ERGO F21 Operator Control Units

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User Manual

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1. Safety

1.1 Intended Use

Your radio remote control is designed for safe remote command and control of machinery and other industrial equipment alike using secure wireless communication technology. Any modification, reconstruction, or extension of the purchased operator control unit without a written consent from Hetronic automatically voids the warranty on the product. Furthermore, Hetronic, as the manufacturer and supplier of the purchased Operator Control Unit (OCU) assumes no liability for damages resulting from the non-observance of the safety operating instructions detailed in this user manual. All personnel, working with this OCU must
• Be suitably trained and qualified as required by Operational Health and Safety regulations.
• Strictly comply with the instructions detailed in this user manual.
Before starting the OCU you must have read and fully understood the instructions in this user manual. The Safety Checklist included in Appendix B to this user manual must be followed each time before the OCU is powered up for use.

1.2 Symbol Notation

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

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

1.3 Practices and Laws

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

1.5 Possible Sources of Danger

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

⚠️ Turn the OCU 'OFF' when not in use. If the OCU does not have user access control password configured, remove the battery when the unit is placed away from the operator.

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

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

NEVER remove or alter any of the safety features.

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

1.6 Security Features

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

1.7 STOP in case of EMERGENCY

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

1.8 Caring for your ERGO F21 OCU

The enclosure materials used on the ERGO F21 OCU have been carefully selected to minimise maintenance requirements.

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

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

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

2. Introduction and Functional Description

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

2.1 Before Operating Your Wireless Control Unit

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

Familiarize yourself thoroughly with all safety precautions outlined in the manual and review the control functions and operation of both the machinery and radio remote control system. When not in use, remember to power off the OCU and store it in a secure location to prevent unauthorized access.

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

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

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

2.2 Product Rating Plate

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

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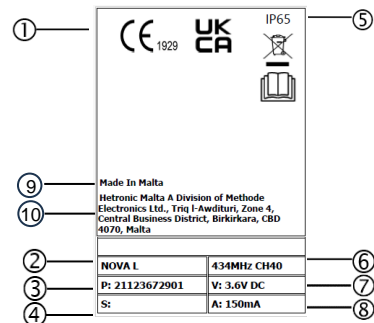
Figure 1. *Product Rating Plate*

2.3 Product Serial Numbers
Our commitment to quality service begins with your convenience! Before reaching out to your Hetronic dealer for service, repairs, or replacement parts, make sure to have the equipment Production and System numbers handy. You can find these numbers conveniently located on the product rating plate, a silver label affixed to your control unit. They're not just a code; it's a legacy of quality craftsmanship from Hetronic. Ensure that this valuable information remains legible throughout the lifetime of your product.
2.3.1 Production Number
The production number, marked by the symbol 'P:', consists of 11 digits. It's not just a number; it's a window into your unit's story. The first digit reveals its manufacturing location, followed by the week and year of production represented by the next four digits. Finally, the trailing six digits offer a unique serial number for your unit.
2.3.2 System Number
The system number, marked by the symbol 'S:', consists of 11 digits. The first digit reveals the manufacturing location at which the unit was uniquely paired with the machine control unit defining it as a complete radio remote control system, followed by the week and year of it was uniquely paired represented by the next four digits. Finally, the trailing six digits offer a unique serial number for your complete radio remote control system.

2.3.3 Read User Manual

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

3. Your ERGO F21 OCU

3.1 General Description

The ERGO F21 offers an endless array of possibilities from the most basic to complex requirements to satisfy most applications. All OCUs are ergonomically designed, programmable wireless units capable of transmitting a wide variety of functions to remotely control a machine or equipment.

Your OCU has a rugged 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 ERGO F21 Basic Features

• Fully programmable via Hetronic PC-Link

• Ergonomic, reinforced polymer enclosure designed for one-hand operation

• IP65 Rated

• 21 Single Detent Easy-Access Buttons

• 4 Side Buttons for Start, Stop

• Stop Button: Combination STOP/address key cap to store configuration settings

• Half Duplex Communication Mode

• Labelled according to project specification

• Integrated LCD graphics display and up to 21 fully programmable feedback LED's

• Typically 200 m (656 ft.) range using CS4XX and CS8xx modules (Line-of-Sight)

• Typically 50 m (164 ft.) range using CS2400 RF module (Line-of-Sight)

• Internal Antenna

• Auto power off feature (configurable)

• Low Battery detection

• Status bi-colour LED Red/Green

• Multi-Address Mode

• Carry belt or strap

• Rechargeable battery pack

4. Product Description
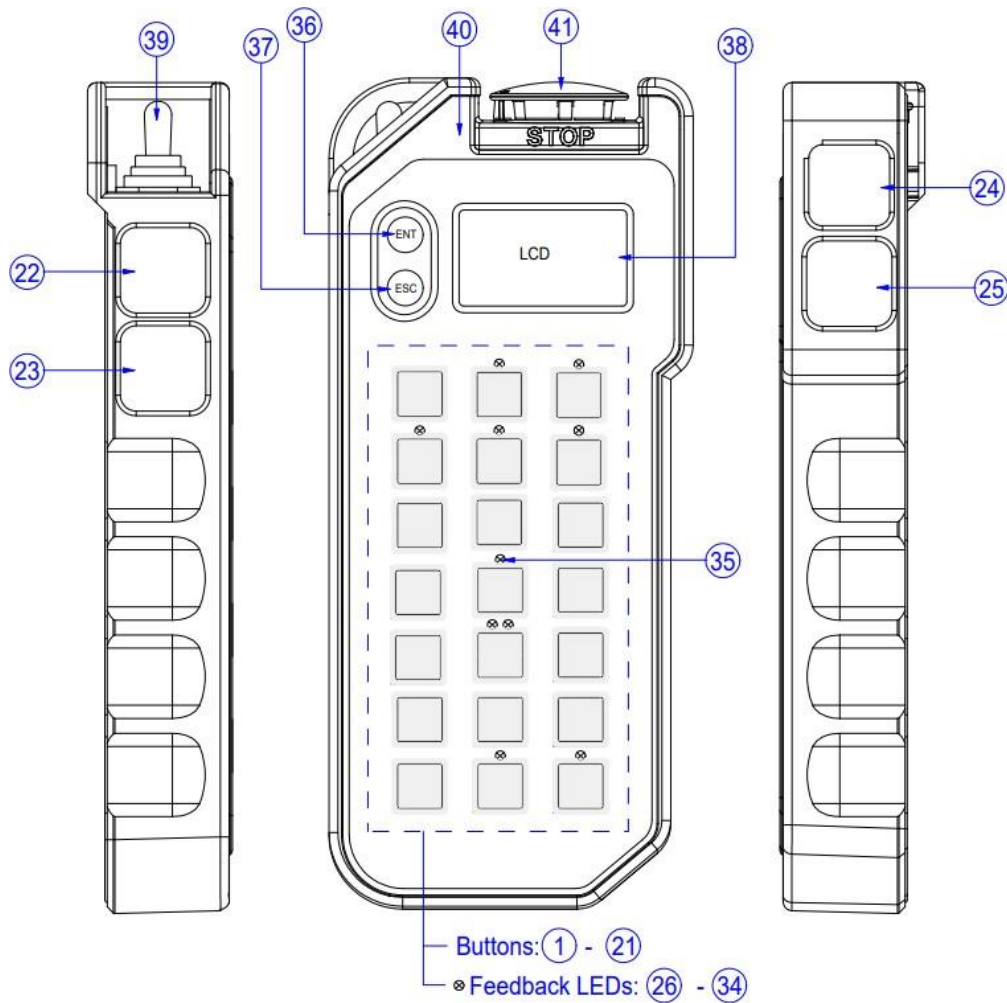
Figure 2. *Ergo F21 OCU (Left, Front, Right)*

1-21	Single Detent Momentary Pushbutton	36	Single Detent Momentary Pushbutton
22	Single Detent Momentary Pushbutton	37	Single Detent Momentary Pushbutton
23	Single Detent Momentary Pushbutton	38	Graphic Display (LCD)
24	Single Detent Momentary START Pushbutton	39	Three Position Maintained Toggle Switch
25	Single Detent Momentary Pushbutton	40	
26-34	Programmable Feedback LEDs	41	Memory Key / STOP Pushbutton
35	Diagnostic LED		

Table 2. *Functional Description*

Some basic features of the ERGO F21 OCU are an ON-OFF-ON maintain toggle switch, pushbutton controls, STOP button, LED status and feedback indicators, graphic display and half duplex transceiver.

The graphic display provides real-time visual information during operation of the OCU. It can be used to change configuration settings, provide two-way feedback and display OCU diagnostic information such as battery life, signal strength and button status. The status and feedback LEDs are bi-colour (green/red). Feedback LEDs are fully configurable via PC H-Link.

5. Operating Your OCU

Get ready to embark on your control adventure!

5.1 Holding Your OCU

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

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

5.2 Visually Checking Your OCU

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

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

5.3 Powering ON and Starting Your OCU

NOTE: When the OCU 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 OCU.

3. Make sure that the **STOP** switch cap is present on the ERGO F21 unit and that no button is pressed.

4. Turn ON the MCU.

5. Press **START** button. The OCU will perform a routine initialization upon start up.

Note: The Start button is usually on the right-hand side of the OCU as indicated above with the symbol ■. The power button is usually paired with the horn function ◁. Some units may be configured to have any button start the unit. This is not a default configuration. Units must be programmed using PC H-Link. Consult Hetronic or your nearest service centre for this feature.

5.4 OCU Initialization with Standard Status LED Indicator

Upon turning the OCU ON, all the LEDs light up as solid colours 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 OCU will boot up and the failure will be displayed as a blinking RED status LED at the baud rate. The OCU may then be connected to Hetronic PC-Link for the error to be corrected.

After a successful initialization, the OCU 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, OCU and MCU documentation as needed.

5.5 OCU Initialization with Graphic User Interface (LCD) and Status LED Indicator

Upon turning the OCU ON, the LCD 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 OCU will boot up and the failure will be displayed as a blinking RED status LED at the baud rate. The OCU may then be connected to Hetronic PC-Link for the error to be corrected.

After a successful initialization, the OCU 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, OCU and MCU documentation as needed.

5.6 Stopping control of your remote machinery

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

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

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

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

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

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

5.7 Battery 'State of Charge' Indication

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

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

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

5.8 LED Behaviour and Meanings

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

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

Table 3. *LED behaviour explained*

5.9 Powering OFF the OCU

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

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

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

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

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

6. Generic Radio Remote System functionalities

6.1 START Function

The Start button, generally marked in green, is required to initialize radio remote control. For safety reasons, the "Start" command must be given to give the MCU 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 OCU one has to make sure the stop button cap must be present and no buttons are pressed.

6.2 STOP Function

The most important feature of the radio remote control system is the Stop function. The OCU 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 MCU causes all functions/motions to stop and the MCU goes into Safe mode.

To restart the system, the Stop button must be present, and the Start/Horn button must be pressed again to close the relays in the MCU 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 OCU and MCU. 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 OCU is turned on, it performs a self-test to be sure that communications are within designated parameters. If an error is detected, the OCU will not transmit any signals.

Whenever Safe mode is active without having the STOP button pressed, the system is in Passive STOP. This means that the safety stop relays in the MCU are open so as not to allow any operation. Possible triggers for Passive STOP (Safe Mode) are:

1. OCU auto shutdown after period of inactivity

2. Radio signal interference

3. OCU 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 OCU is only a remote stop and will operate only when the OCU 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 MCU 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 Functions

Digital control (ON-OFF) determines either the opening or closing of a potential-free relay or solid-state switches on the MCU unit installed on the controlled equipment when the operator activates this control.

PC H-Link tool allows one or more and up to three digital control functions to be associated with the same push button switch. This is valid for all single step buttons on the ERGO F21 unit, front panel buttons, the two LCD buttons and also the left and right hand-side buttons.
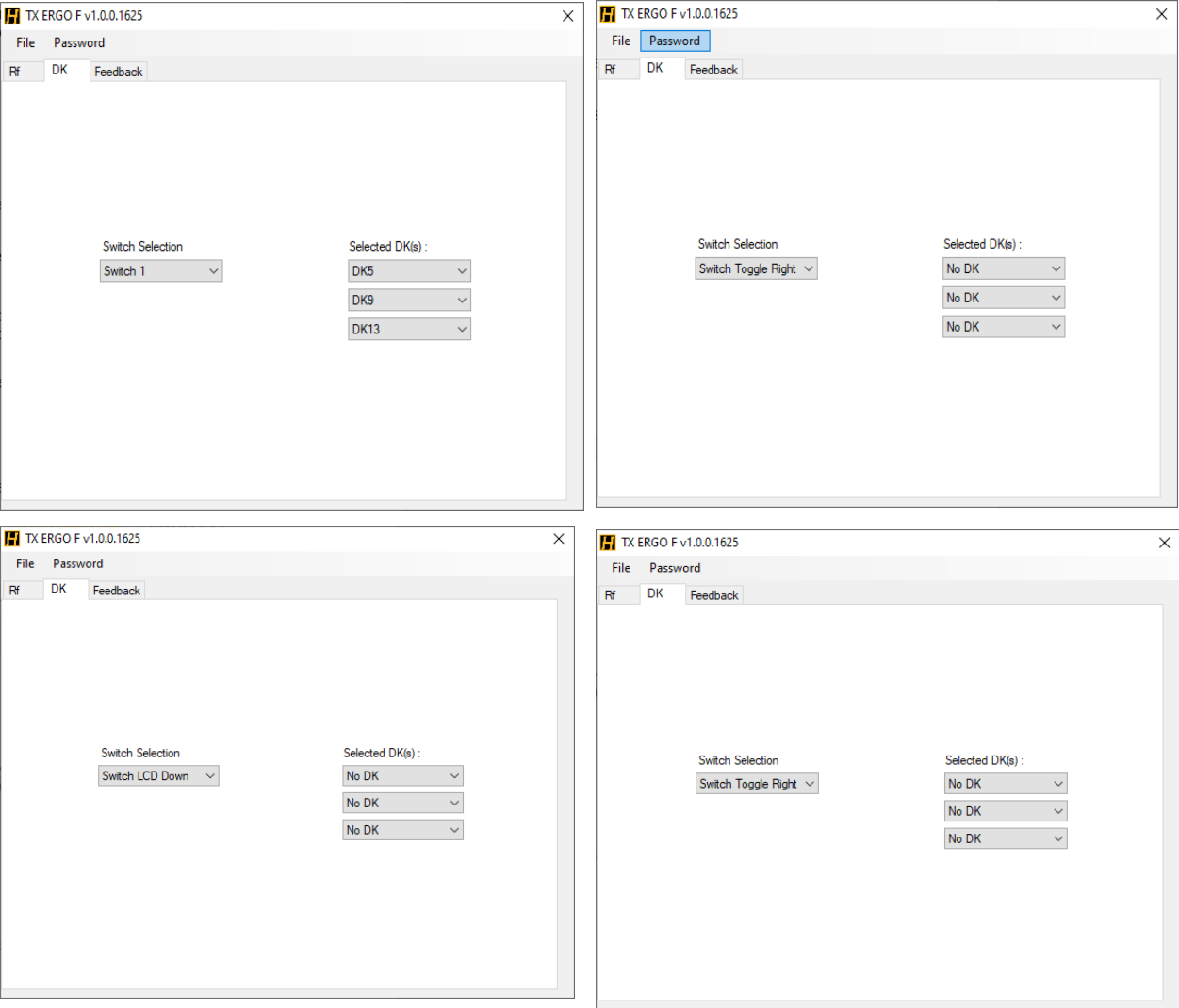
Figure 3. *PC H-Link assignment of digital control channels to push buttons*

7. Setting up your ERGO F21 OCU for Operation

7.1 Coder

7.1.1 Address Identifier

The unique address identifier with which the ERGO F21 OCU has been programmed from the factory can be found listed on the product datasheet included with the delivery of the unit. The address is also accessible through RF tab on PC H-Link.

7.2 Communication

7.2.1 Radio Settings

The Ergo F21 coder is designed with the possibility to connect one radio frequency (RF) module operating in the sub 1GHz range or 2.4GHz. When the radio module is plugged directly on to the coder (onboard), the user may select the frequency channel or group to use for communication. Different radio modules are required when using CS480TR, CS1200TR and CS2400TR radio modules. Possible bit rates are 2400, 4800 and 9600bps.
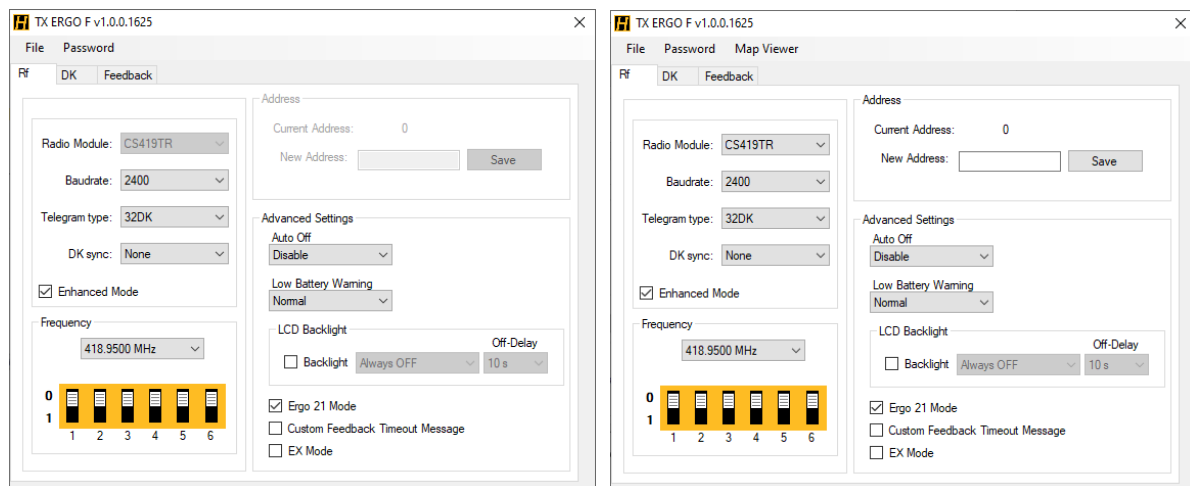
Figure 4. *PC H-Link configuration of radio frequency band, frequency channels and bit rate*

7.2.2 Auto-OFF

A OCU Auto-OFF timer can be configured using PC H-Link tool. This feature powers down the unit if it remains idle for a configured period of time, without any of the control buttons being activated. Once a button is activated, the timer is reset. The Auto-OFF timer can also be disabled so that the unit remains always ON until either switched OFF manually or else when the critical battery voltage level is reached, forcing the unit to turn off automatically.

Figure 5. *Auto off time configuration options*

7.3 DK Telegram

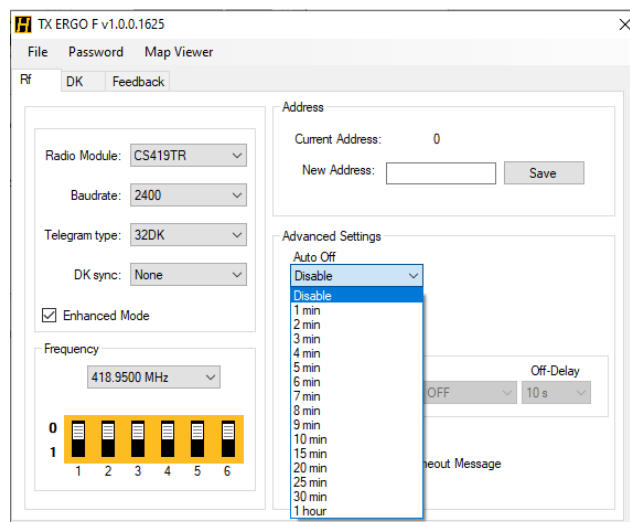There are 32DK switch assignments on the coder board. The definition of the DK control telegram is based on the Hetronic PC-Link configuration which is a logic combination of Input Signal/s and its corresponding DK switch for telegram DK1-DK32.
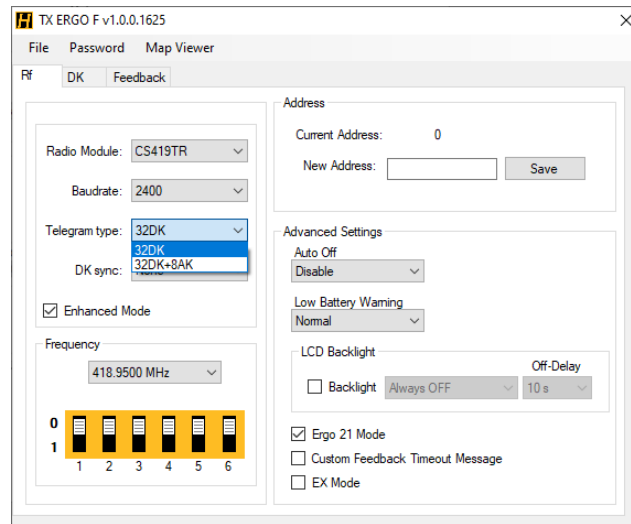
Figure 6. *32DK telegram assignment as default configuration*

7.4 LCD Backlight

The LCD backlight can be enabled or disabled through PC H-Link tool. The option works only on ERGO F21 units equipped with an LCD. It is also possible to associate one or more digital function with the backlight trigger such that the LCD backlight will turn on whenever the digital signal corresponding to the pressed button is activated. Similarly, the four feedback LED signals can be used independently as backlight triggers. An off delay can also be configured such that the backlight turns off automatically after the pre-configured time is elapsed.

Figure 7. *Backlight configuration options*

7.5 LCD Welcome Note

ERGO F21 units equipped with display offer the product owner to configure a custom welcome note message on the display as part of the power up sequence of the unit. The configuration of the w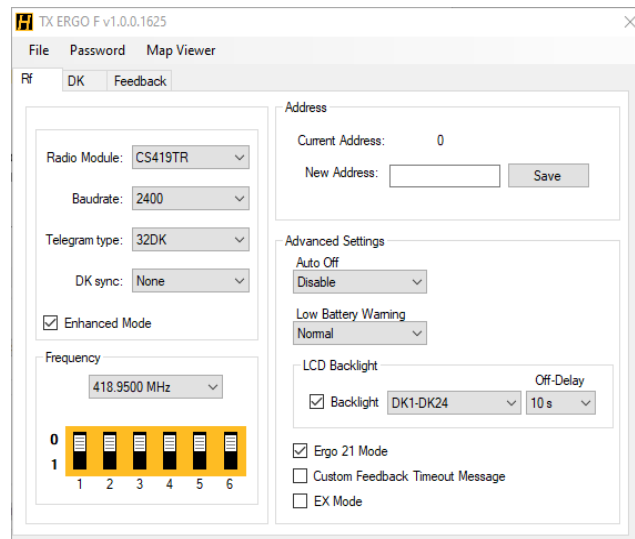elcome note is possible through the Feedback tab on PC H-Link configurator. The welcome note can be presented as four lines of text of 20 characters each or a 70x32pixel graphic.
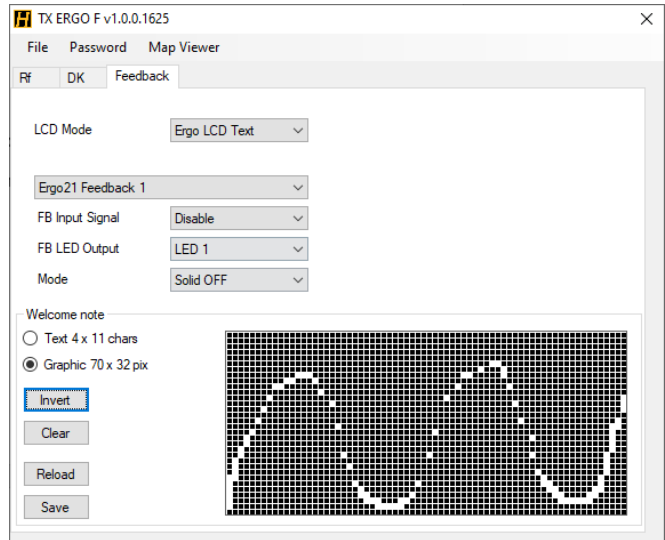
Figure 8. *Welcome note graphic configurator*

7.6 LCD and LED Feedback

ERGO F21 units equipped with display offer the facility of feedback information from the controlled equipment to reach the end-user wirelessly. Three feedback modes are possible on ERGO F21.

7.6.1 ERGO LCD 4-bit

4-bit feedback allows up to 9 alpha-numeric characters to be displayed on the screen for each status of the 4-bit feedback input signals. Refer to the corresponding Hetronic MCU manual for additional information on how to address 4-bit LCD feedback.
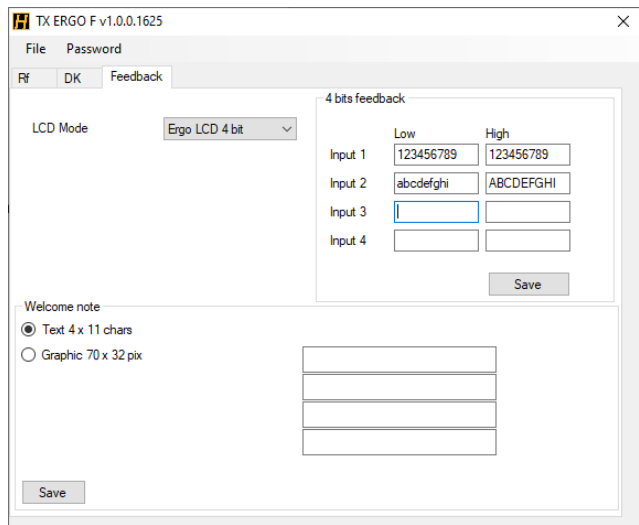
Figure 9. *4-bit LCD feedback configuration*

7.6.2 ERGO LCD Text

Up to four lines with 20 characters on each can be shown on the display using this feedback mode. Refer to the corresponding Hetronic MCU manual for additional information on how to address LCD text feedback.
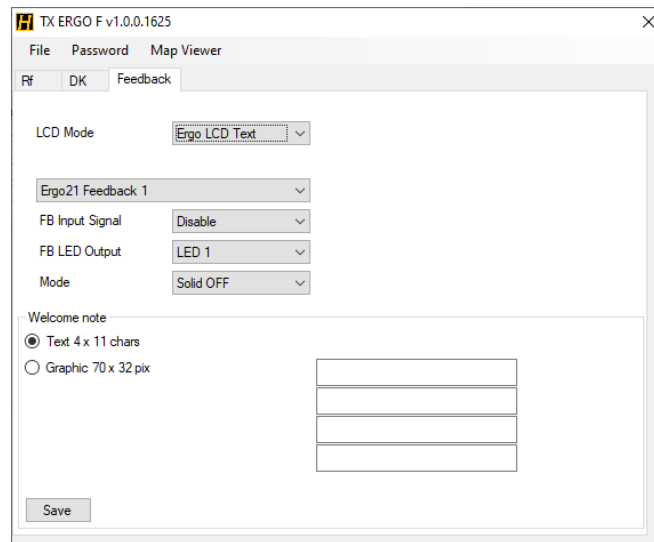
Figure 10. *LCD Text mode*

7.6.3 ERGO Standard

It is also possible to set the LCD feedback mode to standard. This mode allows graphic configuration using LCDxA PC H-Link library. Consult Hetronic or your nearest Hetronic dealer for a copy of this library or additional information.
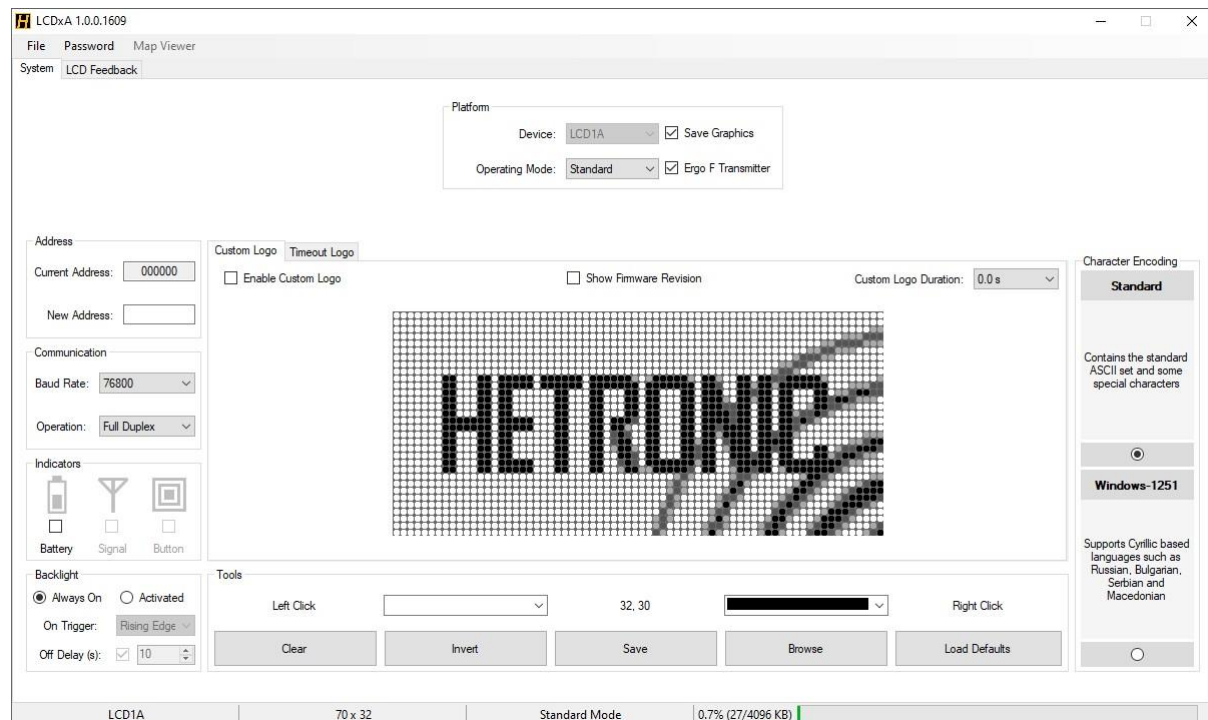
Figure 11. *Standard Graphic display programming mode using PC H-Link LCDxA library*

7.6.4 LED Feedback

ERGO F21 allows programming of up to 10 feedback LEDs on the front panel. The configuration of LEDs and their ON/OFF/Blink pattern can be adjusted through the Feedback tab on PC H-Link configurator tool. It is also possible to configure each feedback LED with a slow or fast blink behaviour independently.
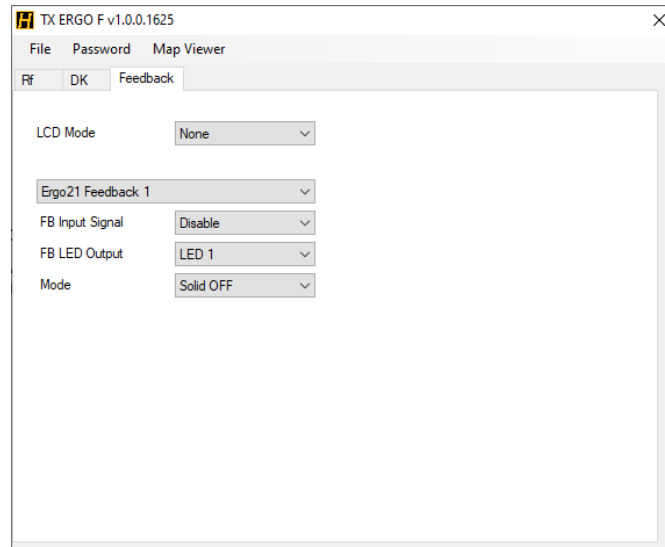
Figure 12. *LED feedback configuration*
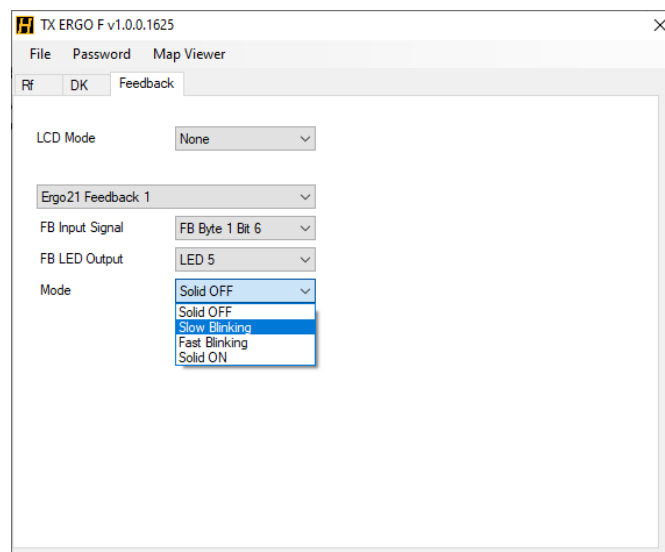
Figure 13. *Feedback LED status configuration options*

8. Theory of Operation

Your ERGO F21 OCU works with a MCU (Machine Control Unit) to transfer machine control commands via radio frequency to your machine. The OCU electronically generates a carrier frequency that allows it to communicate with the MCU without the use of cables or wires. The MCU then converts the carrier frequency information into discrete machine control outputs that interface with your machine's controls. Each OCU and MCU that comprises a system is programmed with a unique address code. The MCU only accepts commands from the OCU 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 MCU and OCU 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, without any electromagnetic shielding and away from any metal surfaces for best transmission range.

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

Do not install the MCU unit too high above the ground as the unit may receive local radio signals that could disturb transceiver 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 MCU.

10. Troubleshooting

If your ERGO F21 OCU 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
OCU won't start	Incorrect Access code(if enabled)	Enter correct access code
	Battery fully discharged	Replace with fully charged battery if needed
The OCU is turned on, but does not transmit (Power LED not flashing)	Battery is discharged	Replace battery with a fully charged battery
	Component failure	Contact your supervisor or nearest Hetronic Service Centre
OCU is transmitting (Power LED flashing), but machine will not respond	No power to the MCU	Check the diagnostic LEDs in the MCU to be sure power is applied. Ensure that the system is properly grounded
	OCU/MCU frequency channels do not match	Follow instructions under "Setting Frequency and channels" or contact your supervisor
	OCU out of range	Take the OCU back into the range of the MCU, press START
	MCU powered off	Turn on power to MCU
	Blown fuse in MCU	Check all fuses and replace if needed
	STOP failure in MCU. Red STOP LED on PC board is illuminated	Contact your supervisor
Battery Status is not displayed	I2C connector inside OCU is loose	Check all connectors, reseat if needed
All machine motions operate intermittently	MCU antenna connection is loose or missing	Tighten or replace antenna
	External antenna (if used) has loose connection, poor grounding or interference	Tighten antenna and ground connection. Contact Hetronic or your Dealer for more information
	Connector inside MCU is loose	Check all connectors, reseat if needed
	Another frequency may be interfering with the system	Contact your supervisor

Table 2. *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 OCU 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

For regulatory information, please refer to the Regulation Booklet.

www.hetronic.com

Appendix A

Definition of terms

The following terms are used throughout the ERGO F21 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. OCU switches must never be mechanically blocked ON or OFF for any motion. When not in use the OCU must be turned off. A safe and secure storage space should be provided for the OCU unit and the unit should always be placed there when not in use. This precaution will prevent unauthorized people from operating the crane. MCUs must be removed from the equipment when it is unlikely that it will be used for a period of time, and properly stored.

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

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

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

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

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

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

8. Put rechargeable batteries on charge at the end of each shift. Chargers are not intended for outdoor use. Use only indoors.

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

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

B.2 Safety Checklist

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

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

	OCU Start-up and Safety Checklist	
1	Are batteries fully charged?	
2	Are all switch labels clear and legible?	
3	Is the OCU 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 OCU 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 OCU 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?	

OCU Specifications

Housing:	Ergonomically designed PC-ABS blend housing, one-hand operation
Environmental Protection:	IP 65 (Exceeds Nema 12/13)
Weight:	Up to 400 g (14.2 oz.), including battery
Dimensions:	Height: 186 mm (7.3 in.)
	Width: 82 mm (3.2 in.)
	Depth: 39 mm (1.3 in.)
Antenna:	Internal
Power Supply:	3 AA batteries (3 Mignon LR6-AA 1.5V)
	Optional 3.6V 2.75Ah NiMH rechargeable battery
Diagnostics:	Status LED for operation and standard/advanced low battery detection
Transmission icon	Battery usage icon
	Push button activation icon
Operation Time:	Up to 20 h continuous transmission
Control Configuration:	25 Single detent push buttons, 1 three position maintained toggle switch, start + stop
Frequency Range:	419 MHz, 429 MHz, 434 MHz, 447 MHz, 458 MHz, 480 MHz, 8xx MHz (FH), 9xx MHz (FH), 2.4GHz (MFS or FH)
RF Unit:	Type CS synthesized with programmable frequencies
Power (RF Output):	< 10mW for non-frequency hopping versions < 10mW for 2.4GHz Multiple Frequency Selection version < 25mW for 8xx and 9xx frequency hopping versions < 100mW for 2.4GHz frequency hopping versions
Typical Operating Range:	~50 m. (328 ft.) for 2.4Ghz MFS ~200m for 4xx, 8xx, 9xx and 2.4GHz FH versions
Safety:	20-bit programmable address concept with up to 1,000,000 combinations
	Hamming Distance 3
Temperature Range:	-25 to +70 degrees C (-11 to +158 degrees F)
Humidity Range:	0 - 97% maximum non-condensing
Response Time:	< 100 msec.
Baud Rate:	Up to 9600 bps for non 2.4GHz versions Up to 50000 bps for 8xx and 9xx FH versions Up to 115200 bps for 2.4Ghz FH version
Standard Features:	Fully programmable using PC H-Link tool & USB dongle7
	Integrated LCD graphics display with feedback capability
	Combination stop/Memory Key cap that stores configuration settings
	Push button monitoring
	Hand and wrist strap

Battery & Charger

You may power your OCU with disposable or rechargeable batteries. Both types use adapter cases that are inserted into the back of the OCU.

Follow the instructions below for your battery type.

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

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

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

RECHARGEABLE BATTERIES:
1. Confirm that your batteries are fully-charged.
2. Slide the recharged battery into the battery compartment on the back of the OCU as shown, and snap it into place.
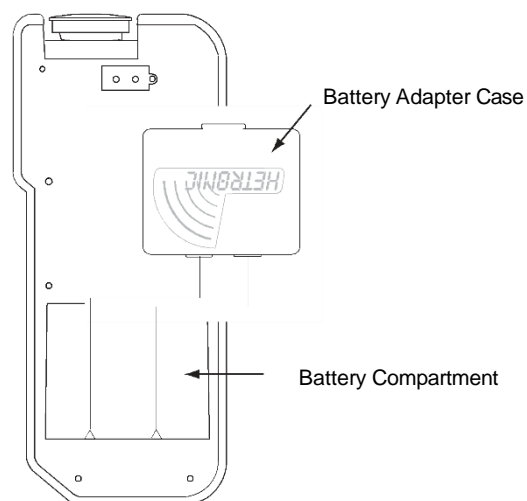
Figure 14. *Inserting Battery*

Accessories and Spare Parts

The standard carrying accessories for the ERGO F 21 OCU are the belt and hand strap.

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.

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)

Table 4 *3.6V 2.75Ah MINI Battery Technical Specification*

Figure 15. *3.6V 2.75Ah NiMH Battery*

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 centre.

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

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

A 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.

Figure 16. *Charger plug variations*

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

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.