

MindSphere

The industrial Cloud & IoT ecosystem

ANDREA NERELLI

MindApps

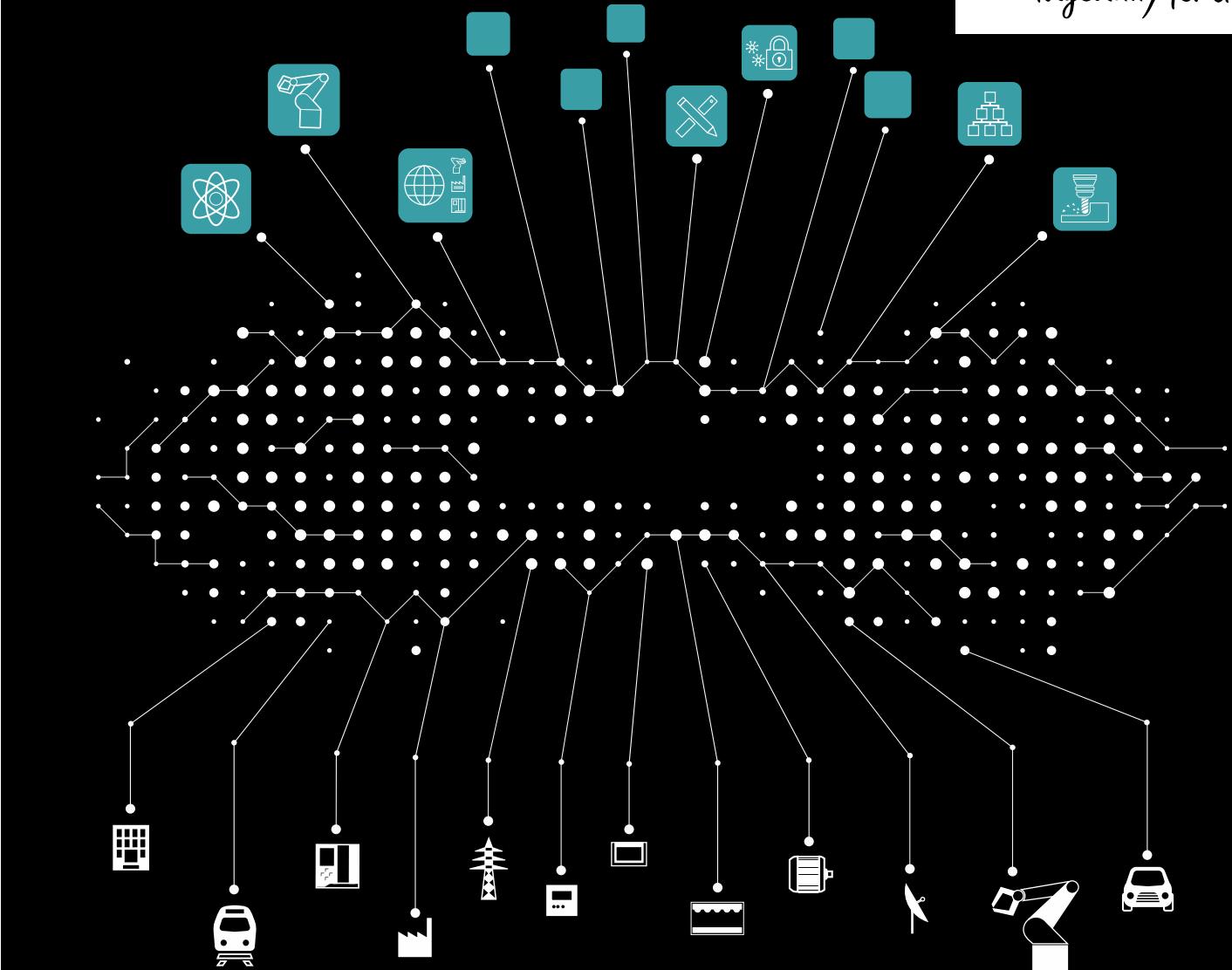
Powerful industry applications and digital services for asset transparency and analytical insights

MindSphere

Open Platform as a Service (PaaS) for scalable, global IoT connectivity and application development

MindConnect

Secure plug and play connection of Siemens and third-party products and equipment

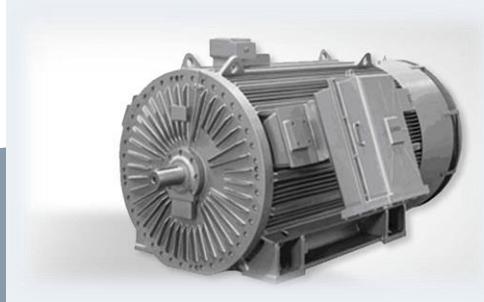


MindSphere - The cloud-based, open IoT Operating System

Our workshop journey

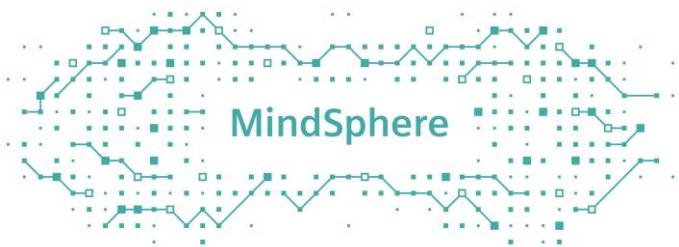


Model in MindSphere

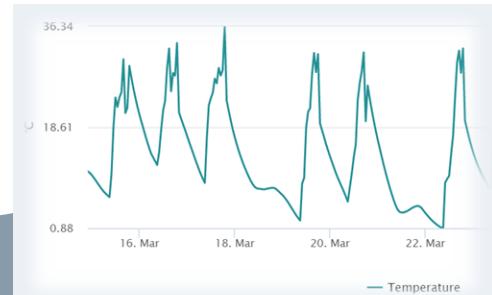


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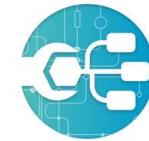
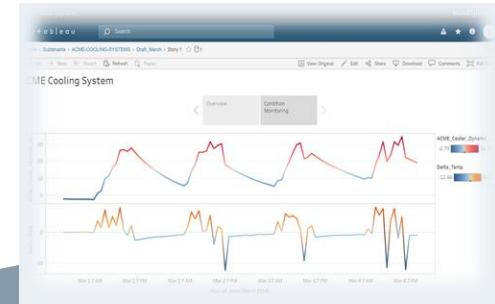
Page 3



Collect and monitor data

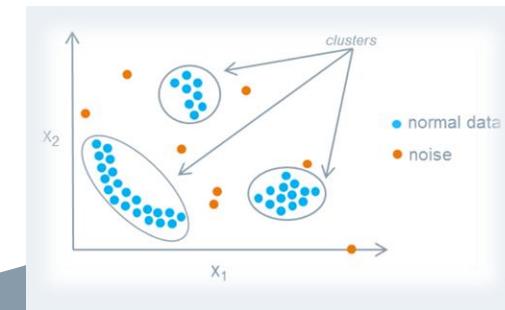


Analyze data and extract information



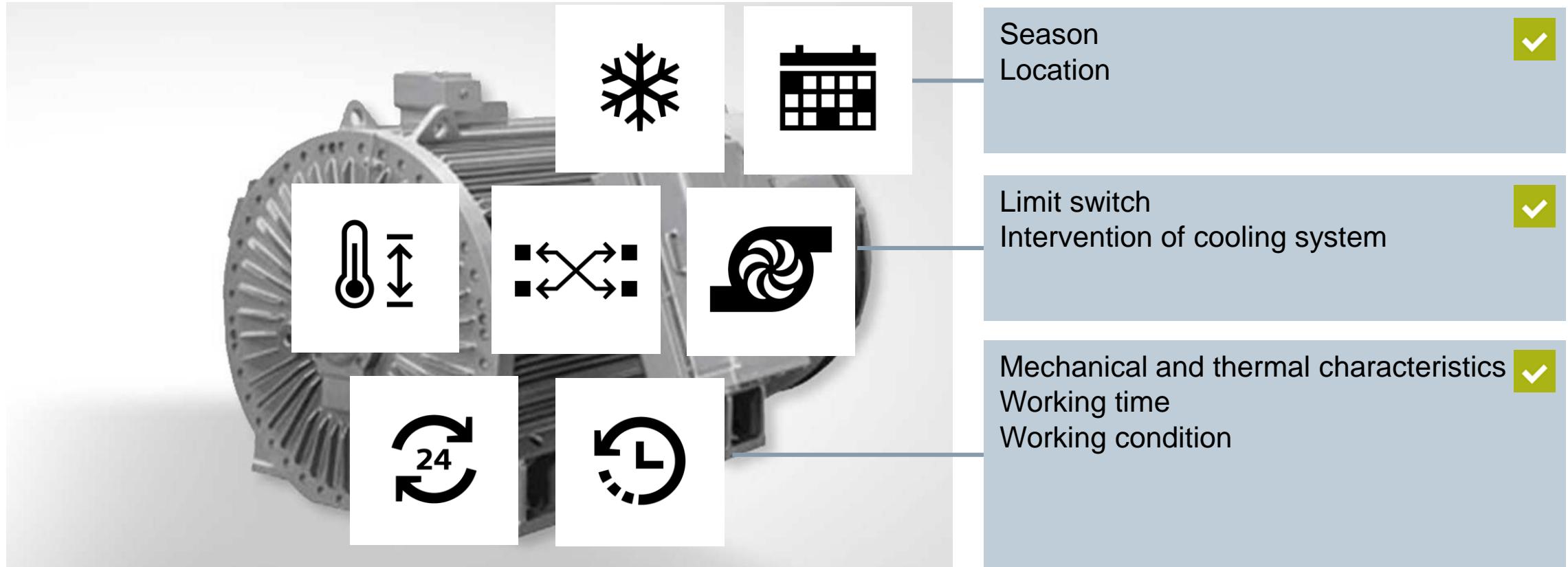
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Apply automatic
Anomaly Detection
solution



Solution development steps

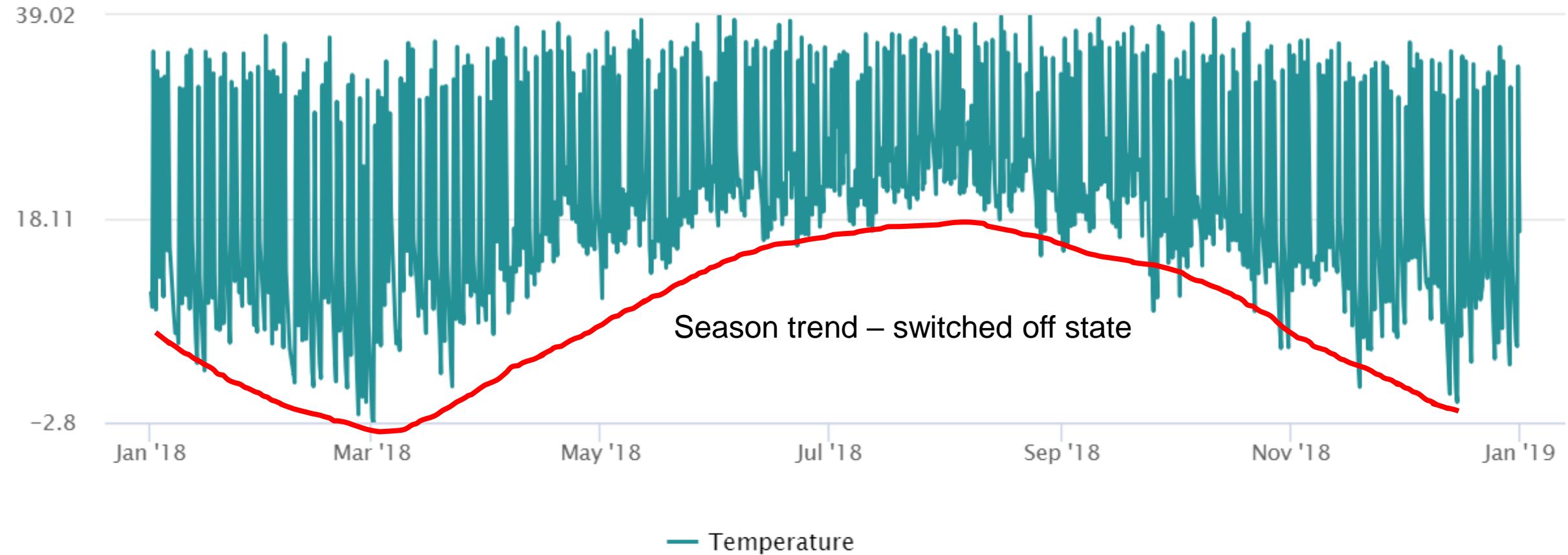
Let's study a real working system (*)



What affects a system temperature trend ?

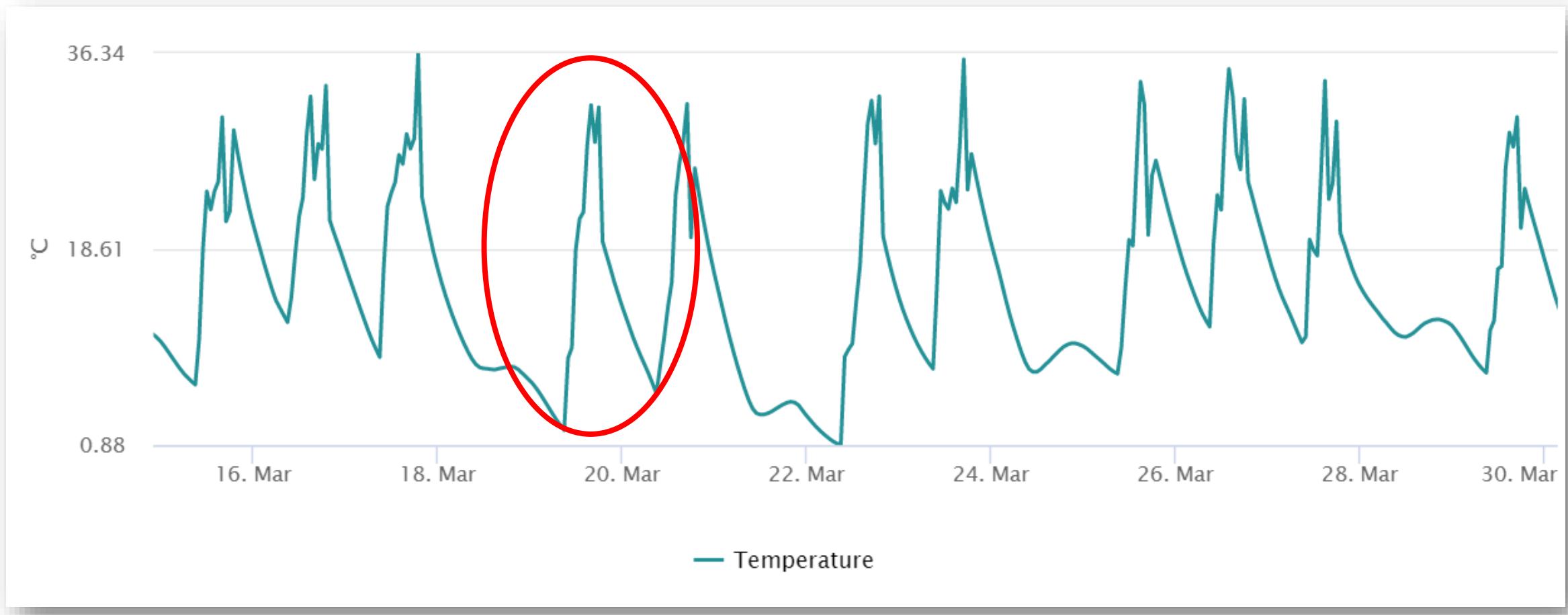
(*) simplified mechanical and thermal models are used in the example

Do data speak ?



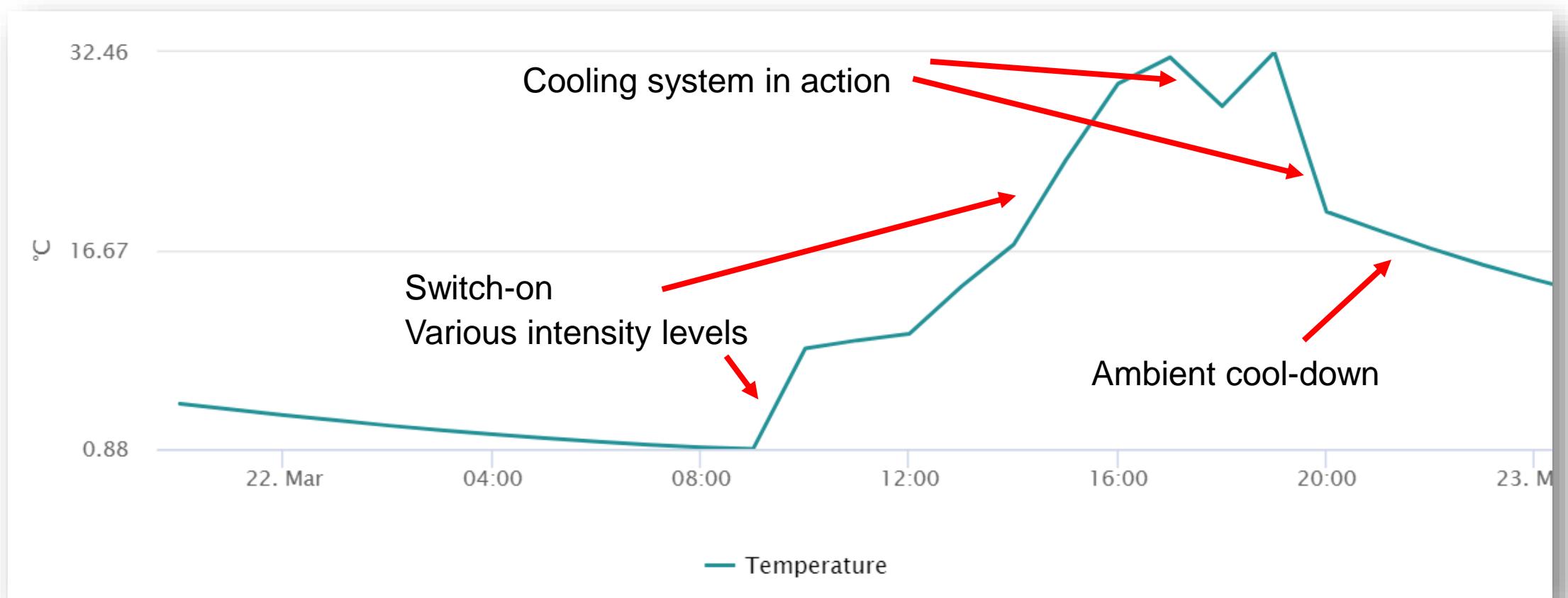
Do data speak ?

Working day trend – up & down



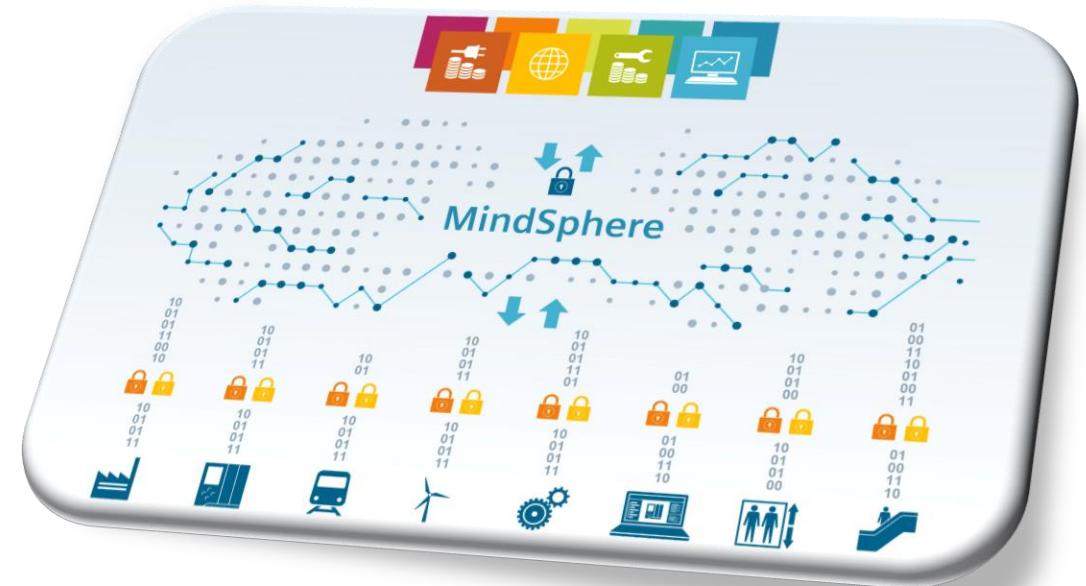
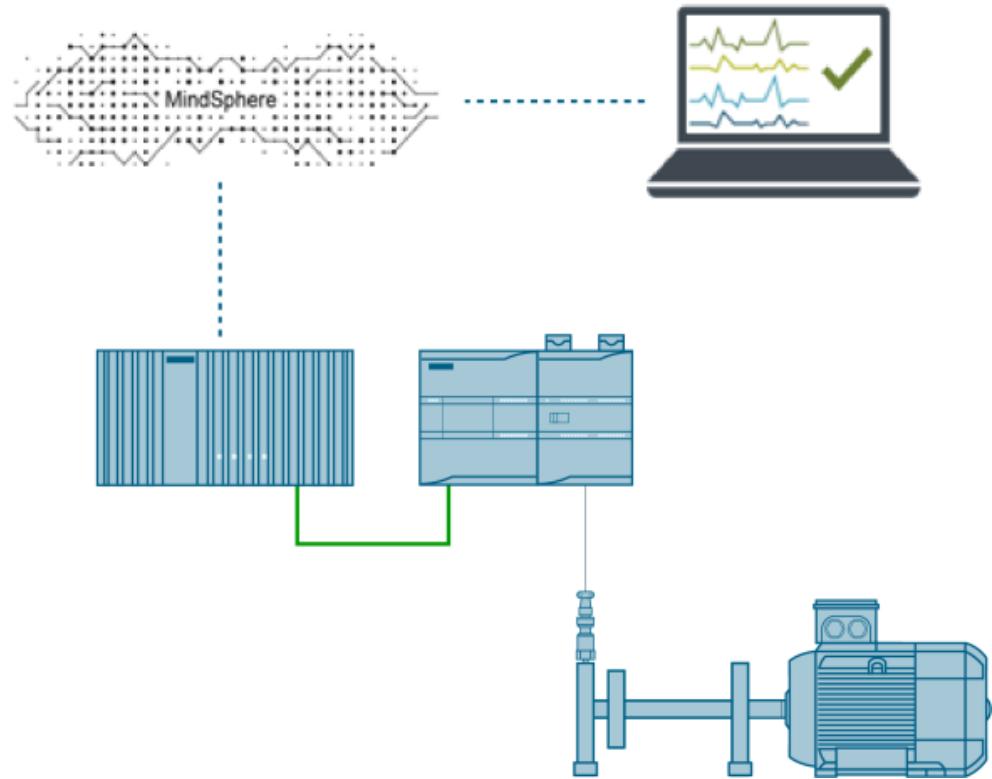
Do data speak ?

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Let's monitoring with MindSphere MindConnect

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mindsphere.io

<https://www.dex.siemens.com/mindsphere/MindConnect>



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MMM /Remote



MindSphere
Settings



MindSphere
Usage Transparency



MindSphere
Visual Explorer



MindSphere
Visual Explorer Connector



MindSphere
Visual Flow Creator



App

Posta in arrivo - an...

25 Google Calendar - I...

Il mio Drive - Googl...

WhatsApp

Google Maps

CNC Shopfloor Ma...

S Announcement: So...

S O2O Reports

S OMS

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Ingegneria per la vita.

Asset Manager

powered by **MindSphere**

Assets



Types



Aspects

BasicAsset[+ Create type](#) **ACME_Cooler_ModelX**
csitalia.ACME_Cooler_ModelX
Type of cooler ModelX by ACME**DoughMachine**
csitalia.DoughMachine**RisingMachine**
csitalia.RisingMachine

core.basicasset > csitalia.ACME_Cooler_ModelX

Edit Add derived type Delete

ACME_Cooler_ModelX

2 Aspects

csitalia.ACME_Cooler_ModelX
IDACME_Cooler_ModelX
NameType of cooler ModelX by ACME
Description

Variables

No variables entered yet

Aspects

Name	Aspect	Category	Defined	
ACME_Cooler_Dynamic	csitalia.ACME_Cooler_Dynamic	Dynamic		
Name	Data type	Unit	Max. length	Value
Temperature	DOUBLE	°C	-	-
> ACME_Cooler_Static		csitalia.ACME_Cooler_Static	Defined	

MindSphere: unlimited connectivity

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Asset Manager

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csitalia

+ Create asset

Filter

ACME-COOLING-SYSTEMS

SubTenant ACME-COOLING-SYSTEMS Asset for csitalia

deleted_FoodBeverage

SubTenant FoodBeverage Asset for csitalia tenant

deleted_Software

SubTenant Software Asset for csitalia tenant



csitalia > ACME-COOLING-SYSTEMS

ACME-COOLING-SYSTEMS

< Back

core.basicsubtenant

Type ID

SV-L1CF6481

● Offline

● Onboarded

V03.03.00.03 b002

UID Connection Status Onboarding Status Firmware

New Datapoint

Name * Temperature

Description Inside motor temperature

Unit * °C

Type * int

Datapoint Address DB710.DBINT12

On Data Change

Accept Cancel

The screenshot shows the Siemens MindSphere Asset Manager interface. On the left, there's a sidebar with navigation icons for Assets, Types, and Aspects, and a list of assets under 'csitalia'. A large image of a Siemens MindConnect device is displayed. The main area shows the 'ACME-COOLING-SYSTEMS' asset details, including its type, status, and firmware version. A red box highlights a modal dialog titled 'New Datapoint' where a new data point for 'Temperature' is being configured. The dialog includes fields for Name, Description, Unit, Type, Datapoint Address, and On Data Change.



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Settings



MindSphere
Usage Transparency



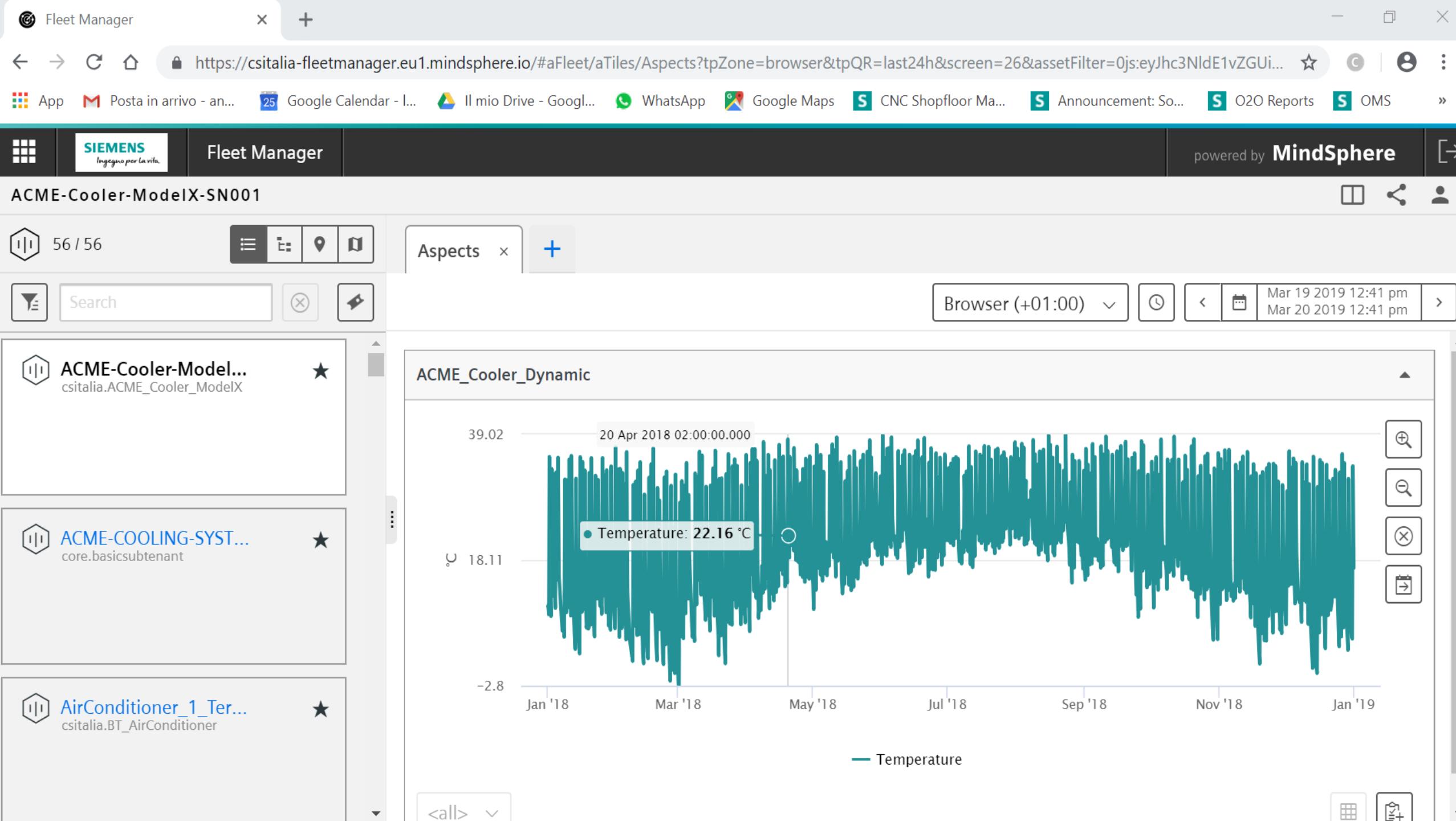
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Visual Explorer



MindSphere
Visual Explorer Connector



MindSphere
Visual Flow Creator



STEP 1: CONNECT



1

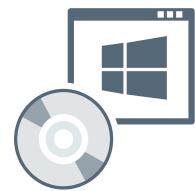
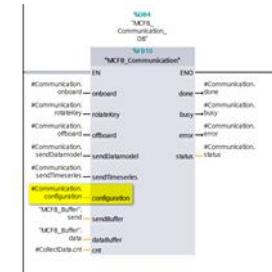


2



3

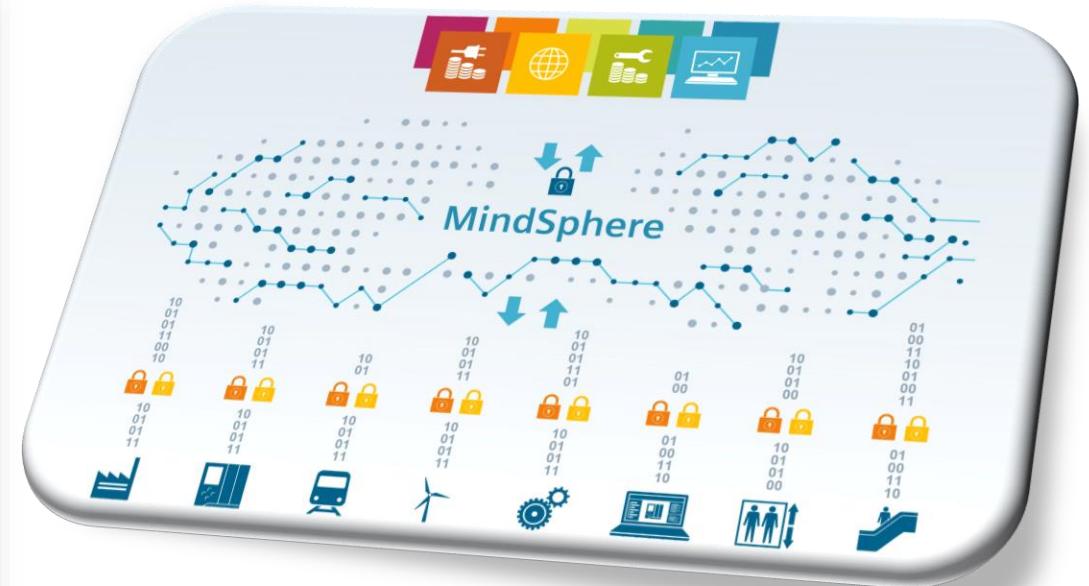
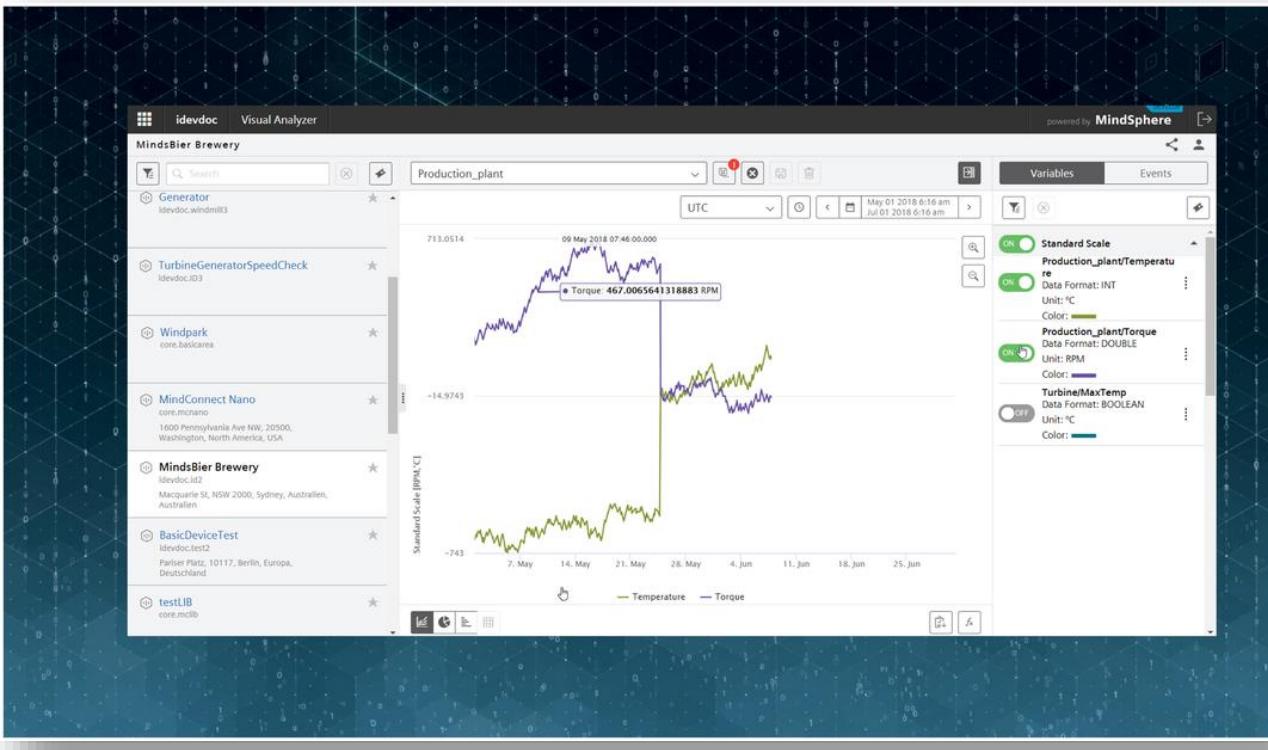
STEP 2: CONFIGURE



MindSphere enables customers to get connected quickly

Let's analyzing with MindSphere Visual Explorer

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<https://www.dex.siemens.com/mindsphere/applications/Visual-Explorer>



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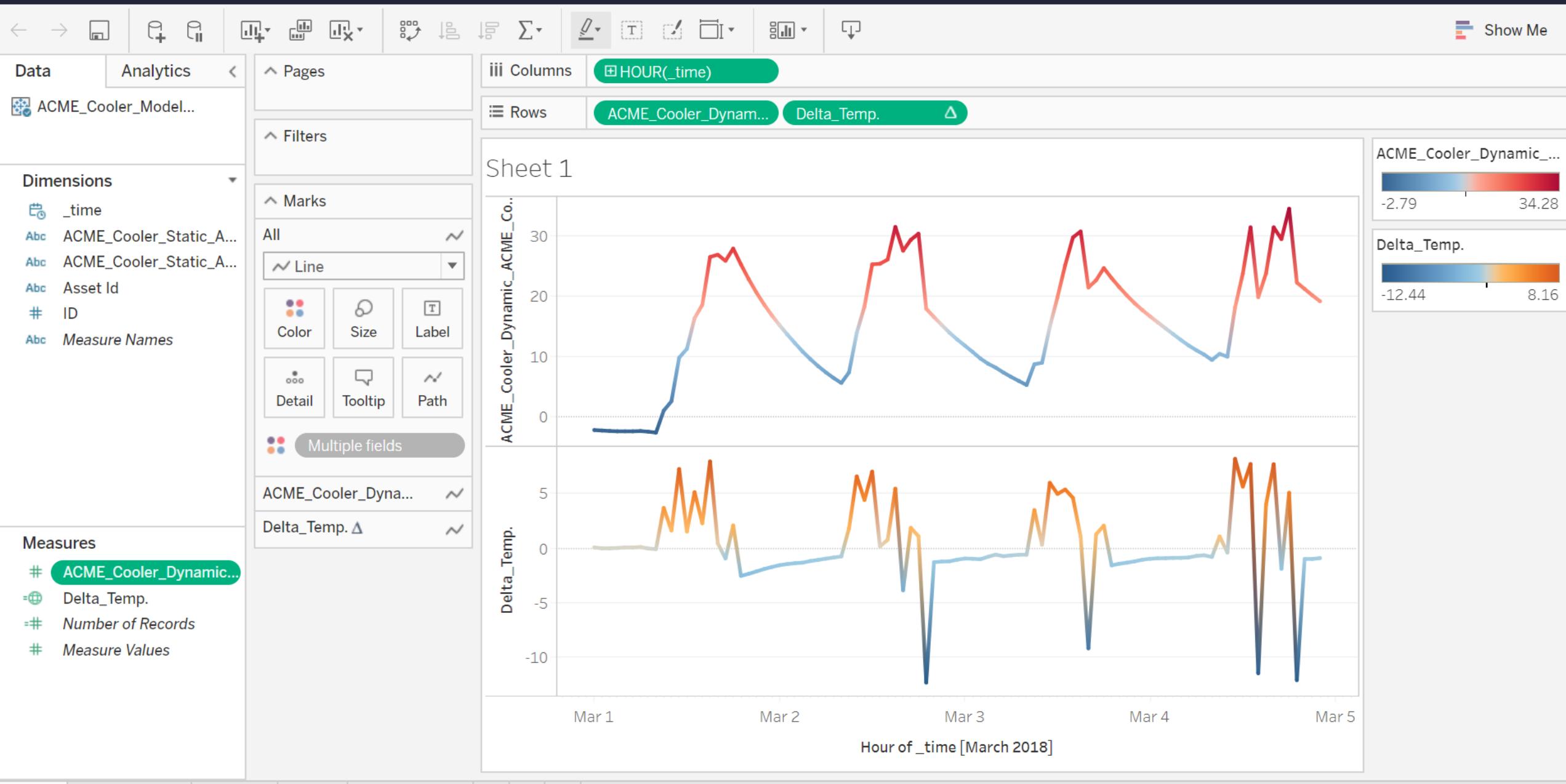
MindSphere
Visual Explorer



MindSphere
Visual Explorer Connector

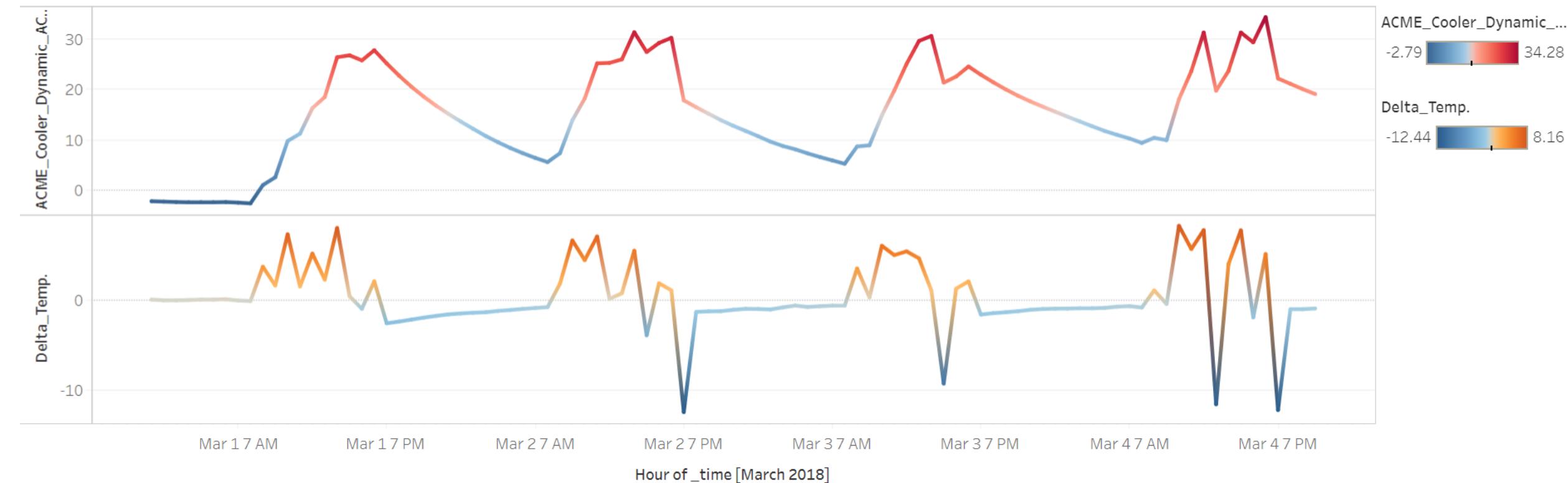


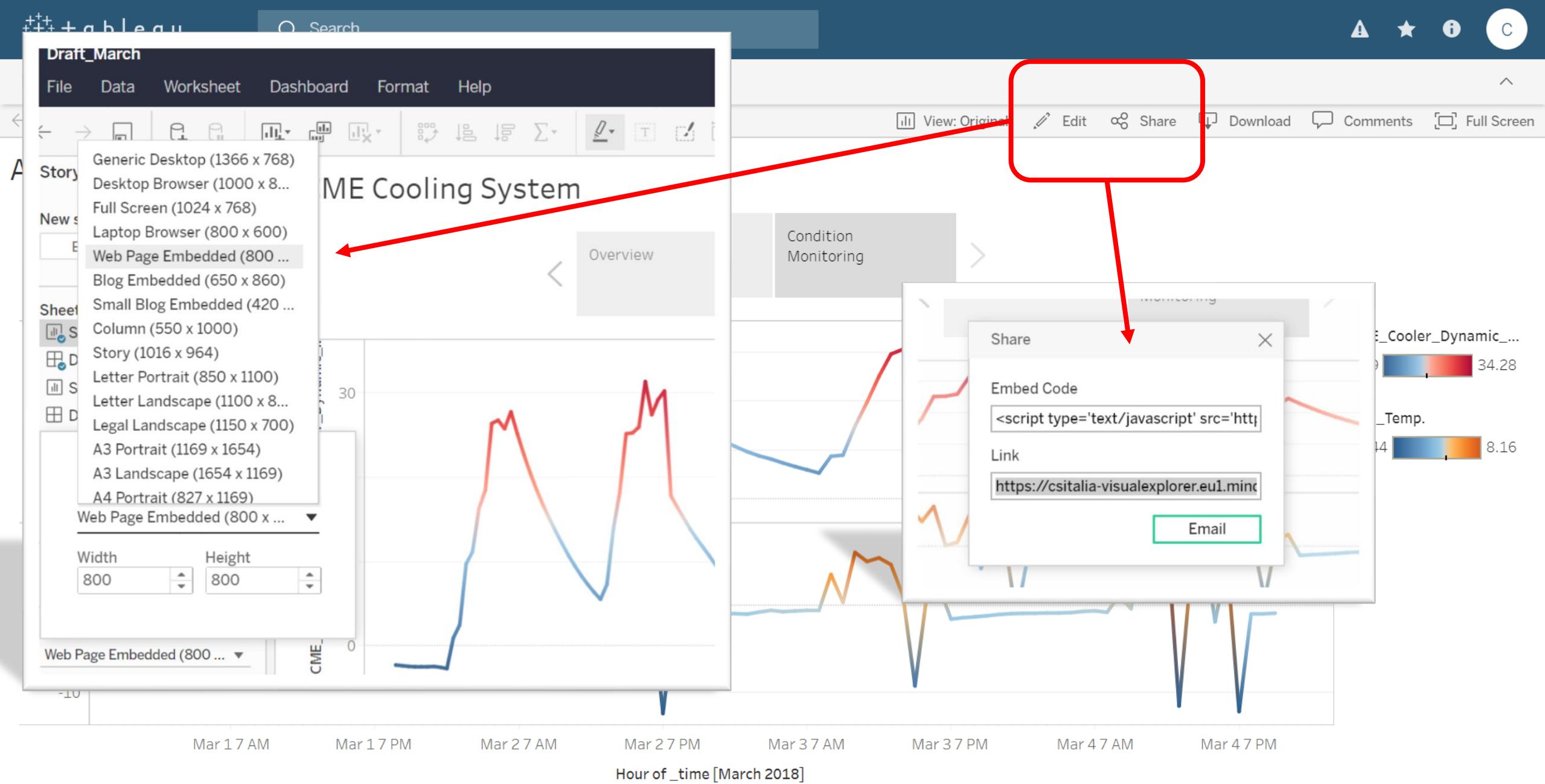
MindSphere
Visual Flow Creator



ACME Cooling System

< Overview Condition Monitoring >





Visual Explorer Workbook: Draft_March Modifica pagina < MindSphere Report powered by MindSphere

https://soci.mindsphereworld.it/wp-admin/post.php?post=336&action=edit

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Bacheca Articoli Media Pagine Tutte le pagine Aggiungi pagina Commenti GDPR Cookie Consent Contatto Aspetto Plugin Utenti Profile Builder Strumenti

Report powered by MindSphere

```
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```

Converti in bozza Anteprima Aggiorna Documento Blocco Stato e visibilità Visibilità Pubblico 20 Mar 2019 14:51 Sposta nel cestino Permalink Immagine in evidenza Discussione Attributi della pagina

WORDPRESS SIEMENS Ingenuity for life

Report powered by MindSphere https://soci.mindsphereworld.it/report-powered-by-mindsphere/?previ... App Posta in arrivo - an... Google Calendar - I... Il mio Drive - Googl... WhatsApp Google Maps

MINDSPHERE|WORLD IN ITALIA Il forum per tutti gli utilizzatori di MindSphere Inizio News Area privata Contattaci Links Esci

REPORT POWERED BY MINDSPHERE Modifica

Monitoring Share Embed Code Link Email

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```

ACME Cooling System Overview Condition Monitoring ACME_Cooler_Dynamic -2.79 34.28 Delta_Temp -12.44 8.16

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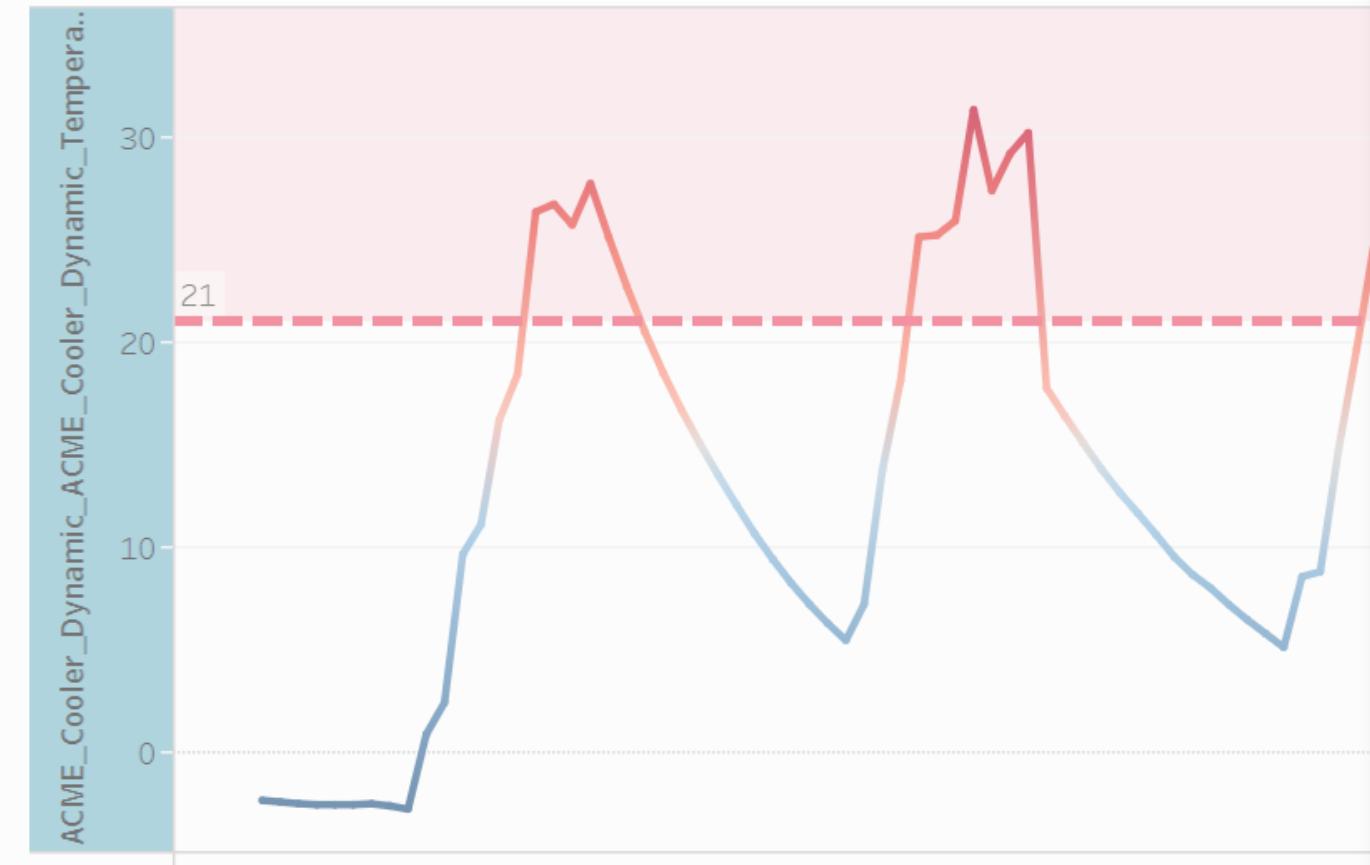
Smart notification

› ACME-COOLING-SYSTEMS › Draft_March › Dashboard 1 ⭐ 1

↶ Revert Refresh Pause

* View: Original Alert Edit Share Download Comments

Sheet 1



Create Alert

Send email if
'ACME_Cooler_Dynamic_ACME_Cooler_Dynamic_Temperature'
is:

Condition Threshold
Above ▼ 21
Condition currently true

Subject
Data alert - Dashboard 1

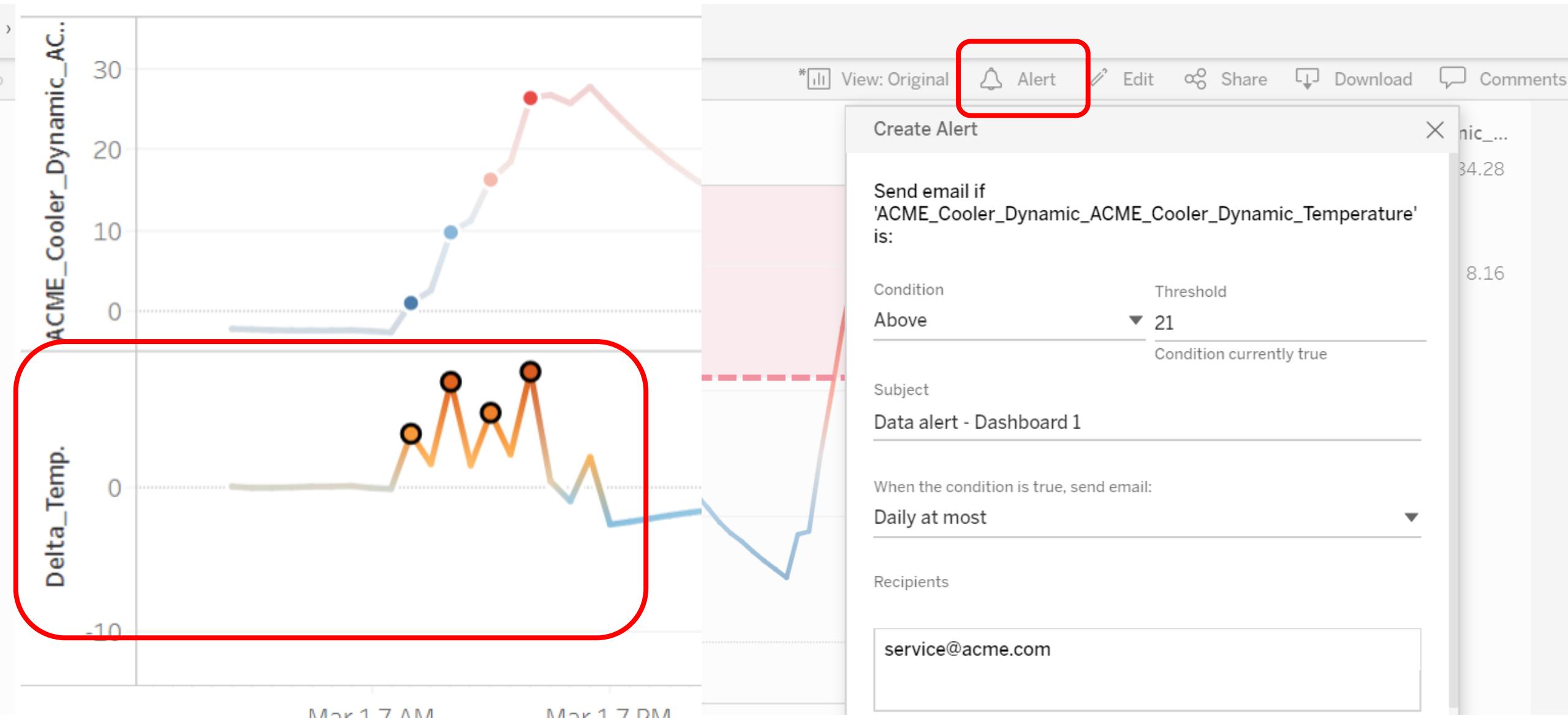
When the condition is true, send email:
Daily at most

Recipients
service@acme.com

The 'Alert' button in the top navigation bar and the 'Condition' section of the 'Create Alert' dialog box are highlighted with red boxes.

Smart notification

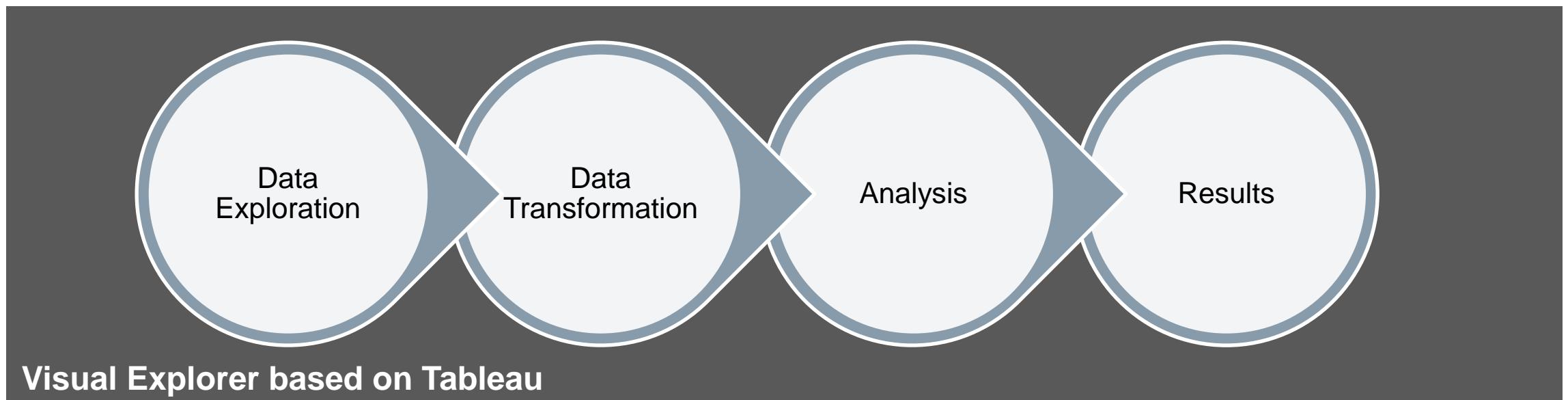
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TABLEAU® ON

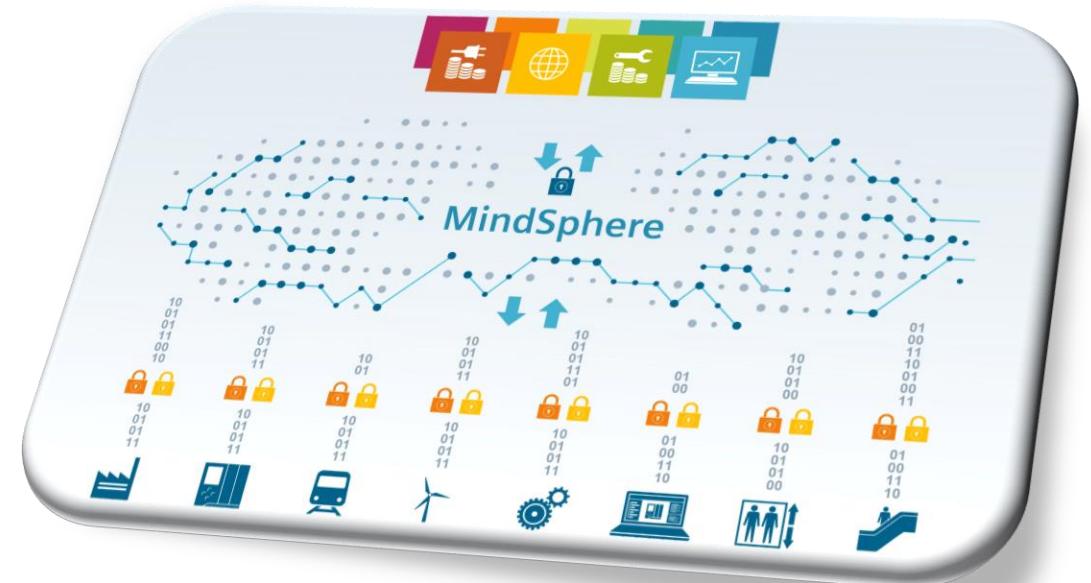
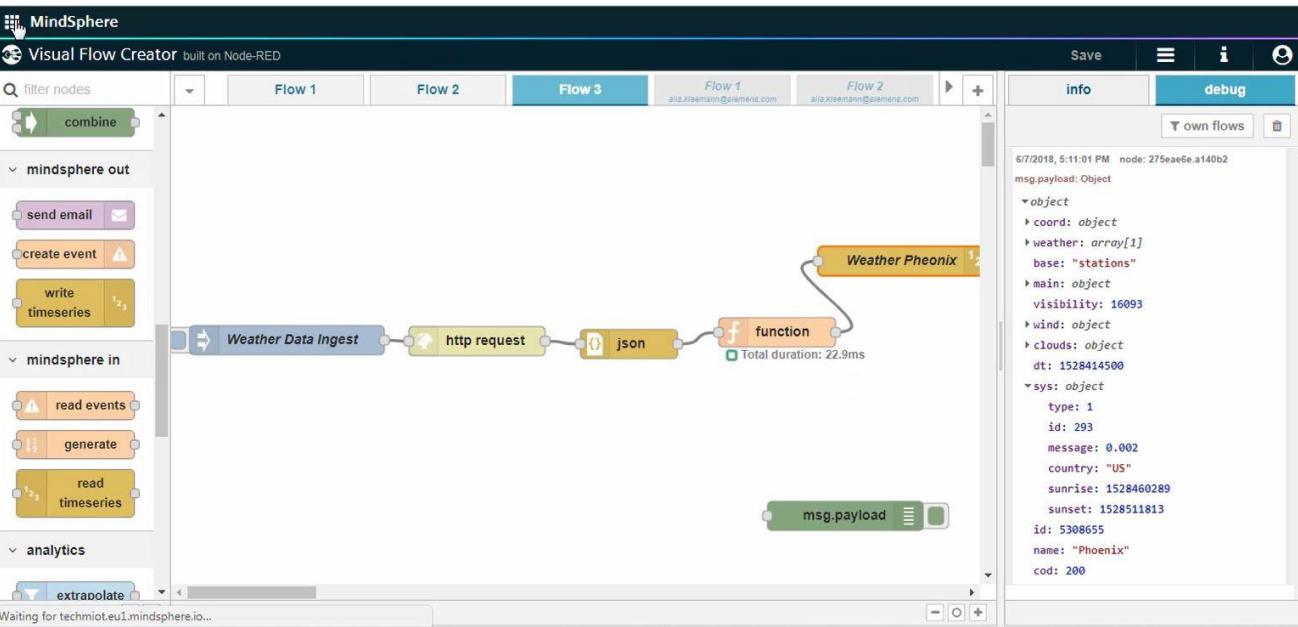


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MindSphere enables customers to easily analyze data and publish results

Let's develop with MindSphere Visual Flow Creator



mindsphere.io

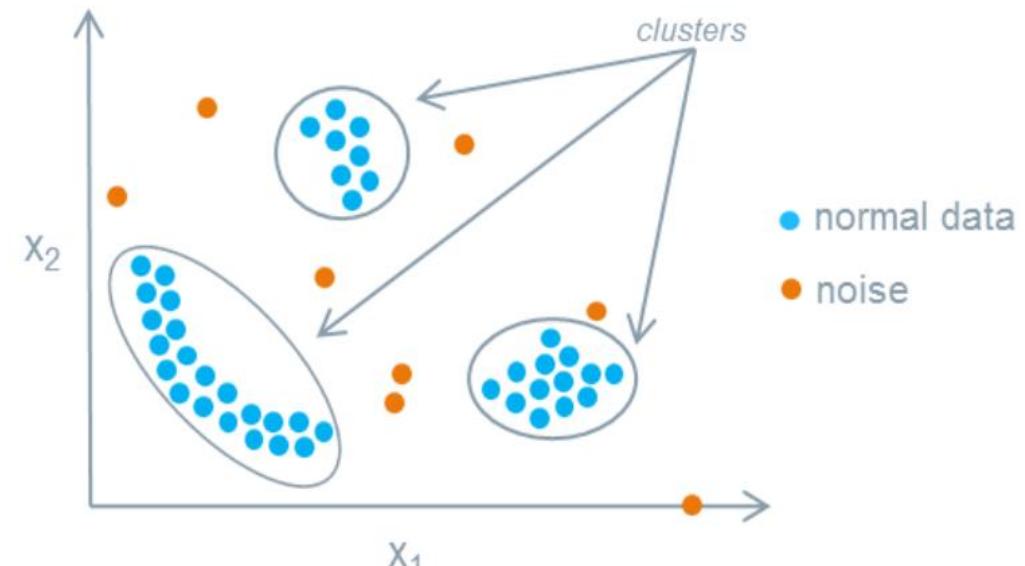
<https://www.dex.siemens.com/mindsphere/applications/Visual-Flow-Creator>

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APIs & Services

[Index](#)[Agent Management Service](#)[Anomaly Detection Service](#)[Overview](#)[Basics](#)[APIs & References](#)[Sample Application](#)[Asset Management Service](#)[Data Exchange Service](#)[Data Flow Engine](#)

Basics



On this Page

- [Idea](#)
- [Access](#)
- [Basics](#)
- [Modes](#)
- [Features](#)
- [Limitations](#)
- [Example Scenario](#)
- [Batch Mode](#)
- [Interactive Mode](#)
- [Related Links](#)



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filter nodes

input

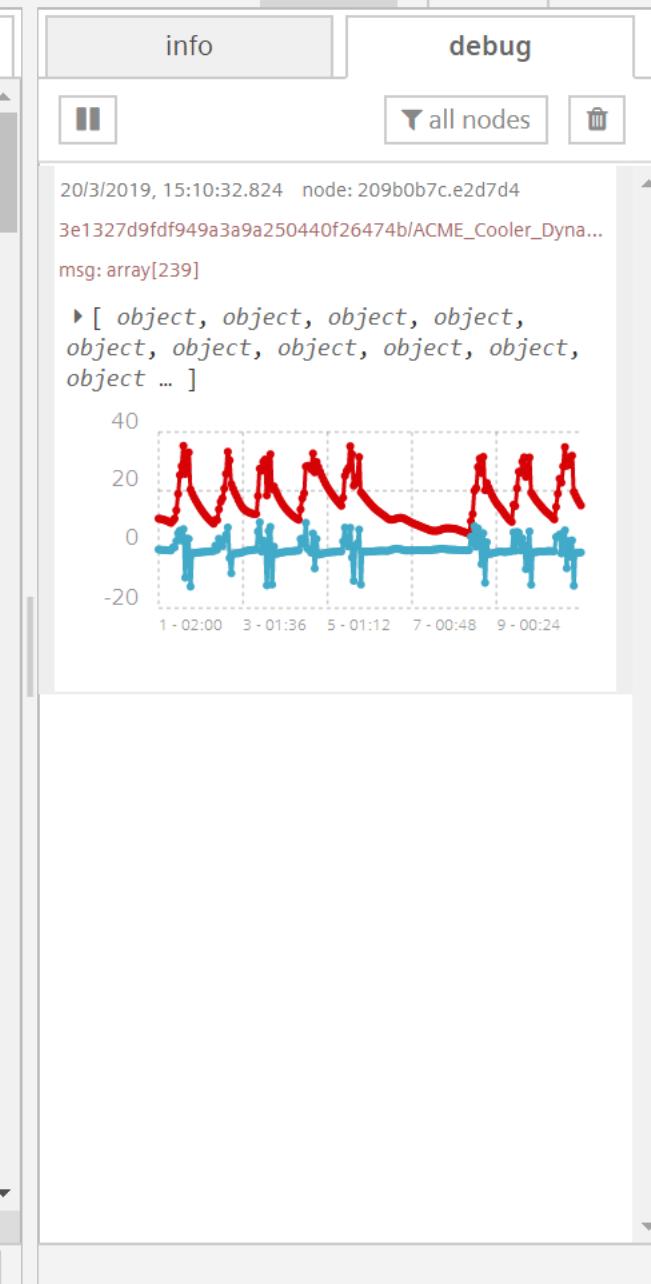
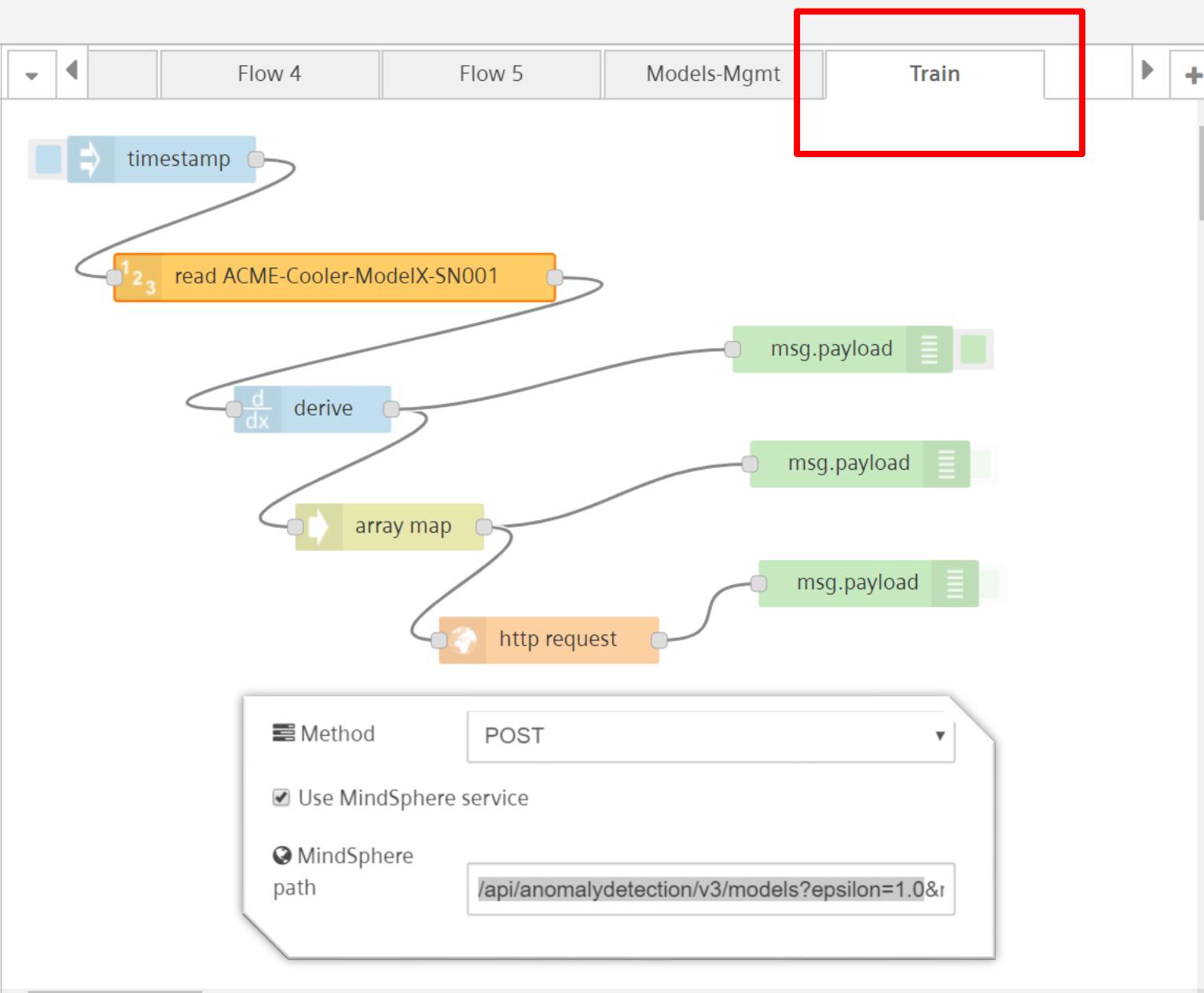
- ! catch
- link
- http
- inject

output

- link
- debug
- http response

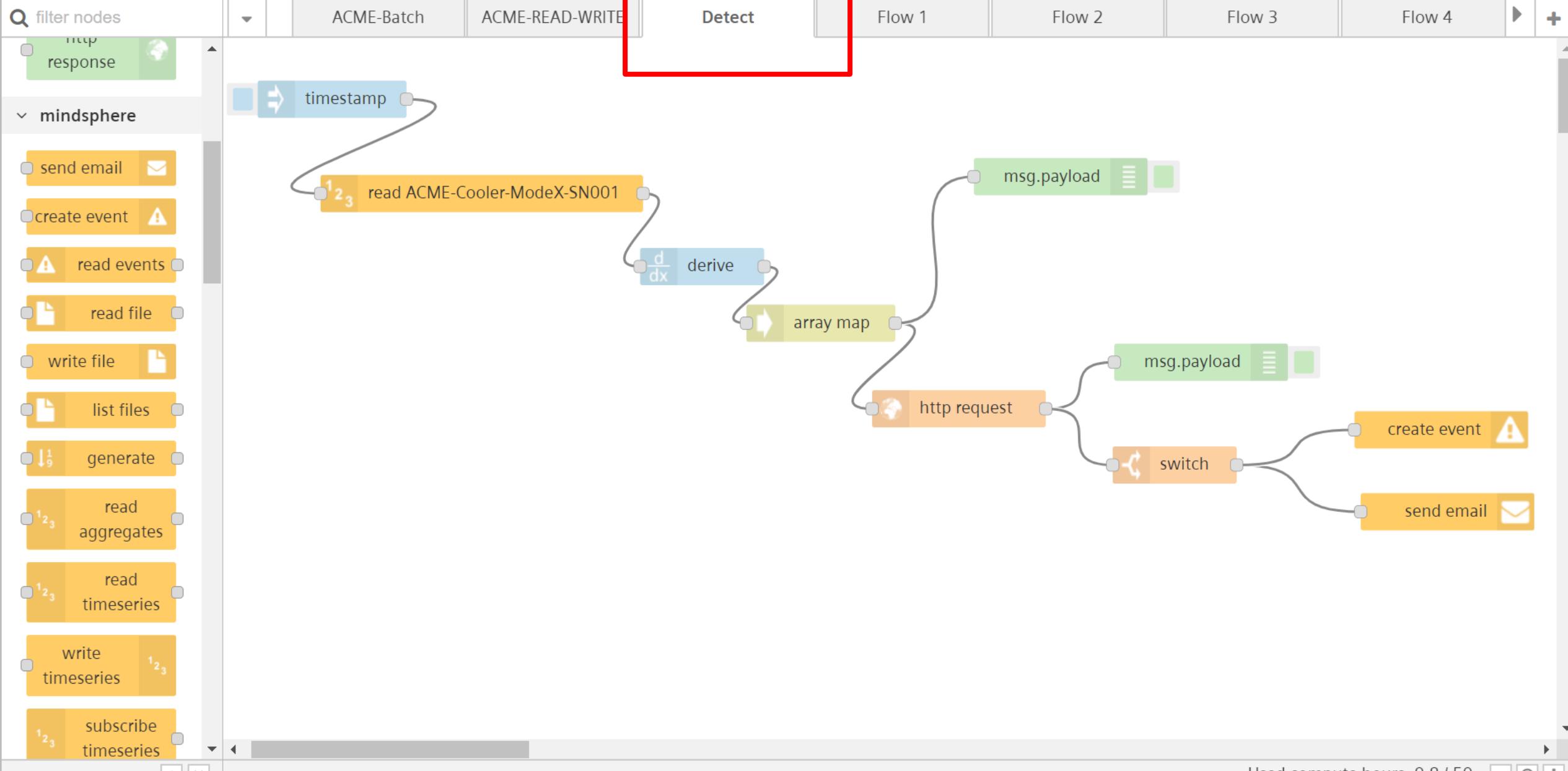
mindsphere

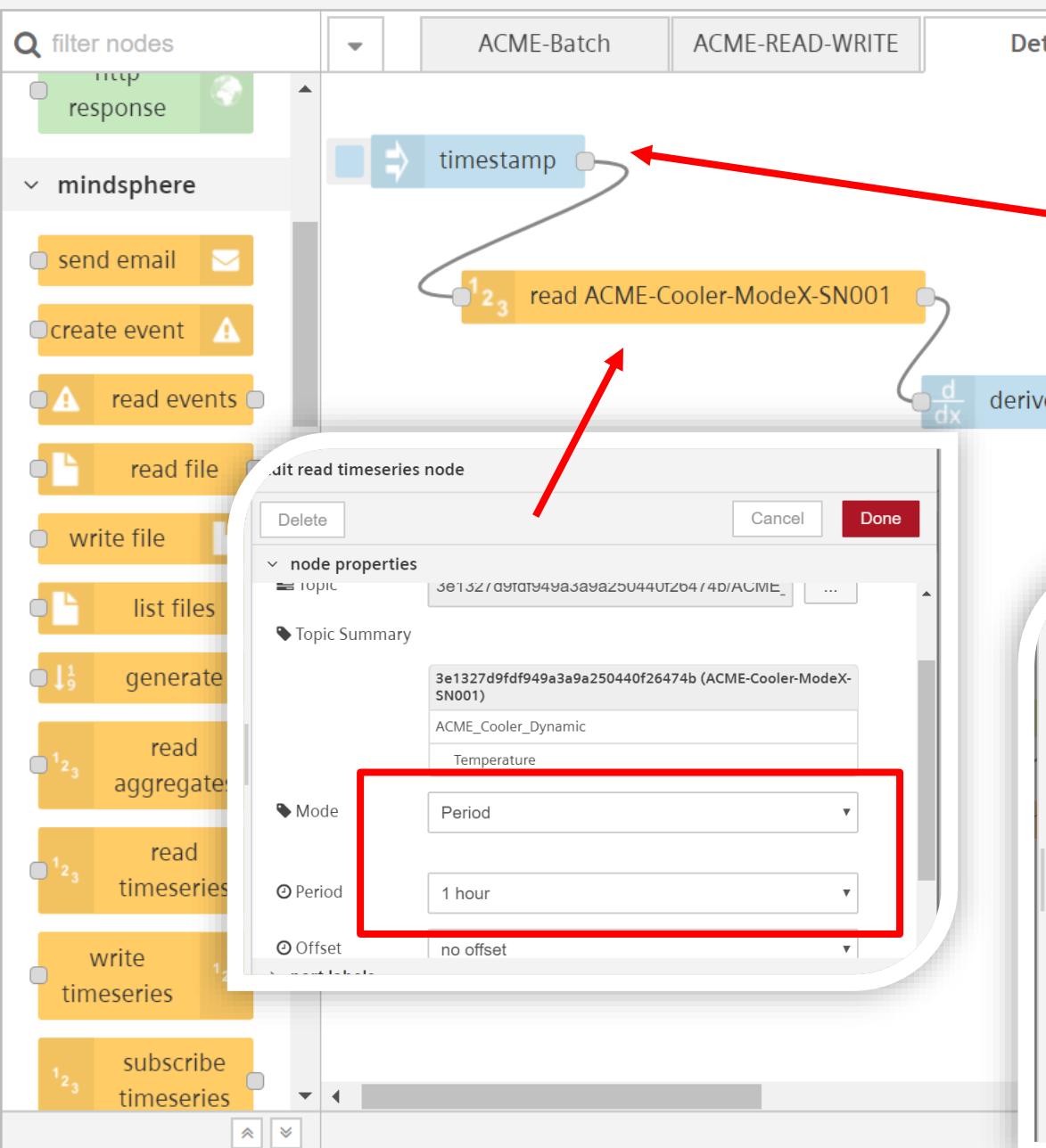
- send email
- create event
- read events
- read file





Save





Edit inject node

Delete Cancel Done

node properties

Name: Name

Payload: timestamp

Topic: Topic

Repeat: interval

every 30 minutes

Note: "interval between times" and "at a specific time" will use cron

Edit send email node

Delete Cancel Done

node properties

Name: Name

Mode: No Category

Recipients: service@acme.com

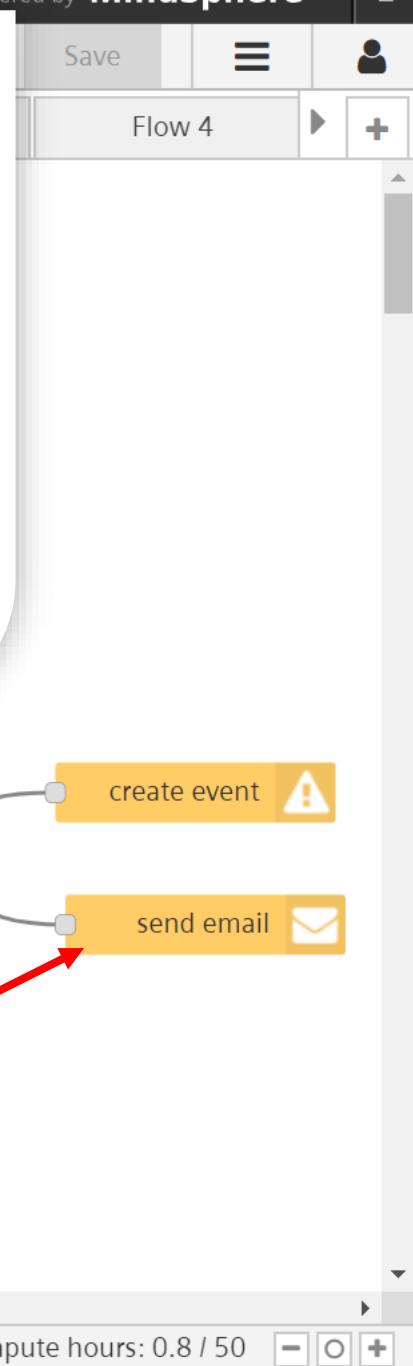
Subject: Anomaly Detected

Priority: High

Message: 1 \${payload}.AssetName

port labels

A red box highlights the "Repeat" section of the inject node and the "Recipients", "Subject", and "Priority" sections of the send email node.



https://csitalia-visualflowcreator.eu1.mindsphere.io/ui/#flow/3acb1441.0030cc

App Posta in arrivo - an... Google Calendar - l... Il mio Drive - Googl... WhatsApp Google Maps CNC Shopfloor Ma... Announcement: So... O2O Reports OMS

Visual Flow Creator powered by MindSphere

Save

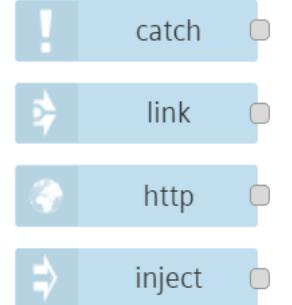
filter nodes

w 1 Flow 2 Flow 3 Flow 4 Check-by-Web-Serv... Models-Mgmt Train +

The screenshot shows a visual flow editor for Siemens MindSphere. On the left, a palette lists various nodes categorized under 'input' (catch, link, http, inject), 'output' (link, debug, http response), and 'mindsphere' (send email). Two nodes from the 'input' category, 'http' and 'inject', are highlighted with red boxes. In the center, a workflow diagram is displayed. It starts with a 'GET' request node: '[GET] /httpin/csitalia/check-asset'. An arrow points from this node to a 'function' node, which is orange with a white 'f'. Another arrow points from the 'function' node to a second 'http' response node. The entire workflow is contained within a single flow labeled 'Check-by-Web-Serv...'.



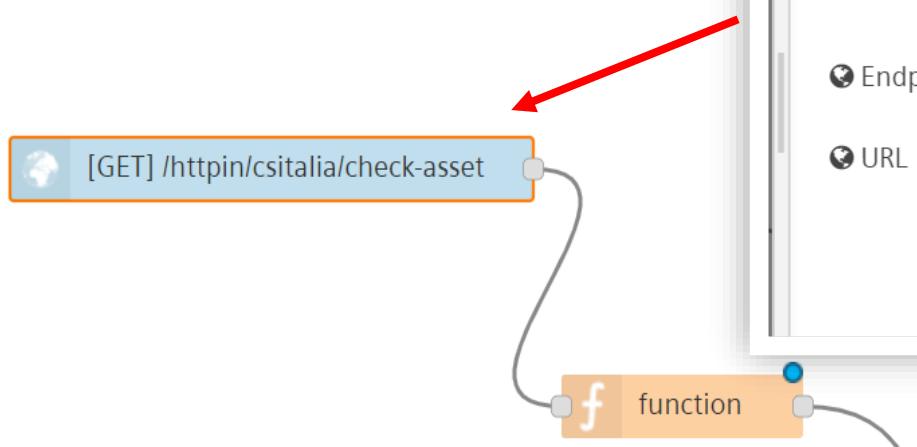
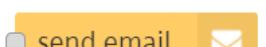
filter nodes



output



mindsphere



YOUR HTML OUTPUT

ASSET IS OK

Edit http in node

Delete

Cancel

Done

node properties

Name

Name

Method

GET

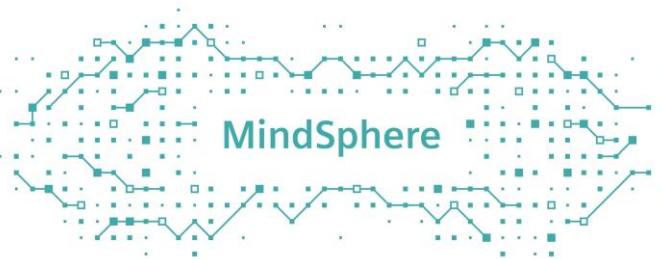
Endpoint

check-asset

URL

/httpin/csitalia/check-asset

Node-RED on



Timeseries (+Methods)



Use Timeseries APIs to read, write and edit Timeseries values from storage

- Aggregated Timeseries (M4)
- Min/Max Values
- Modify Timeseries

Trend Prediction



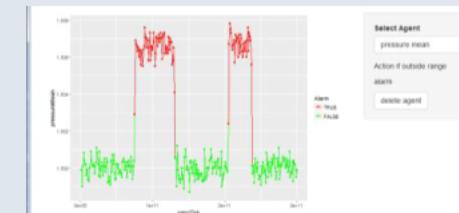
Use Trend Prediction APIs to create predictions based on one aspect



Anomaly Detection



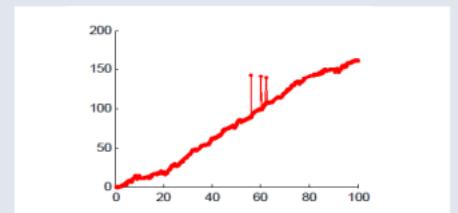
Use Anomaly API to detect correlation analysis of two aspects



Outlier Detection



Use Outlier Detection API to detect failures through e.g. Gradient Check



MindSphere enables you to easily develop Machine Learning solution

Create your custom MindSphere solution

Choose from multiple access options to a broad selection of apps and services as well as connectors for industrial assets to build a MindSphere operating system customized to your needs



MindConnect

Securely connect assets to collect and transfer data to MindSphere



MindAccess

Get immediate access to MindSphere and applications for MindSphere



Applications & components

Analyze IoT data to improve business productivity



MindServices

Accelerate your MindSphere journey with professional services and trainings

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Explore applications and components

Monitor your assets and analyze their data to predict future events using MindSphere applications and components.



Manage MyMachines

Manage MyMachines from Siemens Motion Control leverages expertise in machine tool operations in state and conditions including alarms

[GET NOW](#)



Product Intelligence

Automate insights from product performance data to create actionable intelligence

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Visual Analyzer

Visualize, analyze, and share data across your organization to drive collaboration and insights on your products and processes

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Visual Explorer

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<https://documentation.mindsphere.io/>

<https://developer.mindsphere.io/>

Thank you

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