



72 Rules and Import Scripts

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Import scripts easily comprise 70% of the work that goes into a project. If you have one of the BAS systems that we describe on the following slide, consider saving a massive amount of time by purchasing scripts that are already available.

SparkRules can turn a nice project into a stellar results-driven project. The sparkRules in this package have been tested and proven. You will see real energy and financial savings. These have been converted to components!

The following code has been developed over 12 years on 300 buildings on different continents.

Projects included (but no limited to): offices, medical, schools, churches, labs, and airports



Import Scripts Are Available For:

- Siemens Desigo
- Johnson
- StruxureWare
- Bacnet (only curVal, no trend logs)
- Niagara
- AutomatedLogic
- Trane TracerSummit
- Alerton
- Modbus

AHU Spark Rules

ahuAlternatingHeatCool

Spark when heating and cooling valves or stages alternate more than 5 times in 24 hours.

Ignored if a dual duct system.

ahuCDkHDkOffsetSetpoint

Creates a spark when Cold or Hot Deck occupied and temp not within 2 degrees of setpoint.

ahuHumidityAboveSetpoint

Creates a spark when humidity is above deHumidify setpoint more than 5%.

ahuAlternatingHeatCool

Creates a spark when humidity is below humidify setpoint more than 5%.

ahuHumiditySpTooHighLow

Creates a spark when humidify setpoint is less than 35% and greater than 40%.

Creates a spark when dehumidify setpoint is less than 50% and greater than 55%.

ahuLeakingChilledWaterValve

Check for a drop in DAT over MAT when the Chilled, Hot and Preheat Water valves and outside air damper are closed.

Further limit scope by discharge fan command or speed if the point exists.

AHU Spark Rules

ahuLeakingHotWaterValve

Check for a rise in DAT over MAT when the Chilled, Hot and Preheat Water valves are closed.

Further limit scope if discharge fan cmd or speed is running.

ahuLeakingOAD

Check for drop or rise in MAT above/below RAT when Outside Air Damper closed.

ahuPressureResetMissing

Spark when discharge air pressure set point does not change by more than 0.1 inches of water in a 24 hour period.

Ignore points with "noReset" tag.

ahuSimultaneousHeatCool

Spark with heating and cooling valve (> 0%) or stages(true) are on at the same time.

Ignored if a dual duct system.

ahuSimultaneousHeatEcon

Creates a spark when Hot Valve and Outside Air Damper open simultaneously

Spark Rules

chillerLoopTempOff

Creates a spark when chiller leaving temp varies more than 2 degrees from Loop Supply temp.

Chiller Short Cycling

Creates a spark when any chiller run time is less than 15 minutes.

Ignore daily spark durations less than 30 minutes.

co2Offsetpoint

Spark when CO2 rises 10% (default) above set point. Use 1,000ppm if no set point found.

Ignore single sparks less than 15 minutes (default).

Ignore daily sparks less than 1 hour (default).

energyDataBad

Creates a spark when the energy data violates one of the following rules:

1. Readings are less than zero or greater than 999,999
2. Reading is nan
3. Ignore equip with the "zeroReadings" tag. This point can have zero interval values.

evapDirectCycling

Spark when EVAP fill valve cycles more than one time during the day.

fanCycling

Creates a spark when the fan command or fan speed run duration is less than cyclDur.

Spark Rules

fanRunning24hr

Spark when fan speed exceeds 95% (default) for more than 8 hours (default).

Ignore if equip has "fanSpeedHigh" tag.

fanSpeedHigh

Spark when fan speed exceeds 95% (default) for more than 8 hours (default).

Ignore if equip has "fanSpeedHigh" tag.

fanWithNoFlow

Spark when fan is on or speed greater than 0 and discharge air flow is below minimum 50 cfm (default).

Ignore single sparks less than 15 minutes.
Ignore daily sparks less than 1 hour.

flowDataBad

Creates a spark when data is Nan

flowOffOffsetPair

Creates a spark when the delta between main and track flow of a Phoenix valve pair is +/- 10% of the track flow offset.

flowOffOffsetRoom

Creates a spark when the total room delta flow of a Phoenix room is +/- 10% of the track flow offset.

Spark Rules

flowOffSetpoint

Creates a spark when flow varies more than 20% from setpoint.

flowSensorBad

Creates a spark when the flow reading doesn't vary by more than a given tolerance.

Tolerance is 10% of max cfm.

flowWithNoFan

Spark if air flow greater than 50cfm and no fan is running.

Ignore single sparks less than 15 minutes.
Ignore daily sparks less than 1 hour.

humidityDataBad

Creates a spark when data is Nan

humiditySensorBad

Creates a spark when the humidity reading doesn't vary by more than a given tolerance.

Tolerance is 1% point.

oscillatingActuator

Spark when valve or damper changes position by more than 30% within 30 minutes.

All time periods, ignores occupancy.

Spark Rules

peakLoadAnnual

Sparkable function.

Compares recent peaks to previous 12 months.

peakLoadDaily

Sparkable function.

Sparks maximum kW each day, ignores weekends.

peakLoadMonthly

Sparkable function.

Sparks all kW readings that exceed threshold number of hours down the load duration curve.

pointMissingData

Spark when point has no hisEnd or no current histories or sample counts don't match standard intervals (5, 10, 15, 20, 30 minute).

Ignore points with the "ignoreMissingData" tag.

preCoolAboveSetpoint

Creates a spark when discharge air temp is less than setpoint by more than 3 degrees.

preHeatBelowSetpoint

Creates a spark when discharge air temp is less than setpoint by more than 3 degrees.

Spark Rules

pressureDataBad

Creates a spark when data is Nan.

pressureNegative

Spark when building static pressure is negative for more than 30 minutes.

Ignore individual sparks less than 15 minutes.

pressureOffSetpointAir

Spark when Static Pressure varies more than 0.1 in H2O from Setpoint.

Only check during occupancy.
Ignore sparks < 15 minutes.

pressureSensorBadAir

Creates a spark when the air pressure reading doesn't vary by more than a given tolerance.

Tolerance is 0.10"wc or 1Pa.

setbackMissing

Creates a spark when the cooling or heating setpoint doesn't vary by more than a given tolerance.

setbackTooSmall

Creates a spark when the cooling or heating setpoint varies by more than 0.5 degrees and less than a given tolerance.

Spark Rules

setbackWrongDirection

Finds setback temperatures that move in the wrong direction - unocc cooling setback temps that are lower than the occupied setting and unocc heating setbacks that are higher than the occupied setpoint than the occupied setting and unocc heating setbacks that are higher than the occupied setpoint.

Ignores today.

setpointRapidChange

Creates a spark when the water or air temperature setpoint changes more than a threshold times per hour.

shortLoadDuration

Sparkable function.

This function will detect energy sharp usage peaks with short duration.

spaceTempUncomfortable

Spark when zone temp greater than 78 or less than 64 degrees.

Only checks during occupied periods.

tempDataBad

Creates a spark when the there is no temperature data.

tempOffHeatCoolSp

Creates a spark when zone temp is 2 degrees above cooling or below heating setpoint.

Spark Rules

tempOffSetpointAir

Spark when Space, Supply or Discharge Temp varies more than 3 degrees from Setpoint.

Only check during occupancy.
Ignore sparks < 15 minutes.

tempSensorBad

Creates a spark when the temperature doesn't vary by more than a given tolerance.

towerInsufficientDeltaT

Creates a spark when tower is on and supply and return water temperature delta less than 5 degrees.

valveClosedPumpOn

Find circulation pumps that are on and isolation or coil valve is closed.

valveCmdPosVariance

Creates a spark when valve command and valve feedback position vary more than 5%.

vavAboveSpNoCooling

Creates a spark when Zone Air Temp is above Setpoint and Cooling valve is <5% open.

Spark Rules

vavAlternatingHeatCoolTemp

Creates a spark when ahuRef is occupied and SAT alternates above and below SP more than 5 degrees.

vavBelowSpNoReheat

Creates a spark when Zone Air Temp is below Setpoint and Rht valve is <25% open.

vavCDkFlowDmprClosed

Creates a spark when there is Cold Deck Flow and the Damper is closed.

vavDaTempStratifying

Creates a spark when discharge air temp is above 100 degrees and air flow is below 100 cfm.

vavDamperLowFlow

Creates a spark when Damper is open and no Flow.

vavHDkFlowDamperClosed

Creates a spark when there is Hot Deck Flow and the Damper is closed.

Spark Rules

vavInsufficientFlow

Creates a spark when damper is >95% open for 8 hours and equip is occupied.

vavLeakingReheatValve

Check for a rise in DAT over ahu DAT when the Reheat Water valve is closed.

vavReheatNoDATIncrease

Creates a spark when and Rht valve is >50% open and SAT below zone air temp.

Shift heating test ahead 15 minutes to allow time for SAT change.

vavReheatNoDamper

Creates a spark when Rht valve is >50% open and Damper at 0% and equip is occupied.

vavSimultaneourCDkHDkFlowSp

Creates a spark when VAV Hot and Cold deck flow set points are greater than zero.

vavTstatDisabled

Spark when occupied value is "disabled".

Spark Rules

vavWarmupBeforeCooling

Creates a spark when ahuref is occupied and SAT is above SP before 10:00am and below after.

vrfShortCyclingCmd

Creates a spark when any VRF run time is less than 15 minutes.

Ignore daily spark durations less than 1 hour.

vrfShortCyclingMode

Creates a spark when the vrv status alternates less than cycleDur.

waterPressureOffSetpoint

Creates a spark when water pressure varies more than 3 psi from setpoint.

heatCoolSetpointTooClose

Creates a spark when the effective occupied heating and cooling setpoints are less than two degrees apart.

co2SensorBad

Creates a spark when the co2 reading doesn't vary by more than a given tolerance.

equipToOccupiedPeriods

For a given equip, find the occupied record on it or its airRef, return occupiedPeriods. If no occupied record or no history, return null