

# 12 ModuleInstanceDescriptors

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What	Required	Description	schema location
ModuleInstanceDescriptors.xml	yes	Definition of instances of modules	<a href="https://fewdocs.deltares.nl/schemas/version1.0/moduleInstanceDescriptors.xsd">https://fewdocs.deltares.nl/schemas/version1.0/moduleInstanceDescriptors.xsd</a>

Each module configured in DELFT-FEWS must be registered in the ModuleInstanceDescriptors configuration. This is required to identify the module to DELFT-FEWS (the name is free format), but is also required to define the type of module through reference to the moduleDescriptors defined (see system configuration).

When available on the file system, the name of the XML file for configuring the ModuleInstanceDescriptors is for example:

ModuleInstanceDescriptors 1.00 default.xml

ModuleInstanceDescriptors      Fixed file name for the ModuleInstanceDescriptors configuration

1.00      Version number

default      Flag to indicate the version is the default configuration (otherwise omitted).

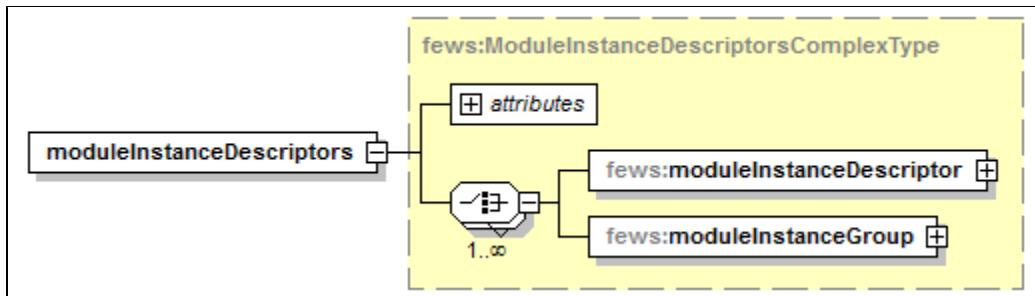


Figure : Root elements of the ModuleInstanceDescriptors configuration

## ModuleInstanceDescriptors

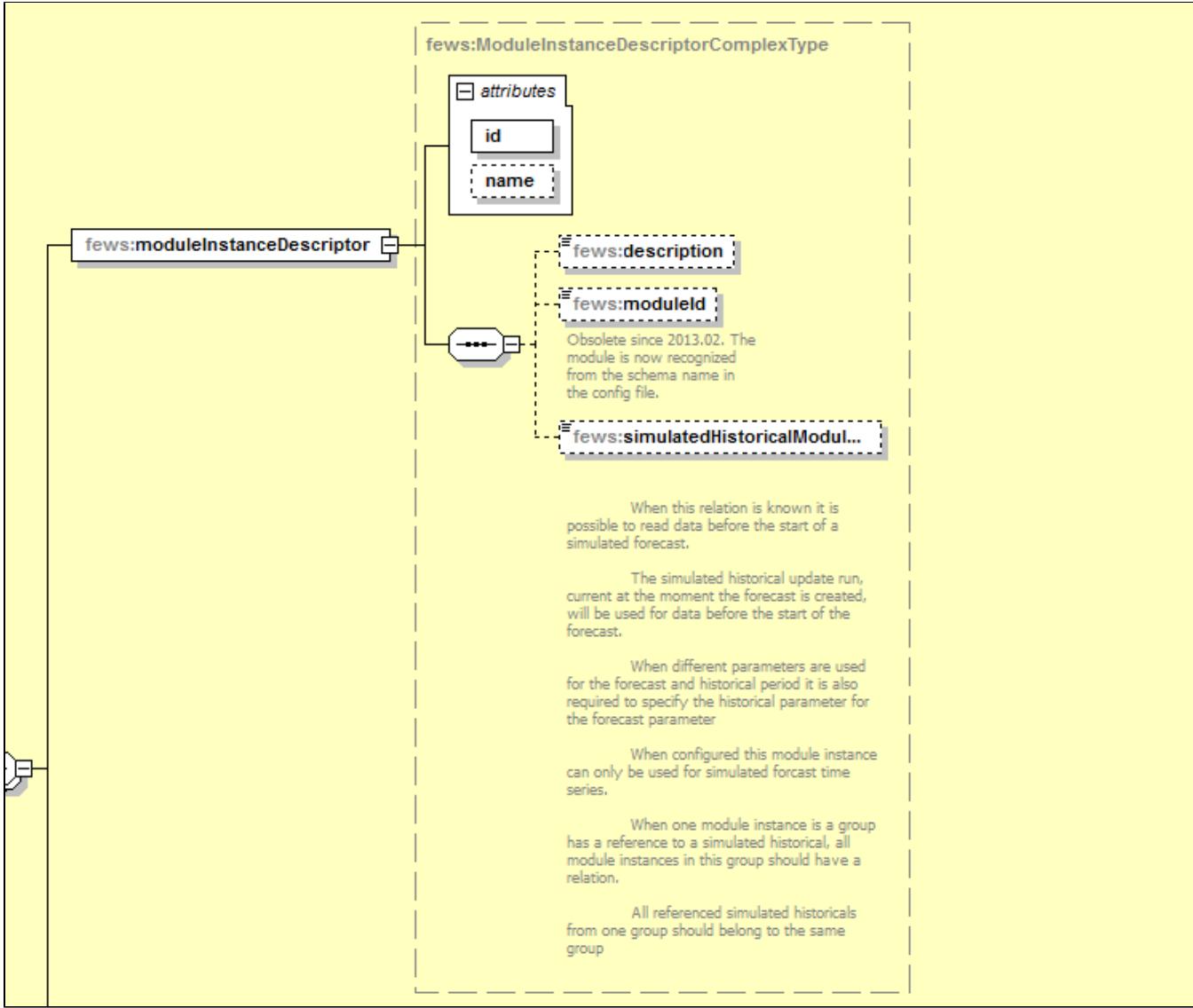
ModuleInstanceDescriptors contains two elements,

- [moduleInstanceDescriptor](#), and
- [moduleInstanceGroup](#).

Each of these two elements can be repeated and can be in any order.

### ModuleInstanceDescriptor

One of the element of the ModuleInstanceDescriptors. For each module there is one ModuleInstanceDescriptor.



#### Attributes:

- `id`: Id of the Module Instance. This Id must be unique. Normally a string is used that gives some understanding of the role of the module (e.g. *SpatialInterpolationPrecipitation*).
- `name`: Optional name for the module. Used for reference purposes only.

#### description

Optional description. Used for reference purposes only.

#### updateModuleRunTimesOnCompletion

Since 2021.01. When true run time statistics in ModuleRunTimes Table are updated for this module instance when the module instance is completed. These run times make it possible to predict when data becomes available the next time the workflow is executed

#### moduleId

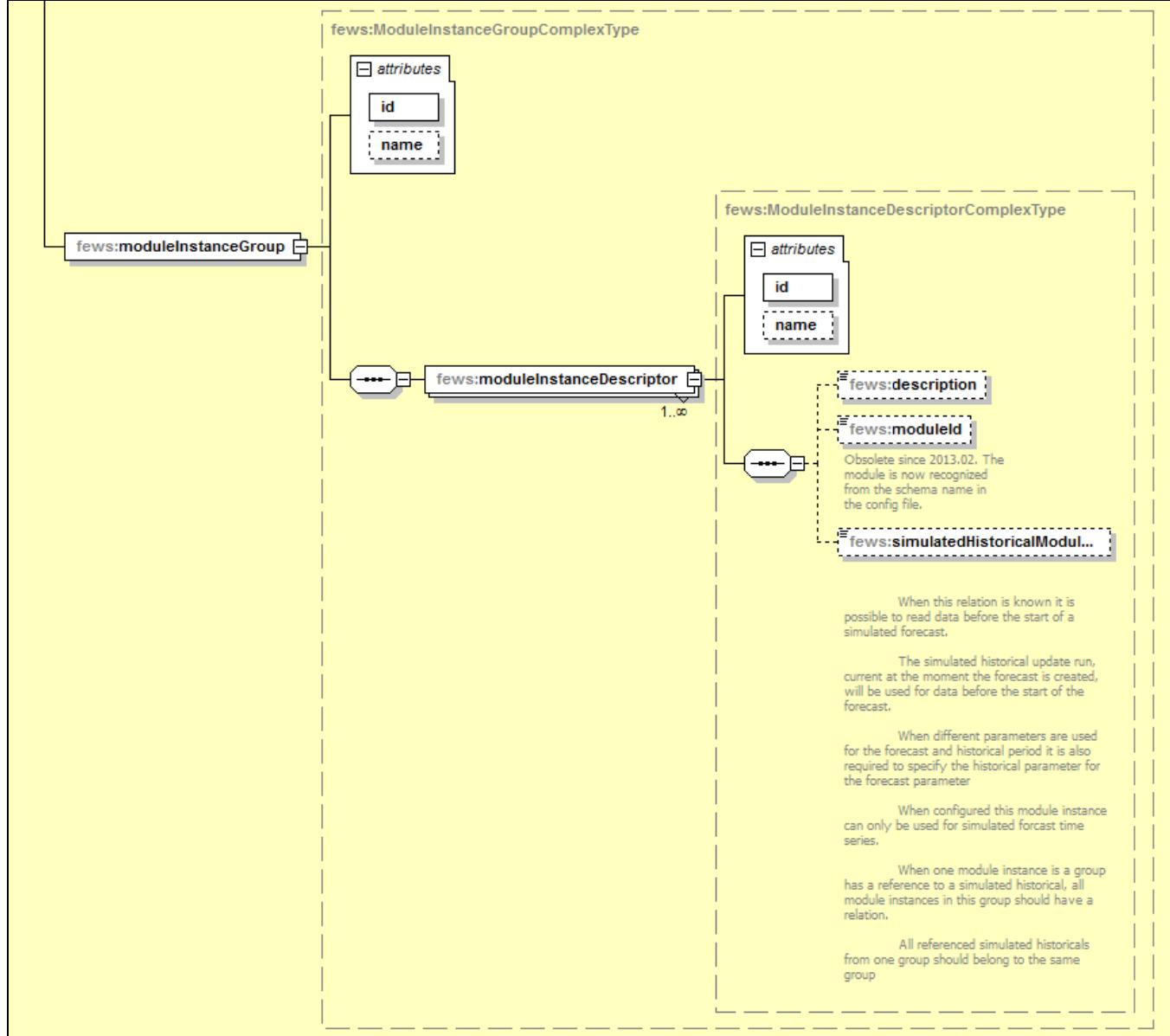
Reference to the ModuleDescriptors defined in the SystemConfiguration to identify the type of module. Since Delft-FEWS Version 2013.02 this element is optional. The Module type is recognized from the Module Config file.

#### simulatedHistoricalModuleInstanceld

When given the relation is made between the module and (simulated historical) Module Instance given here. The simulated historical update run, current at the moment the forecast is created, will be used for data before the start of the forecast. When different parameters are used for the forecast and historical period it is also required to specify the historical parameter for the forecast parameter. When configured this module instance can only be used for simulated forecast time series.

## ModuleInstancegroup

Another element of the ModuleInstanceDescriptors. Here you group all modules under a common ModuleInstance. When a Module is defined in one group it cannot be defined in another group.



Attributes;

- **Id:** Id of the Module Instance group. This Id must be unique. Normally a string is used that gives some understanding of the role of the module (e.g. *SpatialInterpolationPrecipitation*).
- **name:** Optional name for the module group. Used for reference purposes only.

### moduleinstanceDescriptor

One of the elements is the ModuleInstanceDescriptors, as defined earlier. All instances of Modules defined here need not be defined again as individual moduleInstances. Each group can have multiple modules instances.

However following points to be taken into considerations when defining moduleInstances under a single group.

- If one module instance in a group has a reference to a simulated historical, all module instances in the group should have a reference to a simulated historical module.
- All referenced simulated historical moduleinstances should also belong to the same group.
- The ModuleInstancegroup for Historical and Forecast should match i.e. each module instance defined in historical (updatestates) module instance group should match on one-to-one basis with the forecast modules instance group. This means that no modulesintances such as export, import should be added to module instance group.

- A correct configuration example is shown as below. The total number of modulesinstances in update (historical) and forcast matches. Also the referenced simulated historical modules instances in LMBM5\_Forecast modules instance group also belongs to a one same module instance group i.e. LBNM5\_UpdateStates".

moduleInstanceGroup (2)			
= id	moduleInstanceDescriptor		
1 LMBM5_UpdateStates	moduleInstanceDescriptor (9)		
	= id	moduleId	
	1 ADJUSTQ_LMBM5_LMBM5_UpdateStates	TransformationModule	
	2 CHANGET_LMBM5_FGX-6HR_UpdateStates	TransformationModule	
	3 MEANO_LMBM5_LMBM5_UpdateStates	TransformationModule	
	4 MERGETS_LMBM5_MAP_UpdateStates	TransformationModule	
	5 SACSMA_LMBM5_LMBM5_UpdateStates	GeneralAdapter	
	6 SNOW17_LMBM5_LMBM5_UpdateStates	GeneralAdapter	
	7 STAGEQ_LMBM5_LMBM5_UpdateStates	TransformationModule	
	8 STAGEQ_LMBM5_SSTG_UpdateStates	TransformationModule	
	9 UNITHG_LMBM5_LMBM5_UpdateStates	GeneralAdapter	
2 LMBM5_Forecast	moduleInstanceDescriptor (9)		
	= id	moduleId	simulatedHistoricalModuleInstanceId
	1 ADJUSTQ_LMBM5_LMBM5_Forecast	TransformationModule	ADJUSTQ_LMBM5_LMBM5_UpdateStates
	2 CHANGET_LMBM5_FGX-6HR_Forecast	TransformationModule	CHANGET_LMBM5_FGX-6HR_UpdateStates
	3 MEANO_LMBM5_LMBM5_Forecast	TransformationModule	MEANO_LMBM5_LMBM5_UpdateStates
	4 MERGETS_LMBM5_MAP_Forecast	TransformationModule	MERGETS_LMBM5_MAP_UpdateStates
	5 SACSMA_LMBM5_LMBM5_Forecast	GeneralAdapter	SACSMA_LMBM5_LMBM5_UpdateStates
	6 SNOW17_LMBM5_LMBM5_Forecast	GeneralAdapter	SNOW17_LMBM5_LMBM5_UpdateStates
	7 STAGEQ_LMBM5_LMBM5_Forecast	TransformationModule	STAGEQ_LMBM5_LMBM5_UpdateStates
	8 STAGEQ_LMBM5_SSTG_Forecast	TransformationModule	STAGEQ_LMBM5_SSTG_UpdateStates
	9 UNITHG_LMBM5_LMBM5_Forecast	GeneralAdapter	UNITHG_LMBM5_LMBM5_UpdateStates

- An incorrect configuration example is shown as below. Here the Forecast modulesinstancegroup contains 10 moduleinstancegroup while (historical) update moduleinstancegroup contains 9. It is strongly recommended to avoid this.

moduleInstanceGroup (2)			
= id	moduleInstanceDescriptor		
1 LMBM5_UpdateStates	moduleInstanceDescriptor (9)		
	= id	moduleId	
	1 ADJUSTQ_LMBM5_LMBM5_UpdateStates	TransformationModule	
	2 CHANGET_LMBM5_FGX-6HR_UpdateStates	TransformationModule	
	3 MEANO_LMBM5_LMBM5_UpdateStates	TransformationModule	
	4 MERGETS_LMBM5_MAP_UpdateStates	TransformationModule	
	5 SACSMA_LMBM5_LMBM5_UpdateStates	GeneralAdapter	
	6 SNOW17_LMBM5_LMBM5_UpdateStates	GeneralAdapter	
	7 STAGEQ_LMBM5_LMBM5_UpdateStates	TransformationModule	
	8 STAGEQ_LMBM5_SSTG_UpdateStates	TransformationModule	
	9 UNITHG_LMBM5_LMBM5_UpdateStates	GeneralAdapter	
2 LMBM5_Forecast	moduleInstanceDescriptor (10)		
	= id	moduleId	simulatedHistoricalModuleInstanceId
	1 ADJUSTQ_LMBM5_LMBM5_Forecast	TransformationModule	ADJUSTQ_LMBM5_LMBM5_UpdateStates
	2 CHANGET_LMBM5_FGX-6HR_Forecast	TransformationModule	CHANGET_LMBM5_FGX-6HR_UpdateStates
	3 LMBM5_SHEF_Export	TimeSeriesExportRun	
	4 MEANO_LMBM5_LMBM5_Forecast	TransformationModule	MEANO_LMBM5_LMBM5_UpdateStates
	5 MERGETS_LMBM5_MAP_Forecast	TransformationModule	MERGETS_LMBM5_MAP_UpdateStates
	6 SACSMA_LMBM5_LMBM5_Forecast	GeneralAdapter	SACSMA_LMBM5_LMBM5_UpdateStates
	7 SNOW17_LMBM5_LMBM5_Forecast	GeneralAdapter	SNOW17_LMBM5_LMBM5_UpdateStates
	8 STAGEQ_LMBM5_LMBM5_Forecast	TransformationModule	STAGEQ_LMBM5_LMBM5_UpdateStates
	9 STAGEQ_LMBM5_SSTG_Forecast	TransformationModule	STAGEQ_LMBM5_SSTG_UpdateStates
	10 UNITHG_LMBM5_LMBM5_Forecast	GeneralAdapter	UNITHG_LMBM5_LMBM5_UpdateStates

- Module Instance group is used to mainly optimize the way the data is written to the database. This leads to compact databases. Otherwise Modules Instance groups cannot be referred to retrieve data from database.

## Module instance descriptors in csv format with attributes

Since 2022.01 it is possible to define module instance in a csv file. It is only possible to add attributes to the module instances when the csv format is used. These attributes can be used in file export with the %MODULE\_INSTANCE\_ID\_ATTRIBUTE(attributeId; moduleInstanceld)% tag. Standard field names like 'description' can be used as attributes if they are explicitly configured (see attribute 'DESC' doubling the link to the 'description' column of the csv file in the example below)

By using %% can be referred to the content of the columns in the csv file. If number format is expected, the reference may also include calculations, as is done in the example for the waterCoachExternalForecastDelayMinutes column.

**Example:**

```

<?xml version="1.0" encoding="UTF-8"?>
<moduleInstanceDescriptors xmlns="http://www.wldelft.nl/fews" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                           xsi:schemaLocation="http://www.wldelft.nl/fews https://fewsdocs.deltares.nl/schemas
                           /version1.0/moduleInstanceDescriptors.xsd" version="1.0">
    <moduleInstanceDescriptorsCsvFile>
        <file>moduleInstanceDescriptors.csv</file>
        <id>%moduleInstanceId%</id>
        <name>%moduleInstanceName%</name>
        <description>%description%</description>
        <group>%groupId%</group>
        <groupName>%groupName%</groupName>
        <updateModuleRunTimesOnCompletion>%updateModuleRunTimesOnCompletion%</updateModuleRunTimesOnCompletion>
        <simulatedHistoricalModuleInstanceId>%simulatedHistoricalModuleInstanceId%<
/simulatedHistoricalModuleInstanceId>
        <waterCoachExternalForecastDelayHours>%waterCoachExternalForecastDelayMinutes%/60<
/waterCoachExternalForecastDelayHours>
        <timeZoneOffset>+01:00</timeZoneOffset>
        <dateTimePattern>yyyyMMdd HH:mm</dateTimePattern>
        <attribute id="test">
            <text>%test%</text>
        </attribute>
        <attribute id="DESC">
            <text>%description%</text>
        </attribute>
        <attributeFile>
            <csvFile>moduleInstanceDescriptors_attributes.csv</csvFile>
            <id>%ID%</id>
            <attribute id="EXTERNAL_ID">
                <text>%EXTERNAL_ID%</text>
            </attribute>
        </attributeFile>
    </moduleInstanceDescriptorsCsvFile>
</moduleInstanceDescriptors>

```

ModuleInstanceDescriptors.csv located in MapLayerFiles config directory can be as simple as:

```

ID, test
import, a
sobek, b
archive, c

```

ModuleInstanceDescriptors\_attributes.csv located in MapLayerFiles config directory

```

ID, EXTERNAL_ID
import, A
sobek, B
archive, C

```