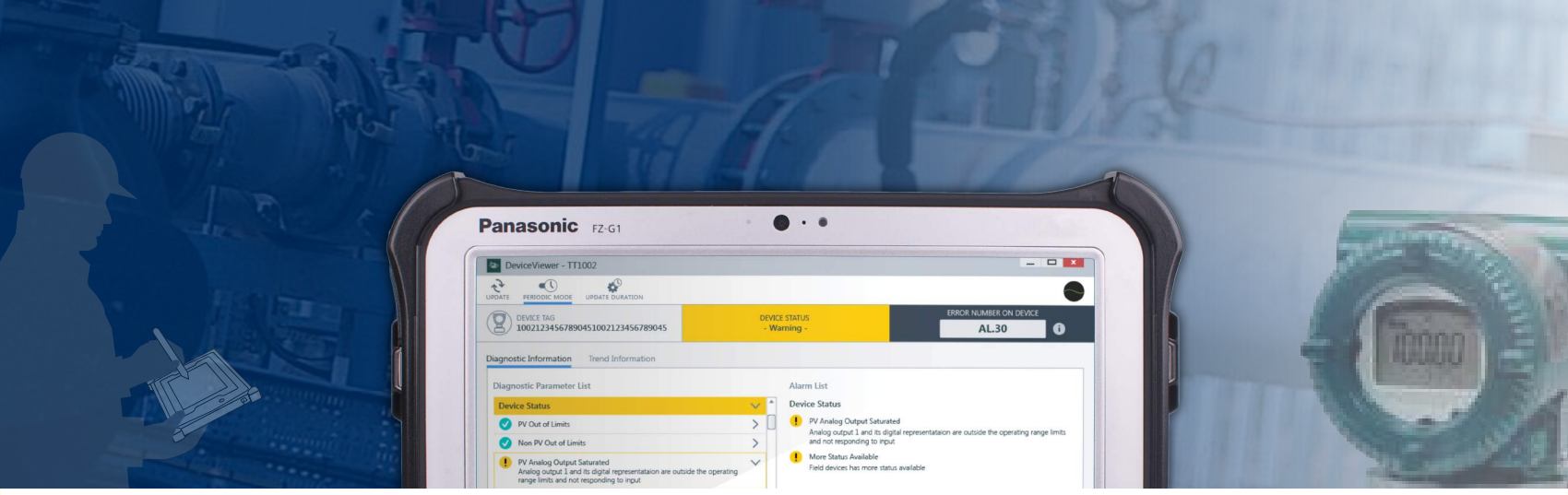


DeviceViewer

FieldMate DeviceViewer is a Windows-based tablet application that enables the users to monitor the Status & Configuration of Devices. This application can be used to streamline Device Maintenance & Replacement activities by leveraging FieldMate's intuitive Operation and integrated environment, which is independent of Communication Protocols and Device vendors.

Design Process

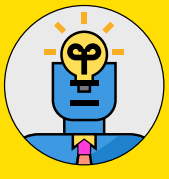
Discover

- Understanding the Requirements
  - **Problem Gap Findings**
  - **How it Works**

Define

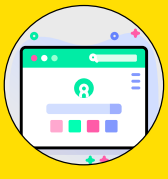
- User Personas
- Information Architecture

Ideate



- Sketching
- Low-Fidelity Design
  - **Concept Prototype Testing**

Design



- High-Fidelity Design
- Assets

Test

- Usability Testing

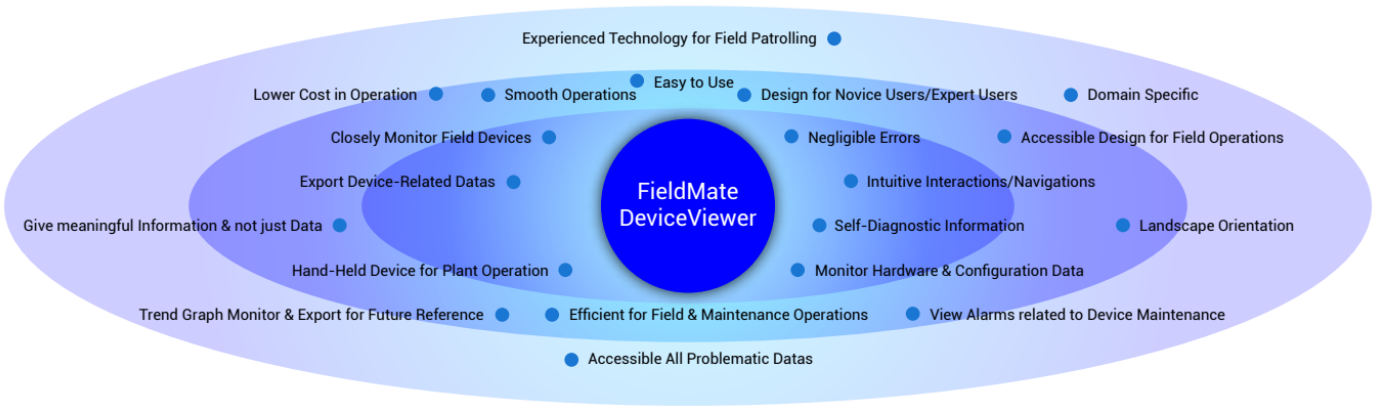
Understanding the Requirements

In a Chemical Process Plant, a number of Field Devices are deployed to measure Pressure, Flow, Temperature and so on. Most of the processes are automated based on the measurement data received from these Devices. Therefore, to ensure Efficient and Safe Operation, it becomes imperative to monitor the Devices continuously, thus ensuring optimum production. The traditional way of monitoring Devices involves tedious, error-prone and manual tracking of Devices, which hampers the productivity of the Plant. The goal of this application is to eliminate the need for performing such tasks manually and to automate the Device Monitoring Process.

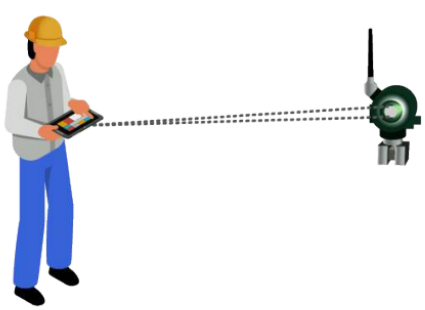
Problem Gap Findings

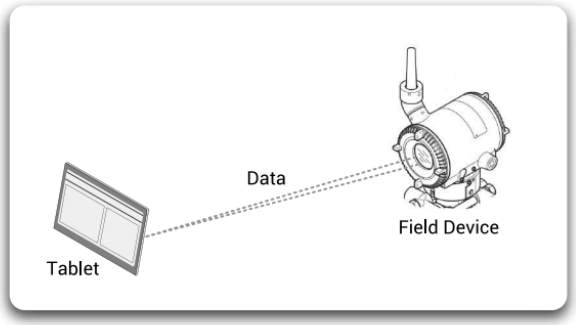
Absence of hand-held device applications to -

- Monitor Field Devices in a Plant.
- Monitor the Hardware & Configuration status of Field Devices including their self-diagnostic Information with negligible errors.
- Export Device-related Data for Future references.
- View Alarms related to Device Maintenance that can enable the engineers to ensure smooth Plant Operations quickly and at a lower cost.



How it Works





User Personas

Nitin George

39, India

Senior Field Operator

STATUS Single | ARCHETYPE Perfectionist | TIRE Mid-Level

PERSONALITY

- Analytical
- Eager to Learn
- Hard Worker
- Team Player

BIO

Nitin is a Senior Field Operator in an Oil Refinery. He needs to check different devices and parameters to run the plant smoothly. He needs to assist the operations team to maximize plant run time and productivity.

Nitin did his B.Sc. in ITI (Chemical) from Gujarat University, Ahmedabad, India.

"I want to run the plant with minimal errors. But I need a handheld system which allows me to monitor Field device parameters without more efforts."

IT Knowledge & Skill

- WINDOWS, C++
- Alarm Management Package of Yokogawa
- MS OFFICE

GOALS

- To keep the plant running smoothly
- Easy to understand and operate
- Should support multiple device access
- To get details Diagnostic Information & Trend Information data to allow Cause-Effect Analysis
- To respond to the emergency situation with professional approach
- A system that can enable hand-holding of the plant operations

ISSUES & PAIN POINTS

- Too many alarms to be attended, set points
- Keep up with emerging technologies
- Lack of analysis tools, he has the data but no means to get to conclusions!!!
- Every automation system has its own way of interpreting information, why can't they all communicate on a common platform?
- Too many alarms to handle

Girish Prabhu

27, India

Junior Field Operator

STATUS Single | ARCHETYPE Perfectionist | TIRE Entry-Level

PERSONALITY

- Very Frank
- Positive Thinker
- Techy
- Team Player

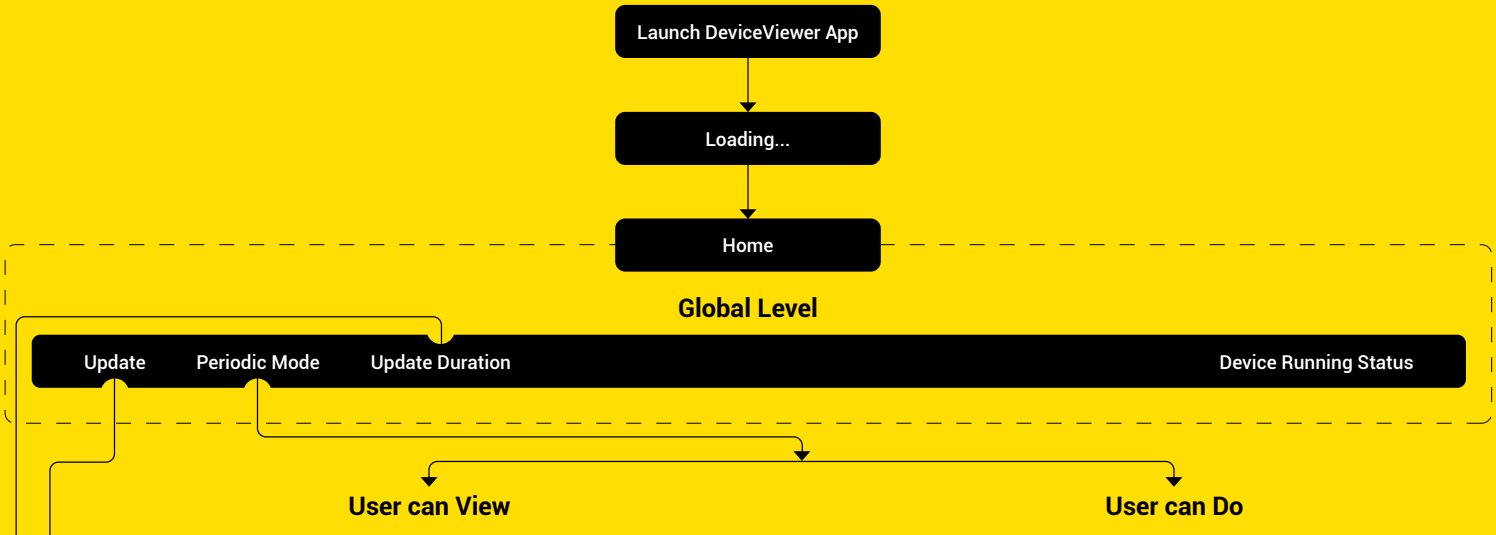
GOALS

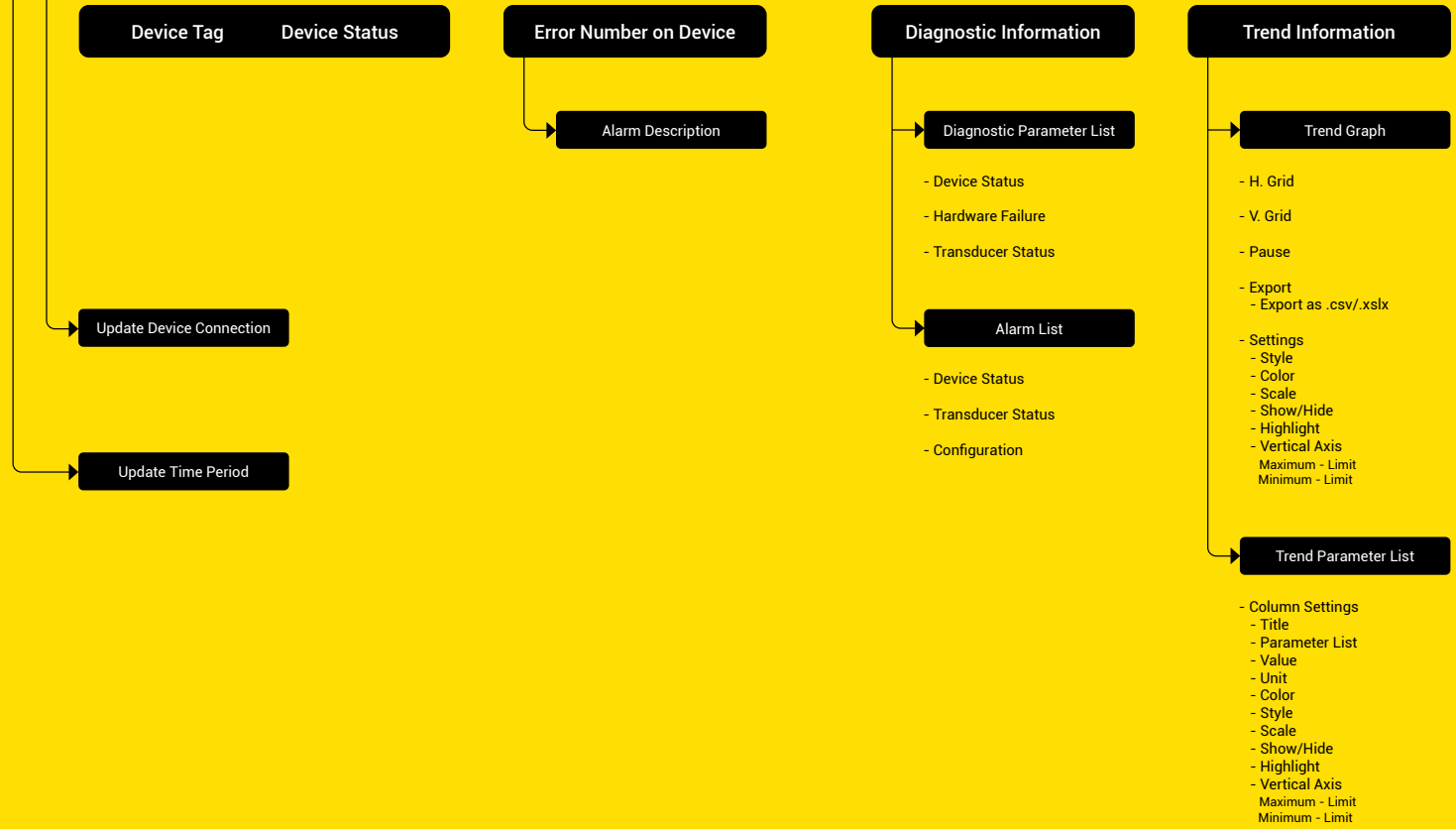
- Fixing, repairing & monitoring broken Field devices to operate plant smoothly
- Help make improvements in how the production units work with minimize errors
- To respond to the emergency situation with professional approach
- Analyze Diagnostic Informations & Trend Informations of devices and create report
- Analyze alarms and solve issues

ISSUES & PAIN POINTS

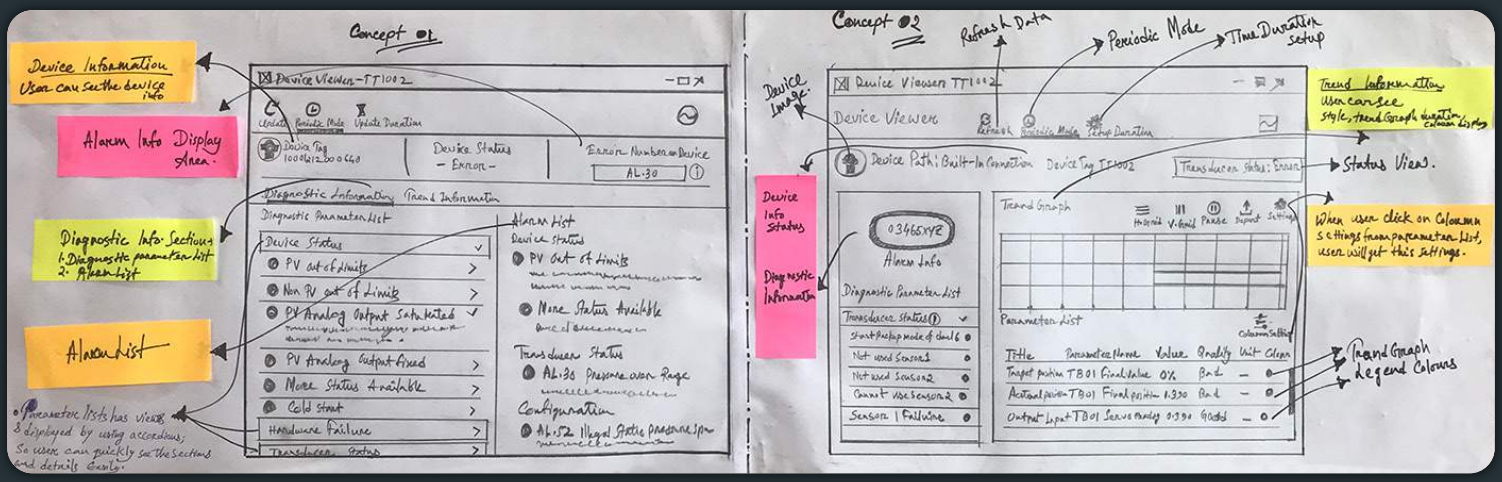
- Need to run here & there to check devices manually
- No user friendly applications to monitor information Intuitively with seamless experience
- Sometime supervisor or one of the most senior operator complaints him on improvements in his work
- Too many alarms to be attended, analyze alarms and create reports

Information Architecture

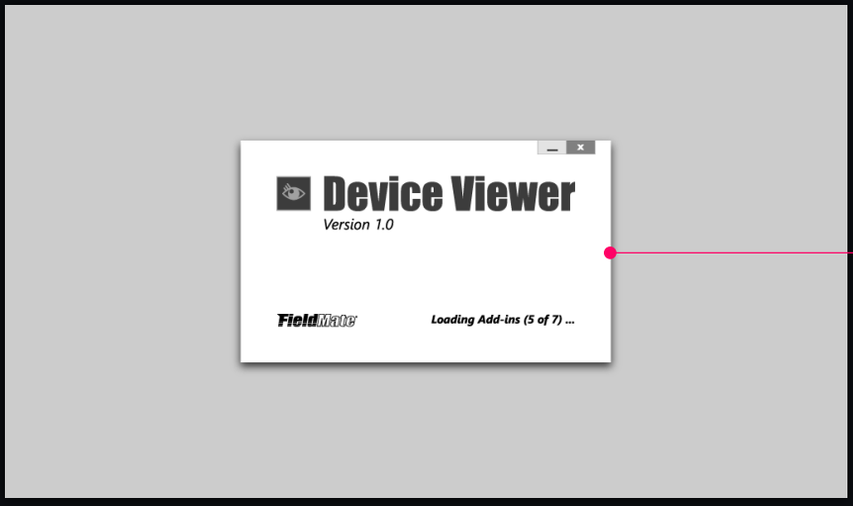




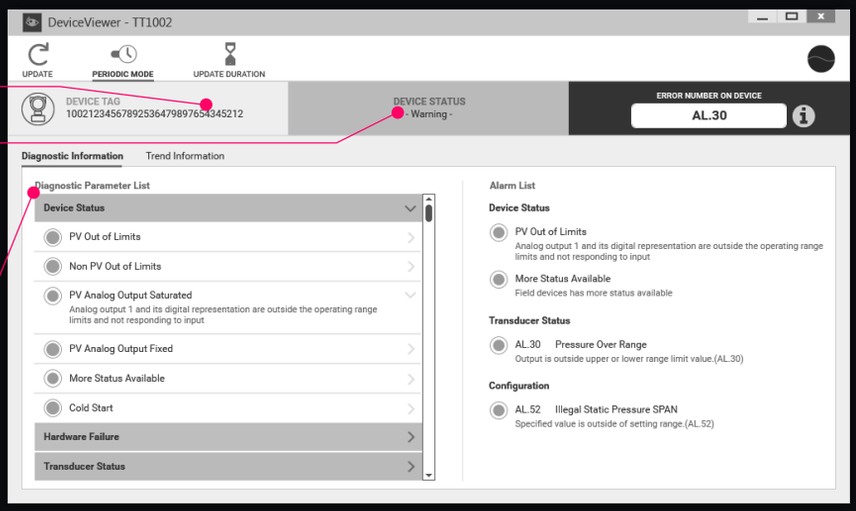
Sketching



Low-Fidelity Design



FieldMate DeviceViewer Loading View



Device Information

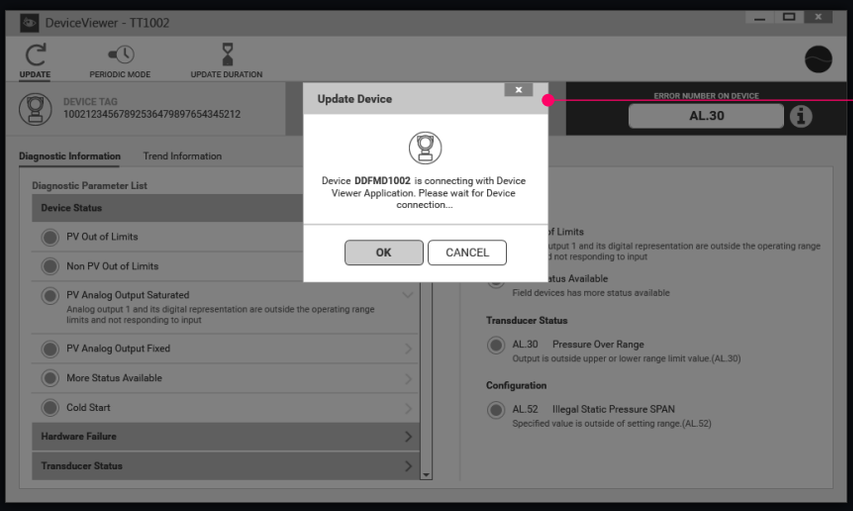
User can view Device Information.

Device Status

User can monitor the Device status based on its connections.

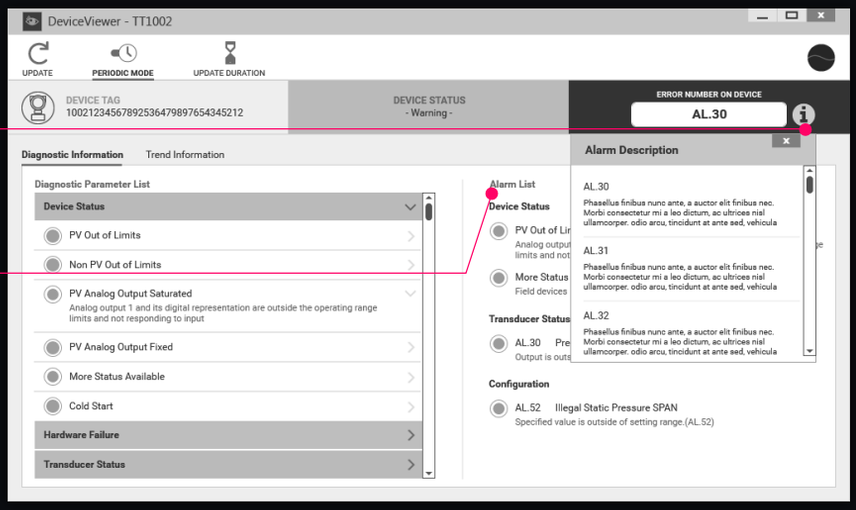
Diagnostic Information

User can view diagnostic information to troubleshoot Device failure using Diagnostic Parameter List & Alarm List.



Update Device

A message appears, indicating that the Device is not connected to DeviceViewer whenever the connection is lost. In such a case, the user shall be able to reconnect the Device.

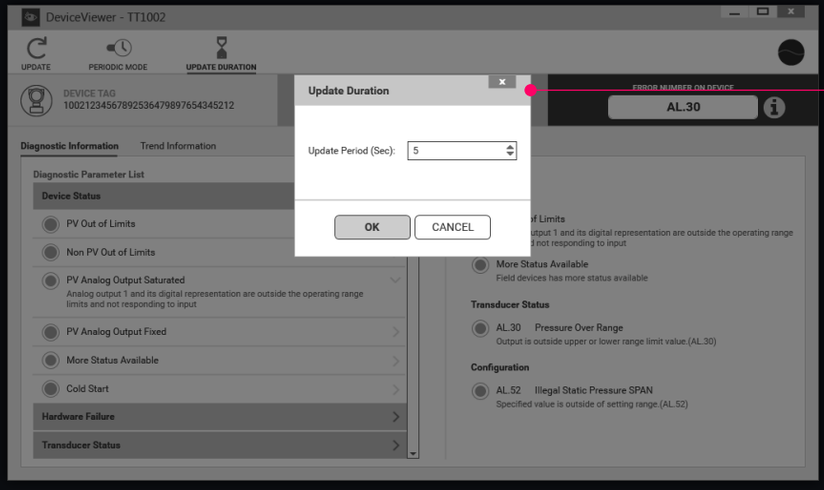


Alarm Description

User can view Alarms and related details for the Device.

Alarm List

User can view the list of Alarms that are categorized as per the Device.



Update Time Duration

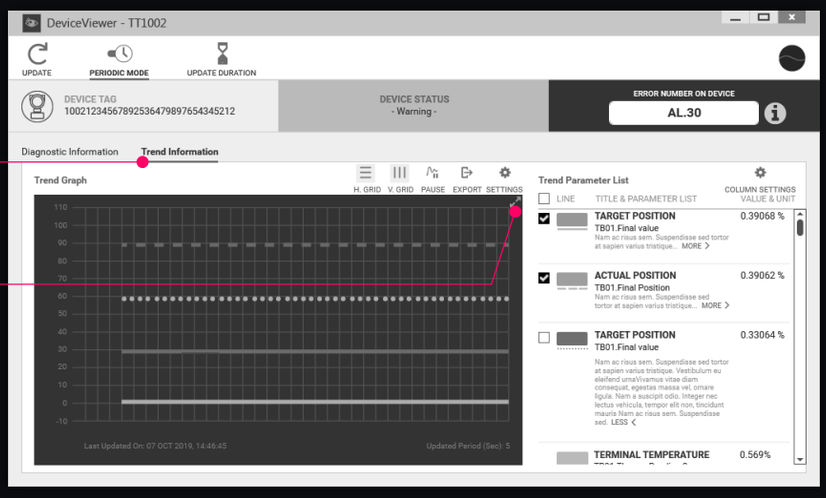
User can set the Time Period based on priorities.

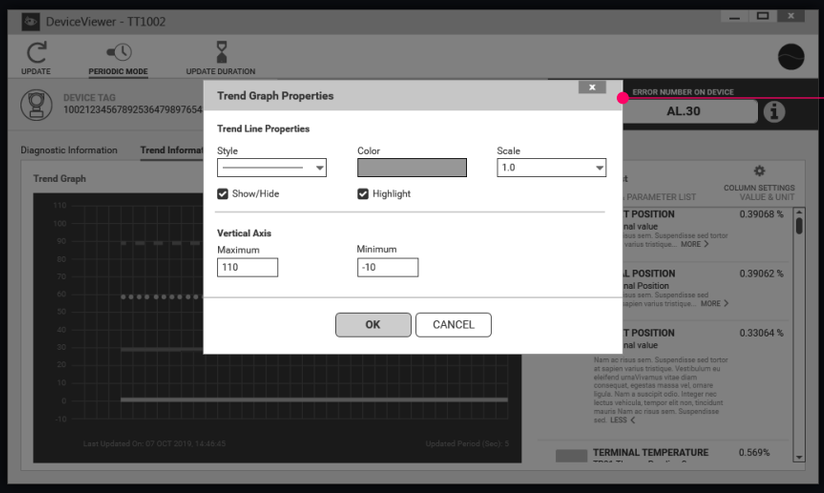
Trend Information

User can view the Trend Graph and the Parameters that are associated with a Device. A number of Customization options are also available.

Expand/Collapse for maximum view space

Provision to expand/collapse a Trend Pane.



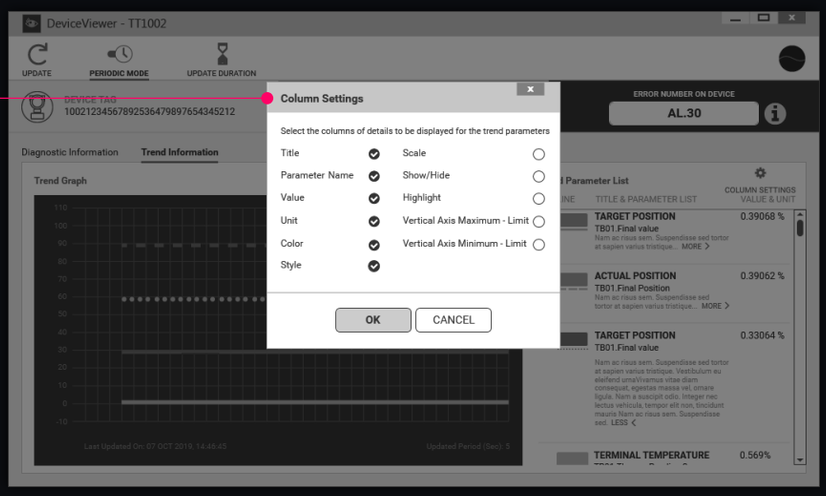


Trend Graph Customization

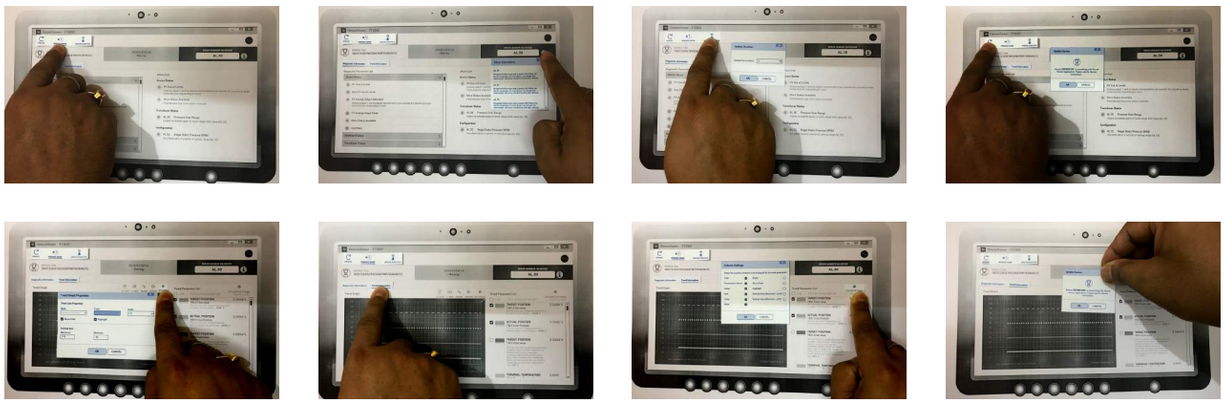
User can set the following properties
- Style
- Color
- Scale
- Show/Hide
- Highlight
- Vertical Axis Maximum - Limit
- Vertical Axis Minimum - Limit

Trend Parameter Customization - Column Settings

User can set the following properties
- Title
- Parameter List
- Value
- Unit
- Color
- Style
- Scale
- Show/Hide
- Highlight
- Vertical Axis Maximum - Limit
- Vertical Axis Minimum - Limit

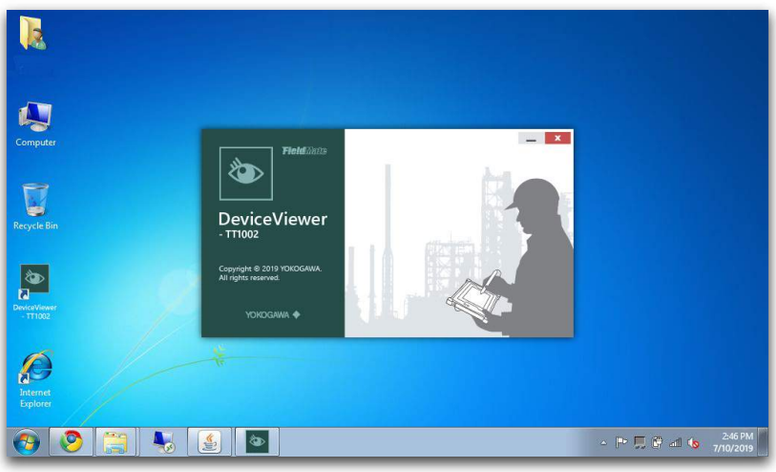


Concept Prototype Testing

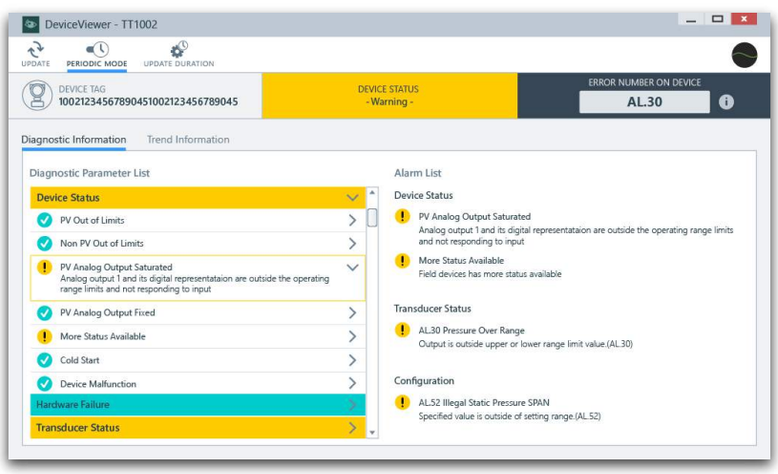


High-Fidelity Design

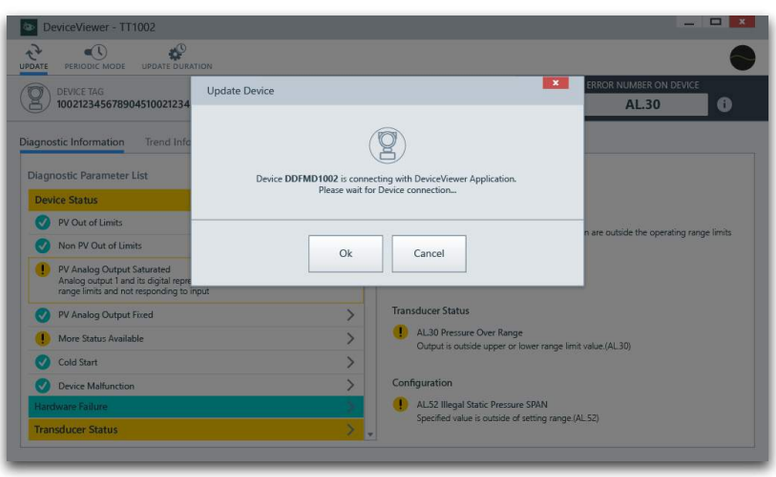
DeviceViewer Application - Launcher Page



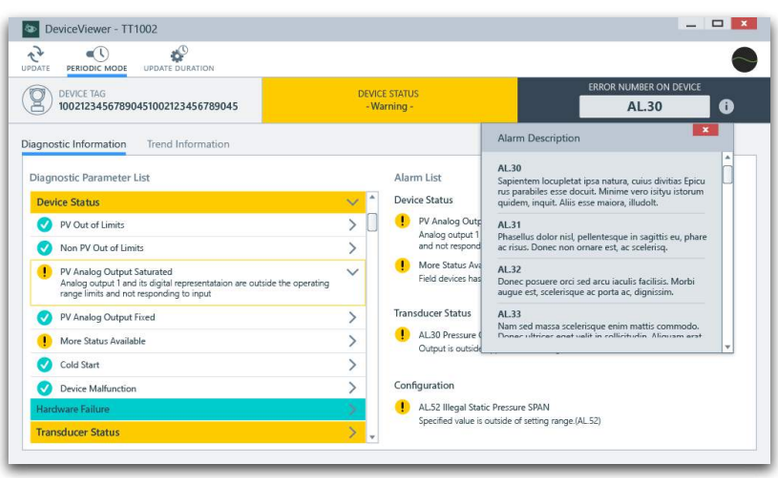
Diagnostic Information



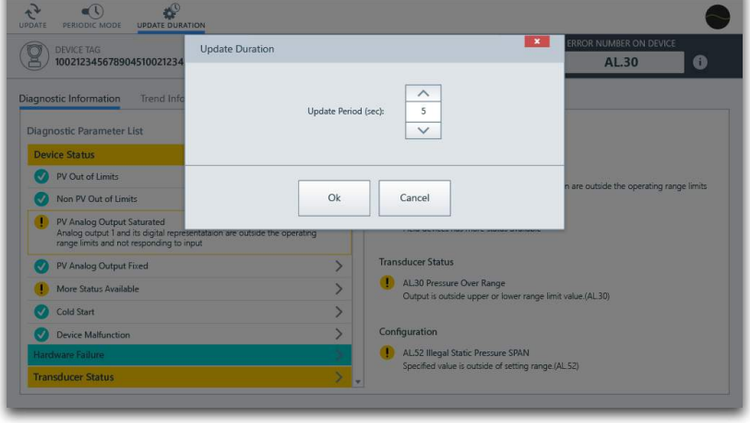
Update Device



Alarm Description



Update Duration

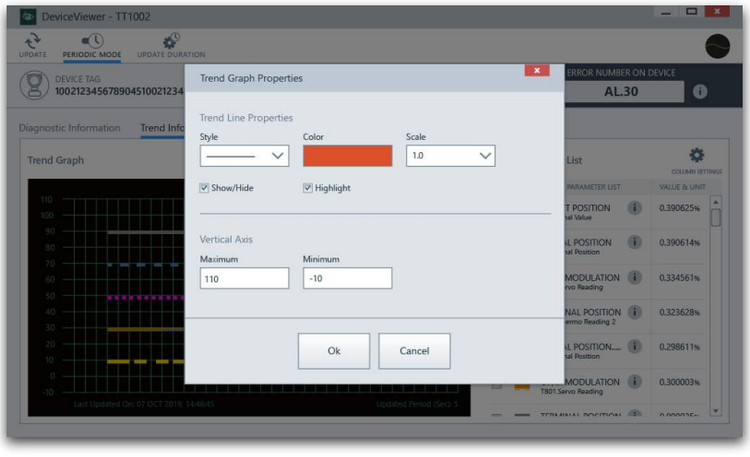


Trend Information - Default View

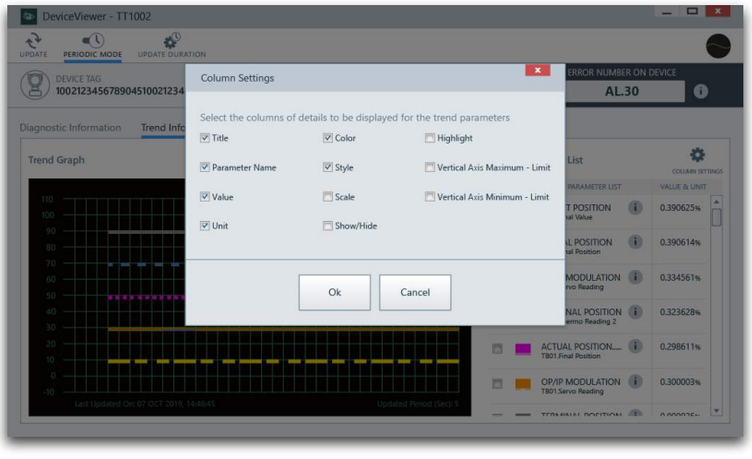
Trend Information - Trend Graph Expand View

Trend Parameter List - Detail of Selected Parameter List

Trend Information - Trend Graph Properties



Trend Parameter List - Column Settings



Usability Testing

After identifying some improvements to get more attention of the user when navigating the application and to provide all functions being more intuitive and easy to take tasks, the follow video link is the final version of the 'DeviceViewer' Digital Prototype.

https://vimeo.com/422529323