Contents

[1 Mappings into OPC UA built-in functionality 6](#_Toc349226353)

[1.1 Time Series 6](#_Toc349226354)

[1.2 Sample Types mapped into OPC UA float with engineering units 6](#_Toc349226355)

[**2** **Simple Types** 7](#_Toc349226356)

[2.1 AlarmStateType 7](#_Toc349226357)

[2.2 AssetIdType 7](#_Toc349226358)

[2.3 AxesListValueType 8](#_Toc349226359)

[2.4 BufferSizeType 8](#_Toc349226360)

[2.5 ComponentIdType 8](#_Toc349226361)

[2.6 ConditionDescriptionType 8](#_Toc349226362)

[2.7 CoordinateSystemType 8](#_Toc349226363)

[2.8 CountValueType 9](#_Toc349226364)

[2.9 CreationTimeType 9](#_Toc349226365)

[2.10 DataItemEnumType 9](#_Toc349226366)

[2.11 DataItemEnumTypeEnum 9](#_Toc349226367)

[2.12 DataItemExtType 13](#_Toc349226368)

[2.13 DataItemIdType 13](#_Toc349226369)

[2.14 DataItemStatisticsType 13](#_Toc349226370)

[2.15 DataItemStatisticsTypeEnum 13](#_Toc349226371)

[2.16 DataItemStatsExtType 14](#_Toc349226372)

[2.17 DataItemSubEnumType 14](#_Toc349226373)

[2.18 DataItemSubEnumTypeEnum 14](#_Toc349226374)

[2.19 DecibelValueType 15](#_Toc349226375)

[2.20 DescriptionTextType 15](#_Toc349226376)

[2.21 DurationTimeType 15](#_Toc349226377)

[2.22 DurationValueType 16](#_Toc349226378)

[2.23 EnergyValueType 16](#_Toc349226379)

[2.24 FeedrateValueType 16](#_Toc349226380)

[2.25 ForceValueType 16](#_Toc349226381)

[2.26 IDType 16](#_Toc349226382)

[2.27 InstanceIdType 17](#_Toc349226383)

[2.28 InterfaceStateType 17](#_Toc349226384)

[2.29 ItemSourceType 17](#_Toc349226385)

[2.30 MassValueType 17](#_Toc349226386)

[2.31 NameType 17](#_Toc349226387)

[2.32 NativeCodeType 18](#_Toc349226388)

[2.33 NativeNotifcationCodeType 18](#_Toc349226389)

[2.34 NativeSeverityType 18](#_Toc349226390)

[2.35 NativeUnitsType 18](#_Toc349226391)

[2.36 NativeUnitsTypeEnum 18](#_Toc349226392)

[2.37 NotifcationCodeType 20](#_Toc349226393)

[2.38 NotifcationDescriptionType 20](#_Toc349226394)

[2.39 OccurrenceTimeType 21](#_Toc349226395)

[2.40 QualifierType 21](#_Toc349226396)

[2.41 RateType 21](#_Toc349226397)

[2.42 SampleRateType 21](#_Toc349226398)

[2.43 SenderType 21](#_Toc349226399)

[2.44 SequenceType 22](#_Toc349226400)

[2.45 SerialNumberType 22](#_Toc349226401)

[2.46 SeverityType 22](#_Toc349226402)

[2.47 SignificantDigitsValueType 22](#_Toc349226403)

[2.48 StationType 23](#_Toc349226404)

[2.49 TestIndicatorType 23](#_Toc349226405)

[2.50 ThreeDimensionalValueType 23](#_Toc349226406)

[2.51 TimestampType 23](#_Toc349226407)

[2.52 ToolEventValueType 23](#_Toc349226408)

[2.53 ToolIdValueType 23](#_Toc349226409)

[2.54 UnitsExtType 24](#_Toc349226410)

[2.55 UnitsType 24](#_Toc349226411)

[2.56 UnitsTypeEnum 24](#_Toc349226412)

[2.57 UuidType 25](#_Toc349226413)

[2.58 VersionType 25](#_Toc349226414)

[2.59 VibrationValueType 25](#_Toc349226415)

[**3** **Complex Types** 26](#_Toc349226416)

[3.1 ActiveAxesType 26](#_Toc349226417)

[3.2 ActuatorStateType 26](#_Toc349226418)

[3.3 AlarmType 26](#_Toc349226419)

[3.4 AssetChangedType 27](#_Toc349226420)

[3.5 AvailabilityType 27](#_Toc349226421)

[3.6 AxesCouplingType 27](#_Toc349226422)

[3.7 BlockType 28](#_Toc349226423)

[3.8 ClampStateType 28](#_Toc349226424)

[3.9 ComponentStreamType 28](#_Toc349226425)

[3.10 ConditionListType 28](#_Toc349226426)

[3.11 ConditionType 29](#_Toc349226427)

[3.12 ControlPowerStateType 29](#_Toc349226428)

[3.13 ControllerModeType 29](#_Toc349226429)

[3.14 CoupledAxesType 30](#_Toc349226430)

[3.15 DeviceStreamType 30](#_Toc349226431)

[3.16 DirectionType 30](#_Toc349226432)

[3.17 DoorStateType 31](#_Toc349226433)

[3.18 EmergencyStopType 31](#_Toc349226434)

[3.19 EventType 31](#_Toc349226435)

[3.20 EventsType 31](#_Toc349226436)

[3.21 ExecutionType 32](#_Toc349226437)

[3.22 HeaderType 32](#_Toc349226438)

[3.23 LinePowerStateType 32](#_Toc349226439)

[3.24 LineType 33](#_Toc349226440)

[3.25 MTConnectStreamsType 33](#_Toc349226441)

[3.26 MessageType 33](#_Toc349226442)

[3.27 PartCountType 33](#_Toc349226443)

[3.28 PartIdType 34](#_Toc349226444)

[3.29 PathModeType 34](#_Toc349226445)

[3.30 PowerStateType 34](#_Toc349226446)

[3.31 ProgramType 34](#_Toc349226447)

[3.32 ResultType 35](#_Toc349226448)

[3.33 RotaryModeType 35](#_Toc349226449)

[3.34 SampleType 35](#_Toc349226450)

[3.35 SamplesType 36](#_Toc349226451)

[3.36 SoundLevelType 36](#_Toc349226452)

[3.37 StreamsType 36](#_Toc349226453)

[3.38 ToolAssetIdType 36](#_Toc349226454)

[3.39 WorkholdingIdType 36](#_Toc349226455)

[**4** **OPC UA Variable Types** 37](#_Toc349226456)

[4.1 Abstract Variable Types 37](#_Toc349226457)

[4.1.1.1 Result 37](#_Toc349226458)

[4.2 Sample Variable Types 37](#_Toc349226459)

[4.2.1.1 AbsTimeSeries 37](#_Toc349226460)

[4.2.1.2 Acceleration 37](#_Toc349226461)

[4.2.1.3 AccumulatedTime 37](#_Toc349226462)

[4.2.1.4 Amperage 37](#_Toc349226463)

[4.2.1.5 Angle 38](#_Toc349226464)

[4.2.1.6 AngularAcceleration 38](#_Toc349226465)

[4.2.1.7 AngularVelocity 38](#_Toc349226466)

[4.2.1.8 AxisFeedrate 38](#_Toc349226467)

[4.2.1.9 Concentration 38](#_Toc349226468)

[4.2.1.10 Conductivity 39](#_Toc349226469)

[4.2.1.11 Displacement 39](#_Toc349226470)

[4.2.1.12 ElectricalEnergy 39](#_Toc349226471)

[4.2.1.13 Flow 39](#_Toc349226472)

[4.2.1.14 Frequency 39](#_Toc349226473)

[4.2.1.15 LinearForce 40](#_Toc349226474)

[4.2.1.16 Load 40](#_Toc349226475)

[4.2.1.17 PathFeedrate 40](#_Toc349226476)

[4.2.1.18 PathPosition 40](#_Toc349226477)

[4.2.1.19 Position 40](#_Toc349226478)

[4.2.1.20 PowerFactor 40](#_Toc349226479)

[4.2.1.21 Pressure 41](#_Toc349226480)

[4.2.1.22 Resistance 41](#_Toc349226481)

[4.2.1.23 RotationalVelocity 41](#_Toc349226482)

[4.2.1.24 Sample 41](#_Toc349226483)

[4.2.1.25 SoundPressure 41](#_Toc349226484)

[4.2.1.26 Strain 42](#_Toc349226485)

[4.2.1.27 Temperature 42](#_Toc349226486)

[4.2.1.28 Tilt 42](#_Toc349226487)

[4.2.1.29 Torque 42](#_Toc349226488)

[4.2.1.30 Velocity 42](#_Toc349226489)

[4.2.1.31 Viscosity 43](#_Toc349226490)

[4.2.1.32 Voltage 43](#_Toc349226491)

[4.2.1.33 Wattage 43](#_Toc349226492)

[4.3 Event Variable Types 43](#_Toc349226493)

[4.3.1.1 ActiveAxes 43](#_Toc349226494)

[4.3.1.2 ActuatorState 43](#_Toc349226495)

[4.3.1.3 Alarm 44](#_Toc349226496)

[4.3.1.4 AssetChanged 44](#_Toc349226497)

[4.3.1.5 Availability 44](#_Toc349226498)

[4.3.1.6 AxesCoupling 44](#_Toc349226499)

[4.3.1.7 Block 44](#_Toc349226500)

[4.3.1.8 ClampState 45](#_Toc349226501)

[4.3.1.9 ControllerMode 45](#_Toc349226502)

[4.3.1.10 CoupledAxes 45](#_Toc349226503)

[4.3.1.11 Direction 45](#_Toc349226504)

[4.3.1.12 DoorState 45](#_Toc349226505)

[4.3.1.13 EmergencyStop 46](#_Toc349226506)

[4.3.1.14 Event 46](#_Toc349226507)

[4.3.1.15 Execution 46](#_Toc349226508)

[4.3.1.16 Line 46](#_Toc349226509)

[4.3.1.17 Message 46](#_Toc349226510)

[4.3.1.18 PartCount 47](#_Toc349226511)

[4.3.1.19 PartId 47](#_Toc349226512)

[4.3.1.20 PathMode 47](#_Toc349226513)

[4.3.1.21 PowerState 47](#_Toc349226514)

[4.3.1.22 Program 47](#_Toc349226515)

[4.3.1.23 RotaryMode 47](#_Toc349226516)

[4.3.1.24 ToolAssetId 48](#_Toc349226517)

[4.3.1.25 WorkholdingId 48](#_Toc349226518)

[4.4 Condition Variable Types 48](#_Toc349226519)

[4.4.1.1 ACCELERATION 48](#_Toc349226520)

[4.4.1.2 ACCUMULATED\_TIME 48](#_Toc349226521)

[4.4.1.3 ACTUATOR 48](#_Toc349226522)

[4.4.1.4 AMPERAGE 49](#_Toc349226523)

[4.4.1.5 ANGLE 49](#_Toc349226524)

[4.4.1.6 ANGULAR-ACCELERATION 49](#_Toc349226525)

[4.4.1.7 ANGULAR\_VELOCITY 49](#_Toc349226526)

[4.4.1.8 COMMUNICATIONS 49](#_Toc349226527)

[4.4.1.9 CONCENTRATION 49](#_Toc349226528)

[4.4.1.10 CONDUCTIVITY 50](#_Toc349226529)

[4.4.1.11 DATA\_RANGE 50](#_Toc349226530)

[4.4.1.12 DIRECTION 50](#_Toc349226531)

[4.4.1.13 DISPLACEMENT 50](#_Toc349226532)

[4.4.1.14 ELECTRICAL\_ENERGY 50](#_Toc349226533)

[4.4.1.15 FILL\_LEVEL 50](#_Toc349226534)

[4.4.1.16 FLOW 51](#_Toc349226535)

[4.4.1.17 FREQUECNCY 51](#_Toc349226536)

[4.4.1.18 HARDWARE 51](#_Toc349226537)

[4.4.1.19 LEVEL 51](#_Toc349226538)

[4.4.1.20 LINEAR\_FORCE 51](#_Toc349226539)

[4.4.1.21 LOAD 51](#_Toc349226540)

[4.4.1.22 LOGIC\_PROGRAM 52](#_Toc349226541)

[4.4.1.23 MASS 52](#_Toc349226542)

[4.4.1.24 MOTION\_PROGRAM 52](#_Toc349226543)

[4.4.1.25 PATH\_FEEDRATE 52](#_Toc349226544)

[4.4.1.26 PATH\_POSITION 52](#_Toc349226545)

[4.4.1.27 PH 52](#_Toc349226546)

[4.4.1.28 POSITION 53](#_Toc349226547)

[4.4.1.29 POWER\_FACTOR 53](#_Toc349226548)

[4.4.1.30 PRESSURE 53](#_Toc349226549)

[4.4.1.31 RESISTANCE 53](#_Toc349226550)

[4.4.1.32 ROTARY\_VELOCITY 53](#_Toc349226551)

[4.4.1.33 SOUND\_LEVEL 53](#_Toc349226552)

[4.4.1.34 SPINDLE\_SPEED 54](#_Toc349226553)

[4.4.1.35 STRAIN 54](#_Toc349226554)

[4.4.1.36 SYSTEM 54](#_Toc349226555)

[4.4.1.37 TEMPERATURE 54](#_Toc349226556)

[4.4.1.38 TILT 54](#_Toc349226557)

[4.4.1.39 TORQUE 54](#_Toc349226558)

[4.4.1.40 VELOCITY 55](#_Toc349226559)

[4.4.1.41 VISCOSITY 55](#_Toc349226560)

[4.4.1.42 VOLTAGE 55](#_Toc349226561)

[4.4.1.43 VOLT\_AMPERAGE 55](#_Toc349226562)

[4.4.1.44 VOLT\_AMPERAGE\_REACTIVE 55](#_Toc349226563)

[4.4.1.45 WATTAGE 55](#_Toc349226564)

# Mappings into OPC UA built-in functionality

## Time Series

A Time Series is a SAMPLE which includes multiple readings of a dataItem taken at a specified sample rate. A time series can be used for collecting high frequency samples of a dataItem and then providing the series of samples to an application as a single dataItem. A time series contains the same *Attributes* as a SAMPLE, plus one additional attribute sampleCount. For a Time Series, sampleRate defines the time period (frequency) for the collection of each reading of the dataItem and sampleCount defines the total number of readings being transmitted. The CDATA **SHALL** be a series of floating point numbers. The number of readings **SHALL** match the sampleCount. The units for a Time Series SHALL be the same as specified for the dataItem.

## Sample Types mapped into OPC UA float with engineering units

The following table lists the MTConnect Complex types that are mapped into OPC UA float type with engineering units.

|  |  |  |
| --- | --- | --- |
| **Sample** | **MTConnect Units** | **OPC UA Engineering Units** |
| AbsTimeSeriesType |  |  |
| AccelerationType | MILLIMETER/SECOND^2 |  |
| AccumulatedTimeType | SECOND |  |
| AmperageType | AMPERE |  |
| AngleType | DEGREE |  |
| AngularAccelerationType | DEGREE/SECOND^2 |  |
| AngularVelocityType | DEGREE/SECOND |  |
| AxisFeedrateType | MILLIMETER/SECOND or PERCENT for override |  |
| ConcentrationType | PERCENT |  |
| ConductivityType | SIEMENS/METER |  |
| DisplacementType | MILLIMETER |  |
| ElectricalEnergyType | WATT\_SECOND |  |
| FlowType | LITER/SECOND |  |
| FrequencyType | HERTZ |  |
| LinearForceType | NEWTON |  |
| LoadType | PERCENT |  |
| PathFeedrateType | MILLIMETER/SECOND or PERCENT for Override |  |
| PathPositionType | default to WORK coordinates in MILLIMETER\_3D |  |
| PositionType | MILLIMETER |  |
| PowerFactorType | PERCENT |  |
| PressureType | PASCAL |  |
| ResistanceType | OHM |  |
| RotationalVelocityType | REVOLUTION/MINUTE or PERCENT for Override |  |
| SoundPressureType | DECIBEL |  |
| StrainType | PERCENT |  |
| TemperatureType | degrees CELSIUS |  |
| TiltType | MICRO\_RADIAN |  |
| TorqueType | NEWTON\_METER |  |
| VelocityType | MILLIMETER/SECOND |  |
| ViscosityType | PASCAL\_SECOND |  |
| VoltageType | VOLT |  |
| WattageType | WATT |  |

1. **Simple Types**

## AlarmStateType

Enumeration: AlarmStateTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| ACTIVE\_1 |  |
| CLEARED\_2 |  |

The active or cleared state of the notification

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AlarmStateType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

## AssetIdType

The unique id of the asset

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AssetIdType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## AxesListValueType

A space delimited list of values

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AxesListValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## BufferSizeType

The size of the agents buffer

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | BufferSizeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of integer | | | | | |

## ComponentIdType

The id of the component (maps to the id from probe)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ComponentIdType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of ID | | | | | |

## ConditionDescriptionType

The description of the Condition

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ConditionDescriptionType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## CoordinateSystemType

Enumeration: CoordinateSystemTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| MACHINE\_1 | Unchangeable coordinate system that has machine zero as its origin. |
| WORK\_2 | The coordinate system that represents the working area for a particular workpiece whose origin is shifted within the MACHINE coordinate system. If the WORK coordinates are not currently defined in the device, the MACHINE coordinates will be used. |

The coordinate system to be used for the position

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CoordinateSystemType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

## CountValueType

The number of values

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CountValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## CreationTimeType

The date and time the document was created

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CreationTimeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of dateTime | | | | | |

## DataItemEnumType

The types of measurements available

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DataItemEnumType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Union of DataItemEnumTypeEnum | | | | | |
| Union of DataItemExtType | | | | | |

## DataItemEnumTypeEnum

Enumeration: DataItemEnumTypeEnumEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| ACCELERATION\_1 | Rate of change of velocity |
| ACCUMULATED\_TIME\_2 | The measurement of accumulated time associated with a component |
| ACTIVE\_AXES\_3 | The set of axes associated with a path that the controller is controlling. If this data item is not provided, it will be assumed the controller is controlling all axes. |
| ACTUATOR\_4 | An actuator related condition. |
| ACTUATOR\_STATE\_5 | The state of the actuator. ACTIVE or INACTIVE. |
| ALARM\_6 | DEPRECATED: Replaced with CONDITION category. Rel. 1.1. |
| AMPERAGE\_7 | The measurement of AC Current or a DC current. Subtypes: ALTERNATING The measurement of alternating current. If not specified further in Statistic, defaults to RMS Current units in AMPERE. DIRECT The measurement of DC current units in AMPERE. |
| ANGLE\_8 | The angular position of a component relative to the parent. ACTUAL The angular position as read from the physical component in units DEGREE. COMMANDED - The angular position computed by the controller in units DEGREE. |
| ANGULAR\_ACCELERATION\_9 | Rate of change of angular velocity. |
| ANGULAR\_VELOCITY\_10 | Rate of change of angular position. |
| ASSET\_CHANGED\_11 |  |
| AVAILABILITY\_12 | Represents the components ability to communicate its availability. This SHALL beprovided for the device and MAY be provided for all other components |
| AXIS\_COUPLING\_13 | Describes the way the axes will be associated to each other. This is used in conjunction with COUPLED\_AXES to indicate the way they are interacting. The possible values are: TANDEM, SYNCHRONOUS, MASTER, and SLAVE. The coupling SHALL be viewed from the perspective of the axis, therefore a MASTER coupling indicates that this axis is the master of the COUPLED\_AXES. |
| AXIS\_FEEDRATE\_14 | The feedrate of a linear axis. Subtypes: ACTUAL - The actual federate of a linear axis in units MILLIMETER/SECOND. OMMANDED - The feedrate as specified in the program in units MILLIMETER/SECOND. OVERRIDE - The operator’s overridden value. Percent of commanded in units PERCENT. |
| BLOCK\_15 | The block of code being executed. The block contains the entire expression of the step in the program. |
| CHANGE\_STOCK\_16 |  |
| CLAMP\_STATUS\_17 |  |
| CODE\_18 | DEPRECATED. Rel 1.1.0 |
| COMMUNICATIONS\_19 | A communications failure indicator. |
| CONCENTRATION\_20 | Percentage of one component within a mixture of components |
| CONDUCTIVITY\_21 | The ability of a material to conduct electricity |
| CONTROLLER\_MODE\_22 | The current controller’s mode. AUTOMATIC, MANUAL, MANUAL\_DATA\_INPUT, FEED\_HOLD, or SEMI\_AUTOMATIC. |
| COUPLED\_AXES\_23 | Refers to the set of associated axes. The value will be a space delimited set of axes names. |
| DIRECTION\_24 | The direction of motion. CLOCKWISE or COUNTER\_CLOCKWISE |
| DISPLACEMENT\_25 | The displacement as the change in position of an object |
| DOOR\_STATE\_26 | The opened or closed state of the door. OPEN, UNLATCHED, or CLOSED. |
| ELECTRICAL\_POWER\_27 |  |
| EMERGENCY\_STOP\_28 | The current state of the emergency stop actuator. ARMED (the circuit is complete and the device is operating) or TRIGGERED (the circuit is open and the device SHALL cease operation). |
| EXECUTION\_29 | The execution status of the Controller. READY, ACTIVE, INTERRUPTED, or STOPPED |
| FEED\_STOCK\_30 |  |
| FILL\_LEVEL\_31 | The measurement of the amount of a substance remaining compared to the planned maximum amount of that substance |
| FLOW\_32 | The rate of flow of a fluid |
| FREQUENCY\_33 | The measurement of the number of occurrences of a repeating event per unit time |
| HARDWARE\_34 | The hardware subsystem of the component operation condition. |
| LEVEL\_35 | Deprecated in Rel. 1.2 See Fill\_Level |
| LINE\_36 | The state of the high voltage line. |
| LINEAR\_FORCE\_37 | The measure of the push or pull introduced by an actuator or exerted on an object |
| LOAD\_38 | The measurement of the percentage of the standard rating of a device |
| LOGIC\_PROGRAM\_39 | An error occurred in the logic program or PLC (programmable logic controller). |
| MASS\_40 | The measurement of the mass of an object(s) or an amount of material |
| MESSAGE\_41 | An uninterpreted textual notification. |
| MOTION\_PROGRAM\_42 | An error occurred in the motion program. |
| PART\_COUNT\_43 | The current count of parts produced as represented by the controller. SHALL be an integer value.ALL The count of all the parts produced. If the subtype is not given, this is the default. GOOD Indicates the count of correct parts made. BAD Indicates the count of incorrect parts produced. |
| PART\_ID\_44 | An identifier of the current part in the device |
| PATH\_FEEDRATE\_45 | The feedrate of the tool path. Subtypes: ACTUAL - The three-dimensional feedrate derived from all components in units MILLIMETER/SECOND. COMMANDED - The feedrate as specified in the program in units MILLIMETER/SECOND. OVERRIDE - The operator’s overridden value. Percent of commanded in unitsPERCENT. |
| PATH\_MODE\_46 | The operational mode for this Path. SYNCHRONOUS, MIRROR, or INDEPENDENT. Default value is INDEPENDENT if not specified. |
| PATH\_POSITION\_47 | The current program control point or program coordinate in WORK coordinates. The coordinate system will revert to MACHINE coordinates if WORK coordinates are not available. ACTUAL The position of the component as read from the device in units MILLIMETER\_3D. COMMANDEDThe position computed by the controller in units MILLIMETER\_3D. TARGET The target position for the movement in units MILLIMETER\_3D. PROBE The position provided by a probe in units MILLIMETER\_3D. |
| PH\_48 | A measure of the acidity or alkalinity of a solution |
| POSITION\_49 | The position of the component. Defaults to MACHINE coordinates. Subtypes: ACTUAL-The position of the component as read from the device in units MILLIMETER. COMMANDED- The position as given by the Controller in units MILLIMETER. TARGET- The target position for the movement in units - MILLIMETER. |
| POWER\_FACTOR\_50 | The measurement of the ratio of real power flowing to a load to the apparent power in that AC circuit. |
| POWER\_STATE\_51 | The ON or OFF status of the component. DEPRECATION WARNING: MAY bedeprecated in the future. |
| POWER\_STATUS\_52 | DEPRECATED. Rel. 1.1. |
| PRESSURE\_53 | The force per unit area exerted by a gas or liquid |
| PROGRAM\_54 | The name of the program being executed |
| RESET\_55 |  |
| RESISTANCE\_56 | The measurement of the degree to which an object opposes an electric current through it |
| ROTARY\_MODE\_57 | The mode for the Rotary axis. SPINDLE, INDEX, or CONTOUR. |
| ROTARY\_VELOCITY\_58 | The rotational speed of a rotary axis. ACTUAL The rotational speed the rotary axis is spinning at. ROTARY\_MODE SHALL be SPINDLE in units REVOLUTION/MINUTE COMMANDED The rotational speed as specified in the program in units REVOLUTION/MINUTE. OVERRIDE The operator’s overridden value. Percent of commanded in units PERCENT. |
| SOUND\_PRESSURE\_59 |  |
| SPINDLE\_SPEED\_60 | DEPRECATED in REL 1.2. Replaced by ROTARY\_VELOCITY |
| STRAIN\_61 | Strain is the amount of deformation per unit length of an object when a load is applied. |
| SYSTEM\_62 | A condition representing something that is not the operator, program, or hardware. This is often used for operating system issues. |
| TEMPERATURE\_63 | The measurement of temperature |
| TILT\_64 | A measurement of angular displacement |
| TOOL\_ASSET\_ID\_65 | The identifier of the tool currently in use for a given Path |
| TORQUE\_66 | The turning force exerted on an object or by an object |
| VELOCITY\_67 | The rate of change of position. |
| VIBRATION\_68 |  |
| VISCOSITY\_69 | A measurement of a fluid’s resistance to flow |
| VOLTAGE\_70 | The measurement of electrical potential between two points |
| VOLT\_AMPERE\_71 | Volt-Ampere (VA) |
| VOLT\_AMPERE\_REACTIVE\_72 | Volt-Ampere Reactive (var) |
| WATTAGE\_73 | The measurement of power consumed or dissipated by an electrical circuit or device |
| WATT\_SECOND\_74 | Measurement of electrical energy, equal to one Joule |
| WORKHOLDING\_ID\_75 | The identifier for the workholding currently in use for a given Path |

The types of measurements available

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DataItemEnumTypeEnum | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

## DataItemExtType

An extension point for data item types

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DataItemExtType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## DataItemIdType

The item's unique ID that references the data item id from probe

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DataItemIdType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of NMTOKEN | | | | | |

## DataItemStatisticsType

Statistical operations on data

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DataItemStatisticsType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Union of DataItemStatisticsTypeEnum | | | | | |
| Union of DataItemStatsExtType | | | | | |

## DataItemStatisticsTypeEnum

Enumeration: DataItemStatisticsTypeEnumEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| AVERAGE\_1 | Mathematical Average value calculated for the DataItem during the calculation period |
| KURTOSIS\_2 | A measure of the “peakedness” of a probability distribution; i.e., the shape of the distribution curve |
| MAXIMUM\_3 | Maximum or peak value recorded for the DataItem during the calculation period |
| MEAN\_4 |  |
| MINIMUM\_5 | Minimum value recorded for the DataItem during the calculation period |
| MODE\_6 | The number in a series of numbers that occurs most often |
| RANGE\_7 | Difference between the Maximum value and Minimum value of a DataItem during the calculation period. Also represents Peak-to-Peak measurement in an waveform. |
| ROOT\_MEAN\_SQUARE\_8 | Mathematical Root Mean Value (RMS) value calculated for the DataItem during the calculation period |
| STANDARD\_DEVIATION\_9 | Statistical Standard Deviation value calculated for the DataItem during the calculation period |

Statistical operations on data

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DataItemStatisticsTypeEnum | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

## DataItemStatsExtType

An extension point for data item statistics types

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DataItemStatsExtType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## DataItemSubEnumType

The sub-types for a measurement

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DataItemSubEnumType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Union of DataItemExtType | | | | | |
| Union of DataItemSubEnumTypeEnum | | | | | |

## DataItemSubEnumTypeEnum

Enumeration: DataItemSubEnumTypeEnumEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| ACTUAL\_1 | The value of the component as read from the device. |
| ALL\_2 |  |
| ALTERNATING\_3 | The measurement of alternating voltage. If not specified further in Statistic, defaults to RMS voltage |
| A\_SCALE\_4 | A Scale weighting factor. This is the default weighting factor if no factor is specified |
| BAD\_5 |  |
| B\_SCALE\_6 | B Scale weighting factor |
| COMMANDED\_7 | The value computed by the controller. |
| CONTROL\_8 | The state of the low power line. |
| C\_SCALE\_9 | C Scale weighting factor |
| DIRECT\_10 | The measurement of DC voltage |
| DYNAMIC\_11 |  |
| D\_SCALE\_12 | D Scale weighting factor |
| GOOD\_13 |  |
| KINETIC\_14 |  |
| LINE\_15 | The state of the high voltage line. |
| MAXIMUM\_16 | Maximum or peak value recorded for the DataItem during the calculation period |
| MINIMUM\_17 | Minimum value recorded for the DataItem during the calculation period |
| MOLE\_18 |  |
| NO\_SCALE\_19 | No weighting factor on the frequency scale |
| OTHER\_20 | Unsupported units |
| OVERRIDE\_21 | The operator’s overridden value. Percent of commanded. |
| PROBE\_22 | The value provided by a probe |
| REQUEST\_23 |  |
| RESPONSE\_24 |  |
| TARGET\_25 | The target value for the movement. |
| VOLUME\_26 |  |
| WEIGHT\_27 |  |

The sub-types for a measurement

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DataItemSubEnumTypeEnum | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

## DecibelValueType

The sound pressure

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DecibelValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## DescriptionTextType

A description

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DescriptionTextType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## DurationTimeType

A length of time in seconds

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DurationTimeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of float | | | | | |

## DurationValueType

The duration of an event in seconds

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DurationValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## EnergyValueType

The value of energy

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | EnergyValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## FeedrateValueType

The feedrate

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | FeedrateValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## ForceValueType

The magnitude of push or pull

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ForceValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## IDType

An identifier

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | IDType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of ID | | | | | |

## InstanceIdType

The instance number of the agent, used for fault tolerance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | InstanceIdType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## InterfaceStateType

Enumeration: InterfaceStateTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| ACTIVE\_1 |  |
| COMPLETE\_2 |  |
| FAIL\_3 |  |
| READY\_4 |  |

Interface state

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | InterfaceStateType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

## ItemSourceType

The measurement source

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ItemSourceType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## MassValueType

The weight of an object

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | MassValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## NameType

A short name for any element

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | NameType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## NativeCodeType

An Condition code as defined by the component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | NativeCodeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## NativeNotifcationCodeType

An Notifcation code as defined by the component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | NativeNotifcationCodeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## NativeSeverityType

The device's severity

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | NativeSeverityType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## NativeUnitsType

The units supported for the source equipment that can be converted into MTC Units.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | NativeUnitsType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Union of NativeUnitsTypeEnum | | | | | |
| Union of UnitsExtType | | | | | |

## NativeUnitsTypeEnum

Enumeration: NativeUnitsTypeEnumEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| AMPERE\_1 | Amps |
| CELSIUS\_2 | Degrees Celsius |
| CENTIPOISE\_3 | A measure of Viscosity |
| COUNT\_4 | A counted event |
| DEGREE\_5 | Angle in degrees |
| DEGREE/MINUTE\_6 | Rotational velocity in degrees per minute |
| DEGREE/SECOND\_7 | Angular degrees per second |
| DEGREE/SECOND^2\_8 | Angular acceleration in degrees per second squared |
| FAHRENHEIT\_9 | Temperature in Fahrenheit |
| FOOT\_10 | Feet |
| FOOT/MINUTE\_11 | Feet per minute |
| FOOT/SECOND\_12 | Feet per second |
| FOOT/SECOND^2\_13 | Acceleration in feet per second squared |
| FOOT\_3D\_14 | A point in space identified by X, Y, and Z positions and represented by a space delimited set of numbers each expressed in feet. |
| GALLON/MINUTE\_15 | Gallons per minute. |
| HERTZ\_16 | Frequency measured in cycles per second |
| INCH\_17 | Inches |
| INCH/MINUTE\_18 | Inches per minute |
| INCH/SECOND\_19 | Inches per second |
| INCH/SECOND^2\_20 | Acceleration in inches per second squared |
| INCH\_3D\_21 | A point in space identified by X, Y, and Z positions and represented by a space delimited set of numbers each expressed in inches. |
| JOULE\_22 | A measurement of energy. |
| KILOGRAM\_23 | Kilograms |
| KILOWATT\_24 | A measurement in kilowatt. |
| KILOWATT\_HOUR\_25 | Kilowatt hours which is 3.6 mega joules. |
| LITER\_26 | Liters |
| LITER/SECOND\_27 | Liters per second |
| MICRO\_RADIAN\_28 | Measurement of Tilt |
| MILLIMETER\_29 | Millimeters |
| MILLIMETER/MINUTE\_30 | Velocity in millimeters per minute |
| MILLIMETER/SECOND\_31 | Millimeters per second |
| MILLIMETER/SECOND^2\_32 | Acceleration in millimeters per second squared |
| MILLIMETER\_3D\_33 | A point in space identified by X, Y, and Z positions and represented by a space delimited set of numbers each expressed in millimeters. |
| NEWTON\_34 | Force in Newtons |
| NEWTON\_METER\_35 | Torque, a unit for force times distance. |
| OHM\_36 | Measure of Electrical Resistance |
| OTHER\_37 | Unsupported units |
| PASCAL\_38 | Pressure in Newtons per square meter |
| PASCAL\_SECOND\_39 | Measurement of Viscosity |
| PERCENT\_40 | Percentage |
| PH\_41 | A measure of the acidity or alkalinity of a solution |
| POUND\_42 | US pounds |
| POUND/INCH^2\_43 | Pressure in pounds per square inch (PSI). |
| RADIAN\_44 |  |
| RADIAN/MINUTE\_45 | Velocity in radians per second. |
| RADIAN/SECOND\_46 | Velocity in radians per second |
| RADIAN/SECOND^2\_47 | Rotational acceleration in radian per second squared |
| REVOLUTION/MINUTE\_48 | Revolutions per minute |
| REVOLUTION/SECOND\_49 | Rotational velocity in revolution per second |
| SECOND\_50 | A measurement of time. |
| SIEMENS/METER\_51 | A measurement of Electrical Conductivity |
| SOUND\_LEVEL\_52 | Measurement of a sound level or sound pressure level relative to atmospheric pressure. Subtypes: NO\_SCALE - No weighting factor on the frequency scale in DECIBEL. A\_SCALE A Scale weighting factor. This is the default weighting factor if no factor is specified in DECIBEL. B\_SCALE- B Scale weighting factor in DECIBEL. C\_SCALE C Scale weighting factor in DECIBEL. D\_SCALE D Scale weighting factor in DECIBEL. |
| VOLT\_53 | Volts |
| VOLT\_AMPERE\_54 | Volt-Ampere (VA) |
| VOLT\_AMPERE\_REACTIVE\_55 | Volt-Ampere Reactive (var) |
| WATT\_56 | Watts |
| WATT\_SECOND\_57 | Measurement of electrical energy, equal to one Joule |

The units supported for the source equipment that can be converted into MTC Units.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | NativeUnitsTypeEnum | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

## NotifcationCodeType

Enumeration: NotifcationCodeTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| CRASH\_1 |  |
| ESTOP\_2 |  |
| FAILURE\_3 |  |
| FAULT\_4 |  |
| JAM\_5 |  |
| MATERIAL\_6 |  |
| MESSAGE\_7 | An uninterpreted textual notification. |
| OTHER\_8 | Unsupported units |
| OVERLOAD\_9 |  |

Types of Notifcations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | NotifcationCodeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

## NotifcationDescriptionType

The description of the Notifcation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | NotifcationDescriptionType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## OccurrenceTimeType

The time a sample occurred

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | OccurrenceTimeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of dateTime | | | | | |

## QualifierType

Enumeration: QualifierTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| HIGH\_1 |  |
| LOW\_2 |  |

A qualifier for the condition

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | QualifierType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

## RateType

A sample rate in milliseconds per sample

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | RateType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of float | | | | | |

## SampleRateType

The sampling rate in samples per second

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SampleRateType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## SenderType

The sender of the message

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SenderType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## SequenceType

A sequence number

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SequenceType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of integer | | | | | |

## SerialNumberType

A serial number for a piece of equipment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SerialNumberType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## SeverityType

Enumeration: SeverityTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| CRITICAL\_1 |  |
| ERROR\_2 |  |
| INFORMATION\_3 |  |
| WARNING\_4 |  |

The severity of the notification

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SeverityType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

## SignificantDigitsValueType

The number significant digits

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SignificantDigitsValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of integer | | | | | |

## StationType

The station id for this device

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | StationType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## TestIndicatorType

A debugging flag for testing.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | TestIndicatorType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of boolean | | | | | |

## ThreeDimensionalValueType

A three dimensional value 'X Y Z' or 'A B C'

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ThreeDimensionalValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## TimestampType

The time the sample was reported

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | TimestampType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of dateTime | | | | | |

## ToolEventValueType

A tool event

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ToolEventValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## ToolIdValueType

The tool identifier

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ToolIdValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## UnitsExtType

An extension point for data item types

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | UnitsExtType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## UnitsType

The units supported

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | UnitsType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Union of UnitsExtType | | | | | |
| Union of UnitsTypeEnum | | | | | |

## UnitsTypeEnum

Enumeration: UnitsTypeEnumEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| AMPERE\_1 | Amps |
| CELSIUS\_2 | Degrees Celsius |
| COUNT\_3 | A counted event |
| DEGREE\_4 | Angle in degrees |
| DEGREE/SECOND\_5 | Angular degrees per second |
| DEGREE/SECOND^2\_6 | Angular acceleration in degrees per second squared |
| HERTZ\_7 | Frequency measured in cycles per second |
| JOULE\_8 | A measurement of energy. |
| KILOGRAM\_9 | Kilograms |
| LITER\_10 | Liters |
| LITER/SECOND\_11 | Liters per second |
| MICRO\_RADIAN\_12 | Measurement of Tilt |
| MILLIMETER\_13 | Millimeters |
| MILLIMETER/SECOND\_14 | Millimeters per second |
| MILLIMETER/SECOND^2\_15 | Acceleration in millimeters per second squared |
| MILLIMETER\_3D\_16 | A point in space identified by X, Y, and Z positions and represented by a space delimited set of numbers each expressed in millimeters. |
| NEWTON\_17 | Force in Newtons |
| NEWTON\_METER\_18 | Torque, a unit for force times distance. |
| OHM\_19 | Measure of Electrical Resistance |
| PASCAL\_20 | Pressure in Newtons per square meter |
| PASCAL\_SECOND\_21 | Measurement of Viscosity |
| PERCENT\_22 | Percentage |
| PH\_23 | A measure of the acidity or alkalinity of a solution |
| REVOLUTION/MINUTE\_24 | Revolutions per minute |
| SECOND\_25 | A measurement of time. |
| SIEMENS/METER\_26 | A measurement of Electrical Conductivity |
| SOUND\_LEVEL\_27 | Measurement of a sound level or sound pressure level relative to atmospheric pressure. Subtypes: NO\_SCALE - No weighting factor on the frequency scale in DECIBEL. A\_SCALE A Scale weighting factor. This is the default weighting factor if no factor is specified in DECIBEL. B\_SCALE- B Scale weighting factor in DECIBEL. C\_SCALE C Scale weighting factor in DECIBEL. D\_SCALE D Scale weighting factor in DECIBEL. |
| VOLT\_28 | Volts |
| VOLT\_AMPERE\_29 | Volt-Ampere (VA) |
| VOLT\_AMPERE\_REACTIVE\_30 | Volt-Ampere Reactive (var) |
| WATT\_31 | Watts |
| WATT\_SECOND\_32 | Measurement of electrical energy, equal to one Joule |

The units supported

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | UnitsTypeEnum | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of enumeration | | | | | |

## UuidType

A universally unique id that uniquely identifies the element for it's entire life

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | UuidType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

## VersionType

A version number

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | VersionType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of NMTOKEN | | | | | |

## VibrationValueType

The vibration

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | VibrationValueType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Subtype of string | | | | | |

1. **Complex Types**

## ActiveAxesType

The list of axes in use. The set of axes associated with a path that the controller is controlling. If this data item is not provided, it will be assumed the controller is controlling all axes.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ActiveAxesType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |

## ActuatorStateType

Enumeration: ActuatorStateTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| ACTIVE\_1 |  |
| INACTIVE\_2 |  |

The actuator state of the component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ActuatorStateType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |
| Restrict values to ActuatorStateTypeEnum | | | | | |

## AlarmType

An Notifcation event

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AlarmType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |
| HasProperty | Variable | code | NotifcationCodeType | ProperyType | Mandatory |
| HasProperty | Variable | severity | SeverityType | ProperyType | Optional |
| HasProperty | Variable | state | AlarmStateType | ProperyType | Optional |
| HasProperty | Variable | nativeCode | NativeNotifcationCodeType | ProperyType | Mandatory |

## AssetChangedType

An asset was just modified

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AssetChangedType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |

## AvailabilityType

Enumeration: AvailabilityTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| AVAILABLE\_1 |  |
| UNAVAILABLE\_2 | No data item reading for this device is avaiable. |

The availability of the component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AvailabilityType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |
| Restrict values to AvailabilityTypeEnum | | | | | |

## AxesCouplingType

Enumeration: AxesCouplingTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| MASTER\_1 | In a master-slave motion system, one controlling axis and one slave axis as a function of the position of the master axis |
| SLAVE\_2 | Controlled position of slave axis as a function of the position of the master axis |
| SYCHRONOUS\_3 |  |
| TANDEM\_4 |  |
| UNAVAILABLE\_5 | No data item reading for this device is avaiable. |

The way the axes are associated

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AxesCouplingType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |
| Restrict values to AxesCouplingTypeEnum | | | | | |

## BlockType

The program code

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | BlockType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |

## ClampStateType

Enumeration: ClampStateTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| CLOSED\_1 | State of being closed. |
| INDETERMINATE\_2 | Indeterminate state. |
| OPEN\_3 | State of being open. |
| UNAVAILABLE\_4 | No data item reading for this device is avaiable. |

The clamp status

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ClampStateType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |
| Restrict values to ClampStateTypeEnum | | | | | |

## ComponentStreamType

The stream of data for a component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ComponentStreamType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| HasProperty | Variable | componentId | ComponentIdType | ProperyType | Mandatory |
| HasProperty | Variable | nativeName | NameType | ProperyType | Optional |
| HasProperty | Variable | component | NameType | ProperyType | Mandatory |
| HasProperty | Variable | uuid | UuidType | ProperyType | Optional |
| HasComponent | Object | Samples | SamplesType | FolderType | Optional(0..1) |
| HasComponent | Object | Events | EventsType | FolderType | Optional(0..1) |
| HasComponent | Object | Condition | ConditionListType | FolderType | Optional(0..1) |
| HasComponent | Object | Interfaces | InterfacesType | FolderType | Optional(0..1) |

## ConditionListType

The condition of the device

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ConditionListType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| HasComponent | Object |  | Condition | FolderType | Mandatory(1..unbounded) |

## ConditionType

An abstract indicator of the device's condition

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ConditionType | | | |
| IsAbstract | | true | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the ConditionDescriptionType | | | | | |
| HasProperty | Variable | sequence | SequenceType | ProperyType | Mandatory |
| HasProperty | Variable | timestamp | TimestampType | ProperyType | Mandatory |
| HasProperty | Variable | type | DataItemEnumType | ProperyType | Mandatory |
| HasProperty | Variable | nativeCode | NativeCodeType | ProperyType | Optional |
| HasProperty | Variable | nativeSeverity | NativeSeverityType | ProperyType | Optional |
| HasProperty | Variable | qualifier | QualifierType | ProperyType | Optional |
| HasProperty | Variable | statistic | DataItemStatisticsType | ProperyType | Optional |
| HasProperty | Variable | subType | DataItemSubEnumType | ProperyType | Optional |

## ControlPowerStateType

The state of the line power

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ControlPowerStateType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the PowerStateType | | | | | |

## ControllerModeType

Enumeration: ControllerModeTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| AUTOMATIC\_1 | Machine mode that allows an operator to execute a part program on the CNC machine. |
| MANUAL\_2 | Machine mode where CNC machine behaves like a standard or conventional machine. |
| MANUAL\_DATA\_INPUT\_3 | Machine mode whereby the operator can enter data through the keyboard on the control panel and display screen. In MDI mode, CNC commands are entered through the keyboard and display screen manually and can be executed once. |
| SEMI\_AUTOMATIC\_4 |  |
| UNAVAILABLE\_5 | No data item reading for this device is avaiable. |

CNC mode state

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ControllerModeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |
| Restrict values to ControllerModeTypeEnum | | | | | |

## CoupledAxesType

The list of associated axes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CoupledAxesType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |

## DeviceStreamType

Data related to a single device

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DeviceStreamType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| HasProperty | Variable | uuid | UuidType | ProperyType | Mandatory |
| HasComponent | Object | ComponentStream | ComponentStreamType | FolderType | Optional(0..unbounded) |

## DirectionType

Enumeration: DirectionTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| CLOCKWISE\_1 |  |
| COUNTER\_CLOCKWISE\_2 |  |
| NEGATIVE\_3 |  |
| POSITIVE\_4 |  |
| UNAVAILABLE\_5 | No data item reading for this device is avaiable. |

The direction of rotation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DirectionType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |
| Restrict values to DirectionTypeEnum | | | | | |

## DoorStateType

Enumeration: DoorStateTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| CLOSED\_1 | State of being closed. |
| INDETERMINATE\_2 | Indeterminate state. |
| OPEN\_3 | State of being open. |
| UNAVAILABLE\_4 | No data item reading for this device is avaiable. |

The status of the door

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DoorStateType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |
| Restrict values to DoorStateTypeEnum | | | | | |

## EmergencyStopType

Enumeration: EmergencyStopTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| ARMED\_1 | The circuit is complete and the device is operating) |
| TRIGGERED\_2 | The circuit is open and the device SHALL cease operation). |
| UNAVAILABLE\_3 | No data item reading for this device is avaiable. |

Emergency Stop status

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | EmergencyStopType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |
| Restrict values to EmergencyStopTypeEnum | | | | | |

## EventType

An abstract event

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | EventType | | | |
| IsAbstract | | true | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the ResultType | | | | | |

## EventsType

A collection of events and alarms for this component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | EventsType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| HasComponent | Object |  | Event | FolderType | Mandatory(1..unbounded) |

## ExecutionType

Enumeration: ExecutionTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| ACTIVE\_1 |  |
| INTERRUPTED\_2 |  |
| READY\_3 |  |
| STOPPED\_4 |  |
| UNAVAILABLE\_5 | No data item reading for this device is avaiable. |

Program execution events

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ExecutionType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |
| Restrict values to ExecutionTypeEnum | | | | | |

## HeaderType

Message header for protocol information

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | HeaderType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the xs:string | | | | | |
| HasProperty | Variable | version | VersionType | ProperyType | Mandatory |
| HasProperty | Variable | creationTime | CreationTimeType | ProperyType | Mandatory |
| HasProperty | Variable | nextSequence | SequenceType | ProperyType | Mandatory |
| HasProperty | Variable | lastSequence | SequenceType | ProperyType | Mandatory |
| HasProperty | Variable | firstSequence | SequenceType | ProperyType | Mandatory |
| HasProperty | Variable | testIndicator | TestIndicatorType | ProperyType | Optional |
| HasProperty | Variable | instanceId | InstanceIdType | ProperyType | Mandatory |
| HasProperty | Variable | sender | SenderType | ProperyType | Mandatory |
| HasProperty | Variable | bufferSize | BufferSizeType | ProperyType | Mandatory |

## LinePowerStateType

The state of the line power

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | LinePowerStateType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the PowerStateType | | | | | |

## LineType

The program's line of execution

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | LineType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |

## MTConnectStreamsType

The root node for MTConnect

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | MTConnectStreamsType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| HasComponent | Object | Header | HeaderType | FolderType | Optional(0..0) |
| HasComponent | Object | Streams | StreamsType | FolderType | Optional(0..0) |

## MessageType

A generic message

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | MessageType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |
| HasProperty | Variable | nativeCode | NativeCodeType | ProperyType | Optional |

## PartCountType

An event that indicates the number of parts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | PartCountType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |

## PartIdType

The current Tool Identifier

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | PartIdType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |

## PathModeType

Enumeration: PathModeTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| INDEPENDENT\_1 |  |
| MIRROR\_2 |  |
| SYNCHRONOUS\_3 |  |

The actuator state of the component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | PathModeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |
| Restrict values to PathModeTypeEnum | | | | | |

## PowerStateType

Enumeration: PowerStateTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| OFF\_1 |  |
| ON\_2 |  |
| UNAVAILABLE\_3 | No data item reading for this device is avaiable. |

The components power state

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | PowerStateType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |
| Restrict values to PowerStateTypeEnum | | | | | |

## ProgramType

The programs file name or identifier

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ProgramType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |

## ResultType

An abstract event

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ResultType | | | |
| IsAbstract | | true | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the ResultValueType | | | | | |
| HasProperty | Variable | sequence | SequenceType | ProperyType | Mandatory |
| HasProperty | Variable | subType | DataItemSubEnumType | ProperyType | Optional |
| HasProperty | Variable | timestamp | TimestampType | ProperyType | Mandatory |

## RotaryModeType

Enumeration: RotaryModeTypeEnum

|  |  |
| --- | --- |
| **Enum** | **Description** |
| CONTOUR\_1 |  |
| INDEX\_2 |  |
| SPINDLE\_3 |  |
| UNAVAILABLE\_4 | No data item reading for this device is avaiable. |

The function of the rotary axis

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | RotaryModeType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |
| Restrict values to RotaryModeTypeEnum | | | | | |

## SampleType

An abstract sample

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SampleType | | | |
| IsAbstract | | true | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the ResultType | | | | | |
| HasProperty | Variable | sampleRate | SampleRateType | ProperyType | Optional |
| HasProperty | Variable | statistic | DataItemStatisticsType | ProperyType | Optional |
| HasProperty | Variable | duration | DurationTimeType | ProperyType | Optional |

## SamplesType

A collection of samples for this component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SamplesType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| HasComponent | Object |  | Sample | FolderType | Mandatory(1..unbounded) |

## SoundLevelType

Measurement of a sound level or sound pressure level relative to atmospheric pressure

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SoundLevelType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the DecibelValueType | | | | | |

## StreamsType

Event container for all component events

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | StreamsType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| HasComponent | Object | DeviceStream | DeviceStreamType | FolderType | Mandatory(1..unbounded) |

## ToolAssetIdType

The unique tool Identifier as referenced in MTConnect specification on assets.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ToolAssetIdType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |

## WorkholdingIdType

The current workholding Identifier

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | WorkholdingIdType | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Inherit the children of the EventType | | | | | |

1. **OPC UA Variable Types**

## Abstract Variable Types

#### Result

An abstract event

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Result | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a type [ResultType](mhtml:file://C:\Program%20Files\NIST\proj\MTConnect\Documentation\MTConnect%20Specification\OPC%20UA%20Companion\MTConnect2UATypesVariables.mht!file:///C:\Program%20Files\NIST\proj\MTConnect\Nist\MTConnectGadgets\OpcUaNotatation\Debug\test.html#ResultType) | | | | | |

## Sample Variable Types

Samples are point-in-time readings from a component reporting what the value is at that instant.

#### AbsTimeSeries

The abstract waveform

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AbsTimeSeries | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type AbsTimeSeriesType | | | | | |

#### Acceleration

The acceleration of the component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Acceleration | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type AccelerationType | | | | | |

#### AccumulatedTime

The non-contiguous duration of an event in seconds

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AccumulatedTime | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type AccumulatedTimeType | | | | | |

#### Amperage

An current a component is drawing

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Amperage | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type AmperageType | | | | | |

#### Angle

The angle of the component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Angle | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type AngleType | | | | | |

#### AngularAcceleration

The angular acceleration of the component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AngularAcceleration | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type AngularAccelerationType | | | | | |

#### AngularVelocity

The angular velocity of the component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AngularVelocity | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type AngularVelocityType | | | | | |

#### AxisFeedrate

The feedrate of the component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AxisFeedrate | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type AxisFeedrateType | | | | | |

#### Concentration

The Concentration

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Concentration | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type ConcentrationType | | | | | |

#### Conductivity

The Conductivity

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Conductivity | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type ConductivityType | | | | | |

#### Displacement

The linear displacement in millimeters

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Displacement | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type DisplacementType | | | | | |

#### ElectricalEnergy

Electrical energy

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ElectricalEnergy | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type ElectricalEnergyType | | | | | |

#### Flow

The flow

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Flow | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type FlowType | | | | | |

#### Frequency

The frequency in hertz

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Frequency | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type FrequencyType | | | | | |

#### LinearForce

The magnitude of a push or pull introduced by an actuator or exerted on an object

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | LinearForce | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type LinearForceType | | | | | |

#### Load

The program code

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Load | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type LoadType | | | | | |

#### PathFeedrate

The feedrate of the component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | PathFeedrate | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type PathFeedrateType | | | | | |

#### PathPosition

The 3 dimensional position for tool tip in the path (X Y Z)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | PathPosition | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type PathPositionType | | | | | |

#### Position

The position of the component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Position | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type PositionType | | | | | |

#### PowerFactor

The power factor

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | PowerFactor | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type PowerFactorType | | | | | |

#### Pressure

The pressure

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Pressure | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type PressureType | | | | | |

#### Resistance

The Resistance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Resistance | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type ResistanceType | | | | | |

#### RotationalVelocity

The rotational velocity of the component in RPM

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | RotationalVelocity | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type RotationalVelocityType | | | | | |

#### Sample

An abstract sample

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Sample | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Result | | | | | |
| Is a type SampleType | | | | | |

#### SoundPressure

The sound pressure

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SoundPressure | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type SoundPressureType | | | | | |

#### Strain

The strain

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Strain | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type StrainType | | | | | |

#### Temperature

The temperature

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Temperature | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type TemperatureType | | | | | |

#### Tilt

The tilt

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Tilt | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type TiltType | | | | | |

#### Torque

The torque

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Torque | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type TorqueType | | | | | |

#### Velocity

The velocity of the component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Velocity | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type VelocityType | | | | | |

#### Viscosity

The Viscosity

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Viscosity | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type ViscosityType | | | | | |

#### Voltage

The voltage

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Voltage | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type VoltageType | | | | | |

#### Wattage

The number of Watts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Wattage | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Sample | | | | | |
| Is a type WattageType | | | | | |

## Event Variable Types

An Event changes state to a limited set of values or represents a message. It is assumed that an event remains at a state until the next event occurs; it cannot have any intermediate values between the reported values.

#### ActiveAxes

The list of axes in use

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ActiveAxes | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type ActiveAxesType | | | | | |

#### ActuatorState

The actuator state of the component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ActuatorState | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type ActuatorStateType | | | | | |

#### Alarm

An Notifcation event

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Alarm | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type AlarmType | | | | | |

#### AssetChanged

An asset was just modified

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AssetChanged | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type AssetChangedType | | | | | |

#### Availability

The availability of the component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Availability | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type AvailabilityType | | | | | |

#### AxesCoupling

The way the axes are associated

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AxesCoupling | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type AxesCouplingType | | | | | |

#### Block

The program code

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Block | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type BlockType | | | | | |

#### ClampState

The clamp status

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ClampState | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type ClampStateType | | | | | |

#### ControllerMode

CNC mode state

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ControllerMode | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type ControllerModeType | | | | | |

#### CoupledAxes

The list of associated axes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CoupledAxes | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type CoupledAxesType | | | | | |

#### Direction

The direction of rotation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Direction | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type DirectionType | | | | | |

#### DoorState

The status of the door

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DoorState | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type DoorStateType | | | | | |

#### EmergencyStop

Emergency Stop status

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | EmergencyStop | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type EmergencyStopType | | | | | |

#### Event

An abstract event

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Event | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Result | | | | | |
| Is a type EventType | | | | | |

#### Execution

Program execution events

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Execution | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type ExecutionType | | | | | |

#### Line

The program's line of execution

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Line | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type LineType | | | | | |

#### Message

A generic message

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Message | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type MessageType | | | | | |

#### PartCount

An event that indicates the number of parts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | PartCount | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type PartCountType | | | | | |

#### PartId

The current Tool Identifier

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | PartId | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type PartIdType | | | | | |

#### PathMode

The actuator state of the component

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | PathMode | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type PathModeType | | | | | |

#### PowerState

The components power state

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | PowerState | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type PowerStateType | | | | | |

#### Program

The programs file name or identifier

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | Program | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type ProgramType | | | | | |

#### RotaryMode

The function of the rotary axis

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | RotaryMode | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type RotaryModeType | | | | | |

#### ToolAssetId

The unique tool Identifier as referenced in MTConnect specification on a assets

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ToolAssetId | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type ToolAssetIdType | | | | | |

#### WorkholdingId

The current workholding Identifier

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | WorkholdingId | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Event | | | | | |
| Is a type WorkholdingIdType | | | | | |

## Condition Variable Types

A Condition communicates the device’s health and ability to function. It can be one of Unavailable, Normal, Warning, or Fault and there can be multiple active conditions at one time; whereas a sample or event can only have a single value at one point in time.

#### ACCELERATION

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ACCELERATION | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### ACCUMULATED\_TIME

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ACCUMULATED\_TIME | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### ACTUATOR

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ACTUATOR | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### AMPERAGE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | AMPERAGE | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### ANGLE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ANGLE | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### ANGULAR-ACCELERATION

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ANGULAR-ACCELERATION | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### ANGULAR\_VELOCITY

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ANGULAR\_VELOCITY | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### COMMUNICATIONS

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | COMMUNICATIONS | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### CONCENTRATION

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CONCENTRATION | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### CONDUCTIVITY

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | CONDUCTIVITY | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### DATA\_RANGE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DATA\_RANGE | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### DIRECTION

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DIRECTION | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### DISPLACEMENT

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | DISPLACEMENT | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### ELECTRICAL\_ENERGY

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ELECTRICAL\_ENERGY | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### FILL\_LEVEL

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | FILL\_LEVEL | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### FLOW

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | FLOW | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### FREQUECNCY

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | FREQUECNCY | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### HARDWARE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | HARDWARE | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### LEVEL

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | LEVEL | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### LINEAR\_FORCE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | LINEAR\_FORCE | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### LOAD

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | LOAD | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### LOGIC\_PROGRAM

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | LOGIC\_PROGRAM | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### MASS

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | MASS | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### MOTION\_PROGRAM

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | MOTION\_PROGRAM | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### PATH\_FEEDRATE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | PATH\_FEEDRATE | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### PATH\_POSITION

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | PATH\_POSITION | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### PH

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | PH | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### POSITION

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | POSITION | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### POWER\_FACTOR

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | POWER\_FACTOR | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### PRESSURE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | PRESSURE | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### RESISTANCE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | RESISTANCE | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### ROTARY\_VELOCITY

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | ROTARY\_VELOCITY | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### SOUND\_LEVEL

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SOUND\_LEVEL | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### SPINDLE\_SPEED

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SPINDLE\_SPEED | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### STRAIN

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | STRAIN | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### SYSTEM

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | SYSTEM | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### TEMPERATURE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | TEMPERATURE | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### TILT

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | TILT | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### TORQUE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | TORQUE | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### VELOCITY

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | VELOCITY | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### VISCOSITY

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | VISCOSITY | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### VOLTAGE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | VOLTAGE | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### VOLT\_AMPERAGE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | VOLT\_AMPERAGE | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### VOLT\_AMPERAGE\_REACTIVE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | VOLT\_AMPERAGE\_REACTIVE | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |

#### WATTAGE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute** | | **Value** | | | |
| BrowseName | | WATTAGE | | | |
| IsAbstract | | false | | | |
| **Reference** | **NodeClass** | **BrowseName** | **DataType** | **TypeDefinition** | **ModelingRule** |
| Is a substitute Condition | | | | | |
| Is a type ConditionType | | | | | |