



Users Guide  
Metrology Communication Interface

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## Introduction

Metrology Communication Interface is a application that provides an interface for a bunch of measuring tools from Hexagon MI. Since most of all PLCs support MQTT Metrology Communication Interface was designed to target the needs of big data and also being configurable to provide just a small amount of data that is needed to automate smaller processes. Once the application is properly setup the application connects to the broker releases a summary of available commands and provided datasets, subscribes to the control topics and publishes data on event. The application supports data encoding in plain JSON-format or in google-protobuf. In general it is possible to define user specific mqtt-topics, but it is recommended to use the personalized standard topics. The application itself provides just some less datasets and controls, but the devices provide the functionality that is needed to control a machine or even the complete measuring process. Configuration setup, available commands will be described in later chapters. It is assumed that the user has general knowledge about mqtt and its functionality.

## The Node

The Node handles the connection to the mqtt-broker and provides an overview over the system. The Node-configuration is used to determine the address of the mqtt-broker paths to certificates, encoding-scheme and other overall system settings. Further the SPS-Mode could be enabled in the Nodeconfiguration.

### Node configuration

Configuration entry	Description
DistributedMode	Selects if devices use their own topics, or every data is collected under nodes topics.
SPSMode	Is used to add additional topic for selectable properties addable with the add-control in the node.
Logfolder	This selection contains the location where the application stores its logs.
Logfilename	Determines the name of the Logfile.
MaxArchivedFiles	Determines the maximal number of created logfiles.
ArchiveAboveSizeMB	Once a logfile reaches the value of MB selected, the Logfile will be archived.
NumShownDebugLines	This selection enables or disables debugging mode shall be removed on release.
IsDebug	This selection enables or disables debugging mode shall be removed on release.
EnableAutomation	This selection enables or disables any command that is addressed to a device.
LicenseWildcards	This selection allows input of up to 3 license wildcards. ["WC1", "WC2", "WC3"] It is possible to use long or short naming scheme. If the WC is related to Device it must be added with /Device. E.g.: "NCon/Home/Dev"
UsedDevices	This selection allows input of used measuringclients. ["CLI1", "CLI2", "CLI3"] Supported are Simulator, PC-DMIS. E.g.: ["PC-DMIS", "Simulator", "Dev"]
Analysistype	Inform about all dimensions or only critical.
NumberOfDecimals	Select the number of decimals used for the dimensions here.
Broker	Enter the server address of the MQTT broker here.
Port	Enter the server port here typical MQTT standard is 1883 or 8883 with TLS, But could also be different.
UseTls	Security feature, the need for a certificate will come up and the connection setup is more complex.
AllowUntrustedCertificates	If true self signed certificates are allowed.
IgnoreCertificateChainErrors	If true certificate chain errors are ignored
IgnoreCertificateRevocationErrors	If true revocation errors are ignored
VerifyCertificateChain	Security feature, the need for a certificate will come up and the connection setup is more complex.
TlsVersion	Security feature, needs to match server/broker (versions 1,1.1,1.2,1.3).
CertificatePath	Location of the server certificate.
Username	Some MQTT setup may have the need for a Username.
Password	Some MQTT setup may have the need for a Password.
UserDefinedCommandTopic	Is used to define a user topic. If left blank (""), the node structure is HXgN1.0/Group_Id/NCMD/Machine_Id for UseStandardMqtt=true, and spBv1.0/Group_Id/NCMD/Machine_Id for UseSparkplugProtobuf=true
UserDefinedDataTopic	Is used to define a user topic. If left blank (""), the node structure is HXgN1.0/Group_Id/NDATA/Machine_Id for UseStandardMqtt=true, and spBv1.0/Group_Id/NDATA/Machine_Id for UseSparkplugProtobuf=true
Group_Id	Is a custom selectable id for the application's location in the environment.

Machine_Id	Is a custom selectable id for the application but must be unique.
ConnectionTimeoutMs	Connection timeout for broker connection.
UseStandardMqtt	If true, plain JSON-encoding is used for transmission. NOTE: Its not recommended to enable UseStandardMqtt and UseSparkplugProtobuf at the same time
UseSparkplugProtobuf	If true, google protobuffering with sparkplug.proto is used for transmission. NOTE: Its not recommended to enable UseStandardMqtt and UseSparkplugProtobuf at the same time
LifesignFrequencyInSeconds	Update timer.
RetainBirthMessages	Retain Birth Messages
RetainDataMessages	Retain Data Messages
UseExtendedMetricNames	Use Extended Metric Names

## Node interface

The next section will list the available controls and datasets.

**Node controls**

name	Node Control/ResetError
shortcut	NCon/ResErr
datatype	BOOLEAN (11)
license	CommunicationControl
cause movement	False
description	Is used to reset a system error and reenale the commandability again.

name	Node Control/Echo
shortcut	NCon/Echo
datatype	STRING (12)
license	CommunicationControl
cause movement	False
description	Could be used to echo states, may be useful for cpus with small memory

name	Node Control/Rebirth
shortcut	NCon/Rebirth
datatype	BOOLEAN (11)
license	CommunicationControl
cause movement	False
description	Will update the birthcertificate, the timestamp will also change

name	Node Control/Reboot
shortcut	NCon/Reboot
datatype	BOOLEAN (11)
license	CommunicationControl
cause movement	False
description	Will restart the application, TBD if really needed

name	Node Control/AddProperty
shortcut	NCon/Add
datatype	TEMPLATE (19)
license	CommunicationControl
cause movement	False
description	With this command the publishing of properties could be enabled. Metrology Communication Interface will publish the selection to the SPS-topic. Only available if SPSMode active.

**Node data**

name	Properties/StateIsOk
shortcut	Prop/IsOk
datatype	BOOLEAN (11)
license	BasicMachineState
description	Informs about the system state

name	Properties/ReceiveSequence
shortcut	Prop/RecSeq
datatype	UINT32 (7)
license	BasicMachineState
description	Counts up on every control activity overflows at 256 so valid values are 0-255.

name	Properties/Lifesign
shortcut	Prop/Life
datatype	STRING (12)
license	CommunicationControl
description	Optional timer output to know the client is alive.

name	Properties/ApplicationVersion
shortcut	Prop/AppVer
datatype	STRING (12)
license	CommunicationControl
description	Application Version

name	Properties/ErrorMessage
shortcut	Prop/ErrDesc
datatype	STRING (12)
license	BasicMachineState
description	Contains Description of latest Error

**Node complex types**

Node Control/AddProperty (NCon/Add) value metrics

name	Selection
datatype	STRING (12)
description	The propertyname to select/deselect for SPS-Topic, for devices use property/device e.g Prop/State/PC-DMIS, for node just the property e.g. Prop/IsOk

name	Mode
datatype	BOOLEAN (11)
description	If true the property is published via SPS-Topic, if false it is not.

Example for UseStandardMqtt = true:

```
{
  "metrics": [
    {
```



```
"name": "Selection",  
"timestamp": 1740685893198,  
"datatype": 12,  
"value": "AddSth"  
},  
{  
"name": "Mode",  
"timestamp": 1740685893198,  
"datatype": 11,  
"value": false  
}  
]  
}
```

**Notes:**

## Supported Measuring Clients

All currently supported measuring clients are supported here. A Simulator that mocks PC-DMIS is included in the application itself. The Simulator has just a subset of functionality and is delivered as is.

### PC-DMIS

To enable functionality for PC-DMIS the device connector must be included to the UsedDevices list in the [Node configuration](#) and its preferences set up well. Metrology Communication Interface supports a variety of PC-DMIS functionality measurement control and dimension feedback might be the most obvious. But also information about the application is available and published as event.

### PC-DMIS configuration

The configuration file is called PcDmis.json.

Configuration entry	Description
ProgramFolder	Defines the location where the .PRG programs for automation are located
ConnectionDelayAfterStartInSeconds	Defines how long the application wait until it tries to connect to PC-DMIS after the executable was detected.
UseLegacyMachineInfos	Determines if the PC-DMIS connector shall evaluate in a less accurate the KeySwitch, Machine Homed, Machine Position, Machine Moving
DataTopic	Used for user defined topic if left blank the standard topic naming scheme is used HXgN1.0/GroupId/DDATA/MachineId/PC-DMIS or suffix spBv1.0
CommandTopic	Used for user defined topic if left blank the standard topic naming scheme is used HXgN1.0/GroupId/DCMD/MachineId/PC-DMIS or suffix spBv1.0
BirthTopic	Used for user defined topic if left blank the standard topic naming scheme is used HXgN1.0/GroupId/DBIRTH/MachineId/PC-DMIS or suffix spBv1.0
DeathTopic	Used for user defined topic if left blank the standard topic naming scheme is used HXgN1.0/GroupId/DDEATH/MachineId/PC-DMIS or suffix spBv1.0

Related to non userdefined topics refer [Node configuration](#) And the typical structure depending on encoding selection.

### PC-DMIS interface

The next section will list the available controls and datasets.

**Device controls**

name	Device Control/StartMeasuring
shortcut	DCon/Start
datatype	STRING (12)
license	BasicMeasuringControl
cause movement	True
description	It is used to start a measurement from external cpu, the program name must be given

name	Device Control/LoadPartProgram
shortcut	DCon/LoadPP
datatype	STRING (12)
license	BasicPartProgramHandling
cause movement	True
description	Used to preload a part program

name	Device Control/StopMeasuring
shortcut	DCon/Stop
datatype	BOOLEAN (11)
license	BasicMeasuringControl
cause movement	False
description	Is used to stop a measurement from external cpu

name	Device Control/PauseMeasuring
shortcut	DCon/Pause
datatype	BOOLEAN (11)
license	BasicMeasuringControl
cause movement	False
description	Is used to pause a measurement from external cpu

name	Device Control/ResumeMeasuring
shortcut	DCon/Resume
datatype	BOOLEAN (11)
license	BasicMeasuringControl
cause movement	True
description	Is used to resume a measurement from external cpu

name	Device Control/RestartMeasuringClient
shortcut	DCon/ResMC
datatype	BOOLEAN (11)
license	CommunicationControl
cause movement	True
description	The purpose is to ask PcDmis to be restarted when the current execution ends

name	Device Control/PressButton
shortcut	DCon/MsgButton
datatype	STRING (12)
license	MessageBoxControl
cause movement	False

description	Could steal the message box user input by remote
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name	Device Control/InputDialog
shortcut	DCon/InBoxData
datatype	TEMPLATE (19)
license	MessageBoxControl
cause movement	False
description	Could steal the input box user input by remote

name	Device Control/TraceInField
shortcut	DCon/TraceIn
datatype	TEMPLATE (19)
license	TracefieldControl
cause movement	False
description	This command enables the possibility to change Tracefields

name	Device Control/TraceOutField
shortcut	DCon/TraceOut
datatype	TEMPLATE (19)
license	TracefieldControl
cause movement	False
description	The trace out variables are selected with this command

**Device data**

name	Properties/State
shortcut	Prop/State
datatype	UINT32 (7)
license	BasicMachineFeedback
description	Inform about actual measuring state 3:Initial value, 5: Loaded, 4:Preparing measurement, 1:Active, 2:Pause, 0:Done

name	Properties/ActiveProgram
shortcut	Prop/Prog
datatype	STRING (12)
license	BasicMachineFeedback
description	Inform what program is active. If no program is run by the host it is empty

name	Properties/Result
shortcut	Prop/Result
datatype	UINT32 (7)
license	BasicResultManagement
description	Inform about measuring result, 3:Init(unknown) 2:Program error, 1:OOT, 0:OK

name	Properties/ProgramList
shortcut	Prop/Progs
datatype	TEMPLATE (19)
license	BasicMachineControl
description	Collects all available programs listed in a dedicated folder. It is updated all 1,5s

name	Properties/Report
shortcut	Prop/Report
datatype	FILE (18)
license	BasicResultManagement
description	Contains the measuring report as Base64 encoded object

name	Properties/Dimension
shortcut	Prop/Dim
datatype	TEMPLATE (19)
license	AdvancedMeasuringFeedback
description	Provides information about the new runtime calculated dimension.

name	Properties/ReportPath
shortcut	Prop/RepPath
datatype	STRING (12)
license	BasicResultManagement
description	Outputs the save location of the measuring report

name	Properties/TraceIn
shortcut	Prop/TraceIn
datatype	TEMPLATE (19)

license	TracefieldControl
description	Allows to set Tracefields

name	Properties/TraceOut
shortcut	Prop/TraceOut
datatype	TEMPLATE (19)
license	TracefieldControl
description	Allows to receive Tracefields

name	Properties/MessageBox
shortcut	Prop/MsgB
datatype	TEMPLATE (19)
license	MessageBoxControl
description	Provides the information if measuring client pop up window occurred

name	Properties/InputDialog
shortcut	Prop/InBox
datatype	TEMPLATE (19)
license	MessageBoxControl
description	Provides the information if measuring client comment window occurred

name	Properties/Tool
shortcut	Prop/Tool
datatype	TEMPLATE (19)
license	AdvancedMachineFeedback
description	Provides information about the active tool (probe tip).

name	Properties/Command
shortcut	Prop/Cmd
datatype	TEMPLATE (19)
license	AdvancedMeasuringFeedback
description	Provides information about the executed metrology software command.

name	Properties/Software
shortcut	Prop/Sft
datatype	TEMPLATE (19)
license	BasicMachineState
description	Provides information about the metrology software application.

name	Properties/MeasuringClientState
shortcut	Prop/McState
datatype	UINT32 (7)
license	BasicMachineState

description	<p>State of the measurement client</p> <p>0:Connecting - MCI is connecting to PC-DMIS</p> <p>1:Connected - MCI has connected to PC-DMIS</p> <p>2:ExitNormal - PC-DMIS was exited normally (i.e. user closes PC-DMIS, PC-DMIS exit command, another app closes PC-DMIS via API)</p> <p>3:ExitAbnormal - PC-DMIS exited abnormally (i.e. Application Error, PC-DMIS Windows Process Ended)</p> <p>4:LostConnection - MCI lost the connection to PC-DMIS. MCI had been connected and now PC-DMIS is not responding. (No connection to PC-DMIS, however PC-DMIS process is still running.) Could be an internal error in PC-DMIS causing the application to stop responding to MCI</p> <p>5:FailedToConnect - MCI failed to connect to PC-DMIS. This occurs after the connecting (0). Normally, MCI publishes the connected state (1) after this, however if the initial connection call fails (can take up to 12 seconds to fail) then this state (5) is reported until MCI tries to connect again then it would return to the connecting state (0). A common reason for this is that PC-DMIS and MCI have different Windows privileges</p> <p>6:InitialValue - Initial is the value when MCI starts and will remain until PC-DMIS starts</p> <p>7:Starting - PC-DMIS Windows process has been started (PCDLRN.exe)</p>
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name	Properties/KeySwitch
shortcut	Prop/KeySw
datatype	UINT32 (7)
license	BasicMachineControl
description	<p>Informs about the present keyswitch setting, 3:Unknown, 2:Auto 2, 1:Auto, 0:Manual</p>

name	Properties/IsHomed
shortcut	Prop/Homed
datatype	BOOLEAN (11)
license	BasicMachineFeedback
description	<p>Informs about the present homing state true:Machine was homed, false:No homing done</p>

name	Properties/Position
shortcut	Prop/Pos
datatype	TEMPLATE (19)
license	AdvancedMachineControl
description	<p>Holds a property set for X,Y,Z position</p>

name	Properties/IsMovin
shortcut	Prop/Mov
datatype	BOOLEAN (11)
license	BasicMachineFeedback
description	<p>Returns true if machine moves and false if the machine stands still</p>

### **PC-DMIS complex types**

Device Control/InputBoxData (DCon/InBoxData) value metrics

name	TEXT
datatype	STRING (12)
description	<p>A userdefined text could be added here and feed to PC-DMIS.</p>



name	BUTTON
datatype	STRING (12)
description	Ok or Cancel to manipulate inputbox.

Example for UseStandardMqtt = true:

```
{
  "metrics": [
    {
      "name": "TEXT",
      "timestamp": 1740685893220,
      "datatype": 12,
      "value": "User text input"
    },
    {
      "name": "BUTTON",
      "timestamp": 1740685893220,
      "datatype": 12,
      "value": "Ok or Cancel"
    }
  ]
}
```

Device Control/TraceInField (DCon/TraceIn) value metrics

name	UserInputVariablName
datatype	STRING (12)
description	This command is depending on the measuring program

Example for UseStandardMqtt = true:

```
{
  "metrics": [
    {
      "name": "UserInputVariablName",
      "timestamp": 1740685893220,
      "datatype": 12,
      "value": "UserInputVariableValue"
    }
  ]
}
```

Device Control/TraceOutField (DCon/TraceOut) value metrics

name	UserOuputVariablName
datatype	STRING (12)
description	This command is depending on the measuring program

Example for UseStandardMqtt = true:

```
{
  "metrics": [
    {
      "name": "UserOuputVariablName",
      "timestamp": 1740685893220,
      "datatype": 12,
      "value": "UserOuputVariableValue"
    }
  ]
}
```

}

## Properties/ProgramList (Prop/Progs) value metrics

name	idN
datatype	STRING (12)
description	A PRG-file, the fileending is not provided.

Example for value payload if UseStandardMqtt = true:

```
{
  "metrics": [
    {
      "name": "idN",
      "timestamp": 1740685893220,
      "datatype": 12,
      "value": "A PRG-file"
    }
  ]
}
```

## Properties/Dimension (Prop/Dim) value metrics

name	Name
datatype	STRING (12)
description	The feature name.

name	AxisLetter
datatype	STRING (12)
description	The axisletter

name	Comment
datatype	STRING (12)
description	A comment if stated in PRG.

name	Nominal
datatype	REAL64 (10)
description	Nominal expected value.

name	Measured
datatype	REAL64 (10)
description	The actual measured value

name	Deviation
datatype	REAL64 (10)
description	The measured deviation

name	UT_Plus
datatype	REAL64 (10)
description	The upper tolerance band.

name	LT_Minus
datatype	REAL64 (10)
description	The lower tolerance band.

name	OOT
datatype	BOOLEAN (11)
description	Determines if deviation is OutOfTolerance.

Example for value payload if UseStandardMqtt = true:

```
{
  "metrics": [
    {
      "name": "Name",
      "timestamp": 1740685893220,
      "datatype": 12,
      "value": "Dimensionname"
    },
    {
      "name": "AxisLetter",
      "timestamp": 1740685893220,
      "datatype": 12,
      "value": "The axis letter"
    },
    {
      "name": "Comment",
      "timestamp": 1740685893220,
      "datatype": 12,
      "value": "A comment to the PRG written in"
    },
    {
      "name": "Nominal",
      "timestamp": 1740685893220,
      "datatype": 10,
      "value": 0.0
    },
    {
      "name": "Measured",
      "timestamp": 1740685893220,
      "datatype": 10,
      "value": 0.0
    },
    {
      "name": "Deviation",
      "timestamp": 1740685893220,
      "datatype": 10,
      "value": 0.0
    },
    {
      "name": "UT_Plus",
      "timestamp": 1740685893220,
      "datatype": 10,
      "value": 0.0
    },
    {
      "name": "LT_Minus",
      "timestamp": 1740685893220,
      "datatype": 10,

```

```

"value": 0.0
},
{
  "name": "OOT",
  "timestamp": 1740685893220,
  "datatype": 11,
  "value": false
}
]
}

```

Properties/TraceIn (Prop/TraceIn) value metrics

name	EXAMPLE_IN
datatype	STRING (12)
description	To-PC-DMIS

Example for value payload if UseStandardMqtt = true:

```

{
  "metrics": [
    {
      "name": "EXAMPLE_IN",
      "timestamp": 1740685893220,
      "datatype": 12,
      "value": "To-PC-DMIS"
    }
  ]
}

```

Properties/TraceOut (Prop/TraceOut) value metrics

name	EXAMPLE_OUT
datatype	STRING (12)
description	From-PC-DMIS

Example for value payload if UseStandardMqtt = true:

```

{
  "metrics": [
    {
      "name": "EXAMPLE_OUT",
      "timestamp": 1740685893220,
      "datatype": 12,
      "value": "From-PC-DMIS"
    }
  ]
}

```

Properties/MessageBox (Prop/MsgB) value metrics

name	topic
datatype	STRING (12)
description	The PC-ePcDmisState window caption of the pop-up.

name	message
datatype	STRING (12)
description	The user message.

name	AdditionalSelections
datatype	BOOLEAN (11)
description	Possible situation depending selections: OK, CANCEL, ABORT, RETRY, IGNORE, YES, NO, HELP and CONTINUE

Example for value payload if UseStandardMqtt = true:

```
{
  "metrics": [
    {
      "name": "topic",
      "timestamp": 1740685893220,
      "datatype": 12,
      "value": "Window caption"
    },
    {
      "name": "message",
      "timestamp": 1740685893220,
      "datatype": 12,
      "value": "Window message"
    },
    {
      "name": "AdditionalSelections",
      "timestamp": 1740685893220,
      "datatype": 11,
      "value": true
    }
  ]
}
```

Properties/InputDialog (Prop/InBox) value metrics

name	topic
datatype	STRING (12)
description	The PC-ePcDmisState window caption of the pop-up.

name	message
datatype	STRING (12)
description	The user message.

name	OK
datatype	BOOLEAN (11)
description	Ok-Button available.

name	CANCEL
datatype	BOOLEAN (11)
description	Cancel-Button available.

name	new
datatype	BOOLEAN (11)
description	Popup is new.

Example for value payload if UseStandardMqtt = true:

```
{
  "metrics": [
    {
      "name": "topic",
      "timestamp": 1740685893220,
      "datatype": 12,
      "value": "Window caption"
    },
    {
      "name": "message",
      "timestamp": 1740685893220,
      "datatype": 12,
      "value": "Window message"
    },
    {
      "name": "OK",
      "timestamp": 1740685893220,
      "datatype": 11,
      "value": false
    },
    {
      "name": "CANCEL",
      "timestamp": 1740685893220,
      "datatype": 11,
      "value": false
    },
    {
      "name": "new",
      "timestamp": 1740685893220,
      "datatype": 11,
      "value": false
    }
  ]
}
```

Properties/Tool (Prop/Tool) value metrics

name	id
datatype	STRING (12)
description	Tool-ID

name	diameter
datatype	REAL64 (10)
description	Tool diameter

name	calibrationDate
datatype	DATETIME (13)
description	Calibration date

name	standardDeviation
datatype	REAL64 (10)
description	Standard deviation

name	radialDeviation
------	-----------------

datatype	REAL64 (10)
description	Radial deviation

name	scanRadialDeviation
datatype	REAL64 (10)
description	Scan radial deviation

name	xOffset
datatype	REAL64 (10)
description	X-Offset

name	yOffset
datatype	REAL64 (10)
description	Y-Offset

name	zOffset
datatype	REAL64 (10)
description	Z-Offset

Example for value payload if UseStandardMqtt = true:

```
{
  "metrics": [
    {
      "name": "id",
      "timestamp": 1740685893220,
      "datatype": 12,
      "value": "Tool-ID"
    },
    {
      "name": "diameter",
      "timestamp": 1740685893220,
      "datatype": 10,
      "value": 0.0
    },
    {
      "name": "calibrationDate",
      "timestamp": 1740685893220,
      "datatype": 13,
      "value": "Timestamp-UTC"
    },
    {
      "name": "standardDeviation",
      "timestamp": 1740685893220,
      "datatype": 10,
      "value": 0.0
    },
    {
      "name": "radialDeviation",
      "timestamp": 1740685893220,
      "datatype": 10,
      "value": 0.0
    }
  ]
}
```

```

"name": "scanRadialDeviation",
"timestamp": 1740685893220,
"datatype": 10,
"value": 0.0
},
{
"name": "xOffset",
"timestamp": 1740685893220,
"datatype": 10,
"value": 0.0
},
{
"name": "yOffset",
"timestamp": 1740685893220,
"datatype": 10,
"value": 0.0
},
{
"name": "zOffset",
"timestamp": 1740685893220,
"datatype": 10,
"value": 0.0
}
]
}

```

## Simulator

To enable functionality for the Simulator the device connector must be included to the UsedDevices list in the [Node configuration](#) and its preferences set up well. The Simulator run is structured with .MSIM files. Missusage might lead to crashes. More information about the .MSIM-files could be found [here](#). Fully supported functionality is start and stop a simulated measuring as retrieving OOT/IT information and a specified tool-data.

## Simulator configuration

The configuration file is called Simulator.json.

Configuration entry	Description
ProgramFolder	Defines the location where the .MSIM programs for automation are located
ConnectionDelayAfterStartInSeconds	No valuable function yet
UseLegacyMachineInfos	No valuable function yet
DataTopic	Used for user defined topic if left blank the standrd topic naming scheme is used HXgN1.0/GroupId/DDATA/MachineId/Simulator or suffix spBv1.0
CommandTopic	Used for user defined topic if left blank the standrd topic naming scheme is used HXgN1.0/GroupId/DCMD/MachineId/Simulator or suffix spBv1.0
BirthTopic	Used for user defined topic if left blank the standrd topic naming scheme is used HXgN1.0/GroupId/DBIRTH/MachineId/Simulator or suffix spBv1.0
DeathTopic	Used for user defined topic if left blank the standrd topic naming scheme is used HXgN1.0/GroupId/DDEATH/MachineId/Simulator or suffix spBv1.0

Related to non userdefined topics refer [Node configuration](#) And the typical structure depending on encoding selection.

## Simulator interface

The simulator is planned to fully support all PCD relevant features. But in actual state only starting an stopping measuring is available. And also a subset of all feedbacks are implemented.



## Blade

To enable functionality for Blade the device connector must be included to the UsedDevices list in the [Node configuration](#) and its preferences set up well. Metrology Communication Interface supports Blade results via BSF files. BSF files must be configured in Blade to output to the same folder defined in the Blade.json settings.

### Blade configuration

The configuration file is called Blade.json.

Configuration entry	Description
BladeDataPath	Defines the location where the Blade BSF result files are located
BladeOutputReadDelayInSeconds	Time to wait in seconds (default: 2s) after BSF file creation before reading the file to prevent read/write collisions with Blade.
DataTopic	Used for user defined topic if left blank the standard topic naming scheme is used HXgN1.0/GroupId/DDATA/MachineId/Blade or suffix spBv1.0
CommandTopic	Used for user defined topic if left blank the standard topic naming scheme is used HXgN1.0/GroupId/DCMD/MachineId/Blade or suffix spBv1.0
BirthTopic	Used for user defined topic if left blank the standard topic naming scheme is used HXgN1.0/GroupId/DBIRTH/MachineId/Blade or suffix spBv1.0
DeathTopic	Used for user defined topic if left blank the standard topic naming scheme is used HXgN1.0/GroupId/DDEATH/MachineId/Blade or suffix spBv1.0

Related to non userdefined topics refer [Node configuration](#) And the typical structure depending on encoding selection.

### Blade interface

The next section will list the available controls and datasets.

***Device controls***

This device does not support any commands.

**Device data**

name	Properties/State
shortcut	Prop/State
datatype	UINT32 (7)
license	BasicMachineFeedback
description	Inform about actual measuring state 3:Initial value, 5: Loaded, 4:Preparing measurement, 1:Active, 2:Pause, 0:Done

name	Properties/ActiveProgram
shortcut	Prop/Prog
datatype	STRING (12)
license	BasicMachineFeedback
description	Inform what program is active. If no program is run by the host it is empty

name	Properties/Result
shortcut	Prop/Result
datatype	UINT32 (7)
license	BasicResultManagement
description	Inform about measuring result, 3:Init(unknown) 2:Program error, 1:OOT, 0:OK

name	Properties/Report
shortcut	Prop/Report
datatype	FILE (18)
license	BasicResultManagement
description	Contains the measuring report as Base64 encoded object

name	Properties/Dimension
shortcut	Prop/Dim
datatype	TEMPLATE (19)
license	AdvancedMeasuringFeedback
description	Provides information about the new runtime calculated dimension.

name	Properties/ReportPath
shortcut	Prop/RepPath
datatype	STRING (12)
license	BasicResultManagement
description	Outputs the save location of the measuring report

name	Properties/Software
shortcut	Prop/Sft
datatype	TEMPLATE (19)
license	BasicMachineState
description	Provides information about the metrology software application.

**Blade complex types**

Properties/Dimension (Prop/Dim) value metrics

name	name
datatype	STRING (12)

description	The name of the measure feature
-------------	---------------------------------

name	nominal
datatype	REAL64 (10)
description	The nominal value

name	upperTolerance
datatype	REAL64 (10)
description	The upper tolerance

name	lowerTolerance
datatype	REAL64 (10)
description	The lower tolerance

name	actual
datatype	REAL64 (10)
description	The actual measured value

name	timestamp
datatype	DATETIME (13)
description	The timestamp of measurement

name	Partfilename
datatype	STRING (12)
description	The partname

name	SectionFieldName
datatype	STRING (12)
description	The section name

name	CalculationFieldName
datatype	STRING (12)
description	The Calculation

Example for value payload if UseStandardMqtt = true:

```
{
  "metrics": [
    {
      "name": "name",
      "timestamp": 1740685893225,
      "datatype": 12,
      "value": "Featurename"
    },
    {
      "name": "nominal",
      "timestamp": 1740685893225,
```

```

"datatype": 10,
"value": 0.0
},
{
"name": "upperTolerance",
"timestamp": 1740685893225,
"datatype": 10,
"value": 0.0
},
{
"name": "lowerTolerance",
"timestamp": 1740685893225,
"datatype": 10,
"value": 0.0
},
{
"name": "actual",
"timestamp": 1740685893225,
"datatype": 10,
"value": 0.0
},
{
"name": "timestamp",
"timestamp": 1740685893225,
"datatype": 13,
"value": "TimeStamp-UTC"
},
{
"name": "Partfilename",
"timestamp": 1740685893225,
"datatype": 12,
"value": "The Part"
},
{
"name": "SectionFieldName",
"timestamp": 1740685893225,
"datatype": 12,
"value": "The Section"
},
{
"name": "CalculationFieldName",
"timestamp": 1740685893225,
"datatype": 12,
"value": "The Calculation"
}
]
}

```

Properties/Software (Prop/Sft) value metrics

name	id
datatype	STRING (12)
description	BladeSoftwareName

name	version
datatype	STRING (12)
description	Version as Major.Minor

Example for value payload if UseStandardMqtt = true:

```
{
  "metrics": [
    {
      "name": "id",
      "timestamp": 1740685893225,
      "datatype": 12,
      "value": "BladeSoftwareName"
    },
    {
      "name": "version",
      "timestamp": 1740685893225,
      "datatype": 12,
      "value": "Major.Minor"
    }
  ]
}
```

**Notes:**