



LINORTEK ITrixx Network Hour Meter User Manual

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LINORTEK ITrixx Network Hour Meter



Specifications

- **Product Name:** iTrixx NHM
- **Manufacturer:** Linortek
- **Model:** NHM
- **Warranty:** One-year limited warranty
- **Power Supply:** Power-supply cord
- **Compatibility:** Designed to be integrated into existing equipment
- **Hour Counters:** Two separate hour counters
- **Digital Inputs:** Two digital inputs for external on/off state detection
- **Relay Outputs:** Two 1-FORM-A relays (8A@48VAC Max)

Product Usage Instructions

Wiring your iTrixx NHM

The iTrixx NHM is designed to monitor run-time by integrating into existing equipment. Follow the steps below to wire your NHM

Step 1: Tapping Circuits

Identify the circuits on the equipment you want to monitor and tap into them. This will involve connecting the NHM to the power source of the equipment.

Step 2: Activation Methods

The NHM can be activated in different ways

1. **Simplest Setup:** The NHM is automatically activated when power is applied to the unit. Connect the NHM to the same power source as the equipment you want to monitor.
2. **Digital Inputs:** Use one of the two digital inputs to turn counting on and off. These inputs detect the external

on/off state of a sensor.

3. **Relays:** Configure the NHM to count when a specific relay is activated. Connect the relay to the NHM using the provided 2-position connectors.

Step 3: Digital Inputs Connection

The NHM supports two modes of operation for the digital inputs

- **ISOLATED (ISO) mode:** By default, the NHM is set to ISOLATED mode. In this mode, you can directly drive the NHM's opto-isolator with an external voltage. Make sure to set the input switch to ISO before applying an external voltage.
- **PULL UP (PU) mode:** This mode is not the default setting. If you want to use PULL UP mode, please refer to the user manual for detailed instructions on how to switch to this mode.

Step 4: Relay Output Connection

The NHM has 2 1-FORM-A relays (8A@48VAC Max) that can be used to control external devices or trigger the meter. To wire a device to the relay output, follow the provided iTrixx NHM Wiring diagram.

Step 5: Powering On

Once you have finished wiring the NHM to your equipment, power on your equipment.

Frequently Asked Questions (FAQ)

- **Q: What should I do if the power-supply cord or plug is damaged?**

A: If the power-supply cord or plug is damaged, it is recommended to contact Linortek support for assistance and potential replacement.

- **Q: Can I use the NHM in wet conditions?**

A: No, the NHM should not be exposed to rain or water. It is not designed for outdoor or wet environments.

- **Q: How can I prevent memory corruption?**

A: The NHM has a voltage threshold that allows it to stop counting when power is lost. This helps prevent memory corruption. Ensure that the NHM is connected to the same power source as the equipment you want to monitor.

- **Q: What is the purpose of the digital inputs?**

A: The digital inputs allow the NHM to detect the on/off state of an external sensor. You can use the digital inputs to control when the NHM starts or stops counting.

- **Q: Can I control external devices using the NHM?**

A: Yes, the NHM has 2 relays that can be used to control external devices. These relays are normally open and can be wired according to the provided iTrixx NHM Wiring diagram.

- **Q: Is the NHM compatible with all equipment?**

A: The NHM is designed to be integrated into existing equipment. However, it is recommended to check the compatibility of your specific equipment with the NHM before installation.

Thank you for purchasing the Linortek iTrixx NHM. The NHM is an IoT controller and run-time meter. The NHM is equipped with two 5-24VDC digital inputs capable of tracking run-time hours of up to two different pieces of equipment.

All of our controllers come complete with all parts and software necessary for installation, operation and ability to control the devices attached to it. Upon arrival, please inspect the contents of the box to ensure that your kit is complete and contains all necessary components.

For instructional videos, FAQ's and contact information for our technical support team, please visit:

<https://www.linortek.com/technical-support>

For full instructions on the Web Interface please see the Fargo G2 and Koda Manual available at:

<https://www.linortek.com/downloads/documentations/>

PRODUCT CHECKLIST – Each product kit box contains the following

- ____ One iTrixx NHM SERVER
- ____ One 12VDC Power Supply
- ____ One CAT5 Patch Cord
- ____ One DIN rail mount clip
- ____ iTrixx NHM User Manual
- ____ One 2.2k Ohm Resistor Kit

LINORTEK ONE-YEAR LIMITED WARRANTY

Consumer law: For consumers who are covered by consumer protection laws or regulations in their country of residence ("Consumer Law"), the benefits provided in this Linortek One-Year Limited Warranty ("Linortek Limited Warranty") are in addition to and not instead of the rights provided by Consumer Law and it does not exclude, limit or suspend your rights arising from Consumer Law. You should consult the proper authorities in your country of residence for further information about these rights.

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Disclaimers

1. **Read Instructions** – Read all the safety and operating instructions before operating the product.
2. **Retain Instructions** – Retain the safety and operating instructions for future reference.
3. **Heed Warnings** – Adhere to all warnings on the product and in the operating instructions.
4. **Follow Instructions** – Follow all operating and use instructions.
5. **Cleaning** – Unplug the product from power before cleaning. Do not use liquid cleaners or aerosol cleaners.
Use a damp cloth for cleaning the enclosure only.
6. **Attachments** – Do not use attachments unless they are specifically recommended by Linortek. Using incompatible or otherwise unsuitable attachments can be hazardous.
7. **Accessories** – Do not place this product on an unstable stand, tripod, bracket, or mount. The product may fall, causing serious injury to a person and serious damage to the product. Use only with a stand, tripod, bracket, or mount recommended by the manufacturer, or sold with the product. Follow the manufacturer's instructions when mounting the product, and only use mounting accessories recommended by the manufacturer. Be cautious when using an appliance and cart combination. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.
8. **Ventilation** – Openings in the enclosure, if any, are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating. Do not block or cover these openings. Do not place this product in a built-in installation unless proper ventilation is provided or the Linortek's instructions have been adhered to.
9. **Power Sources** – Operate this product only from the power source type indicated in the instruction manual or on the product label. If you are not sure of the type of power supply you plan to use, consult your appliance dealer or local power company – provided that use of any power source type other than indicated in the instruction manual or marking label will void any warranty. For products intended to operate from battery power, or other sources, refer to the operating instructions [included with the product].
10. **Grounding or Polarization** – This product may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug still fails to fit it is because your outlet is incompatible with the plug. Contact your electrician to replace your outlet with one that is compatible. Do not force the plug to fit into an incompatible outlet or otherwise try to defeat the safety purpose of the plug. Alternately, this product may be equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. Do not force the plug to fit into an incompatible outlet or otherwise try to defeat the safety purpose of the plug. If your outlet is incompatible with the plug, contact your electrician to replace your outlet with one that is compatible.
11. **Power-Cord Protection** – Route power supply cords so that they are not likely to be walked on or pinched by

items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles, and the point where the cords exit from the appliance.

12. **Power Lines** – Do not place an outdoor system anywhere in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outdoor system, use extreme care to keep from touching such power lines or circuits as contact with them might be fatal.
13. **Overloading** – Do not overload outlets and extension cords as this can cause fire or electric shock.
14. **Object and Liquid Entry** – Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts which can cause fire or electric shock. Never spill liquid of any kind on the product.
15. **Servicing** – Do not attempt to service to this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing of the product to Linortek.
16. **Damage Requiring Service** – Unplug the product from the outlet and refer servicing to Linortek Customer Support under the following conditions
 - When the power-supply cord or plug is damaged.
 - If liquid has been spilled, or objects have fallen onto the product.
 - If the product has been exposed to rain or water.
 - If the product does not operate normally by following the operating instructions [included with the product]. Adjust only those controls that are covered by the operating instructions, as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
 - If the product has been dropped or the cabinet has been damaged.
 - If the product exhibits a distinct change in performance.
17. **Replacement Parts** – If replacement parts are necessary, have a Low-Voltage Electrician replace them using only part specified by the manufacturer. Unauthorized substitutions may result in fire, electric shock or other hazards. Replacement parts can be found at <https://www.linortek.com/store/>
18. **Safety Check** – Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.
19. **Coax Grounding** – If an outside cable system is connected to the product, be sure the cable system is grounded. U.S.A. models only—Section 810 of the National Electrical Code, ANSI/NFPA No.70-1981, provides information with respect to proper grounding of the mount and supporting structure, grounding of the coax to a discharge product, size of grounding conductors, location of discharge product, connection to grounding electrodes, and requirements for the grounding electrode.
20. **Lightning** – For added protection of this product during a lightning storm, or before leaving it unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the cable system. This will prevent damage to the product due to lightning and power-line surges.
21. **Outdoor Use** – This product is not waterproof and should not be allowed to get wet. Do not expose to rain or other types of liquid. Do not leave out-of-doors overnight as condensation may occur.
22. While changing batteries, fuses or handling a board level product be careful of electrostatic discharge which can damage electronic devices. It is best to use a grounded electronics service bench. If this is not available you can discharge yourself by touching a metal appliance or pipe. While changing the batteries or fuses do not touch i) any wires other than the battery wires and ii) the printed circuit board.

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Unless specifically stated, our Products are NOT designed to switch line voltage (110V and above) devices. To control device that operate at line voltages a qualified electrician MUST install an intermediary device such as a relay. When choosing devices to control, it is best to select low voltage controls such as a 24VAC solenoid to water flow control. Only qualified electricians may wire a line voltage device. Additionally, local codes must be followed including but not limited to wire gauge size and suitable housing. Linortek assumes no responsibility for harm to the user or third parties for improperly using our Products. This liability remains with the user. Linortek assumes no responsibility for damage to the device due to improperly using our Products.

RELAY VOLTAGE SPECIFICATIONS

Please use caution when connecting devices to electrical circuits or other equipment. This web controller is NOT designed to connect to any voltage greater than 48V. If you want the product to control Line Voltage products and devices, refer to Diagram 1 below. Utilizing this arrangement, should allow you to virtually control anything. It is important that you use licensed electricians and comply with electrical codes that are applicable to your location. These codes exist for your safety, as well as the safety of others. Linortek assumes no responsibility for any harm or damage resulting from a failure adhere to local laws, ordinances or regulations or failure to follow specified instructions for installation and product usage

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9. Assignment.

You may not assign any of your rights or obligations under this EULA, and any attempt to assign will be void and without effect.

10. Notices.

Linortek may provide any notice to you related to this EULA using the email and address that you provided when you registered with Linortek.

11. Waiver

To be effective, any and all waivers by Linortek hereunder must be in writing and signed by an authorized

Linortek representative. Any other failure of Linortek to enforce any term hereunder will not be deemed a waiver.


12. Severability.

Any provision of this EULA that is found to be unenforceable will be edited and interpreted to accomplish the objectives of that provision to the greatest extent possible under applicable law and all remaining provisions will remain in full force and effect.

13. Governing Law; Venue.


You agree that this EULA, and any claim, dispute, action, cause of action, issue, or request for relief arising out of or relating to this EULA, will be governed by the laws of the state of North Carolina, U.S.A., without regard to conflicts of laws principles, provided that if you reside in a country that will not apply U.S. law to disputes related to these terms, then the laws of your country will apply. You also agree that the United Nations Convention on Contracts for the International Sale of Goods shall not apply. You agree that regardless of any statute or law to the contrary, any cause of action against us arising out of or related to the Linortek website, the Software or the Linortek Products must commence within one (1) year after the cause of action accrues or such cause of action shall be permanently barred. Any action or proceeding relating to this EULA must be brought in a federal or state court located in Raleigh, North Carolina and each party irrevocably submits to the jurisdiction and venue of any such court in any such claim or dispute, except that Linortek may seek injunctive relief in any court having jurisdiction to protect its intellectual property.

14. California Proposition Prop 65 Warning.

 **WARNING:** This product can expose you to chemicals including lead, which is known to the State of California to cause cancer. For more information, go to www.P65Warnings.ca.gov.

Wiring your ITrixx NHM

The ITrixx NHM is designed to be integrated into existing equipment to monitor run-time. Installing your NHM will involve tapping circuits on the equipment you intend to monitor.

 **IN NO EVENT WILL LINOR TECHNOLOGY BE LIABLE, WHETHER IN CONTRACT, TORT, OR OTHERWISE, FOR ANY INCIDENTAL, SPECIAL, INDIRECT, CONSEQUENTIAL OR PUNITIVE DAMAGES, INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR ANY LOSS OF USE, LOSS OF TIME, INCONVENIENCE, COMMERCIAL LOSS, OR LOST PROFITS, SAVINGS, OR REVENUES TO THE FULL EXTENT SUCH MAY BE DISCLAIMED BY LAW.**

FURTHER NOTICE FOR LIMITATION OF USE

- Unless specifically stated, this product is NOT designed to switch line voltage devices. This limitation includes all of FARGO AND KODA products. To control device that operate at line voltages the user MUST install and intermediary device such as a relay.
- When wiring a line voltage device using intermediary device, you MUST either be a qualified electrician or use the services of a qualified electrician. Additionally, local codes must be followed including, but not limited to, wire gauge size and suitable housing.
- Linortek cannot assume any responsibility for harm to the user or third parties for improperly using our Fargo product. This liability remains with the user. Linortek cannot assume any responsibility for damage to the device for improperly using our SERVER product.

Activate the Meter

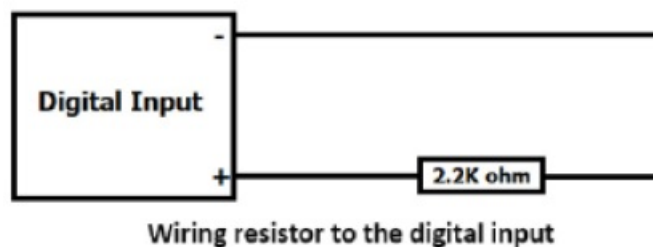
The iTrixx Hour Meter has two separate hour counters. The hour counters may be activated in a number of different ways.

1. In the simplest setup the NHM may be activated whenever power is applied to the unit. In this case, if the NHM is on, it is counting. A voltage threshold is provided so the NHM may stop counting as power is lost to prevent memory corruption. In this way, you only need to connect the NHM to the same power source of the equipment you wish to collect running data, no other wiring required.
2. You may also use one of the inputs to turn counting on and off. There are two digital inputs in the NHM. The digital inputs allow NHM to detect an external on/off state of a sensor.
3. Alternatively, it can be configured to follow one of the relays such that when the relay is activated the NHM will count. There are two removeable 2 position connectors (1 for each relay) and are simply numbered "1" and "2" on the NHM. These relays are dry contact relays and normally open.

Most common use case is to wire a sensor to a digital input to the same power source of your iTrixx Server to trigger the meter, so when your equipment is on, iTrixx is counting.

Digital Inputs Connection

iTrixx servers have 2 digital inputs (5-24VDC) built-in to the board. The digital inputs allow the SERVER to detect an external on/off state of a sensor. With this information the SERVER can display whether an input is on or off, count events in a resettable or non-resettable counter, and calculate the frequency (such as for use as a tachometer) or the period of the input. See Board Reference Layout page to locate the digital input. A circuit that switches on and off with your equipment can be wired to this digital input to detect whether or not your machine is running. Please note, when connecting a 12VDC--24VDC circuit to the input, an external resistor (provided, 2.2k ohm 0.5watt) must be used. For how to use a resistor for the digital input, please refer to the diagram below



There are two modes of operation for the digital inputs ISOLATED (ISO) and PULL UP (PU). These are set at the factory to ISO by default.

- **ISOLATED** mode allows you to directly drive the iTrixx's opto-isolator with an external voltage though an internal 1K resistor. This voltage may be in the range of 5VDC to 24VDC supplying a minimum of 2mA or a maximum of 30mA to the opto-isolator diode. There is no other internal connection to this voltage so it is an isolated input. The DIN in this mode will default to an ON state.
- **PULL-UP** mode connects a 1K resistor to an internal voltage allowing you to use a simple switch (such as a magnetic door switch) across terminals 1 and 2. When the switch is activated a signal is sent to the input. These modes are selected by the switch on the server (see the board layout for reference). The DIN in this mode will default to OFF state. To set this mode, move the DIN switch to the down position.

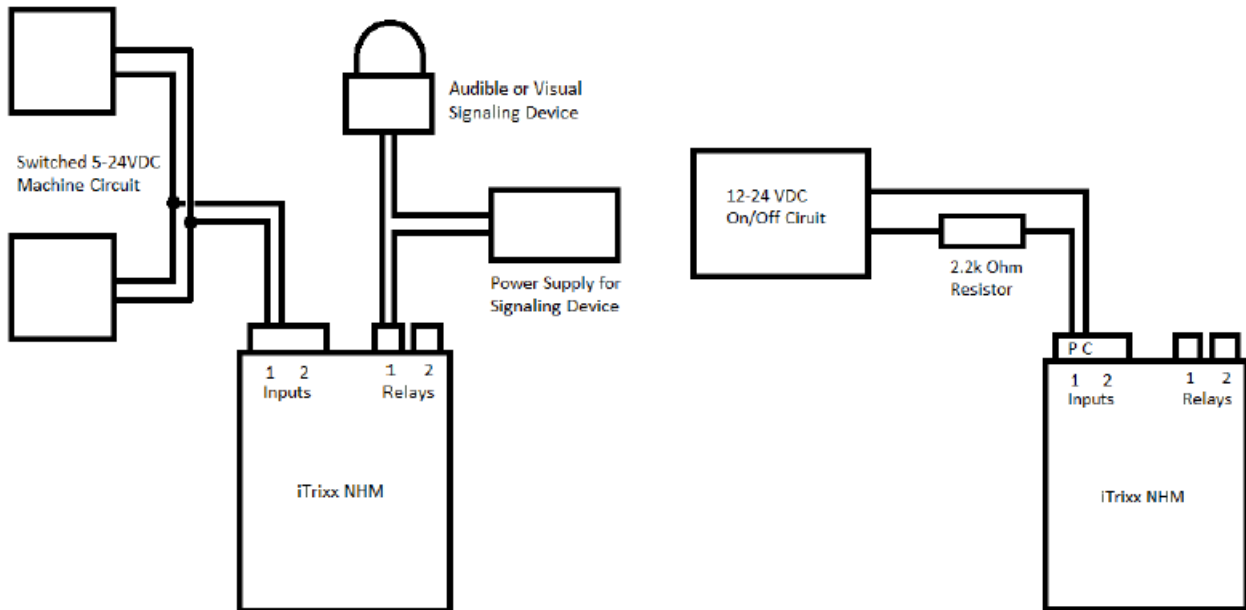


Caution: If you intend to use isolated mode, verify input switch is set to ISO before applying an external voltage. Doing otherwise may damage the SERVER or POE originating device.

To wire your equipment to the NHM's digital input, identify a circuit of 5 – 24VDC that switches on and off with your equipment. Wire this to Input 1 on your NHM. Note: If using a circuit above 12VDC you must include a 2.2k

ohm resistor between the tapped circuit and the NHM. The NHM will only detect a voltage on this circuit and will not draw any power or interfere with this circuit. Do not exceed 24VDC on your digital input. Once wired, see the section Configuring the Hour Meter page 10 to trigger the hour counter and other hour meter settings.

Once you are finished wiring the NHM to your equipment, you may then power on your equipment.



Left: iTrixx NHM wiring; Relay Output Connection
circuit to digital input using 2.2k ohm inline resistor

Right : Wiring 12-24VDC

There are 2 1-FORM-A relays (8A@48VAC Max) on the NHM with which you can control external devices, or use it to trigger the meter. These relays are normally open. To wire a device to the relay output, please following the iTrixx NHM Wiring diagram above.

Accessing your iTrixx NHM Software

• Powering the NHM

To power the NHM you may use the included 12VDC power supply or you may tap a 12 – 48VDC circuit on your equipment. Do not exceed 48VDC. To tap a circuit cut the barrel connector from the power supply along with at least an inch of wire. Strip the ends of the wire and tap into an existing circuit. Finally plug the barrel connector into the NHM. The iTrixx NHM can also be powered via PoE. See Board Reference Layout page 15 for connections.

Note: If powering the NHM from a circuit on your equipment, the power circuit **MUST** be a different circuit than the circuit used to trigger the hour meter. Failure to separate these circuits will cause the NHM to crash.

- **CAUTION:** WHEN YOU USE POE NETWORK SWITCH, DO NOT USE THE 12VDC POWER SUPPLY TO POWER THE SERVER AT THE SAME TIME, IT WILL DAMAGE THE BOARD.

• Connecting NHM to the Network

You will need to plug your iTrixx NHM into the network via Ethernet for initial configuration. If no network connection is available, you may also plug the NHM directly to your computer via Ethernet.

Once your NHM is powered on and connected to the network, it will automatically obtain an IP address via DHCP as long as your router is configured to do so. To connect, enter the IP address into your web browser.

This will take you to your NHM's landing page. To log in, click the Log In button on the top right of the page.

Your browser will prompt you to enter your username and password. By default, these credentials are both set

to admin. To find your NHM's IP address, see below.

- **Finding the IP Address**

- **Finding the IP Address with Discover Program**

The Discoverer program will automatically locate your ITrixx NHM SERVER. The Discoverer is a Java program, and requires Java Runtime to be installed to use this feature. Java can be found here:

<http://java.com/en/download/index.jsp>.

To download the Discover program, please go to:

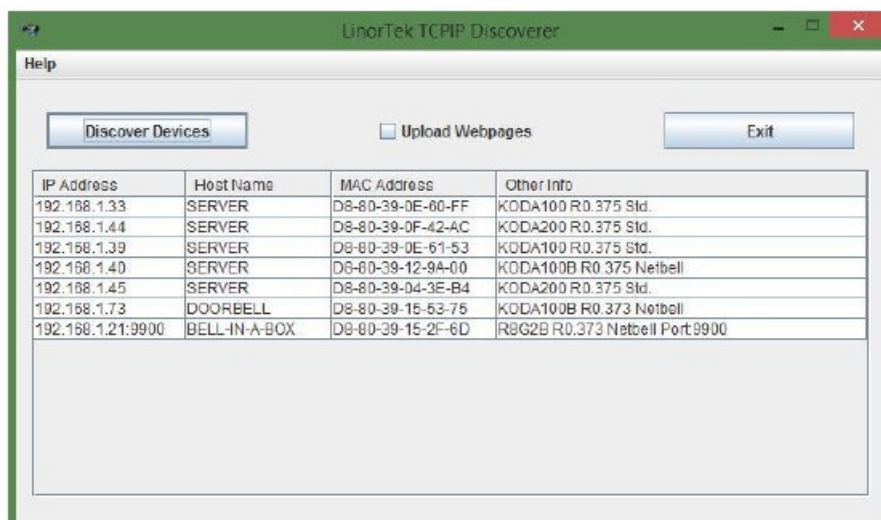
<https://www.linortek.com/downloads/supportprogramming/>

Use of Chrome & Firefox browsers is recommended. **Please note:** If you prefer to use Internet Explorer, Internet Explorer saves Linortek Discoverer as a Zip file by default. In order to use the Discoverer, you will need to select Save as and rename the file as Linortek Discoverer.jar when you download.

When downloading the Discover program, sometimes you will see a popup warning message depending on your browser security settings, asking if you want to keep or discard this file, please click the Keep button as this is a Java program, it won't harm your computer.

Once Discoverer locates your device, it will display

1. IP Address
2. Host Name
3. MAC Address
4. Other Info
 - Blue LED (if on)
 - Product Name
 - Server Software Revision
 - Port Number (If ported)



Click the device you want to use shown on the Discoverer program to launch the SERVER web pages in your browser. Click the Login button on the homepage. Default username/password is: admin/admin. You may change these as you desire or disable this feature in the settings menu.

- **Connecting your ITrixx NHM Directly to Your PC**

You can also plug your NHM directly to your PC in the case there is no network connection available. If you plug your NHM into your PC's Ethernet port it will use the default IP address: 169.254.1.1 unless you have

previously configured your NHM to use a static IP. Enter 169.254.1.1 into your web browser to connect. No internet connection required. Once configured, you can then install your NHM where desired.

- **Server Configuration**

If you are configuring your NHM for the first time, or if you are keeping your NHM disconnected from the internet, see the section below to set your time zone or adjust the NHM built-in time clock. Otherwise Skip ahead to the section Configuring the Hour Meter page 10.

- **NHM Landing Page**

The NHM has a different landing page from most Linortek devices. In addition to the normally displayed information, this page also displays the data from each of the two meters on your device.



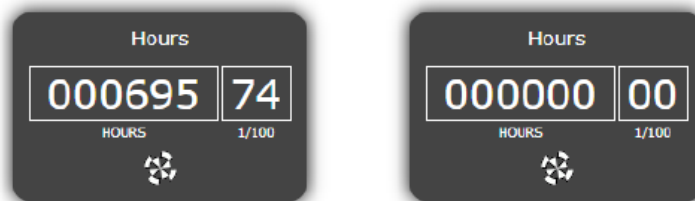
LOGIN

NHMDemo

Please log in.

Welcome to the KODA configuration website. Please log in using the button located at the top right of the page. Your credentials are good until you close your browser, so for security, please close your browser when you are finished using the KODA device.

Depending on the type and configuration of this KODA, different web pages are available under the Services menu tab. These items are stored as "cookies" so please make sure they are enabled in your browser.



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Standard Red Hours Version

The landing page displays the following settings

1. **Two meters:** Each Network Hour Meter includes two separate hour meters with independent triggers.
2. Each meter can record 999999.99 hours, decimal hours with 1/100 hour.
3. **Running indicator:** Spins if all conditions are met and counting hours.

Setting Time and Date

When first configuring your NHM you will need to verify the time and date on your home page. Your NHM is configured by default to use Eastern Standard Time (GMT-5) and will apply correction for daylight savings time. To change these settings, navigate to the Settings dropdown menu and then choose Time/Date. You can then change your time zone by adjusting the value in the third box labeled Time Zone. If you intend to keep your NHM off your network after configuring, you will need to uncheck Use Daylight Savings Time and Use NTP Update. You will then have to manually set the time to account for daylight savings, and adjust the time periodically to account for time creep.

Time/Date

Use hh:mm:ss and yy/mm/dd formats for setting the Time and Date.

Time	<input type="text" value="10:47:44"/>	Format HH:MM:SS Always use Standard Time.
Date	<input type="text" value="28/03/25"/>	Format YY/MM/DD
Time Zone	<input type="text" value="-5"/>	
	<input checked="" type="checkbox"/> Use Daylight Savings Time	
	<input type="checkbox"/> Use MIL Time (24hr clock)	
	<input checked="" type="checkbox"/> Use NTP Update	
	<input type="checkbox"/> RTC Cap Sel 12.5pf (7pf def)	
RTC Crystal Freq.	<input type="text" value="32768.8"/>	32768.0 + if clock is slow, 32768.0 - if fast.
NTP Web Site	<input type="text" value="time.nist.gov"/>	
NTP Interval	<input type="text" value="30"/>	
	<input type="checkbox"/> Log NTP Event	
	<input type="button" value="SAVE"/>	<input type="button" value="CANCEL"/>

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Standard Red Version

Setting Data Report

In order to have your NHM send its data to the Hour Collector desktop app (see page 12), navigate to the Settings dropdown menu and select Settings. For the NHM ensure Java Report is enabled. Please note that WIFI Report is not used.

Settings

Use Active Main: <input checked="" type="checkbox"/>	Use System eMails: <input type="checkbox"/>	Switch Bypass 1: <input type="checkbox"/>
Require Login: <input checked="" type="checkbox"/>	Use Fahrenheit: <input type="checkbox"/>	Switch Bypass 2: <input type="checkbox"/>
Use IP Ranges: <input type="checkbox"/>	PGM Dynamic Relays: <input type="checkbox"/>	Setting 19: <input type="checkbox"/>
Use RESTful IP Ranges: <input type="checkbox"/>	CLR PGMs on Start: <input checked="" type="checkbox"/>	Use Audio File System: <input type="checkbox"/>
Use Remote IP Ranges: <input type="checkbox"/>	RTC Temperature Compensation: <input checked="" type="checkbox"/>	WiFi Report: <input type="checkbox"/>
Use RESTful Authentication: <input type="checkbox"/>	Use AM2302: <input type="checkbox"/>	Active Landing Page: <input type="checkbox"/>
Extend Relay Range: <input type="checkbox"/>	Java Report: <input checked="" type="checkbox"/>	Invert Relay Control: <input type="checkbox"/>
Use Relay Radio Buttons: <input type="checkbox"/>	Use Metric: <input type="checkbox"/>	Setting 24: <input type="checkbox"/>
SSL Port No.: <input type="text" value="443"/>	UART Usage: <input type="text" value="None"/>	
	<input type="button" value="SAVE"/>	<input type="button" value="CANCEL"/>

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Standard Red Version

Configuring the Digital Input

Before your NHM can collect run-time data, you first need to configure your digital input (If using to trigger the meter). To access the digital input setup page, navigate to the Services dropdown menu, and click In/Out. Under the Inputs section, click the pencil edit icon under DIN 1 or DIN 2 – depending which input you are using to trigger your meter. This will take you to the Set Digital Input page.

Set Digital Input Page

On this page you can enable and configure your digital input. To set your DIN to detect a voltage provided by the tapped circuit, follow the following steps

1. Enter a Name or Label if desired to identify this input
2. Check the USE box to turn this input on
3. Set Type to State. This tells the DIN to provide a binary (on/off) reading
4. For testing purposes, you may wish to set Display to Values to ensure your NHM is detecting a voltage from the circuit. This will display as 0 or 1 in the window on the In/Out page.
5. If you wish to trigger the hour meter when the circuit is off, enter i into the Command Z/N/I field
6. Click the SAVE button.

Other settings are not required to trigger the NHM's hour meter. Other settings are explained in the Fargo G2 and Koda Manual available at <https://www.linortek.com/downloads/documentations/>

The screenshot shows the LINORTEK web interface. At the top is the LINORTEK logo and a PAUSE button. Below is a navigation bar with links: Home, Services, Tasks, Logs, Settings, Configure, and System. The main heading is "Set Digital Input". The form contains the following fields and options:

- Digital Input Selected: 1
- Name: [text input]
- Label: [text input]
- Connector: [text input] (Note: Two term connector, use +,-,*,/ value, separate terms with space. For example: +B /1.5)
- USE: ☒
- Type: State (dropdown)
- Display: None (dropdown)
- Relay L/T: 0 (text input) (Note: R#+L: Relay linked to Input state, R#+T: Triggers relay)
- Command L/Z/N/I: Norm (text input) (Note: L: Load counter, Z: Zero Counter, N: Input Normal mode, I: Invert input)
- Value: Min: 0, Max: 0 (text inputs)
- Yellow: From: 0, To: 0 (text inputs)
- Red: From: 0, To: 0 (text inputs)
- Green: From: 0, To: 0 (text inputs)
- Buttons: SAVE, CANCEL

At the bottom, a footer states: Version v19.04.203 Copyright (c) 2013-2019 Linor Technology Inc. - All rights reserved. Standard Red Version.

Configuring the Hour Meter

After wiring your NHM into your equipment (see page 5) and setting your digital input (page 10), you now need to configure the hour meter. To reach the Hour Meter page, navigate to the Services dropdown menu and select Hours. On this page there are two identical columns; one for each hour meter.

After wiring your NHM into your equipment (see page 5) and setting your digital input (page 10), you now need to configure the hour meter. To reach the Hour Meter page, navigate to the Services dropdown menu and select Hours. On this page there are two identical columns; one for each hour meter.

1. **Use Meter** – Hour counter will not run unless the “Use Meter” is checked.
2. **Trigger** – The trigger selects the condition to start and stop the counter meter. You can select an INPUT or a RELAY. If those conditions are met such that the device is ON, the meter will start running. You may additionally select to have the INPUT VOLTAGE start the counter. For example, if the Network Hour Meter Hour is powered the counter runs.

3. **Meter Name** – Give the meter a name to identify what is being metered.
4. **Seconds/Tick** – The ticks set the counting resolution. The smaller the number the faster the memory is used up. Usually set to 2.
5. **Used Endurance** – Because the number of memory writes is finite, the Endurance indicator gives an idea of the memories condition. It will wear out. (Tick*512*100000 = memory endurance in seconds.)
6. **Voltage Threshold** – The Voltage Threshold condition must be satisfied along with the trigger condition to make the meter count. This is useful to stop the counter should the unit start to lose power. **For example:** by setting a threshold of 20 volts on a 24-volt system, the Hour Meter will assume that the power is declining and shut off to prevent a counter memory error.
7. **Send Email** – Using the Email checkbox and the Count, the unit will send an email when this value is exceeded. (This unit is NOT compatible with SSL/TLS, there are 3rd party SMTP delivery servers which do not require SSL and can be used. For instructions on how to use a 3rd party SMTP delivery service, please refer to Appendix 1 at the end of this manual.
8. **Email Count** – Hour meter value to send email notification. This value may be entered in [seconds] or (hours).
9. **Relay Control** – By using a Relay Number and a Count, the unit will activate a relay when the value is exceeded. This is useful for turning on a maintenance light or buzzer on a machine that requires a look.
10. **Relay Count** – Hour meter value to trigger relay. This value may be entered in [seconds] or (hours).
11. **Preset** – The Preset is used to ZERO the meter or set it to any value you like. This value may be entered in [seconds] or (hours).
12. **Push Report Interval** – You can change how often to send the hour report out to the Hour Collector App, it's set for 1 minute by default. If you want to change the frequency, you can enter the number here (by minutes).

LINORTEK PAUSE

Home Services Tasks Logs Settings Configure System

Hour Meters

Use [nn] for settings in seconds, (nn) for settings in hours.

Enter the settings in the fields below:

Meter 1	Meter 2
Use Meter 1 : <input checked="" type="checkbox"/>	Use Meter 2 : <input checked="" type="checkbox"/>
Trigger : Input Voltage	Trigger : Input Voltage
Meter 1 Name : Hours	Meter 2 Name : SMD Machine
Seconds/Tick : 2	Seconds/Tick : 2
Used endurance : <div><div></div></div>	Used endurance : <div><div></div></div>
Voltage Threshold : 0	Voltage Threshold : 0
Send Email : <input type="checkbox"/>	Send Email : <input type="checkbox"/>
Email Count : 0.00 Hrs [0]	Email Count : 0.00 Hrs [0]
Relay Control : <input checked="" type="radio"/> On <input type="radio"/> Off 0	Relay Control : <input checked="" type="radio"/> On <input type="radio"/> Off 0
Relay Count : 0.00 Hrs [0]	Relay Count : 0.00 Hrs [0]
Preset : n/a	Preset : n/a
Push Report Interval : 5	Push Report Interval : 1440

UPDATE CANCEL

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Standard Red Version

Reset the Meter Automatically

In some cases, you might need to reset the meter at regular time, for example, daily. You can do so by setting a task on the TASKS page. Below is an example to reset meter#2 every day at 12:00am. For instructions on how to

use the IF...THEN...THAT logic statement from the TASKS page for automation, please refer to Page 15-17 of the Fargo G2 and Koda User Manual. This manual can be downloaded here https://www.linortek.com/download/fargo%20g2_koda%20downloads/fargo%20g2_koda%20documentation/Fargo-G2-and-Koda-Instruction-Manual-Rev-B.pdf

LINORTEK PAUSE

Home Services **Tasks** Logs Settings Configure System

Set Schedule

This page allows the user to edit the settings for the individual scheduled task selected on the previous page. Click "Save" to save changes made or click "Cancel" to return to the previous page. Leaving the page without clicking save will result in your changes being ignored by the Fargo server.

Schedule Select: 1

Schedule Name:

Use ☒ Log ☐ Email ☐

IF

Device A: TIME

Data A: 00:00 A/D-In: C=, S D-In: S=State, C=Ctrl, c=Resettable Ctrl, F=Freq, P=Period

Logic: NONE

Device B: NONE

Data B: A/D-In: C=, S D-In: S=State, C=Ctrl, c=Resettable Ctrl, F=Freq, P=Period

THEN

Device C: HOURMETER

Data C: 2 Which meter to reset

Action: RESET

SAVE CANCEL

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Data Collection

Once your NHM is wired and configured, it will periodically report its data over your network. Any computer on the same network can collect that data using the free Linortek Hour Collector app, Linortek DataCollector app, RESTful API, Microsoft Excel, or other software via API.

Hour Collector App

- The Hour Collector app was developed for use with the Linortek NHM. This is free to download at <https://www.linortek.com/downloads/support-programming/>
- Before downloading, ensure your computer has Java installed. Java is available for download here: <https://www.java.com/en/>
- The Hour Collector app will automatically locate your NHM and allows for quick access similar to the Discoverer app. The Hour Collector app updates every two minutes.
- When first opening the Hour Collector app, it will create a folder on our desktop named CSV_FILE. Inside is a .csv file containing a log the data collected by the hour collector app. This file can be viewed using MS Excel. In order for this log to update, the Hour Collector app must be running and the .csv file must not be open otherwise the Hour Collector cannot automatically edit the file. The Hour Collector app will display the following information

1. IP Address
2. Meter Name

3. Date/Time
4. Meter 1 Information
5. Meter 2 Information
6. Input Information
7. Relay Information
8. Sensor Information
9. Port Number (if ported)
10. MAC Address

Clicking the DATA SELECTION button, you can check or uncheck which information you want to display on the Collector window. The “Write All Data” checkbox means it will write all the data to the .csv file, whether it is displayed or not displayed, unchecking this and then checking other data boxes will only write the selected data to the .csv file.

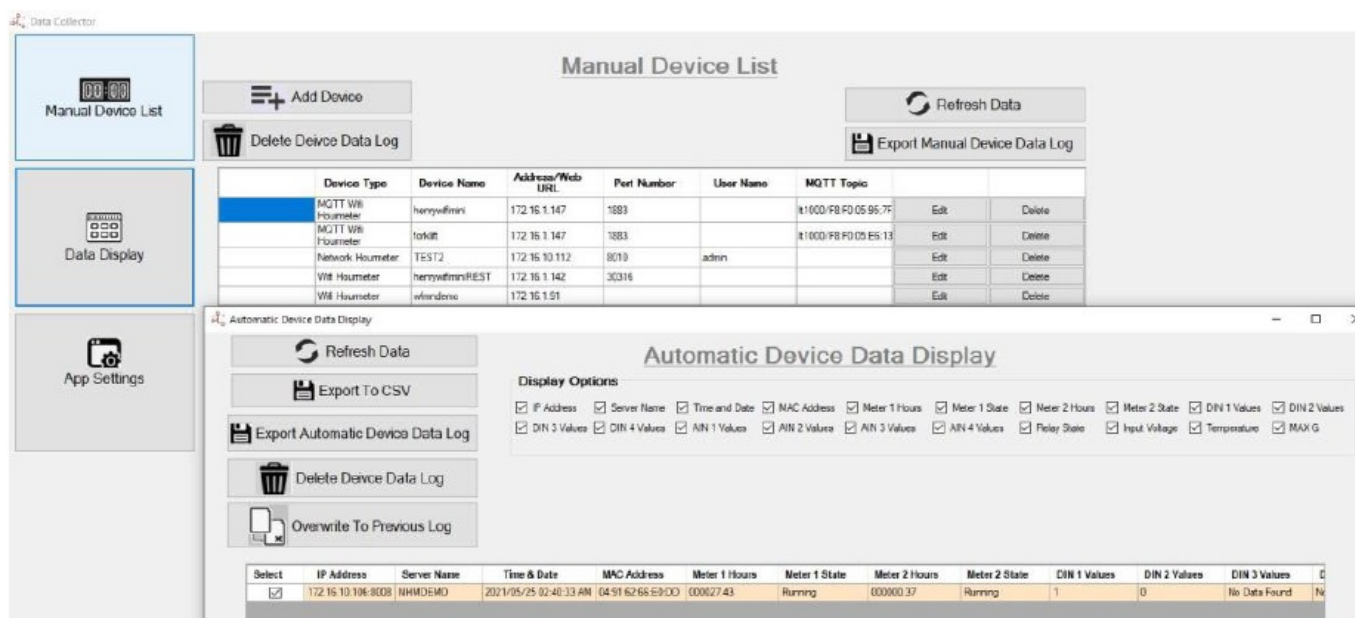
IP Address	Meter Name	Date/Time	Meter 1	Meter 2	Inputs	Relays	Sensor	Port	Mac Address
172.16.1.4	environmentaltes	20200410T12:11:36-0400	0 (S)	0 (S)	0.0.0.0	0.0.0.0.0.0...	73.87C		F8:F0:05:E6:13:39
172.16.10.1...	NHMDemo	Apr 10, 2020 12:08:45 pm	Hours: 000722.00; R	Hours: 000000.00; S	1.1.0.0	1.0.0.0.0.0...	11.77 VDC; IT > 41.4 DegC	Port...	04:91:62:66:E0:DD

DataCollector Pro App

The DataCollector Pro app is an upgraded version of the HourCollector app. Like our HourCollector App, this app can listen for UDP broadcasts from our hour meter devices. It can record and log this data into a .csv file.

It can not only display the hour readings and digital/analog input data for each meter, but also allows you to select manually/automatically collecting/exporting data. The DataCollector Pro App can be downloaded here

[https://www.linortek.com/downloads/support-programming/.](https://www.linortek.com/downloads/support-programming/)



Alternatively, you can also set it to manually acquire data. This is useful for port forwarded network hour meters as it can go out to the internet and read data off the device's XML pages. It can also collect data from the iTrixx WiFi Hour Meter both via REST or subscribe to an MQTT broker.

Install the DataCollector

1. Run ndp48-web.exe (this will install .net framework if it is not already on your computer)
2. Run SQLServer2016-SSEI-Expr.exe (this will install SQL server)
 - Choose custom install, follow the prompts until you are given a checklist of features to install. make sure to check "LocalDB" at the bottom of the list.
 - All other options can be left as default
3. Copy the linortek_db folder to your C: drive
4. Run LinorTekSetup.msi to install the program.
5. If your PC has already installed previous version, you have to uninstall previous version "Linortek Data Collector App" from Control panel>> Add remove program and then new version "Linortek Data Collector.msi" setup file need to install.

Use the DataCollector

1. Open the Data Collector app and navigate to the App Settings window.
 - Set desired date and time format
 - Choose whether you wish for data collector to listen for UDP message from Linortek devices (easy) or to manually collect device data (advanced)
 - Choose whether to log data
 - Choose update frequency (manual mode only)
2. If using Automatic mode, open the Data Display window. Data will be shown as it is received.
3. If using Manual mode, navigate to the Device List and click Add Device.
 - Select your device type
 - Enter device name
 - Enter IP address (if local) or web address (if remote)

- Enter Port (if assigned)
- Enter user name and password for device
- Repeat the above for each device

Open Data Display window. The data collector will automatically collect data for devices set in the Device List. In either manual or automatic mode, you may export the current data to .CSV, or export the data log (if set) to .CSV. **Note:** if the log is not exported periodically, the amount of system memory required to export will increase and may cause the app to not respond. If this happens, delete the device data log.

RESTful API

Here is the available APIs that you can export the data from the device directly (**NOTE: THIS API COMMANDS ARE FOR SOFTWARE REV. 427 AND ABOVE**)

Meter 1: your_IP_address/api/hourmeter/1/getcount

Meter 2: your_IP_address/api/hourmeter/2/getcount

For pulling the hours out, there are two XML commands built in;

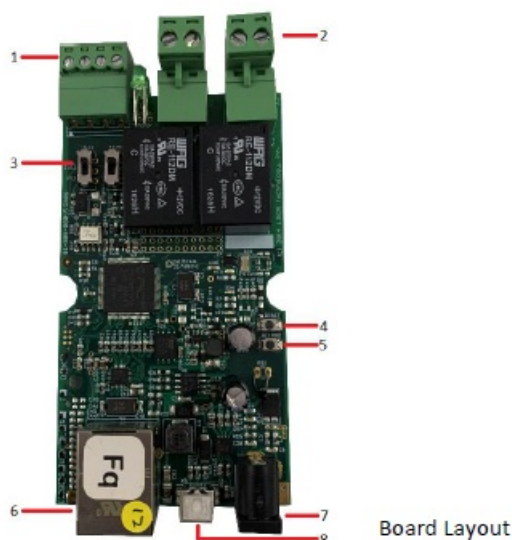
- your_IP_addressr/hours.xml
- your_IP_address/hourdetail.xml

Microsoft Excel

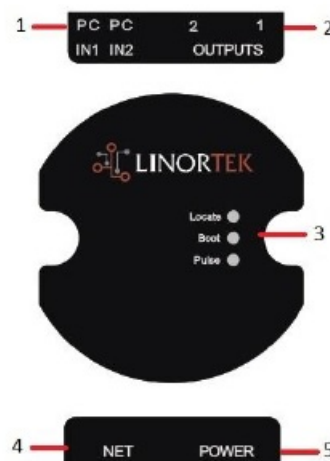
You can use MS Excel to directly gather data from your NHM. Please refer to this post on our website for details of how to export hour meter data to your own database using Microsoft Excel here:

<https://www.linortek.com/importing-data-from-hour-meter-to-spreadsheet/>.

Board Reference Layout



Board Layout



Enclosure Layout

1. Digital Inputs (#1 on the left) 5VDC-48VDC (12VDC-48VDC must use the external resistor provided)
2. Relay Outputs (#1 is on the right) 8A@48VAC max
3. Digital Input Switches (IN 1 on left)
4. Reset Button
5. Reload Button (turns on blue LED – identifies on Discoverer)
6. Rj45 Connector

7. Power Connector (12VDC)
8. USB Mini Connector for Temperature/Humidity Sensor (sold separately)

The image on the left is a bare board ITrixx NHM, it explains the inputs and outputs of the device and the ratings for each. A 12VDC power supply is provided with the unit, it is also POE (Power Over Ethernet) capable. The image on the right is the enclosure label of the iTrixx NHM.

1. Digital Inputs (#1 on the left)
2. Relay Outputs (#1 is on the right)
3. Status LED lights
4. Network Connector
5. Power Input

Factory Reset

To reset the SERVER to its factory defaults, first to push the RESET button, the RED LED should be blinking and the GREEN LED is on. While in this state (called Bootload state) press and hold the RELOAD button (about 10-15seconds) until the RED LED comes on steady (blinks at 1 second rate).

There is an equivalent RESET DEFAULTS function in the web browser at System/ Load/Reboot System page. Check the Restore Default Values box, then click the Boot Mode button, your device will be reset to factory default once the RED LED come back to normal (blinks at 1 second rate).

If you need assistance with your device please visit www.linortek.com/technical-support

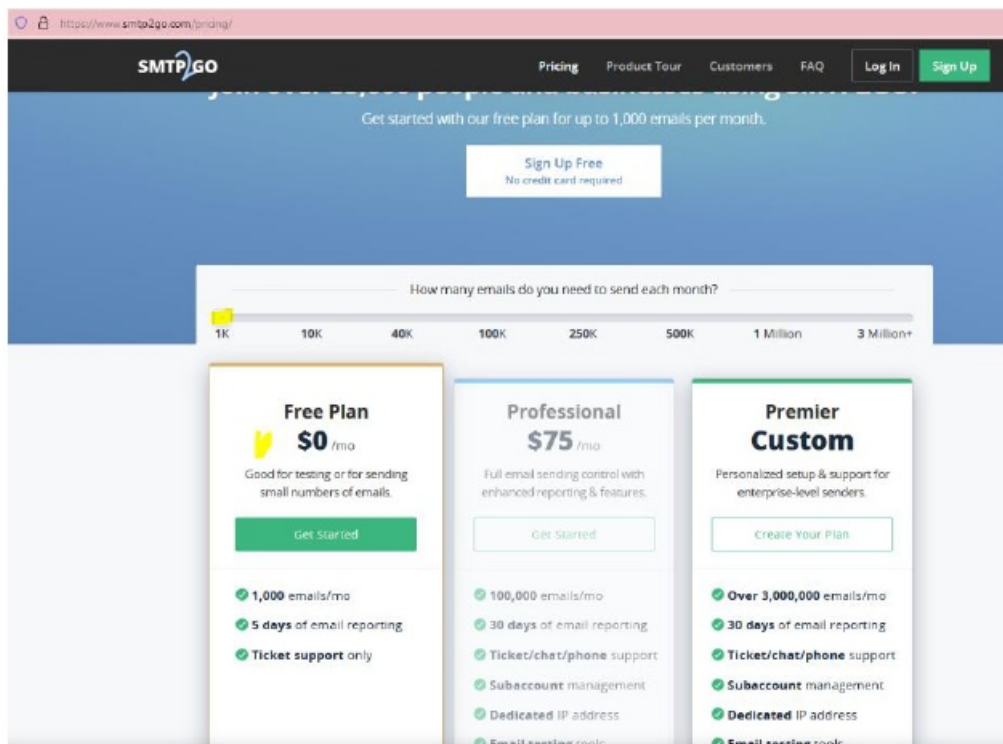
Appendix 1

How to Send SSL Emails Using a 3rd Party SMTP Service for Linortek Fargo and Koda Devices

By default, Koda/Fargo devices use non-SSL SMTP email servers. But most of the email servers today have switched to SSL security protocol, there are 3rd party SMTP delivery servers which do not require SSL and can be used. There are a lot of SMTP email service providers in the market. We use SMTP2GO as an example to demonstrate the setting up process. SMTP2GO is free to use with up to 1000 emails/month. To use SMTP2GO, please visit <https://www.smtp2go.com/> .

Step 1. Create the SMTP2GO account.

To create an account simply click on "Sign up", choose "1K Emails" on the scale, and choose "Free plan" (If you need to send more than 1000 emails per month, select the plan that meet your requirements.)



To create an account on SMTP2GO, a corporate email address will be needed. Free email service such as Gmail or Yahoo will not let you continue. After activating your SMTP2GO account, you need to add a user.

Step 2. Add a user.

The user you create on SMTP2GO, will be the Outgoing mail server when you setup the Fargo/Koda device to send email reports, please make sure your corporation email server will not block the emails if you use free email account such as Yahoo or Gmail to add a user here.

Login to your SMTP2GO account, on the left side menu choose “Settings” > “SMTP Users”, Click on “Add SMTP user” and fill the form.

<

Add SMTP User

Add the SMTP user details below. Optionally set a rate limit, unsubscribe footer, or choose advanced options.

Configure user

Username

Password
🔓

Description

Rate Limit

Unlimited
▼

☒ Use default

Add SMTP User
Back

After the user is added to your SMTP2GO account, it will display the information you need to setup the email

notification on your Fargo/Koda devices.

Username	Description
support@linortek.com	Koda report
Connecting via SMTP SMTP Servers: mail.smtp2go.com SMTP Port: 2525 Alternative ports: 8025, 587, 80 or 25. TLS is available on the same ports. SSL is available on ports 465, 8465 and 443.	Default Rate Limit Per SMTP User If a user has no rate limit set, they'll use this default limit. It's currently set to Unlimited . Change Rate Limit Default

Step 3. Configure the Linortek device.

After you created an account and added a user, login to your Linortek device, navigate to Configure – Email setup page to setup Email notification

- **SMTP Server** – Enter the outgoing mail server that you want to use, it's mail.smtp2go.com in our example.
- **Port** – This is the port on that server. The SMTP port is 2525 in our example.
- **Use SSL** – Leave it unchecked when you use 3rd party SMTP server.
- **User Name** – The username from SMTP2GO when we created a user in previous step.
- **Password** – The user's password from SMTP2GO when we created a user in previous step.
- **To Address** – Enter up to 3 addresses for this email set up. An addressee, a CC and a BC.
- **Subject** – Subject line of the email header.

LINORTEK PAUSE

Home Services Tasks Logs Settings **Configure** System

Send E-Mail

Enter the appropriate settings in the fields below:
(Your SMTP server may not require a user name or password.)

SMTP Server: mail.smtp2go.com

Port: 2525

☐ Use SSL (usually port 465)

User Name : support@linortek.com

Password :

To Address: support@linortek.com

To CC:

To BCC:

Subject: Hour Reading Report

SAVE/TEST **CANCEL**

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As soon as you hit “Save/Test”, the device automatically sends the test email. Please check Junk/Other folder to find it if it is not in Inbox folder.

Step 4. Set the task for automatic Email notifications.

You should be able to receive email notifications for various events from the Fargo/Koda controller at this point. If you need to receive condition-logic notifications, you can use the condition-logic configuration to setup such

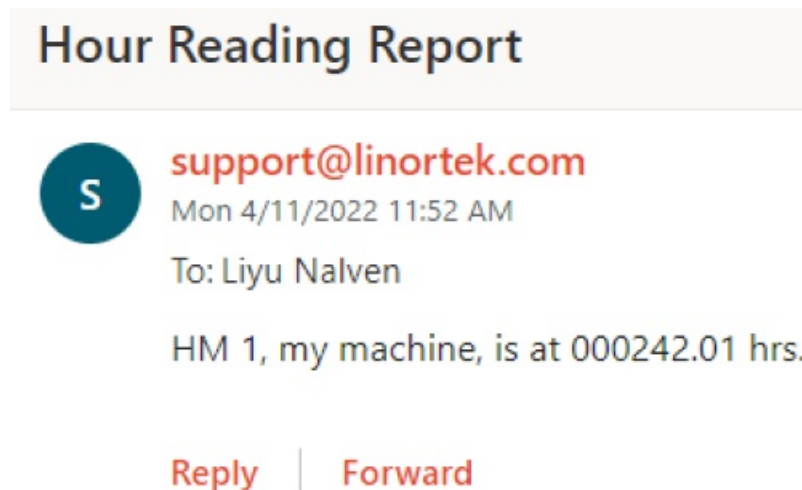
reports. To setup the condition-logic report notification, go to Tasks page on your Fargo/Koda device, click the Edit icon of a Schedule. For details of how to create a logic-based event, please refer to the Set Schedule Page on the Fargo/Koda User Manual, which can be downloaded here

https://www.linortek.com/download/fargo%20g2_koda%20downloads/fargo%20g2_koda%20documentation/Fargo-G2-and-Koda-User-Manual.pdf

In this sample We will use the Network Hour Meter device as an example for how to receive email reports every day at 11:52am.


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As soon as all conditions of the task are met, you get the following email
















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Documents / Resources

	<p>LINORTEK ITrixx Network Hour Meter [pdf] User Manual ITrixx Network Hour Meter, ITrixx, Network Hour Meter, Hour Meter, Meter</p>
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References

-  [Linortek - Remote Control Monitoring Solutions](#)
-  [Linortek - Remote Control Monitoring Solutions](#)
-  [Linortek`s Technical Support and FAQ Page](#)
-  [P65Warnings.ca.gov](#)
-  [java.com/en/](#)
-  [Documentations](#)
-  [Linortek Products Support Programming Resources](#)
-  [End-User License Agreement](#)
-  [Export Hour Meter Data to Use on Your Own Database](#)
-  [LINORTEK ONE-YEAR LIMITED WARRANTY](#)
-  [Linortek Website Store](#)
-  [Linortek`s Technical Support and FAQ Page](#)
-  [SMTP2GO: Reliable & Scalable Email Delivery Service](#)
- [User Manual](#)