

**ORTEK**  
Machine  
Hour  
Meter



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## LINORTEK WFMN Machine Hour Meter



## iTrixx-WFMN-C Packing List

- iTrixx-WFMN Server (01-910-00060)
- 12 VDC power supply (01-850-00034)
- 2.2k Ohm resistor kit (01-880-00134)
- Current Sensor (01-390-00022)

- Wago Connectors (01-850-00029) (4)
- iTrixx-WFMN-C Packing List and Quick Setting Instructions

## Safety Instructions

- This device can be powered by 12-48VDC power source. If your equipment can not provide such power source to power the device, use only the power adapter provided by Linortek that comes with your order. Other power supplies may damage or destroy the device, affect its behavior, or induce noise.
- Avoid placing the cables where people may trip over them or where they may be exposed to mechanical pressure as this may damage them.
- This device is for indoor use only! NOT FOR OUTDOOR USE!
- Do NOT install the device in rooms with high humidity. Do NOT immerse the device in water and do NOT spill or pour liquids of any kind onto or into the device.
- Do NOT install the device in surroundings at risk for explosions. Do NOT use the device if you smell gas or other potentially explosive fumes.
- Do NOT use the device during thunderstorms. Lightning striking the power grid may cause electric shocks.
- Do NOT remove the device's power supply (Ethernet cable when using PoE, power adapter when not using PoE) when the RED LED is blinking and the GREEN LED is on (called Bootload state); a firmware update is ongoing. Cutting off the device's power during a firmware update (red LED blinking, green LED on) will damage the firmware and render the SERVER inoperative. In such cases, it will need to be returned to factory for resetting.

## Get to Know iTrixx-WFMN Hardware

### iTrixx-WFMN Wire Chart

There is 1 cable on the iTrixx-WFMN-Di, 3 cables on the iTrixx-WFMNA-ADi. From the top to bottom, they are marked as cable 1, 2, 3. See the chart below for explanation.



iTrixx-WFMN-Di Hardware



iTrixx-WFMN-ADi Hardware

### Cable 1: Analog Inputs (for iTrixx-WFMN-ADi only)

| Wire Color | Function | Note                                  |
|------------|----------|---------------------------------------|
| Green      | Ain1     | Analog 1                              |
| Brown      | Return   |                                       |
| Red        | 5V       | If 12V sensor, use a 12V power supply |
| White      | Ain2     | Analog 2                              |
| Blue       | Return   |                                       |
| Black      | 5V       | If 12V sensor, use a 12V power supply |

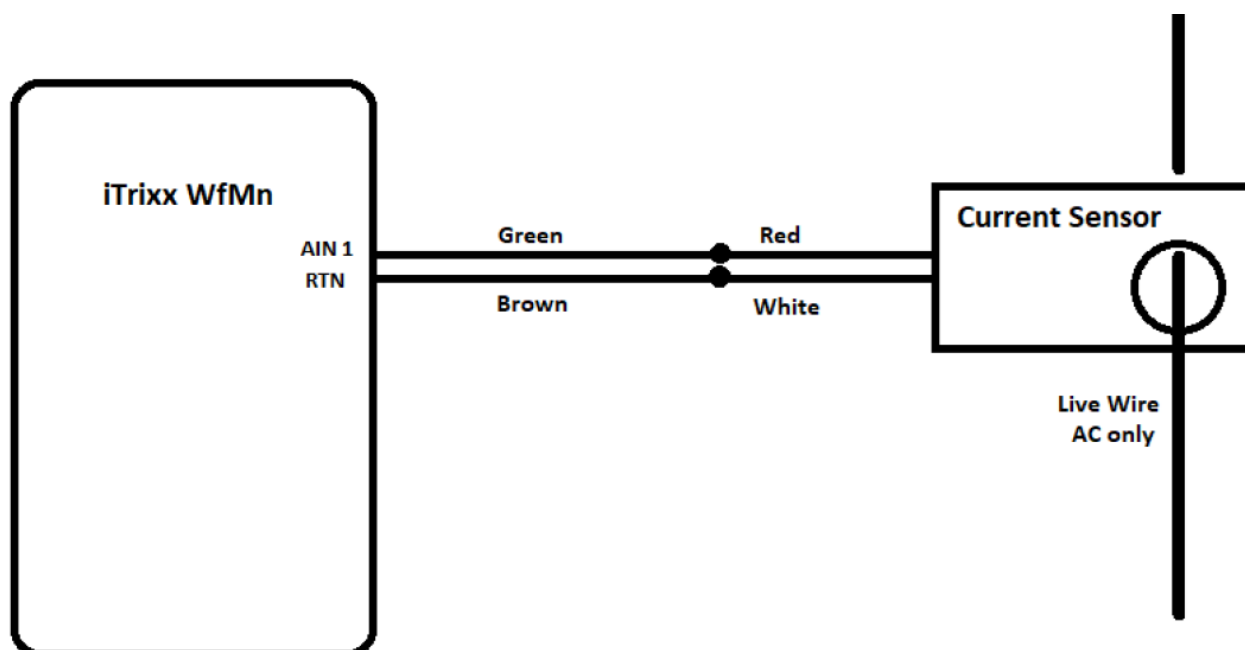
**Cable 2: Relay Outputs (for iTrixx-WFMN-ADi only)**

| Wire Color | Function   | Note    |
|------------|------------|---------|
| Brown      | Relay 1 NC | Relay 1 |
| Green      | Relay 1 C  |         |
| Red        | Relay 1 NO |         |
| Blue       | Relay 1 NC | Relay 1 |
| White      | Relay 2 C  |         |
| Black      | Relay 2 NO |         |

**Cable 3: Digital Inputs and Power Input**

| Wire Color | Function | Note  |
|------------|----------|---|
| Red        | 12-48VDC | Power Input   |
| Black      | Ground   |   |
| Green      | DIN 1A   | Input 1, 5-24VDC. If using a voltage above 12VDC for a digital input, you must use a 2.2K ohm resistor. |
| White      | DIN 1e   |   |
| Brown      | DIN 2A   | Input 2, 5-24VDC. If using a voltage above 12VDC for a digital input, you must use a 2.2K ohm resistor. |
| Blue       | DIN 2C   |   |

## Wiring Instructions



Current Sensor Wiring Diagram

#### Current sensor connection:

Please follow the Current Sensor Wiring Diagram above to wire your current sensor to the iTrixx-WFMN controller. To wire current sensor to AIN 1: Connect the Red wire on the current sensor to the Green wire on the iTrixx-WFMN, White wire to Brown wire.

Please NOTE: The default current sensor is intended to monitor a load up to 15 Amps. If you believe the current draw on your equipment is over 15 Amps, please contact us to replace it with a 30 Amps one.

#### Power connection

The iTrixx-WFMN can be powered by 12-48VDC power source. You can connect the iTrixx-WFMN to the power source of your mobile equipment if needed. For instructions on how to connect the iTrixx-WFMN to your mobile equipment, please refer to the Wiring the iTrixx to Mobile Vehicles section on iTrixx-WFMN User Manual.

You can also use the provided 12VDC power supply to power your iTrixx-WFMN server. To connect the power supply to your iTrixx server, connect the positive wire on the power supply to the Red wire on the iTrixx-WFMN, negative wire (marked with red tape) to Black wire.

#### Relay and digital input connections

If you wish to use the relay outputs to control an external device, please refer to the Relay Connection section on the iTrixx-WFMN User Manual.

If you want to use the digital input to monitor external equipment, please refer to the Digital Inputs Connection section on the iTrixx-WFMN User Manual.

### Connect to Your Network

#### Before powering up the iTrixx

To configure your iTrixx, you will need the following information during the setup process, we suggest you to gather that information before putting your device in Provisioning Mode, because once you put your device in Provisioning Mode, you will have 2 minutes to connect it to your network before this mode times out.

1. Your network name and your WiFi password.
2. Write down the last 6 characters of your device's MAC address, this will be the password to login to your iTrixx server when you config the software on Telnet. You can find the MAC address at the back of your device.
3. Download the HourCollector desktop App from our website download page, this free tool can help you to find the IP address on your network, as well as for data collection/monitoring. 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 iTrixx and allows for quick access. The Hour Collector app will not immediately locate the iTrixx if not connected via Ethernet. The iTrixx will appear once the HourCollector updates after receiving data from iTrixx devices. The HourCollector app updates every two minutes by default. You can download this tool here:

<https://www.linortek.com/downloads/support-programming/>

4. We use Telnet for the iTrixx-WFMN configuration: To configure Telnet on Windows 8.1 or Windows 10, follow the steps below:
  - Open Control Panel
  - Select Programs
  - Under Programs and Features select Turn Windows features on or off
  - Scroll down and select the checkbox for Telnet Client and click OK
5. Connect your iTrixx-WFMN to your network from your web browser and using this config link: <http://wifihm-config.com>
6. Since the iTrixx config page is not encrypted, you will need to make sure when you enter the config link on your browser, and the browser will NOT change to <https://wifihm-config.com> , otherwise, you can't connect. Here are some samples on how to change your browser settings in order to connect to the config page:
  - On Google Chrome, you can go to Settings-Privacy and Security-Safe Browsing, select No Protection.
  - On Firefox, go to Privacy & Security Setting, scroll down to the page, on HTTPS-Only Mode, select Don't Enable HTTPS-Only Mode.
  - For other browsers, you can add [wifihm-config.com](http://wifihm-config.com) to your browser unprotected site so that you can access the config page.

### **Connecting iTrixx to WiFi Network**

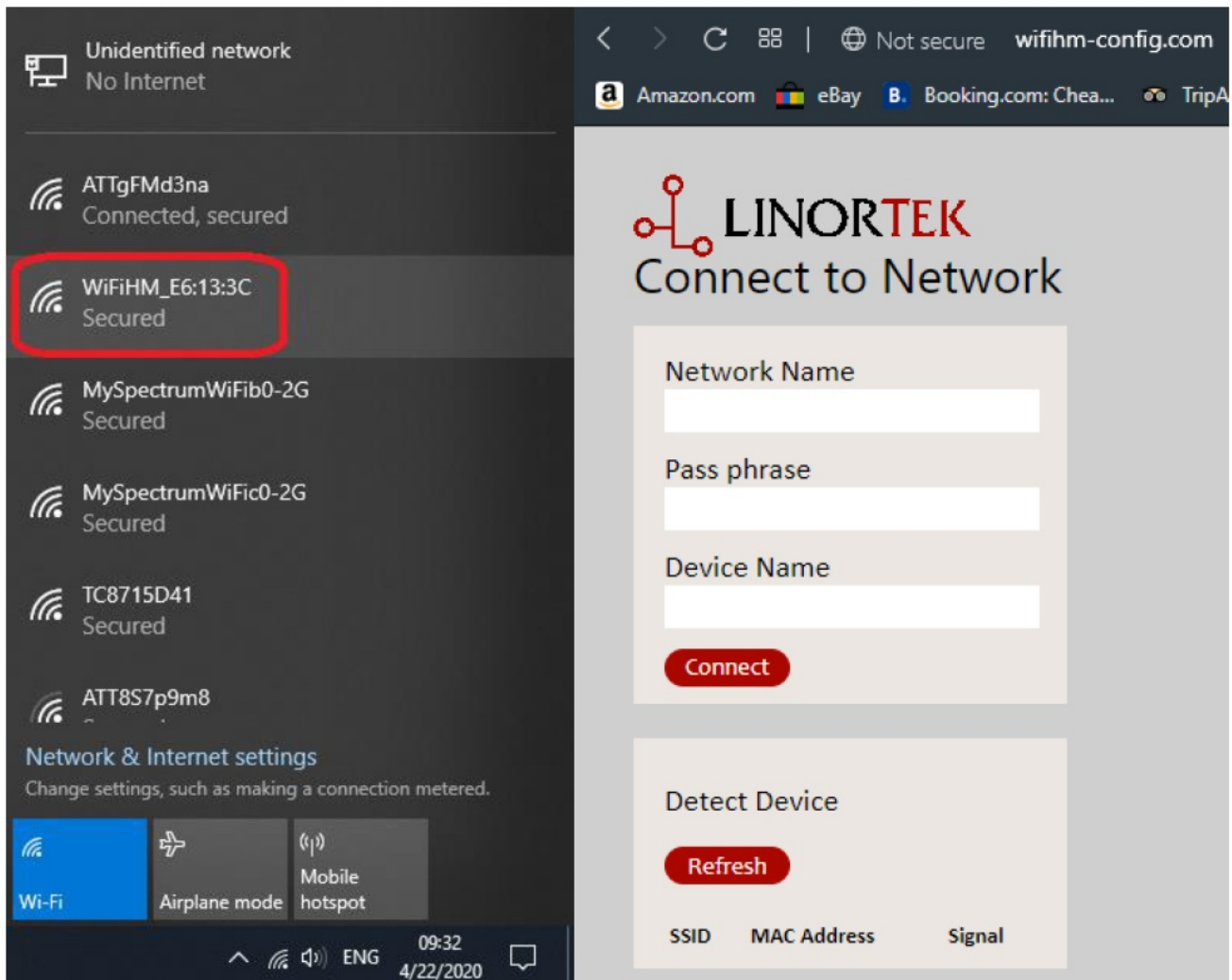
After having all the information ready from the previous step, powering up the iTrixx server, you are now ready to connect it to your network. To connect, follow the steps below:

1. Open the cover of the iTrixx, locate the DFLT button, push and hold the DFLT button with a paper clip until the blue LED starts flashing. Your device is now in Provisioning Mode. You have 2 minutes to configure connect to your network before this mode times out. Once the Provisioning mode times out, you will need to repeat the first step and put it in Provisioning mode.
2. Use a WiFi enabled PC or a mobile device to connect to your server's AP (WiFi enabled device is only required for the initial setup, once you have connected your iTrixx to your network, you can use any PC on the same network to config the device). If you use a PC, click the Network icon at the right side corner, the iTrixx will be displayed as a WiFi network named WiFiHM\_xx:xx:xx (The x's make up the last 6 characters of your device's MAC address)
3. When prompted enter the password: wifihmpsk
4. Once connected you may receive a message stating there is no internet connection. Disregard this message.
5. Using your web browser, type in this URL: <http://wifihm-config.com> .  
Note: Please make sure your browser doesn't change http to https!
6. Enter the name of your WiFi network under Network Name and your WiFi password under Pass phrase

Click Connect. The Blue LED on your device will stop blinking and stay on solid. Your iTrixx server is now connected to your network, at this time, your computer should connect back to your network. If it's not automatically switched to your network, click the network icon on your computer, and select the same network your

iTrixx connected to in our previous step.

Troubleshooting: If you are unable to connect the iTrixx to your WiFi network (error message: reject to connect), this is because your WiFi security blocks unrecognized SSIDs, please contact your IT department to whitelist the SSID for the iTrixx device.



## Find the IP address

Before using Telnet to config to your iTrixx, you will need to find its IP address from your network.

The easiest way to find your server's IP address is by using the Linortek Hour Collector app. Once you open the HourCollector App, it will display all iTrixx devices that you have installed on the same network. If you can't find the IP address, press the RESET button with a paper clip and it will identify upon reboot.

You may also find your device's IP address by signing on to your router and searching the list of connected devices. Your iTrixx hour meter will be identified on your router as WiFiHM\_xxxxxx where the x's are the last 6 characters of the device's MAC address.

## 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

Hour Meter Collector

LINORTEK

DISCOVER DATA SELECTION 5 | APPLY SAVE AS

☒ IP Address ☒ Meter Name ☒ Date/Time ☒ Meter 1 ☒ Meter 2 ☒ Inputs ☒ Relays ☒ Sensor ☒ Port ☒ Mac Address ☒ WRITE ALL DATA

| IP Address         | Meter Name    | Date/Time                    | Meter 1             | Meter 2             | Inputs  | Relays          | Sensor                             | Port    | Mac Address       |
|--------------------|---------------|------------------------------|---------------------|---------------------|---------|-----------------|------------------------------------|---------|-------------------|
| 172.16.1.37        | ULTRAHM-DEMO  | Mon, 11 Oct 2021 09:16:22 AM | Hours: 000660.05; R | Hours: 000000.00; S | 1.1     | 0.0.0.0.0.0.0.0 | 11.9 VDC; IT > 37.0 DegC           | 8019    | 80:1f:12:90:92:cf |
| 172.16.1.49        | not yet known | 20211011T132138+0000         | 157.36 (R)          | 2355.64 (R)         | 1.1.0.0 | 0.0.0.0.0.0.0.0 | 34.02C                             |         | F8:F0:05:E6:13:52 |
| 172.16.10.106:8... | HMDemo        | Oct 11, 2021 09:16:22 am     | Hours: 002221.34; S | Hours: 000000.38; S | 0.0.0.0 | 0.0.0.0.0.0.0.0 | AN0 ;AN1 ;11.86 VDC; IT > 41.7 ... | Port... | 04:91:62:66:E0:DD |

## Program iTrixx from Telnet

You will need to use a Telnet client to configure your iTrixx server. To configure Telnet on Windows 8.1 or Windows 10, follow these steps:

1. Open Control Panel
2. Select Programs
3. Under Programs and Features select Turn Windows features on or off
4. Scroll down and select the checkbox for Telnet Client and click OK

**To connect to the iTrixx server using your PC, follow these steps:**

1. Search Command Prompt on your search bar (Windows 10), click and open Command Prompt
2. Enter telnet nnn.nnn.nnn.nnn 30316 where n is your device's IP address
3. Once connected, it will prompt you for a password. By default, this password is the last 6 characters of its MAC address – without colons and all lower case– which can be found printed on the enclosure or the HourCollector App. (ex: cd56ef)
4. After entering your password, all available commands will be listed in the command prompt window. For details of how to use the commands, please refer to the manual Appendix 1: Available Commands.

```

C:\> Command Prompt
Microsoft Windows [Version 10.0.18363.778]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\henry>telnet 192.168.1.234 30316

```

You can also download a TCP Telnet app for a mobile device to be able to send Telnet commands to the WFMN provided the mobile device is also connected to the same WiFi network (does not work on cellular network).

## iTrixx Server Basic Configuration

To configure your server, you will need to issue commands via the Telnet terminal. This section will cover the basic configuration of your device. For a full list of commands and syntax, see the Available Commands on the iTrixx-

**IMPORTANT NOTE:** Make certain to use the save command after making changes otherwise your changes will be lost when your server reboots.

#### 1. Naming your server

To make your iTrixx server more identifiable on your network, enter `server=<name>` replacing `<name>` with your desired server name.

#### 2. Setting Time and Date

By default, your server is configured for GMT. To adjust the time zone, enter `timezone=x` where `x` is your time zone offset. For example: `timezone=-5` for EST, `timezone=-4` for EDT if you are in Eastern DayLight-Saving time. To check your server's time, you may enter the command: `time`. This will display the current time and date formatted as: `yyyymmddThhmmss` followed by the time zone offset (ISO 8601). For example:

`20200422T133000-0400` for 4/22/2020 1:30pm GMT-4.

You may also set your preferred NTP server and update interval. By default, your server uses the NTP server: `time.nist.gov` and updates the time every 11 minutes. To change the NTP server, enter `ntphost=<NTP host name>` (ex: `ntphost=time.nist.gov`). To change the update frequency, use the command `ntpperiod=x` where `x` is the update frequency in minutes (ex: `ntpperiod=11`)

Note: If you build a dedicated network for the iTrixx to collect machine data without internet connection, the iTrixx server will not be able to reach the NTP server and update its time. To make the iTrixx server to get the time from your computer, you need to disable the NTP host with this command: `ntphost=` Once you click the Discover button on the HourCollector desktop app, it will send UDP message with current date/time to the iTrixx server. (This feature is available for software version 0.58.0v. and up)

### **Activating the Meter**



```

> report
OK
{
  "reason": "manual report",
  "server": {
    "name": "mobiletest",
    "ip": "172.16.1.185",
    "port": "30315",
    "s.name": "mobiletest",
    "mac": "F8:F0:05:E6:13:01",
    "ap_mac": "40:ED:00:DA:D0:68",
    "td": "09000911T0000000-0600",
    "inputs": "1.0.0.0",
    "relays": "0.0.0.0.0.0.0.0",
    "input_voltage": "11.39",
    "onboard_temp01": "33.81",
    "onboard_temp01_type": "C",
    "g_max": "1.07G",
    "boot_count": "39"
  },
  "report": [
    {
      "name": "Meter 1",
      "value": 1711.28,
      "status": "R"
    },
    {
      "name": "Meter 2",
      "value": 0.07,
      "status": "S"
    }
  ],
  "AIN": [
    {
      "name": "AIN1",
      "value": 0.01
    },
    {
      "name": "AIN2",
      "value": 0.00
    }
  ]
}

```

To use the current sensor data to activate the meter counter, you will need to run a test on the software to find out what's the voltage threshold when a machine is running and you want the iTrixx start counting.

Once you installed the iTrixx on your equipment, and connected the device to your network, using Telnet and run 'report' command. Simply type 'report' and press Enter, you will see a list of reports for your device, including the current readings, input data.

AIN1 shows 0.00-0.01V when there is no current draw.

Start your equipment, when the equipment is running, you need to run the 'report' command again, see what is the number for AIN1 when the equipment is up and running, the AIN1 might show a different number, you then can use this number for the trigger. Let's say the AIN 1 reading is 0.3 at full run. There are two-meter counters on the software, you can use one for uptime, one for downtime. In this example, we use the current reading to activate the meters – when the equipment is on, count it as uptime, down for downtime. Here are the triggers you need to enter on the Telnet:

- trigger=ain.1,gt.0.3:0.1,hm.1 (Start Hourmeter 1 whenever AIN1 shows more than 0.3; stop the meter when AIN1 shows 0.1 – Uptime)
- trigger=ain.1,le.0.1:0.3,hm.2 (Start Hourmeter 2 whenever AIN1 shows less than 0.1, stop when AIN1 shows 0.3 – Downtime)

'save' – to save the configurations

For complete product documentation including list of configurations and triggers, current software, web pages and various utilities, visit <https://www.linortek.com/downloads/> . The product manual, as well as software updates, are available for download.

## Technical Support

If you need assistance on setting your devices, please feel free to contact us:

- Phone: (001)[336-485-6199](tel:336-485-6199)
- Email: [support@linortek.com](mailto:support@linortek.com)

You can also start a chat from our website to reach our support teams.

## Linor Technology, Inc.

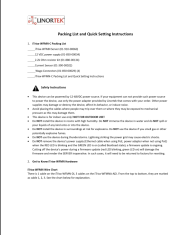
Information subject to change without notice.

- [www.linortek.com](http://www.linortek.com)




## FAQ

- **Q: What should I do if my iTrixx server gets stuck during the firmware update?**  
A: Do not power off the device. Contact the factory for resetting to avoid damaging the firmware.
- **Q: How can I find the MAC address of my device?**  
A: The MAC address is located at the back of your device. It is the last 6 characters you need for login credentials.

## Documents / Resources

|   |  |
|---|--|
|  | <a href="#">LINORTEK WFMN Machine Hour Meter [pdf]</a> Instruction Manual<br>iTrixx-WFMN-C, iTrixx-WFMN-Di, iTrixx-WFMNA-ADi, WFMN Machine Hour Meter, WFMN, Machine Hour Meter, Hour Meter, Meter |
|---|--|

## References

-  [Linortek Remote IO, Audible & Visual Alarm Systems, and IoTMeter](#)
-  [Linortek Remote IO, Audible & Visual Alarm Systems, and IoTMeter](#)
-  [Downloads/Resources](#)
- [User Manual](#)

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