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World-Leading Automation Software

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Unconditional support.
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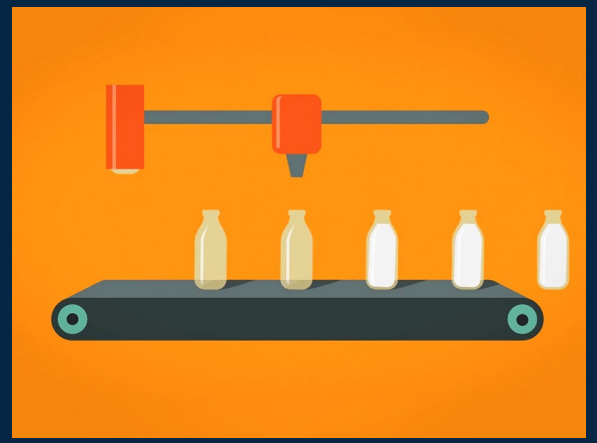
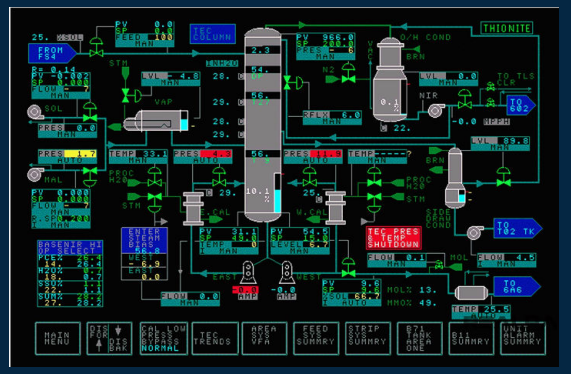
High Performance HMI Techniques with Ignition

In the past...

- HMI's were poorly designed, which compromised:
  - Safety
  - Quality
  - Profitability
- Made use of:
  - Many colours
  - Unnecessary graphics
  - Visual distractions
  - Unnecessary alarms
  - Lack of overall situational awareness





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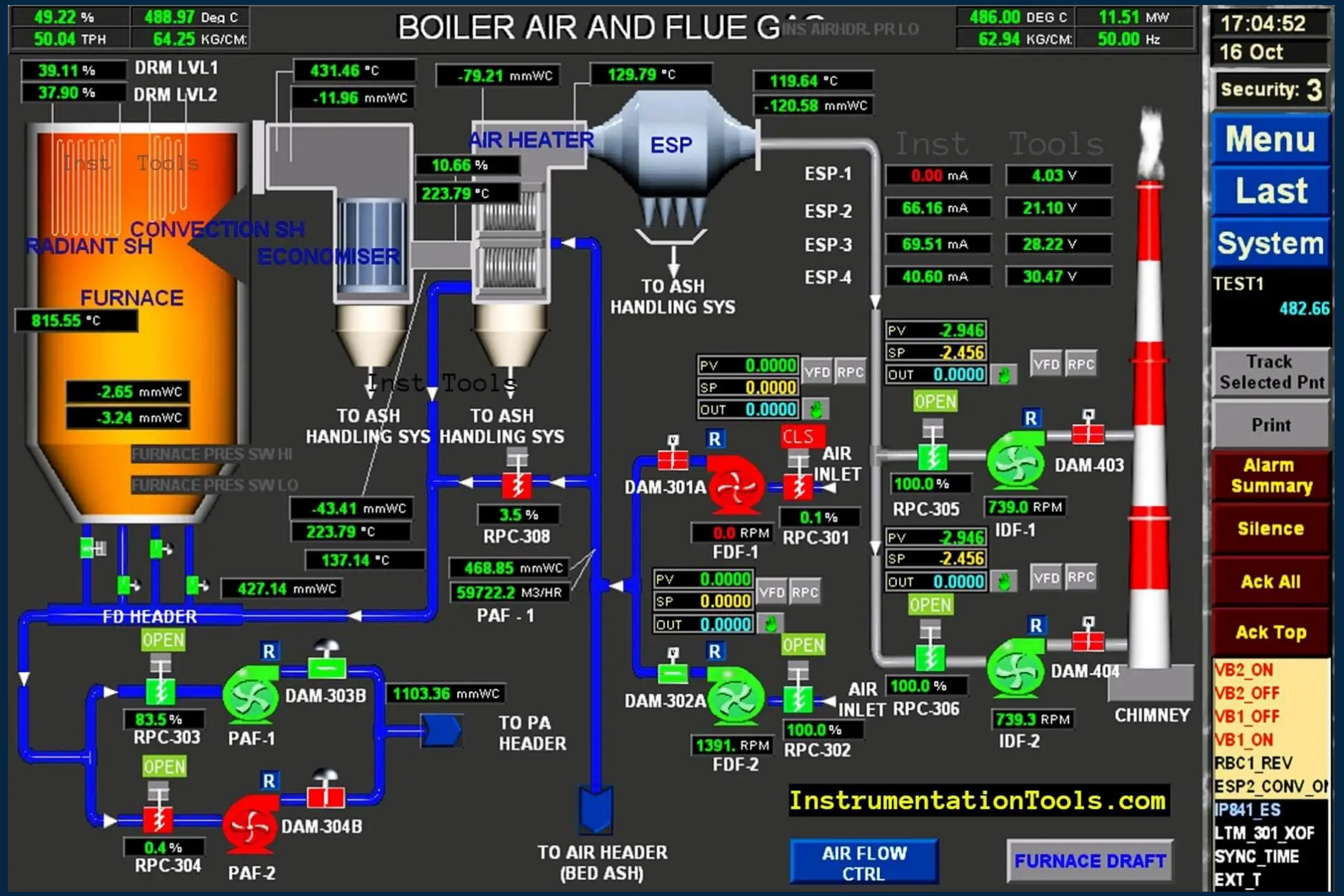
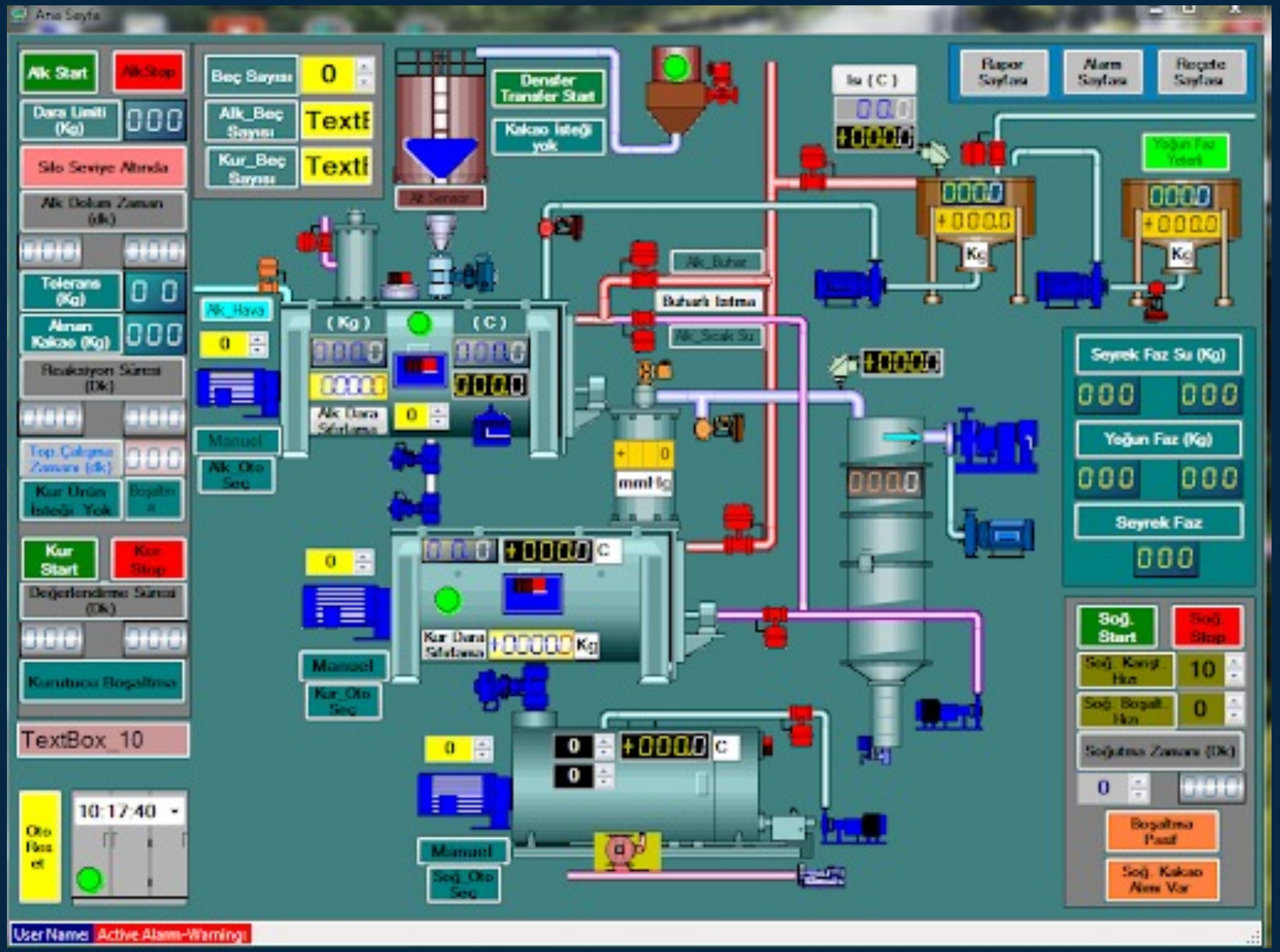
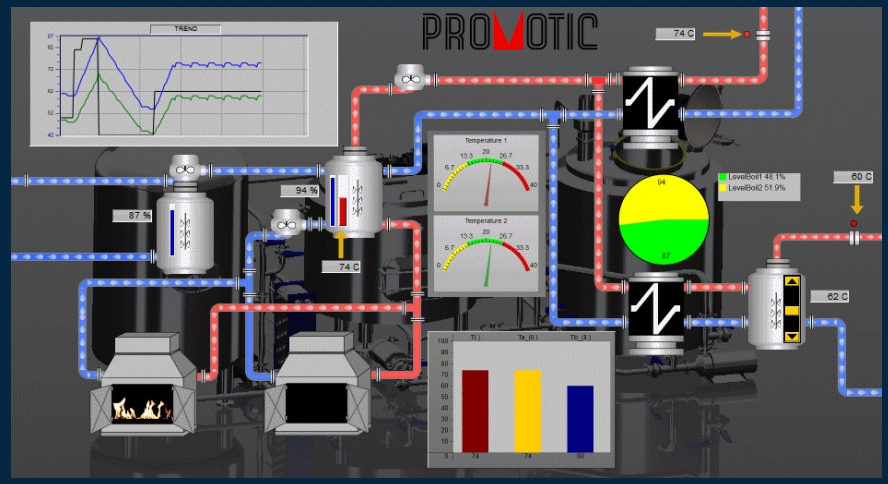

BOILER AIR AND FLUE GAS
49.22 %
488.97 Deg C
50.04 TPH
64.25 KG/CM2
486.00 DEG C
11.51 MW
62.94 KG/CM2
50.00 Hz
17:04:52
16 Oct
Security: 3
Menu
Last
System
TEST1
482.66
Track Selected Pnt
Print
Alarm Summary
Silence
Ack All
Ack Top
VB2_ON
VB2_OFF
VB1_OFF
VB1_ON
RBC1_REV
ESP2_CONV_OI
IP841_ES
LTM_301_XOF
SYNC_TIME
EXT_T
39.11 % DRM LVL1
37.90 % DRM LVL2
431.46 °C
-11.96 mmWC
-79.21 mmWC
129.79 °C
119.64 °C
-120.58 mmWC
AIR HEATER
ESP
ESP-1 0.00 mA 4.03 V
ESP-2 66.16 mA 21.10 V
ESP-3 69.51 mA 28.22 V
ESP-4 40.60 mA 30.47 V
TO ASH HANDLING SYS
10.66 %
223.79 °C
CONVECTION SH
RADIANT SH
ECONOMISER
FURNACE
815.55 °C
-2.65 mmWC
-3.24 mmWC
FURNACE PRES SW HI
FURNACE PRES SW LO
TO ASH HANDLING SYS
TO ASH HANDLING SYS
-43.41 mmWC
223.79 °C
137.14 °C
3.5 %
RPC-308
427.14 mmWC
FD HEADER
468.85 mmWC
59722.2 M3/HR
PAF - 1
PV 0.0000 SP 0.0000 OUT 0.0000 VFD RPC
DAM-301A
CLS
AIR INLET
0.0 RPM
FDF-1
0.1 %
RPC-301
PV 0.0000 SP 0.0000 OUT 0.0000 VFD RPC
DAM-302A
OPEN
AIR INLET
100.0 %
RPC-302
1391. RPM
FDF-2
PV -2.946 SP -2.456 OUT 0.0000 VFD RPC
OPEN
100.0 %
RPC-305
DAM-403
739.0 RPM
IDF-1
PV -2.946 SP -2.456 OUT 0.0000 VFD RPC
OPEN
100.0 %
RPC-306
DAM-404
739.3 RPM
IDF-2
CHIMNEY
OPEN
83.5 %
RPC-303
DAM-303B
PAF-1
1103.36 mmWC
TO PA HEADER
OPEN
0.4 %
RPC-304
DAM-304B
PAF-2
TO AIR HEADER (BED ASH)
InstrumentationTools.com
AIR FLOW CTRL
FURNACE DRAFT

8


Ana Sayfa
Alk Start
Alk Stop
Beç Sayısı
Alk_Beç Sayısı
Kur_Beç Sayısı
Denizler Transfer Start
Kakao İsteği yok
Rapor Sayfası
Alarm Sayfası
Reçete Sayfası
Silo Seviye Altında
Alk Dolum Zamanı (dk)
Tolerans (Kg)
Alınan Kakao (Kg)
Reaksiyon Süresi (Dk)
Kur Start
Kur Stop
Değerlendirme Süresi (Dk)
Kurutucu Boşaltma
TextBox_10
Alk_Hava
Manuel
Alk_Oto Seç
Alk_Buhar
Buharlı Isıtma
Alk_Sıcak Su
Seyrek Faz Su (Kg)
Yoğun Faz (Kg)
Seyrek Faz
Soğ. Start
Soğ. Stop
Soğ. Kimyl. Hızı
Soğ. Boşalt. Hızı
Soğutma Zamanı (Dk)
Boşaltma Pasif
Soğ. Kakao Alımı Var
Kur_Oto Seç
Soğ_Oto Seç
10:17:40
User Name: Active Alarm-Warning:

This resulted in….

- Lack of standards for visualizing information
- Inconsistent navigation
- Difficulty in understanding data being represented
- Bad alarm notifications
- Animations that meant nothing
- Operators not responding to abnormal situations timeously



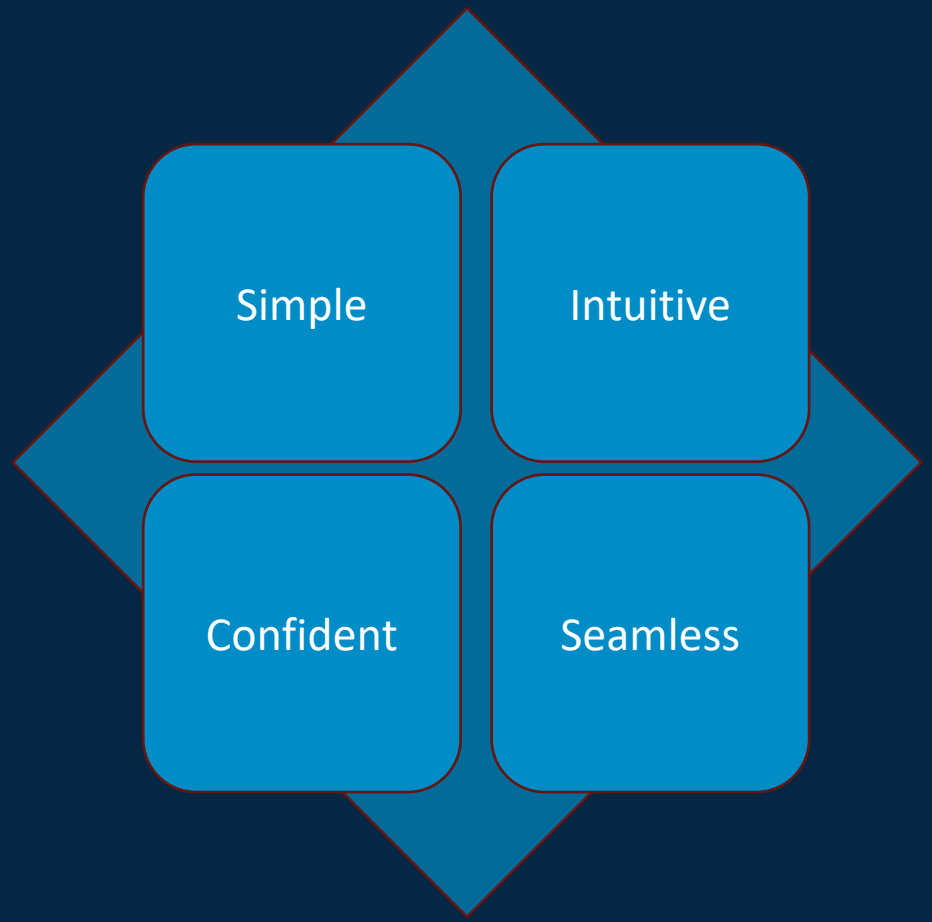
What is a High-Performance HMI?

- Uses Standards
- Allows for easy and intuitive navigation and is easy to use
- Has more productive graphics
- Supports a smooth and stable operation of the process
- Based on the concept of visually contrasting critical and non-critical states
  - Easily identify abnormalities in the operation
- Allows the viewer to make the best decisions in the shortest amount of time

What makes a good operator interface?

Recognise and understand information with ease and speed

Have confidence in the control system



Anticipate and recognize quickly, and respond instantly

Complete their tasks and navigate seamlessly

We know what you are thinking

"High Performance HMI is just a bunch of boring, grayscale, featureless screens, and it can't make me a better operator."

"I need a complete, real-world representation of the process. That's all that makes sense.

"My screens are unique to my process. That High-Performance HMI stuff is cookie-cutter and one-size-fits-all. That doesn't apply to me.

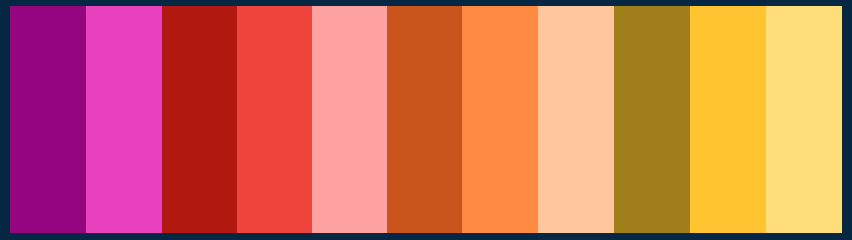
I have been using the same screens for 10 years, I know where everything is.

It’s not just 50 shades of grey

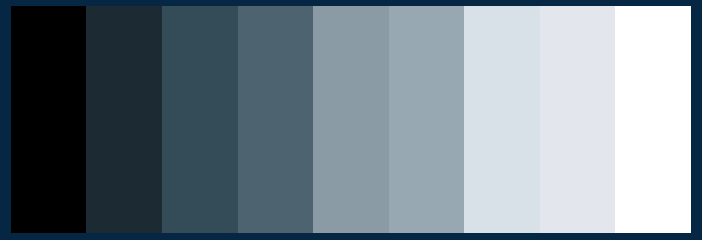
- It includes:
  - Shape and style
  - Typography
  - Colours
  - Navigation
  - Situational analysis
  - Intelligent alarming
  - Trending

Colour is used to draw attention

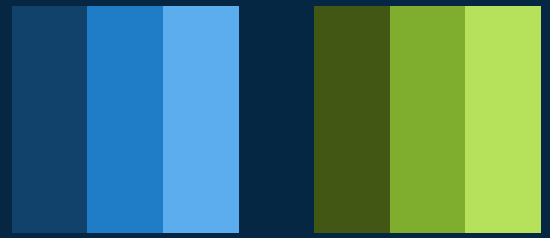
Warm Colours



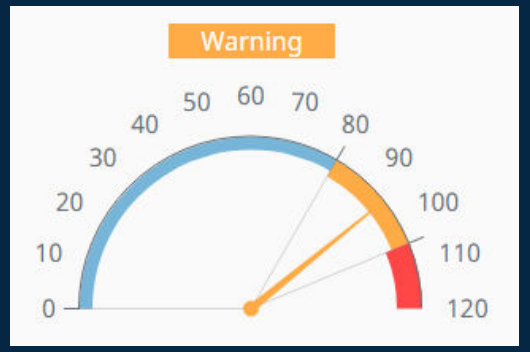
Neutral Colours

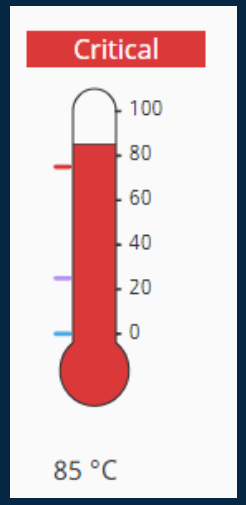


Cool Colours

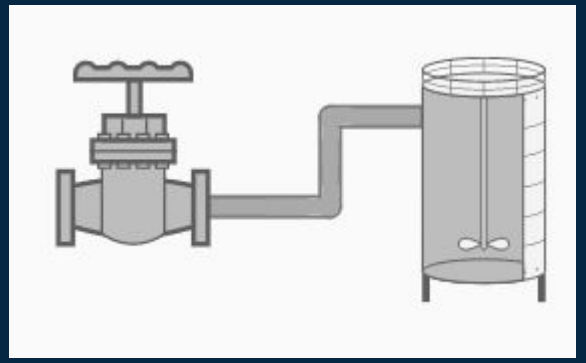


Alarms, Alerts, Warnings, Urgent Notifications

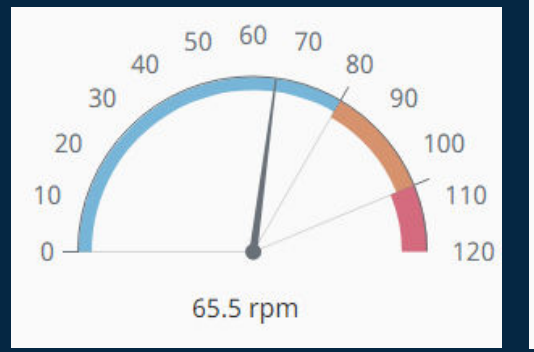


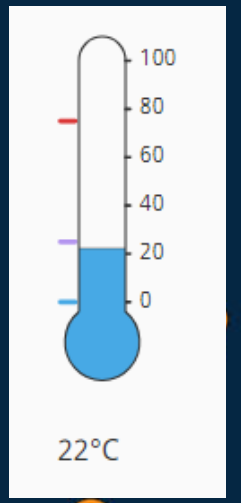


Contextual elements, Assets, Labels, Connectors



All clear, Good State, Normal

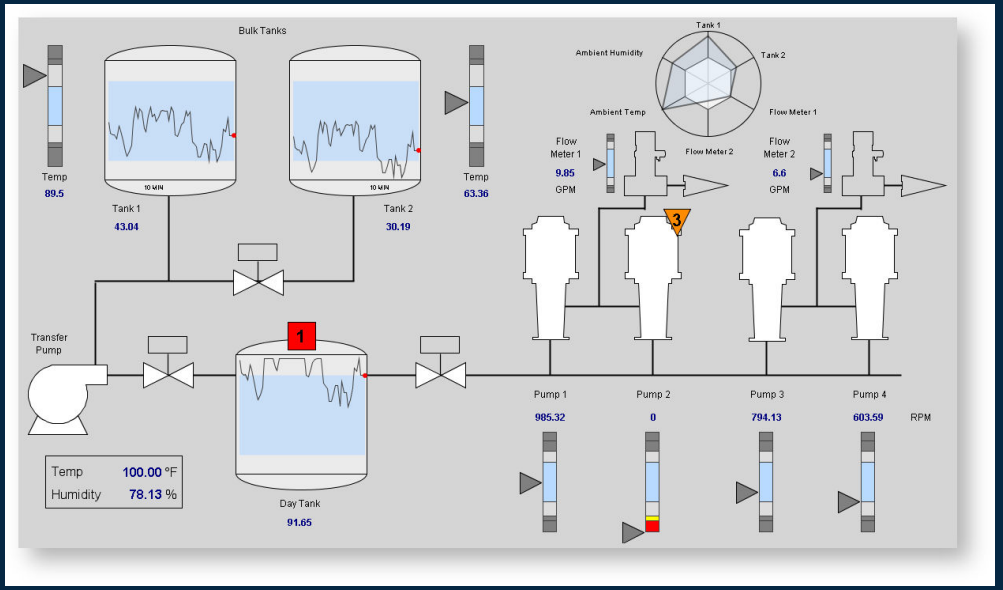




High-Performance HMI

- Typically simplistic
  - Gray-scale colours
  - Use the idea of visual contrasts to depict critical and non-critical states

- The idea is that when something goes wrong, the HMI will quickly guide the operator to the source of the problem



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Why do I need a High-Performance HMI?

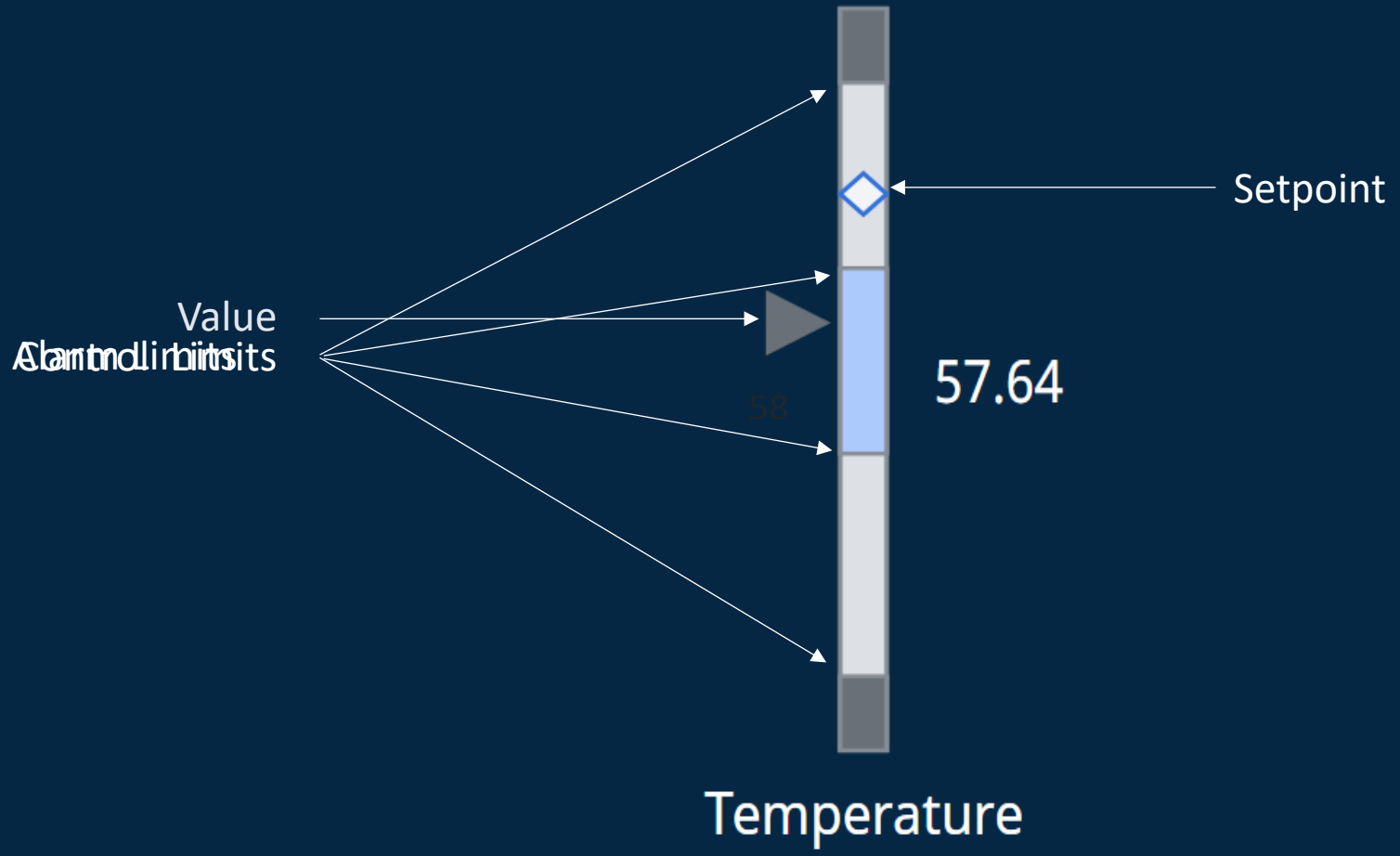
- Efficiency and accuracy
- Safety
- Standardization
- Simplicity
- Training

High-Performance Symbols

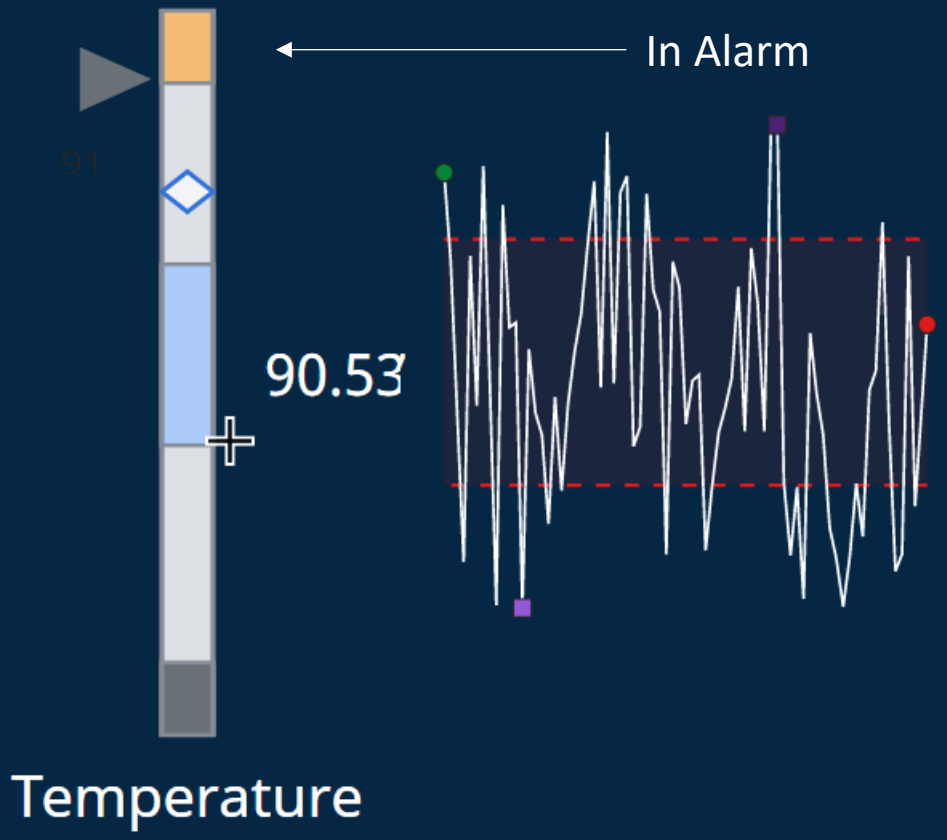
- Let’s look at an Analog Display

- What is the Setpoint?
- Is this close to an alarm limit or a control limit?
- What is the history of this value?

Something better?



Add A Sparkline



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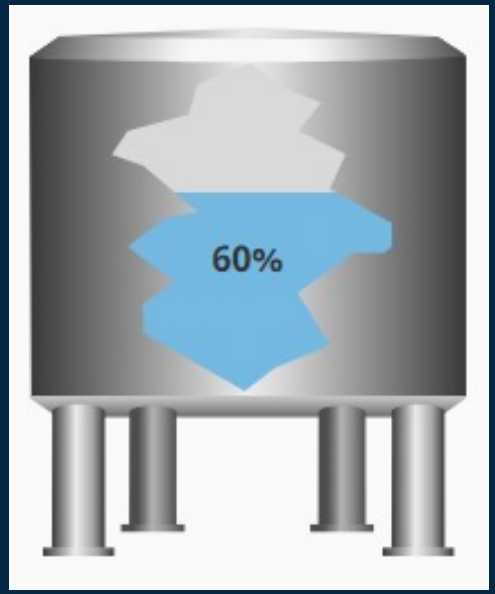
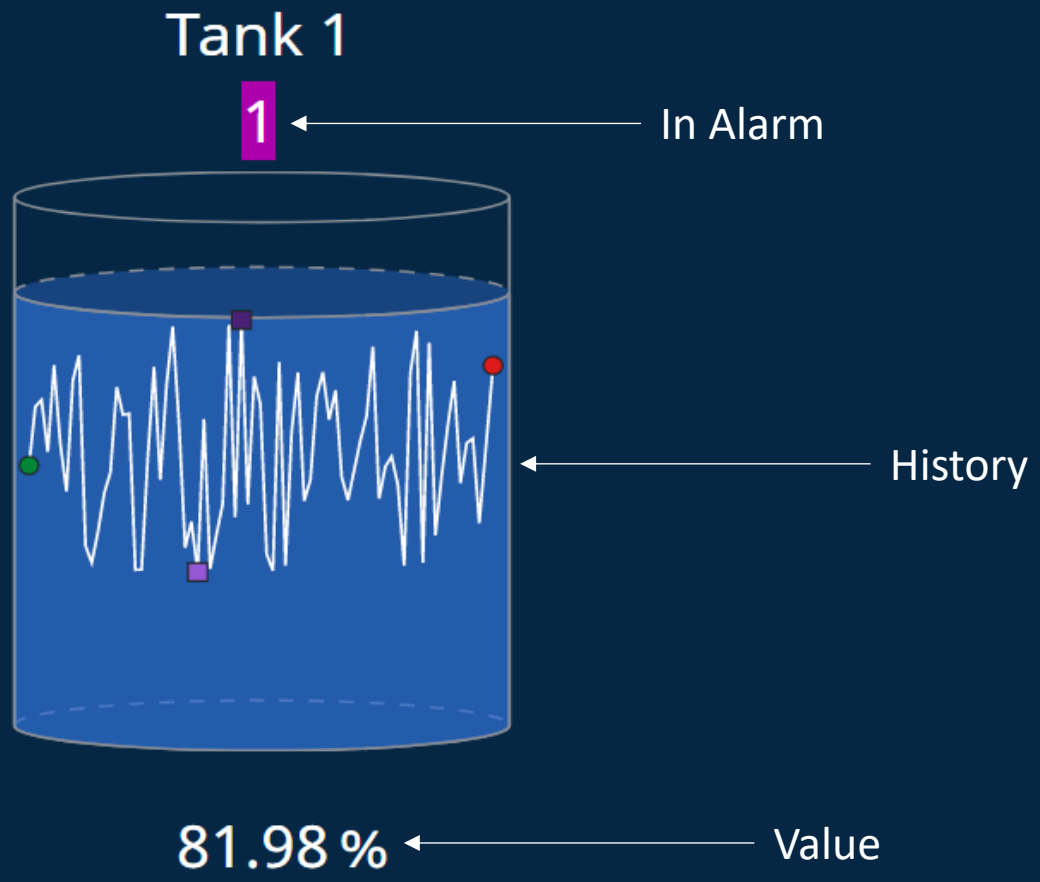
How about a Tank?



Better?



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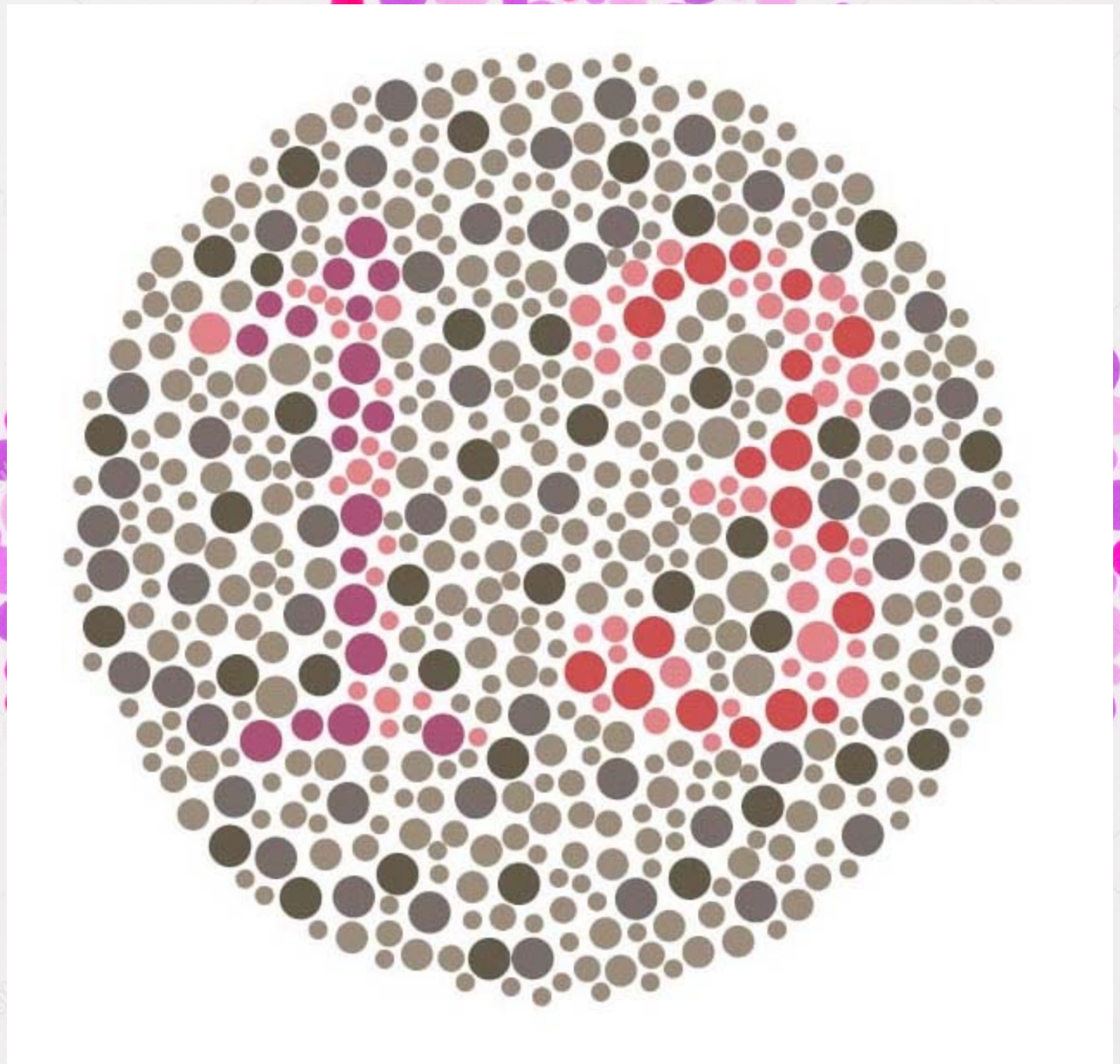
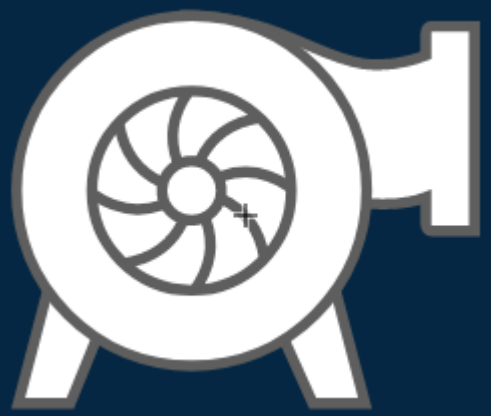
Colour Blin



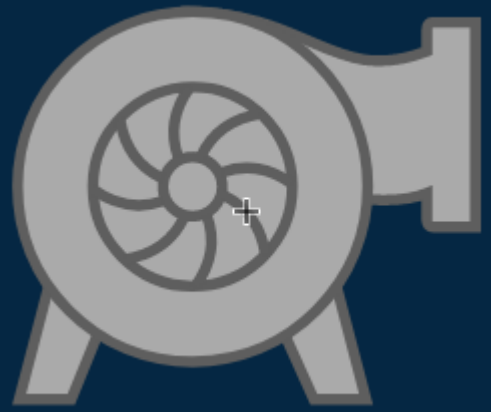
Motors etc.

Pump1



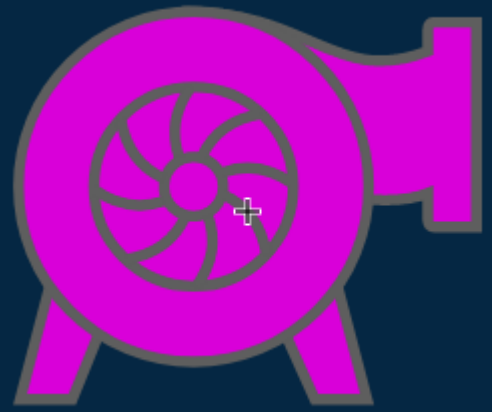
Running

Pump1



Stopped

Pump1



Faulted

Themes

- Ignition has built-in themes
  - Light
  - Light Cool
  - Light Warm
  - Dark
  - Dark Cool
  - Dark Warm
- There is a colour swatch for each of these themes

	light	light-cool	light-warm	dark	dark-cool	dark-warm
--neutral-10						
--neutral-20						
--neutral-30						
--neutral-40						
--neutral-50						
--neutral-60						
--neutral-70						
--neutral-80						
--neutral-90						
--neutral-100						
--seq-1						
--seq-2						
--seq-3						
--seq-4						
--seq-5						
--seq-6						
--div-1						

Themes – How do we use them?

- Styles and Style Classes
- Perspective Session Props – theme
- Colours
- Custom Theme

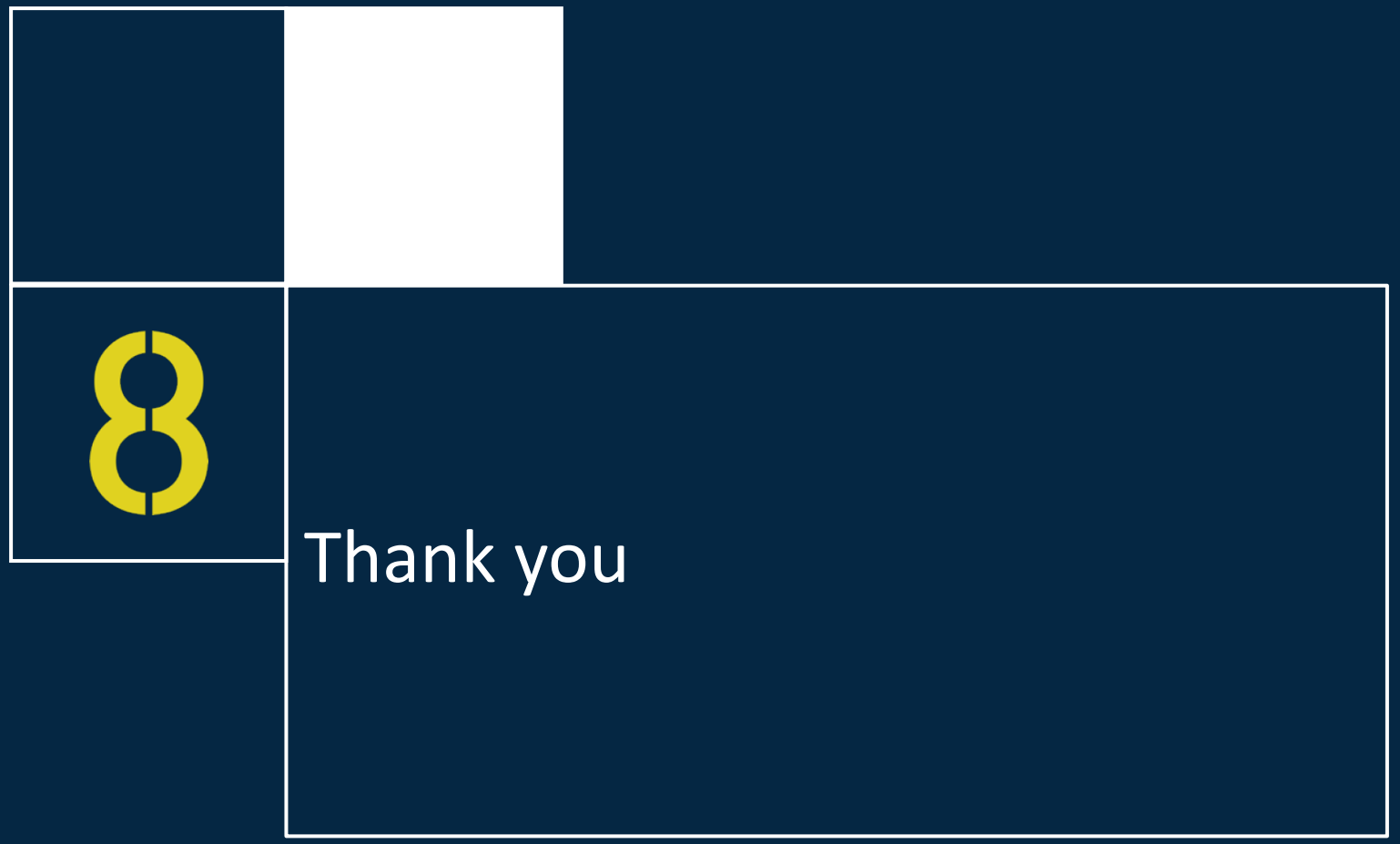
More information

- Design Like a Pro: Exceptional Industry-Specific HMIs
- Design Like a Pro: Mobile-Responsive HMIs for Any Screen
- The Art of Displaying Industrial Data
- Design Like a Pro: Developing & Deploying Perspective Applications as HMIs
- Design Like a Pro: How to Best Plan Your Perspective Project

8

To Summarize

- Use Analog Indicators with moving pointers instead of numerical displays
- Access to trend data is critical
- Greyscale is preferred over multiple colours
- Text must be consistent across the project
- Navigation must be simple
- HMI must be intuitive and easy to use


Thank you

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