What is OSCAT Library

OSCAT stands for "Open Source Community for Automation Technology". This community created the Open Source Library (library with open source code) based on the standard IEC 61131-3. The aim was to create a library that is not dependent on the functionality of a PLC manufacturer It is easily portable for all PLCs that are compatible with the IEC 61131-3 standard.

The reasons for the creation such library were as follows:

1. Libraries of almost all manufacturers are protected and source code is not generally free accessible. When an error occurs in the library its repair is extremely difficult, often even impossible.

2. Development of programs in graphic environments with libraries that are specific to the PLC manufacturer, can quickly become confusing, inefficient and prone to error, because the existing specific functions cannot be repaired or modified at the user level for real needs because the source code is usually available at the user level or repair.

3. Change the hardware PLC, in particular the move to another manufacturer, it is difficult because it depends on the manufacturer supplied programs libraries, thereby losing one of the advantages of standard IEC 61131-3. Replacement of proprietary libraries of a certain manufacturer is very difficult, because library manufacturers vary widely in scope and content.

4. Understanding of complex functions and function blocks without consulting the source code is also often very difficult. Programs are then inefficient and error prone.

OSCAT understands the new library as a template or tool for development not as a final product. The user is solely responsible for testing functions used in their applications and must itself verify their accuracy, quality and functionality. OSCAT liability is expressly excluded.

Using the OSCAT library is free and library can be used for both private and commercial purposes. You can also use only the necessary parts library, which is also permitted to freely modify.

Guarantee of the functionality of the library is not offered, on the contrary, it is explicitly excluded. Because the software modules contained in the library are provided free of charge, there is no guarantee to the extent required by law. Unless explicitly stated in writing, copyright holders and / or third-party software modules are provided "as is" without warranty of any kind, expressed or implied.

For details see the library documentation, which is available on www.oscat.de. There is also user discussion forum on that site.

Portation OSCAT Library for the Mosaic environment

OSCAT library is designed for the CoDeSys environment and is tested on different systems. There exist portation for STEP7 and Multiprog environments.

The source code library in ST language, which you can download at www.oscat.de/downloadmanager/viewcategory/3.html was used for portation to the Mosaic

The source was first modified as follows

1. All occurrences of keyword „POINTER TO" have been replaced by the keyword „PTR_TO". Declaration of pointer is not specified in IEC 61131-3 and in environment Mosaic other keyword is used than in CoDeSys.
2. In declarations of chains with other than the default length the parentheses were replaced by square parentheses. Eg. „STR : STRING(STRING_LENGTH);" was changed to „STR : STRING[STRING_LENGTH];". According the IEC 61131-3 there should be the square parentheses.
3. Declarations „VAR_INPUT CONSTANT" were changed to „VAR_INPUT". Declaration „VAR_INPUT CONSTANT" is enhancing of IEC 61131-3, which is not supported in Mosaic.
4. Following comments related to the environment CoDeSys were dropped:
   (* @NESTEDCOMMENTS := 'Yes' *)
   (* @OBJECTFLAGS := '0, 8' *)
   (* @SYMFILEFLAGS := '2048' *)
   (* @END_DECLARATION := '0' *)
5. Description of functions / function blocks was moved immediately after the definition of the function / function block (for automatic display described in IEC manager of Mosaic)
6. Following functions were renamed in the library:

   „CEIL" for „CEIL1", „FLOOR" for „FLOOR1" a „ROUND" for „ROUND1"

   These functions are not defined in IEC 61131-3, but ST compiler in Mosaic supports these functions as standard. So the names of the functions of library OSCAT crossed with standard functions supported in Mosaic

7. The "MULTIME" has been renamed "MUL_TIME" because the "MULTIME" is the standard supported in Mosaic

After that project was created in Mosaic, into which all the functions and function blocks were successively inserted from the source file. Project files are named according to the individual chapters in the library documentation and they contains functions and function blocks which are described in that chapters. The order of files in the project, as well as the order of the functions and function blocks in the files have been modified so that it can be translated in Mosaic (to allow the function or function block to be used, they must be declared first).

The following changes were done in the project:

1. Conversion types of have been added in expressions containing various data types. Mosaic compiler requires explicit indication of conversion functions when the expression works with different data types.

2. Brackets were added to the declaration of initializing the field that there according to IEC 61131-3 should be. For example, the declaration
   MTH_OFS : ARRAY[1..12] OF INT := 0,31,59,90,120,151,181,212,243,273,304,334;

   was modified as

   MTH_OFS : ARRAY[1..12] OF INT := [0,31,59,90,120,151,181,212,243,273,304,334];

3. ST compiler of Mosaic does not support a direct pointer to the array declaration. These structures have been replaced as follows

   PT : POINTER TO ARRAY[0..32767] OF BYTE;

   was replaced by the type definition

   TYPE
      OSCAD_BASIC_ARRAY0_32767_OF_BYTE : ARRAY[0..32767] OF BYTE;
   END_TYPE

   and then by declaration

   PT : PTR_TO OSCAD_BASIC_ARRAY0_32767_OF_BYTE;

8. Local variables in function block "VAR RETAIN" are not supported by Mosaic. These declarations have been changed to 'VAR_IN_OUT'. That variables has to be established in "VAR_GLOBAL RETAIN"

The source code of the project and the translated library are available on www.tecomat.com. To translate it the ST compiler version 3.10.2.0 or higher (Mosaic 2015.1 or later) has to be used.