Decision Makers Ltd.

MicroEDS

Mindset Detector

Product of Decision Makers Ltd.

Mindset-Detector - MicroEDS(V 1.0)

A machine learning-based tool for industrial application. Aim for abnormal quality event detection.

Do you have critical mission equipment or process that needs expert monitor 24/7?

Would it be beneficial to detect abnormal situation related to this equipment or process a head of time?

Are you hesitating to invest large amount of money in complicated data analysis before you see any proven results?

If the answer to these questions is Yes, Yes, Yes, Please keep reading this brochure. High probability that you will find the answer to your questions in our product.

The "MicroEDS" is an Event Detection System (EDS), design to run on top of SBC (Single Board Computer). It is a software platform which utilizes a machine learning (ML) technology, aims to detect abnormal conditions both in process and hardware. Its mission is detecting pending problems in industrial environment before it developed into severe problems.

The "MicroEDS" communicates with field devices using Modbus/TCP[1]. It is capable of reading sensor measurements at 100 milliseconds time intervals.

[1] Additional communication protocols will be available soon.

Algorithms

Each sample is analyzed using a set of algorithms to detect possible pending problems in the monitored process by using the following:

1. Seasonal statistics limits for each measurement.
2. Anomalous leaps that don't violate regulation but hint for pending problems.
3. Violating pre-defined engineering rules.
4. Recognizing long-term patterns and trends.
5. Detection of low-quality data (static parameter, too long fixed values, fixed noise).
6. Unordinary behavior of the I/O cards.
7. Abnormal event combination.
8. Hazard predefined data combinations.
9. Unreasonable noise of group of sensors.
10. Similarity of measurements signature to known harmful patterns.

Each type of indication can base one or several "Detectors." A Detector is an algorithm trained to detect a specific abnormality in data. An example of a Detector is an algorithm that detects when a variable is beyond its statistical limits. Such a Detector "learns" the statistical limits of each variable; when actual data violates these limits (after a delay time), The MicroEDS generates an alert.

MicroEDS has been tested with several standard SBCs such as Raspberry Pi and equivalent products.

Powered by Sixfab* Hardware and Raspberry Pi**

Fast installation
All algorithms have a self-learning capability and a default setup which shortens the system's initial installation.

Filtration of false alarm
Operational changes (e.g., change of flow or pressure), cause by changes in the control regime of the monitored process is used by the MicroEDS to filter out false alarms.
A patterns recognition mechanism helps the MicroEDS to identify similarity to known bad or good sequences and to notify the hosting system accordingly.

* For details see https://sixfab.com/
** For details see https://www.raspberrypi.org/

Main features of microEDS

The MicroEDS is built as a stand-alone product based on a royalty-free operating system. It can communicate with the industrial environment using Modbus/TCP protocol. In parallel, it can deliver reports, datasets and alarms to any configured destination and using standard internet-based protocol.

The MicroEDS builds a mathematical model that describes the relationship between inputs and outputs based on both public and proprietary machine learning algorithms. No knowledge of mathematical modeling is required - models are generated automatically.

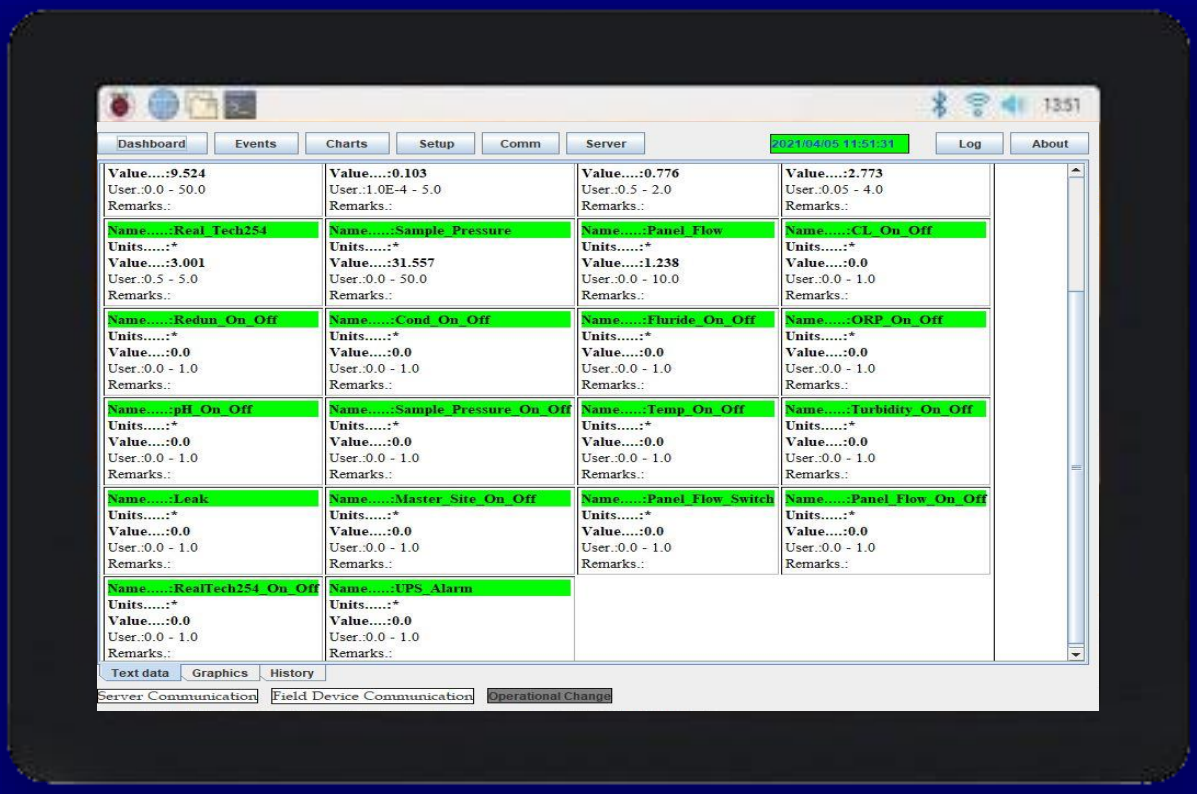
To avoid false alarms when the monitored system moves from one state to another, the microEDS monitors operational changes in process variables.

Adjust for model sensitivity or set a target value for false positives and false negatives.

Classify events as Hazard, Non-hazard, Maintenance or Instruments Malfunctioning to improve model performance.

Remote Access

The MicroEDS can be accessed remotely and securely using VNC protocol
Unit comes with a cellular modem, a network cable connection and Wi-Fi.



Cloud backup

Decision Makers LTD supplies automatic backup of the MicroEDS model and data. Based on IBM cloud services an automatic backup services and storage of customer's data are implemented.

Model Caliberation and Tuning

Using the cloud backup (or ad hoc data transfer), Decision Makers supplies a calibration process for the MicroEDS. This calibration procedure aims to guarantee a low rate of false-positive and false-negative alarms.

Our services include:

- Analysis of historical data
- Classification of hazardous historical events
- Evaluation of monitoring station performance
- Periodic calibration of online detection models
- Remote monitoring of field devices using secured communication.

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For details and demonstrations
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