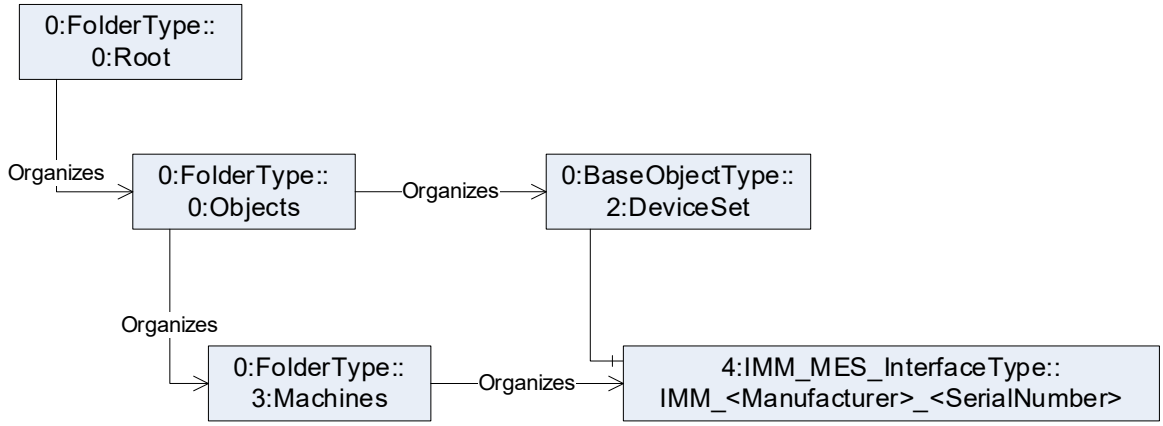
OPC 40077 Instance for umati Demonstrator

The namespace for the instances is manufacturer specific, e.g.
`http://samplemanufacturer.com/umati_sample_IMM_instance/`

Table 2 shows the complete structure of the instance needed for the umati demonstrator. The demonstrator requires, that all mandatory elements of the *IMM_MES_InterfaceType* are existent, even if there are not displayed in the dashboard. If the value of a variable a not displayed, is can be filled with a static dummy value (e.g. empty string). All displayed values are highlighted in light-blue.

Important: In OPC 40077 it is defined, that the instance of the *IMM_MES_InterfaceType* is located under the Object *DeviceSet*. For umati it is necessary to add it under the Machines folder defined by OPC UA for machinery. In practice it is not necessary to create a new instance. It is sufficient to have an *Organizes Reference* from the *Machines* folder to the instance located under DeviceSet



In addition, OPC 40077 uses the *MachineInformationType* defined in OPC 40083. For participation in the umati demonstrator it is necessary to create in parallel an instance of the *MachineIdentificationType* defined in OPC UA for Machinery.

Table 1 – Namespaces used in this document

NamespaceURI	Namespace Index	Example
http://opcfoundation.org/UA/	0	0:NodeVersion
http://opcfoundation.org/UA/PlasticsRubber/IMM2MES/	1	*Default namespace of OPC 40077 → no prefix used, e.g.* IMM_MES_InterfaceType
http://opcfoundation.org/UA/DI/	2	2:DeviceClass
http://opcfoundation.org/UA/PlasticsRubber/GeneralTypes/	3	3:MachineInformationType
http://opcfoundation.org/UA/Machinery	4	4:MachineIdentificationType

Table 2 – Sample instance of IMM_MES_InterfaceType

BrowseName	Type	Example Value	Remarks
Objects			
↳ Machines			
↳ IMM_<Manufacturer>_<SerialNumber>	IMM_MES_InterfaceType		
↳ 2:Identification	4:MachineIdentificationType		1)
– 2:ProductInstanceUri		“http://samplemanufacturer.com/IMM 123”	2)
– 2:Manufacturer	0:LocalizedText	“Sample Manufacturer”	
– 2:Model	0:LocalizedText	“Machine Model 3000”	3)
– 2:SerialNumber	0:String	“IMM123”	
– 2:DeviceClass	0:String	“Injection Moulding Machine”	
– 4:Location	0:String	“K 14 F42/N 51.260407 E 6.744588”	3), 4)
↳ MachineInformation	3:MachineInformationType		
– 2:DeviceClass	0:String	“Injection Moulding Machine”	
– 2:Manufacturer	0:LocalizedText	“Sample Manufacturer”	
– 2:Model	0:LocalizedText	“Machine Model 3000”	
– 2:SerialNumber	0:String	“IMM123”	
– 3:ControllerName	0:String	“My Controller”	2)
– 3:SupportedLogbookEvents	3:LogbookEventsEnumeration[]	*empty array / NULL*	2)
↳ MachineConfiguration	3:MachineConfigurationType		2)
– 3:UserMachineName	0:String	“My injection moulding machine”	2)
– 3:LocationName	0:String	“K 14 F42/N 51.260407 E 6.744588”	2)
– 3:TimeZoneOffset	0:TimeZoneDataType	*offset*: 0 *daylightSavingInOffset:* true	2)
↳ MachineMESConfiguration	3:MachineMESConfigurationType		2)
– 3:StandstillReasons	3:StandstillReasonType[]	*empty array / NULL*	2)
– 3:StandstillReasonsLockedByMES	0:Boolean	false	2)
↳ MachineStatus	3:MachineStatusType		
– 3:IsPresent	0:Boolean	true	2)
– 3:MachineMode	3:MachineModeEnumeration	1 (=AUTOMATIC)	
↳ 3:Users	3:UsersType		2), 5)
– 0:NodeVersion	0:String	“1”	2)
↳ MachineMESStatus	3:MachineMESStatusType		2)
– 3:StandstillReasonId	0:String	“”	2)
↳ 3:StandstillMessage	3:StandstillMessageType		2)
– 3:Id	0:String	“”	2)
– 0:Message	0:LocalizedText	“”	2)
– 0:Severity	0:UInt16	0	2)
– 3:Classification	0:IMMMessageClassification Enumeration	0 (= OTHER)	2)
↳ 3:MESMessage	3:MESMessageType		2)
– 3:Id	0:String	“”	2)
– 0:Message	0:LocalizedText	“”	2)
– 0:Severity	0:UInt16	0	2)
↳ 3:ProductionControl	3:ProductionControlType		2)
– 3:ProductionStatus	ProductionStatusEnumeration	4 (= PRODUCTION)	2)
– 3:ProductionReleasedByMES	0:Boolean	true	2)
– 3:AutomaticRunEnabled	0:Boolean	true	2)
↳ PowerUnits	3:PowerUnitsType		2), 5)
– 0:NodeVersion	0:String	“1”	2)
↳ Moulds	3:MouldsType		2), 5)
– 0:NodeVersion	0:String	“1”	2)

BrowseName	Type	Example Value	Remarks
↳ InjectionUnits	3:InjectionUnitsType		
– 0:NodeVersion	0:String	"1"	2)
↳ InjectionUnit_1	3:InjectionUnitType		3)
– Index	0:UInt32	1	2)
– BarrelId	0:String	"Barrel1"	2)
– IsPresent	0:Boolean	true	2)
– InProduction	0:Boolean	true	2)
↳ TemperatureZones	3:TemperatureZonesType		
– 0:NodeVersion	0:String	"1"	2)
↳ BarrelTemperatureZone_1	3:BarrelTemperatureZoneType		
– 3:Index	0:UInt32	1	2)
– 3:Name	0:String	"Temperature Zone 1"	2)
– 3:IsPresent	0:Boolean	true	2)
– 3:ControlMode	3:ControlModeEnumeration	2 (= AUTOMATIC)	2)
– 3:NominalTemperature	0:AnalogItemType → 0:Double	120	2)
– EURange	0:Range	*Low*: 0 *High*: 200	2)
– EngineeringUnits	0:EUInformation	namespaceUri: "http://www.opcfoundation.org/UA/units/un/cefact" unitId: 4408652 displayName: "°C" description: "degree Celsius"	2)
– 3:ActualTemperature	0:AnalogItemType → 0:Double	120.5	
– EURange	0:Range	*Low*: 0 *High*: 200	2)
– EngineeringUnits	0:EUInformation	namespaceUri: "http://www.opcfoundation.org/UA/units/un/cefact" unitId: 4408652 displayName: "°C" description: "degree Celsius"	
– 3:Position	0:UInt32	1	2)
↳ Jobs	3:JobsType		3)
↳ ActiveJob	3:CyclicJobInformationType		
– JobName	0:String	"Order 12345"	2)
– JobDescription	0:String	"128000 screw caps 38mm"	2)
– CustomerName	0:String	"My customer"	2)
– ProductionDatasetName	0:String	"Cap Dataset 1"	2)
– ProductionDatasetDescription	0:String	"Dataset for the production of screw cap 38mm"	2)
– Material	0:String[]	["PE-HD"]	2)
– ProductName	0:String[]	"screw cap 38mm"	
– ProductDescription	0:String[]	"screw cap for PET bottels with 38mm diameter"	2)
– ContinueAtJobEnd	0:Boolean	false	2)
– NominalParts	0:UInt64	128000	2)
↳ ActiveJobValues	3:ActiveCyclicJobValuesType		
– JobStatus	JobStatusEnumeration	6 (= JOB_IN_PRODUCTION)	
– CurrentLotName	0:String	"Lot 123"	2)
– LastCycleTime	0:Duration	2400	2)
– JobPartsCounter	0:UInt64	6400	
– JobGoodPartsCounter	0:UInt64	6390	2)
– JobBadPartsCounter	0:UInt64	10	2)
– JobTestSamplesCounter	0:UInt64	0	2)

1) Not included in OPC 40077 IMM_MES_InterfaceType. To be added in the instance
2) This variable is mandatory in the model but will not be displayed in the demonstrator
3) Not mandatory in OPC UA for Machinery but for this model and will be displayed in the demonstrator
4) See https://showcase.umati.org/Dashboard.html#location-of-fair-machine-and-software-icons-on-the-dashboard for rules for filling the location.
5) Container object is mandatory in the model, but no instances inside (besides Variable *NodeVersion*) needed.