



FDDWorX

Fault State Tracking



APPLICATION NOTE

October 2015

Description: Guide to using fault state tracking.

General Requirement: GENESIS64 and FDDWorX knowledge.

Introduction

FDDWorX is a predictive building automation solution that uses an advanced Fault Detection and Diagnostics Engine. It incorporates algorithms that weigh the probability of faults and advice management, operators and maintenance personnel of actions to prevent equipment failures or excessive use of energy.

Once the faults are configured, they will be checked and triggered by the FDD engine based on the rules defined for each fault.

These faults show up as Fault Incidents and can be viewed using the FDD Viewer within PortalWorX-SL or within GraphWorX through a FDD Viewer control.

With the advent of version 10.85, we have made several enhancements to the FDD engine, the configurator as well as the viewer. This application note will focus on one of the enhancements made to the FDD engine known as Fault State Tracking.

We now have the ability to track the current state of a fault incident and display the time the fault incident was in the active state.

Difference in Fault Logging

Previously

In the previous version of FDDWorX, logging used to occur only when

- The Fault incident became active

Currently

With version 10.85 or later, logging occurs when

- The fault incident becomes active
- The fault goes back to the normal state

This gives the engine the ability to analyze and *track the state of the fault*, and calculate the 'in-fault' duration for an incident.

This would display the duration during which the Fault was active.

Advantages of Fault State Tracking

With the FDD Engine now enhanced to calculate the 'in-fault' duration for an incident, it presents the following advantages,

1. Ability to check how long a certain fault was in the faulted state
2. Analyze the response time in getting a Faulty equipment resolved from start to finish
3. Identify possible areas of cost saving by studying the 'in-fault' duration based on the priority and cost of reported fault

View Duration of Faults

In order to view the duration of the faults, within the FDD Viewer, a new view has been added called *Add Fault Incidents View*.

Please refer to the Application Note *FDDWorX – Fault Incidents View and Fault Acknowledgement* for more details on using the Fault Incident view.

Once you add a FDD Viewer,

- Right click on Viewer
- Select Fault Incidents View
- Select the Data tab

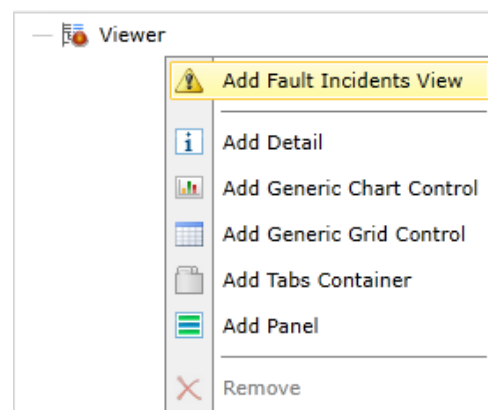


Figure 1 - Adding a Fault Incidents View

Among a few other new columns, two new columns *LocalFaultDeactivationTime* and *FormattedActiveDuration* have been added.



FDDWorX Fault State Tracking



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General Data Appearance				
☒ Include Child Assets				
Grid Columns:				
Column ID	Title	Visible	Display*	Index
AssetName	Asset Name	☒	1	
AssetLevelName	Level Name	☐	2	
AssetPath	Asset Path	☐	3	
AssetSource	Asset Source	☐	4	
Image	Asset Picture	☐	5	
FaultName	Fault Name	☒	6	
LocalFaultActiveTime	Fault Active Time	☒	7	
IncidentStatus	Status	☒	8	
LocalFaultDeactivationTime	Deactivation Time	☒	9	
FormattedActiveDuration	Active Duration	☒	10	
Severity	Severity	☒	11	
ActiveSymptoms	Active Symptoms	☐	12	
LocalDiagnosticTime	Diagnostic Time	☐	13	
RelatedValue1	RelatedValue1	☐	14	
RelatedValue2	RelatedValue2	☐	15	
RelatedValue3	RelatedValue3	☐	16	
RelatedValue4	RelatedValue4	☐	17	
RelatedValue5	RelatedValue5	☐	18	

Figure 2 - Local Fault Deactivation Time and Formatted Active Duration columns

In order to view these columns, make sure the *Visible* checkbox is checked.

Local Fault Deactivation Time

This column would give you the time when the fault incident was no longer in the faulted state.

A fault is considered to be out of the faulted state either if,

- The issue has been resolved and the Fault rule is no longer true
- The operator manually sets a particular fault to be De-activated. For more information on manually De-activating faults, please refer to the application note

FDDWorX – Fault Incidents View and Fault Acknowledgement

As long as the Status of the fault is ACTIVE, the Fault Deactivation Time will not be populated.

Fault Name	Fault Active Time	Status	Deactivation Time
Damper Stuck Open	9/16/2015 1:40:59 PM	INACTIVE	9/16/2015 1:41:49 PM
Overheating Fault	9/16/2015 1:40:59 PM	INACTIVE ACK RESOLVED	9/16/2015 1:42:20 PM
Under Heating Fault	9/16/2015 1:40:59 PM	ACTIVE	

Figure 3 - Active Fault with no Deactivation Time

Active Duration Time

As soon as the fault is out of the faulted state, the Fault Deactivation Time gets set and the Active Duration is calculated based on the Fault Active Time.

$$\text{ActiveDuration} = \text{FaultDeactivationTime} - \text{FaultActiveTime}$$

Fault Active Time	Status	Deactivation Time	Active Duration
9/16/2015 1:40:59 PM	INACTIVE	9/16/2015 1:41:49 PM	000d 00h 00m 50s
9/16/2015 1:40:59 PM	INACTIVE ACK RESOLVED	9/16/2015 1:42:20 PM	000d 00h 01m 21s
9/16/2015 1:40:59 PM	ACTIVE		000d 00h 02m 43s

Figure 4 - Active Durations