



# How Haystack Tagging Enables Analytics

Kevin Mamajek - *IoT Sales Engineer*

# 72

May 13-15, 2019



Sum of four consecutive primes  
(13 + 17 + 19 + 23)

In a plane, the exterior angles of a regular pentagon measure 72 degrees each

The atomic number of **hafnium** used in filaments and electrodes

Messier object m72, globular cluster in Aquarius

The number of members in National Senate of Argentina

# 72

The registry of the U.S Navy's nuclear aircraft carrier **USS Abraham Lincoln** (CNV-72)

In typography, 72-point characters are 1 inch tall

radio shorthand translates as "Best wishes"

Usual par for an 18-holes of golf

Number of spaces in a game of Parcheesi

# 72

Or is it just the current room temperature

Context

72

Temperature

Room

Return

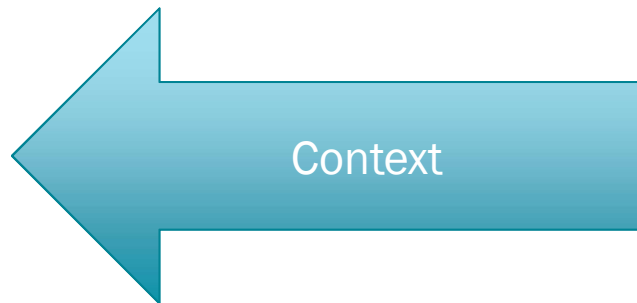
Supply


Outside

Deck

# You need more, before you can analyze

# 72



-  siteRef
-  equipRef
-  RTU
-  Temperature
-  Zone
-  vavZone

# Niagara tagging tools

- Tag Dictionary Service
- Haystack Pallett
  - Where you install the Haystack tag dictionary into the service

Niagara Workbench

File Edit Search Bookmarks Tools Window Manager Help

My ... : Station (Examples\_ACTIVE) : Config : Services : TagDictionaryService Tag Dictionary Manager

Nav

- Services
  - DashboardService
  - DebugService
  - EmailService
  - FoxService
  - HierarchyService
  - HistoryService
  - JobService
  - LogHistoryService
  - ProgramService
  - RoleService
  - SearchService
  - TagDictionaryService**
  - TemplateService
  - UserService
  - WeatherService
  - WebService
  - ReportService

Palette

- haystack
- Haystack

Database

5 objects

Name	Type	Status	Namespace	Fault Cause
Niagara	Niagara Tag Dictionary	{ok}	n	
Haystack	Hs Tag Dictionary	{ok}	hs	
WattStopper	Smart Tag Dictionary	{ok}	ws	
analytics	Tag Dictionary	{ok}	a	
myTags	Smart Tag Dictionary	{ok}	mt	

New Edit Import Export Tags-->TagGroups...

May 13-15, 2019



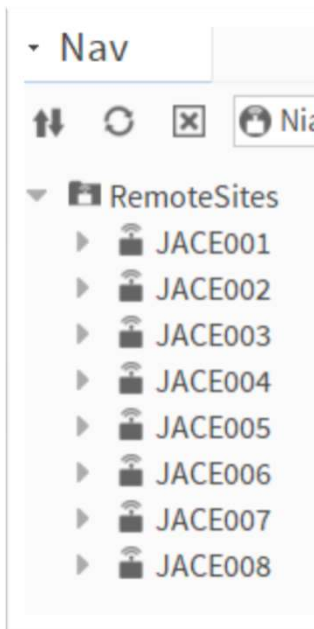


# Hierarchy

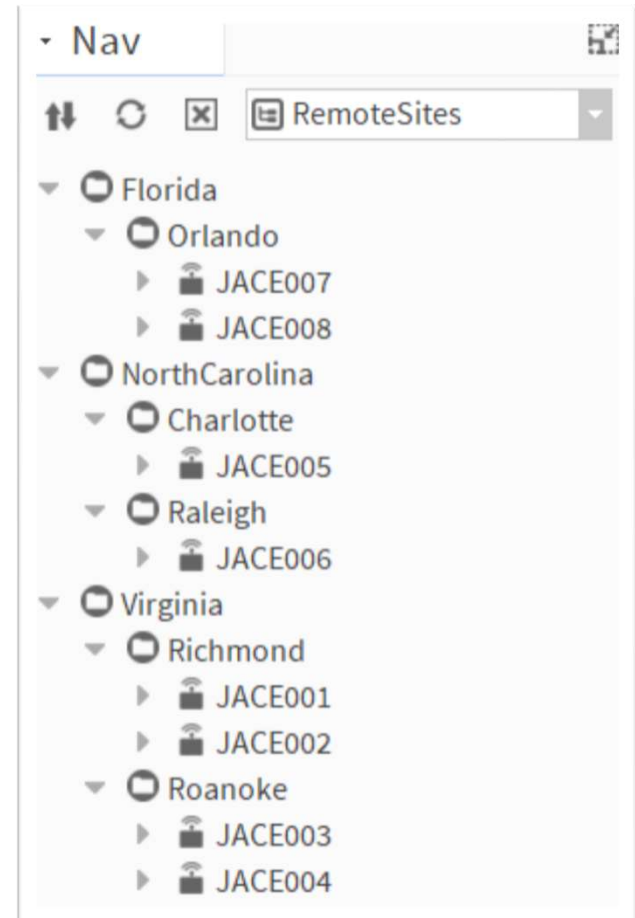
- Hierarchy can take advantage of tags

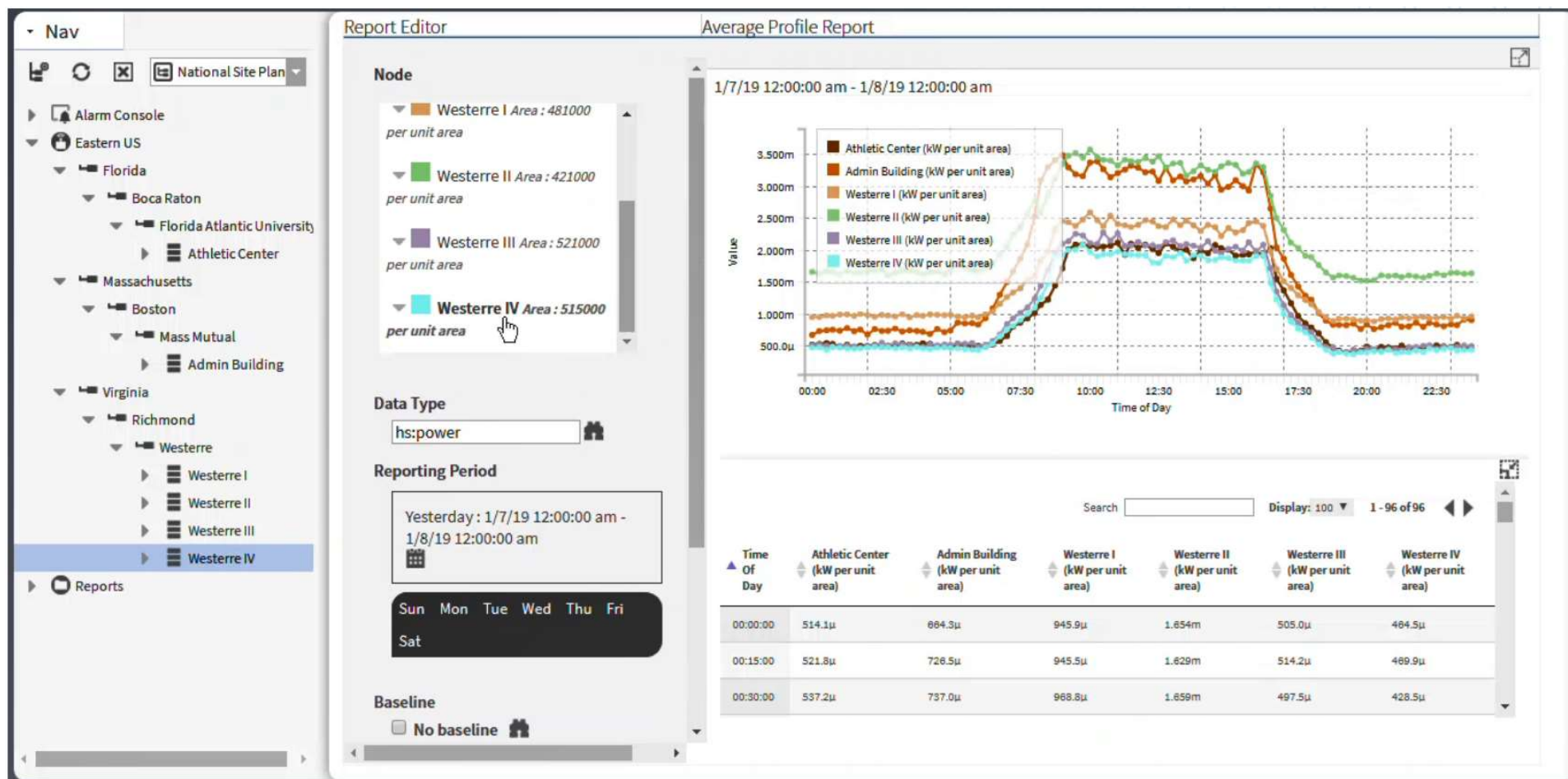
May 13-15, 2019





Property Sheet	
RemoteSites (Hierarchy)	
Query Context	>> ⚙
Status	{ok}
Fault Cause	
Scope	Hierarchy Scope Container
Tags	Hierarchy Tags
Cache Status	NotCached
Cache Creation Time	null
Cache On Station Started	false
GroupLevelDefGEOSTATE	Group Level Def groupBy: hs:ge...
Query Context	>> ⚙
Group By	hs:geoState
Include Empty Groups	false
Sort	Ascending
Tags	Hierarchy Tags
GroupLevelDefGEOCITY	Group Level Def groupBy: hs:ge...
Query Context	>> ⚙
Group By	hs:geoCity
Include Empty Groups	false
Sort	Ascending
Tags	Hierarchy Tags
QueryLevelDefDEVICE	Query Level Def: hs:device
Query Context	>> ⚙
Query	hs:device
Include Grouping Queries	true
Sort	Ascending
RelationLevelDefPOINTS	Relation Level Def: in: n:childPo...





May 13-15, 2019

# Types of tags

- Direct
- Implied



Haystack Show All

Tag Dictionary 441 objects

Name	Type
Tags	
absorption	Marker

Direct Tags Implied Tags

direct (Component)

hs:sensor	marker
a:a	marker

Save AddTag RemoveTag Cancel

# Direct tags

- Direct tagging can be hard and laborious
  - Individual points themselves



# Implied tags

- Are dynamic
- Automatically Applied (implied) during runtime
- Easily changed
- Reusable on multiple stations
- Haystack Dictionary implies tags too!
  - You get basic ones just by adding the dictionary to the services

Haystack 🏠 Show All 441 objects

### Tag Dictionary

Name	Type
absorption	Marker

**Direct Tags** **Implied Tags**

**implied (Component)**

n:name	Room\$20Humidity
n:displayName	Room Humidity
n:type	control:NumericPoint
n:ordInSession	station: h:f4ab
n:station	BLUE
n:point	marker
n:input	marker
hs:cur	marker
hs:curErr	
hs:curStatus	ok
hs:curVal	66.00
hs:id	h:f4ab
hs:kind	Number
hs:maxVal	+inf
hs:minVal	-inf
hs:point	marker
hs:tz	New_York
hs:unit	misc () percent relative humidity (%RH)
hs:humidity	marker

Save Add Tag Remove Tag Cancel







# Tag Rules

Implied tags use tag rules

*A better way to tag*

Niagara Workbench

File Edit Search Bookmarks Tools Window Manager Help

Quick Search

My ... : Station (Examples\_ACTIVE) : Config : Services : TagDictionaryService Tag Dictionary Manager

Nav

- My Network
  - RoleService
  - SearchService
  - TagDictionaryService**
    - Niagara
    - Haystack
    - WattStopper
    - analytics
    - myTags
      - Tag Definitions
      - Tag Group Definition
      - Relation Definitions
      - Tag Rules
  - TemplateService
  - UserService
  - WeatherService
  - WebService
  - ReportService

Database 5 objects

Name	Type	Status	Namespace	Fault Cause
Niagara	Niagara Tag Dictionary	{ok}	n	
Haystack	Hs Tag Dictionary	{ok}	hs	
WattStopper	Smart Tag Dictionary	{ok}	ws	
analytics	Tag Dictionary	{ok}	a	
myTags	Smart Tag Dictionary	{ok}	mt	

Palette

New Edit Import Export Tags-->TagGroups...

May 13-15, 2019



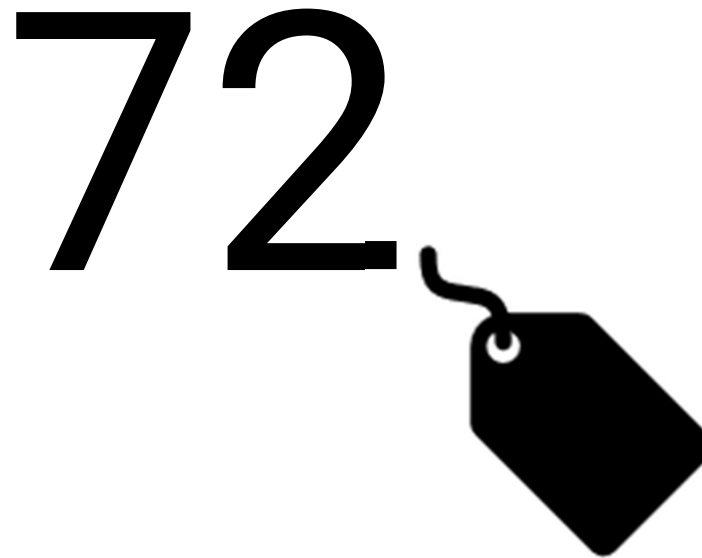
18

# Haystack tags enable analytics

- Energy usage
- Comfort
- Fault Detection
- Maintenance
- Smarter Alarming

May 13-15, 2019





The importance of tagging is understanding the data

## ENERGY ANALYTICS - CompareMonthly

Current Month

MegaWatt

18.70

GigaWatt

0.02

Monthly



KW-Hr

55,719.50

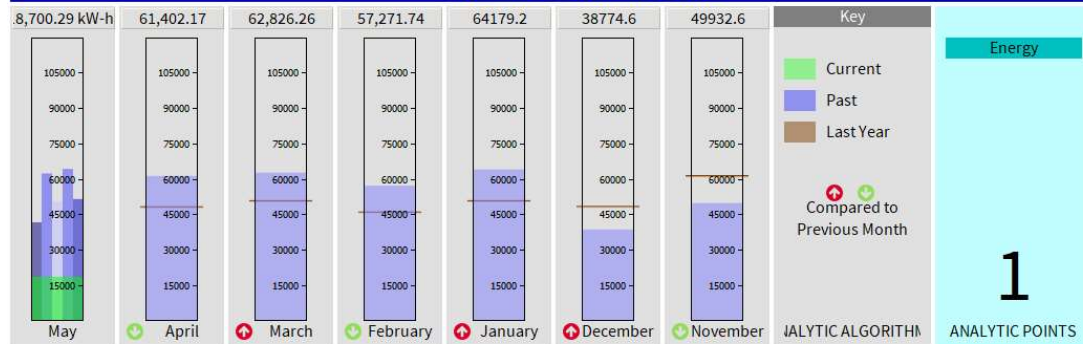
6 Month Average

Load Factor

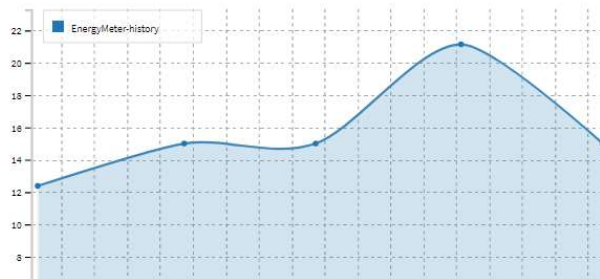
89.1

Month to Date

## MONTHLY ENERGY USAGE



This Year

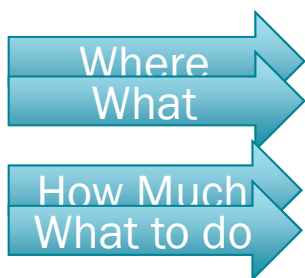


# Niagara analytics basics

- The where, what, how much, what to do

May 13-15, 2019





Property Sheet

N Today (Numeric Writable)

Facets units=kW-hr,precision=2 kW-hr,min=-inf kW-hr,max=+... >> ⌚

Proxy Ext Analytic Proxy Ext

Enabled	<input checked="" type="checkbox"/> true
Status	{ok}
Fault Cause	
Node	slot:/Examples/Analytics/Energy/EnergyMeter
Data	hs:energy
Data Filter	
Time Range	today
Rollup	Sum
Interval	
Aggregation	
Totalize	true
Node Count	1
Poller	Default
Last Poll	13-May-2019 07:13:54 PM
Missing Data Strategy	
Out	1,976.96 kW-hr {ok} @ 16

## SAMPLE 5 YEAR on BAR

<b>YearBack1</b>	
Numeric Writable	
Out	51616.3 {ok} @ 16
In10	- {null}
In16	51616.3 {ok}
Poll	

<b>YearBack2</b>	
Numeric Writable	
Out	64376.3 {ok} @ 16
In10	- {null}
In16	64376.3 {ok}
Poll	

<b>YearBack3</b>	
Numeric Writable	
Out	50486.4 {ok} @ 16
In10	- {null}
In16	50486.4 {ok}
Poll	

<b>YearBack4</b>	
Numeric Writable	
Out	62479.3 {ok} @ 16
In10	- {null}
In16	62479.3 {ok}
Poll	

<b>YearBack5</b>	
Numeric Writable	
Out	41788.1 {ok} @ 16
In10	- {null}
In16	41788.1 {ok}
Poll	

## N YearBack1 (Numeric Writable)

Facets units=null,precision=1,min=-inf,max=+inf >> ⌚

Proxy Ext Analytic Proxy Ext

Enabled ☒ true

Status {ok}

Fault Cause

Node station:|slot:/Examples/Analytics/Energy/EnergyMeter

Data hs:energy

Data Filter

Time Range

☒ Use This Value

From This Month - 1 Years To + 1 Months

OK Cancel

Node Count 1

Poller Default

Last Poll 09-May-2019 11:01:55 PM

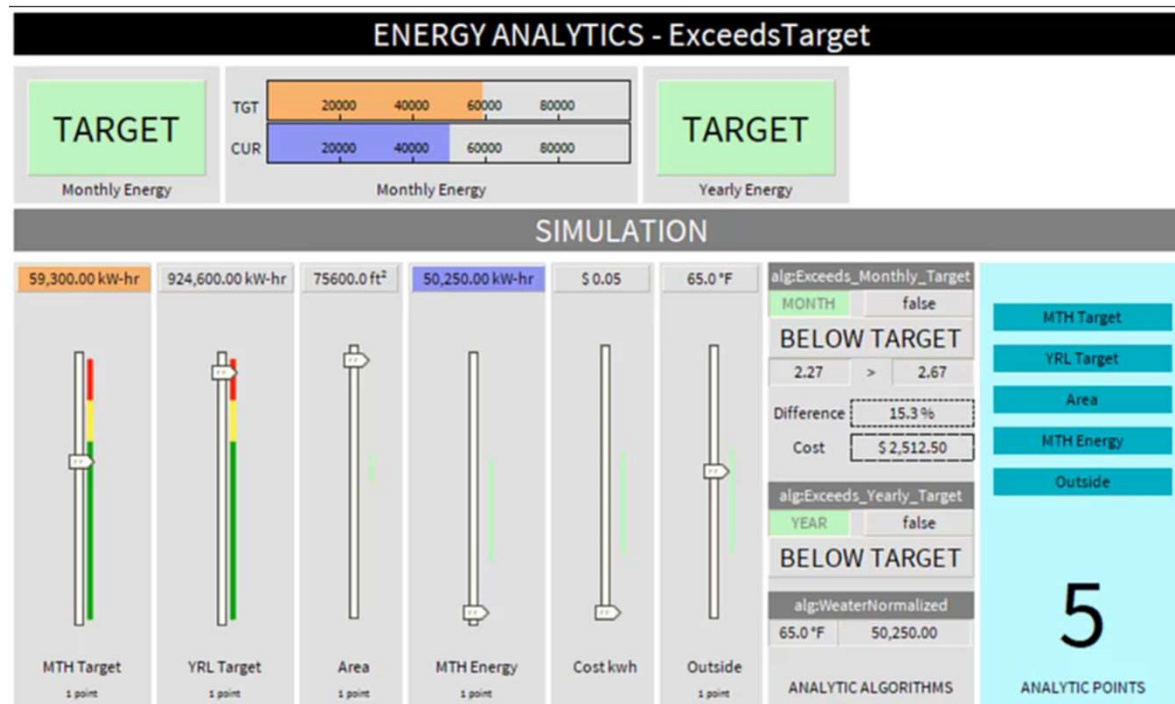
Missing Data Strategy

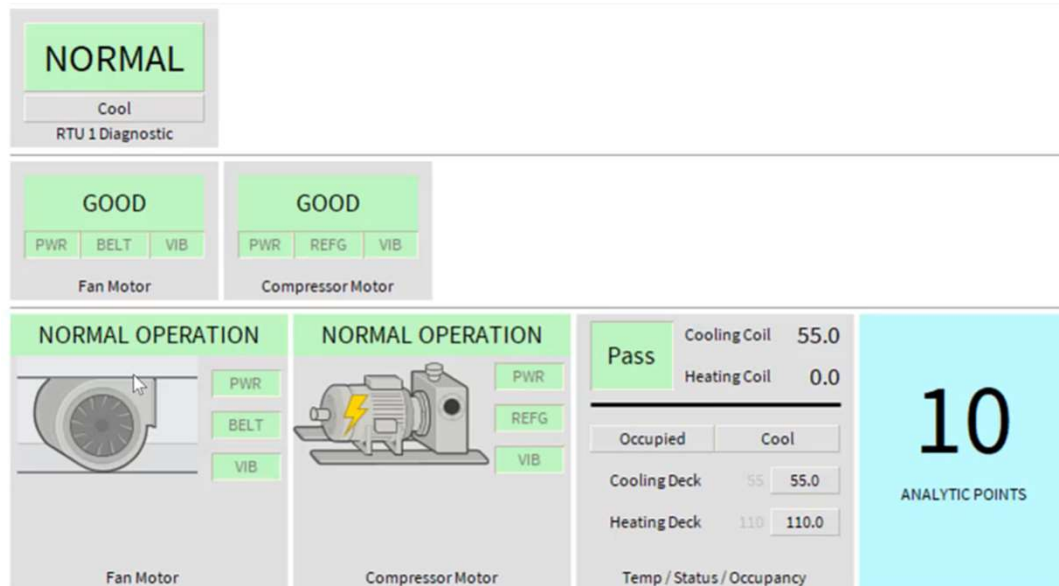
Out 51616.3 {ok} @ 16



# analytics examples

- Monthly / Yearly energy targets
- Fault detection
- Smart alarming
- Comfort
- Edge 10 – analytics reusability





## COMFORT ANALYTICS - TempRecovery

NORMAL

+ Temperature Recovery -

## SIMULATION

70.0	68.0	50.0	alg:TempRecoveryCheck		Temp SetPoint Outside  Outside not used yet  2  ANALYTIC POINTS
<input type="button" value="+"/> <input type="range" value="70.0"/> <input type="button" value="-"/>	<input type="button" value="+"/> <input type="range" value="68.0"/> <input type="button" value="-"/>	<input type="button" value="+"/> <input type="range" value="50.0"/> <input type="button" value="-"/>	RCV	70.0	
	Override		Offset:	3.00 {ok}	
			<input type="button" value="Alarms"/>		
			alg:TempRecoveryCheckAlert		
			Alert		
			<input type="text" value="0.0"/>		
			Alarm 30s Delay		
			<input type="text" value="0.0"/>		
			<input type="text" value="95"/> <input type="text" value="16:54:45"/>		
			Realtime Example		
			ANALYTIC ALGORITHMS		

## COMFORT ANALYTICS - Comfort

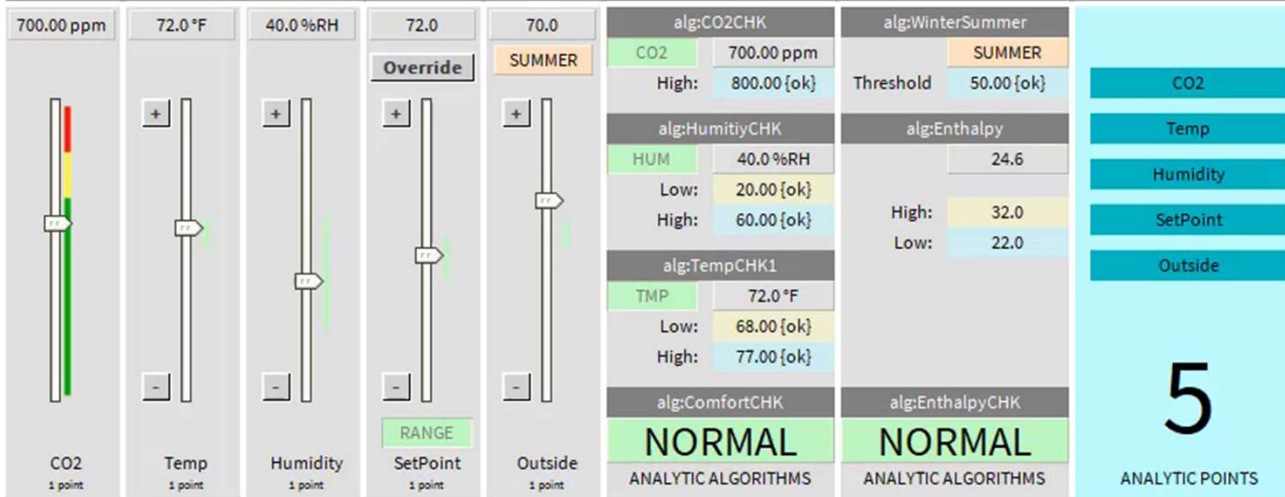
NORMAL

+ Comfort -

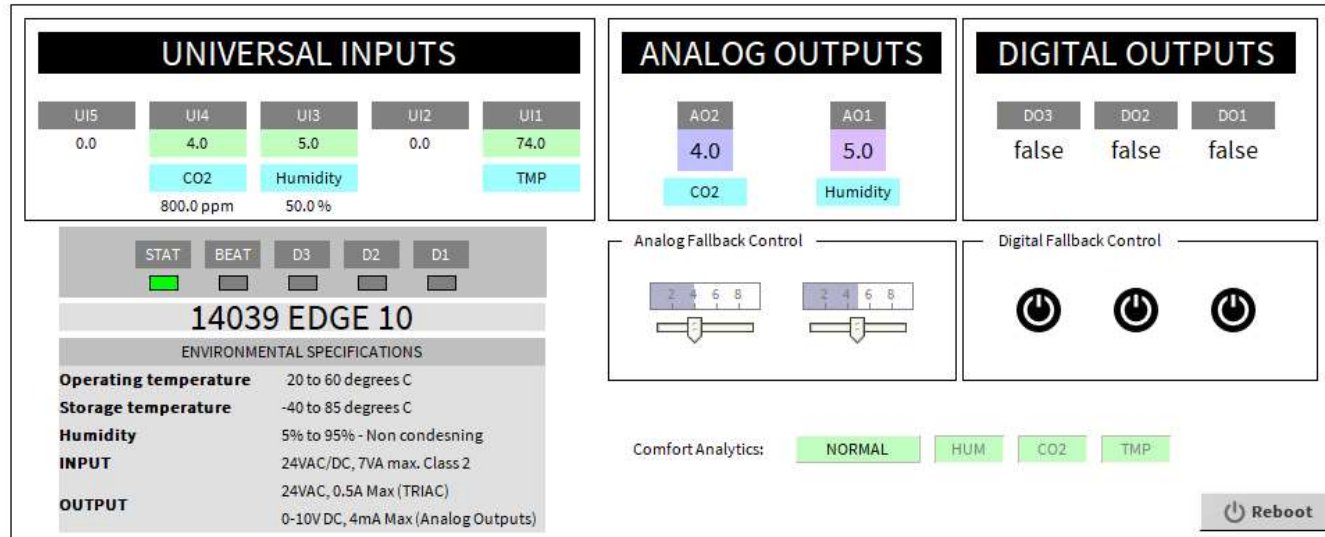
NORMAL

+ Enthalpy ASHRAE -

## SIMULATION

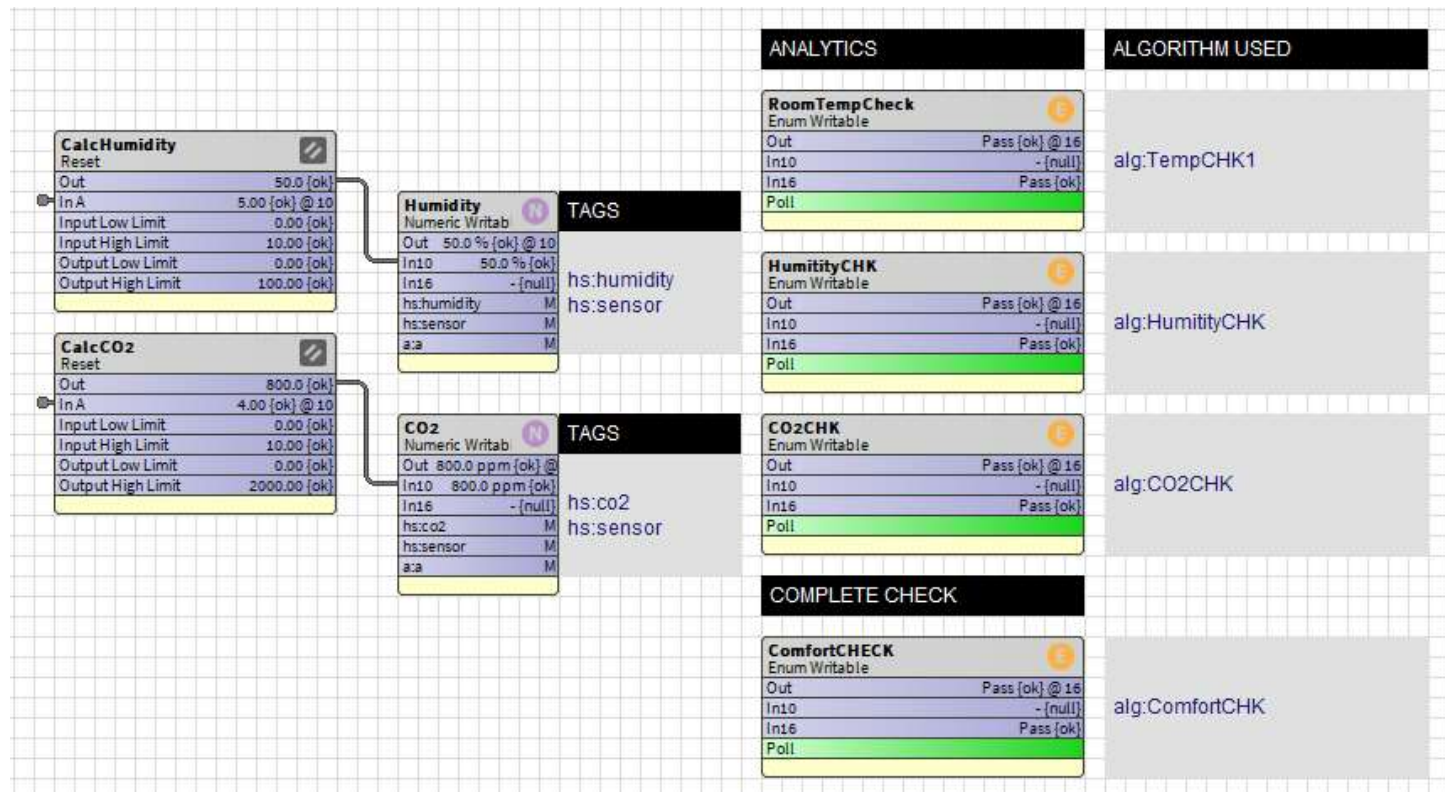


## EDGE 10 DIAGNOSTICS




3

ANALYTIC POINTS



# 72



It comes down to this: perfect temperature