



**INDÚSTRIA EFICIENTE**

# **Implementando a Indústria 4.0 – Estratégias práticas com benefícios tangíveis imediatos**



*Divulgando as tecnologias a favor da vida.*

[WWW.ETECHN.COM.BR](http://WWW.ETECHN.COM.BR)

# AVISO IMPORTANTE

O conteúdo técnico da palestra é de responsabilidade da empresa palestrante.

Fique à vontade para baixar o arquivo em PDF e se atualizar com as novas tecnologias apresentadas nesta edição.

NÃO É PERMITIDO COPIAR AS INFORMAÇÕES E IMAGENS E REPRODUZIR SEM A AUTORIZAÇÃO DA EMPRESA.

Qualquer dúvida em relação ao conteúdo apresentado, você pode entrar em contato direto com o palestrante.

# VOCÊ JÁ ESTÁ TOMANDO DECISÃO COM BASE EM DADOS?

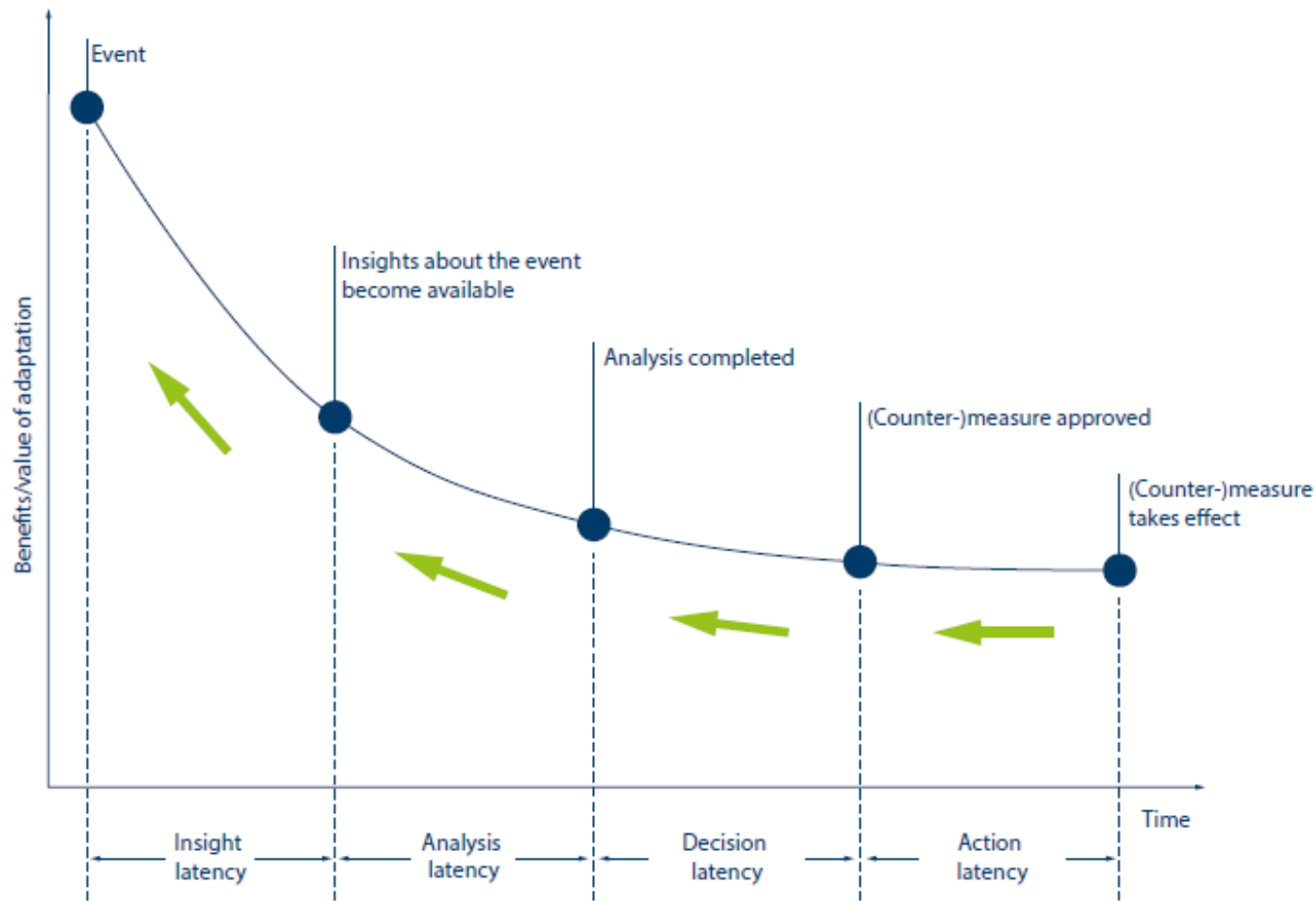


Figure 2: Corporate adaptation processes (source: based on Hackathorn 2002; Muehlen/Shapiro 2010)

- Tomadas de Decisão - Agilidade e Assertividade
- O valor do Monitoramento de condições é exponencial, com base no tempo.

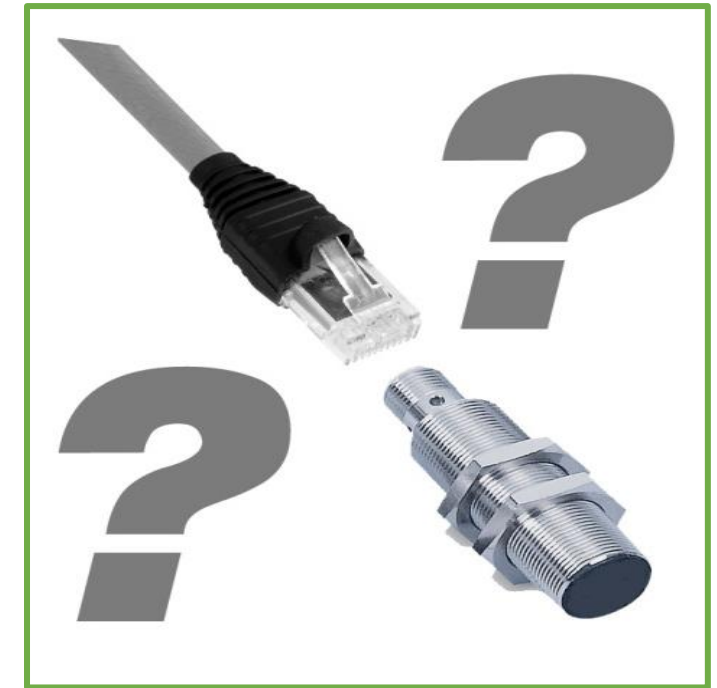
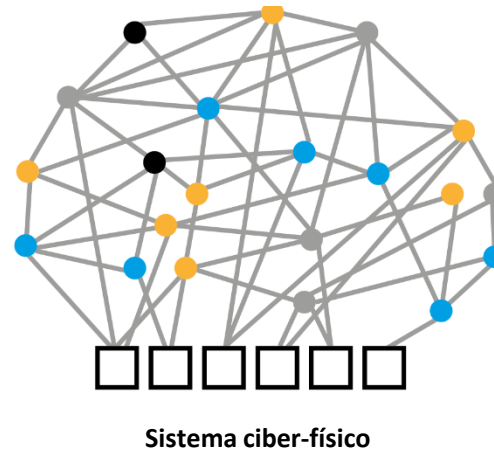
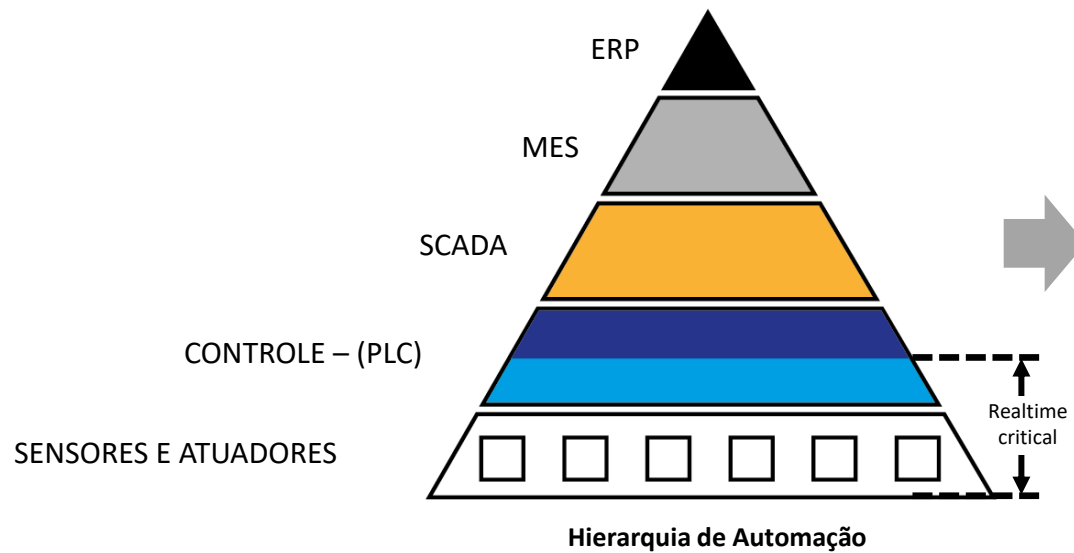
2005



2013

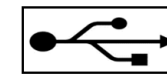
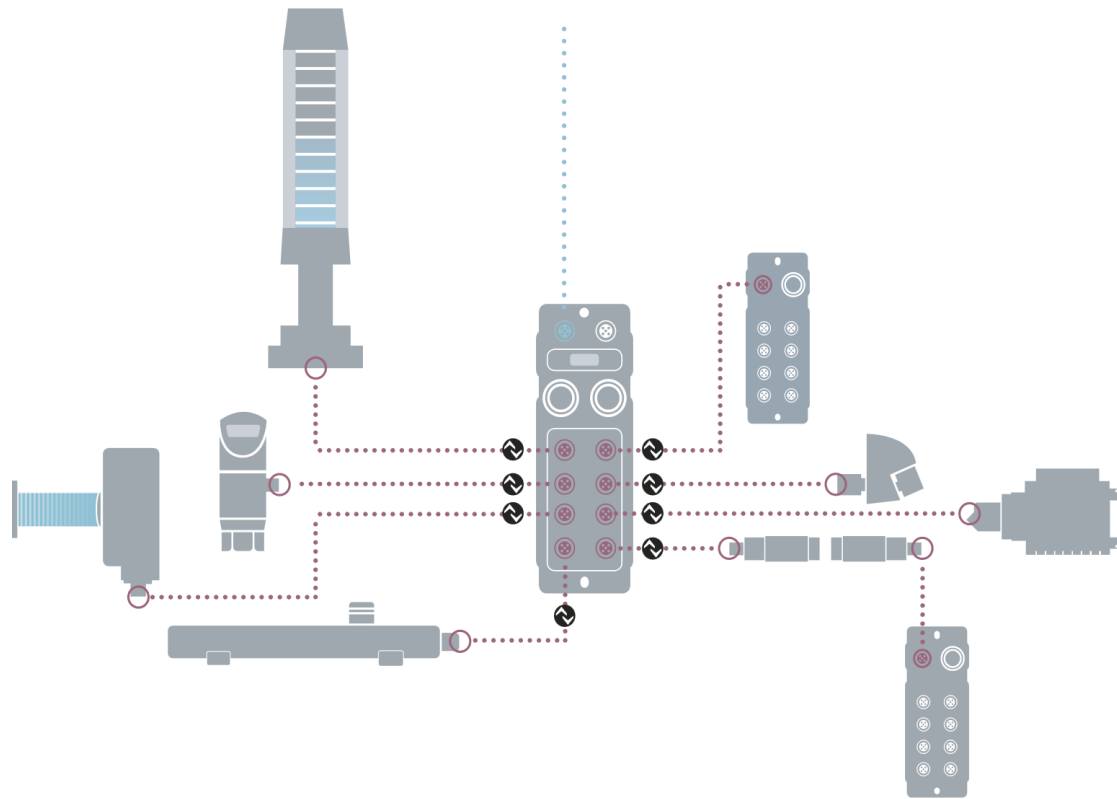


# PIRÂMIDE DE AUTOMAÇÃO



# IO-LINK – CONVERGÊNCIA x COEXISTÊNCIA REDES

EtherNet/IP EtherCAT CC-Link IE PROFINET

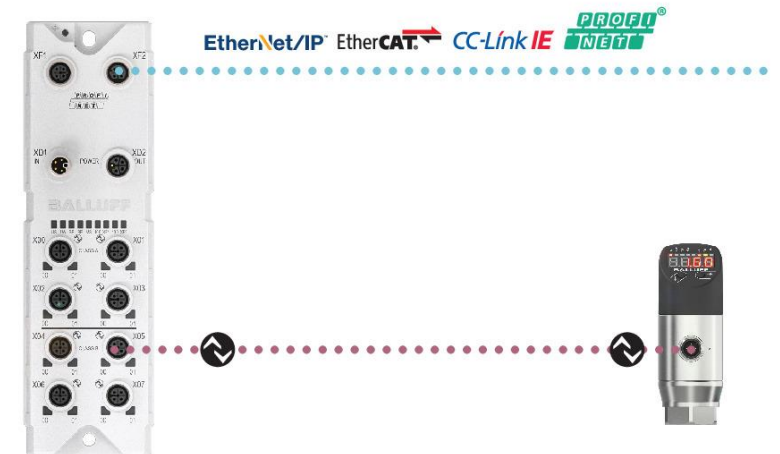


For Computer

=



For Automation



# IO-LINK – CONCEITO E IEC 61131-9

**Primeira tecnologia de IO  
padronizada globalmente com  
norma internacional (IEC 61131-9)**



## Universal

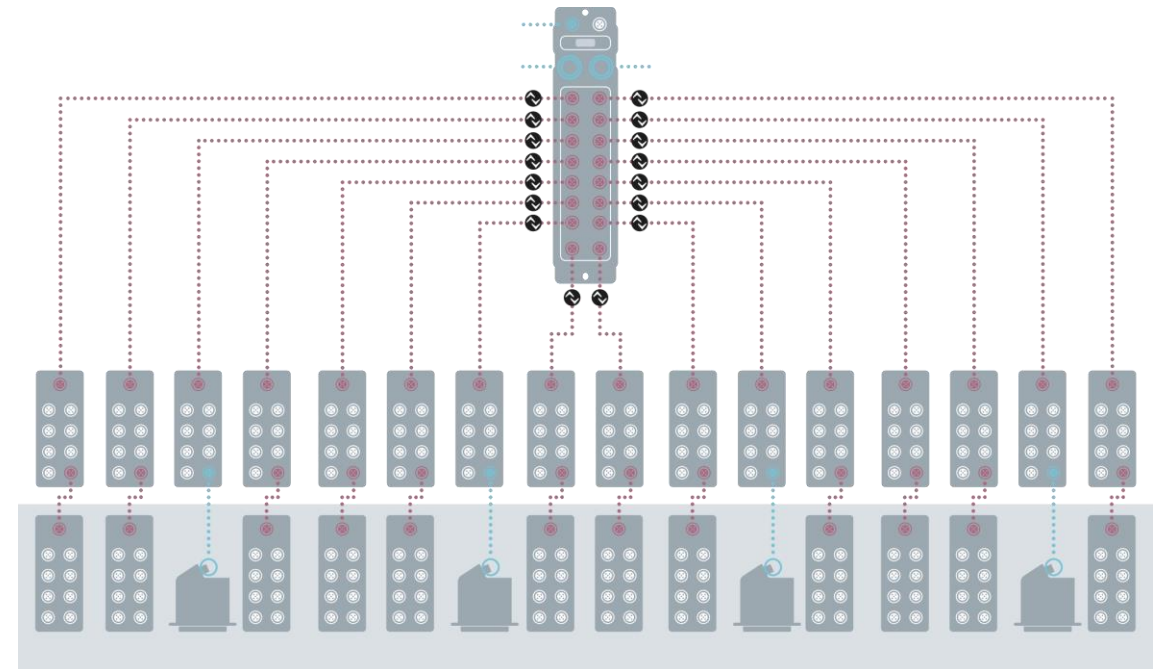
Global, padronizada, interoperável, com múltiplas possibilidades

## Smart

Principal tecnologia IIoT e de I4.0 para sensores e atuadores

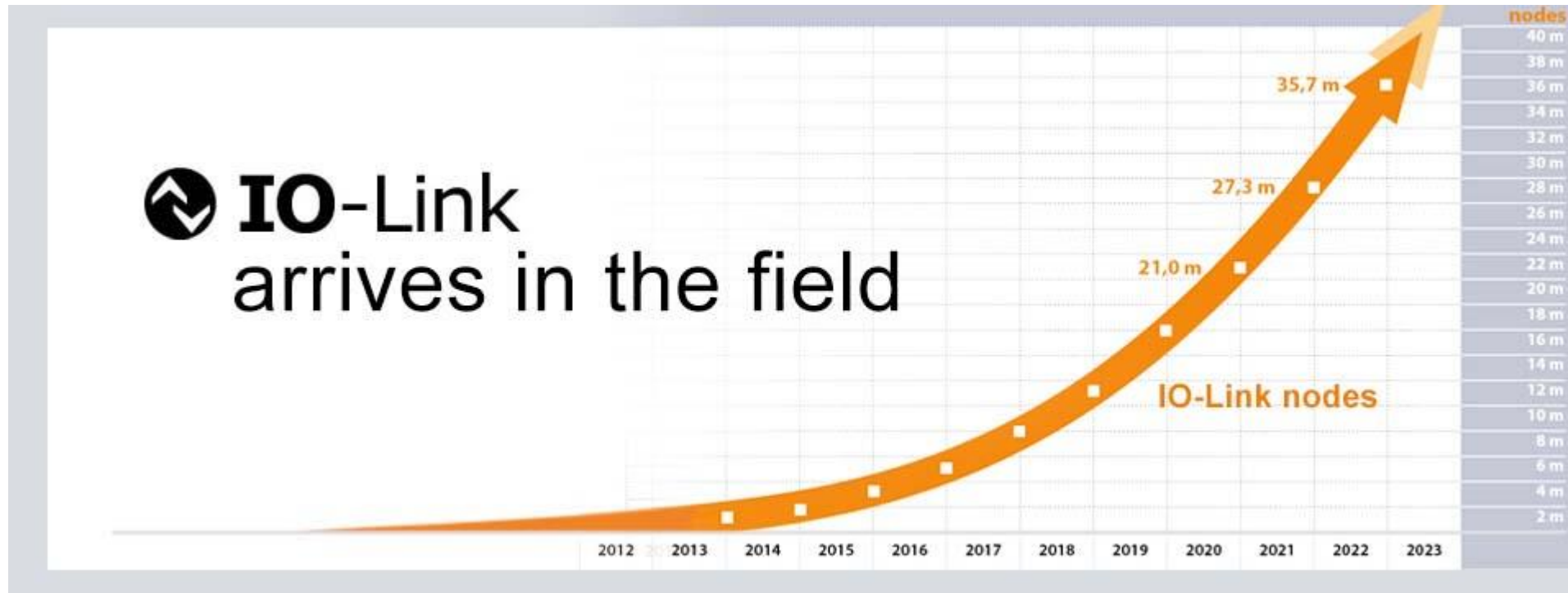
## Easy

Conectar/Plugar ao invés de instalar





# ATUALIZAÇÃO DE MERCADO



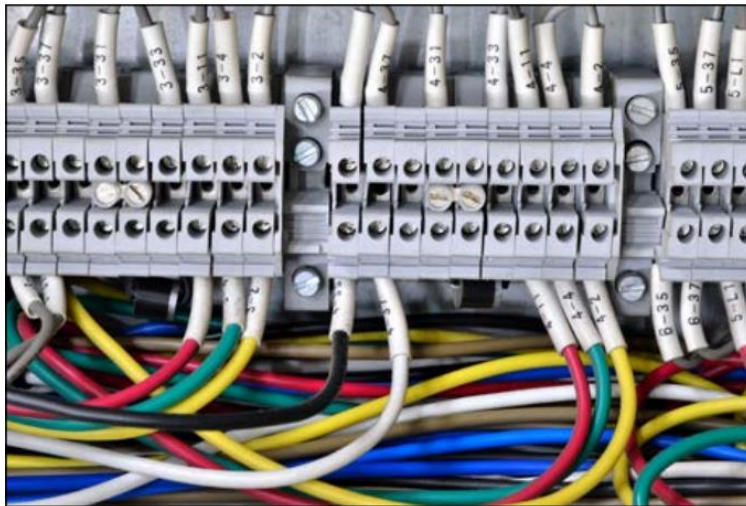
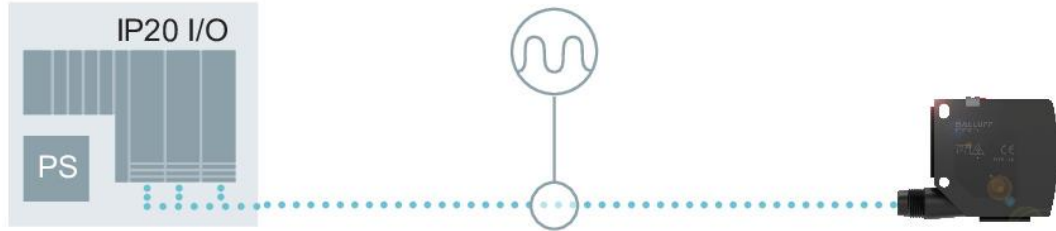
# 35.7

Milhões

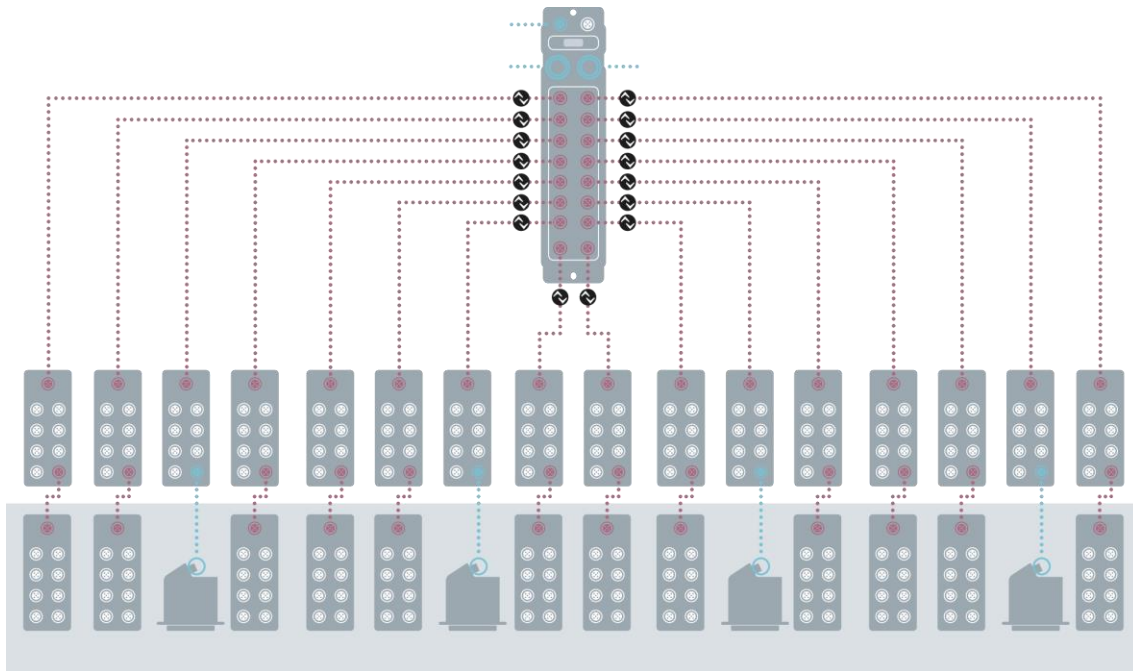
Nós instalados no total  
(Crescimento Exponencial)

Dados extraídos do Consórcio IO-Link em 05/2023

# SISTEMA CONVENCIONAL



# REDES INDUSTRIAIS COM IO-LINK IP67



Before

80% savings on cabinet space  
50% savings on labor



After

# REDUÇÃO DE CUSTO COM CABEAMENTO

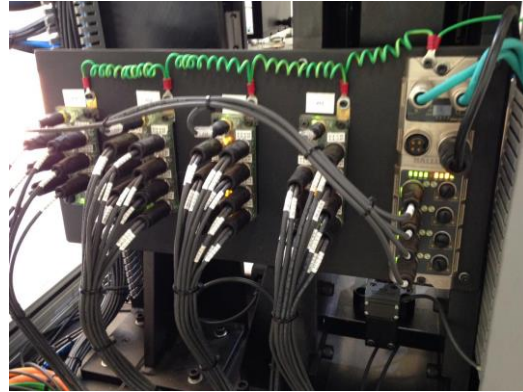
**+20%**

**Redução** de custo da  
Arquitetura de Controle

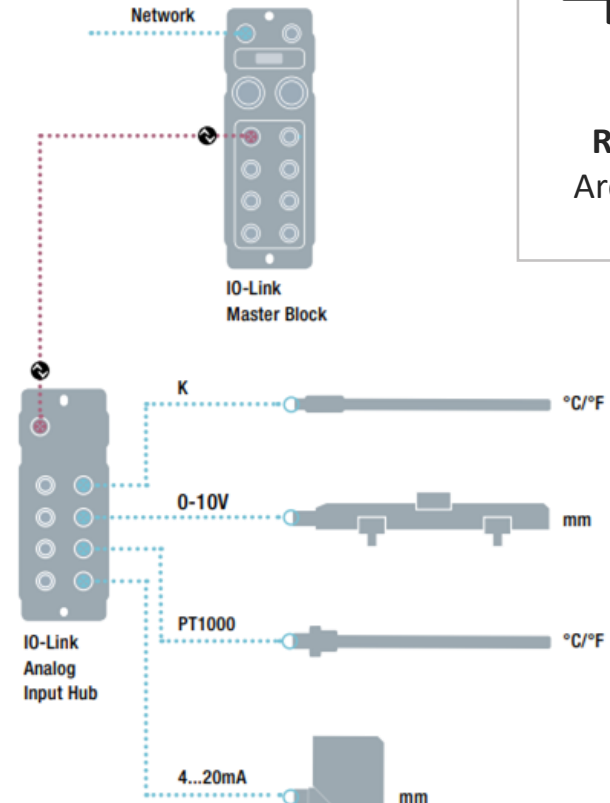
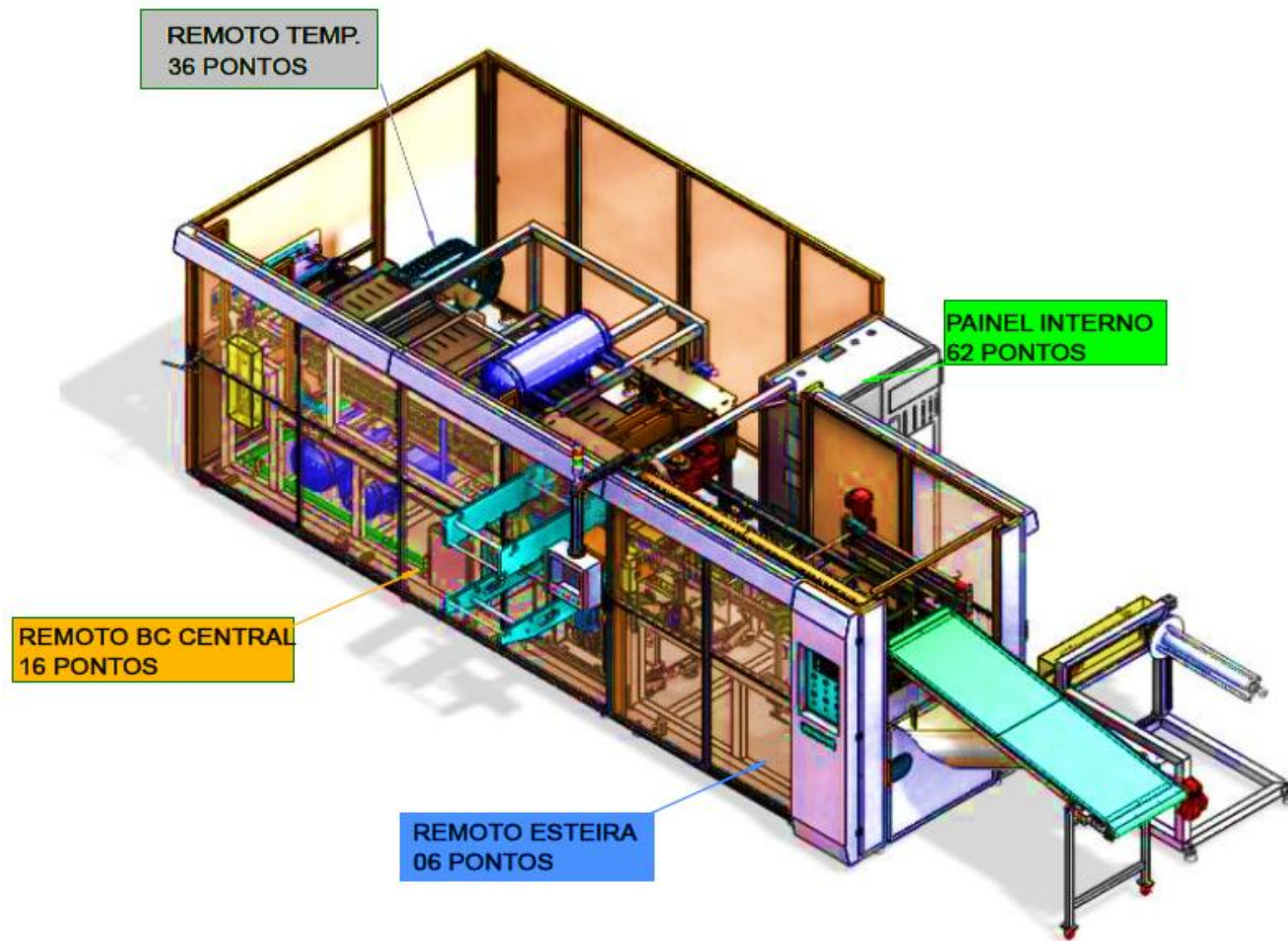


**+30%**

**Ganho** em tempo de  
Montagem, Instalação,  
Trasnporte,  
Comissionamento e Start up



# REDUÇÃO DE CUSTO – DISPOSITIVOS ANALÓGICOS



# 48,4%

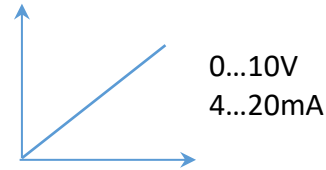
Redução em custo da  
Arquitetura de Controle

# GANHO EM OEE - DISPONIBILIDADE

One sensor –  
datapoint

One

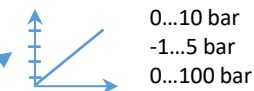
Analog value



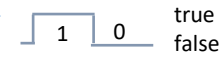
One sensor -  
**Multiple** datapoints

IO-Link

Measurement



Switching points



Parameter



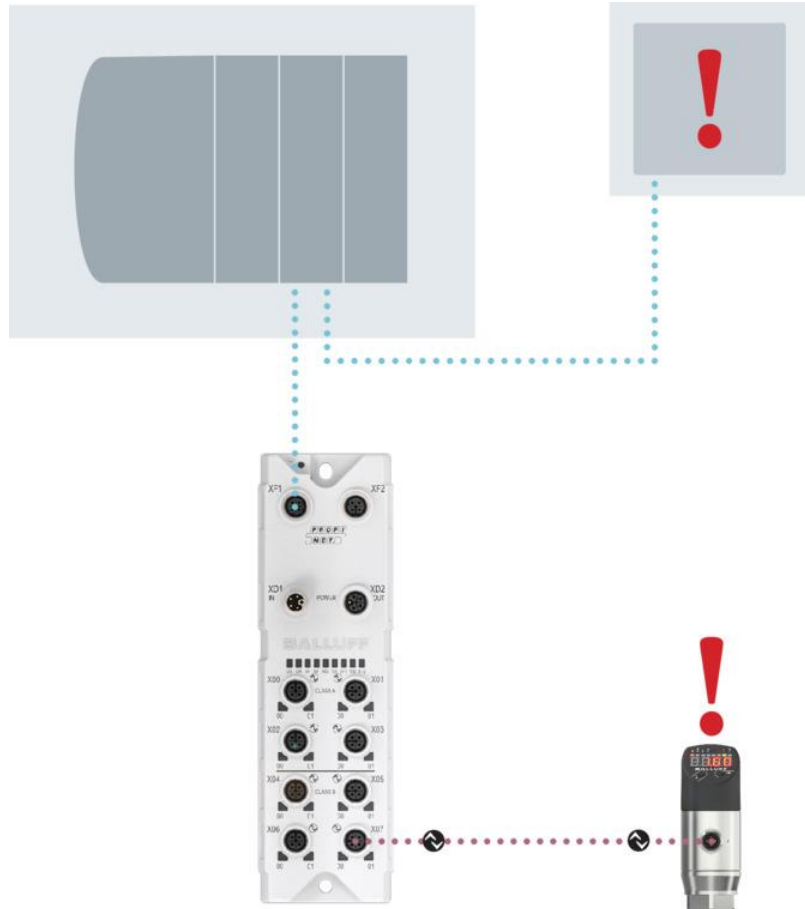
Diagnostic data



Metadata

```
ProductText: "IO-Link Pressure Sensor, -  
1..2 bar SIO 1xPNP + 0..10V"  
VendorName: "Balluff GmbH"  
VendorText: "www.balluff.com"  
ProductName: "BSP"  
ProductId: "BSP008L"  
SerialNumber: "1000368090"  
HwRev: "1.2"  
FwRev: "n110"  
ApplTag: "*****"  
Event: "0x0"  
EventFlag: "0x0"  
ProcessInputs: "FF E8 00 00 00 00 00 00  
00 00 00 00 00 00 00 00 00 00 00 00  
00 00 00 00 00 00 00 00 00 00 00 00 "  
ProcessOutputs: "00 00 00 00 00 00 00 00  
00 00 00 00 00 00 00 00 00 00 00 00  
00 00 00 00 00 00 00 00 00 00 00 00 "  
DirectParameters: "00 00 32 1B 11 50 00  
03 78 01 14 03 00 00 00 00 "  
Status: "87FF"  
DsContentVendorId: "00 00 "  
DsContentDeviceId: "00 00 00 "  
DsContentChecksum: "00 00 00 00 "  
DsContentBuffer: "(none)"
```

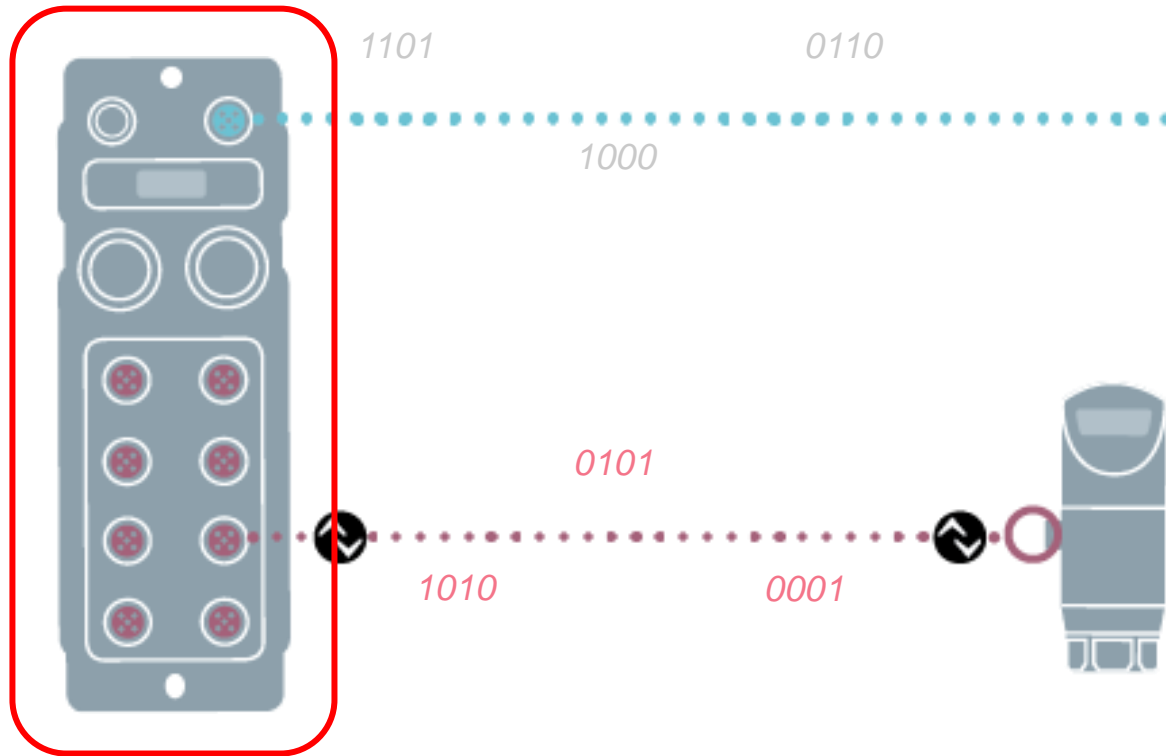
# ATUALIZAÇÃO DE TECNOLOGIA – SMART DEVICES



## Diagnósticos para Eficiência de Produção:

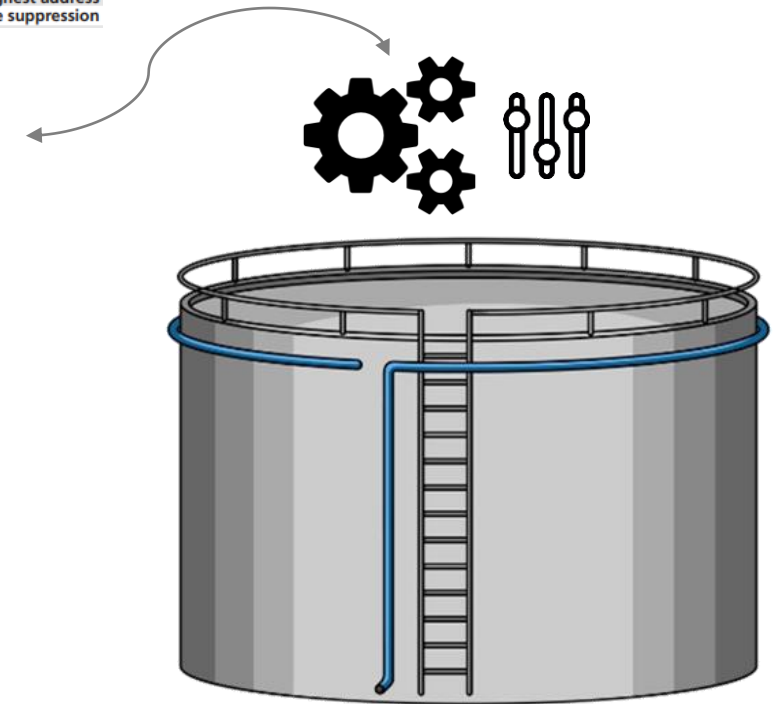
- Vibração
- Inclinação
- Temperatura
- Umidade
- Tensão/Corrente
- Qualidade do Sinal
- Status do Ambiente
- LED para Diagnóstico
- Horas de Operação
- Contagem de Boot Cycle
- PING – Descoberta do Dispositivo
- Dados Estatísticos

# HOT SWAP



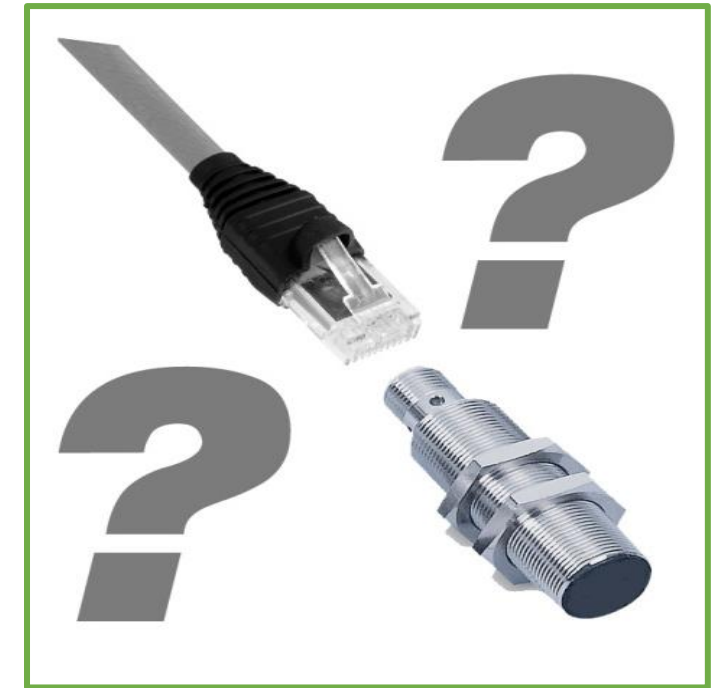
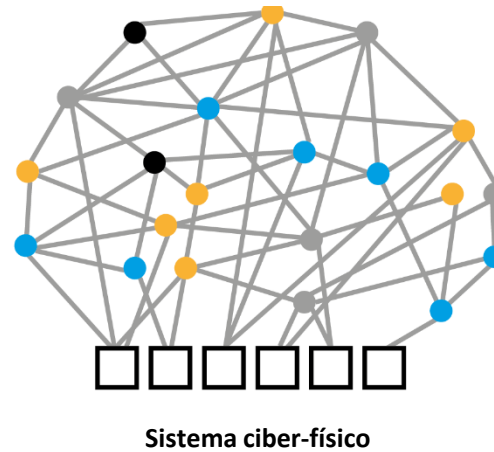
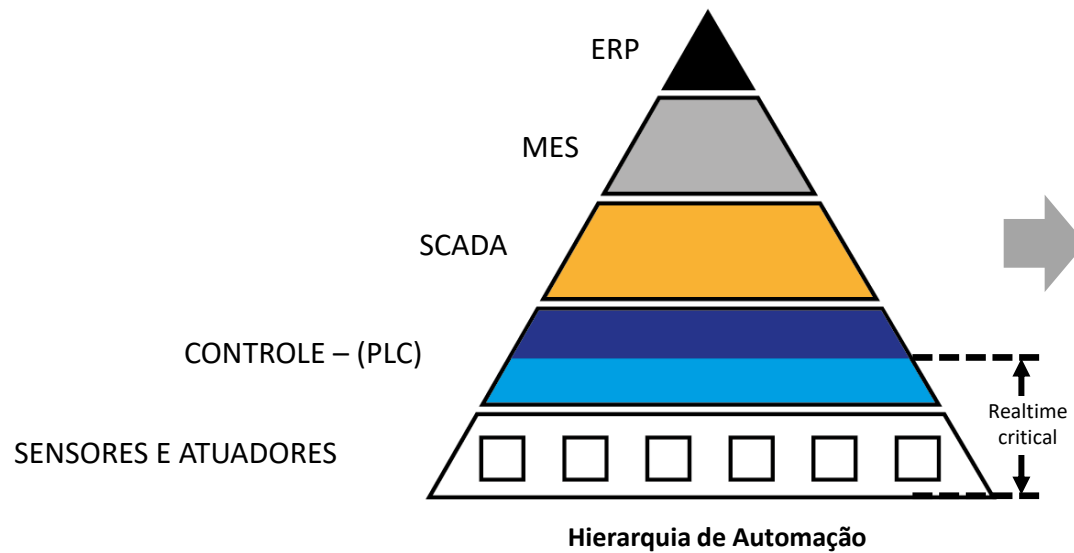
- service data sensor specific
- detect point 1
- return detect point 1
- detect point 2
- return detect point 2
- foreground suppression
- maximum range
- Teach-in via push-button T1/T2
- set NOC/NCC
- measurement filter
- filter strength
- temperature compensation
- switch-on delay
- detection zone sensitivity
- multiplex mode device addressing
- multiplex mode highest address
- interference noise suppression

- Processo
- Parâmetros
- Diagnóstico



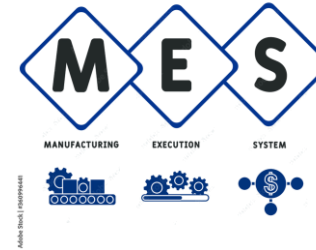
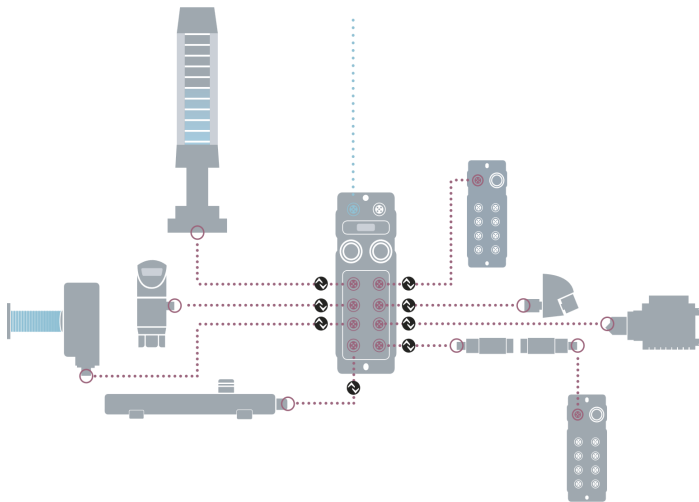


# PIRÂMIDE DE AUTOMAÇÃO



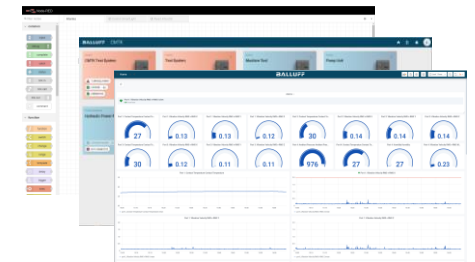
# IO-LINK – CONVERGÊNCIA x COEXISTÊNCIA REDES

EtherNet/IP EtherCAT CC-Link IE PROFINET



OPC UA

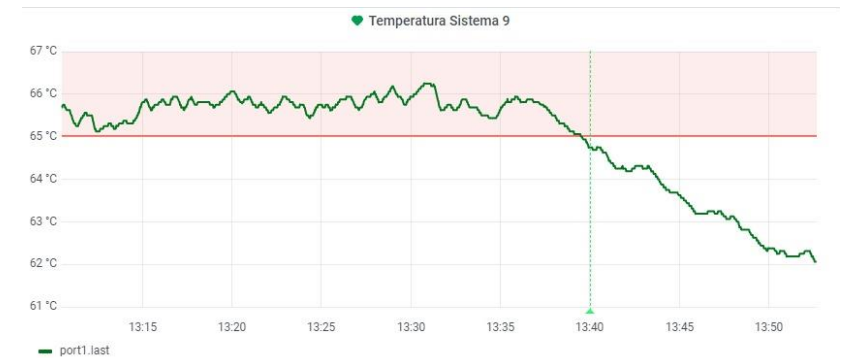
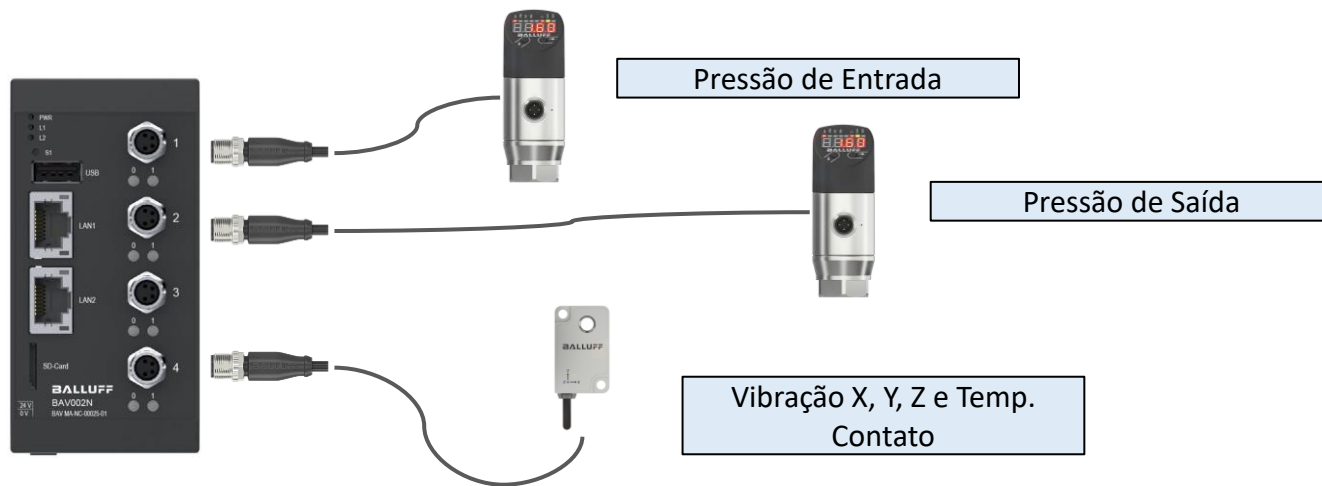
MQTT



- 12 portas IO-Links
- 360 IO's Digitais
- 96 Pontos Analógicos
  - Tensão
  - Corrente
  - Temperatura

# BOMBAS DE PRESSÃO UNID. HIDRÁULICA

Panel Title



## Sensors &amp; IO-Link Masters

Database

E-Mail

MQTT

OPC-UA Server

OPC-UA Client

Docker

Certificates

Network

Time Settings

Software Update

General

## Sensors &amp; IO-Link Masters

📄 UPLOAD IODD

+ ADD MASTER

REINITIALIZE DATA VISUALIZ

BAV MA-NC-00025-01

Master 1

Connected



1 BCM R15E-001-D100-01,5-S4



2 BOO 23K-LI01-S4



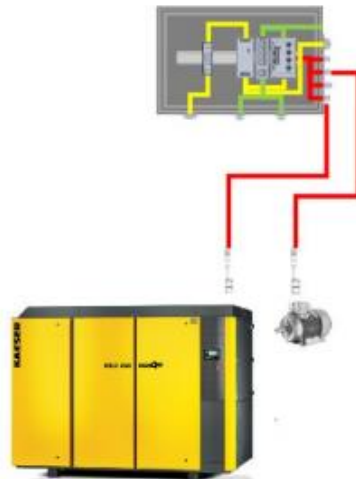
3 BSP B010-EV009-P00S2B-S4



4 BNI IOL-800-000-Z037



# MACHINERY HEALTHY - COMPRESSORES

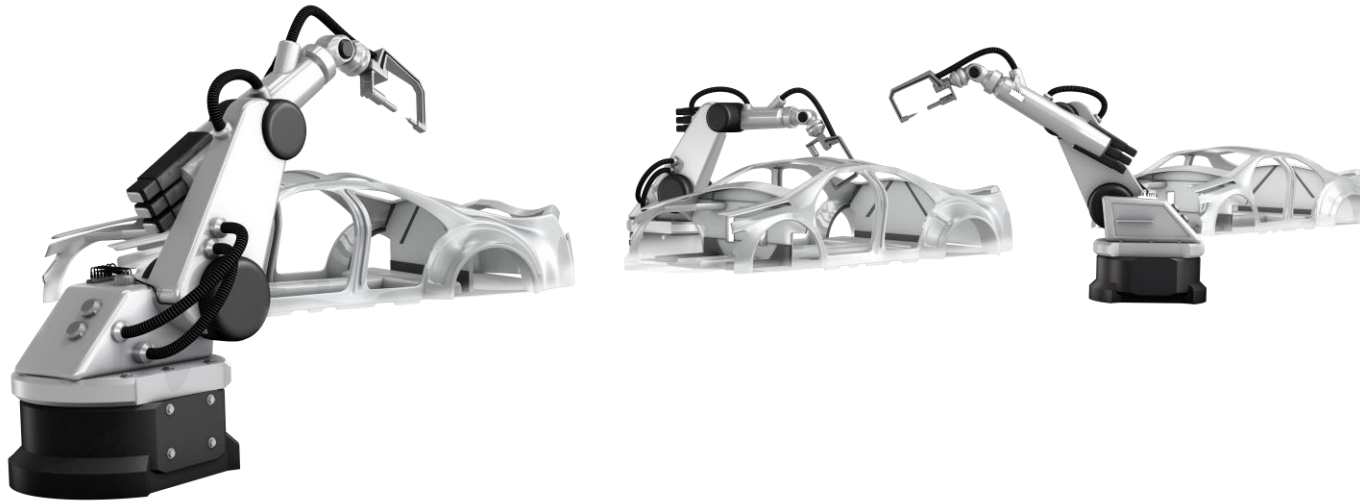


- Case de Sucesso Aplicado em Indústria do setor automotivo (Tier1).
- **Condition Monitoring:**
  - Vibração
  - Temperatura ambiente
  - Consumo de energia dos ativos.
- Com base nos dados, foi possível criar tendências de manutenção, bem como, comportamento dos ativos.

# MACHINERY HEALTHY - ROBÔS

## Montadora de Automóveis - Robôs nas áreas de Assembly e Welding.

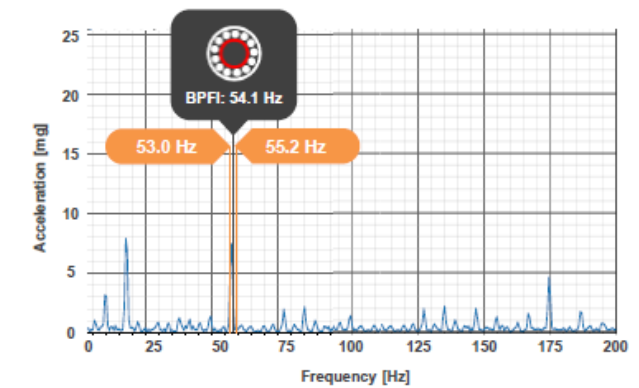
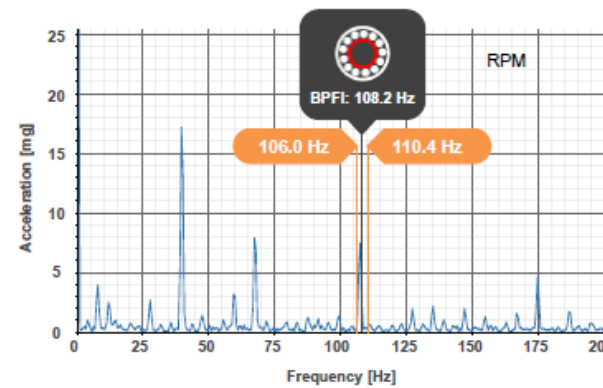
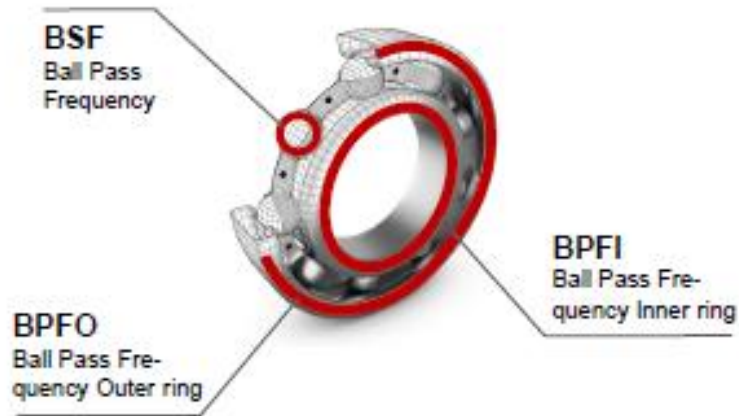
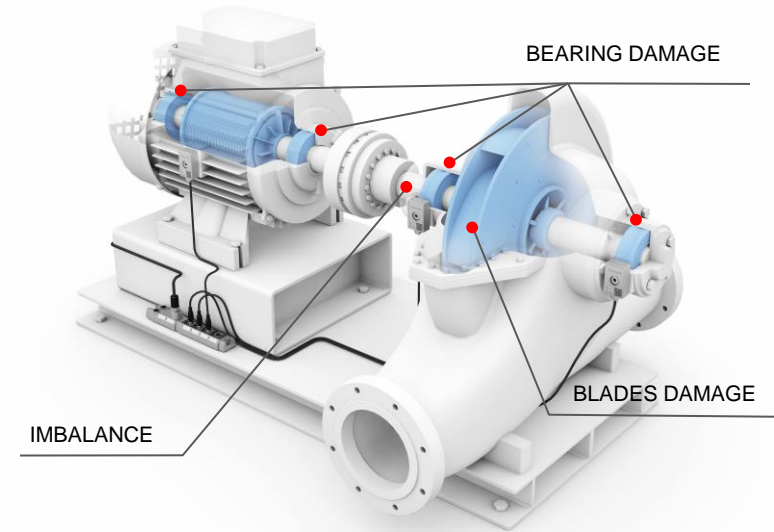
- Queda significativa de OEE – Servo Motores danificados
- Qualidade afetada – Pressão da Unidade Hidráulica (Welding)



# MACHINERY HEALTHY - ROLAMENTOS

## Rolamento de Esferas

- Monitoramento em Tempo Real:
  - Pista Interna
  - Pista Externa
  - Esferas



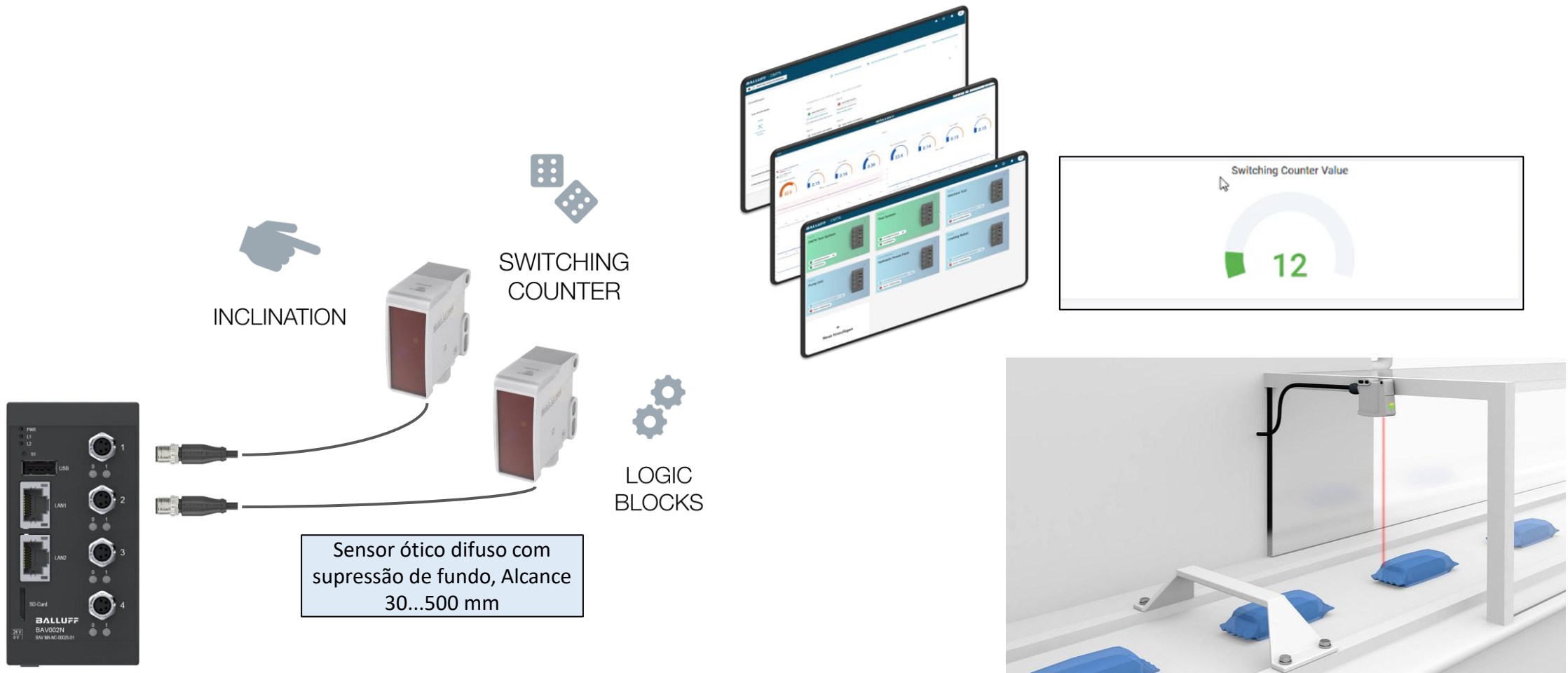
**Create new configuration**

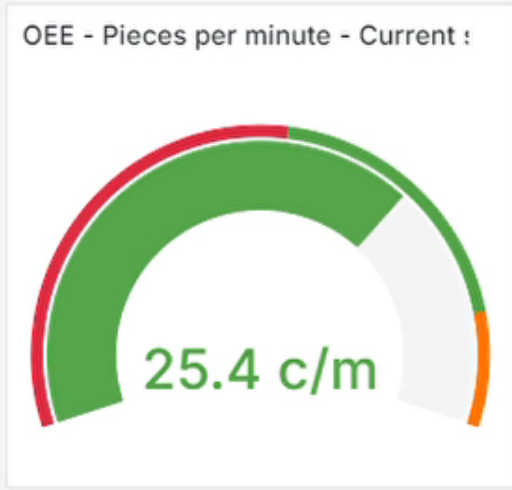
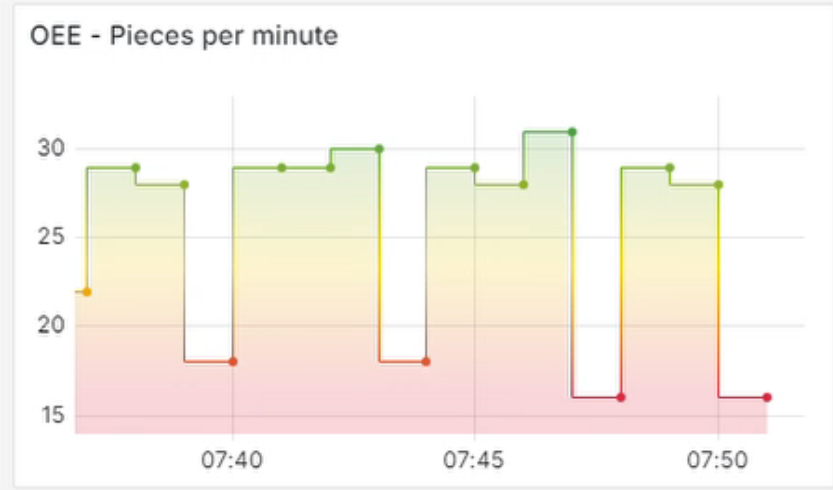
Select the machine type in question to start the wizard for configuring the sensor. The machine type can only be selected for the initial configuration and cannot be changed for additional configurations.

**Motor****Pump****Fan****Compressor****Custom**

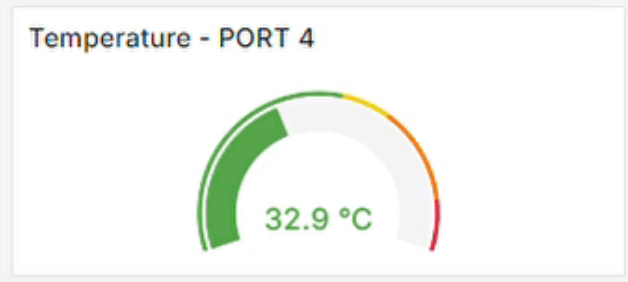
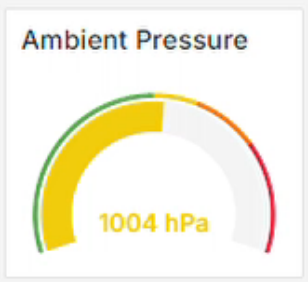
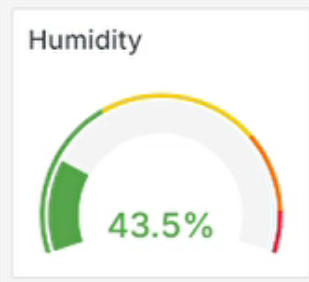
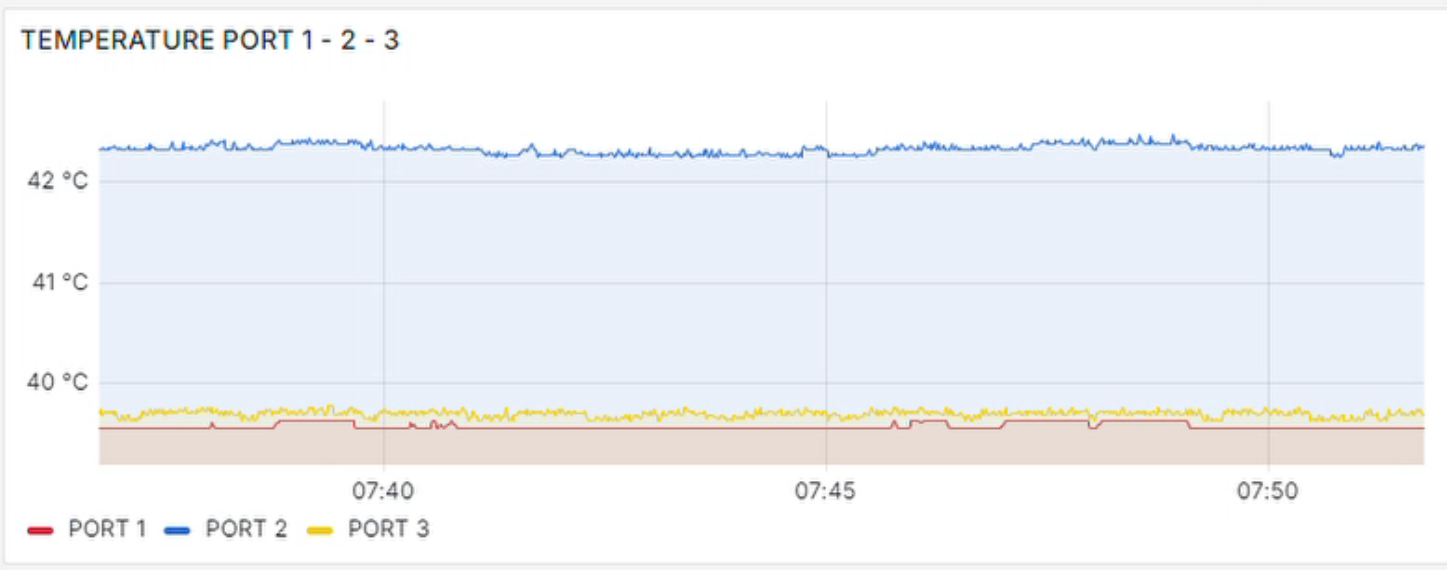
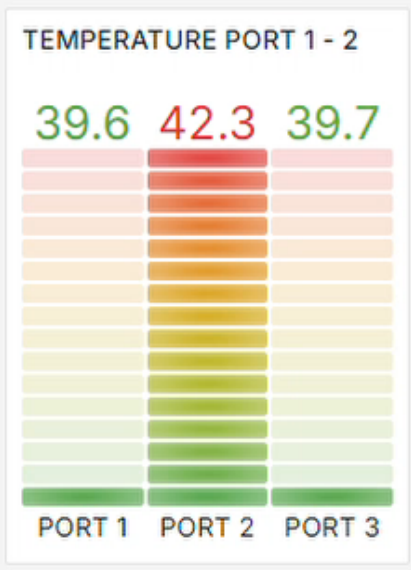


# CONTAGEM DE PEÇAS X FLUXO DE AR CONSUMIDO





- ### Dashboard selector
- ADP Host ☆  
Delta robot system
  - Main dashboard ☆  
Delta robot system
  - Network traffic ☆  
Delta robot system
  - PostgreSQL Database ☆

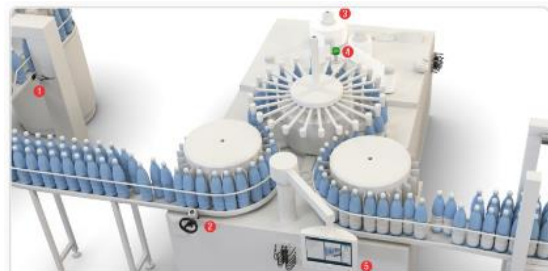


# SET-UP, SMED, TROCA DE FORMATO GUIADA



# 37%

Redução no tempo de Troca de Formato - Rampup



1. identificar os pontos de passagem para o euro



2. selecção e instalação de sensores e dispositivos



3. Criação das instruções passo a passo

# BALLUFF

 *innovating automation*

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Business Development Specialist

