STEP-BY-STEP USER GUIDE
WatcherJET 3.0

WatcherJET
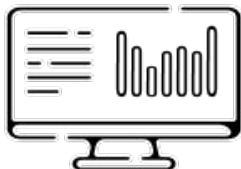Industrial Monitoring
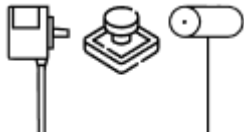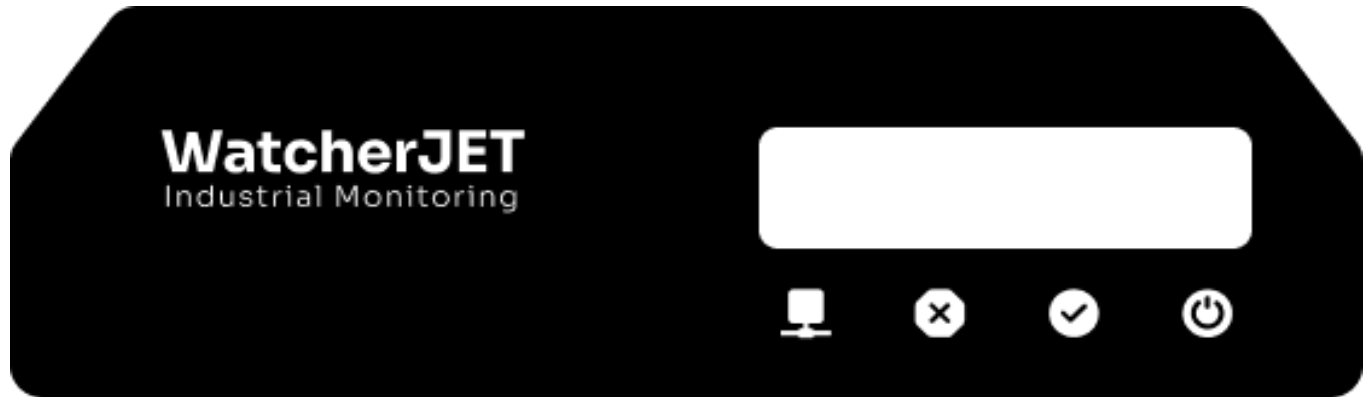
Step 1:

Connect the sensors

Step 2:

Connect the power supply

DC= 12V-24V

Step 3:

Provide an access point (AP)

Step 4:

Go to console.monitait.com/factory/watchers to add your watcher and get real-time feedback

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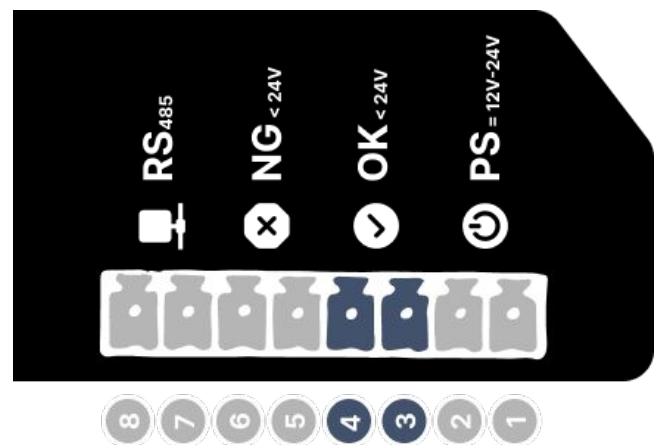## External machine signal

- **Production Count**

  Any 12-24 signal from the machine can be used as a one piece counter. Connect 2 wires from your machine to the OK inputs (3 and 4) to start counting automatically with WatcherJET.

  *Bidirectional signal and isolated by internal optocoupler

- **Counting Defects**

  Connect the ejector signal or the machine output to the NG inputs (5 and 6).
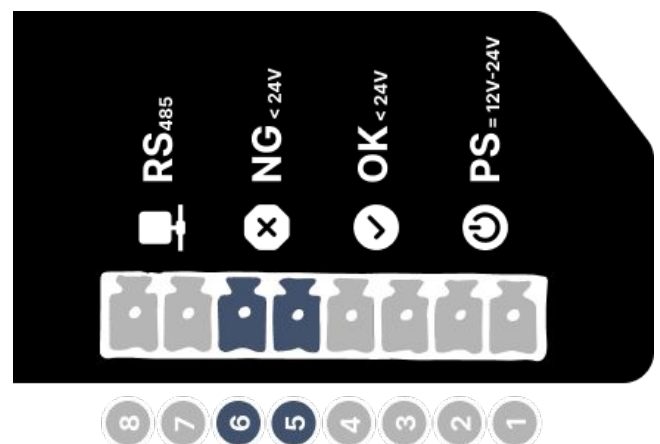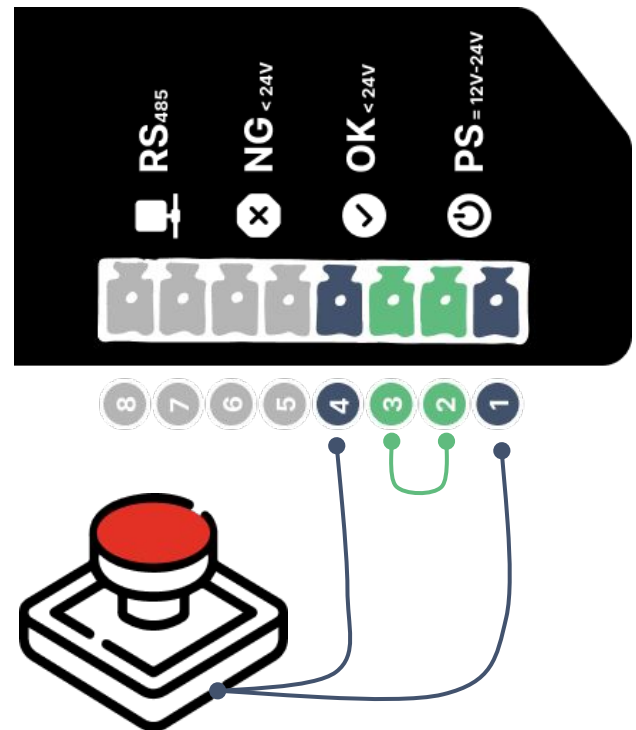
Push button

- **Production Count**

  Take one wire from the push button and connect it to the **OK input (4).** Connect the other wire from the same button to the **negative power input (1).**

  Now, take a wire and connect the **other OK input (3) to the positive power input (2).**
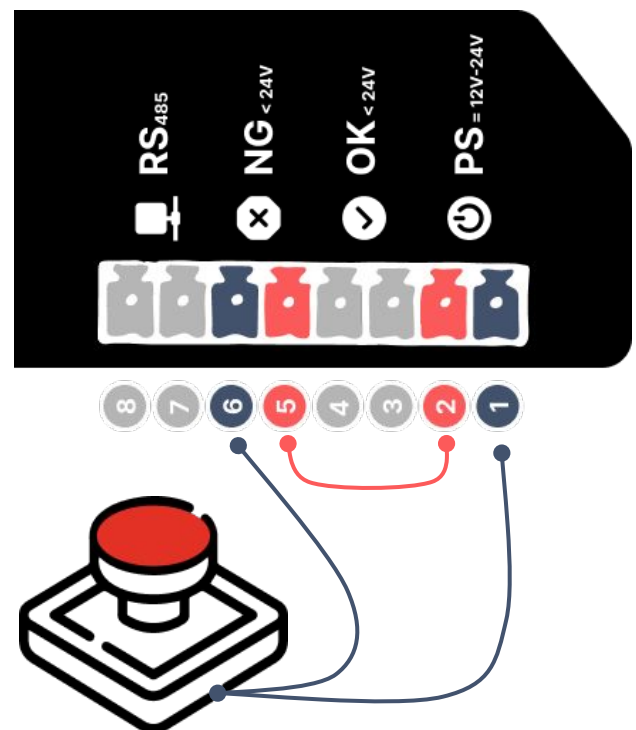

- **Counting Defects**

  To count defects with a push button repeat the same steps with another push button and the NG inputs.

  Take one wire from the push button and connect it to the **NG input (6).** Connect the other wire from the same button to the **negative power input (1).**

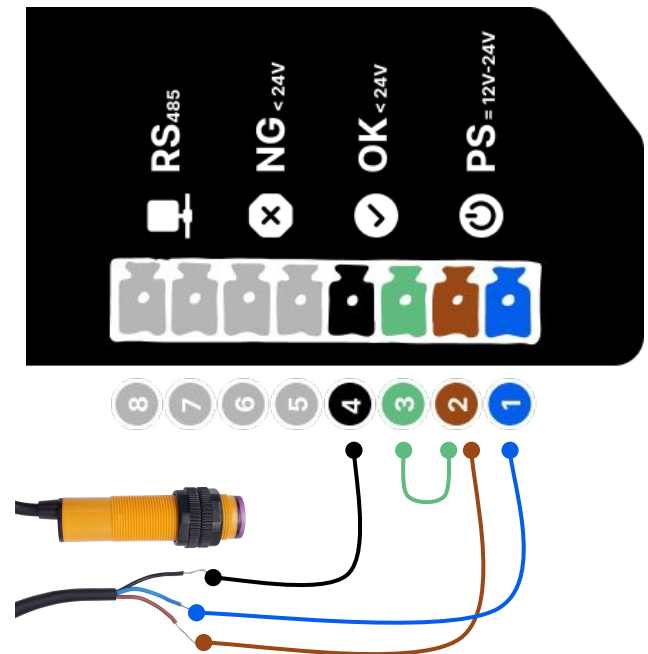 Now, take a wire and connect the **other NG input (5) to the positive power input (2).**

Obstacle sensor

- **Production Count**

  Take the sensor **black wire** and connect it to the **OK input (4).** Then connect the **brown wire** to the **positive power input (2)** and the **blue wire** to the **negative power input (1).**

  Now, take a wire and connect the **other OK input (3) to the positive power input (2).**

- **Counting Defects**

  To count defects with a obstacle sensor repeat the same steps with another sensor and the NG inputs.

  Take the sensor **black wire** and connect it to the **NG input (6).** Then connect the **brown wire** to the **positive power input (2)** and the **blue wire** to the **negative power input (1).**

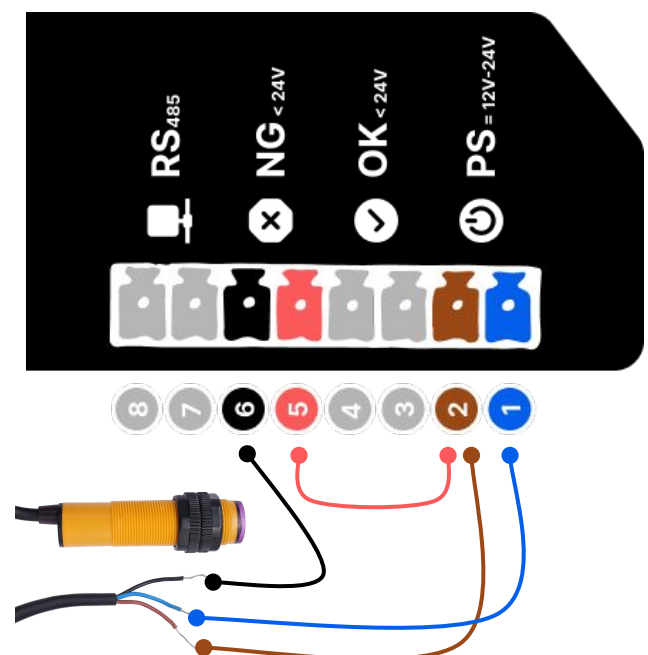 Now, take a wire and connect the **other NG input (5) to the positive power input (2).**
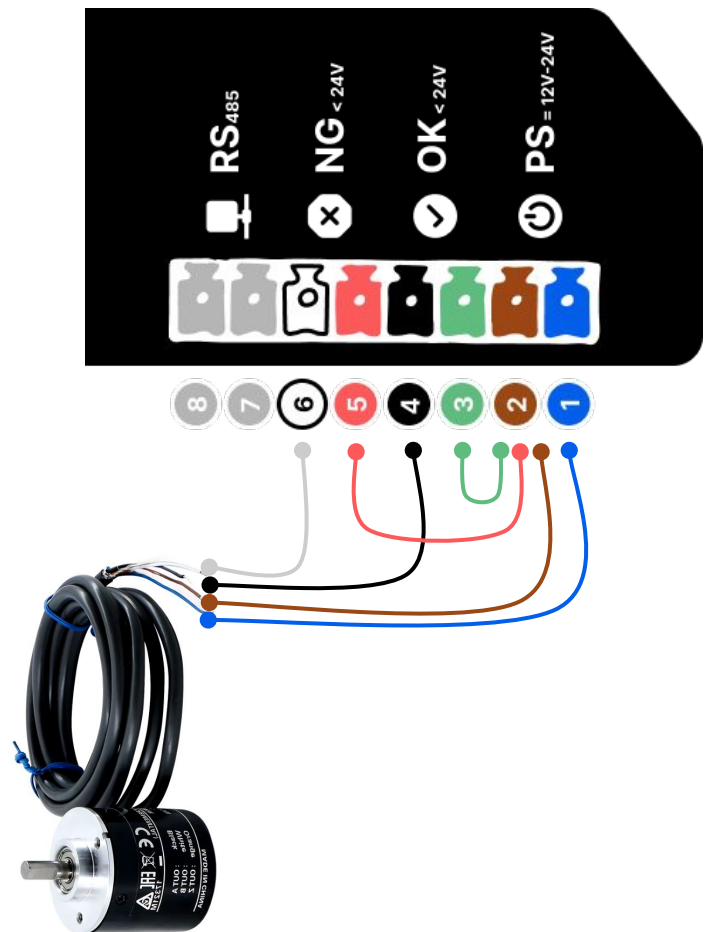
Step 1: Connect the sensors

Encoder

Take the encoder **white** wire and connect it to one of the **NG inputs (6).** Then take the **black wire** and connect it to the **OK input (4).** Now, connect the **brown wire** to the **positive power input (2)** and the **blue wire** to the **negative power input (1).**

Finally take two wires and connect the **other OK input (3) and the other NG input (5) to the positive power input (2).**

RS₄₈₅ protocol

If you want to connect more than one sensor to your device and collect other types of data you need to use RS485 protocol. Take the A lead from your RS485 BUS and connect it to the RS485-A inputs (8) then take the B lead of the RS485 BUS and connect it to the RS485-B inputs (7).
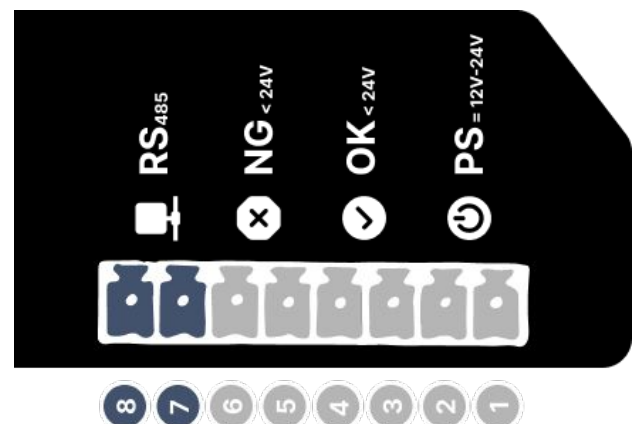
Plug the device into power

Connect the power supply unit to the power inputs (1,2) then plug into power and check if the green light for the power turns on.
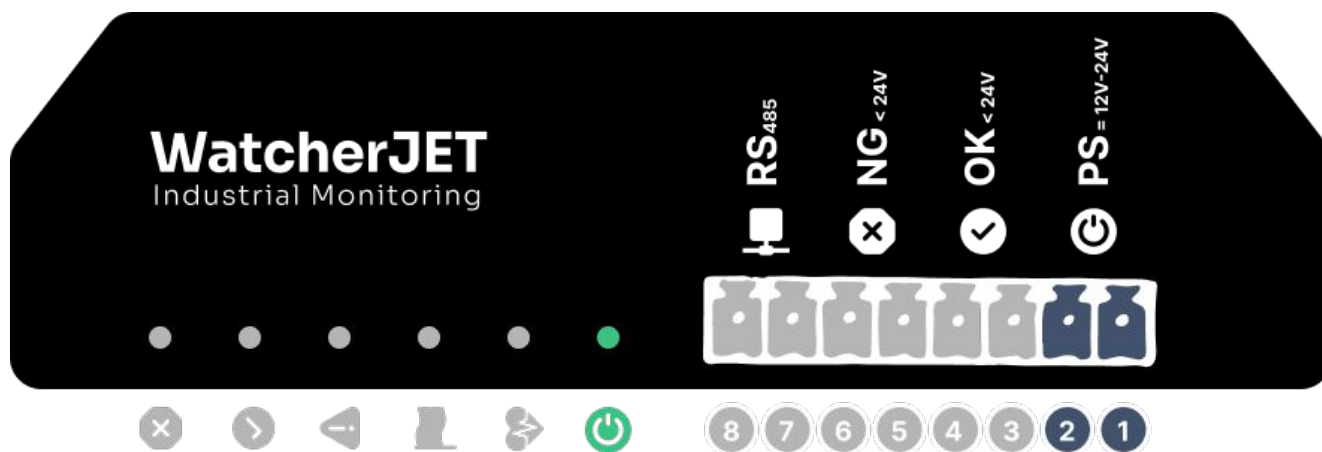
Power supply specifications

Power Supply Unit (Recommended)	
Input Voltage	12-24v DC
Output Voltage	12-24v DC
Input Current	100mA
Maximum output current	2A
Frequency	50Hz
Operating Temperature	-10 to 50 ºC

Temporary setup using mobile hotspot

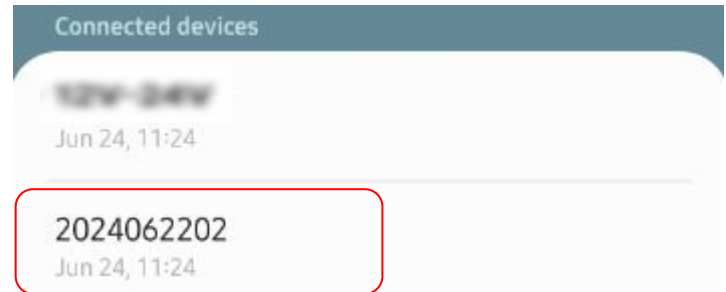*Use this to test your watchers

1. Turn on the hotspot
2. Change hotspot name & password

    *Name: **Monitait**

    *Password: **p@ssword**

    The watchers will connect to the hotspot automatically (this might take a few seconds)
3. Go to connected devices on your phone to find watcher register ID

Permanent setup using router

You can use any type of router you have for this step but if you are considering acquiring new ones there are three models that have been tested and completely compatible with WatcherJET system:

Tenda N301 - setup

D-Link DIR-612 - setup

UniFi AP-AC-LR - setup

LAN network connection (Best practice)

Use Ethernet cables to connect your device to the router or switch. Ensure the cables are securely plugged in.

We strongly recommend that you use this option to have a longer uptime and a more reliable connection.

If you are using a firewall add a rule and give access to this address:
*.monitait.com

LAN Port

Step 4: Go to console.monitait.com
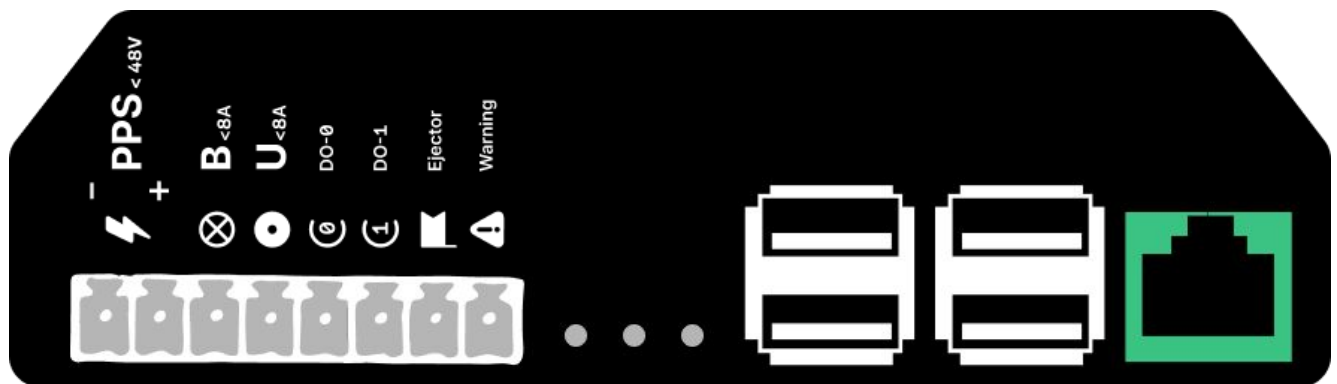
1. Sign up or log into your monitait account from <u>console.monitait.com</u>

2. Go to the **watchers tab** from the factory & setup section On the Monitait panel and click on the +Add Watcher button

Powered by Monitait
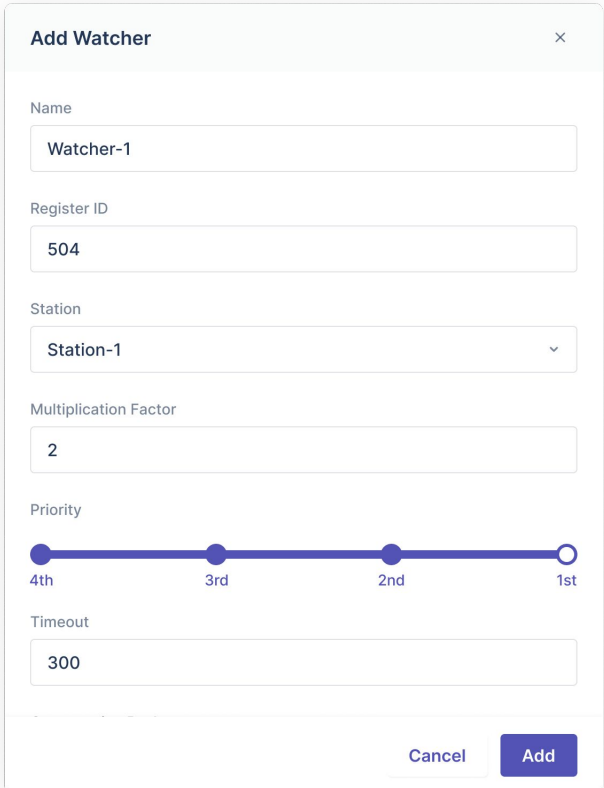
3. On the add watcher modal pick a name for your watcher then enter the watcher's **registration ID** on your device and select the station where this watcher is going to be installed.

Advanced settings:

- **Multiplication Factor:** Sets the quantity for each received signal
- **Priority:** Specifies which data to prioritize when receiving data from multiple watchers.
- **Timeout:** Defines the minimum duration that will be considered downtime when the watcher isn't sending signals.

Add Watcher   ×

Name

Watcher-1

Register ID

504

Station

Station-1

Multiplication Factor

2

Priority

4th   3rd   2nd   1st

Timeout

300

Cancel   **Add**

4. To confirm connectivity and healthy data capturing, initiate counting with the sensors and check if the red LED with the heart icon (💓) blinks.

WatcherJET
Industrial Monitoring
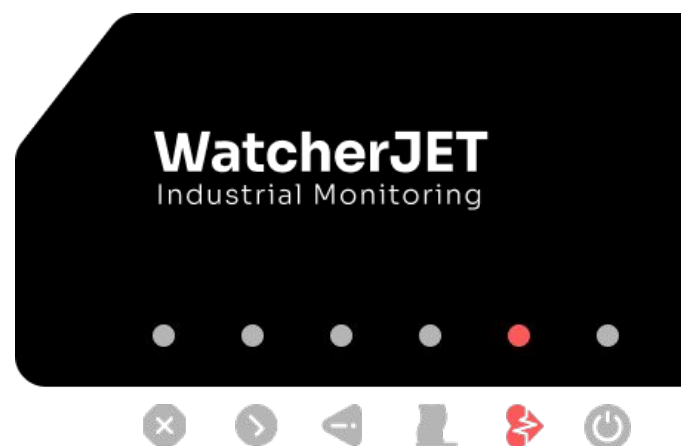
If only one sensor is connected for counting (inputs 3 and 4), the LED with the checkmark icon (✓) will light up during the counting of acceptable products.
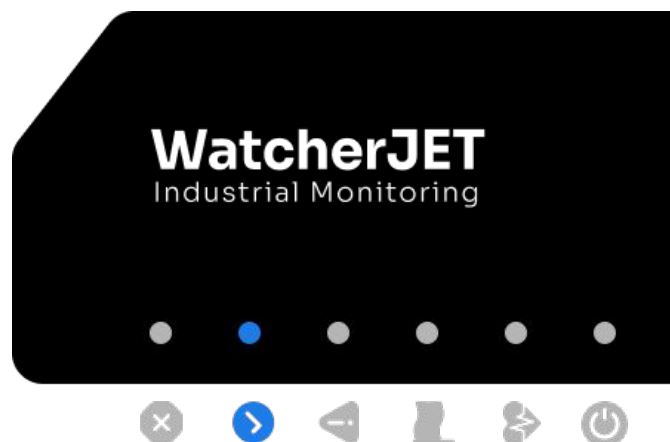
If a sensor is connected for counting defects (inputs 5 and 6), the LED with the rejection icon (✗) will turn on during the counting of defective products.
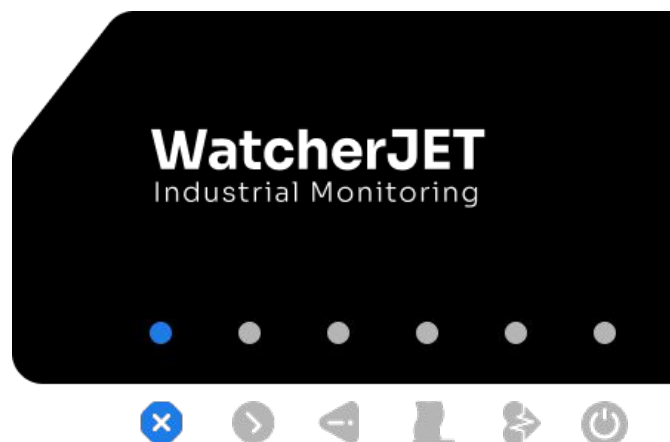
5. Go to your Monitait **dashboard** to view your production data

— cam-118 Total: 0   — 75 Total: 2838393
— 2024040502 Total: 8681338
— 2024030302 Total: 5782055

— cam-118 Total: 6   — 75 Total: 75
— 2024040502 Total: 174   — 2024030302 Total: 119
— 2024022002 Total: 934   — 1234567899 Total: 101

Step 1: Connect the high current power supply
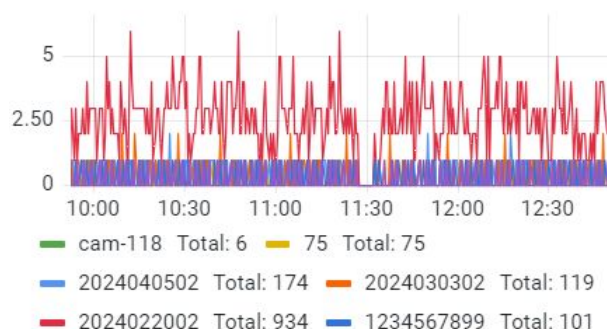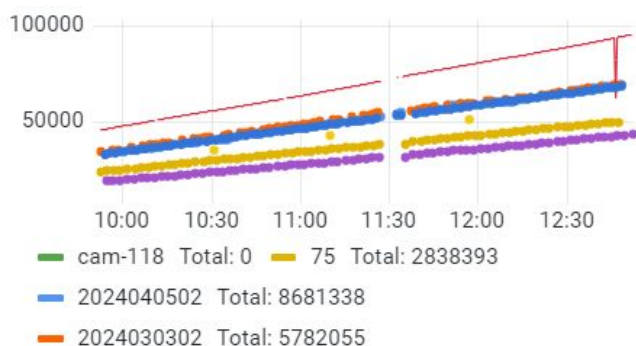
> ⚠️ **Caution!**
>
> Before using a high-current power supply, make sure you fully understand how it works and follow all the safety instructions in its manual and **ENSURE THAT YOUR POWER SUPPLY IS NOT EXCEEDING 48V.**

- Take a wire and connect one of the negative power supply outputs to the negative PPS input on the watcher (10).

- Take another wire and connect one of the positive power supply outputs to the positive PPS input on the watcher (9).

- After connecting the wires, confirm proper wiring by checking that the green light with thunder icon (⚡) is on.
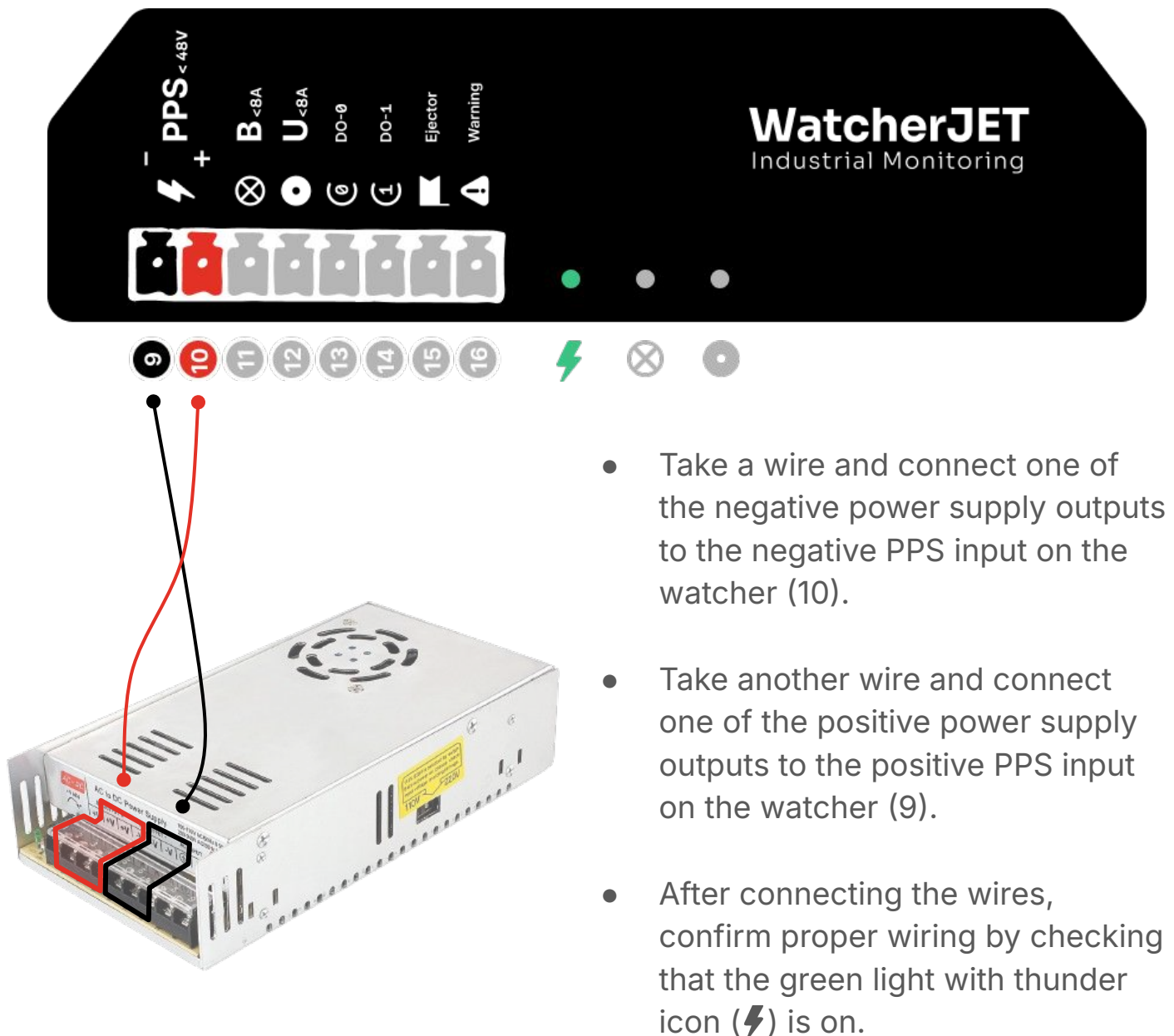
Connecting the emitters

Any device or component that generates and releases a specific type of signal, such as light, sound, or electromagnetic waves, projecting it in an unidirectional flow, can be considered an emitter.
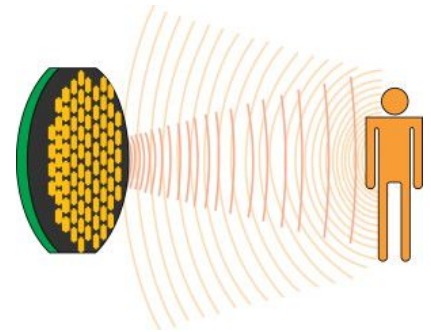
Take the positive contact from the emitter and connect it to the positive PPS input on the watcher (10).
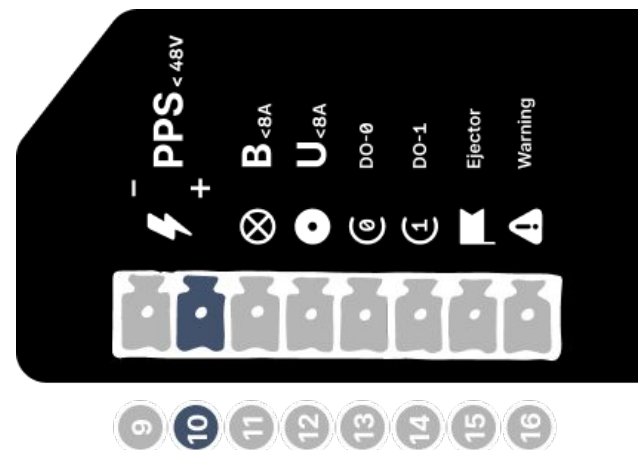
> ### 💡 Hint!
>
> For optimal protection of the WatcherJET system from potential high-current damage, it is strongly recommended that you connect the positive terminal of the emitters directly to the positive output of the power supply.

The rest of this process depends on the emitter intended placement:

- **Adverse Emitters:** If the emitters are placed far from the detector and their signal comes from the other side they are considered to be 'adverse'. In this case take the **negative contact from the emitter** and connect it to the **B output (11)** on the watcher.

- **Aligned Emitters:** If the emitters are positioned side by side and in close proximity to the detector, they are considered to be 'aligned'. In this case take the **negative contact from the emitter** and connect it to the **U output (12)** on the watcher.

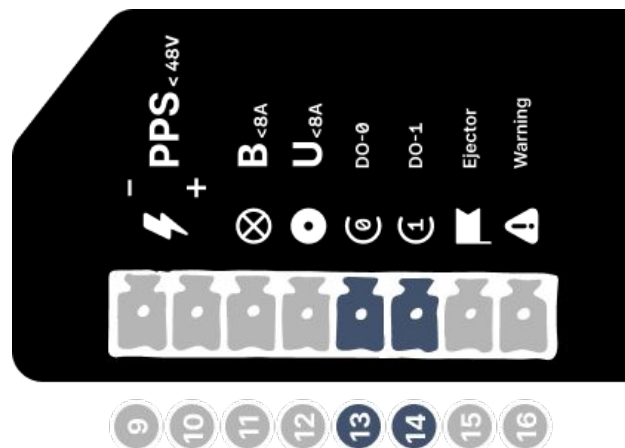- Check the blue LED associated with each emitter to determine whether the emitter is active.

> ## 💡 Hint!
>
> You can use a SSR relay if the emitter demands more than 8A.

Digital Outputs

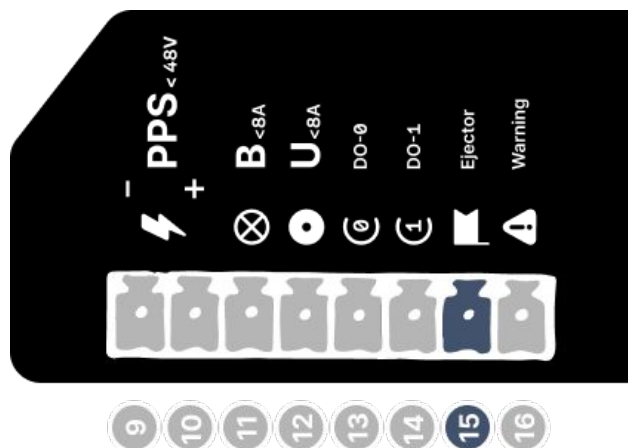DO-0 and DO-1 (13 and 14) are digital outputs and they need advanced settings.
Contact our technical team to learn more about these outputs.

Ejector

To take action based on the collected data you can connect the ejector output (15) to your PLC digital input.
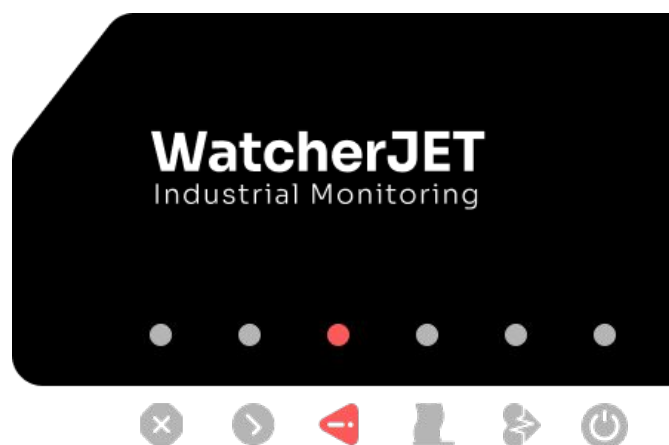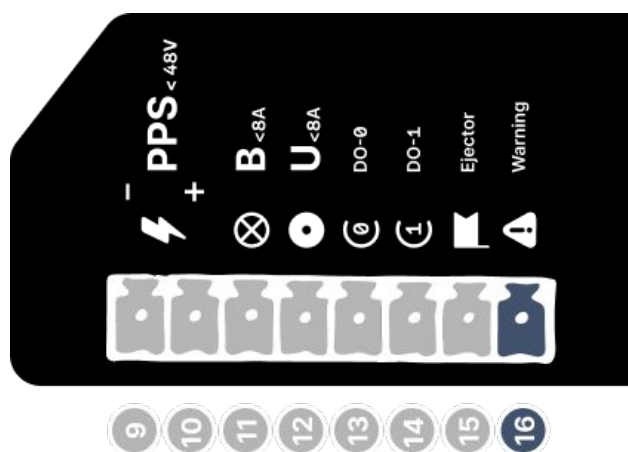
The LED indicator for the ejector is located on the other side and will blink whenever an item is ejected.

Warning

You can also connect warning output (16) to your PLC digital input to get notified about the mechanical risks.

The LED indicator for warnings, located on the other side, will activate whenever there is a mechanical risk.
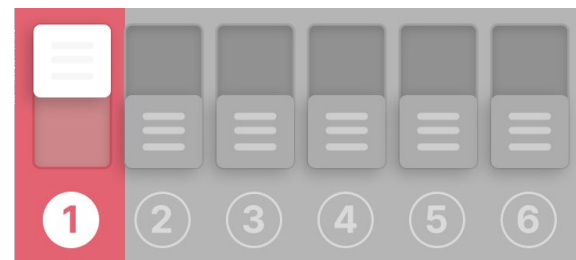

*For your safety, please reach out to us to consult with our experts regarding the warning.

⚠️ **Caution!**

These outputs are just OPTO isolated NPN outputs. PLEASE DO NOT USE THESE FOR ANY HIGH CURRENT LOAD.
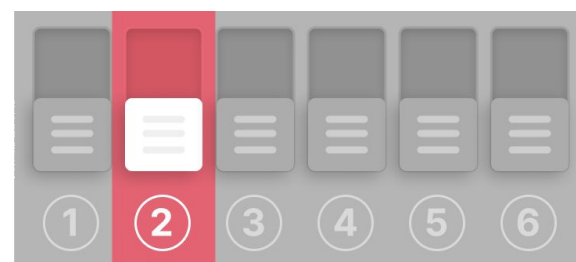
The Keys

Key-1: Buzzer

This button controls the buzzer, which is enabled by default. You can turn it off by switching down the button if the sound is not needed.

Key-2: Battery

If you need to use batteries, you must provide two 18650 batteries and turn on this key.

*Please note that this involves opening the device, which is done at your own responsibility.

Key-3: Camera

After connecting the camera to your device, you must turn on this switch to begin data collection via the camera. Until the switch is activated, WatcherJET will disregard the connected camera.

Key-4: Scanner

If you are using the scanner for module training or other functions, please activate Key 4 to allow WatcherJET to identify the scanner.

Key-5: TX and Key-6: RX

Keys 5 and 6 establish the RS232 connection between the Arduino and the Raspberry Pi. If you intend to use the external connectors, you must turn off these two keys. For example, when you want to use FabriQC/PartQC.
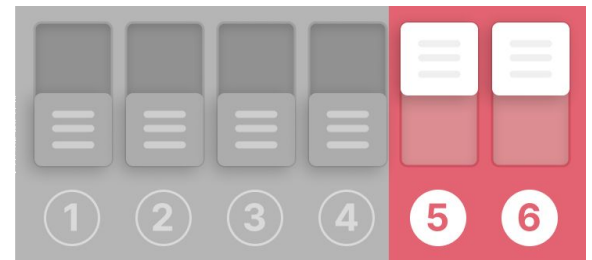
Adjustment screws

The function of the two screws next to the keys is to adjust the counting frequency. The default frequency for counting ranges from zero to 1700 Hz, which should be sufficient for most applications. However, there may be production lines with higher speeds that experience signal loss. In such cases, they can turn the screws clockwise to increase the frequency until no signals are lost.