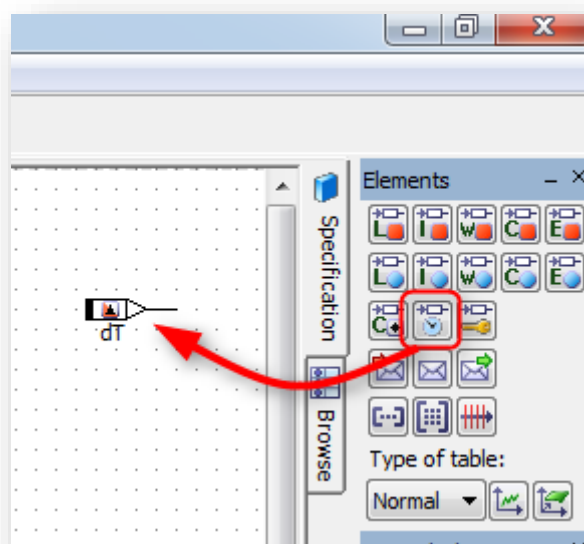


ASCET-DEVELOPER - Where is dT?

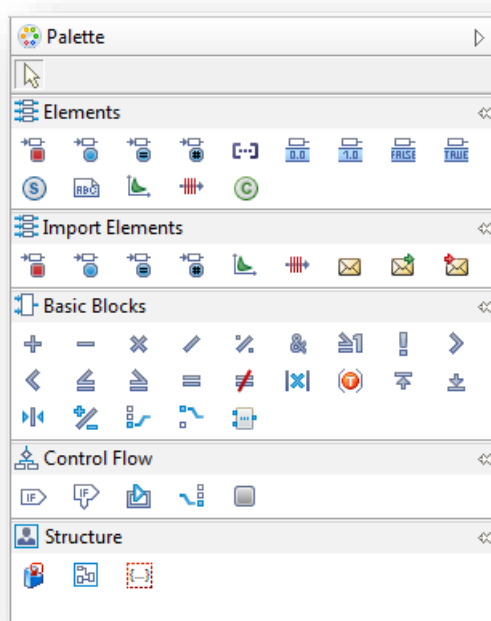


Question

- I am missing dT in ASCET-DEVELOPER
- In ASCET V6.x block diagram editor in view **Elements** there is an element "dT"



- Where is this dT element in ASCET-DEVELOPER?



- From **ASCET Online Help** → Tab **Contents** → **Reference to User Interface** → **Block Diagram Editor** → **Palettes** → **Elements Palette**

The **Elements palette** contains following functions:

	Logic Variable	The Variable and Parameter buttons can be used to create elements of type logic, limitInt, wrapInt, udisc, sdisc, cont, or enumeration.
	Limited Integer Variable (Signed Discrete Variable)	By default, the Limited Integer * and Wrap-Around Integer * buttons are displayed. To display the Signed Discrete * and Unsigned Discrete * buttons instead, the editor option Use signed/unsigned discrete types must be activated.
	Wrap-Around Integer Variable (Unsigned Discrete Variable)	See also Creating a Basic Element and Inserting an Enumeration .
	Continuous Variable	
	Enumeration Variable	
	Logic Parameter	
	Limited Integer Parameter (Signed Discrete Parameter)	
	Wrap-Around Integer Parameter (Unsigned Discrete Parameter)	
	Continuous Parameter	
	Enumeration Parameter	
	Implementation Cast	
	Delta t	dt system parameter The name dt is reserved for the system parameter. You cannot create any other element with the name dt. Since upper and lower case letters are not distinguished, the names DT, dt, and Dt are reserved, too.
	Resource	See also Resources .
	Receive Message	These buttons can be used to create scalar messages only.
	Send Receive Message	See also Creating a Message .
	Send Message	
	Array	See also Creating an Array or Matrix .
	Matrix	
	Distribution	See also Creating a Distribution .
	OneD Table	The table buttons can be used to create normal, group, or fixed characteristic lines/maps, depending on the selection in the combo box.

- I cannot find according information in ASCET-DEVELOPER Online Help

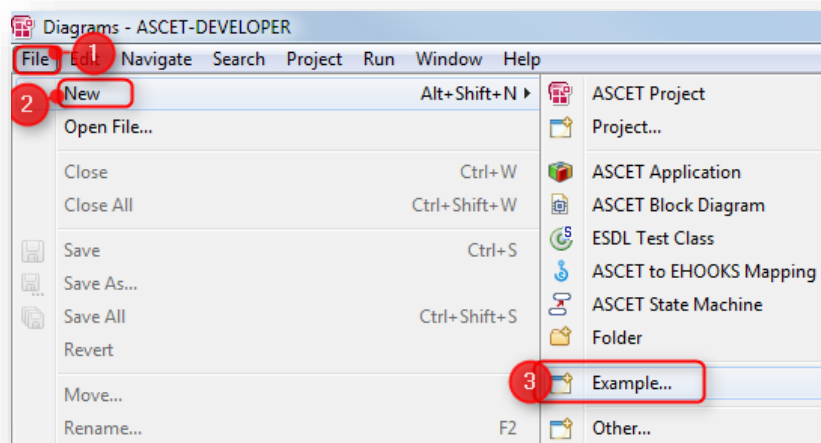


Answer

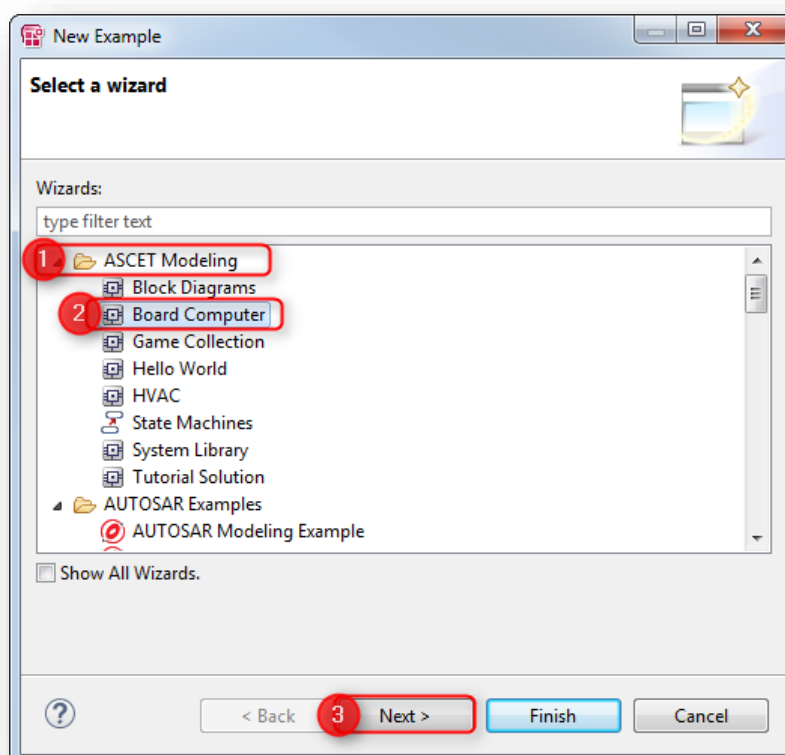
- Define a variable if you want to use "Delta T" in ASCET-DEVELOPER
- Define a variable of type **public static** via **@dT**
- There is an **example** implementation available in the example project **Board Computer**

Follow these steps to have a look at this example implementation:

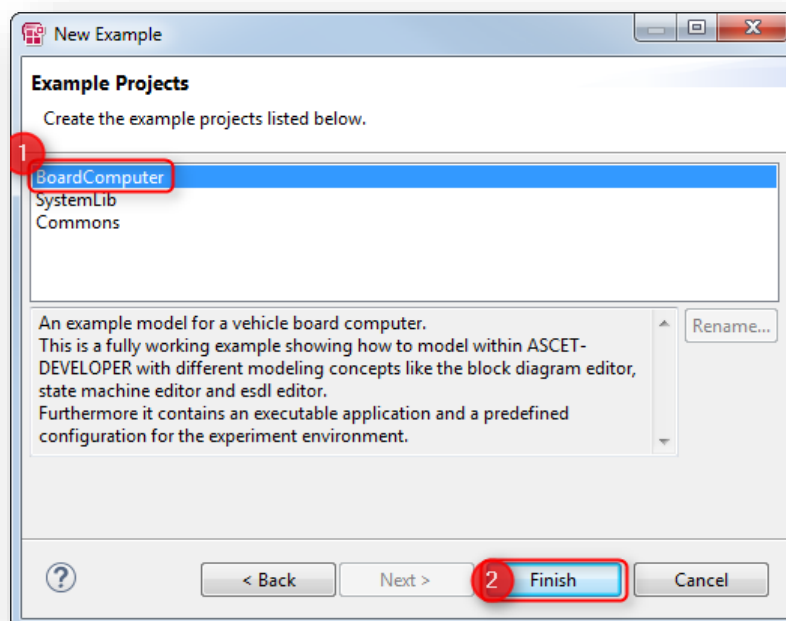
1. In **ASCET-DEVELOPER** → **File** → **New** → **Example...**



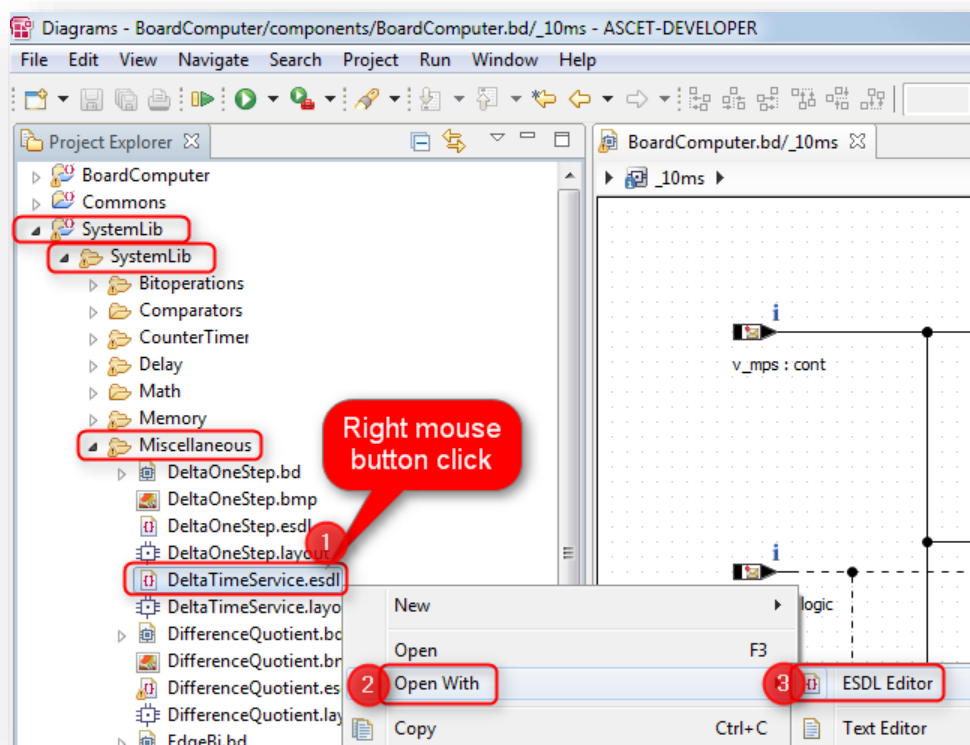
2. In dialog **New Example** → **ASCET Modeling** → **Board Computer** → Click **Next >** button



3. In dialog **New Example** → **BoardComputer** → Click **Finish** button



4. In **Project Explorer** → **SystemLib** → **SystemLib** → **Miscellaneous** → **DeltaTimeService.esdl**: Right mouse button click → **Open With** → **ESDL Editor**



- In **DeltaTimeService.esdl** at lines 14 + 15: Find the implementation of **deltaT**

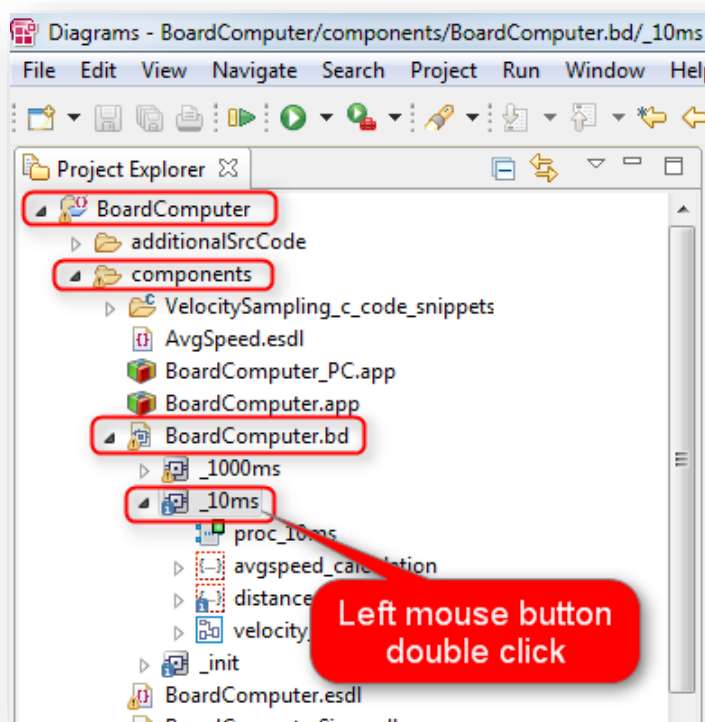
```

1 package SystemLib.Miscellaneous;
2
3 // time is using seconds as unit
4 type TimeType is real 0.0 .. 100.0;
5
6 /**
7  * Provides the delta time variable
8  */
9 static class DeltaTimeService {
10  /**
11   * This value contains the delta time between two subsequent task activations in seconds
12   * There are several representations possible
13   */
14  @dT
15  public TimeType deltaT = 0.0;
16
    
```

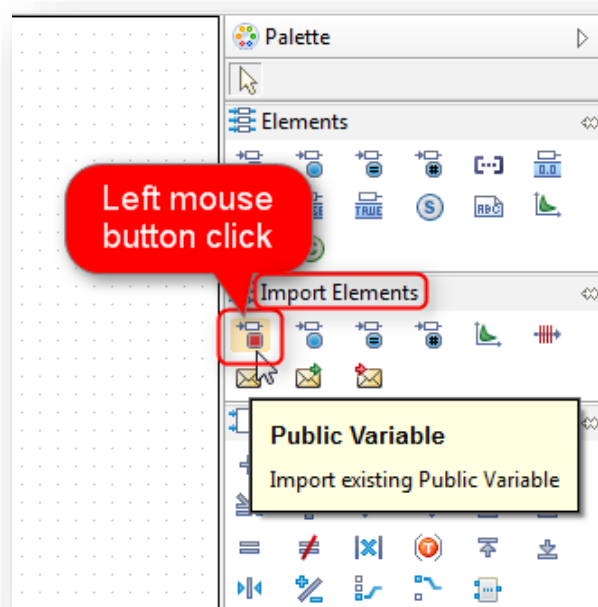
Now, this variable **deltaT** can be used as described in the following steps:

- Open a block diagram in block diagram editor

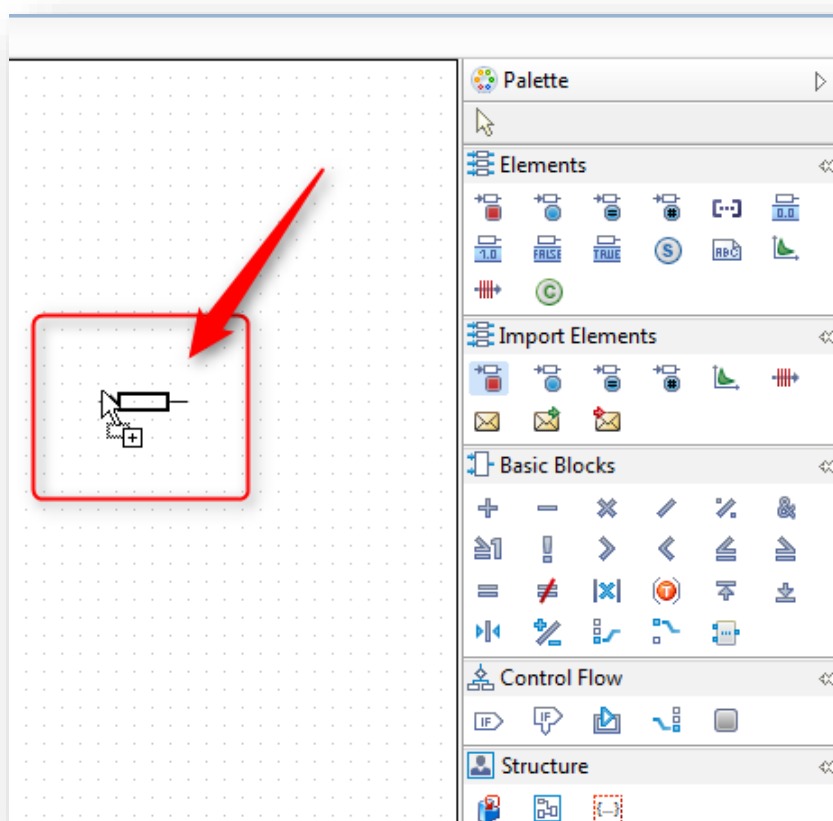
For example: In **Project Explorer** → **BoardComputer** → **components** → **BoardComputer.bd** → **_10ms**: Left mouse button double click



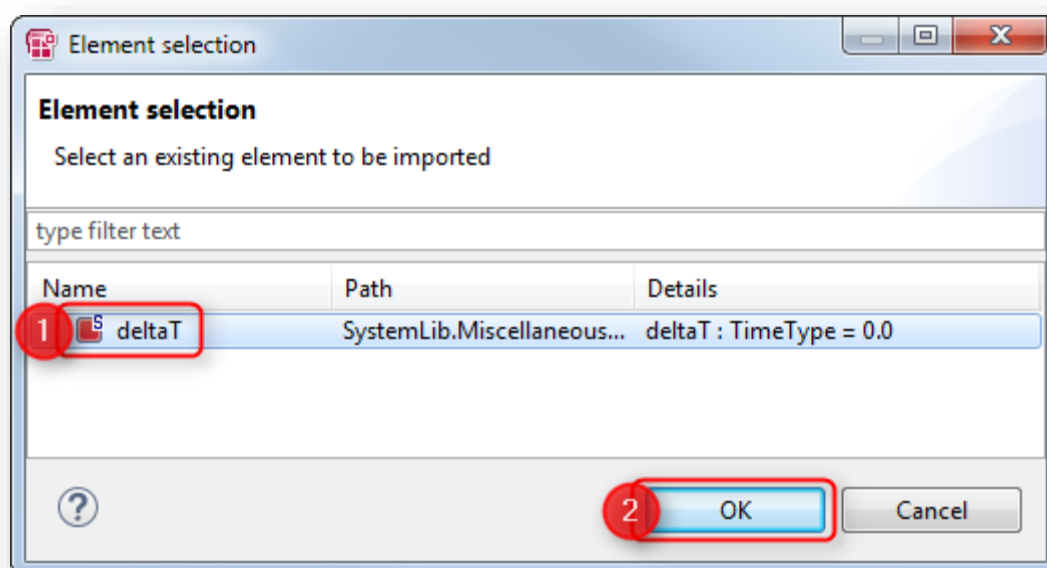
7. In **Block Diagram Editor** → **Import Elements** → **Public Variable**: Left mouse button click



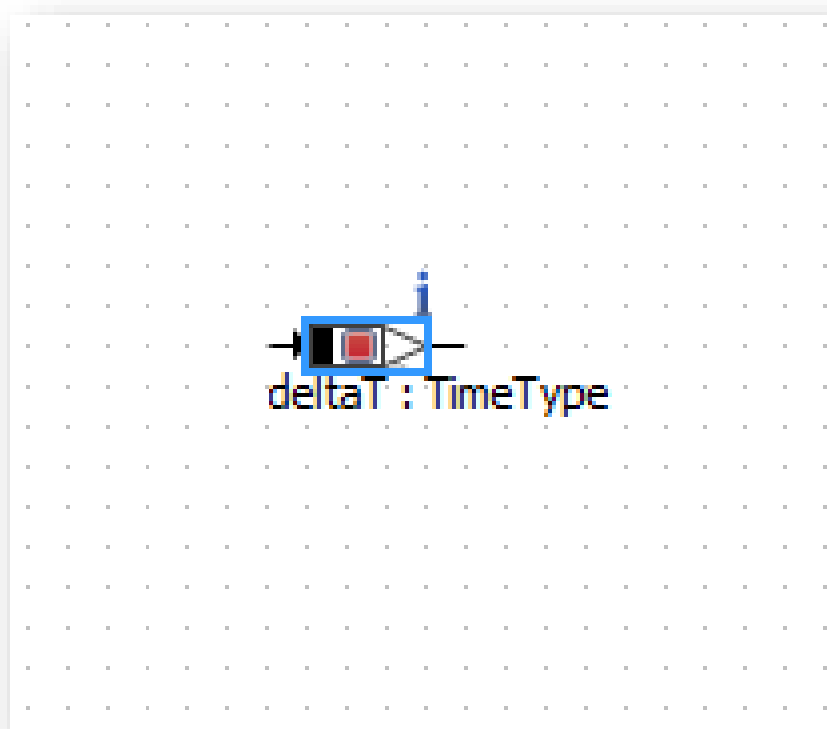
8. In **Block Diagram Editor** → Click somewhere in the drawing area to place the variable



9. In dialog **Element selection** → **deltaT** → Click **OK** button



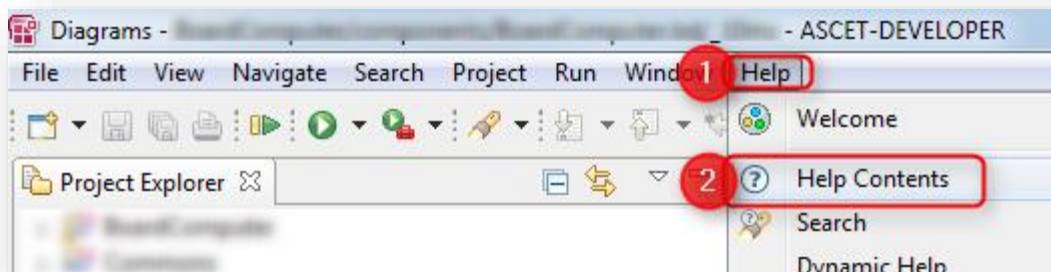
10. In **Block Diagram Editor**: There is **deltaT**



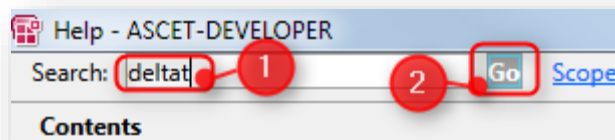


Additional information

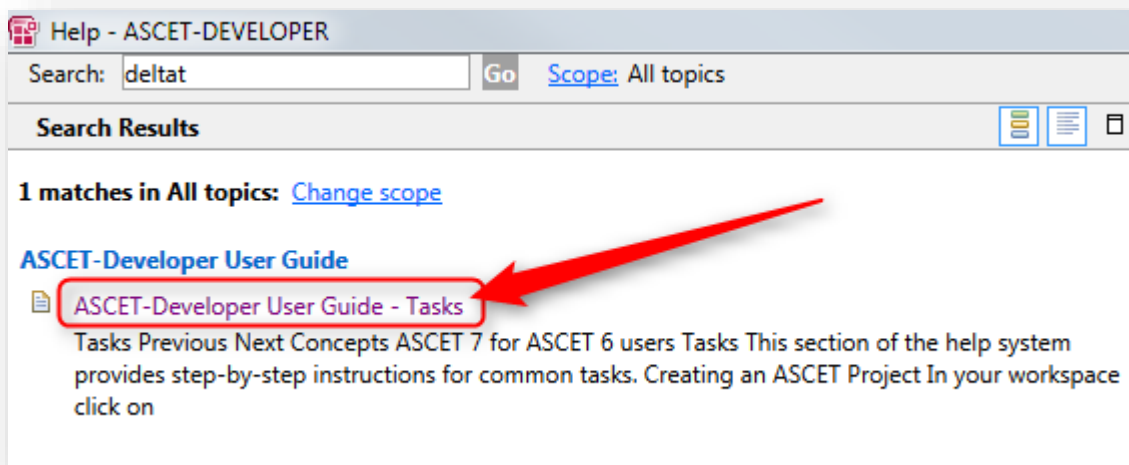
- In ASCET-DEVELOPER → Menu bar → Help → Help Contents



- In dialog **Help** → Field **Search:** Type "deltat" → Click **Go** Button



- Click **ASCET-Developer User Guide - Tasks** link



- On the right side there is further information regarding delta T:

How to get delta time between task activations

For controlling algorithms it's often required to get the delta time between two subsequent task activations.

In ASCET 6.x there is a global/exported `dt` variable directly in project, which can be imported in every class and contains the delta time value of currently running task in seconds.

In ASCET 7 a `@dT` annotation can be used to define such a variable within a static class.

So let's define a class like following:

```
type TimeType is real 0.0 .. 100.0;

static class DeltaTimeService {
  /**
   * This value contains the delta time between two subsequent task activations in seconds
   */
  @dT
  public TimeType deltaT = 0.0;

  representation Float64Resolution {
    represent deltaT using {
      datatype = float64;
    };
  }

  representation FixpointMilliSecondResolution {
    represent deltaT using {
      datatype = uint32;
      delta = 1.0e-3; // millisecond resolution
    };
  }
}
```

The class element `deltaT` is annotated with `@dT`. That means:

- Write access to that variable is forbidden.
- The type must be derived from **real**.
- The data struct in C for class `DeltaTimeService` is empty. The element `deltaT` will be generated like in ASCET 6.x as a global `ASD_DT_SCALED` variable.
- Variable must be public and can be access in other classes in static context just by writing somewhere in expressions `DeltaTimeService.deltaT`.
- Within an application scope only one instance of `@dT` annotated variable is allowed.
- During the code generation access to that variable will be replaced by code which will provide the required delta time value.
- That variable will be excluded from ASAM MCD-MC/ASAP2 generation, since dependent on underlying implementation it's not ensured, there will be a memory location for that. Also usually we can not expect to measure something meaningful here, since that value is highly volatile.
- Also in back-animation such variable will be excluded.



Do you still have questions?

- You will find **further FAQ articles** on the ETAS homepage: www.etas.com/en/faq
- **Movies** corresponding to FAQ articles can be found on the [ETAS YouTube channel](#)
- Please feel free to contact our Support Center, if you have further questions.
- Here you can find all information: <http://www.etas.com/en/hotlines.php>
- Direct URL of this FAQ article:
- https://www.etas.com/download-center-files/products_ASCET_Software_Products/faq_602051599_en_ascet-developer-where_is_dt.pdf

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