

NOVA Transmitters

USER MANUAL

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User Manual

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1. Safety

1.1 Intended Use

Your radio remote control is designed for remote operation of machines and systems using safe wireless communications technology. Any modification, reconstruction or extension of the systems without a written agreement of Hetronic may lead to the loss of your warranty and guarantee claims.

Hetronic assumes no liability for damages resulting out of the non-observance of this operating manual. All persons, working with this radio remote control must




- Be suitably trained and qualified as required by the safety regulations.
- Strictly comply with the contents of this operating manual.

Before starting the radio remote control you must have read and fully understood this operating manual. The Safety Checklist in Appendix B is intended to be followed before each time the transmitter is powered up for operation.

1.2 Symbol Notation

The following symbols are used in this operating manual. The safety alert symbol is used in decals on the unit and with proper operation procedures in this manual.

Understand the safety message. It contains important information about personal safety on or near the unit.

	STOP! This symbol gives you warning of imminent danger of life, risk of accident and risk of injury, as well as damage to property in case of non-observance of the working instructions.
	ATTENTION! This symbol advises against a possible damage to the system in case of non-observance of the working instructions.
	TIP! This symbol points to features and information which allow for an easier handling or operation.

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 Required Operator Training

The original purchaser of this unit was instructed by the seller on safe and proper operation. If unit is to be used by someone other than original purchaser; loaned, rented or sold, ALWAYS provide this manual and any needed safety training before operation. ALWAYS read and understand the documentation for any machine to be controlled by radio remote control.

1.5 Possible Sources of Danger

This device is part of a system that makes remote control via wireless radio signals possible. The transmission of control commands can take place around obstacles and out of the operator's direct line of sight. Take the following precautions to prevent accidental start-up and possible injury or damage:



Switch "OFF" the transmitter when it is not in use. Unless the transmitter has user access control password configured, remove the battery if unit is placed away from the operator.



Disconnect the power supply from the receiver before any assembly, maintenance or repair work is done.



AVOID SYSTEM DAMAGE - ALWAYS disconnect receiver power supply and control wiring before welding on any part of the machine.



NEVER remove or alter any of the safety features.



ALWAYS confirm that the machine and radio remote control Stop functions work properly **BEFORE** beginning any machine operation.

1.6 Protective Features

This transmitter is equipped with electronic and mechanical safety features. Control signals from other transmitters cannot be processed because transmission coding is unique to each system.

1.7 STOP in case of EMERGENCY

Push the emergency stop on the machine.

1.8 Caring for your NOVA Transmitter

The enclosure materials employed on the NOVA transmitter have been carefully selected to minimise maintenance requirements.



Always use genuine chargers and accessories. Cheaper ones that are not compatible or made for going with your NOVA can harm the unit or shorten its lifespan.

Do not keep your NOVA transmitter stored in a closed container for extended periods of time unless it is powered off and the battery is removed from the unit. Charging the battery in a closed container is a potential fire hazard and may shorten its lifespan. Batteries give off heat when charging and when discharging. Keep your battery percentage between 40%-80% for longer battery life.



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

2. Introduction and Functional Description

We congratulate you on the purchase of your new Hetronic NOVA transmitter. You have chosen a high quality product. Familiarise yourself with the unit before using it for the first time. In addition please carefully refer to the operating instructions and the safety advice given in this manual. Only use the product as instructed and only for the intended field of application. Keep these instructions in a safe place. If you pass the product on to anyone else, please ensure that you also pass on all the documentation with it.

NOTE: This manual does not cover the EX versions of NOVA transmitters.

2.1 Production and System Numbers

Before contacting your dealer or Hetronic about service, repair or replacement parts, note the equipment Production and System numbers. These numbers are located on the silver label affixed to the unit.

2.2 Before Operating Your Wireless Control Unit

Confirm that installation of all your system components has been properly completed. Before start up, **ALWAYS** confirm that the machine and radio remote control Stop functions work properly.

Understand all Safety Precautions provided in the manuals and review control functions and operation of the machine and this radio remote control system. When not in use, turn the transmitter off and store in a safe place to prevent unauthorized use. Ensure that the USB Dongle (which acts as a security key to program the transmitter) is kept in a separate but safe and secure place. If the machine does not respond properly, immediately stop operation. Turn off the transmitter and report the condition to your supervisor.

Turn off the transmitter before any maintenance work is done. Always have fresh batteries on hand or an optional rechargeable battery pack in the battery charger to ensure the availability of a fully charged battery. Installation, setup and service must be performed by authorized and qualified personnel only.

2.3 Unit Labels

2.3.1 Blank Rating Plate

1. Specific approvals, such as CE, FCC, IC, etc.
2. Type of NOVA transmitter
3. Eleven-digit Production Number
4. Eleven-digit System Number
5. Ingress Protection Rating
6. Frequency information
7. Supply voltage
8. Current rating

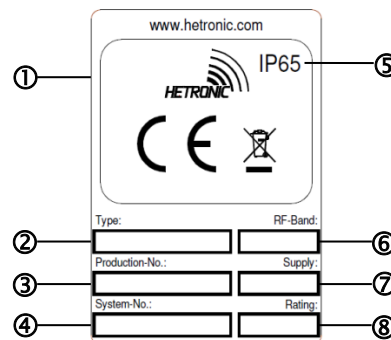


Figure 1. Blank Rating Plate

2.3.2 Read User Manual



The "Read User Manual" symbol on the transmitter acts as a reminder for the user to thoroughly read through the manual before attempting to operate the system. This manual must always be placed in a safe and easily accessible place when not being used for when there is the need to refer to it.

3. Your NOVA Transmitter

3.1 General Description

The NOVA family consists of a variety of transmitter sizes offering the user an endless array of possibilities from the most basic to the most complex requirements to satisfy most applications. All transmitters are ergonomically designed, programmable wireless units capable of transmitting a wide variety of functions to remotely control a machine or equipment.

Your transmitter is encased in a rugged minimum IP65 rated housing, is battery-powered, and comes equipped with built-in low battery detection. Standard equipment includes two sets of rechargeable batteries and a battery charger.

3.2 NOVA Basic Features

- Fully programmable via Hetronic PC-Link (depends on type of coder)
- Push buttons with up to two detents
- Single detent Start button/switch
- Joysticks (cross or lever, optional)
- Minimum 150 m (492 ft.) range using CS4XX and CS8xx modules (Line-of-Sight)
- Minimum 70 m (150 ft.) range using CS2400 RF module (Line-of-Sight)
- Internal Antenna (can also be external)
- Auto power off feature (configurable)
- Programming mode
- Low Battery detection
- Status bi-colour LED Red/Green
- Multi-Address Mode
- Belt/shoulder strap/harness/shoulder bar
- Buzzer (configurable)
- Rechargeable battery pack

Additional NOVA Options

- Feedback LEDs
- Display (depends on type of transmitter, can be monochrome or colour)
- Tilt Sensor
- Cable Control (RS232, CAN)
- Palm Sensor (only available on Nova M, Nova L, Nova XL, Nova XL 2.8, Nova XXL 4.3)

3.3 Standard NOVA Configurations

The NOVA-Series transmitters are available either in the following standard configurations or else in highly customizable variants:

Nova-S



- Digital functionality
- Any combination of toggle switches, push-button controls, rotary switches and key switches with removable key caps
- Status LED for operation and low battery indication
- Operating frequencies: 4xxMHz, 8xxMHz, 9xxMHz
- Minimum operating range: 150m (Line-of-Sight)
- Dimensions: H125mm x W160mm x D70mm
- Weight: 369g

- Carry options: Belly Belt
- Battery: 3.6V NiMH rechargeable battery pack
- Cable back up: Serial through battery enclosure. Custom cable lengths on request

Nova-M



- Digital 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 low battery indication
- Operating Frequencies: 4xxMHz, 8xxMHz, 9xxMHz, 1.2GHz, 2.4GHz
- Minimum operating range: 150m (Line-of-Sight)
- Dimensions: H150mm x W180mm x D110mm
- Weight: 910g
- Carry options: Neck or belly belt
- Battery: 3.6V NiMH rechargeable battery pack
- Cable back up: Serial (RS232/CAN) through battery enclosure or connector plug. Custom cable lengths on request

Nova-L



- 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
- Half or full duplex
- Operating Frequencies: 4xxMHz, 8xxMHz, 9xxMHz, 1.2GHz, 2.4GHz
- Minimum operating range: 150m (492ft) for ≤ 1GHz 10mW module (Line-of-Sight), 70m (150ft) for 2.4GHz 10mW module
- Dimensions: H235mm x W160mm x D95mm
- Weight: 1kg
- 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

Nova L 2.4



- 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 Feedback LEDs
- Half or full duplex
- High resolution colour TFT 2.4" 240x320, 262K colours with backlight

➤ Operating Frequencies: 4xxMhz, 8xxMHz, 9xxMHz, 1.2GHz, 2.4GHz

Minimum operating range: 150m (492ft) for $\leq 1\text{GHz}$ 10mW module (Line-of-Sight), 70m (150ft) for 2.4GHz 10mW module

➤ Dimensions: H264mmxW151mmxD213mm

➤ Weight: 1.8kg

➤ 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

Nova-XL



➤ Digital and/or Proportional functionality

➤ Up to either four dual-axis joysticks or eight 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

➤ Optional Feedback LEDs

➤ Half or full duplex

➤ Optional monochrome LCD 120x320

➤ Operating Frequencies: 4xxMhz, 8xxMHz, 9xxMHz, 1.2GHz, 2.4GHz

➤ Minimum operating range: 150m (492ft) for $\leq 1\text{GHz}$ 10mW module (Line-of-Sight), 70m (150ft) for 2.4GHz 10mW module

➤ Dimensions: H165mm x W312mm x D170mm

➤ Weight: 1.9kg

➤ Carry options: Belly belt, neck belt or shoulder bar

➤ Battery: 3.6V NiMH rechargeable battery

➤ Cable back-up: Serial (RS232/CAN) through battery enclosure or connector plug. Custom cable lengths on request



Nova XL 2.8



➤ Digital and/or Proportional functionality

➤ Up to four multi-axis joysticks or eight linear 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

➤ Optional Feedback LEDs

➤ Half of full duplex

➤ High resolution colour TFT 2.8" with backlight

➤ Operating Frequencies: 4xxMhz, 8xxMHz, 9xxMHz, 1.2GHz, 2.4GHz

Minimum operating range: 150m (492ft) for $\leq 1\text{GHz}$ 10mW module (Line-of-Sight), 70m (150ft) for 2.4GHz 10mW module

➤ Dimensions: H334mm x W216mm x D160mm

➤ Weight: 1.8kg

➤ Carry options: Belly belt, neck belt or shoulder bar

➤ Battery: 3.6V NiMH rechargeable battery



➤ Cable back-up: Serial (RS232/CAN) through battery enclosure or connector plug.
Custom cable lengths on request

Nova XL 4.3



- Digital and/or Proportional functionality
- Up to four multi-axis joysticks or eight linear 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
- Optional Feedback LEDs
- Half of full duplex
- High resolution colour TFT 4.3" with backlight
- Operating Frequencies: 4xxMHz, 8xxMHz, 9xxMHz, 1.2GHz, 2.4GHz
- Minimum operating range: 150m (492ft) for ≤ 1GHz 10mW module (Line-of-Sight), 70m (150ft) for 2.4GHz 10mW module
- Dimensions: H210mm x W335mm x D220mm
- Weight: 2.3kg
- Carry options: Belly belt, neck belt or shoulder bar
- Battery: 3.6V NiMH rechargeable battery pack or 3.7V Li-Ion rechargeable battery
- Cable back-up: Serial (RS232/CAN) through battery enclosure or connector plug.
Custom cable lengths on request

Nova XXL 4.3



- Digital and/or Proportional functionality
- Up to four multi-axis 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 Feedback LEDs
- Half or full duplex
- High resolution colour TFT 4.3" 480x272, 262K colours with backlight
- Real time data access, feedback and optional real-time video capability with up to 4 simultaneous camera streams
- 8Gb on-board memory by default
- Operating Frequencies: 4xxMHz, 8xxMHz, 9xxMHz, 1.2GHz, 2.4GHz
- Video Frequency 2.4GHz or 5GHz
- Minimum operating range: 150m (492ft) for ≤ 1GHz 10mW module (Line-of-Sight), 70m (150ft) for 2.4GHz 10mW module
- Dimensions: L367mm x W229mm x D174mm
- Weight: 2.4kg
- 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

4. Product Description

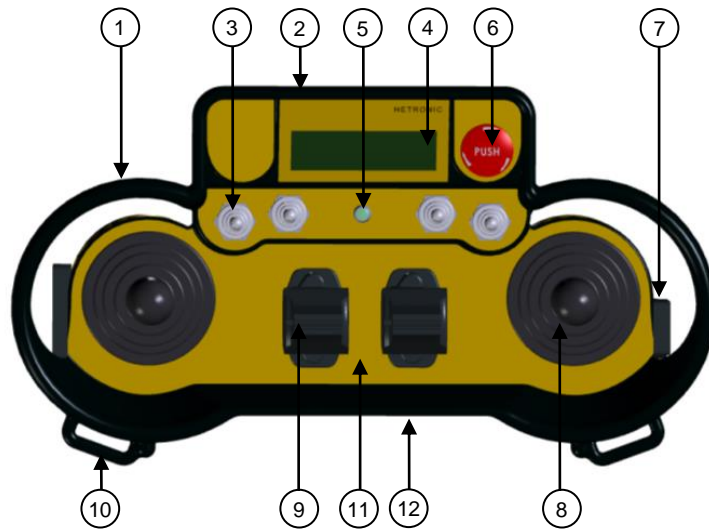


Figure 2. Generic Transmitter Front view

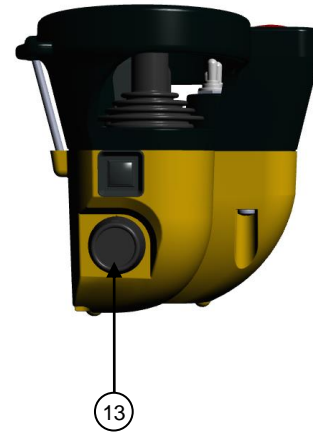


Figure 3. Generic Transmitter Side View

1	Transmitter Handlebar
2	Customizable Logo
3	Toggle Switch
4	TFT/LCD
5	Status bi-colour LED
6	STOP Pushbutton
7	Start Push button
8	Cross Joystick
9	Paddle Lever
10	Gripping handles for belt clips
11	Customisable labels
12	Battery Compartment (located in the bottom)
13	Key switch with Key Cap

Table 1. Nova Transmitter Generic features

Some basic features of a standard Nova Transmitter are toggle switches, pushbutton controls, rotary switches, key switches, STOP button, LED status indicator, dual-axis joysticks (digital or proportional) or proportional paddle levers, optional graphical display (size dependant on the transmitter size), optional half or full duplex, cable back up, LEDs for feedback.

The optional graphic display provides real-time visual information during operation of the Nova transmitter. It can be used to change configuration settings, provide two-way feedback and display transmitter diagnostic information such as battery life, signal strength and button status. The status LED is normally a bi-colour (green/red) LED and feedback LEDs can be white, yellow, blue, green or red (and these can also be of the high brightness type).

5. Operating Your Transmitter

5.1 Holding Your Transmitter

Hold the transmitter upright with the front facing you. Confirm that you are able to easily read and understand any operation text or symbols. Complete the following procedures once a day, before the start of an operation and at all shift changes.

5.2 Visually Checking Your Transmitter



Always check the transmitter, batteries and accessories for any physical damage before any operation. Check equipment for wear or damage and confirm that you can read and understand all of the safety labels. Never operate a transmitter with worn out or damaged parts.

5.3 Powering ON and Starting Your Transmitter

NOTE: When the transmitter is not being used by the operator, it must be stored in a safe place.

1. Confirm that all safety measures required by the equipment manufacturer have been followed.
2. Insert a battery adapter with fresh batteries into the battery compartment of the transmitter.
3. Make sure that the **STOP** switch (#6) is not pressed and that no other switch is in the operational position.
3. Insert the black key cap supplied with the transmitter in the key switch and turn it to the ON (I) position.
4. Turn ON the receiver.
5. Press **START** (#7). The transmitter will perform a routine initialization upon start up.

Note: The Start button is usually on the right hand side of the transmitter as indicated above, however, it can also take the form of a momentary toggle switch or round push button anywhere on the top face with the symbol ■. This can and is usually paired with the horn function ◀.

Note: For the powering up and starting procedure for the standard Nova-S transmitter refer to the respective section in the Nova S appendix.

5.4 Transmitter Initialization with Standard Status LED Indicator

Upon turning the transmitter ON, all the LEDs light up as solid colours, the buzzer beeps twice (approximately two seconds apart) and then the LEDs switch off before the unit performs the routine initialization.

During initialization, if the coder finds an error in the radio module, address, configuration or feedback, the transmitter will boot up and the failure will be displayed as a blinking RED status LED at the baud rate. The transmitter (all Nova L, Nova XL and Nova XXL variants) may then be connected to Hetronic PC-Link (refer to Programming and Servicing Manual for instructions) for the Error to be corrected.

Note: If the buzzer output remains continuously ON, this shows that the Address module is not present, not plugged in correctly or in error state.

After a successful initialization, the transmitter will enter Normal Operation Mode. The Green LED will blink at the baud rate i.e. the LED toggles on with every transmitted telegram frame. All other LEDs switch off. Test all machine functions. Refer to your machine, transmitter and receiver documentation as needed.

5.5 Transmitter Initialization with Graphic User Interface (TFT) and Standard Status LED Indicator

Upon turning the transmitter ON, the TFT screen turns ON and the LEDs light up as solid colours and then switch off before the unit performs the routine initialization.

During initialization, if the coder finds an error in the radio module, address, configuration or feedback, the transmitter will boot up and the failure will be displayed as a blinking RED status LED at the baud rate. The transmitter (all Nova L, Nova XL and Nova XXL variants) may then be connected to Hetronic PC-Link (refer to instructions in Programming and Service Manual) for the Error to be corrected.

Note: If the buzzer output remains continuously ON, this shows that the Address module is not present, not plugged in correctly or in error state.

After a successful initialization, the NOVA transmitter will enter Normal Operation Mode and display the software version and the splash screen (if present).

The basic home screen will then be displayed and the Green LED will also blink at the baud rate i.e. the LED toggles on with every transmitted telegram frame. All other LEDs switch off. Test all machine functions. Refer to your machine, transmitter and receiver documentation as needed.

5.6 Stopping the Radio Remote Control

In order to completely stop the transmission of data manually, the user must press the **STOP** button (#6).

Then the text **STOP** appears on the display (if present), the RED status LED blinks at a fast rate and the transmitter sends a Stop telegram to the receiver. Upon receiving the Stop telegram, the receiver goes into Safe Mode and turns OFF all receiver outputs.



If the user wishes to resume operation, this is possible by deactivating the STOP switch and pressing the Start switch (#7) again.

Note: For the stopping procedure for the standard Nova-S transmitter refer to the respective section in the Nova S appendix.



WARNING: Holding the transmitter improperly while operating your machine could result in unexpected machine response.



WARNING: Test the stop function as described in the machine manufacturer's operator manual before beginning any operation.



WARNING: To avoid accidental start-up, always press STOP when not in use.

Turn OFF your machine if there is a fault or problem with the safety check.



NEVER operate the machine if the STOP function does not work properly.

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

5.7 Battery 'State of Charge' Indication

Unless the transmitter is equipped with a TFT screen, in which case the Battery Level is also displayed on the status bar, the transmitter uses two different warning signs to show the user that the battery needs replacement.

When the Low Battery level warning has been triggered, the RED status LED will blink at a slow rate. The GREEN status LED will still blink at the same rate as the baud 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 low battery warning, a fixed critical battery level is also monitored. When critical battery level is reached, the RED Status LED will blink faster. The coder will automatically trigger the Stop telegram for about 5 seconds until it shuts off.

5.8 LED Behaviour and Meanings

All transmitting units are equipped with LED lights that signal operating status, battery level and fault messages.

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 Outputs Description

Note: For LED Behaviour on Nova-S Transmitters refer to respective Appendix

5.9 Powering OFF the Transmitter

To turn off the transmitter, the operator must turn the key switch clockwise to the "0" position. It is suggested that the battery is removed from the transmitter when not in use and stored in a safe place so as to avoid accidental operation.

Note: For the powering off procedure for the standard Nova-S transmitter refer to the respective section in the Nova S appendix.

The coder can also be switched off through either one of the following:

- 1) through the manual activation (Active Stop) of the Stop switch (#6) which will in turn, open the 'Machine Stop' relay in the receiver
- 2) when the Stop function is automatically triggered (Passive Stop) due to an error, such as, transmitter out of range
- 3) when the duration of the Auto-OFF timer has elapsed during which no operational activity has been detected.
- 4) when the battery has been discharged to 3.4V and the critical battery duration has elapsed.

5.10 Belts

The practical belt hangers on the Nova transmitter housings allow the user to clip on the appropriate belt for ease of access and operator safety during operation. Each type of transmitter has its own set of belts which are adequately and ergonomically designed to offer the least strain possible on the operator.

6. Generic Radio Remote System functionalities

6.1 “Start” Function

Start switch (#7), generally in green and very close to the key switch, is required to initialize radio remote control. For safety reasons, the “Start” command must be given to give the receiver control every time there is an interruption in the control signals. This switch is in many cases paired with the Horn function ■/▲.

In order to start up the radio remote control system from the transmitter one has to make sure the stop button (#6) must be released and all control levers must be in neutral position. The key switch must be turned to the “ON” position (I) on the transmitter and the “Start” button (#7) pressed.

6.2 Stop Switch

The most important feature of the radio remote control system is the Stop function. The transmitter sends the Stop status signal along with the rest of the commands through the telegram. This method confirms that ongoing operations are safe. If the Stop pushbutton is pressed (Active STOP), the Stop relay in the receiver causes all functions/motions to stop and the receiver goes into Safe mode.

To restart the system, the Stop button (#6) must be disengaged and the Start/Horn button (#7) is to be pressed again to close the relays in the receiver and resume function.

The Stop functionality responds faster than any other command. When Stop is engaged, the system ignores any other signal that is transmitted. The problem must be corrected before the system will respond to any other signal.

The Stop functionality is self-monitoring and redundant in the transmitter and receiver. The system performs a self-test to ensure the Stop circuit is working properly. If an error is detected, the system automatically goes into Safe mode.

When the transmitter is turned on, it performs a self-test to be sure that communications are within designated parameters. If an error is detected, the transmitter will not transmit any signals.

Whenever Safe mode is active without having the STOP button pressed, the system is said to be in Passive STOP. This means that the Stop button (#6) is still disengaged however the relays in the receiver are open so as not to allow any operation.

Possible triggers for Passive STOP (Safe Mode) are:

1. Transmitter Auto shutdown after period of inactivity
2. Radio signal interference
3. Transmitter out of operating range
4. Low battery sends Stop signal after time out elapses

While it is perfectly protected against unintentional collisions, the STOP button is easily accessible and can be quickly operated with priority.

The STOP button on the transmitter is only a remote stop and will operate only when the transmitter is powered up.



Pressing the STOP pushbutton does not ensure the machine will come to a complete stop. STOP button functionality is subject to the wiring of receiver STOP relays to machine emergency stop circuit and controlled machine logic where applicable.

ALWAYS test the STOP function at the beginning of every operation session or when there is change of operator/shift.

6.3 Digital and Proportional Functions

There are two possible types of electronic control that can be operated from the Radio Remote Control; the digital and the proportional functions.

Digital control (ON-OFF) determines either the opening or closing of a potential-free relay or solid-state switches within the receiver when the transmitter activates this control. These commands are normally sent from push buttons, toggle switches, selector switches or digital joysticks.

Proportional control is a function determining a variable output in either current or voltage in a directly proportional way to the varying of the position of an analogical actuator on the transmitter. This can be a joystick or a simple potentiometer. Cross joysticks operate on either one, two or three axes (X, Y and Z respectively) depending on the application, with the X and Y axes having up to 4 mechanical detents in each direction and the Z axis being the rotation the joystick lever on its own axis. When stepless proportional control is required, the initial movement of the joystick will activate the safety channel before any output can be obtained. The standard paddle joysticks use the same principle as the cross joysticks, however they operate on one axis.

Note: In all cases, all joysticks/levers must be in the neutral position for the system to be able to start.

6.4 Quickset/Programming mode

In most cases, the snail-rabbit toggle switch is present so as to change between slow and fast speed levels of the joystick. However when the transmitting unit has another toggle switch/push buttons with "+" and "-" labels, it is possible to manually change the slow speed levels for each joystick in real time, so as to adapt the application's response to the load and precision needs required at that point in time.

In order to activate this functionality, the user has to:

1. Switch OFF transmitter and remove black key cap.
2. Insert red key cap and turn the key to "I" position to switch on the transmitter. An acoustic signal is heard.



3. Turn the key to 'P' position to activate 'Programming' mode and keep holding the "Start" button down for 2 seconds.
4. In order to set the minimum speed for a function, slowly move the joystick until it reaches the point when the safety DK is activated. Hold the joystick in this position and press the '-' or '+' buttons to reduce or increase the speed, respectively.
5. In order to set the maximum speed, move the joystick until its maximum position is reached and press the '-' or '+' buttons to reduce or increase speed.

N.B. Ensure that the speed of only one function is programmed at one go. Whenever a speed setting is completed, wait for approx 10 seconds before disconnecting the transmitter so as to make sure that the correct values are stored in the system.

N.B. The "Snail" and "Hare" functions are independent to each other, thus if the speed of the function "Snail" is to be set, this has to be selected beforehand.

6. When all required joysticks speeds have been set, switch off transmitter by turning the red key cap to the '0' position.
7. Replace red key cap with black key cap and switch on transmitter to resume operation.

7. Setting up your Nova Transmitter for Operation

7.1 Coder

7.1.1 Address

The coder address with which the NOVA transmitter has been programmed from the factory can be found listed on the datasheet. This can be updated via Hetronic PC-Link in the 'RF' tab and any number between 1 and 999999 can be used (refer to Service and Programming Manual for instructions).

7.2 Communication

7.2.1 Radio Settings

The NOVA coder is designed with the possibility to connect two on board RF modules either operating in the sub 1GHz range as well as 2.4GHz. When the RF module is plugged directly on to the coder (onboard), the user may select the frequency channel or group to use for communication. If the RF module is connected to the coder externally (through a cable set inside the transmitter) the channel will depend on the SIP switch settings as outlined in the RF module and Frequency Bands charts. The RF module is used for either transmitting only the control telegram or else operating in half duplex mode. For the coder to operate in full duplex mode then a second RF module has to be connected and configured using Hetronic PC-Link (refer to Service and Programming Manual for instructions).

7.2.2 Auto-OFF

A transmitter Auto-OFF timer can also be set which powers down the coder if it remains idle for a configured period of time. The Auto-OFF timer can also be disabled so that the coder remains always ON until either switched OFF manually or else when the critical battery voltage level is reached and thus the transmitter switches off automatically (refer to Service and Programming Manual for instructions).

Note: In the case of Nova-S transmitters, a jumper setting on the coder determines whether the transmitter switches off or not after 10 minutes of inactivity.

7.2.3 Radio Mode vs Cable Control Mode

Detection of the presence of Cable Control supply can be set automatically to switch to Cable Control mode. In Cable Control mode, the telegram will be sent through the cable RS232/CAN and the Radio mode will be OFF.

Cable Control detection can also be disabled. In this case, the Radio mode will always be used. This is useful whenever the remote control is required to work in Radio mode and the available voltage supply is between 5 and 30V, thus must be supplied via the cable control connector.

The presence of Cable Control supply can also be used as signal to activate a C12HL output.

7.3 DK Configuration

There are 32DK switch assignments on the coder board and an additional 48DK switches can be used when an optional expansion board is added to the system. The 80DK switches have fixed assignments corresponding to DK1 to DK80 and cannot be modified. The final status of the telegram DKs is dependent on the Hetronic PC-Link configuration which is a logic combination of Input Signal/s and its corresponding DK switch for telegram DK1-DK32 and selected Input Signal or DK switch for telegram DK33-DK80.

7.4 AK Configuration

There are 16 configurable AK channels (AK1 to AK16). Each AK channel can be independently assigned to a particular Signal. When no Signal is configured to the AK, the corresponding AK channel will remain in neutral position. The neutral position can be 0x7F or 0x00 hex value corresponding to the Type selected which is Uref/2 or 0-Uref respectively. The AK Channel signals can be either set as Analog Inputs or Gray Code or ADC configurations, in which the analog inputs are used to generate digital step or gray code signals that can be used to trigger telegram DKs. Refer to Service and Programming Manual for instructions.

7.5 Digital Outputs

The coder has 25 configurable outputs which include the Buzzer, two open collector outputs, six push pull digital outputs (TTL1 to TTL6) and 16 optional outputs (LED1 to LED16) when an additional expansion board is used. All the outputs can be assigned with DK signals, feedback bits, logic gates and any coder status signals available. The output active state can be set as either continuous or pulsing with adjustable On/Off durations.

All outputs can be configured latching, thus it will remain active once the signal is activated and remains active even after the signal is deactivated. The latched output turns OFF after the signal is reactivated. The latching function can also be set to switch OFF once the Stop function is activated. Refer to Service and Programming Manual for instructions.

7.6 Inactivity Warning

This feature is mainly used in applications which require one or more functions to be continuously ON and thus, the switch operations are monitored for abnormal conditions. The 14 Timer Triggers can be assigned different trigger signals and timer durations.

When any of these 14 timers is triggered they will in turn trigger a Level 1 Warning signal which will be used to trigger an output. The Level 1 Warning signal is reset when the input trigger is disabled. When the Level 1 Warning signal is activated this automatically triggers a second independent timer which will be used to monitor the presence of the Level 1 Warning signal. If the Level 1 Warning signal remains active all throughout the second timer duration, the Level 2 Warning signal will become active if this is configured. The Level 2 Warning signal can also be used to trigger an output. The Level 2 Warning signal will remain ON once it is activated until the next system power OFF and ON. When a logic output signal is used as a trigger, the corresponding timer will be reset every time one of the inputs of the logic signal changes state.

7.7 Multi-Address Mode

This function provides the possibility to have the transmitter control a number of receivers, one at a time, depending on the address selected. The user can set the addresses to be used by an offset value configurable from 1 to 999 relative to the base address.

Incrementing or decrementing address offset is only possible whenever the assigned "Enable/Select DK Switch" is active. This DK can be assigned from DK11 to DK80 and is outlined on the main drawing of the transmitter.

Increment DK switch and Decrement DK switch are the configured DKs which will be used to change the current address of the coder with the corresponding offset value. The possible DKs are DK11 to DK80 and these can also be configured to offset change the address digits by 10s or 100s for faster operation. The configured DK switches are also outlined on the main drawing of the transmitter.

Confirm DK switch is used to confirm the change in address offset and can also be assigned from DK11 to DK80. The user is also made aware as to which switch is responsible for this functionality through the transmitter drawing.

7.8 Optional Add-Ons

7.8.1 Tilt Sensor

The tilt sensor is a module attached to the inside of the transmitter which is used to trigger an output whenever the transmitter is tilted further than the preset angle. The module supports two independently monitored axis and the corresponding maximum and minimum tilt angle for each. The switched output time delay can also be adjusted from 1 to 60 seconds and the angle detection can be up to 90° in both the X and the Y axis.

7.8.2 Palm Sensor

The palm/touch sensor is used on Nova enclosures to act as a "man-down" safety feature. Its purpose is to detect the presence of a hand through the plastic handle of the housing, even if wearing leather or rubber gloves. The Palm sensor can be used on the Nova M, Nova L, Nova XL, Nova XL 2.8, Nova XL 4.3 and Nova XXL 4.3 variants.

7.8.3 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 transmitter and receiver, 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.

7.9 Cable Control (optional)

Cable control is also possible on NOVA Transmitters and this allows for the operation of the transmitter with no wireless radio transmission, e.g in cases where radio transmission is not permissible or when the batteries are exhausted and the transmitter must be kept on for continual crane operation. This feature requires an additional cable and this can be either plugged in the battery compartment in place of the battery or connected directly to a plug on the side of the transmitter. In either case, both the transmitter and receiver must be configured for CAN or RS232 communication. The CAN communication supports both CANopen and J1939 while RS232 communication is by default set to full duplex communication (refer to Service and Programming Manual for instructions).

The standard cable length is 10m. When the control cable is used all the pre-set adjustments and other optional functions do not change. When not in use, the cable should be stored in a safe compartment inside the truck cabin. The cable with the battery enclosure must not be stored in an area subject to magnetic fields as this could damage it.

7.9.1 Installation of Cable Control Cable

1. Switch off the receiver and NOVA transmitter and remove the battery.
2. Plug in the cable/battery enclosure for cable control in the transmitter and the other end in the receiver, making sure they are securely fastened.
3. Switch on the receiver and the transmitter and press 'Start' to enable communication.

Note: The cable connection point is located on the lower side of the installed receiver unit.

Types of Cable Control:

Sure Seal to Sure Seal connector



Amphenol to Amphenol connector



Battery to Amphenol connector




7.9.2 Operation of NOVA in Cable Control Mode

With cable control cable attached, switch on transmitter following the start up sequence as outlined in Section 4. During start up, the transmitter 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.



All controls on the transmitter will function the same regardless of whether the transmitter is in cable control mode or wireless mode.

7.9.3 Decoder Address Learning (CC interface)

The coder address can be configured by a decoder (ex. BMS2, Rx14HL, DC Mobile) through its cable control (RS232) interface whenever the same coder is powered directly by the decoder. This is possible on all transmitters with a colour display. To put the coder in address learn mode, it must be powered ON with DK1 switch (#7) ON and not in STOP condition. During this stage the red status LED (with the symbol ) starts blinking confirming the coder is in address learn mode. Once the coder is in address learn mode DK1 must be turned OFF and ON again to send address learn command to the decoder. In this mode, it will wait for receiver address information which will be provided by the decoder. Once the address information is being retrieved from the receiver, the green LED will turn ON. The coder will receive the address sent from the decoder and validates the address. The address will be saved into the ADMO if the received address is valid and the green LED turns OFF. If the address received is not valid or if there is any error in the communication while receiving the address, the green LED will remain continuously ON. If there is an error then the coder must be turned OFF and the address learning procedure outlined above must be performed again.

7.9.4 Returning Transmitter to Wireless Mode

To return to wireless mode, the transmitter must be powered off and the cable disconnected. Following the start up sequence from Section 4, restart the transmitter. This will automatically detect that it is no longer in cable control mode and will start the unit in its normal wireless mode.

8. Theory of Operation

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

9. Installing the Radio Remote Control

The following instructions are recommended so as to set up a properly operating radio remote control system. The radio remote control must be installed by qualified personnel only.

Install the receiving unit's antenna in the line of sight of the transmitting unit, with no electromagnetic shielding, and if possible, not on metal surfaces so as to improve the operating range.

Do not bypass the safety instructions outlined by the equipment's manufacturer.

Do not install the receiver unit too high above the ground as the unit may receive local radio signals that could disturb transceiving operations.

To prevent water infiltrations, install the receiving unit vertically, with any cable clamps and any other connections at the bottom.

In case of strong mechanical vibrations, rubber shock-absorbing buffers may be installed between the machine and the receiver.

10. Troubleshooting

If your NOVA transmitter does not operate after normal start-up, follow the recommended troubleshooting sequence below to help isolate the cause and determine corrective action. If you need more information, contact your nearest Hetronic dealer.

PROBLEM	PROBABLE CAUSE	CORRECTION
Transmitter won't start	Incorrect Access code(if enabled)	Enter correct access code
	Battery fully discharged	Replace with fully charged battery if needed
The transmitter is turned on, but does not transmit (Power LED not flashing)	Battery is discharged	Replace battery with a fully charged battery
	Component failure	Contact your supervisor or nearest Hetronic Service Centre
Transmitter is transmitting (Power LED flashing), but machine will not respond	No power to the receiver	Check the diagnostic LEDs in the receiver to be sure power is applied. Ensure that the system is properly grounded
	Transmitter/receiver frequency channels do not match	Follow instructions under "Setting Frequency and channels" or contact your supervisor
	Transmitter out of range	Take the transmitter back into the range of the receiver, press START
	Receiver powered off	Turn on power to receiver
	Blown fuse in receiver	Check all fuses and replace if needed
	STOP failure in receiver. Red STOP LED on PC board is illuminated	Contact your supervisor
Battery Status is not displayed	I2C connector inside transmitter is loose	Check all connectors, reseal if needed
All machine motions operate intermittently	Receiver 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 receiver is loose	Check all connectors, reseal if needed
	Another frequency may be interfering with the system	Contact your supervisor

Table 3. Troubleshooting tips

11. Warranty, Service, Repairs and Maintenance

Before any service or maintenance intervention on remote controlled equipment always:

- Remove all electrical power from the equipment
- Follow lock out procedures

Hetronic products are covered by a guarantee/warranty against material, construction and manufacturing faults. During the guarantee/warranty period, Hetronic may replace the product or faulty parts. Work under guarantee/warranty must be carried out by Hetronic, or by an authorized service centre specified by Hetronic. Any modification, reconstruction or extension of the systems without a written agreement of Hetronic may lead to the loss of your warranty and guarantee claims.

The following are **not** covered by the guarantee/warranty:

- Faults resulting from normal wear and tear
- Consumables e.g. batteries
- Products that have been subject to unauthorized modifications
- Faults resulting from incorrect installation and use

Maintenance and Preventive Care

- Repairs and maintenance must be carried out by qualified personnel
- Only use original Hetronic spare parts
- Contact your representative for service or any other assistance
- 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 transmitter as detachment of the pressure balance element may lead to ingress protection problems

NEVER USE:

- Abrasive cleaning solutions or high-pressure water jets.
- Sharp, pointed objects or any hard items as these may tear the rubber parts.
- Compressed air as this may lead to ingress protection issues.
- Petroleum based solvents including Diesel and Gasoline to clean the unit as these may react with the silicone rubber of the joystick gaiter.

Note: Refer to web shop for items available as spare parts.

12. Regulatory Information

12.1 Europe

CE Marking

Transmitters - Hetronic hereby declares that the safety component "Radio Remote Control Transmitter Type NOVA" types 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 component meets the following relevant directives at the time of delivery from the Hetronic manufacturing facilities:

Machinery Directive	2006/42/EU
RED Directive	2014/53/EU

Batteries - Hetronic declares that the components listed as "Rechargeable Battery Type MINI NiMH" are in accordance with all provisions of Annex I of the EU Council Directive 2014/30/EU referred to as EMC Directive.

Chargers - Hetronic declares that the safety components listed as "Battery Charger UCH 2" and "Battery Charger UCH 3", in accordance with 2006/42/EU article 2(c), are designed for installation on machinery or other devices. Further, the above listed safety components meet the following directives at the time of delivery from the Hetronic manufacturing facilities:

Machinery Directive	2006/42/EU
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The latest version of the complete EU Declarations of Conformity for the NOVA Transmitter, MINI Battery and UCH-2 and UCH-3 chargers are available on the Hetronic website www.hetronic.com.

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.

REACH Compliance

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 www.hetronic.com.

RoHS Compliance

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 Directive 2002/95/EC. The latest version of the complete Declaration of Conformity is available on the Hetronic website www.hetronic.com

12.2 North America

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.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

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 transmitter.

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 receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

12.3 Industry Canada (IC/ISED) Statement

IC RF Exposure Statement

This device meets the IC requirements for RF exposure in public or uncontrolled environments.

IC Warning

This product complies with Industry Canada's licence-exempt RSS standards. Operation is subject to the following two conditions:

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



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Appendix A

Definition of terms

The following terms are used throughout the NOVA User Manual and may be unfamiliar to some operators.

Term	Definition
baud rate	The transmitting speed measured in bits per second.
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.
base address	The base address is the Hetronic PC-Link assigned address of the coder

Appendix B

B.1 Operator Safety Basics

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. Transmitter switches must never be mechanically blocked ON or OFF for any motion. When not in use the transmitter must be turned off. A safe and secure storage space should be provided for the transmitter unit and the unit should always be placed there when not in use. This precaution will prevent unauthorized people from operating the crane. Receivers 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 transmitter, 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 transmitter at any point.
6. Do not operate the transmitter 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 transmitters. Use ONLY Hetronic rechargeable batteries.
10. Use protective gloves when surface temperature of unit exceeds 58°C (136°F) as per IEC 62368-1:2014.

B.2 Safety Checklist

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

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

Transmitter Start-up and Safety Checklist		
1	Are batteries fully charged?	
2	Are all switch labels clear and legible?	
3	Is the transmitter free from cracks and damages?	
4	Are the battery enclosures free from cracks and damages?	
5	Is the STOP function working as it should be?	
6	Is the correct key cap being used?	
7	Has each function of the transmitter been tested independently to ensure the equipment is responding correctly?	
8	Is the TFT (where applicable) free from cracks, deep scratches and damages?	
9	Are the switches/rubber caps free from damages/tears?	
10	Are the LEDs on the transmitter clearly visible?	
11	Are the charger and plug in good working condition?	
12	Is the cable control cable (where applicable) free from kinks and damages?	

B.3 Nova Variants and Current Rating

71 ABCDEF.A

A		B		C		D	E	F
0	Dig	0	Nova S	0	No Display	Spare / Undefined	System Reference	Spare / Undefined
1	Prop	1	Nova M	1	2.8in TFT			
		2	Nova L	4	4.3in TFT			
		3	Nova XL					
		4	Nova XXL					

The table on the following page shows how the item number of a Nova unit is broken down and explains what each digit refers to with regards to different features available on the transmitter. The suffix, e.g. '.A' denotes the version number of the system as a whole.

Item number	Description	Type	Item number breakdown							Current Rating (mA)
			71	A	B	C	D	E	F	
71000020.B	Dig V2 R2CON	Nova S	71	0	0	0	0	2	0	150
71010003.A	DIG-IND-3	Nova M	71	0	1	0	0	0	3	72
71010040.D	DIG-V04	Nova M	71	0	1	0	0	4	0	72
71010050.E	DIG V5	Nova M	71	0	1	0	0	5	0	72
71110140.C	PROP-4K	Nova M	71	1	1	0	1	4	0	150
71110200.A	PROP-4L	Nova M	71	1	1	0	2	0	0	150
71020010.D	DIG-V01	Nova L	71	0	2	0	0	1	0	50
71020020.D	DIG V02	Nova L	71	0	2	0	0	2	0	50
71020100.C	DIG-V10	Nova L	71	0	2	0	1	0	0	50
71020110.D	DIG-V11	Nova L	71	0	2	0	1	1	0	50
71020200.D	DIG-IND-1V2	Nova L	71	0	2	0	2	0	0	50
71020205.C	DIG-IND-2	Nova L	71	0	2	0	2	0	5	50
71110130.C	PROP-4K W. SURE SEAL	Nova L	71	1	1	0	1	3	0	50
71120040.B	PROP-4L	Nova L	71	1	2	0	0	4	0	50
71120050.A	PROP-4L W. INDIV. SK	Nova L	71	1	2	0	0	5	0	50
71120060.B	PROP-6L	Nova L	71	1	2	0	0	6	0	50
71120070.A	PROP-6L W. INDIV. SK	Nova L	71	1	2	0	0	7	0	50
71120080.A	PROP-6L W. SURE SEAL	Nova L	71	1	2	0	0	8	0	50
71120140.D	PROP-4K	Nova L	71	1	2	0	1	4	0	50
71030200.B	DIG-IND-1V2	Nova XL	71	0	3	0	2	0	0	50
71120150.B	PROP-4K / 2L	Nova XL	71	1	2	0	1	5	0	50
71130060.A	PROP-6L	Nova XL	71	1	3	0	0	6	0	50
71130080.C	PROP-8L	Nova XL	71	1	3	0	0	8	0	50
71130160.C	PROP-6K	Nova XL	71	1	3	0	1	6	0	50
71130165.B	PROP 6K	Nova XL	71	1	3	0	1	6	5	50
71131080.A	PROP-8L	Nova XL 2.8	71	1	3	1	0	8	0	200
71131160.A	PROP-6K	Nova XL 2.8	71	1	3	1	1	6	0	200
71144140.A	PROP-4K	Nova L 2.4	71	1	4	4	1	4	0	190
71144080.A	PROP-8L	Nova XXL 4.3	71	1	4	4	0	8	0	550
71144160.A	PROP-6K	Nova XXL 4.3	71	1	4	4	1	6	0	550

Appendix C

C.1 TFT Protection Film Replacement

The following instructions apply for Protection Film replacement for both the 2.4" TFT on the Nova L and the 4.3" TFT on Nova XXL transmitters. The steps are to be followed cautiously so as not to incur any scratches/damage to the TFT screen or transmitter.

Items required:

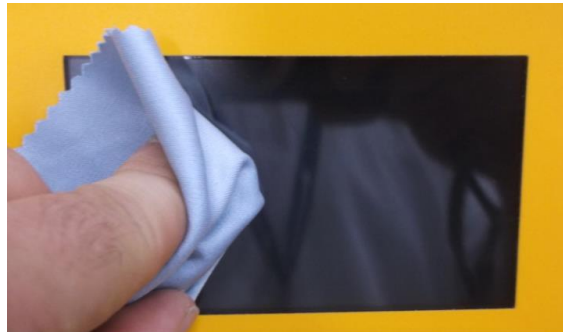
- New protection film depending on the TFT screen size
- Flat smooth-edged tool to remove air bubbles
- Lint-free cloth

Instructions:

1. Remove the protection film to be replaced.
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.



Protective Film on 2.4" TFT



Protective Film on 4.3" TFT

6. Remove the protective red tab cover.

Transmitter Nova S

Layout Options



Powering ON the Nova S Transmitter

Unlike the other Nova transmitters, the Nova-S does not have a key switch for switching on. Instead, the standard Nova-S versions power up either via a push button on the side or top of the transmitter (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 transmitter ON, so as to enable communication with the receiver.

Note: In some cases, the Start Function is also combined with the Horn function (🔊).

Stopping your Transmitter

Press the STOP button (#6). This will automatically make the system ignore any other signal that is transmitted and switch OFF the transmitter.

Powering OFF your Transmitter

Since the standard versions of the Nova S transmitter have no key switch, the coder can be switched off through any one of the following:

- 1) either through the manual activation (Active Stop) of the Stop switch (#6) which will in turn, open the 'Machine Stop' relay in the receiver
- 2) or when the Stop function is automatically triggered (Passive Stop) due to an error, such as, transmitter out of range
- 3) or when the duration of the Auto-OFF timer has elapsed during which no operational activity has been detected.
- 4) or when the battery has been discharged to 3.4V.

Auto-Off Timer

The coder can be set with a 10-minute timer which will switch off the transmitter when no activity is detected.

Battery State-of-Charge Signals

The onboard buzzer starts beeping fast when the battery reaches 3.4V and the LED starts blinking fast indicating that the coder will soon switch off.

Transmitter Specifications

Transmitter NOVA S	
Housing	Ergonomically designed Impact Resistant Polymer Composite
Environmental Protection	IP 65 (Exceeds Nema 12/13)
Weight	~0.37kg (13oz) depending on configuration
Dimensions	Height: 125 mm
	Width: 160 mm
	Depth: 70 mm
Antenna	Internal as default, external via TNC connector
Power Supply	3.6V NiMH rechargeable MINI battery
Diagnostics	Status LED for operation and standard low battery detection
Battery Operation Time	Min 12 hrs continuous transmission*
Typical Control Configuration (max 24 digital inputs)	Momentary push button for Start-Horn
	3-position maintained toggle switch
	3-position maintained-off-momentary toggle switch
	Push-Pull mushroom head STOP switch
	12-position rotary switch
	Key switch with removable key cap
Frequency Range	4xxMHz or 8xxMhz or 9xxMHz**
Power (RF Output)	Typically $\leq 10\text{mW}$ E.I.R.P
Typical Operating Range	Minimum 150 m. (492ft.) for $\leq 1\text{GHz}$ (Line-of-Sight)
Safety	20-bit programmable address concept with up to 1,000,000 combinations
	Active & Passive Stop Function
	Parity and Checksum
Operating Temperature Range	-25°C . . . 70°C (-13°F . . . 158°F)
Humidity Range	0 - 97% maximum non-condensing
Response Time	Less than 100 msec.
Accessories	Serial cable control through battery enclosure

Technical Specification Transmitter Nova S

*varies by transmitter configuration

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

Battery & Charger

You may power your Nova S transmitter with a Hetronic rechargeable NiMH 3.6V Grey MINI battery inserted in the battery compartment in the bottom side of the transmitter.

Follow the instructions below to ensure best performance of your transmitter and prolonged battery lifetime.

1. Confirm that your batteries are fully-charged. See "Recharging Your Batteries" section in the UCH 2 Charger section.
2. Slide the recharged battery into the battery compartment at the bottom of the transmitter as shown, and snap it into place.

Cable back-up

Cable control on Nova-S transmitters is only possible through the battery compartment due to the space restrictions inside the transmitter. For the control cable to be connected, the battery will have to be removed, and once supply is restored to the transmitter via the control cable, all radio transmissions are cut off automatically.

Accessories and Spare Parts

The Nova-S transmitter comes with a standard belt clip which can be attached to the belly belt specifically designed for the transmitter.

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>

NOTE: Any service/maintenance work and replacement of parts must be carried out by an authorized dealer or service centre specified by Hetronic.

Transmitter Nova M

Layout Options



Powering ON your Transmitter

To switch on the Nova-M transmitter, the standard procedure outlined in section 4.3 is to be followed.

Stopping your Transmitter

Refer to Section 4.6.

Powering OFF your Transmitter

Refer to Section 4.7.

Auto-Off Timer

The coder can be set with a 10-minute timer which will switch off the transmitter when no activity is detected.

Battery State-of-Charge Signals

The onboard buzzer starts beeping fast when the battery reaches 3.4V and the status LED starts blinking red at the same rate indicating that the coder will soon switch off.

Transmitter Specifications

Transmitter NOVA M	
Housing	Ergonomically designed Impact Resistant Polymer Composite
Environmental Protection	IP 65 (Exceeds Nema 12/13)
Weight	~0.91kg (2.1lbs) depending on configuration
Dimensions	Height: 150 mm
	Width: 180 mm
	Depth: 110 mm
Antenna	Internal as default, external via TNC connector
Power Supply	3.6V NiMH rechargeable battery 5 to 30V for cable control
Diagnostics	Status LED for operation and std/adv low battery detection
Battery Operation Time	Min 12hrs continuous transmission*
Control Configuration	Up to 2x Single/Dual/Triple axis cross joysticks or 4x paddle levers
	Digital or Proportional functionality
	Combination of key switches, toggle switches, push buttons, rotary switches, potentiometers and stop switches
	Customized switches available upon request
	Half or Full duplex feedback
Frequency Range	4xxMHz or 8xxMHz or 9xxMHz or 1.216GHz or 2.4GHz**
Power (RF Output)	Typically $\leq 10\text{mW}$ E.I.R.P
Typical Operating Range	Minimum 150 m. (492 ft.) for $\leq 1\text{GHz}$ (Line-of-Sight)
Safety	20-bit programmable address concept with up to 1,000,000 combinations
	Active & Passive Stop Function
	Parity and Checksum
Operating Temperature Range	-25°C . . . 70°C (-13°F . . . 158°F)
Humidity Range	0 - 97% maximum non-condensing
Response Time	Less than 100 msec.
Accessories and options	Cushion and customer logo option
	Optional Custom housing colour
	RS232/CAN Cable control

Technical Specification Transmitter Nova M

*varies by transmitter configuration

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

The Nova-M transmitter can use either an analogue or a digital coder board, depending on the required configuration. The analogue version can hold up to 6 analogue channels and 16 digital channel inputs whilst the digital coder board can hold up to 24 digital channel inputs. Either coder board has an onboard horn which can be used separately or together with an additional optional horn.

Battery & Charger

You may power your Nova M transmitter with a Hetronic rechargeable NiMH 3.6V Grey MINI battery inserted in the battery compartment in the bottom side of the transmitter.

Follow the instructions below to ensure best performance of your transmitter and prolonged battery lifetime.

1. Confirm that your batteries are fully-charged. See "Recharging Your Batteries" section in the UCH 2 Charger section.
2. Slide the recharged battery into the battery compartment at the bottom of the transmitter as shown, and snap it into place.

Cable back-up

Cable control on Nova-M transmitters is possible through either the battery compartment or from a connector plug installed on the side of the transmitter. For back up/control via the battery compartment, the battery will have to be removed. For back up/control via the connector plug, the battery may be left inside the battery compartment as the coder will automatically detect the presence of the cable and disable all wireless activity.

Accessories and Spare Parts

The standard belts for the NOVA M transmitter are the neck and belly belt and these can be obtained with or without the cushion and with or without the logo.

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>

NOTE: Any service/maintenance work and replacement of parts must be carried out by an authorized dealer or service centre specified by Hetronic.

NOTE: Keep the safety instructions for future reference. Always download the User Manual instructions from our website for the latest version available.

Transmitter Nova L

Layout Options



Powering ON your Transmitter

Refer to Section 4.3.

Stopping your Transmitter

Refer to Section 4.6.

Powering OFF your Transmitter

Refer to Section 4.7.

Auto-Off Timer

The coder can be set with a 10-minute timer which will switch off the transmitter when no activity is detected.

Battery State-of-Charge Signals

The onboard buzzer starts beeping fast when the battery reaches 3.4V and the status LED starts blinking red at the same rate indicating that the coder will soon switch off.

Transmitter Specifications

Transmitter NOVA L	
Housing	Ergonomically designed Impact Resistant Polymer Composite
Environmental Protection	IP 65 (Exceeds Nema 12/13)
Weight	~0.745kg (1.6lbs) depending on configuration
Dimensions	Height: 235 mm
	Width: 160 mm
	Depth: 95 mm
Antenna	Internal as default, external via TNC connector
Power Supply	3.6V NiMH rechargeable battery 5 to 30V for cable control
Diagnostics	Status LED for operation and standard/advanced low battery detection
Battery Operation Time	Min 12 hrs continuous transmission*
Control Configuration	2x Single/Dual/Triple axis cross joysticks
	6x Single axis paddle levers
	Combination of key switches, toggle switches, push buttons, rotary switches, potentiometers and stop switches
	Customized switches available upon request
	Half or Full duplex feedback
Frequency Range	4xxMHz or 8xxMHz or 9xxMHz or 1.216GHz or 2.4GHz**
Power (RF Output)	Typically $\leq 10\text{mW}$ E.I.R.P
Typical Operating Range	150m (492ft) for $\leq 1\text{GHz}$ 10mW module (Line-of-Sight) 70m (150ft) for 2.4GHz 10mW module
Safety	20-bit programmable address concept with up to 1,000,000 combinations
	Active & Passive Stop Function
	Parity and Checksum
Operating Temperature Range	-25°C . . . 70°C (-13°F . . . 158°F)
Humidity Range	0 - 97% maximum non-condensing
Response Time	Less than 100 msec.
Accessories and options	Belly belt, neck belt, chest belt or shoulder bar
	Cushion and customer logo option
	Optional Custom housing colour
	RS232/CAN Cable control
TFT	Back-lit monochrome TFT 120x32

Technical Specification Transmitter Nova L

*varies by transmitter configuration

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

Monochrome LCD Display (optional)

There are several standard screens that are displayed on the LCD:

1. Software version

As soon as the display turns on the LCD type and software version installed in the controller are displayed.

GRAPHIC LCD 120x32
SOFT. VERSION: 2.60

2. Welcome screen



The standard Hetronic welcome screen is displayed as soon as the LCD display turns ON after Start Up. The user can opt to choose a different welcome screen by defining the requirements with an authorized Hetronic dealer who can then implement this via a specific graphics programming tool or else choose from the available options when placing the order.

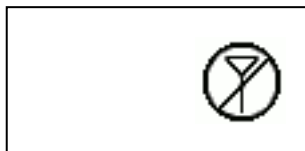
3. Feedback

The feedback function is used to transmit information from the machine or receiver to the transmitter in half or full duplex operation. A number of graphic modes (with different positions and sizes of graphic icons) or up to four lines of text may be used to display the feedback information on the LCD, the format being dependent on the type of message received from the machine. Up to four other on/off digital outputs can also be designated through LCD Feedback.

Contact a Hetronic dealer for information on how to display feedback accordingly.

4. Feedback Error

If the antenna symbol flashes, this means that there is feedback failure i.e. the transmitter has not received a valid telegram for 5 seconds. When this happens there is an imminent risk of losing radio connection thus it is important to check that there are no obstacles blocking the connection and that the units are within the range of the radio system.



5. STOP

The STOP screen is displayed whenever the Transmitter is in STOP mode. This can be achieved when in Active (User manually activates the Stop button #6) or Passive Stop (Transmitter is outside the Antenna reception range or an error occurs).



Battery & Charger

You may power your Nova L transmitter with a Hetronic rechargeable NiMH 3.6V Grey MINI battery inserted in the battery compartment in the bottom side of the transmitter.

Follow the instructions below to ensure best performance of your transmitter and prolonged battery lifetime.

1. Confirm that your batteries are fully-charged. See "Recharging Your Batteries" section in the UCH 2 Charger section.
2. Slide the recharged battery into the battery compartment at the bottom of the transmitter as shown, and snap it into place.

Cable back-up

Cable control on Nova-L transmitters is possible through either the battery compartment or from a connector plug installed on the side of the transmitter. For back up/control via the battery compartment, the battery will have to be removed. For back up/control via the connector plug, the battery may be left inside the battery compartment as the coder will automatically detect the presence of the cable and disable all wireless activity.

Note: When the transmitter is in cable control, the coder offers the possibility to recharge the battery if this is left inside the battery compartment in the transmitter.

Refer to Section 6.9 for more details.

Accessories and Spare Parts

The standard belts for the NOVA L transmitter are the neck, belly and chest belt and these can be obtained with or without the cushion and with or without the logo.

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>

NOTE: Any service/maintenance work and replacement of parts must be carried out by an authorized dealer or service centre specified by Hetronic.

NOTE: Keep the safety instructions for future reference. Always download the User Manual instructions from our website for the latest version available.

Transmitter Nova L 2.4

Layout Options



Powering ON your Transmitter

Refer to Section 4.3.

Stopping your Transmitter

Refer to Section 4.6.

Powering OFF your Transmitter

Refer to Section 4.7.

Auto-Off Timer

The coder can be set with a 10-minute timer which will switch off the transmitter when no activity is detected.

Battery State-of-Charge Signals

The onboard buzzer starts beeping fast when the battery reaches 3.4V and the status LED starts blinking red at the same rate indicating that the coder will soon switch off.

The battery level indicator on the TFT also alerts the user that the battery is being depleted.

TFT Display

The TFT screen layout can be modified according to the user's preferences using the Hetronic Graphics Programming tool.

NOTE: The Protective film covering the TFT can be replaced if scratched or broken. Refer to the instructions in Appendix C.

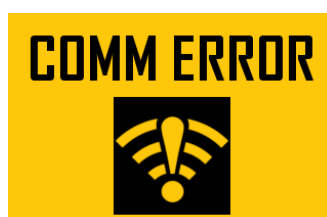
The default TFT display is divided into several segments:



1. The Field Strength (only for systems with feedback)

The field strength indication provides information about the quality of the radio connection. The field strength indication is always visible when the transmitter is switched on. With a perfect connection quality, all 4 bars of the indication are displayed. As the quality of the connection weakens, the reception signal shows less bars depending on how low the quality of the connection is.

If the 'COM error' page is displayed, this means that there is feedback failure i.e. the transmitter is not receiving signals from the receiver. When this happens there is an imminent risk of losing radio connection thus it is important to check that there are no obstacles blocking the connection and that the units are within the range of the radio system.

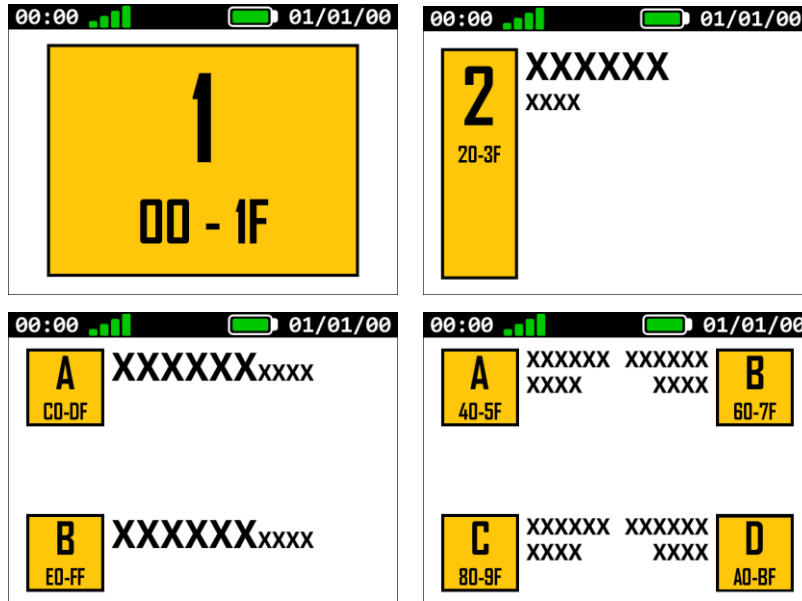


2. Battery Level

The battery level indicator provides information about the current condition of the battery. It is always visible when the transmitter is switched on. As the battery status weakens, the battery level indicator is displayed as a depleting battery until it starts flickering which indicates that it needs to be charged and replaced.

3. Feedback

The feedback function is used to transmit information from the machine or receiver to the transmitter. A number of symbols/graphics or a combination with lines of text are available for displaying feedback information. Contact a Hetronic dealer for information on how to display feedback accordingly.



4. STOP

The STOP screen is displayed whenever the Transmitter is in STOP mode. This can be achieved when in Active (User manually activates the Stop button #6) or Passive Stop (Transmitter is outside the Antenna reception range or an error occurs).



Transmitter Specifications

Transmitter NOVA L 2.4	
Housing	Ergonomically designed Impact Resistant Polymer Composite
Environmental Protection	IP 65 (Exceeds Nema 12/13)
Weight	~1.8kg (3.96lbs) depending on configuration
Dimensions	Height: 264 mm
	Width: 151 mm
	Depth: 213 mm
Antenna	Internal as default, external via TNC connector
Power Supply	3.6V NiMH rechargeable battery pack or 5V to 30V via cable control
Diagnostics	Status LED for operation and standard/advanced low battery detection
Battery Operation Time	Min 12 hrs continuous transmission*
Control Configuration	2x Single/Dual/Triple axis cross joysticks
	Any combination of toggle switches, push-button controls, rotary switches and key switches with removable key caps
	Customized switches available upon request
	Half duplex or Full duplex feedback
Frequency Range	4xxMHz or 8xxMHz or 9xxMHz or 1.216GHz or 2.4GHz**
Power (RF Output)	Typically $\leq 10\text{mW}$ E.I.R.P
Typical Operating Range	150m (492ft) for $\leq 1\text{GHz}$ 10mW module (Line-of-Sight) 70m (150ft) for 2.4GHz 10mW module
Safety	20-bit programmable address concept with up to 1,000,000 combinations
Operating Temperature Range	Active & Passive Stop Function
	Parity and Checksum
	-25°C . . . 70°C (-13°F . . . 158°F)
Humidity Range	0 - 97% maximum non-condensing
Response Time	Less than 100 msec.
Accessories and options	32Mb TFT driver memory
	Cushion and customer logo option
	Optional Custom housing colour
	Belly belt, neck belt, chest belt and shoulder bar
	RS232/CAN Cable control
TFT	2.4" full colour 240x360 back-lit TFT

Technical Specification Transmitter Nova L 2.4

*varies by transmitter configuration

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

Battery & Charger

You may power your Nova L 2.4 transmitter with a Hetronic rechargeable NiMH 3.6V Grey MINI battery inserted in the battery compartment in the bottom side of the transmitter.

Follow the instructions below to ensure best performance of your transmitter and prolonged battery lifetime.

1. Confirm that your batteries are fully-charged. See "Recharging Your Batteries" section in the UCH 2 Charger section.
2. Slide the recharged battery into the battery compartment at the bottom of the transmitter as shown, and snap it into place.

Cable Back-up

Cable control on Nova L 2.4 transmitters is possible through a connector plug installed on the side of the transmitter. The battery may be left inside the battery compartment as the coder will automatically detect the presence of the cable, thus disable all wireless activity, and recharge the battery if this is left inside the battery compartment in the transmitter. Refer to Section 6.9 for more details.

Accessories and Spare Parts

The standard belts for the NOVA L 2.4 transmitter are the chest, neck and belly belt and these can be obtained with or without the cushion and with or without the logo.

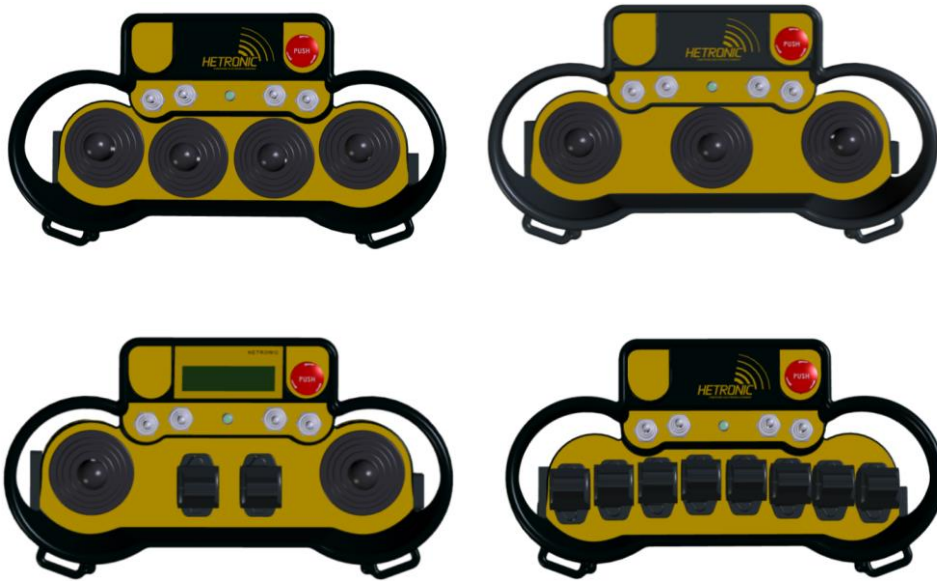
Refer to the online web shop for respective part numbers of any other parts that may need replacement:

<https://shop.hetronic.com.mt/en/home>

NOTE: Any maintenance work or replacement of parts must be carried out by an authorized dealer or service centre specified by Hetronic.

Transmitter Nova XL

Layout Options



Powering ON your Transmitter

Refer to Section 4.3.

Stopping your Transmitter

Refer to Section 4.6.

Powering OFF your Transmitter

Refer to Section 4.7.

Auto-Off Timer

The coder can be set with a 10-minute timer which will switch off the transmitter when no activity is detected.

Battery State-of-Charge Signals

The onboard buzzer starts beeping fast when the battery reaches 3.4V and the status LED starts blinking RED at the same rate indicating that the coder will soon switch off.

Transmitter Specifications

Transmitter NOVA XL	
Housing	Ergonomically designed Impact Resistant Polymer Composite
Environmental Protection	IP 65 (Exceeds Nema 12/13)
Weight	~1.9kg (4.1lbs) depending on configuration
Dimensions	Height: 165 mm
	Width: 312 mm
	Depth: 170 mm
Antenna	Internal as default, external via TNC connector
Power Supply	3.6V NiMH rechargeable battery pack or 5V to 30V via cable control
Diagnostics	Status LED for operation and standard/advanced low battery detection
Battery Operation Time	Min 12 hrs continuous transmission* for NiMH Min 20 hrs continuous transmission* for Li-Ion
Control Configuration	4x Single/Dual/Triple axis cross joysticks
	8x Single axis paddle levers
	Any combination of key switches, toggle switches, push buttons, rotary switches, potentiometers and stop switches
	Customized switches available upon request
	Half or Full duplex feedback
Frequency Range	4xxMHz or 8xxMHz or 9xxMHz or 1.216GHz or 2.4GHz**
Power (RF Output)	Typically $\leq 10\text{mW}$ E.I.R.P
Typical Operating Range	150m (492ft) for $\leq 1\text{GHz}$ 10mW module (Line-of-Sight) 70m (150ft) for 2.4GHz 10mW module
Safety	20-bit programmable address concept with up to 1,000,000 combinations
Operating Temperature Range	Active & Passive Stop Function
	Parity and Checksum
	-25°C . . . 70°C (-13°F . . . 158°F)
Humidity Range	0 - 97% maximum non-condensing
Response Time	Less than 100 msec.
Accessories and options	Belly belt, neck belt or shoulder bar
	Cushion and customer logo option
	Optional Custom housing colour
	RS232/CAN Cable control
	LCD Display
LCD	Monochrome LCD 120x320

Technical Specification Transmitter Nova XL

*varies by transmitter configuration and battery type

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

Monochrome LCD Display (optional)

There are several standard screens that are displayed on the LCD:

1. Software version

GRAPHIC LCD 120x32
SOFT. VERSION: 2.60

As soon as the display turns on the LCD type and software version installed in the controller are displayed.

2. Welcome screen



The standard Hetronic welcome screen is displayed as soon as the LCD display turns ON after Start Up. The user can opt to choose a different welcome screen by defining the requirements with an authorized Hetronic dealer who can then implement this via a specific graphics programming tool or else choose from the available options when placing the order.

3. Feedback

The feedback function is used to transmit information from the machine or receiver to the transmitter in half or full duplex operation. A number of graphic modes (with different positions and sizes of graphic icons) or up to four lines of text may be used to display the feedback information on the LCD, the format being dependent on the type of message received from the machine. Up to four other on/off digital outputs can also be designated through LCD Feedback.

Contact a Hetronic dealer for information on how to display feedback accordingly.

4. Feedback Error

If the antenna symbol flashes, this means that there is feedback failure i.e. the transmitter has not received a valid telegram for 5 seconds. When this happens there is an imminent risk of losing radio connection thus it is important to check that there are no obstacles blocking the connection and that the units are within the range of the radio system.



5. STOP

The STOP screen is displayed whenever the Transmitter is in STOP mode. This can be achieved when in Active (User manually activates the Stop button #6) or Passive Stop (Transmitter is outside the Antenna reception range or an error occurs).



Battery & Charger

You may power your Nova XL transmitter with a Hetronic rechargeable NiMH 3.6V Grey MINI battery inserted in the battery compartment in the bottom side of the transmitter.

Follow the instructions below to ensure best performance of your transmitter and prolonged battery lifetime.

1. Confirm that your batteries are fully-charged. See "Recharging Your Batteries" section in the UCH 2 Charger section.
2. Slide the recharged battery into the battery compartment at the bottom of the transmitter as shown, and snap it into place.

Cable Back-up

Cable control on Nova-XL transmitters is possible through either the battery compartment or from a connector plug installed on the side of the transmitter. For back up/control via the battery compartment, the battery will have to be removed. For back up/control via the connector plug, the battery may be left inside the battery compartment as the coder will automatically detect the presence of the cable and disable all wireless activity.

Note: When the transmitter is in cable control, the coder offers the possibility to recharge the battery if this is left inside the battery compartment in the transmitter.

Refer to Section 6.9 for more details.

Accessories and Spare Parts

The standard belts for the NOVA XL transmitter are the neck and belly belt and these can be obtained with or without the cushion and with or without the logo.

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>

NOTE: Any service/maintenance work and replacement of parts must be carried out by an authorized dealer or service centre specified by Hetronic.

Transmitter Nova XL 2.8

Layout Options



Powering ON your Transmitter

Refer to Section 4.3.

Stopping your Transmitter

Refer to Section 4.6.

Powering OFF your Transmitter

Refer to Section 4.7.

Auto-Off Timer

The coder can be set with a 10-minute timer which will switch off the transmitter when no activity is detected.

Battery State-of-Charge Signals

The onboard buzzer starts beeping fast when the battery reaches 3.4V and the LED starts blinking RED at the same rate indicating that the coder will soon switch off.

The battery level indicator on the TFT also alerts the user that the battery is being depleted.

TFT Display

The TFT screen layout can be modified according to the user's preferences using the Hetronic Graphics Programming tool.

NOTE: The Protective film covering the TFT can be replaced if scratched or broken. Refer to the instructions in Appendix C.

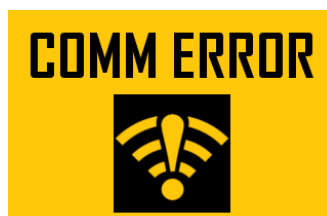
The default TFT display is divided into several segments:



1. The Field Strength (only for systems with feedback)

The field strength indication provides information about the quality of the radio connection. The field strength indication is always visible when the transmitter is switched on. With a perfect connection quality, all 4 bars of the indication are displayed. As the quality of the connection weakens, the reception signal shows less bars depending on how low the quality of the connection is.

If the 'COM error' page is displayed, this means that there is feedback failure i.e. the transmitter is not receiving signals from the receiver. When this happens there is an imminent risk of losing radio connection thus it is important to check that there are no obstacles blocking the connection and that the units are within the range of the radio system.

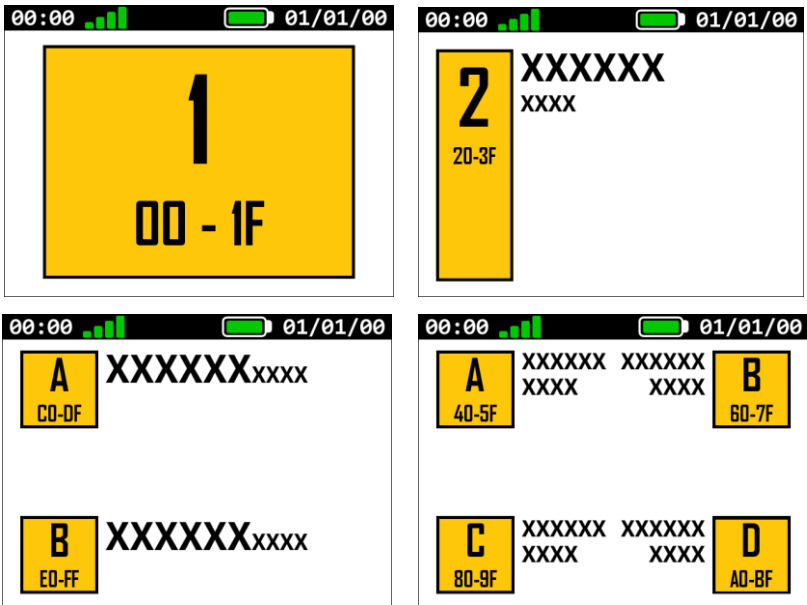


2. Battery Level

The battery level indicator provides information about the current condition of the battery. It is always visible when the transmitter is switched on. As the battery status weakens, the battery level indicator is displayed as a depleting battery until it starts flickering which indicates that it needs to be charged and replaced.

3. Feedback

The feedback function is used to transmit information from the machine or receiver to the transmitter. A number of symbols/graphics or a combination with lines of text are available for displaying feedback information. Contact a Hetronic dealer for information on how to display feedback accordingly.



4. STOP

The STOP screen is displayed whenever the Transmitter is in STOP mode. This can be achieved when in Active (User manually activates the Stop button #6) or Passive Stop (Transmitter is outside the Antenna reception range or an error occurs).



Transmitter Specifications

Transmitter NOVA XL 2.8	
Housing	Ergonomically designed Impact Resistant Polymer Composite
Environmental Protection	IP 65 (Exceeds Nema 12/13)
Weight	~1.9kg (4.1lbs) depending on configuration
Dimensions	Height: 334 mm
	Width: 216 mm
	Depth: 160 mm
Antenna	Internal as default, external via TNC connector
Power Supply	3.6V NiMH rechargeable battery pack 5V-30V via cable control
Diagnostics	Status LED for operation and standard/advanced low battery detection
Battery Operation Time	Min 12 hrs continuous transmission* for NiMH Min 20 hrs continuous transmission* for Li-Ion
Control Configuration	4x Single/Dual/Triple axis cross joysticks
	8x Single axis paddle levers
	Any combination of key switches, toggle switches, push buttons, rotary switches, potentiometers and stop switches
	Customized switches available upon request
	Half or Full duplex feedback
Frequency Range	4xxMHz or 8xxMHz or 9xxMHz or 1.216GHz or 2.4GHz**
Power (RF Output)	Typically ≤ 10mW E.I.R.P
Typical Operating Range	150m (492ft) for ≤ 1GHz 10mW module (Line-of-Sight) 70m (150ft) for 2.4GHz 10mW module
Safety	20-bit programmable address concept with up to 1,000,000 combinations
Operating Temperature Range	Active & Passive Stop Function
	Parity and Checksum
	-25°C . . . 70°C (-13°F . . . 158°F)
Humidity Range	0 - 97% maximum non-condensing
Response Time	Less than 100 msec.
Accessories and options	Belly belt, neck belt or shoulder bar
	Cushion and customer logo option
	Optional Custom housing colour
	RS232/CAN Cable control
	TFT Display
LCD	2.8" 240x320 back-lit TFT, 262K colours

Technical Specification Transmitter Nova XL 2.8

*varies by transmitter configuration and battery type

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

Battery & Charger

You may power your Nova XL 2.8 transmitter with a Hetronic rechargeable NiMH 3.6V Grey MINI battery inserted in the battery compartment in the bottom side of the transmitter.

Follow the instructions below to ensure best performance of your transmitter and prolonged battery lifetime.

1. Confirm that your batteries are fully-charged. See "Recharging Your Batteries" section in the UCH 2 Charger section.
2. Slide the recharged battery into the battery compartment at the bottom of the transmitter as shown, and snap it into place.

Cable Back-up

Cable control on Nova-XL 2.8 transmitters is possible through a connector plug installed on the side of the transmitter. The battery may be left inside the battery compartment as the coder will automatically detect the presence of the cable, thus disable all wireless activity, and recharge the battery if this is left inside the battery compartment in the transmitter.

Refer to Section 6.9 for more details.

Accessories and Spare Parts

The standard belts for the NOVA XL 2.8 transmitter are the neck and belly belt and these can be obtained with or without the cushion and with or without the logo.

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>

NOTE: Any service/maintenance work and replacement of parts must be carried out by an authorized dealer or service centre specified by Hetronic.

Transmitter Nova XL 4.3

Layout Options



Powering ON your Transmitter

Refer to Section 4.3.

Stopping your Transmitter

Refer to Section 4.6.

Powering OFF your Transmitter

Refer to Section 4.7.

Auto-Off Timer

The coder can be set with a 10-minute timer which will switch off the transmitter when no activity is detected.

Battery State-of-Charge Signals

The onboard buzzer starts beeping fast when the battery reaches 3.4V and the LED starts blinking RED at the same rate indicating that the coder will soon switch off.

The battery level indicator on the TFT also alerts the user that the battery is being depleted.

TFT Display

The TFT screen layout can be modified according to the user's preferences using the Hetronic Graphics Programming tool.

NOTE: The Protective film covering the TFT can be replaced if scratched or broken. Refer to the instructions in Appendix C.

The default TFT display is divided into several segments:



1. The Field Strength (only for systems with feedback)

The field strength indication provides information about the quality of the radio connection. The field strength indication is always visible when the transmitter is switched on. With a perfect connection quality, all 4 bars of the indication are displayed. As the quality of the connection weakens, the reception signal shows less bars depending on how low the quality of the connection is.

If the 'COM error' page is displayed, this means that there is feedback failure i.e. the transmitter is not receiving signals from the receiver. When this happens there is an imminent risk of losing radio connection thus it is important to check that there are no obstacles blocking the connection and that the units are within the range of the radio system.

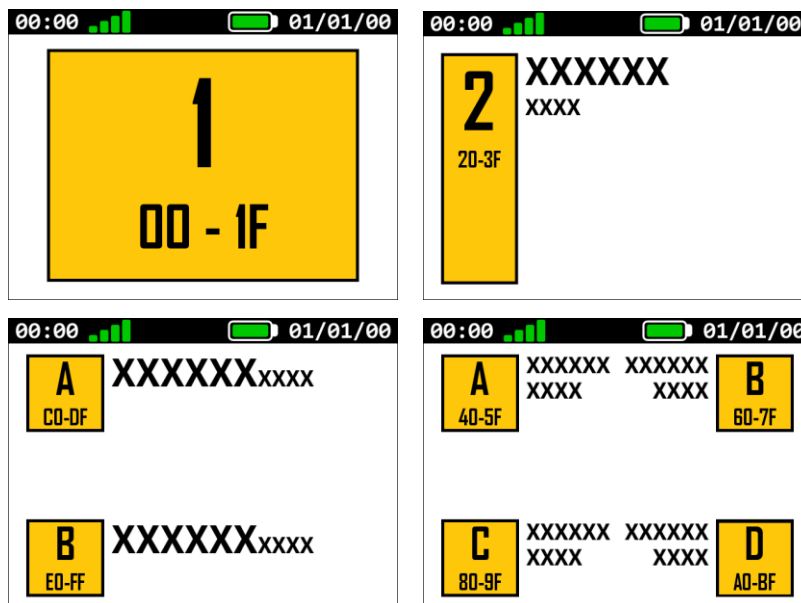


2. Battery Level

The battery level indicator provides information about the current condition of the battery. It is always visible when the transmitter is switched on. As the battery status weakens, the battery level indicator is displayed as a depleting battery until it starts flickering which indicates that it needs to be charged and replaced.

3. Feedback

The feedback function is used to transmit information from the machine or receiver to the transmitter. A number of symbols/graphics or a combination with lines of text are available for displaying feedback information. Contact a Hetronic dealer for information on how to display feedback accordingly.



4. STOP

The STOP screen is displayed whenever the Transmitter is in STOP mode. This can be achieved when in Active (User manually activates the Stop button #6) or Passive Stop (Transmitter is outside the Antenna reception range or an error occurs).



Transmitter Specifications

Transmitter NOVA XL 4.3	
Housing	Ergonomically designed Impact Resistant Polymer Composite
Environmental Protection	IP 65 (Exceeds Nema 12/13)
Weight	~2.3kgs (5lbs.) depending on configuration
Dimensions	Height: 210mm
	Width: 335mm
	Depth: 220mm
Antenna	Internal as default, external via TNC connector
Power Supply	3.7V Li-Ion rechargeable battery 3.6V NiMH rechargeable battery 5V to 30V via cable control
Diagnostics	Status LED for operation and standard/advanced low battery detection
Operation Time	Minimum 20 hrs continuous transmission*
Control Configuration	Up to 4x Single/Dual/Triple axis cross joysticks
	Up to 8x Single axis paddle levers
	Any combination of key switches, toggle switches, push buttons, rotary switches, potentiometers and stop switches
	Customized switches available upon request
Frequency Range	Half or Full duplex
	4xxMHz or 8xxMHz or 9xxMHz or 1.216GHz or 2.4GHz** Video frequency is 2.4GHz or 5 GHz
Power (RF Output)	Typically ≤ 10 mW E.I.R.P
Typical Operating Range	150m (492ft) for ≤ 1GHz 10mW module (Line-of-Sight) 70m (150ft) for 2.4GHz 10mW module
Operating Range for Video Feedback	Near Real-Time Video Feedback 1 to 4 camera capability 100'~300' w/o booster; extended range with boosters up to 2 miles
Safety	20-bit programmable address concept with up to 1,000,000 combinations
	Active & Passive Stop Function
	Parity and Checksum
	Hamming Distance 4
Operating Temperature Range	-20°C . . . 70°C (-4°F . . . 158°F)
Storage Temperature Range	-40°C . . . 85°C (-40°F . . . 185°F)
Humidity Range	0 - 97% maximum non-condensing
Response Time	Less than 100 msec.
Standard Features	8GB on-board memory (by default)
	Linux operating system for advanced graphics management
Accessories	Belly, neck, chest or shoulder belt
	Cushion and customer logo option
	Optional Custom housing colour
TFT	4.3in 480x272 back-lit TFT 262K colours User-replaceable protection cover

Technical Specification Transmitter Nova XL 4.3

*varies by transmitter configuration, GUI and/or Video option

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

Video Feedback (Optional)

The Nova XL 4.3VF option can be used with up to four cameras to provide improved safety and productivity. Video Streaming operates at 2.4GHz.

Battery & Charger

You may power your Nova XL 4.3 transmitter with a Hetronic rechargeable Battery MINI 3.6V Grey NiMH inserted in the battery compartment in the bottom side of the transmitter.

Follow the instructions below to ensure best performance of your transmitter and prolonged battery lifetime.

1. Confirm that your batteries are fully-charged. See "Recharging Your Batteries" section in the UCH 2 Charger section.
2. Slide the recharged battery into the battery compartment at the bottom of the transmitter as shown, and snap it into place.

Cable Back-up

Cable control on Nova-XL 2.8 transmitters is possible through a connector plug installed on the side of the transmitter. The battery may be left inside the battery compartment as the coder will automatically detect the presence of the cable, thus disable all wireless activity, and recharge the battery if this is left inside the battery compartment in the transmitter.

Refer to Section 6.9 for more details.

Accessories and Spare Parts

The standard belts for the NOVA XL 2.8 transmitter are the neck and belly belt and these can be obtained with or without the cushion and with or without the logo.

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>

NOTE: Any service/maintenance work and replacement of parts must be carried out by an authorized dealer or service centre specified by Hetronic.

Transmitter Nova XXL 4.3

Layout Options



Almost any configuration imaginable can be applied on this Nova version, from 4 cross joysticks to 8 paddle levers, together with any combination of push buttons, toggle switches, rotary switches, potentiometers, LEDs, key switches, stop switches. All these can be combined with customizable labels and artwork to meet any customer-specific requirements.

Powering ON your Transmitter

Refer to Section 4.3.

Stopping your Transmitter

Refer to Section 4.6.

Powering OFF your Transmitter

Refer to Section 4.7.

Auto-Off Timer

The coder can be set with a 10-minute timer which will switch off the transmitter when no activity is detected.

Battery State-of-Charge Signals

The onboard buzzer starts beeping fast when the battery reaches 3.4V and the status LED starts blinking RED at the same rate indicating that the coder will soon switch off.

The battery level indicator on the TFT also alerts the user that the battery is being depleted.

TFT Display

The TFT screen layout can be modified according to the user's preferences using the Hetronic Graphics Programming tool.

NOTE: The Protective film covering the TFT can be replaced if scratched or broken. Refer to the instructions in Appendix C.

The default TFT display is divided into several segments:



1. The Field Strength (only for systems with feedback)

The field strength indication provides information about the quality of the radio connection. The field strength indication is always visible when the transmitter is switched on. With a perfect connection quality, all 4 bars of the indication are displayed. As the quality of the connection weakens, the reception signal shows less bars depending on how low the quality of the connection is.

If the 'COM error' page is displayed, this means that there is feedback failure i.e. the transmitter is not receiving signals from the receiver. When this happens there is an imminent risk of losing radio connection thus it is important to check that there are no obstacles blocking the connection and that the units are within the range of the radio system.

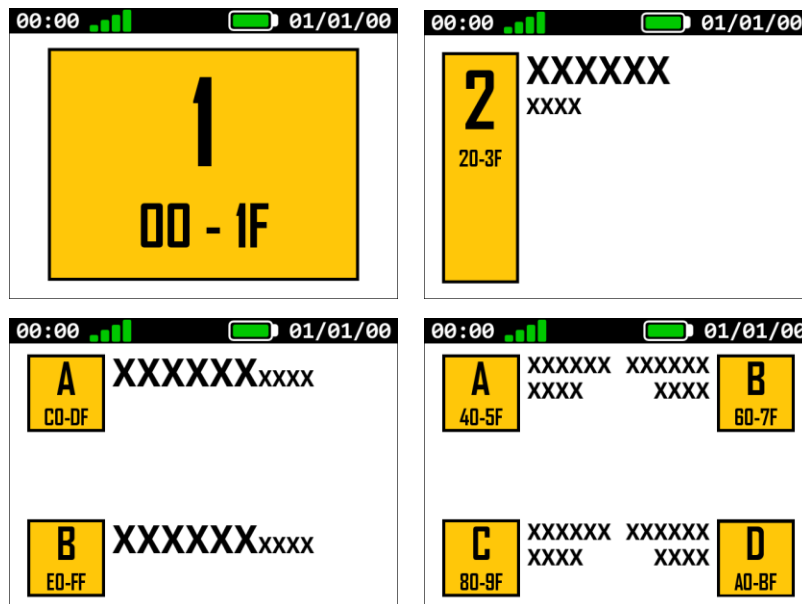


2. Battery Level

The battery level indicator provides information about the current condition of the battery. It is always visible when the transmitter is switched on. As the battery status weakens, the battery level indicator is displayed as a depleting battery until it starts flickering which indicates that it needs to be charged and replaced.

3. Feedback

The feedback function is used to transmit information from the machine or receiver to the transmitter. A number of symbols/graphics or a combination with lines of text are available for displaying feedback information. Contact a Hetronic dealer for information on how to display feedback accordingly.



4. STOP

The STOP screen is displayed whenever the Transmitter is in STOP mode. This can be achieved when in Active (User manually activates the Stop button #6) or Passive Stop (Transmitter is outside the Antenna reception range or an error occurs).



Transmitter Specifications

Transmitter NOVA XXL 4.3	
Housing	Ergonomically designed Impact Resistant Polymer Composite
Environmental Protection	IP 65 (Exceeds Nema 12/13)
Weight	~1.8kg (3.97lbs) to 3.5kgs (8lbs.) depending on configuration
Dimensions	Height: 367 mm
	Width: 229 mm
	Depth: 174 mm
Antenna	Internal as default, external via TNC connector
Power Supply	3.7V Li-Ion rechargeable or 5V to 30V via cable control
Diagnostics	Status LED for operation and standard/advanced low battery detection
Operation Time	Minimum 20 hrs continuous transmission*
Control Configuration	Up to 4x Single/Dual/Triple axis cross joysticks
	Up to 8x Single axis paddle levers
	Any combination of key switches, toggle switches, push buttons, rotary switches, potentiometers and stop switches
	Customized switches available upon request
	Half or Full duplex
Frequency Range	4xxMHz or 8xxMHz or 9xxMHz or 1.216GHz or 2.4GHz** Video frequency is 2.4GHz or 5 GHz
Power (RF Output)	Typically ≤ 10 mW E.I.R.P
Typical Operating Range	150m (492ft) for ≤ 1GHz 10mW module (Line-of-Sight) 70m (150ft) for 2.4GHz 10mW module
Operating Range for Video Feedback	Near Real-Time Video Feedback 1 to 4 camera capability 100'~300' w/o booster; extended range with boosters up to 2 miles
Safety	20-bit programmable address concept with up to 1,000,000 combinations
	Active & Passive Stop Function
	Parity and Checksum
	Hamming Distance 4
Operating Temperature Range	-20°C . . . 70°C (-4°F . . . 158°F)
Storage Temperature Range	-40°C . . . 85°C (-40°F . . . 185°F)
Humidity Range	0 - 97% maximum non-condensing
Response Time	Less than 100 msec.
Standard Features	8GB on-board memory (by default)
	Linux operating system for advanced graphics management
Accessories	Belly, neck, chest or shoulder belt
	Cushion and customer logo option
	Optional Custom housing colour
TFT	4.3in 480x272 back-lit TFT 262K colours User-replaceable protection cover

Technical Specification Transmitter Nova XXL 4.3

*varies by transmitter configuration, GUI and/or Video option

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

Video Feedback (Optional)

The NOVA XXL4.3VF option can be used with from one to four cameras to provide improved safety and productivity. Video streaming operates at 2.4GHz.

Battery & Charger

You may power your Nova XXL 4.3 transmitter with a Hetronic rechargeable 3.7V/9Ah Black Li-Ion Battery inserted in the battery compartment in the bottom side of the transmitter.

Follow the instructions below to ensure best performance of your transmitter and prolonged battery lifetime.

1. Confirm that your batteries are fully-charged. See "Recharging Your Batteries" section in the UCH 3 Charger section.
2. Slide the recharged battery into the battery compartment at the bottom of the transmitter as shown, and snap it into place.

Cable Back up

Cable control on Nova-XXL 4.3 transmitters is possible through a connector plug installed on the side of the transmitter. The battery may be left inside the battery compartment as the coder will automatically detect the presence of the cable, thus disable all wireless activity, and recharge the battery if this is left inside the battery compartment in the transmitter.

Refer to Section 6.9 for more details.

Accessories and Spare Parts

The standard belts for the NOVA XXL 4.3 transmitter are the neck, chest and belly and the shoulder belt and these can be obtained with or without the cushion and with or without the logo.

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>

NOTE: Any service/maintenance work and replacement of parts must be carried out by an authorized dealer or service centre specified by Hetronic.

Battery Types and Specifications

Battery MINI 3.6V/2.75Ah Grey NiMH

Item No. 68301000

Battery MINI 3.6V 2.75Ah	
Rated Capacity	3.6V 2.75Ah NiMH rechargeable battery pack
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)	14 (0.1 CmA)

3.6V 2.75Ah MINI Battery Technical Specification



Battery 3.7V/9.75Ah Black Li-Ion

Item No. 68303607.A

Battery Li-Ion 3.7V 9.75Ah	
Rated Capacity	3.7V Li-Ion rechargeable battery pack, 9.75Ah
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)

3.7V 9.75Ah Li-Ion Battery Technical Specification



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.

Standard Hetronic rechargeable batteries are the Lithium-Ion type. These batteries have no “memory effect” when charging a battery that is not fully discharged.

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%.



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



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

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

MINI UCH 2 Battery Charger

Recharging your Batteries

To charge the MINI battery, it must be removed from the transmitter 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 switch on the indicator panel initiates fast charging of the battery. 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.



Charging the MINI Battery

Leave the battery in the charger until it is needed. The charger supplies a "trickle" charge but it will not over-charge the battery.

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.



Charger plug variations

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

List of UCH 2 Charger Variants

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.

UCH 3 Battery Charger

Follow the instructions below to ensure best performance of your transmitter and prolonged battery lifetime.

Recharging your Batteries

To charge the 3.7V Li-Ion Battery pack, it must be removed from the transmitter 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 and make sure that at least one of the four red LEDs switches on. The red LEDs will switch ON sequentially as charging progresses and during the whole charging process. 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 supplies a “trickle” charge but it will not over-charge the battery.

The charger power cable is supplied with different plugging options: EU plug, cigarette lighter plug, US plug, etc.



Charger plug variations

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

List of UCH 3 Charger Variants



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.