



AI on the edge

in zabbix

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Who We Are & Why This Topic

unlocking
The value
Of data

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Zabbix Certified

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Zabbix Certified

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Zabbix Certified

Professionals

ZABBIX

wazuh.

 PostgreSQL



ZABBIX

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 **PostgreSQL**

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standard.**

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Heimónex



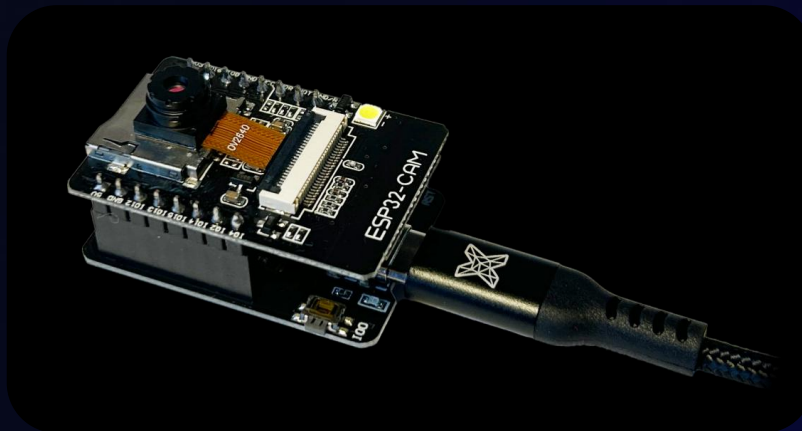
The Idea In One Picture

The Idea in One Picture

Camera → ROI processing → Inference → JSON/MQTT/HTTP → Zabbix



water meter



ESP32-CAM

```
{
  "main": {
    "value": "103.4210",
    "raw": "103.4210",
    "pre": "103.4210",
    "error": "no error",
    "rate": "0.023780",
    "timestamp": "2025-10-10T16:00:00+0200"
  }
}
```

API number preview

(Images stay in LAN; we send results, not streams)

The Idea in One Picture

Camera → ROI processing → Inference → JSON/MQTT/HTTP → Zabbix

01




- A simple Setup Wizard is ready at <http://<IP-of-your-device>/setup.html> you can relaunch it anytime by visiting that URL directly.
- For a quick start, use the DEMO data from the [jomjol](#) repository.

The Idea in One Picture

Camera → ROI processing → Inference → JSON/MQTT/HTTP → Zabbix

02




Digitizer - AI on the edge - Initial setup
 An ESP32 all inclusive neural network recognition system for meter digitalization

Restart Setup Previous Step Next Step Abort Setup Setup Progress: WiFi Signal: Excellent (-52dBm)

Step 4 / 7: Configuration Of ROIs For Digit Numbers

Digit ROI
 ▼ [CLICK HERE](#) for usage description. More info in documentation: [ROI Configuration](#)
 Region Of Interest (ROI) for digit numbers can be defined on this page. If no digit numbers need to be processed, disable digit processing by deselecting "Digit ROI Processing".
 By default one number sequence (a number sequence contains of 1-x digit ROIs + 1-x analog counter ROIs which are processed together) is predefined and already selected in the drop down "Number sequence". If you need more than one number sequence additional one's can be added with the buttons next to the drop down. Each number sequence will be processed separately.
 Using drag and drop by mouse or by manually entering the parameters into the given fields the digit ROIs can be positioned to the digit numbers on the reference image. To have proper ROI definition please check the documentation: [ROI Configuration](#). It's very important to be really precise to have reliable processing. With the drop down "ROI" you can change between the different ROIs in the selected number sequence. To create new ROIs use "New ROI".
 The order of the ROIs defines the position (and therefore the multiplication factor) within the reading sequence. The position in the number sequence can be changed with the buttons "Move ROI Lower" and "Move ROI Higher". The multiplication factor which is shown below the ROI drop down is the multiplication factor of pure position/order in number sequence and the factor right-hand side to this is the additionally corrected by decimal shift setting (configuration, expert parameter, default: 0).
 After definition of digit ROIs is completed don't forget to save with the "Save Config" button!
NOTE: There is no need to perform a reboot after every saving or step. It's sufficient to reboot after all configuration steps (reference image, alignment, ROI configuration) are completed to activate new configuration.

☒ **Digit ROI Processing**

Number Sequence:
 main New Sequence Rename Sequence Delete Sequence

ROI:
 dig4 New ROI Rename ROI Delete ROI
 Multiplier: x1000 (only based on order) Multiplier: x1000 (order + decimal shift: 0)
 Move ROI Higher Move ROI Lower

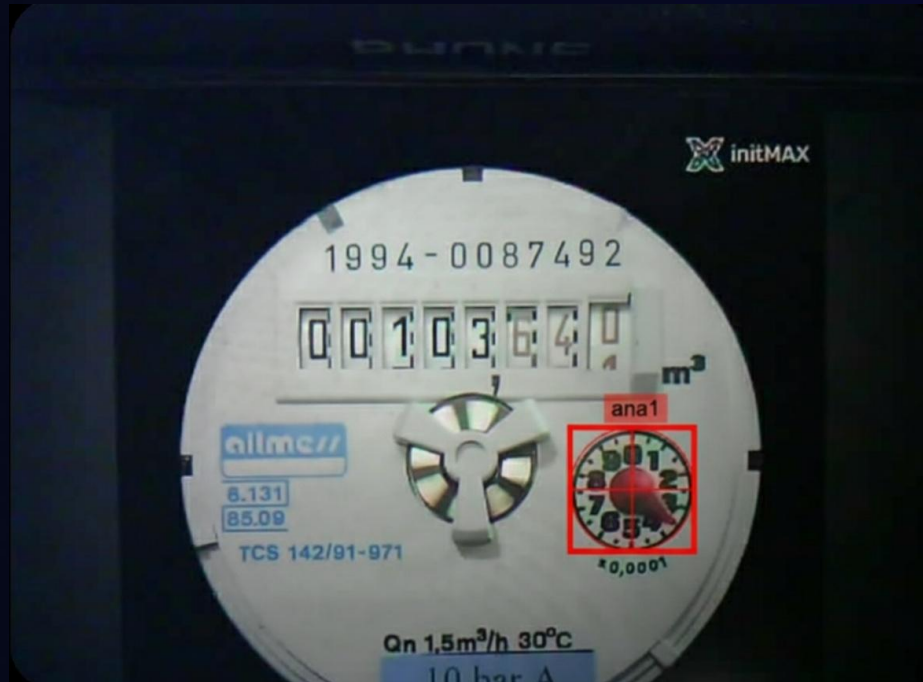
x: 318 Δx: 21
 y: 211 Δy: 38


The following settings are only used for easier setup, they are not persisted on the device:
☒ Show all ROIs
☒ Lock aspect ratio
☒ Synchronize x, Δx and Δy between ROIs
☒ Keep equidistance of 8 between all ROIs

The Idea in One Picture

Camera → ROI processing → Inference → JSON/MQTT/HTTP → Zabbix

03




Digitizer - AI on the edge - Initial setup
 An ESP32 all inclusive neural network recognition system for meter digitalization

Restart Setup Previous Step Next Step Abort Setup Setup Progress: WiFi Signal: Good (-61dBm)

Step 5 / 7: Configuration Of ROIs For Analog Counters

Analog ROI
 ▼ [CLICK HERE](#) for usage description. More info in documentation: [ROI Configuration](#)
 Region Of Interest (ROI) for analog pointer counter can be defined on this page. If no analog pointer counter need to be processed, disable analog pointer counter processing by deselecting "Analog ROI Processing".
 By default one number sequence (a number sequence contains of 1-x digit ROIs + 1-x analog counter ROIs which are processed together) is predefined and already selected in the drop down "Number Sequence". If you need more than one number sequence additional one's can be added with the buttons next to the drop down. Each number sequence will be processed separately.
 Using drag and drop by mouse or by manually entering the parameters into the given fields the analog ROIs can be positioned to the analog pointer counters on the reference image. To have proper ROI definition please check the documentation: [ROI Configuration](#). It's very important to be really precise to have reliable processing. With the drop down "ROI" you can change between the different ROIs in the selected number sequence. To create new ROIs use "New ROI".
 The order of the ROIs defines the position (and therefore the multiplication factor) within the reading sequence. The position in the number sequence can be changed with the buttons "Move ROI Lower" and "Move ROI Higher". The multiplication factor which is shown below the ROI drop down is the multiplication factor of pure position/order in number sequence and the factor right-hand side to this is the additionally corrected by decimal shift setting (configuration, expert parameter, default: 0).
 After definition of digit ROIs is completed don't forget to save with the "Save Config" button!
 NOTE: There is no need to perform a reboot after every saving or step. It's sufficient to reboot after all configuration steps (reference image, alignment, ROI configuration) are completed to activate new configuration.

☒ **Analog ROI Processing**

Number Sequence: main New Sequence Rename Sequence Delete Sequence

ROI: ana1 New ROI Rename ROI Delete ROI
 Multiplier: x0.1 (only based on order) Multiplier: x0.1 (order + decimal shift: 0) Move ROI Higher Move ROI Lower


x: 389 Δx: 81
 y: 298 Δy: 81
☐ Counter clockwise rotation (CCW)

The following settings are only used for easier setup, they are not persisted on the device:
☒ Show all ROIs
☒ Lock aspect ratio
☒ Synchronize x, Δx and Δy between ROIs

The Idea in One Picture

Camera → ROI processing → Inference → JSON/MQTT/HTTP → Zabbix

04



Digitizer - AI on the edge - watermeter

An ESP32 all inclusive neural network recognition system for meter Digitization

- Overview
- Settings
- Data
- System

Value

Previous Value

444.70000

Raw Value

103.6623

Value Status

Neg. Rate - Read: - Raw: 103.6623 - Pre: 444.7000

Process State

Flow finished (11:34:42)

System Info

Date/Time on device: 2025-10-06 11:34:43
 Last Page Refresh: 11:34:43
 CPU Temperature: 48°C
 WIFI Signal: Good (-60dBm)

The Idea in One Picture

- Many enterprise signals are still analog (meters, dials, LEDs, displays).
- Edge AI converts images → numbers locally (privacy, no cloud lock-in).
- Works with tiny budget and off-the-shelf parts (\$10 - \$20 USD).
- A simple “AI game” anyone can try, learn, and extend.

Who built it?



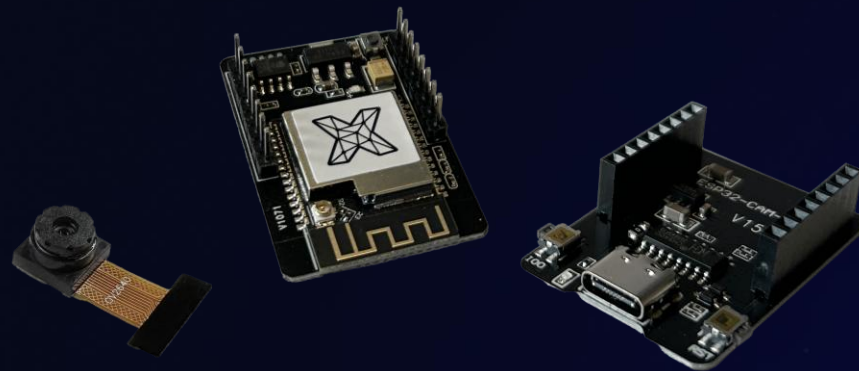
Open-source (non-commercial limits; credit: Josef / jomjol)
<https://github.com/jomjol/AI-on-the-edge-device>



The Idea in One Picture

Camera → ROI processing → Inference → JSON/MQTT/HTTP → Zabbix

01



- OV2640 camera (2 MP).
- ESP32-CAM (ESP32, **8 MB PSRAM**), 2.4 GHz Wi-Fi; power 5 V / ≥ 500 mA.
- microSD ≥ 2 GB with FAT32.
- Use ESP32-CAM-MB (USB-UART) for programming and power; connect with a USB-C cable (a USB-mini board variant is also available).
- Data cable for firmware upload, power delivery and debug console access.

The Idea in One Picture

Camera → ROI processing → Inference → JSON/MQTT/HTTP → Zabbix

02



- Workshop AI Monitoring Kit — everything you need to get started.
- Recommended: CAM Adjuster for precise lens fine-tuning.
- The kit includes a demo holder; for specific setups, you can 3D-print your own design/mount.



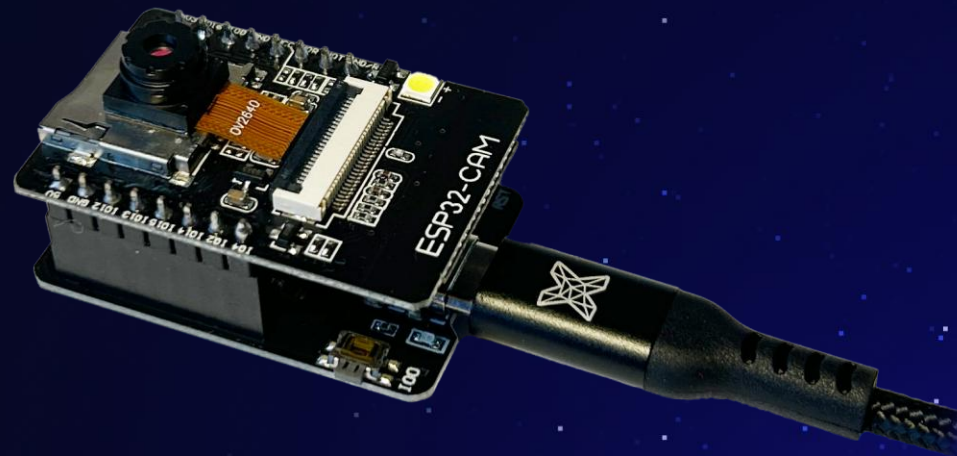
How to monitor this **with Zabbix**

Why zabbix

- **Mature open-source platform** – built-in alerting, SLA and escalations
- **Broad inputs** – HTTP Agent, MQTT (Agent2), Trapper (push/pull)
- **Large data storage (including images)** – store long-term time-series and image snapshots for audits, comparisons and model tuning
- **Item Browser** – double-check image and numeric values side-by-side
- **Clean widgets** – build clear, readable dashboards
- **Calculated/Aggregate items** – daily/monthly statistics and rollups
- **Easy-to-configure notifications and escalations**
- **Because Zabbix is COOL!!!**

Why Zabbix

Monitoring from Zabbix server or proxy via HTTP Agent
Easy to check and get your data



Why Zabbix

Monitoring from Zabbix server or proxy via HTTP agent

Item

Item

Tags

Preprocessing

Name

Watermetter RAW Data

Type

HTTP agent

Key

watermetter.raw

Select

Type of information

Text

URL

http://10.1.1.108/json

Parse

Query fields

Name	Value
name	value

Add

Request type

GET

Request body type

Raw data

JSON data

XML data

Request body

Headers

Name	Value
name	value

Add

Test item

Get value from host

☒

Host address

Port

Test with

Server

Proxy

LozaProxy X

Select

Value

{

Not supported

Error

error text

Previous value

End of line sequence

LF

CRLF

Result

Result converted to Text

{ "main": { "value": "295.505", "raw": "295.505", "pre": "295.505", "error": "no error", "rate": "0.000000", "timestamp": "2025-10-06T13:12:03+0200" }

Request body

Headers

Name	Value
name	value

Add

Get value

Time

now

Prev. time

Get value and test

Cancel

×

{

"main":

{

"value": "295.505",

"raw": "295.505",

"pre": "295.505",

"error": "no error",

"rate": "0.000000",

"timestamp": "2025-10-06T13:12:03+0200"

}

}

}

×

Why zabbix

Sending data via MQTT (recommended)



Why Zabbix

Sending data via MQTT (recommended)

☒ MQTT

☒ URI

mqtt://10.10.0.10:1883



☒ Main Topic

/summit/meter000



☒ Client ID

Trainer



☐ Username

USERNAME



☐ Password

PASSWORD



Retain Messages

disabled (false) ▾



Why Zabbix

Sending data via MQTT (recommended)

Item

Item

Tags 1

Preprocessing

* Name

Meter MQTT RAW

Type

Zabbix agent (active) ▼

* Key

mqtt.get[tcp://127.0.0.1:1883/summit/meter000/main/json]

Select

Type of information

Text ▼

* History

Do not store

Store up to

31d

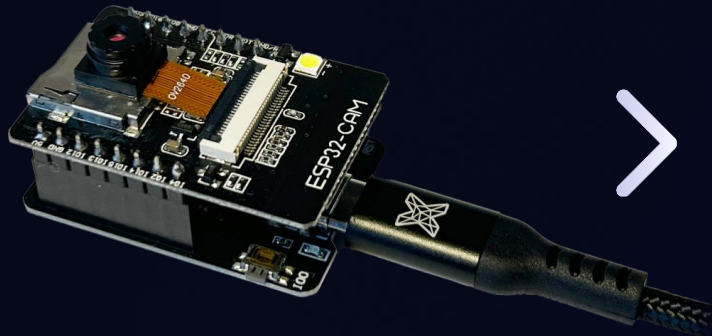
Populates host inventory field

-None- ▼

<input type="checkbox"/>	Host	Name ▲	Interval	History	Trends	Type	Last check	Last value	Change	Tags	Info
<input type="checkbox"/>	Trainer	Meter MQTT RAW mqtt.get[tcp://127.0.0.1:1...	1d	Zabbix...	9s			{ "value": "", "ra...		RAW	History

Why Zabbix

Sending data via Webhook



Zabbix sender
history.push



Why Zabbix

Webhook



**WEBHOOK
SERVER**



**Zabbix sender
history.push**



Item

Item Tags 1 Preprocessing

* Name Meter RAW

Type HTTP agent

* Key meter [Select](#)

Type of information Text

* URL http://10.10.3.11/json [Parse](#)

Query fields

Name	Value
name	value

[Add](#) [Remove](#)

Request type GET

Request body type Raw data JSON data XML data

Request body

Headers

Name	Value
name	value

[Add](#) [Remove](#)

Required status codes

Follow redirects ☒

Retrieve mode **Body** Headers Body and headers

Convert to JSON ☐

HTTP proxy [protocol://user[:password]@proxy.example.com[:port]]

HTTP authentication None

SSL verify peer ☐

SSL verify host ☐

SSL certificate file

SSL key file

SSL key password

* Update interval 1d

Custom intervals

Type	Interval	Period
Flexible	Scheduling	50s 1-7:00:00-24:00

[Add](#) [Remove](#)

* Timeout Global Override 3s [Timeouts](#)

* History Do not store Store up to 31d

Enable trapping ☒

[Update](#) [Clone](#) [Test](#) [Delete](#) [Cancel](#)

Why Zabbix

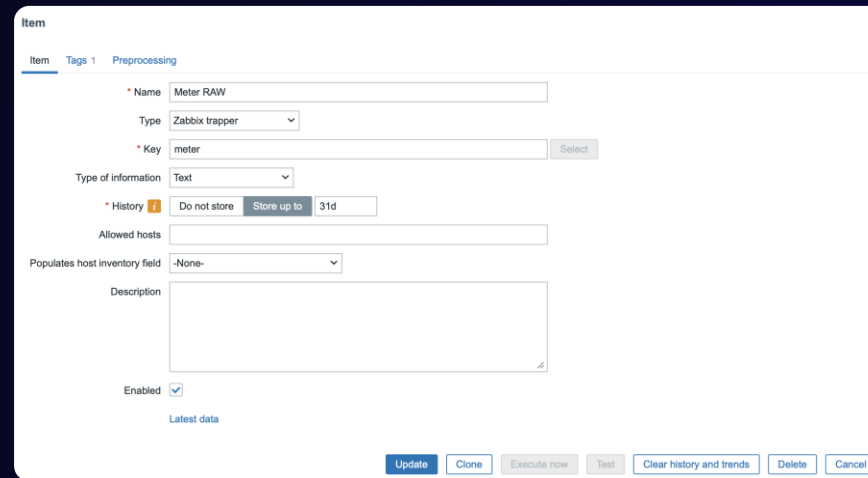
Webhook



**WEBHOOK
SERVER**



**Zabbix sender
history.push**



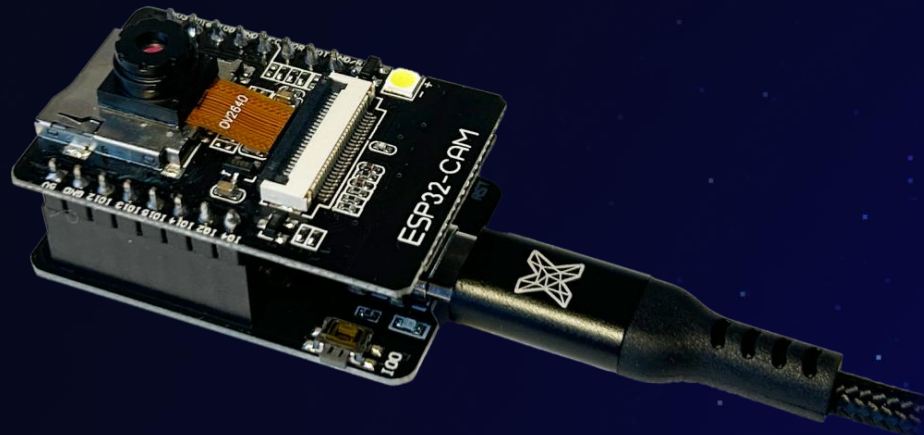
The screenshot shows the 'Item' configuration window in Zabbix, specifically the 'Preprocessing' tab. The configuration is as follows:

- Name:** Meter RAW
- Type:** Zabbix trapper
- Key:** meter
- Type of information:** Text
- History:** Do not store (selected), Store up to: 31d
- Allowed hosts:** (empty field)
- Populates host inventory field:** -None-
- Description:** (empty text area)
- Enabled:** ☒
- Latest data:** (checkbox, currently unchecked)

At the bottom, there are buttons for 'Update', 'Clone', 'Execute now', 'Test', 'Clear history and trends', 'Delete', and 'Cancel'.

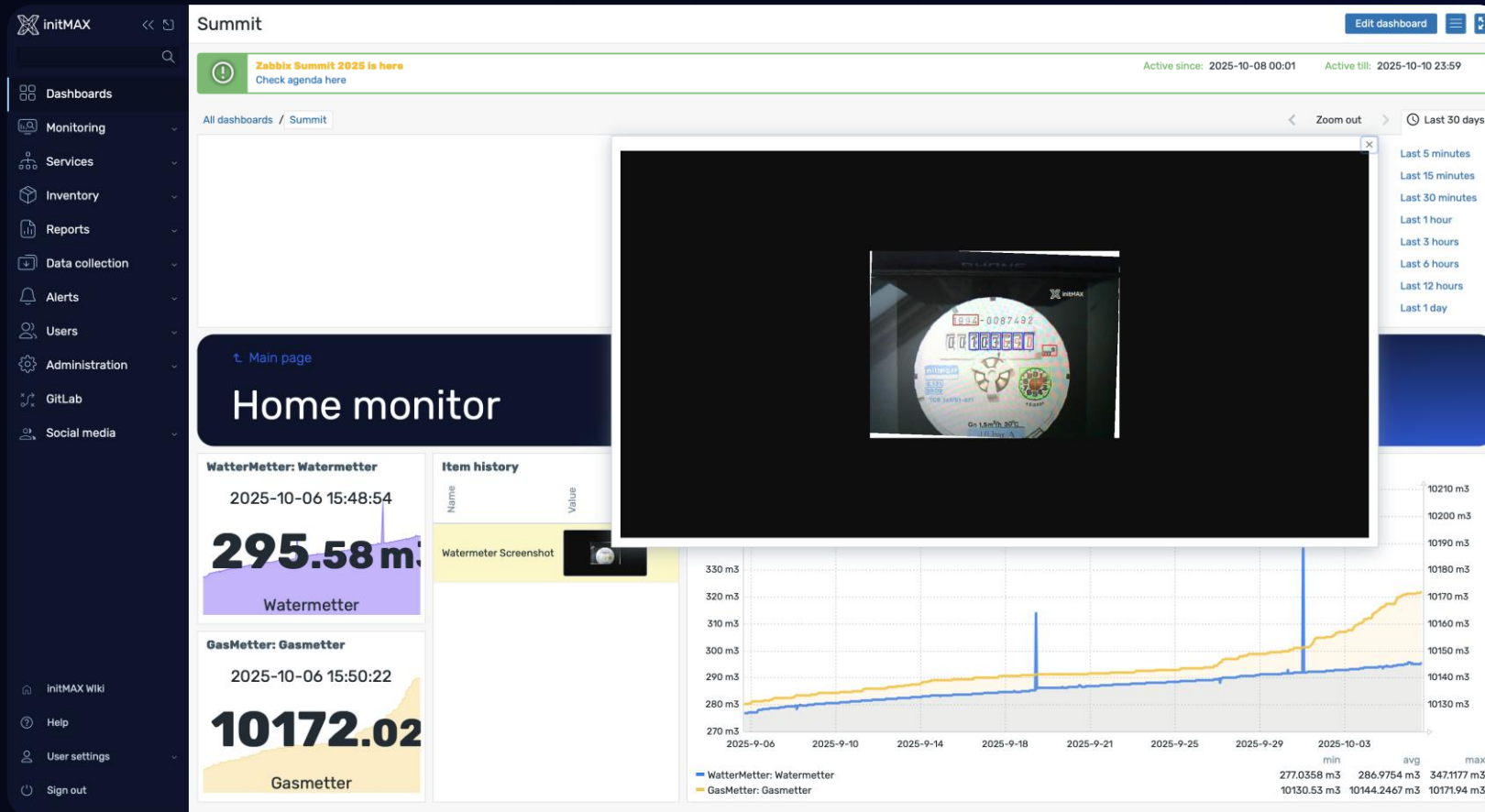
Why Zabbix

Extra check by item Browser



Why Zabbix

Item Browser http://<IP-of-your-device>/img_tmp/alg_roi.jpg





Recommendations and **additional tips**

tips

- Stable power (5 V / ≥ 500 mA; solar is viable thanks to low draw).
- Reliable Wi-Fi; no Internet required (runs locally).
- Take time to calibrate - focus, ROI, thresholds.
- Telemetry cadence: ≥ 1 minute (sub-minute not supported). Make sure the whole pipeline finishes within 60 s.
- Prefer MQTT or webhook push so data are sent only when ready - less polling, lower device load, better performance/power.
- Dashboard idea: scene snapshot + item value + 1-min trend chart.
- Range option: ESP32-CAM supports an external antenna for stronger Wi-Fi signal, but it requires a solder modification.





Industrial usage



Water Leak



Garage door



Light detect



OBJECT
detect



ACID TANK

Meet us

ZABBIX
PREMIUM PARTNER

ZABBIX
CERTIFIED TRAINER



Tomáš
CEO



Tomáš
Developer



Alois
Technical consultant



Marek
Technical consultant

Gifts

Same as last year, we've prepared a few gifts for you!



**Workshop
+ present**



**E-shop
discount**



**New Game
tetrisMAX**



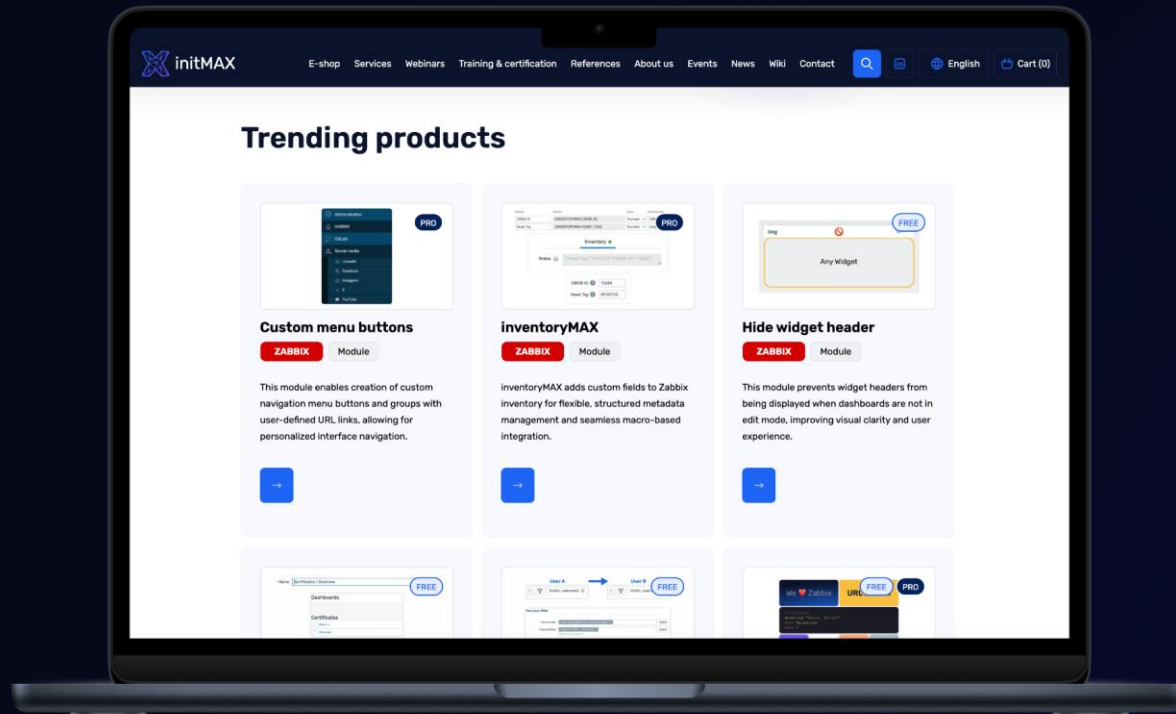
workshop

10. October
11 am

Few seats left!



Register for
workshop

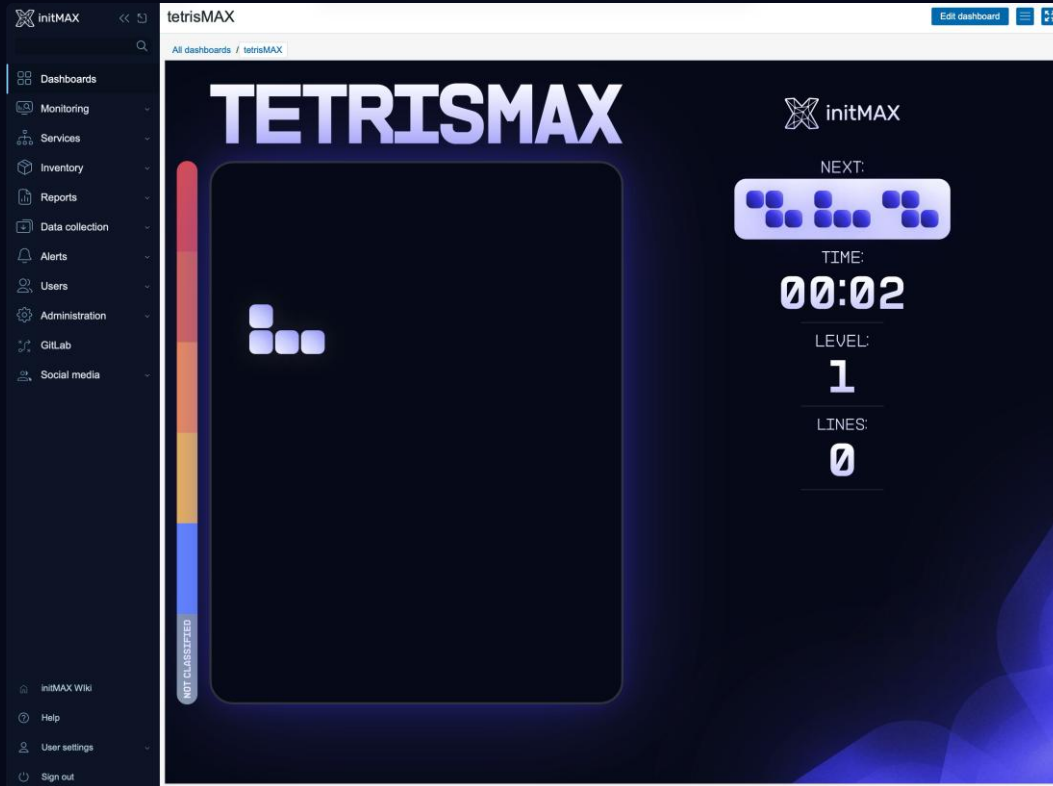


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initmax.com/eshop



tetrisMAX

Original Game in Zabbix

Join our mini-game & win great prizes!

Join US and win our prizes

- 1) Open the Zabbix demo: <https://www.initmax.com/zabbix/>
- 2) Play our game tetrisMAX and win
- 3) The game starts now—results update in real time. We'll finalize and announce the winners at the end of the Summit on our LinkedIn page.

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1



1-year Zabbix Academy
subscription

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Lifetime license for one
selected initMAX widget

3



initMAX
Goodie Pack

Discover more

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2 hours of free consultancy



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**Thank
You**