5
1	0	1	24, 22, 19, 15, 9, 1	6
1	1	0	27, 21, 13, 11, 8, 4	7
1	1	1	26, 18, 14, 12, 6, 3	8

C3 429MHz Fixed Frequency Channel Table

D1	D2	D3	D4	D5	D6	Frequency (MHz)	Channel No.
1	1	1	0	0	0	429.2500	7
0	0	0	1	0	0	429.2625	8
1	0	0	1	0	0	429.2750	9
0	1	0	1	0	0	429.2875	10
1	1	0	1	0	0	429.3000	11
0	0	1	1	0	0	429.3125	12
1	0	1	1	0	0	429.3250	13
0	1	1	1	0	0	429.3375	14
1	1	1	1	0	0	429.3500	15
0	0	0	0	1	0	429.3625	16
1	0	0	0	1	0	429.3750	17
0	1	0	0	1	0	429.3875	18
1	1	0	0	1	0	429.4000	19
0	0	1	0	1	0	429.4125	20
1	0	1	0	1	0	429.4250	21
0	1	1	0	1	0	429.4375	22
1	1	0	0	1	0	429.4500	23
0	0	0	1	1	0	429.4625	24
1	0	0	1	1	0	429.4750	25
0	1	0	1	1	0	429.4875	26
1	1	1	1	1	0	429.3000	27
0	0	1	1	1	0	429.3125	28
1	0	1	1	1	0	429.5250	29
0	1	1	1	1	0	429.5375	30
1	1	0	1	1	0	429.5500	31
0	0	0	0	0	1	429.5625	32
1	0	0	0	0	1	429.5750	33
0	1	0	0	0	1	429.5875	34
1	1	1	0	0	1	429.6000	35
0	0	1	0	0	1	429.6125	36
1	0	1	0	0	1	429.6250	37
0	1	1	0	0	1	429.6375	38
1	1	0	0	0	1	429.6500	39
0	0	0	1	0	1	429.6625	40
1	0	0	1	0	1	429.6750	41
0	1	0	1	0	1	429.6875	42
1	1	0	1	0	1	429.7000	43
0	0	1	1	0	1	429.7125	44
1	0	1	1	0	1	429.7250	45
0	1	1	1	0	1	429.7375	46



S1 = 0 : Manual/Fixed Channel

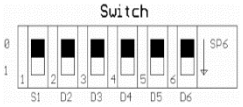
S1 = 1 : Automatic Channel

D2 = 1 : FCS TX and Scan-RX

D3 = 1 : AUTX and Scan-RX

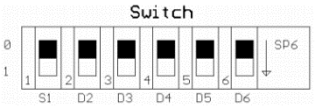
C3.1 429MHz Automatic Frequency Channel Table

D1	D2	D3	D4	D5	D6	Channel No. within Scan-Group	Scan-Group No.
0	0	0	0	0	0	7,11,15,19,23,27,31,35,39,43	1
1	0	0	0	0	0	8,12,16,20,24,28,32,36,40,44	2
0	1	0	0	0	0	9,13,17,21,25,29,33,37,41,45	3
1	1	0	0	0	0	10,14,18,22,26,30,34,38,42,46	4
0	0	1	0	0	0	No function	5
1	0	1	0	0	0	No function	6
0	1	1	0	0	0	Scan all channels	7



C4 434MHz Fixed Frequency Channel Table

D2	D3	D4	D5	D6	Frequency (MHz)	Channel No.
0	0	0	0	0	433.1000	2
0	0	0	0	1	433.5500	20
0	0	0	1	0	434.0500	40
0	0	0	1	1	434.0750	41
0	0	1	0	0	434.1000	42
0	0	1	0	1	434.1250	43
0	0	1	1	0	434.1500	44
0	0	1	1	1	434.1750	45
0	1	0	0	0	434.2000	46
0	1	0	0	1	434.2250	47
0	1	0	1	0	434.2500	48
0	1	0	1	1	434.2750	49
0	1	1	0	0	434.3000	50
0	1	1	0	1	434.3250	51
0	1	1	1	0	434.3500	52
0	1	1	1	1	434.3750	53
1	0	0	0	0	434.4000	54
1	0	0	0	1	434.4250	55
1	0	0	1	0	434.4500	56
1	0	0	1	1	434.4750	57
1	0	1	0	0	434.5000	58
1	0	1	0	1	434.5250	59
1	0	1	1	0	434.5500	60
1	0	1	1	1	434.5750	61
1	1	0	0	0	434.6000	62
1	1	0	0	1	434.6250	63
1	1	0	1	0	434.6500	64
1	1	0	1	1	434.6750	65
1	1	1	0	0	434.7000	66
1	1	1	0	1	434.7250	67
1	1	1	1	0	434.7500	68
1	1	1	1	1	434.7750	69



S1 = 0 : Manual/Fixed Channel

S1 = 1 : Automatic Channel

D2 = 1 : FCS TX and Scan-RX

D3 = 1 : AUTX and Scan-RX

Maximum Power is 10mW ERP, 100% duty cycle in Europe

Maximum Power is 1mW ERP, 100% duty cycle in Europe

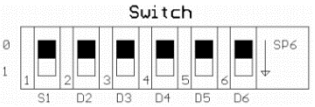
C4.1

434MHz Automatic Frequency Channel Table

D4	D5	D6	Channel No. within Scan-Group	Scan-Group No.
0	0	0	68, 58, 54, 52, 49, 41	1
0	0	1	67, 59, 55, 53, 47, 44	2
0	1	0	66, 64, 61, 57, 51, 43	3
0	1	1	65, 63, 60, 56, 50, 42	4
1	0	0	38, 32, 28, 18, 10, 8, 5	5
1	0	1	37, 29, 25, 23, 17, 14, 4	6
1	1	0	36, 34, 31, 27, 21, 13, 3	7
1	1	1	35, 33, 30, 26, 20, 12, 2	8

C5 447MHz Fixed Frequency Channel Table

D2	D3	D4	D5	D6	Frequency (MHz)	Channel No.
0	0	0	0	0	447.8625	47
0	0	0	0	1	447.8750	48
0	0	0	1	0	447.8875	49
0	0	0	1	1	447.9000	50
0	0	1	0	0	447.9125	51
0	0	1	0	1	447.9250	52
0	0	1	1	0	447.9375	53
0	0	1	1	1	447.9500	53
0	1	0	0	0	447.9625	55
0	1	0	0	1	447.9750	56
0	1	0	1	0	447.9875	57
0	1	0	1	1	447.3000	2
o	1	1	0	o	447.3250	4
0	1	1	0	1	447.3500	6
0	1	1	1	0	447.3750	8
0	1	1	1	1	447.4000	10
1	0	0	0	0	447.4250	12
1	0	0	0	1	447.4500	14
1	0	0	1	0	447.4750	16
1	0	0	1	1	447.5000	18
1	0	1	o	o	447.5250	20
1	0	1	0	1	447.5500	22
1	0	1	1	0	447.6000	26
1	0	1	1	1	447.6250	28
1	1	0	0	0	447.7750	30
1	1	0	0	1	447.9250	32
1	1	0	1	0	448.0750	34
1	1	0	1	1	448.2250	36
1	1	1	0	0	448.3750	38
1	1	1	0	1	448.5250	40
1	1	1	1	0	448.6750	42
1	1	1	1	1	448.8250	44



S1 = 0 : Manual/Fixed Channel

S1 = 1 : Automatic Channel

D2 = 1 : FCS TX and Scan-RX

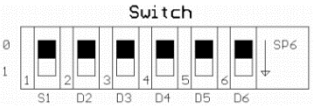
D3 = 1 : AUTX and Scan-RX

C5.1 447MHz Automatic Frequency Channel Table

D4	D5	D6	Channel No. within Scan-Group	Scan-Group No.
0	0	0	57, 55,52, 48	1
0	0	1	56, 54, 51, 47	2
0	1	0	49, 38, 28, 20, 14, 10, 7, 5	3
0	1	1	50, 39, 29, 21, 15, 11, 8, 6	4
1	0	0	56, 53, 51, 40, 30, 22, 16, 12	5
1	0	1	57, 54, 50, 41, 31, 23, 17, 13	6
1	1	0	48, 44, 36, 33, 26, 24, 18, 3	7
1	1	1	57, 42, 34, 25, 19, 9, 4, 2	8

C6 458MHz Fixed Frequency Channel Table

D2	D3	D4	D5	D6	Frequency (MHz)	Channel No.
0	0	0	0	0	458.5000	0
0	0	0	0	1	458.5250	1
0	0	0	1	0	458.5500	2
0	0	0	1	1	458.5700	3
0	0	1	0	0	458.6000	4
0	0	1	0	1	458.6250	5
0	0	1	1	0	458.6500	6
0	0	1	1	1	458.6750	7
0	1	0	0	0	458.7000	8
0	1	0	0	1	458.7250	9
0	1	0	1	0	458.7500	10
0	1	0	1	1	458.7750	11
o	1	1	0	o	458.8000	12
0	1	1	0	1	458.8250	13
0	1	1	1	0	458.8500	14
0	1	1	1	1	458.8750	15
1	0	0	0	0	458.9000	16
1	0	0	0	1	458.9250	17
1	0	0	1	0	458.9500	18
1	0	0	1	1	458.9750	19
1	0	1	o	o	459.0000	20
1	0	1	0	1	459.0250	21
1	0	1	1	0	459.0500	22
1	0	1	1	1	459.0750	23
1	1	0	0	0	459.1000	24
1	1	0	0	1	459.1250	25
1	1	0	1	0	459.1500	26
1	1	0	1	1	459.1750	27
1	1	1	0	0	459.2000	28
1	1	1	0	1	458.5000	0
1	1	1	1	0	458.5250	1
1	1	1	1	1	458.5500	2



S1 = 0 : Manual/Fixed Channel

S1 = 1 : Automatic Channel

D2 = 1 : FCS TX and Scan-RX

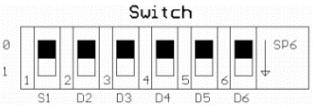
D3 = 1 : AUTX and Scan-RX

C6.1 458MHz Automatic Frequency Channel Table

D4	D5	D6	Channel No. within Scan-Group	Scan-Group No.
0	0	0	18, 15, 10, 3, 1	1
0	0	1	17, 14, 8, 2, 0	2
0	1	0	18, 12, 8, 5, 3	3
0	1	1	17, 11, 7, 4, 2	4
1	0	0	27, 19, 16, 14, 10, 0	5
1	0	1	24, 15, 13, 9, 6, 1	6
1	1	0	26, 18, 12, 8, 5, 3	7
1	1	1	25, 17, 11, 7, 4, 2	8

C7 480MHz Fixed Frequency Channel Table

D2	D3	D4	D5	D6	Frequency (MHz)	Channel No.
0	0	0	0	0	480.0500	1
0	0	0	0	1	480.0750	2
0	0	0	1	0	480.1000	3
0	0	0	1	1	480.1250	4
0	0	1	0	0	480.1500	5
0	0	1	0	1	480.1750	6
0	0	1	1	0	480.2000	7
0	0	1	1	1	480.2250	8
0	1	0	0	0	480.2500	9
0	1	0	0	1	480.2750	10
0	1	0	1	0	480.3500	11
0	1	0	1	1	480.4000	12



S1 = 0 : Manual/Fixed Channel

S1 = 1 : Automatic Channel

D2 = 1 : FCS TX and Scan-RX

D3 = 1 : AUTX and Scan-RX

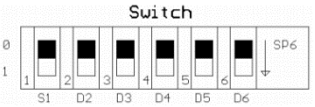
Note: If switches are set differently than those denoted on the table, the module will operate on a default frequency of 480.0500MHz (CH1)

C7.1 480MHz Automatic Frequency Channel Table

D4	D5	D6	Channel No. within Scan-Group	Scan-Group No.
0	0	0	12, 6, 3, 1	1
0	0	1	11, 10, 4, 2	2
0	1	0	12, 11, 9, 6	3
0	1	1	10, 8, 5, 1	4
1	0	0	11, 9, 7, 4	5
1	0	1	12, 10, 7, 5	6
1	1	0	11, 10, 6, 1	7
1	1	1	12, 7, 4, 2	8

C8 868MHz Fixed Frequency Channel Table

D2	D3	D4	D5	D6	Frequency (MHz)	Channel No.
0	0	0	0	0	869.3000	52
0	0	0	0	1	869.3250	53
0	0	0	1	0	869.3500	54
0	0	0	1	1	869.3750	55
0	0	1	0	0	869.4000	56
0	0	1	0	1	869.7000	68
0	0	1	1	0	869.7250	69
0	0	1	1	1	869.7500	70
0	1	0	0	0	869.7750	71
0	1	0	0	1	869.8000	72
0	1	0	1	0	869.8250	73
0	1	0	1	1	869.8500	74
o	1	1	0	o	869.8750	75
0	1	1	0	1	869.9000	76
0	1	1	1	0	869.9250	77
0	1	1	1	1	869.9500	78
1	0	0	0	0	869.9750	79
1	0	0	0	1	870.0000	80
1	0	0	1	0	869.4250	57
1	0	0	1	1	869.4500	58
1	0	1	o	o	869.4750	59
1	0	1	0	1	869.5000	60
1	0	1	1	0	869.5250	61
1	0	1	1	1	869.5500	62
1	1	0	0	0	869.5750	63
1	1	0	0	1	869.6000	64
1	1	0	1	0	869.6250	65
1	1	0	1	1	869.6500	66
1	1	1	0	0	869.6750	67
1	1	1	0	1	868.0000	0
1	1	1	1	0	868.2050	10
1	1	1	1	1	868.5000	20



S1 = 0 : Manual/Fixed Channel

S1 = 1 : Automatic Channel

D2 = 1 : FCS TX and Scan-RX

D3 = 1 : AUTX and Scan-RX

Allowed duty cycle 100%

Allowed duty cycle 10%

Allowed duty cycle 1%

Note: This frequency allocation is designed for use in Europe Non-License Band.

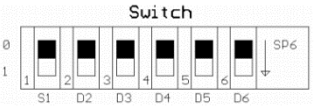
For use in different countries, please check with local authority.

C8.1 868MHz Automatic Frequency Channel Table

D4	D5	D6	Channel No. within Scan-Group	Scan-Group No.
0	0	0	75, 71, 68, 54, 52	1
0	0	1	76, 72, 69, 55, 53	2
0	1	0	79, 77, 73, 70, 56	3
0	1	1	78, 76, 73, 69, 55	4
1	0	0	66, 62, 59, 57	5
1	0	1	67, 63, 60, 58	6
1	1	0	24, 19, 16, 7, 3, 1	7
1	1	1	23, 18, 15, 6, 2, 0	8

C9 1216MHz Fixed Frequency Channel Table

D2	D3	D4	D5	D6	Frequency (MHz)	Channel No.
0	0	0	0	0	1216.0375	1
0	0	0	0	1	1216.0625	2
0	0	0	1	0	1216.0875	3
0	0	0	1	1	1216.1125	4
0	0	1	0	0	1216.1375	5
0	0	1	0	1	1216.1625	6
0	0	1	1	0	1216.1875	7
0	0	1	1	1	1216.2125	8
0	1	0	0	0	1216.2375	9
0	1	0	0	1	1216.2625	10
0	1	0	1	0	1216.2875	11
0	1	0	1	1	1216.3125	12
o	1	1	0	o	1216.3375	13
0	1	1	0	1	1216.3625	14
0	1	1	1	0	1216.3875	15
0	1	1	1	1	1216.4125	16
1	0	0	0	0	1216.4375	17
1	0	0	0	1	1216.4625	18
1	0	0	1	0	1216.4875	19



S1 = 0 : Manual/Fixed Channel

S1 = 1 : Automatic Channel

D2 = 1 : FCS TX and Scan-RX

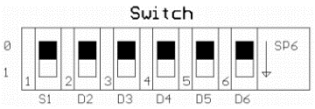
D3 = 1 : AUTX and Scan-RX

C9.1 1216MHz Automatic Frequency Channel Table

D1	D2	D3	D4	D5	D6	Channel No. within Scan-Group	Scan-Group No.
0	0	0	0	0	0	1, 6, 10, 13, 15	0
1	0	0	0	0	0	2, 4, 7, 11, 16	1
0	1	0	0	0	0	5, 9, 12, 17, 19	2
1	1	0	0	0	0	3, 8, 14, 18	3
0	0	1	0	0	0	Not used	4
1	0	1	0	0	0	Not used	5
0	1	1	0	0	0	Scan Channels (CH1-19)	6

C10 2400MHz Fixed Frequency Channel Table

D3	D4	D5	D6	Frequency (MHz)	Channel No.
0	0	0	0	2405	1
0	0	0	1	2410	2
0	0	1	0	2415	3
0	0	1	1	2420	4
0	1	0	0	2425	5
0	1	0	1	2430	6
0	1	1	0	2435	7
0	1	1	1	2440	8
1	0	0	0	2445	9
1	0	0	1	2450	10
1	0	1	0	2455	11
1	0	1	1	2460	12
1	1	0	o	2465	13
1	1	0	1	2470	14
1	1	1	0	2475	15
1	1	1	1	2480	16



S1 = 0 : Manual/Fixed Channel

S1 = 1 : Automatic Channel

D2 = 1 : FCS TX and Scan-RX

D3 = 1 : AUTX and Scan-RX

C10.1 2400MHz Automatic Frequency Channel Table

S1	D1	D2	D3	D4	D5	D6	Channel No. within Scan-Group	Scan-Group No.
1	FCS = 1	AUTX = 1	0	0	0	0	1, 6, 10, 13, 15	0
1			0	0	0	0	2, 4, 7, 11, 16	1
1			0	0	0	0	5, 9, 12, 17, 19	2
1			0	0	0	0	3, 8, 14, 18	3
1			1	0	0	0	Not used	4
1			1	0	0	0	Not used	5
1			1	0	0	0	Scan Channels (CH1-19)	6

Appendix D – OCU Care

D.1 Caring for your OCU Display

In the harsh industrial environment where your OCU operates, it's crucial to take special care of the display, a legacy option on your OCU, to ensure continued performance and visibility. Regularly clean the display cover using a soft, lint-free cloth lightly dampened with water or a mild, non-abrasive cleaning solution. Avoid using harsh chemicals or abrasive materials that could damage the display protection cover permanently. Exercise caution when cleaning around the display to prevent accidental scratching or other damage. Additionally, consider using display protective films to minimize exposure to abrasive dust, concrete, metal filings, welding sparks, and other corrosive elements present in your work environment. These are available for purchase from your nearest Hetronic dealer or the Hetronic web shop. By following these care instructions, you can prolong the lifespan and maintain the functionality of the display on your OCU, crucial for controlling your valuable industrial equipment.

Battery Types and Specifications

Battery MINI 3.6V/2.75Ah Grey NiMH Item No. 68301000

Technical Specification - Battery MINI 3.6V 2.75Ah	
Rated Capacity	2750mAh
Storage Environment Conditions	-20°C . . . 40°C, 85%RH max (for short periods less than 1 month) -20°C . . . 30°C, 85%RH max (for periods less than 3 months) -20°C . . . 20°C, 85%RH max (for long term storage, max 1 year)
Charging Temperature Range	0°C . . . 40°C (32°F . . . 104°F), max 85%RH
Discharging Temperature Range	-10°C . . . 55°C (14°F . . . 131°F) , max 85%RH
Charging Time (hrs)	8 (0.3 C)

Battery Disposal

AVOID ENVIRONMENTAL POLLUTION. Recycle your rechargeable batteries according to local recycling rules and regulations. If you have questions or problems operating your battery charger, please contact your nearest Hetronic dealer or service center.

Prolonged Battery Life

Avoid battery misuse, over charging, overheating or regular dropping. This can cause permanent damage to the cells.

It is recommended that the battery is not used at temperatures exceeding 60°C for a prolonged time since this will shorten the battery lifetime by approximately 15%.

Standard Hetronic rechargeable batteries are the nickel metal hydride type. These batteries have no “memory effect”. They can be stored partially charged.

Do not store fully charged batteries at an elevated ambient temperature. Battery pack does not die suddenly but the battery autonomy gradually shortens as the capacity fades.

Keeping the charge in the 40% to 80% range prolongs battery life.

Unfortunately, there is no avoiding fact that battery has a finite life, after which they will certainly degrade. Following these basic tips can help delay the inevitable.

MINI UCH 2 Battery Charger

LED Indicators

The UCH 2 battery charger is equipped with three visual LED indicators to show the charger operating status.

LED Indicator	Status
CHARGE	Solid yellow when charging the battery Blinks yellow when charger detects an issue with the loaded battery
FAST CHARGE	Solid red when option is enabled
READY	OFF when battery is charging Solid green when battery is fully charged

Charging your Batteries

Remove the battery from the OCU by lifting it up and sliding it out of the battery compartment. Slide the battery in the charging unit until it clips in place and the yellow ‘CHARGE” LED flashes for two seconds. The yellow LED will remain ON for the whole charging process. When the battery is fully charged, the “READY” green LED lights up and the “CHARGE” yellow LED goes off.

NOTE: If the yellow LED continues to blink after 2 seconds of inserting the battery in the charger, then the battery is defective and must be replaced.

A fast charge option is available. This mode can be enabled by pressing the switch on the indicator panel. The switch is located under the “CHARGE” decal symbol. When “Fast Charge” is in progress a red LED turns on together with the yellow “CHARGE” LED. When fast charging is complete, the green “READY” LED lights up and the red LED switches off.

Leave the battery in the charger as long as required. The charger is smart enough to maintain a constant state of charge without ever over-charging the battery.

EXPLOSIVE GASES AND FLYING DEBRIS can cause death or serious injury. Use only Hetronic replacement rechargeable batteries. Use of unauthorized replacement batteries could cause a battery explosion resulting in injury or death of the operator or other people in the work area.

Charger Variants

The charger power cable is supplied with different plugging options: EU plug, cigarette lighter plug, US plug, etc. Below is the list of the variants available.

Reference ID	Item Number	Description
A	68108570	Charger Mini 90-270VAC 300/780mA Euro-Plug with Fast Charge
B	68108690	Charger Mini 10-30VDC 300/780mA Plug Cigarette Lighter with Fast Charge
C	68108580	Charger MINI 90-270VAC 300/780mA UL-Plug with Fast Charge
D	68108595	Charger Mini 90-270VAC 300/780mA Australia/N.Z. Plug with Fast Charge
E	68108670	Charger Mini 10-30VDC 300/780mA Sliding Socket with Fast Charge
F	68108560	Charger Mini 90-270VAC 300/780mA UK-Plug with Fast Charge