USER MANUAL

NOVA Operator Control Units

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User Manual

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1. Safety

1.1 Intended Use

Your Operator Control Unit (OCU) 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 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 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 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 NOVA Product

The enclosure materials used in the NOVA 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 NOVA can potentially damage the unit or shorten its lifespan.

Do not store your NOVA 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.

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 NOVA 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.

Note: This manual does not cover the EX versions of NOVA 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's full service support potential.

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

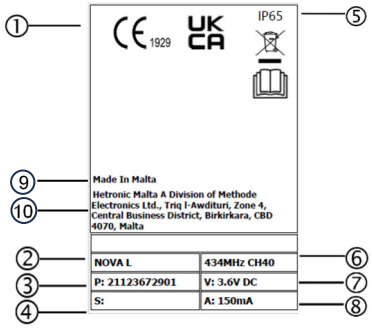


Figure 1. *Product Rating Plate*

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 NOVA OCU

3.1 NOVA General Description

The NOVA family comprises a range of OCU sizes, offering users a diverse array of possibilities to meet both basic and complex requirements across various applications. All OCUs are ergonomically designed and programmable wireless units, capable of transmitting a wide range of functions to remotely control machinery or other equipment.

Your OCU is housed in a rugged casing with a minimum IP65 rating, ensuring durability in challenging environments. It operates on battery power and includes built-in low battery detection for added convenience. Standard equipment includes two sets of rechargeable batteries and a battery charger.

3.2 NOVA Basic Features

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

- Fully PC H-Link programmable controller (excluding M series)
- Push buttons with up to two detents
- Single detent Start button/switch
- Joysticks (cross or paddle lever, optional)
- Internal Antenna as a standard configuration. External antenna option is available on demand.
- A software configurable auto power off feature
- Quickset Programming mode
- A software configurable low battery detection with visible and audible warning
- Status bi-colour LED Red/Green for radio link and battery status indication
- Unique address code
- Neck or belly belt/shoulder strap/harness/shoulder bar. Consult your Hetronic dealer to find the accessory that best suits your product and application
- A software configurable warning buzzer
- Rechargeable battery pack

Additional optional features are available for the NOVA OCUs, catering to sophisticated applications and more technology-driven users. These include:

- 12 or more programmable machine feedback colour LEDs
- Sunlight readable LCD or TFT display. Display characteristics are relative to OCU type
- 2-axis, factory programmable tilt sensor
- Programmable haptic feedback
- Cable Control (RS232, CAN or other bus protocols). Consult for Hetronic dealer for a full list of available protocols for each OCU family.
- Palm Sensor (only available on Nova M 4L, Nova C, Nova L, Nova XL, Nova XL 2.8 and Nova XXL 4.3)
- Foot Path or Control Console Lighting on Nova XL and XXL Variants
- Glow in the dark decals

3.3 Standard NOVA Series OCUs

The NOVA Series OCUs are available either of the following standard configurations or highly customizable variants.

NOVA C

- Coded power key switch for secure user authentication
- Two 3-axis digital or proportional joystick controls or up to for proportional paddle levers
- Up to a combination of four toggle switches, four momentary color coded push-buttons controls, rotary switches and key switches with removable key caps
- Machine feedback LEDs with custom decal label with integrated LEDs or sun-light readable 2.4inch color display
- Independent battery status indicators
- Half or full duplex secure wireless transmission
- Operating frequency band options: 4xxMHz, 8xxMHz, 9xxMHz or 2.4GHz
- Dimensions: H:143mm (5.6”) x W:242mm (9.5”) x D: 164mm (6.5”)
- Weight: Typically 2200g (4.85lbs), depending on equipped options
- Carry options: Neck or belly belt
- 2x Batteries: 3.7V 3400mAh Li-Ion rechargeable battery packs supporting hot swapping
- Optional Cable Back-up: Through ITT connector. Custom cable lengths up to 20 meters available on request
- Color-coded bottom enclosure. Consult your Hetronic dealer for custom color coding
- Brand and control function colored decals

NOVA S

- Up to 5 toggle switches or colour coded push buttons
- Status LED for normal operation and low battery indication
- Operating frequency band options: 4xxMhz, 8xxMHz, 9xxMHz, 2.4GHz
- Dimensions: H:150mm (5.9”)x W:180mm (7.9”) x D:110mm (4.3”)
- Weight: Typically 910g (2lbs), depending on equipped options
- Carry options: Neck or belly belt
- Battery: 3.6V 2750mAh NiMH rechargeable battery pack
- Cabled battery back- up: Serial through battery enclosure. Custom cable lengths up to 20m available on request
- Color-coded bottom enclosure. Consult your Hetronic dealer for custom color coding
- Brand and control function colored decals

NOVA M

- Coded power key switch for secure user authentication
- Two two-axis Digital/Proportional joystick controls or up to four proportional paddle levers
- One toggle switch
- Up to four color coded push-buttons
- Status LED for normal operation and low battery indication
- Operating frequency band options: 4xxMhz, 8xxMHz, 9xxMHz, 2.4GHz
- Dimensions: H150mm (5.9")x W180mm (7.9") x D110mm (4.3")
- Weight: Typically 910g (2lbs), depending on equipped options
- Carry options: Neck or belly belt
- Battery: 3.6V 2750mAh NiMH rechargeable battery pack
- Cable back up: Serial (RS232/CAN) through battery enclosure or connector plug. Custom cable lengths up to 20m available on request
- Color-coded bottom enclosure. Consult your Hetronic dealer for custom color coding
- Brand and control function colored decals

NOVA L

- Key-coded power switch for secure user authentication
- Digital and/or Proportional functionality
- Up to either two dual-axis joysticks or six paddle levers
- Any combination of toggle switches, push-button controls, rotary switches and key switches with removable key caps
- Status LED for operation and standard/advanced low battery indication
- Optional Feedback LEDs or sunlight readable 72x32p. backlit monochrome LCD
- Half or full duplex secure wireless transmission
- Operating frequency band options: 4xxMhz, 8xxMHz, 9xxMHz, 2.4GHz
- Dimensions: H160mm (6.3”) x W235mm (9.3”) x D110mm (4.3”)
- Weight: Typically 1000g (2.2lbs.), depending on equipped options
- Carry options: Belly belt, neck belt, chest belt or shoulder bar
- Battery: 3.6V 2750mAh NiMH rechargeable battery pack
- Cable back up: Serial (RS232/CAN) through battery enclosure or connector plug. Custom cable lengths up to 20m available on request
- Color-coded bottom enclosure. Consult your Hetronic dealer for custom color coding
- Brand and control function colored decals

NOVA L 2.4

- Key-coded power switch for secure user authentication
- Digital and/or Proportional functionality
- Up to two dual-axis joysticks
- Any combination of toggle switches, push-button controls, rotary switches and key switches with removable key caps
- Status LED for operation and standard/advanced low battery indication
- Optional machine feedback color LEDs
- Half or full duplex secure wireless transmission
- Sunlight readable 2.4”, 240x320, 262K colors backlit TFT display
- Operating frequency band options: 4xxMhz, 8xxMHz, 9xxMHz, 1.2GHz, 2.4GHz
- Dimensions: H205mm (8.1”) xW265mm (10.4“) x D155mm (6.1“)
- Weight: Typically 1500g (3.3lbs.), depending on equipped options
- Carry options: Belly belt, neck belt, chest belt or shoulder bar
- Battery: 3.6V NiMH rechargeable battery pack
- Cable back-up: Serial (RS232/CAN) through battery enclosure or connector plug. Custom cable lengths on request
- Color-coded bottom enclosure. Consult your Hetronic dealer for custom color coding
- Brand and control function colored decals

NOVA XL

- Key-coded power switch for secure user authentication
- Digital and/or Proportional functionality
- Up to either four multiple-axis digital/proportional/gray-code joysticks or eight proportional paddle levers or a combination of both
- Any combination of toggle switches, push-button controls, rotary switches and key switches with removable key caps
- Status LED for operation and standard/advanced low battery
- Optional Feedback LEDs
- Half or full duplex secure wireless transmission
- Optional monochrome LCD 120x32p.
- Operating Frequency Band Options: 4xxMhz, 8xxMHz, 9xxMHz, 1.2GHz, 2.4GHz
- Dimensions: H165mm(6.49“) x W312mm(12.28“) x D170mm (6.69")
- Weight: Typically 1.9kg (4.19lbs.), depending on equipped options
- Carry options: Belly belt, neck belt or shoulder bar
- Battery: Standard 3.6V 2750mAh NiMH or 3.7V 9750mAh Li-Ion rechargeable battery as option
- Cable back-up: Serial (RS232/CAN) through battery enclosure or connector plug. Custom cable lengths up to 20m on request
- Color-coded bottom enclosure. Consult your Hetronic dealer for custom color coding
- Brand and control function colored decals

Nova XL 2.8

- Key-coded power switch for secure user authentication
- Digital and/or Proportional functionality
- Up to four multiple-axis digital/proportional/gray-code joysticks or eight linear paddle levers or a combination of both
- Any combination of toggle switches, push-button controls, rotary switches and key switches with removable key caps
- Status LED for operation and low battery warning
- Optional machine feedback LEDs
- Half of full duplex secure transmission
- Sunlight readable, 2.8”, 320x240, 262K colors, 350nits backlit TFT display
- Operating Frequencies: 4xxMhz, 8xxMHz, 9xxMHz, 1.2GHz, 2.4GHz
- Dimensions: H200mm (7.9”) x W330mm (13.0”) x D220mm (8.7”)
- Weight: Typically 2700kg (5.9lbs.), depending on equipped options
- Carry options: Belly belt, neck belt or shoulder bar
- Battery: 3.7V 9750mAh Li-Ion rechargeable battery pack
- cable lengths on request
- Color-coded bottom enclosure. Consult your Hetronic dealer for custom color coding
- Brand and control function colored decals

Nova XL 4.3

- Key-coded power switch for secure user authentication
- Up to four multiple-axis digital/proportional/gray-code joysticks or eight proportional linear paddle levers or a combination of both
- Any combination of toggle switches, push-button controls, rotary switches and key switches with removable key caps.
- Status LED for operation and standard/advanced low battery
- Optional machine feedback LEDs
- Half of full duplex secure wireless transmission
- Sunlight readable, 4.3", 480x272, 16.7M colors, 550nits backlit TFT display with optional capacitive touch
- Operating frequency band options: 4xxMhz, 8xxMHz, 9xxMHz, 1.2GHz, 2.4GHz
- Linux OS with minimum 16Gb on-board, high speed, microSD user application memory
- Dimensions: H210mm x W335mm x D220mm
- Weight: 2300g (5.07lbs.), depending on equipped options
- Carry options: Belly belt, neck belt or shoulder bar
- Battery: Battery: 3.7V 9750mAh Li-Ion rechargeable battery pack
- Cable back-up: Serial (RS232/CAN) through battery enclosure or connector plug. Custom cable lengths up to 20m on request
- Color-coded bottom enclosure. Consult your Hetronic dealer for custom color coding
- Brand and control function colored decals

Nova XXL 4.3

- Key-coded power switch for secure user authentication
- Up to four multiple-axis digital/proportional/gray-code joysticks or eight linear paddle levers or a combination of both
- Any combination of toggle switches, push-button controls, rotary switches and key switches with removable key caps
- Status LED for operation and standard/advanced low battery
- Optional machine feedback LEDs
- Half or full duplex secure wireless transmission
- Sunlight readable, 4.3", 480x272, 16.7M colors, 550nits backlit TFT display with optional capacitive touch
- Real time data access with optional video feedback capability with up to 4 simultaneous camera streams over 2.4GHz WiFi
- Operating frequency bands options: 4xxMhz, 8xxMHz, 9xxMHz, 1.2GHz, 2.4GHz
- Linux OS with minimum 16Gb on-board, high speed, microSD user application memory
- Dimensions: L367mm x W229mm x D174mm
- Weight: Typically 2400g (5.29lbs.), depending on equipped options
- Carry options: belly, neck, shoulder or chest belt
- Battery: 3.7V Li-Ion rechargeable battery packs
- Cable back-up: Serial (RS232/CAN) through battery enclosure or connector plug. Custom cable lengths on request
- Color-coded bottom enclosure. Consult your Hetronic dealer for custom color coding
- Brand and control function colored decals

4. Product Description

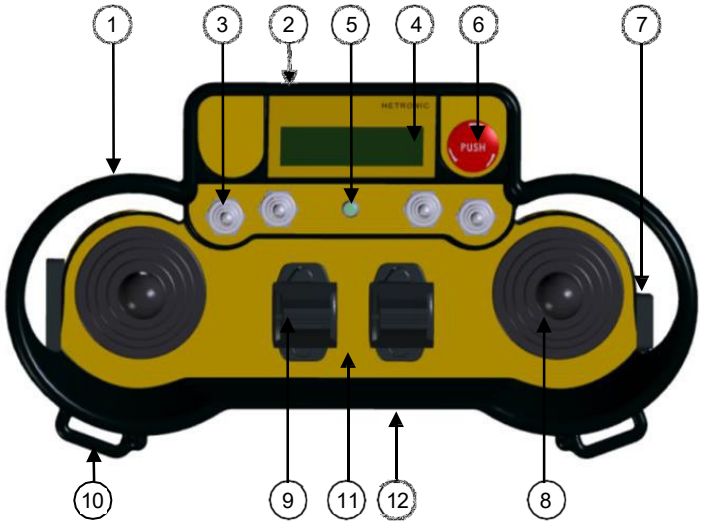


Figure 2. *Generic OCU Console view*

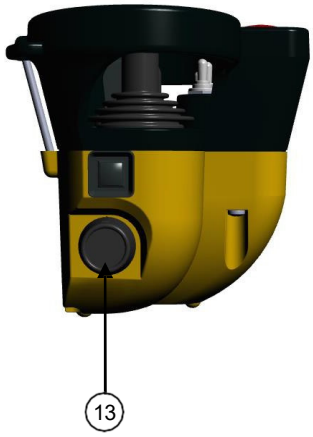


Figure 3. *Generic OCU Side View*

1	OCU Handlebar
2	Customizable Logo
3	Toggle Switch
4	TFT/LCD
5	Status bi-color LED
6	Generic Safe STOP push button
7	Start push button
8	Cross Joystick
9	Paddle Lever
10	Gripping handles for belt clips
11	Customizable decals
12	Battery Compartment (located in the bottom)
13	Coded key switch with key cap

Table 1. *NOVA OCU Generic features*

Standard NOVA OCUs come with a variety of basic features, including toggle switches, pushbutton controls, rotary switches, key switches, a generic safe ISO13849, EN62745 compliant STOP button, LED status indicators, dual-axis joysticks (digital or proportional), or proportional paddle levers. They also offer optional graphical displays, with size options dependent on the OCU size, as well as optional half or full duplex, cable backup, and feedback LEDs.

The optional graphical display provides real-time visual information during operation, allowing users to change configuration settings, 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:

1. Double-check that you've got all the safety measures covered as described previously.
2. Load up your OCU with fresh batteries.
3. Ensure the STOP switch (#6) is OFF and no other switches are in action mode.
4. Time to power up! Pop the black key cap into the key switch and turn it to the ON (I) position.
5. Power ON the equipment if required for the machine control unit to initialise itself.
6. Finally, hit that START button (#7) and watch your OCU do its startup self-test initialisation sequence.

Note: The Start button is typically a green quadratic push button located on the right-hand side of the OCU, as indicated above. However, it may also appear as a momentary toggle switch or round push button with the symbol ■, often paired with the horn function 🔈.

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 Initialization of OCUs equipped with a status LED indicators

When the OCU is turned ON, all LEDs illuminate as solid colors, accompanied by two beeps from the buzzer on the OCU, approximately two seconds apart. Subsequently, the LEDs turn off as the OCU proceeds with routine initialization.

During initialization, if the OCU logic controller detects an error in the radio frequency module, address, configuration, or feedback, the OCU will still boot up. An error will be indicated by a blinking RED status LED. In such cases, all variants of the Nova C, Nova L, Nova XL, and Nova XXL OCUs may be connected to Hetronic PC-Link (please refer to the Programming and Servicing Manual for instructions) to diagnose and address the error.

Please note: If the buzzer output remains continuously ON, it indicates an issue with the address module, which itself may not be present, plugged in correctly, or is defective.

Upon successful initialization, the OCU enters Normal Operation Mode. The Green LED blinks periodically, toggling on with every transmitted telegram frame, while all other LEDs remaining in OFF state. It's recommended to thoroughly test all machine functions and refer to the respective documentation for your machine, OCU, and radio remote MCU as needed.

5.5 Initialization of OCUs equipped with a display and status LED indicators

The initialization sequence is similar to the one described in section 5.4. After a successful initialization, the NOVA OCU enters Normal Operation Mode. The display will show the software version and the splash screen if the latter has been configured. After initialization, the basic home screen will appear, accompanied by the blinking of the green LED. The LED toggles ON with every transmitted telegram frame, while all other LEDs switch off. Proceed to test all machine functions. Refer to the documentation provided for your machine, OCU, and remote control MCU as necessary.

5.6 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 all MCU control and machine movement.

To resume operation, deactivate the STOP button and activate the OCU start function again.

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

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.

5.7 Battery 'State of Charge' Indicatator

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 five seconds until it automatically powers off completely.

5.8 LED Behaviour 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 Behaviour	RED LED Behaviour	Buzzer	Meaning
Off	Off	Off	Power OFF
Off	On	Off	Power ON initialization
On	Off	On	Startup process ~1.5s
On	Off	Off	Startup process ~ 1.5-2.8s
On	Off	On	Startup process ~ 2.8-3.5s
Blinking	Off	Off	Start of Normal Operation GRN LED is toggled every telegram frame transmitted
Blinking	Slow Blinking	-	Low Battery Warning
Blinking	Fast Blinking	-	Critical Battery Warning
Blinking	Blinking Randomly	-	Hetronic PC-Link communication
Blinking	-	On/Off	Buzzer output is activated

Table 2. *LED and Buzzer Behavior*

Note: The LED behavior on NOVA S OCU is described in the respective appendix of this user manual.

5.9 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.

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.

To power off the OCU, turn the key switch clockwise to the "0" position. 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. Consult the NOVA Service and Programming Manual or reach out to your Hetronic dealer for more details.

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

The NOVA S OCU model is not equipped with a key switch. Refer to the appendix corresponding to this OCU model within this instruction manual for more details on how to power OFF this OCU.

5.10 Belt Accessories

The practical belt hangers on the NOVA OCUs enable users to easily attach the appropriate belt for convenient access and operator safety during operation. Each OCU model includes exclusively designed belt accessories, prioritizing ergonomic design to minimize user strain.

6. OCU Functional Description

6.1 “START” Function

The start function, typically associated with a green quadratic button positioned near the key switch, is essential for initializing the radio remote control system. For safety compliance, the "Start" command must be activated to grant machine control whenever interruptions to the wireless communication link occur. Often, this switch is paired with the machine horn function ■/◀.

To start up the radio remote control system from the OCU, ensure that the stop button is released and all control levers are in the neutral position. Turn the key switch on the OCU to the “ON” position (I), then activate the “Start” command.

6.2 “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 are 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 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.

6.3 Digital and Proportional Control

Two types of control are available for operation from the OCU: digital and proportional functions.

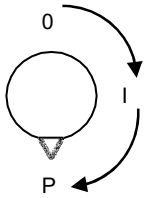
Digital control (ON-OFF) dictates the opening or closing of potential-free relays or switching of solid-state circuits on the MCU when the associated functions are activated on the OCU. These commands are typically associated with simple push buttons, toggle switches, selector switches, or digital/gray-code joysticks.

Proportional control determines a variable output, either in current or voltage, directly proportional to the position variation of an analog actuator on the OCU. This actuator can be a cross joystick, a paddle lever or a linear potentiometer. .Cross joysticks operate on one, two, or three axes (X, Y, and Z respectively), depending on the application. Depending on the OCU configuration, the X and Y axes can have up to six mechanical detents in each direction, while the Z axis involves the rotation of the joystick lever on its own axis. When smooth, stepless proportional control is required, the initial mechanical movement of the joystick or paddle lever activates the safety monitoring before any machine control is granted.

In all scenarios where start-interlocking is programmed or configured, it's imperative that all control elements remain in the neutral position for the system to initiate. Ensure to consult your Hetronic dealer to confirm the availability of adequate start-interlocking safety features on your OCU, tailored to ensure the safe operation of your remote-controlled machinery.

6.4 Quickset Programming

Typically, standard OCU configurations include a snail-rabbit toggle switch to allow switching between slow and fast speed controls associated with proportional functions. Furthermore, some OCUs include additional toggle switches or push buttons labeled with “+” and “-“ symbols. When this option is available, the slow speed levels for each proportional function can be adjusted without the need for special tools. This allows for finer adjustment of the OCU’s response to applications requiring precise control of machinery functions. This adjustment is possible through Quickset Programming mode. Assuming the OCU supports this functionality, and the dedicated red key cap is available, this mode can be activated as follows.



1. Switch OFF the OCU, remove black key cap and replace it by the red key
2. Turn the red key to the “I” position to switch ON the OCU. A beep is heard.
3. Turn the red key further to the ‘P’ position for ‘Programming’ mode to be activated whilst holding the “Start” button pressed for 2 seconds.
4. To adjust the minimum speed for a function, gradually move the joystick until the safety Dead Key (DK) is activated. Maintain the joystick or paddle lever in this position and press the ‘-‘ or ’+’ buttons on the OCU to decrease or increase the speed respectively.
5. To adjust the maximum speed, move the joystick or paddle lever to its maximum position and then use the ‘-‘ or ‘+’ buttons to decrease or increase the speed respectively.
6. Ensure that only one function's speed is adjusted at a time. After completing a speed adjustment, wait approximately 10 seconds before disconnecting the OCU to ensure that the correct values are saved in the radio remote control system.
7. The "Snail" and "Hare" functions are independent of each other. Therefore, if the speed of the "Snail" function needs to be set, it must be selected beforehand.
8. When all the necessary speed adjustments are completed, switch OFF the OCU by turning the red key cap to the ‘0’ position.
9. After replacing the red key cap with the black key cap, switch ON the OCU to resume operation with the newly adjusted proportional functions.

7. Configuring your NOVA 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 NOVA OCU as a trained and authorized technician is available on the NOVA 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.

7.1 Logic Controller

7.1.1 ADMO Address

The ADMO address serves as a unique code identifier for your NOVA 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.

7.2 Wireless Communication

7.2.1 Frequency Channel and Scan-Group Configuration

The NOVA logic controller for C, L, XL, XXL models 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.

If the RF module is not mounted onboard the logic controller as in the case of the NOVA S and some other custom NOVA OCUs, the channel configuration depends on the SIP switch settings, as outlined in the RF module and frequency bands charts provided in the appendix of this user manual.

Additionally, users must select the type of radio link. For a simplex link, where only the OCU transmits to the MCU, the half-duplex parameter must be selected. For a duplex link, enabling simultaneous bidirectional communication between the OCU and MCU, two independent fixed frequencies or scan-groups must be configured.

7.2.2 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.

Note: For NOVA S and M models, the OCU automatic shuts down after 10 minutes of inactivity. This is determined by a physical jumper on the logic controller and can be disabled.

7.2.3 Radio Mode vs Cable Control Mode

In certain field applications, wireless transmission may need to be muted for security reasons. In such cases, remote control over a cable is possible if the OCU is equipped with this option.

Automatic detection of the presence of the control cable forces the OCU to shut down the wireless radio link and communicate to the MCU over the cable in *Cable Control* mode.

When cable detection is disabled, the OCU only communicates to the MCU wirelessly. Section 7.9 of this user manual explains cable operation in more detail.

7.3 DK Configuration

The logic controllers on standard NOVA OCUs support up to 32 digital channels (DK). 48 additional DKs are possible with an optional expansion board to the logic controller. is added to the system. The 80DKs have fixed assignments corresponding to the logic channels DK1 to DK80 and cannot be modified. The assignment of DKs to each digital control element is however hardware configurable. Further software configuration is possible for NOVA C, L, XL and XXL through Hetronic's PC H-Link tool.

7.4 AK Configuration

Standard NOVA OCUs support up to 16 configurable analog channels (AK). Each AK channel can be independently hardware assigned to a particular control. When no control element is assigned to the AK, the corresponding channel remains unused and automatically assumes a safe logic neutral state. Refer to Service and Programming Manual for instructions for a more detailed explanation of analog channel assignments and associated logic possibilities.

7.5 Inactivity Warning

This feature is primarily utilized in applications where one or more control functions need to remain continuously active, thus requiring enhanced monitoring for abnormal conditions. Up to 14 time based triggers can be configured, each with an independent trigger signal and timer.

Once any of the configured timers is triggered, a *Level 1 Warning* signal is generated, subsequently triggering a visual or audible output on the OCU depending on how the logic controller is configured. The *Level 1 Warning* signal is reset when the input trigger is disabled. Upon activation of the *Level 1 Warning* signal, a second independent timer is automatically initiated to monitor its presence. If the *Level 1 Warning* signal persists throughout the duration of the second timer, a *Level 2 Warning* signal will activate if one is configured. The *Level 2 Warning* signal can also trigger an output and remains active until the next system power cycle. When a logic output signal is employed as a trigger, the corresponding timer resets each time one of the inputs of the logic signal changes state.

Note: This function is not available on NOVA S and M models.

7.6 Multi-Address Mode

When configured, this function allows the OCU to control a pre-set number of different MCUs independently and one at a time, depending on the remote machine selected by the user. Different MCUs associated with different controlled equipment are assigned distinct addresses, an offset value configurable from 1 to 999 relative to the base ADMO address of the OCU.

OCUs equipped with this function include a selector switch which is associated with the *Enable/Select DK Switch* parameter on PC H-Link configuration tool. Incrementing or decrementing the address offset is only possible whenever the assigned *Enable/Select DK Switch* is active. Refer to the OCU layout technical drawing for a definition of the DKs associated with your particular NOVA OCU.

Increment DK switch and *Decrement DK switch* are the configured DKs allowing changes to the current base address of the logic controller with the corresponding offset value. Possible DK values are DK11 to DK80. These DKs can be configured to offset the base address by a value of 10 or 100 for faster selection. The configured DK switches are also outlined on the OCU layout technical drawing.

The *Confirm DK switch* is used to confirm the change in the base address offset. It accepts assignments from DK11 to DK80. Here again, the configured values are denoted on the the OCU layout technical drawing.

Note: This function is not available on NOVA S and M models.

Tampering with multi-addressing may lead to communication failure between the OCU and MCU. It could also result in unintended control of machinery other than the selected one. Make sure this configuration is thoroughly checked by a trained authorized person before the OCU is operated. Consult your nearest Hetronic dealer if necessary.

7.7 Optional Functions

7.7.1 Tilt Sensor

Tilt sensing requires the NOVA OCU to be equipped with the optional tilt sensor. This two-axis sensor allows for detection of tilt and subsequently the generation of warnings to the end user when the OCU is tilted beyond a preset angle. The sensor allows for independent monitoring of the minimum and maximum tilt thresholds up to 90° for each axis. The generation of user warning, in the form of a visual, audible or haptic one can be assigned a time delay from the instant the tilt threshold is exceeded. This time can be adjusted from 1 to 60 seconds. The configuration of the tilt sensor cannot be done via PC H-Link software and must be done directly on the tilt sensor itself.

7.7.2 Palm Sensor

The NOVA M 4L, L (excluding 2.4), XL, and XXL variants can be optionally equipped with a capacitive sensor in the palm bars (handles). The sensor can be configured to provide “man-down” detection or alternatively to force two hand operation of the OCU. The sensitivity of the sensor can be adjusted for different scenarios, like for example the wearing of leather or rubber gloves through software using the PC H-Link tool.

7.7.3 Proximity Detection Sensor

This module operates in the 2.4GHz band to measure the distance between two nodes contained within a specific range and communicate between them. By using a Proximity Detection Module in a paired OCU and MCU, the location from where the operator can stand to operate the system can be chosen. The user can choose to either operate the system from within the configured distance to the receiving PDM node or else from outside the configured range.

7.8 Tethered Control using the optional Control Cable

When equipped, NOVA OCUs also support machine control over cable. This feature requires a dedicated cable, purchased as an additional option. The control cable is typically a 10 to 25m cable. This is plugged to the side of the OCU or the front wall depending on the OCU configuration.

Sure Seal to Sure Seal connector

Amphenol to Amphenol connector

7.8.1 Installing the Control Cable

1. Switch OFF the NOVA OCU. For security reasons, it is also recommended to remove the battery from the OCU.
2. Plug in the dedicated control cable to the OCU. The other end of the control cable must be connected to the dedicated connector on the MCU or the designated port on the controlled equipment relative to the design of your machine. Make sure the connectors are securely fastened.
3. Switch on the OCU and press 'Start' to establish communication link with the MCU.

7.8.2 Operating the OCU in Cable Control Mode

With cable control cable attached, switch on OCU following the start-up sequence as outlined in Section 4. During start up, the OCU will automatically recognize that the cable is attached and communicating and thus will switch into cable control mode. This will turn off all wireless transmission and send/receive all command and feedback signals through the cable. Operating in cable mode, the OCU automatically shuts down the wireless radio link and powers itself directly from the MCU installed on the machine side.

The OCU functions seamlessly just like in wireless/radio mode. During cable operation, the OCU does not consume the battery mounted on it.

7.8.3 Returning OCU to Wireless Control Mode

Power OFF the OCU and disconnect the control cable. Follow the startup sequence outlined in Section 4 to restart the OCU in the default wireless mode.

7.9 Pairing OCU to MCU

Standard NOVA C, L, XL and XXL 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.

Nova S and M models 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.

1.1.1 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.

1.1.2 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.

7.10 Cabled Battery Back-Up

NOVA OCUs can also be powered up via cable through the battery compartment. This approach requires the corresponding battery cable back-up optional accessory for your NOVA OCU. This can be purchased from your nearest Hetronic dealer.

Cabled battery back-up option is not to be mixed with cable control option. The two options use distinct and non-exchangeable cables. In cabled battery back-up mode, the OCU is powered from the machine MCU. Unlike in tethered/cable control mode, the OCU and MCU still communicate wirelessly in the case of Nova C, L, XL and XXL.

Cabled Battery Backup

8. 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.

9. Troubleshooting

If your NOVA 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	Incorrect Access code (if enabled)	Enter correct access code
	Battery fully discharged	Replace with fully charged battery if needed
The OCU is turned ON, but does not transmit – Power/Green 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 *"Frequency Channel and Scan-Group configuration"* or contact your supervisor
	OCU out of range	Take the OCU back into the range of the MCU, press START
	MCU powered off	Turn ON power to MCU
	Blown fuse in MCU	Check all fuses and replace if needed. Make sure you identify the cause for blown fuse(s) before powering on the MCU again.
	STOP failure in MCU. Red STOP LED on PC board is illuminated	Contact your supervisor
Battery Status indicator is not displayed or is not updating itself	Loose or disconnected I2C cable inside OCU	Open OCU and check I2C connection.
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

Table 3. *Troubleshooting tips*

10. 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.

11. Regulatory Information

11.1 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 Operator Control Units

Hetronic hereby declares that the safety component “Radio Remote Control Type NOVA” 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.

CE Compliant Batteries

Hetronic declares that the components listed as “Rechargeable Battery Type MINI NiMH” and “Rechargeable Battery Type Li-Ion 3450mAh” are in accordance with all provisions of the EU Council Directive 2023/1542

CE Compliant Battery Chargers

Hetronic declares that the safety components listed as “Battery Charger UCH 2”, “Battery Charger UCH 3” and “Battery Charger UCH 5”, in accordance with Machinery Regulation (EU) 2023/1230 or other devices. Further, the above listed safety components meet the requirements of Machinery Regulation (EU) 2023/1230 and RED Directive 2014/53/EU 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 OCU.

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."

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 NOVA OCU
OCU	Operator Control Unit – The portable NOVA 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 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.

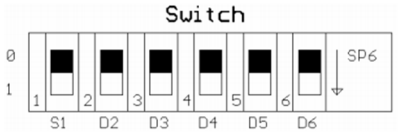
OCU Start-up and Safety Checklist		
1	Are batteries fully charged?	
2	Are all switch decal symbols clear and legible?	
3	Is the OCU enclosure free from cracks and other damage compromising ingress protection?	
4	Are the battery enclosures free from cracks and other damage?	
5	Is the STOP function working 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.

C.1 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.

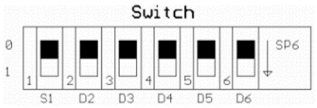
If FCS is selected Module will remember the last frequency it is set and then the frequency change is made by pushing decrement button/ Switch For detail FCS functionality, please read description above.

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.

C.2 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

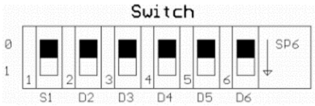
Highlighted channels are for China

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

C.3 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

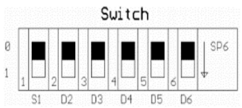
S1 = 1 : Automatic Channel

D2 = 1 : FCS TX and Scan-RX

D3 = 1 : AUTX and Scan-RX

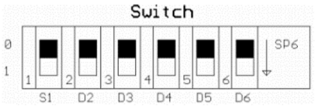
C3.1 429MHz Automatic Frequency Channel Table

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



C.4 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

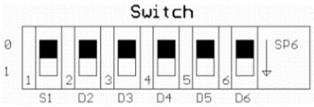
Maximum Power is 1mW ERP, 100% duty cycle in Europe

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

C.5 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

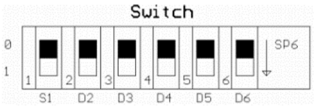
D3 = 1 : AUTX and Scan-RX

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

C.6 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

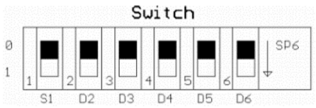
Note: Channels for United Kingdom

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

C.7 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

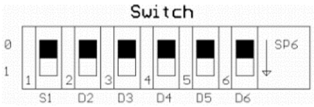
Note: If switches are set differently than those denoted on the table, the module will operate on a default frequency of 480.0500MHz (CH1)

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

C.8 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.

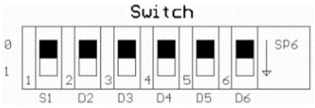
For use in different countries, please check with local authority.

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

C.9 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

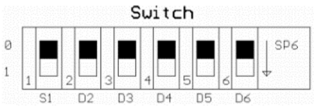
D3 = 1 : AUTX and Scan-RX

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

C.10 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

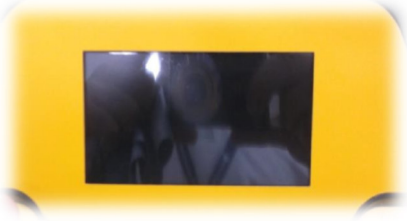
In the harsh industrial environment where your OCU operates, it's crucial to take special care of the display, a legacy option on your OCU, to ensure continued performance and visibility. Regularly clean the display cover using a soft, lint-free cloth lightly dampened with water or a mild, non-abrasive 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.

D.2 Display Protection Film Replacement

The following instructions apply for Protection Film replacement for OCU models NOVA C, Nova L, XL and XXL and variants thereof equipped with a graphic display. The steps must followed cautiously so as not to incur any scratches/damage to the display cover or the OCU itself. The process requires a) a new protection film corresponding to the display size on your OCU, b) a flat smooth-edged tool, and c) a lint-free cloth. Proceed as follows:

1. If your OCU is already equipped with a display protection film, remove this from your OCU.

2. Check that the display is free from scratches and dents before the new protective film is to be applied.



3. Use the lint-free cloth to clean the surface of the display from any dust, grease or particles.

4. Peel the protective blue tab backing and position the screen protector to centre it on the display.

5. Use the smoothing tool to remove any bubbles trapped under the film by pushing them towards the nearest edge. Care must be taken so as not to scratch the upper protecting film.

6. Remove the protective red tab cover

NOVA C Operator Control Unit

Powering ON the OCU

To power ON the NOVA C, turn the key switch to the ON or '1' position following the standard procedure outlined in section 4.3 of the user manual.

STOP Control from the OCU

To stop control of your remote equipment, press the STOP button. Refer to section 4.6 of the user manual for more details.

Powering OFF the OCU

To power OFF the NOVA C, turn the key switch to the OFF or '0' position following the standard procedure outlined in section 4.7 of the user manual.

OCU Automatic Shut Down

The OCU can be configured with an auto-off shut down timer. The OCU powers OFF automatically when no activity is detected and auto-off timer elapses.

Battery State-of-Charge Indicators

The NOVA C OCU includes two battery compartments on its bottom, compatible with Hetronic's 3.7V 3450mAh rechargeable Li-Ion batteries. When two batteries are mounted on the OCU, the logic controller toggles automatically between the batteries as soon as either of the batteries is discharged. Depending on the OCU variant, the battery state of charge is either indicated by the corresponding LED on the middle console or by the corresponding icon on the display.

Subject to how the OCU is configured, a periodic audible warning is given to indicate low battery level. Once both batteries reach a critical state of charge, a faster audible warning is given, indicating that the OCU will soon power OFF.

Battery Charging

The NOVA C batteries are only compatible with Hetronic UCH-5 battery charger. Follow the instructions in the UCH-5 battery charger user manual to ensure best performance of your OCU and prolonged battery lifetime.

Tethered Control using Control Cable

If equipped with this option, use the control cable provided with the purchase of your NOVA C OCU. Follow the instructions provided in section 7.8 of the user manual for further guidance.

Pairing the NOVA C to a new MCU

Follow the instructions provided in section 7.9 of the user manual.

Accessories and Spare Parts

The standard belts for the NOVA OCU are the neck and belly belt. Both belts can be purchased with or without the cushion. Similarly, belts can be purchased with or without brand logo. Refer to the online web shop on https://shop.hetronic.com.mt/en/home for more information on this and any other parts you may need.

NOVA C Technical Specifications

HOUSING	Impact Resistant Polymer Composite	FREQUENCY RANGE	4xxMHz, 8xxMHz (FHSS), 9xxMHz (FHSS), 1.2GHz and 2.4GHz (FHSS)
DIMENSIONS	H: 143mm x W: 242mm x D: 164mm H: 5.62" x W: 9.52" x D: 6.45"	ANTENNA	Internal (external on request)
WEIGHT	Max. 2.2Kg (2.3 lbs.); depends on configuration	STANDARD POWER RF OUTPUT EIRP (50 OHM)	Sub 1GHz: 25mW max or subject to country legislation 2.4GHz: 100mW
ENVIRONMENTAL PROTECTION	Min IP 65 (Exceeds Nema 4)	OPERATING TIME	>30hrs of continuous operation on single charge
OPERATING TEMPERATURE STORAGE TEMPERATURE	-20C to +70C (-4F to +158F) -40C to +85C (-40F to +185F)	SAFETY	Enhanced Rolling Code, AES-128 or AES-256 encryption Active and Passive STOP function Parity and Checksum Minimum CAT3 PLd STOP and user controls
BATTERY RATING/TYPE	2x 3.7V Li-ion rechargeable UN38.3 IEC62133 certified battery pack	RESPONSE TIME	Less than 70ms
BATTERY CHARGER	Hetronic UCH-5	OPERATING RANGE	Typical line of sight > 250m. Varies depending on RF output.
DIAGNOSTICS	Status LED for operation and standard/advanced low battery detection	OPTIONS	Neck belt Palm sensor with LED indicator Battery Hot Swapping Tilt sensor Footpath LED lighting Sunlight readable color display
HUMIDITY RANGE	0 to 97% max. non-condensing	TYPICAL CONTROL CONFIGURATION OPTIONS	Up to two (2) axis spring return to center, stepped or not stepped digital or proportional joysticks. Up to four (4) proportional, single axis paddle levers. Any combination of key switches, toggle switches, push buttons, rotary switches and stop switch. Mushroom type "PUSH" STOP Switch Maintained off/on/program power key switch with removable key cap Momentary start/horn push button

NOVA S Operator Control Unit

Powering ON the OCU

Unlike the other NOVA OCUs, the NOVA S does not have a power key switch. Instead, this OCU powers up either via a push button on the side or top of the OCU (normally, this will be green in colour) or with the operation of a toggle switch. In many cases, the 'ON' switch will also activate 'Start' function, if these are on the same control switch. The specific button/switch will be indicated by the standard ON (**I**) and Start (■) symbols. If these are on separate switches then the 'Start' operation must always be carried out after switching the OCU ON, so as to enable communication with the MCU. In some cases, the Start function is also combined with the Horn function (🔊).

Stop Control from the OCU

Press the STOP button. This will automatically make the system ignore any other signal that is transmitted and switch OFF the OCU.

Powering OFF the OCU

The OCU will power OFF through any one of the following options:
1) Manual activation of the STOP switch.
2) STOP function is automatically triggered due to an abnormal situation, such as for example, OCU and MCU are out of range
3) Auto-OFF timer has elapsed during which time interval no operational activity was detected.
4) Battery has been discharged below critical level.

OCU Automatic Shut Down

The logic controller inside the OCU can be hardware configured with a 10-minute inactivity timer, after the OCU is powered off.

Battery State-of-Charge Indicators

The onboard buzzer starts beeping fast when the battery reaches critical charger level. The status LED on the OCU blinks fast during this event.

Battery Charging

NOVA S OCUs are powered up by Hetronic rechargeable NiMH 3.6V MINI battery inserted in the battery compartment in the bottom side of the OCU. These batteries are only compatible with Hetronic UCH-2 battery chargers. Follow the instructions in the UCH-2 battery charger user manual to ensure best performance of your OCU and prolonged battery lifetime.

Cabled Battery Back-up and Tethered Control

Cable control on NOVA S OCUs is only possible through the battery compartment using the cabled battery back-up option. Follow the instructions provided in section 7.8 of the user manual for further guidance.

Pairing the NOVA S to a new MCU

The NOVA S OCU can only be paired with a new MCU by exchanging the ADMO keys inside the OCU with pre-programmed ones. Follow section 7.9 of the user manual for further instructions.

Accessories and Spare Parts

The NOVA S OCU comes with a standard belt clip which can be attached to the belly belt specifically designed for the OCU. Refer to the online web shop for respective part numbers of any other parts that may need replacement: https://shop.hetronic.com.mt/en/home

NOVA S Technical Specification

HOUSING	Impact Resistant Polymer Composite	FREQUENCY RANGE	4xxMHz, 8xxMHz, 9xxMHz, 1.2GHz and 2.4GHz
DIMENSIONS	H: 125mm x W: 160mm x D: 70mm H: 5.03" x W: 6.30" x D: 2.76"	ANTENNA	Internal (external on request)
WEIGHT	Max. 0.37Kg (0.82 lbs.); depends on configuration	STANDARD POWER RF OUTPUT EIRP (50 OHM)	10mW max or subject to country legislation
ENVIRONMENTAL PROTECTION	Min. IP65 (Exceeds Nema 4)	OPERATING TIME	>12hrs of continuous operation on single charge
OPERATING TEMPERATURE STORAGE TEMPERATURE	-20C to +70C (-4F to +158F) -40C to +85C (-40F to +185F)	SAFETY	Enhanced Rolling Code Active and Passive STOP function Parity and Checksum
BATTERY RATING/TYPE	1x 3.6V NiNH rechargeable UN38.3 IEC62133 certified battery pack	RESPONSE TIME	Less than 70ms
BATTERY CHARGER	Hetronic UCH-2	OPERATING RANGE	Typical line of sight > 250m. Varies depending on RF output.
DIAGNOSTICS	Status LED for operation and standard/advanced low battery detection	OPTIONS	Branded decals External antenna
HUMIDITY RANGE	0 to 97% max. non-condensing	TYPICAL CONTROL CONFIGURATION OPTIONS	Any combination of toggle switches, push buttons up to 7 depending on type. Mushroom type "PUSH" STOP Switch. Customs design on request

NOVA M Operator Control Unit

Powering ON the OCU

To power ON the NOVA M, turn the key switch to the ON or '1' position following the standard procedure outlined in section 4.3 of the user manual.

STOP Control from the OCU

To stop control of your remote equipment, press the STOP button. Refer to section 4.6 of the user manual for more details.

Powering OFF the OCU

To power OFF the NOVA M, turn the key switch to the OFF or '0' position following the standard procedure outlined in section 4.7 of the user manual.

OCU Automatic Shut Down

The OCU can be configured with an auto-off shut down timer. The OCU powers OFF automatically when no activity is detected and auto-off timer elapses.

Battery State-of-Charge Indicators

The NOVA M OCU includes one battery compartment on its bottom, compatible with Hetronic's 3.6V NiMH batteries. Depending on the OCU variant, the battery state of charge is either indicated by the corresponding LED on the middle console or by the corresponding icon on the LCD display.

Subject to how the OCU is configured, a periodic audible warning is given to indicate low battery level. Once the battery reaches a critical state of charge, a faster audible warning is given, indicating that the OCU will soon power OFF.

Battery Charging

The NOVA M batteries are only compatible with Hetronic UCH-2 battery charger. Follow the instructions in the UCH-2 battery charger user manual to ensure best performance of your OCU and prolonged battery lifetime.

Tethered Control using Control Cable or Cabled Battery Back-up

If equipped with this option, use the control cable provided with the purchase of your NOVA M OCU. Follow the instructions provided in section 7.8 of the user manual for further guidance. Alternatively, if OCU was purchased with the cabled battery back-up option, the corresponding cable can be used.

Pairing the NOVA M to a new MCU

The Hetronic standard NOVA M OCU can only be paired with a new MCU by exchanging the ADMO keys inside the OCU with pre-programmed ones. Follow section 7.9 of the user manual for further instructions.

Accessories and Spare Parts

The standard belts for the NOVA M OCU are the neck and belly belt. Both belts can be purchased with or without the cushion. Similarly, belts can be purchased with or without brand logo. Refer to the online web shop on https://shop.hetronic.com.mt/en/home for more information on this and any other parts you may need.

NOVA M Technical Specifications

HOUSING	Impact Resistant Polymer Composite	**FREQUENCY RANGE**	4xxMHz, 8xxMHz, 9xxMHz, 1.2GHz and 2.4GHz
DIMENSIONS	H: 150mm x W: 180mm x D: 110mm H: 5.90" x W: 7.10" x D: 4.30"	**ANTENNA**	Internal (external on request)
WEIGHT	~ 0.91Kg (2.0lbs.); depending on configuration	**STANDARD POWER RF OUTPUT EIRP (50 OHM)**	Typically 10mW, or more subject to country legislation
ENVIRONMENTAL PROTECTION	Min. IP65 (Exceeds Nema 4)	**OPERATING TIME**	>12hrs of continuous operation on single charge
OPERATING TEMPERATURE **STORAGE TEMPERATURE**	-20C to +70C (-4F to +158F) -40C to +85C (-40F to +185F)	**SAFETY**	Enhanced Rolling Code Active and Passive STOP function Parity and Checksum
BATTERY RATING/TYPE	1x 3.6V NiNH rechargeable UN38.3 IEC62133 certified battery pack or 3x AA batteries	**RESPONSE TIME**	Less than 70ms
BATTERY CHARGER	Hetronic UCH-2	**OPERATING RANGE**	Typical line of sight – Varies depending on RF power and working environment ~250m for 400MHz, ~100m for 800MHz and 2.4GHz quoted at 10mW ERP.
DIAGNOSTICS	Status LED for operation and standard/advanced low battery detection, internal buzzer	**OPTIONS**	Branding decals External antenna Color coded for bottom enclosure Palm sensor (4L version only)
HUMIDITY RANGE	0 to 97% max. non-condensing	**TYPICAL CONTROL CONFIGURATION OPTIONS**	Any combination of toggle switches, push buttons, maximum of two cross joysticks or four paddle levers,.mushroom type "PUSH" STOP Switch. Custom designs on request.

NOVA L Operator Control Unit

Powering ON the OCU

To power on the NOVA L OCU, turn the key switch to the ON or '1' position following the standard procedure outlined in section 4.3 of the user manual. Custom OCUs may not include a key switch. Check equipment manufacturer user manual for details.

STOP Control from the OCU

To stop control of your remote equipment, press the STOP button. Refer to section 4.6 of the OCU user manual for more details.

Powering OFF the OCU

To power OFF the NOVA M, turn the key switch to the OFF or '0' position following the standard procedure outlined in section 4.7 of the OCU user manual.

OCU Automatic Shut Down

The OCU can be configured with an auto-off shut down timer. The OCU powers OFF automatically when no activity is detected and auto-off timer elapses.

Battery State-of-Charge Indicators

The NOVA L OCU includes one battery compartment on its bottom, compatible with Hetronic's 3.6V NiMH batteries. Depending on the OCU variant, the battery state of charge is either indicated by the corresponding LED on the middle console or by the corresponding icon on the LCD display.

Subject to how the OCU is configured, a periodic audible warning is given to indicate low battery level. Once the battery reaches a critical state of charge, a faster audible warning is given, indicating that the OCU will soon power OFF.

Battery Charging

The NOVA L batteries are only compatible with Hetronic UCH-2 battery charger. Follow the instructions in the UCH-2 battery charger user manual to ensure best performance of your OCU and prolonged battery lifetime.

Tethered Control using Control Cable or Cabled Battery Back-up

If equipped with this option, use the control cable provided with the purchase of your NOVA L OCU. Follow the instructions provided in section 7.8 of the user manual for further guidance. Alternatively, if OCU was purchased with the cabled battery back-up option, the corresponding cable can be used.

Pairing the NOVA L to a new MCU

The Hetronic standard NOVA L OCU can be paired with a new MCU following either of the following approaches:

i. Exchanging the ADMO keys inside the OCU with pre-programmed ones. Follow section 7.9 of the user manual for further instructions.

ii. Programming the ADMO address on the logic control unit integrated inside the OCU to match the address on MCU using PC H-Link configuration tool. Refer to the Nova Service and Programming Manual for details.

iii. Adopting the address learn procedure in cable mode as described in section 7.9.1 of this user manual.

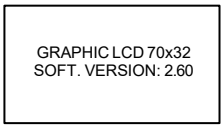
iv. Where applicable, adopting the wireless learn procedure described in section 7.9.2 of this user manual.

Monochrome LCD Display (Optional)

Custom Nova L OCUs may be equipped with a 70x32p monochrome, backlit LCD. The LCD displays several standard screens, including software version, splash screen, communication error, and STOP screen each designed to provide essential information about the status of the OCU. Custom displays can be designed using Hetronic's PC-HLink tool for LCD displays. LCD features are summarized as follows:

LCD Software version

When the display powers on, it will immediately show the LCD type and the installed software version of the display controller.



LCD Welcome Screen

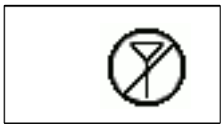
After the initial display of the standard LCD software information, users have the option to select a different welcome screen. Unless customized, the Hetronic logo is used as a welcome screen. This customization can be arranged by specifying requirements to an authorized Hetronic dealer whilst negotiating the purchase of your new OCU or alternatively using Hetronic's PC H-Link LCD display graphics programming tool.

Remote Controlled Machine Feedback

The feedback function is used to communicate information from the machine MCU to the OCU using either a half or full duplex link, as equipped on the purchased OCU. A number of graphic modes supporting different custom graphics of different size and configuration, or alternatively up to four lines of text, each line with 11 ascii characters may be used to represent machine feedback information on the LCD. The format of the feedback is dependent on the type of feedback telegram configured on the MCU. Up to four other on/off digital outputs, that can drive additional optional LEDs on the OCU can also be designated through the LCD feedback option. Contact your nearest Hetronic dealer for more information.

Machine Communication Feedback Error

When the antenna symbol flashes, it indicates a feedback communication link failure; meaning the OCU has not received a valid telegram from the MCU for 5 seconds. This poses an imminent risk of losing radio connection. Therefore, it is crucial to check for any obstacles blocking the connection and ensure that the units are within the range of the radio system.



OCU STOP Status

The STOP screen is displayed whenever the OCU is in STOP mode. This shows when the user manually activates the Stop button or alternatively when an automatic passive Stop is generated like in the event of an OCU and MCU outside the reception range or in case of an OCU error.

Accessories and Spare Parts

The standard belts for the NOVA L OCU are the neck and belly belt. Both belts can be purchased with or without the cushion. Similarly, belts can be purchased with or without brand logo. Refer to the online web shop on https://shop.hetronic.com.mt/en/home for more information on this and any other parts you may need.

NOVA L Technical Specifications

HOUSING	Impact Resistant Polymer Composite	**FREQUENCY RANGE**	4xxMHz, 8xxMHz, 9xxMHz, 1.2GHz and 2.4GHz
DIMENSIONS	H: 160mm x W: 235mm x D: 110mm H: 6.30" x W: 9.30" x D: 4.3"	**ANTENNA**	Internal (external on request)
WEIGHT	~1.450Kg (3.2 lbs.); depends on configuration	**STANDARD POWER RF OUTPUT ERP (50 OHM)**	Typically 10mW, or more subject to country legislation
ENVIRONMENTAL PROTECTION	Min IP 65 (Exceeds Nema 4)	**OPERATING TIME**	>10hrs of continuous operation on single charge depending on configuration
OPERATING TEMPERATURE **STORAGE TEMPERATURE**	-20C to +70C (-4F to +158F) -40C to +85C (-40F to +185F)	**SAFETY**	Enhanced Rolling Code for 400MHz links AES encryption for FHSS links Active and Passive STOP function up to CAT 3 PLd Parity and Checksum
BATTERY RATING/TYPE	1x 3.6V NiMH rechargeable UN38.3 IEC62133 certified battery pack or 3x AA batteries	**RESPONSE TIME**	Less than 70ms
BATTERY CHARGER	Hetronic UCH-2	**OPERATING RANGE**	Typical line of sight – Varies depending on RF power and working environment > 250m for 400MHz band at 10mW ERP > 250m for 800MHz(FH) band at 25mW ERP > 200m for 2.4GHz (FH) band at 30mW ERP
DIAGNOSTICS	Status LED for operation and standard/advanced low battery detection, internal buzzer	**OPTIONS**	External antenna Monochrome 70x32 backlit LCD Branding decals Color coded bottom enclosure Programmable Tilt and palm sensors TTL or CAN Cable Control Cabled Battery Back-Up Foot path LED light Haptic vibration feedback
HUMIDITY RANGE	0 to 97% max. non-condensing	**TYPICAL CONTROL CONFIGURATION OPTIONS**	Any combination of toggle switches, push buttons, maximum of two multiple axis cross joysticks or six paddle levers, mushroom type "PUSH" STOP Switch. Custom designs on request.

NOVA L 2.4 Operator Control Unit

Powering ON the OCU

To power on the OCU, turn the key switch to the ON or '1' position following the standard procedure outlined in section 4.3 of the user manual. Custom OCUs may not include a key switch. Check equipment manufacturer user manual for details.

STOP Control from the OCU

To stop control of your remote equipment, press the STOP button. Refer to section 4.6 of the OCU user manual for more details.

Powering OFF the OCU

To power off the OCU, turn the key switch to the OFF or '0' position following the standard procedure outlined in section 4.7 of the OCU user manual.

OCU Automatic Shut Down

The OCU can be configured with an auto-off shut down timer. The OCU powers OFF automatically when no activity is detected and auto-off timer elapses.

Battery State-of-Charge Indicators

The NOVA L OCU includes one battery compartment on its bottom, compatible with Hetronic's 3.6V NiMH batteries. Depending on the OCU variant, the battery state of charge is either indicated by the corresponding LED on the middle console or by the corresponding icon on the LCD display.

Subject to how the OCU is configured, a periodic audible warning is given to indicate low battery level. Once the battery reaches a critical state of charge, a faster audible warning is given, indicating that the OCU will soon power OFF.

Battery Charging

The NOVA L 2.4 batteries are only compatible with Hetronic UCH-2 battery charger. Follow the instructions in the UCH-2 battery charger user manual to ensure best performance of your OCU and prolonged battery lifetime.

Tethered Control using Control Cable or Cabled Battery Back-up

If equipped with this option, use the control cable provided with the purchase of your NOVA L OCU. Follow the instructions provided in section 7.8 of the user manual for further guidance. Alternatively, if OCU was purchased with the cabled battery back-up option, the corresponding cable can be used.

Pairing the NOVA L 2.4 to a new MCU

The Hetronic standard NOVA L 2.4 OCU can be paired with a new MCU following either of the following approaches:

i. Exchanging the ADMO keys inside the OCU with pre-programmed ones. Follow section 7.9 of the user manual for further instructions.

ii. Programming the ADMO address on the logic control unit integrated inside the OCU to match the address on MCU using PC H-Link configuration tool. Refer to the Nova Service and Programming Manual for details.

iii. If equipped, adopting the address learn procedure in cable mode as described in section 7.9.1 of this user manual.

iv. Where applicable, adopting the wireless learn procedure described in section 7.9.2 of this user manual.

OCU Display

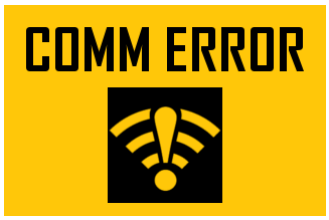
The Nova L 2.4 OCU is equipped with a full color sunlight readable TFT screen. Its graphical layout can be programmed using the Hetronic Graphics Programming (HGP) tool. The default display graphical interface includes a status bar at the top. This includes the time, signal strength bar, battery indicator and the date. The status bar can be disabled from the HGP tool.

Signal Strength Indicator

The signal strength indicator is only present on OCUs supporting feedback function from the MCU. This indicator provides information about the quality of the feedback radio link between the OCU and the MCU. It is always visible when the OCU is switched on. The indicator is defined by four vertical bars, with each bar being representative of the strength of the communication link. A strong link is represented by four bars. As the link quality deteriorates, the signal indicator shows less bars relative to the strength of the OCU received signal from the MCU.

COMM Error

If a 'COMM error' page is displayed, it indicates an MCU to OCU feedback link failure, meaning the OCU is not receiving signals from the MCU. This poses an imminent risk of losing radio connection. Therefore, it is important to check for any obstacles blocking the connection and ensure that the units are within the range of the radio system. The COMM Error graphics can be changed using the HGP tool.



OCU STOP Status

The STOP screen is displayed whenever the OCU is in STOP mode, either when the user manually activates the Stop button or when the OCU goes into a passive stop when OCU and MCU are out of range or an OCU error occurs. The ‘STOP’ graphic can be changed using the HGP tool.

Battery Level Indicator

The battery level indicator provides indicative information about the charge status of the battery. As the battery charge depletes, the battery level indicator is represented by a depleting battery. The color indicator decreases as the battery is discharged until it reaches low battery level. At this stage the indicator starts flashing indicating that it needs to be replaced.

Graphical Feedback

The feedback function is used to transmit information from the equipment through the Hetronic MCU. Graphical user interface can be a combination of text and custom graphical images configured through HGP tool to meet the requirements of the user and OCU application. Refer to the HGP user manual for more information about programming the OCU display.

Accessories and Spare Parts

The standard belts for the NOVA L 2.4 OCU are the neck and belly belt. Both belts can be purchased with or without the cushion. Similarly, belts can be purchased with or without brand logo. Refer to the online web shop on https://shop.hetronic.com.mt/en/home for more information on this and any other parts you may need.

NOVA L 2.4 Technical Specifications

HOUSING	Impact Resistant Polymer Composite	**FREQUENCY RANGE**	4xxMHz, 8xxMHz, 9xxMHz, 1.2GHz and 2.4GHz
DIMENSIONS	H: 205mm x W: 265mm x D: 155mm H: 8.10" x W: 10.40" x D: 6.10"	**ANTENNA**	Internal (external on request)
WEIGHT	~1.500Kg (3.3 lbs.); depends on configuration	**STANDARD POWER RF OUTPUT ERP (50 OHM)**	Typically 10mW, or more subject to country legislation
ENVIRONMENTAL PROTECTION	Min IP 65 (Exceeds Nema 4)	**OPERATING TIME**	~8hrs of continuous operation on single charge depending on configuration
OPERATING TEMPERATURE **STORAGE TEMPERATURE**	-20C to +70C (-4F to +158F) -40C to +85C (-40F to +185F)	**SAFETY AND SECURITY**	Enhanced Rolling Code for 400MHz links Encrypted transmission for FHSS links Active and Passive STOP function up to CAT 3 PLd Parity and Checksum
BATTERY RATING/TYPE	1x 3.6V NiNH rechargeable UN38.3 IEC62133 certified battery pack or 3x AA batteries	**RESPONSE TIME**	Less than 70ms
BATTERY CHARGER	Hetronic UCH-2	**OPERATING RANGE**	Typical line of sight – Varies depending on RF power and working environment > 250m for 400MHz band at 10mW ERP > 250m for 800MHz(FH) band at 25mW ERP > 200m for 2.4GHz (FH) band at 30mW ERP
DIAGNOSTICS	Status LED for operation and standard/advanced low battery detection, internal buzzer	**OPTIONS**	Full color 378x272 backlit TFT with 16Mb on-board flash memory Branding decals Color coded bottom enclosure Programmable tilt and palm sensors TTL or CAN Cable Control Foot path LED light Haptic vibration feedback
HUMIDITY RANGE	0 to 97% max. non-condensing	**TYPICAL CONTROL CONFIGURATION OPTIONS**	Any combination of toggle switches, push buttons, maximum of two multiple axis cross joysticks or four paddle levers, mushroom type "PUSH" STOP Switch. Custom designs on request.

NOVA XL Operator Control Unit

Powering ON the OCU

To power on the NOVA L OCU, turn the key switch to the ON or '1' position following the standard procedure outlined in section 4.3 of the user manual. Custom OCUs may not include a key switch. Check equipment manufacturer user manual for details.

STOP Control from the OCU

To stop control of your remote equipment, press the STOP button. Refer to section 4.6 of the OCU user manual for more details.

Powering OFF the OCU

To power OFF the NOVA M, turn the key switch to the OFF or '0' position following the standard procedure outlined in section 4.7 of the OCU user manual.

OCU Automatic Shut Down

The OCU can be configured with an auto-off shut down timer. The OCU powers OFF automatically when no activity is detected and auto-off timer elapses.

Battery State-of-Charge Indicators

The NOVA L OCU includes one battery compartment on its bottom, compatible with Hetronic's 3.6V NiMH batteries. Depending on the OCU variant, the battery state of charge is either indicated by the corresponding LED on the middle console or by the corresponding icon on the LCD display.

Subject to how the OCU is configured, a periodic audible warning is given to indicate low battery level. Once the battery reaches a critical state of charge, a faster audible warning is given, indicating that the OCU will soon power OFF.

Battery Charging

The NOVA L batteries are only compatible with Hetronic UCH-2 battery charger. Follow the instructions in the UCH-2 battery charger user manual to ensure best performance of your OCU and prolonged battery lifetime.

Tethered Control using Control Cable or Cabled Battery Back-up

If equipped with this option, use the control cable provided with the purchase of your NOVA L OCU. Follow the instructions provided in section 7.8 of the user manual for further guidance. Alternatively, if OCU was purchased with the cabled battery back-up option, the corresponding cable can be used.

Pairing the NOVA XL to a new MCU

The Hetronic standard NOVA XL OCU can be paired with a new MCU following either of the following approaches:

i. Exchanging the ADMO keys inside the OCU with pre-programmed ones. Follow section 7.9 of the user manual for further instructions.

ii. Programming the ADMO address on the logic control unit integrated inside the OCU to match the address on MCU using PC H-Link configuration tool. Refer to the Nova Service and Programming Manual for details.

iii. Adopting the address learn procedure in cable mode as described in section 7.9.1 of this user manual.

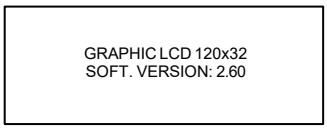
iv. Where applicable, adopting the wireless learn procedure described in section 7.9.2 of this user manual.

Monochrome LCD Display (Optional)

Custom Nova XL OCUs may be equipped with a 120x32p monochrome, backlit LCD. The LCD displays several standard screens, including software version, splash screen, communication error, and STOP screen each designed to provide essential information about the status of the OCU. Custom displays can be designed using Hetronic's PC-HLink tool for LCD displays. LCD features are summarized as follows.

LCD Software version

When the display powers on, it will immediately show the LCD type and the installed software version of the display controller.



LCD Welcome Screen

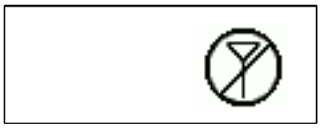
After the initial display of the standard LCD software information, users have the option to select a different welcome screen. Unless customized, the Hetronic logo is used as a welcome screen. This customization can be arranged by specifying requirements to an authorized Hetronic dealer whilst negotiating the purchase of your new OCU or alternatively using Hetronic's PC H-Link LCD display graphics programming tool.

Remote Controlled Machine Feedback

The feedback function is used to communicate information from the machine MCU to the OCU using either a half or full duplex link, as equipped on the purchased OCU. A number of graphic modes supporting different custom graphics of different size and configuration, or alternatively up to four lines of text, each line with 11 ascii characters may be used to represent machine feedback information on the LCD. The format of the feedback is dependent on the type of feedback telegram configured on the MCU. Up to four other on/off digital outputs, that can drive additional optional LEDs on the OCU can also be designated through the LCD feedback option. Contact your nearest Hetronic dealer for more information.

Machine Communication Feedback Error

When the antenna symbol flashes, it indicates a feedback communication link failure; meaning the OCU has not received a valid telegram from the MCU for 5 seconds. This poses an imminent risk of losing radio connection. Therefore, it is crucial to check for any obstacles blocking the connection and ensure that the units are within the range of the radio system.



OCU STOP Status

The STOP screen is displayed whenever the OCU is in STOP mode. This shows when the user manually activates the Stop button or alternatively when an automatic passive Stop is generated like in the event of an OCU and MCU outside the reception range or in case of an OCU error.

Accessories and Spare Parts

The standard belts for the NOVA XL OCU are the neck and belly belt. Both belts can be purchased with or without the cushion. Similarly, belts can be purchased with or without brand logo. Refer to the online web shop on https://shop.hetronic.com.mt/en/home for more information on this and any other parts you may need.

NOVA XL Technical Specifications

HOUSING	Impact Resistant Polymer Composite	**FREQUENCY RANGE**	4xxMHz, 8xxMHz, 9xxMHz, 1.2GHz and 2.4GHz
DIMENSIONS	H: 165mm x W: 315mm x D: 170mm H: 6.5" x W: 12.4" x D: 6.7"	**ANTENNA**	Internal (external on request)
WEIGHT	~1.9Kg (4.2 lbs.); depends on configuration	**STANDARD POWER RF OUTPUT ERP (50 OHM)**	Typically 10mW, or more subject to country legislation
ENVIRONMENTAL PROTECTION	Min IP 65 (Exceeds Nema 4)	**OPERATING TIME**	>10hrs for NiMH batteries > 20hrs for Li-Ion batteries Continuous operation on single charge depending on OCU configuration
OPERATING TEMPERATURE **STORAGE TEMPERATURE**	-20C to +70C (-4F to +158F) -40C to +85C (-40F to +185F)	**SAFETY**	Enhanced Rolling Code for 400MHz links AES encryption for FHSS links Active and Passive STOP function up to CAT 3 PLd Optional PLd on other controls Parity and Checksum
BATTERY RATING/TYPE	1x 3.6V NiMH or 1x 3.7V Li-Ion 9Ah rechargeable UN38.3 IEC62133 certified battery packs depending on OCU type	**RESPONSE TIME**	Less than 100ms
BATTERY CHARGER	Hetronic UCH-2 for NiMH or UCH-3 for Li-Ion battery	**OPERATING RANGE**	Typical line of sight – Varies depending on RF power and working environment > 250m for 400MHz band at 10mW ERP > 250m for 800MHz(FH) band at 25mW ERP > 200m for 2.4GHz (FH) band at 30mW ERP
DIAGNOSTICS	Status LED for operation and standard/advanced low battery detection, internal buzzer	**OPTIONS**	External antenna Monochrome 120x32 backlit LCD Branding decals Color coded bottom enclosure Programmable tilt and palm sensors TTL or CAN Cable Control Cabled Battery Back-Up Foot path LED light Haptic vibration feedback
HUMIDITY RANGE	0 to 97% max. non-condensing	**TYPICAL CONTROL CONFIGURATION OPTIONS**	Any combination of toggle switches, push buttons, maximum of two multiple axis cross joysticks or six paddle levers, mushroom type "PUSH" STOP Switch. Custom designs on request.

NOVA XL 2.8 Operator Control Unit

Powering ON the OCU

To power on the OCU, turn the key switch to the ON or '1' position following the standard procedure outlined in section 4.3 of the user manual. Custom OCUs may not include a key switch. Check equipment manufacturer user manual for details.

STOP Control from the OCU

To stop control of your remote equipment, press the STOP button. Refer to section 4.6 of the OCU user manual for more details.

Powering OFF the OCU

To power off the OCU, turn the key switch to the OFF or '0' position following the standard procedure outlined in section 4.7 of the OCU user manual.

OCU Automatic Shut Down

The OCU can be configured with an auto-off shut down timer. The OCU powers OFF automatically when no activity is detected and auto-off timer elapses.

Battery State-of-Charge Indicators

The NOVA XL 2.8 OCU includes one battery compartment on its bottom, compatible with Hetronic's 3.7V Li-Ion batteries. Depending on the OCU variant, the battery state of charge is either indicated by the corresponding LED on the middle console or by the corresponding icon on the LCD display.

Subject to how the OCU is configured, a periodic audible warning is given to indicate low battery level. Once the battery reaches a critical state of charge, a faster audible warning is given, indicating that the OCU will soon power OFF.

Battery Charging

The NOVA XL 2.8 batteries are only compatible with Hetronic UCH-3 Li-Ion battery charger. Follow the instructions in the UCH-3 battery charger user manual to ensure best performance of your OCU and prolonged battery lifetime.

Tethered Control using Control Cable or Cabled Battery Back-up

If equipped with this option, use the control cable provided with the purchase of your NOVA XL 2.8 OCU. Follow the instructions provided in section 7.8 of the user manual for further guidance. Alternatively, if OCU was purchased with the cabled battery back-up option, the corresponding cable can be used.

Pairing the NOVA XL 2.8 OCU to a new MCU

The Hetronic standard NOVA XL 2.8 OCU can be paired with a new MCU following either of the following approaches:

i. Exchanging the ADMO keys inside the OCU with pre-programmed ones. Follow section 7.9 of the user manual for further instructions.

ii. Programming the ADMO address on the logic control unit integrated inside the OCU to match the address on MCU using PC H-Link configuration tool. Refer to the Nova Service and Programming Manual for details.

iii. If equipped, adopting the address learn procedure in cable mode as described in section 7.9.1 of this user manual.

iv. Where applicable, adopting the wireless learn procedure described in section 7.9.2 of this user manual.

OCU Display

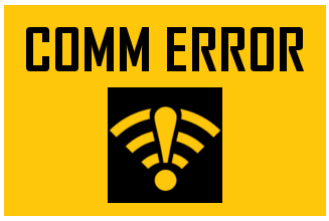
The Nova XL 2.8 OCU is equipped with a full color sunlight readable TFT screen. Its graphical layout can be programmed using the Hetronic Graphics Programming (HGP) tool. The default display graphical interface includes a status bar at the top. This includes the time, signal strength bar, battery indicator and the date. The status bar can be disabled from the HGP tool.

Signal Strength Indicator

The signal strength indicator is only present on OCUs supporting feedback function from the MCU. This indicator provides information about the quality of the feedback radio link between the OCU and the MCU. It is always visible when the OCU is switched on. The indicator is defined by four vertical bars, with each bar being representative of the strength of the communication link. A strong link is represented by four bars. As the link quality deteriorates, the signal indicator shows less bars relative to the strength of the OCU received signal from the MCU.

COMM Error

If a 'COMM error' page is displayed, it indicates an MCU to OCU feedback link failure, meaning the OCU is not receiving signals from the MCU. This poses an imminent risk of losing radio connection. Therefore, it is important to check for any obstacles blocking the connection and ensure that the units are within the range of the radio system. The COMM Error graphics can be changed using the HGP tool.



OCU STOP Status

The STOP screen is displayed whenever the OCU is in STOP mode, either when the user manually activates the Stop button or when the OCU goes into a passive stop when OCU and MCU are out of range or an OCU error occurs. The ‘STOP’ graphic can be changed using the HGP tool.

Battery Level Indicator

The battery level indicator provides indicative information about the charge status of the battery. As the battery charge depletes, the battery level indicator is represented by a depleting battery. The color indicator decreases as the battery is discharged until it reaches low battery level. At this stage the indicator starts flashing indicating that it needs to be replaced.

Graphical Feedback

The feedback function is used to transmit information from the remote-controlled equipment through the Hetronic MCU. Graphical user interface can be a combination of text and custom graphical images configured through HGP tool to meet the requirements of the user and OCU application. Refer to the HGP user manual for more information about programming the OCU display.

Accessories and Spare Parts

The standard belts for the NOVA XL 2.8 OCU are the neck and belly belt. Both belts can be purchased with or without the cushion. Similarly, belts can be purchased with or without brand logo. Refer to the online web shop on https://shop.hetronic.com.mt/en/home for more information on this and any other parts you may need.

NOVA XL 2.8 Technical Specifications

HOUSING	Impact Resistant Polymer Composite	**FREQUENCY RANGE**	4xxMHz, 8xxMHz, 9xxMHz, 1.2GHz and 2.4GHz
DIMENSIONS	H: 165mm x W: 315mm x D: 170mm H: 6.5" x W: 12.4" x D: 6.7"	**ANTENNA**	Internal (external on request)
WEIGHT	~1.9Kg (4.2 lbs.); depends on configuration	**STANDARD POWER RF OUTPUT ERP (50 OHM)**	Typically 10mW, or more subject to country legislation
ENVIRONMENTAL PROTECTION	Min IP 65 (Exceeds Nema 4)	**OPERATING TIME**	>10hrs for NiMH batteries > 20hrs for Li-Ion batteries Continuous operation on single charge depending on OCU configuration
OPERATING TEMPERATURE **STORAGE TEMPERATURE**	-20C to +70C (-4F to +158F) -40C to +85C (-40F to +185F)	**SAFETY**	Enhanced Rolling Code for 400MHz links AES encryption for FHSS links Active and Passive STOP function up to CAT 3 PLd Optional PLd on other controls Parity and Checksum
BATTERY RATING/TYPE	1x 3.6V NiMH or 1x 3.7V Li-Ion 9Ah rechargeable UN38.3 IEC62133 certified battery packs depending on OCU type	**RESPONSE TIME**	Less than 100ms
BATTERY CHARGER	Hetronic UCH-2 for NiMH or UCH-3 for Li-Ion battery	**OPERATING RANGE**	Typical line of sight – Varies depending on RF power and working environment > 250m for 400MHz band at 10mW ERP > 250m for 800MHz(FH) band at 25mW ERP > 200m for 2.4GHz (FH) band at 30mW ERP
DIAGNOSTICS	Status LED for operation and standard/advanced low battery detection, internal buzzer	**OPTIONS**	External antenna Branding decals Color coded bottom enclosure Programmable Tilt and palm sensors TTL or CAN Cable Control Cabled Battery Back-Up Foot path LED light Haptic vibration feedback
HUMIDITY RANGE	0 to 97% max. non-condensing	**TYPICAL CONTROL CONFIGURATION OPTIONS**	Any combination of toggle switches, push buttons, maximum of two multiple axis cross joysticks or six paddle levers, mushroom type "PUSH" STOP Switch. Custom designs on request.
DISPLAY	378x276p, 65K color, 450nits, sunlight readable, programmable GUI using Hetronic HGP tool		

NOVA XL 4.3 Operator Control Unit

Powering ON the OCU

To power on the OCU, turn the key switch to the ON or '1' position following the standard procedure outlined in section 4.3 of the user manual. Custom OCUs may not include a key switch. Check equipment manufacturer user manual for details.

STOP Control from the OCU

To stop control of your remote equipment, press the STOP button. Refer to section 4.6 of the OCU user manual for more details.

Powering OFF the OCU

To power off the OCU, turn the key switch to the OFF or '0' position following the standard procedure outlined in section 4.7 of the OCU user manual.

OCU Automatic Shut Down

The OCU can be configured with an auto-off shut down timer. The OCU powers OFF automatically when no activity is detected and auto-off timer elapses.

Battery State-of-Charge Indicators

The NOVA XL 4.3 OCU includes one battery compartment on its bottom, compatible with Hetronic's 3.7V Li-Ion batteries. Depending on the OCU variant, the battery state of charge is either indicated by the corresponding LED on the middle console or by the corresponding icon on the display.

Subject to how the OCU is configured, a periodic audible warning is given to indicate low battery level. Once the battery reaches a critical state of charge, a faster audible warning is given, indicating that the OCU will soon power OFF.

Battery Charging

The NOVA XL 4.3 batteries are only compatible with Hetronic UCH-3 Li-Ion battery charger. Follow the instructions in the UCH-3 battery charger user manual to ensure best performance of your OCU and prolonged battery lifetime.

Tethered Control using Control Cable or Cabled Battery Back-up

If equipped with this option, use the control cable provided with the purchase of your NOVA XL 4.3 OCU. Follow the instructions provided in section 7.8 of the user manual for further guidance. Alternatively, if OCU was purchased with the cabled battery back-up option, the corresponding cable can be used.

Pairing the NOVA XL 4.3 OCU to a new MCU

The Hetronic standard NOVA XL 4.3 OCU can be paired with a new MCU following either of the following approaches:

i. Exchanging the ADMO keys inside the OCU with pre-programmed ones. Follow section 7.9 of the user manual for further instructions.

ii. Programming the ADMO address on the logic control unit integrated inside the OCU to match the address on MCU using PC H-Link configuration tool. Refer to the Nova Service and Programming Manual for details.

iii. If equipped, adopting the address learn procedure in cable mode as described in section 7.9.1 of this user manual.

iv. Where applicable, adopting the wireless learn procedure described in section 7.9.2 of this user manual.

OCU Display

The Nova XL 4.3 OCU is equipped with a full color sunlight readable TFT display. Its graphical layout can be programmed using Qt or optionally Codesys. The default display graphical interface includes a status bar at the top. This includes the time, signal strength bar, battery indicator. Contact your nearest Hetronic dealer to discuss your graphical user interface needs and your preferred programming platform.

Touch Display (Optional)

The OCU can be optionally upgraded to include a capacitive touch display. With this option, users can make selections and input commands directly through the display, depending on the design of the graphical user interface programmed on the OCU.

WiFi (Optional)

NOVA XL 4.3 OCUs, equipped with a 4.3-inch display, can be optionally upgraded with Hetronic's WLAN WiFi module, operating at 2.4GHz. This module enables IP-based wireless connections to private gateways and IP networks. Typical applications include digital video transmission or remote connectivity for OCU service and diagnostic purposes. For further information about this option, please contact your nearest Hetronic dealer.

Video Feedback (Optional)

The Nova XL 4.3 OCU, when equipped with the WiFi option, can be configured to support real-time video streaming. This option requires additional hardware, including video cameras and WiFi routers, all available for purchase from your nearest Hetronic dealer. The OCU supports up to four simultaneous video cameras which when strategically installed on the controlled equipment provide enhanced safety and productivity. Users can switch between streams instantaneously using dedicated controls on the OCU or the display itself.

Accessories and Spare Parts

The standard belts for the NOVA XL 4.3 OCU are the neck and belly belt. Both belts can be purchased with or without the cushion. Similarly, belts can be purchased with or without brand logo. Refer to the online web shop on https://shop.hetronic.com.mt/en/home for more information on this and any other parts you may need.

NOVA XL 4.3 Technical Specifications

HOUSING	Impact Resistant Polymer Composite	**FREQUENCY RANGE**	4xxMHz, 8xxMHz, 9xxMHz, 1.2GHz and 2.4GHz
DIMENSIONS	H: 190mm x W: 340mm x D: 205mm H: 7.5" x W: 13.4" x D: 8.1"	**ANTENNA**	Internal (external on request)
WEIGHT	~2.15Kg (4.7 lbs.); depends on configuration	**STANDARD POWER RF OUTPUT ERP (50 OHM)**	Typically 10mW, or more subject to country legislation
ENVIRONMENTAL PROTECTION	Min IP 65 (Exceeds Nema 4)	**OPERATING TIME**	> 20hrs for Li-Ion batteries Continuous operation on single charge depending on OCU configuration
OPERATING TEMPERATURE **STORAGE TEMPERATURE**	-20C to +70C (-4F to +158F) -40C to +85C (-40F to +185F)	**SAFETY**	Enhanced Rolling Code for 400MHz links AES encryption for FHSS links Active and Passive STOP function up to CAT 3 PLd Optional PLd on other controls Parity and Checksum
BATTERY RATING/TYPE	1x 3.7V Li-Ion 9Ah rechargeable UN38.3 IEC62133 certified battery pack	**RESPONSE TIME**	Less than 100ms
BATTERY CHARGER	Hetronic UCH-3 for Li-Ion battery	**OPERATING RANGE**	Typical line of sight – Varies depending on RF power and working environment > 250m for 400MHz band at 10mW ERP > 250m for 800MHz(FH) band at 25mW ERP > 200m for 2.4GHz (FH) band at 30mW ERP
DIAGNOSTICS	Status LED for operation and standard/advanced low battery detection, internal buzzer	**OPTIONS**	External antenna Branding decals Color coded bottom enclosure Programmable Tilt and palm sensors TTL or CAN Cable Control Cabled Battery Back-Up Foot path LED light Haptic vibration feedback Video Feedback
HUMIDITY RANGE	0 to 97% max. non-condensing	**TYPICAL CONTROL CONFIGURATION OPTIONS**	Any combination of toggle switches, push buttons, maximum of four multiple axis cross joysticks or eight paddle levers, mushroom type "PUSH" STOP Switch. Custom designs on request.
DISPLAY	480x272p, 262K colors, 850nits, sunlight readable, programmable GUI using Qt or Codesys Linux OS with 16Gb SDCard User replaceable sun-visor and TFT protection foil	**VIDEO FEEDBACK**	Optional Near Real-Time Video Feedback 1 to 4 IP-based wired camera capability 100'~300' w/o booster; extended range with boosters up to 2 miles

NOVA XXL 4.3 Operator Control Unit

Powering ON the OCU

To power on the OCU, turn the key switch to the ON or '1' position following the standard procedure outlined in section 4.3 of the user manual. Custom OCUs may not include a key switch. Check equipment manufacturer user manual for details.

STOP Control from the OCU

To stop control of your remote equipment, press the STOP button. Refer to section 4.6 of the OCU user manual for more details.

Powering OFF the OCU

To power off the OCU, turn the key switch to the OFF or '0' position following the standard procedure outlined in section 4.7 of the OCU user manual.

OCU Automatic Shut Down

The OCU can be configured with an auto-off shut down timer. The OCU powers OFF automatically when no activity is detected and auto-off timer elapses.

Battery State-of-Charge Indicators

The NOVA XXL 4.3 OCU includes one battery compartment on its bottom, compatible with Hetronic's 3.7V Li-Ion batteries. Depending on the OCU variant, the battery state of charge is either indicated by the corresponding LED on the middle console or by the corresponding icon on the display.

Subject to how the OCU is configured, a periodic audible warning is given to indicate low battery level. Once the battery reaches a critical state of charge, a faster audible warning is given, indicating that the OCU will soon power OFF.

Battery Charging

The NOVA XXL 4.3 batteries are only compatible with Hetronic UCH-3 Li-Ion battery charger. Follow the instructions in the UCH-3 battery charger user manual to ensure best performance of your OCU and prolonged battery lifetime.

Tethered Control using Control Cable or Cabled Battery Back-up

If equipped with this option, use the control cable provided with the purchase of your NOVA XXL 4.3 OCU. Follow the instructions provided in section 7.8 of the user manual for further guidance. Alternatively, if OCU was purchased with the cabled battery back-up option, the corresponding cable can be used.

Pairing the NOVA XXL 4.3 OCU to a new MCU

The Hetronic standard NOVA XXL 4.3 OCU can be paired with a new MCU following either of the following approaches:

i. Exchanging the ADMO keys inside the OCU with pre-programmed ones. Follow section 7.9 of the user manual for further instructions.

ii. Programming the ADMO address on the logic control unit integrated inside the OCU to match the address on MCU using PC H-Link configuration tool. Refer to the Nova Service and Programming Manual for details.

iii. If equipped, adopting the address learn procedure in cable mode as described in section 7.9.1 of this user manual.

iv. Where applicable, adopting the wireless learn procedure described in section 7.9.2 of this user manual.

OCU Display

The Nova XXL 4.3 OCU is equipped with a full color sunlight readable TFT display. Its graphical layout can be programmed using Qt or optionally Codesys. The default display graphical interface includes a status bar at the top. This includes the time, signal strength bar, battery indicator. Contact your nearest Hetronic dealer to discuss your graphical user interface needs and your preferred programming platform.

Touch Display (Optional)

The OCU can be optionally upgraded to include a capacitive touch display. With this option, users can make selections and input commands directly through the display, depending on the design of the graphical user interface programmed on the OCU.

WiFi (Optional)

NOVA XXL 4.3 OCUs, equipped with a 4.3-inch display, can be optionally upgraded with Hetronic's WLAN WiFi module, operating at 2.4GHz. This module enables IP-based wireless connections to private gateways and IP networks. Typical applications include digital video transmission or remote connectivity for OCU service and diagnostic purposes. For further information about this option, please contact your nearest Hetronic dealer.

Video Feedback (Optional)

The Nova XXL 4.3 OCU, when equipped with the WiFi option, can be configured to support real-time video streaming. This option requires additional hardware, including video cameras and WiFi routers, all available for purchase from your nearest Hetronic dealer. The OCU supports up to four simultaneous video cameras which when strategically installed on the controlled equipment provide enhanced safety and productivity. Users can switch between streams instantaneously using dedicated controls on the OCU or the display itself.

Accessories and Spare Parts

The standard belts for the NOVA XXL 4.3 OCU are the neck and belly belt. Both belts can be purchased with or without the cushion. Similarly, belts can be purchased with or without brand logo. Refer to the online web shop on https://shop.hetronic.com.mt/en/home for more information on this and any other parts you may need.

NOVA XXL 4.3 Technical Specifications

HOUSING	Impact Resistant Polymer Composite	**FREQUENCY RANGE**	4xxMHz, 8xxMHz, 9xxMHz, 1.2GHz and 2.4GHz
DIMENSIONS	H: 185mm x W: 370mm x D: 240mm H: 7.3" x W: 14.6" x D: 9.4"	**ANTENNA**	Internal (external on request)
WEIGHT	~2.7Kg (5.9 lbs.); depends on configuration	**STANDARD POWER RF OUTPUT ERP (50 OHM)**	Typically 10mW, or more subject to country legislation
ENVIRONMENTAL PROTECTION	Min IP 65 (Exceeds Nema 4)	**OPERATING TIME**	> 20hrs for Li-Ion batteries Continuous operation on single charge depending on OCU configuration
OPERATING TEMPERATURE **STORAGE TEMPERATURE**	-20C to +70C (-4F to +158F) -40C to +85C (-40F to +185F)	**SAFETY**	Enhanced Rolling Code for 400MHz links AES encryption for FHSS links Active and Passive STOP function up to CAT 3 PLd Optional PLd on other controls Parity and Checksum
BATTERY RATING/TYPE	1x 3.7V Li-Ion 9Ah rechargeable UN38.3 IEC62133 certified battery pack	**RESPONSE TIME**	Less than 100ms
BATTERY CHARGER	Hetronic UCH-3 for Li-Ion battery	**OPERATING RANGE**	Typical line of sight – Varies depending on RF power and working environment > 250m for 400MHz band at 10mW ERP > 250m for 800MHz(FH) band at 25mW ERP > 200m for 2.4GHz (FH) band at 30mW ERP
DIAGNOSTICS	Status LED for operation and standard/advanced low battery detection, internal buzzer	**OPTIONS**	External antenna Branding decals Color coded bottom enclosure Programmable Tilt and palm sensors TTL or CAN Cable Control Cabled Battery Back-Up Foot path LED light Haptic vibration feedback Video Feedback
HUMIDITY RANGE	0 to 97% max. non-condensing	**TYPICAL CONTROL CONFIGURATION OPTIONS**	Any combination of toggle switches, push buttons, maximum of four multiple axis cross joysticks or eight paddle levers, mushroom type "PUSH" STOP Switch. Custom designs on request.
DISPLAY	480x272p, 262K colors, 850nits, sunlight readable, programmable GUI using Qt or Codesys Linux OS with 16Gb SDCard User replaceable sun-visor and TFT protection foil	**VIDEO FEEDBACK**	Optional Near Real-Time Video Feedback 1 to 4 IP-based wired camera capability 100'~300' w/o booster; extended range with boosters up to 2 miles

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 3.7V/9.75Ah Black Li-Ion Item No. 68303607

Technical Specification - Battery Li-Ion 3.7V 9.75Ah	
Rated Capacity	9750mAh
Storage Environment Conditions	-20°C . . . 50°C, 85%RH max (for periods less than 1 month) -20°C . . . 45°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 . . . 45°C (32°F . . . 113°F), max 85%RH (for standard charge)
Discharging Temperature Range	-20°C . . . 50°C (-4°F . . . 122°F) , max 85%RH
Charging Time (hrs)	6 (0.3C)

Battery 3.7V/3.4Ah Black Li-Ion Item No. 68303720

Technical Specification - Battery Li-Ion 3.7V 3.4Ah	
Rated Capacity	3400mAh
Storage Environment Conditions	-20°C . . . 50°C, 85%RH max (for periods less than 1 month) -20°C . . . 45°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 . . . 45°C (32°F . . . 113°F), max 85%RH (for standard charge)
Discharging Temperature Range	-20°C . . . 50°C (-4°F . . . 122°F) , max 85%RH
Charging Time (hrs)	4 (0.3C)

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%.

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

UCH 3 Battery Charger

LED Indicators

The UCH 3 battery charger is equipped with an LED indicator to show the charger operating status.

LED Indicator	Status
Inactive	Charger OFF
Solid Green	Three solid green LEDs indicating battery is fully charged
Solid Red	One to four red leds indicating the charge status of the battery. One red LED is approximately 25% state of charge

Charging your Batteries

Remove the Li-Ion battery pack from the OCU by lifting it up and sliding it out of the battery compartment. Slide the battery pack in the charging unit until it clips in place. At least one of the four red LEDs switches must turn solid on. The red LEDs switch on sequentially during the battery charging charging process as the battery state of charge increases. When the battery is fully charged, the red LEDs switch off and the three green LEDs switch on instead.

Leave the battery in the charger until it is needed. The charger is smart enough to keep a constant state of charge without over-charginhg 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.

Reference ID	Item Number	Description
A	68108870	Charger UCH-3 9-30VDC 1A Sliding Socket
B	68108875	Charger UCH-3 9-30VDC 1A Plug Cigarette Lighter
C	68108880	Charger UCH-3 9-30VDC 1A AC Adapter

UCH 5 Battery Charger

LED Indicators

The UCH 5 battery charger is equipped with two battery charging bays for Li-Ion batteries, similar to those used on the Nova C OCU. Each battery charging bay has a dedicated LED indicator which provides information about the charger operating status and the state of charge of the corresponding battery.

LED Indicator	Status
Inactive	OFF
Flashing Green	Battery charging in progress
Solid Green	Battery charging complete
Flashing Red	Error (Damaged or Faulty Battery)
Solid Red	Out of Battery Charging Temperature Range

Charging your Batteries

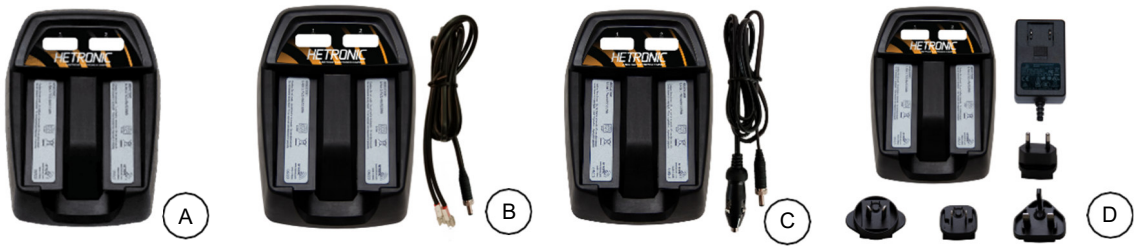
Remove the battery from the OCU by pressing it in, lifting it up and sliding it out of the battery compartment. Slide the battery pack in the charging unit until it clips in place. The green light corresponding to the loaded charging bay will come on, flashing to indicate that the battery is charging. If the LED remains solid green, the loaded battery is already fully charged. In the event the LED starts flashing red, the battery is most likely damaged. Remove the battery from the bay and load it again. If the red flashing persists, dispose of the battery following the instructions provided in this manual. If the LED indicator turns solid red, this means battery pack is too hot or cold. Wait until the battery and battery charger return to an ambient temperature within the charging temperature specification range.

A fully discharged battery pack with an internal temperature in the normal range will charge in roughly 4 hours. Heavily cycled batteries may take longer to charge.

After charging is complete, the LED indicator for the corresponding charging bay turns solid green. The smart UCH-5 charger keeps the battery pack fully charged if it is left in the charging bay but it will not over-charge the battery.

Charger Variants

The charger power cable is supplied with different termination options, like for example cigarette lighter plug, AC adapter plugs for different countries, or DC sliding sockets.



Reference ID	Item Number	Description	Termination
A	68108960	CHARGER UCH-5 10-30VDC 2A for Dual Battery Li-ION 3.7V/3.4Ah Unit Only	None
B	68108970	CHARGER UCH-5 10-30VDC 2A for Dual Battery Li-ION 3.7V/3.4Ah	DC Sliding Socket
C	68108975	CHARGER UCH-5 10-30VDC 2A for Dual Battery Li-ION 3.7V/3.4Ah	Plug Cigarette Lighter (4A Fuse)
D	68108980	CHARGER UCH-5 10-30VDC 2A for Dual Battery Li-ION 3.7V/3.4Ah	AC Adapter 110-250Vac