

UR67-MP-78-16DIO-12-60M, UR67-MP-HP-16DIO-12-60M

Quick Start Guide for Implementation of UR67-MP-xx-16DIO-x modules in EtherCAT mode into Codesys 3.5

Abstract:

The implementation procedure of UR67-MP-xx-16DIO-12-60M modules in EtherCAT mode into Codesys differs from other EtherCAT nodes. It is not possible to use the online network scan, the modules need to be inserted into the project manually while offline. This Quick Start Guide shows the necessary steps for a successful commissioning. The basic principle shown here can also be helpful with other software platforms, e.g. OMRON Sysmac Studio.

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Hardware reference

No.	Component name	Article No.	Hardware / Firmware version
1	UR67-MP-78-16DIO-12-60M	2512830000	-
2	UR67-MP-HP-16DIO-12-60M	2512840000	-

Software reference

No.	Software name	Article No.	Software version
1	Codesys	-	3.5

File reference

No.	Name	Description	Version
1	-	-	-

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1 Warning and Disclaimer

Warning

Controls may fail in unsafe operating conditions, causing uncontrolled operation of the controlled devices. Such hazardous events can result in death and / or serious injury and / or property damage. Therefore, there must be safety equipment provided / electrical safety design or other redundant safety features that are independent from the automation system.

Disclaimer

This Application Note / Quick Start Guide / Example Program does not relieve you of the obligation to handle it safely during use, installation, operation and maintenance. Each user is responsible for the correct operation of his control system. By using this Application Note / Quick Start Guide / Example Program prepared by Weidmüller, you accept that Weidmüller cannot be held liable for any damage to property and / or personal injury that may occur because of the use.

Note

The given descriptions and examples do not represent any customer-specific solutions, they are simply intended to help for typical tasks. The user is responsible for the proper operation of the described products. Application notes / Quick Start Guides / Example Programs are not binding and do not claim to be complete in terms of configuration as well as any contingencies. By using this Application Note / Quick Start Guide / Example Program, you acknowledge that we cannot be held liable for any damages beyond the described liability regime. We reserve the right to make changes to this application note / quick start guide / example at any time without notice. In case of discrepancies between the proposals Application Notes / Quick Start Guides / Program Examples and other Weidmüller publications, like manuals, such contents have always more priority to the examples. We assume no liability for the information contained in this document. Our liability, for whatever legal reason, for damages caused using the examples, instructions, programs, project planning and performance data, etc. described in this Application Note / Quick Start Guide / Example is excluded.

Security notes

In order to protect equipment, systems, machines and networks against cyber threats, it is necessary to implement (and maintain) a complete state-of-the-art industrial security concept. The customer is responsible for preventing unauthorized access to his equipment, systems, machines and networks. Systems, machines and components should only be connected to the corporate network or the Internet if necessary and appropriate safeguards (such as firewalls and network segmentation) have been taken.

2 Preparations

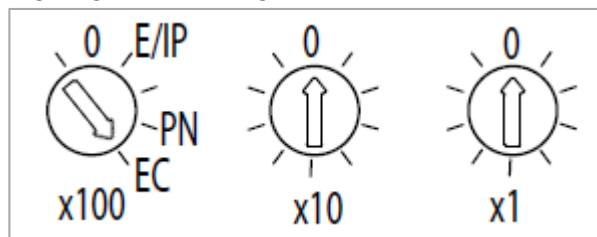
2.1 UR67 module connection and protocol setup

- 1) Connect the UR67 module's fieldbus connector to the Codesys with a M12 to RJ45 cable.
- 2) Make sure the rotary switches on the module are set to EtherCAT (400 to 499).



The fieldbus protocol can only be changed after the module has been reset to factory settings.

- 3) Optional: If the module has not been set to EtherCAT mode yet, then
 - Power off the module.
 - Set the rotary switches to position 979.
 - Power on the module, the "RUN" LED should be blinking red now.
 - Wait for the "RUN" LED turn from red blinking to green blinking.
 - Power off the module.
 - Set the "x100" rotary switch to position 4 / "EC" (positions of rotary switches "x10" and "x1" are irrelevant).
 - Power on the UR67 module – now it should boot in EtherCAT mode.



2.2 ESI file download

Download the latest device description bundle from the Weidmüller website, www.weidmueller.com. If there are multiple files for download, chose the one from the top of the list. Unpack the zip file on the computer with the Codesys installation in a local folder.

UR67-MP-78-16DIO-12-60M



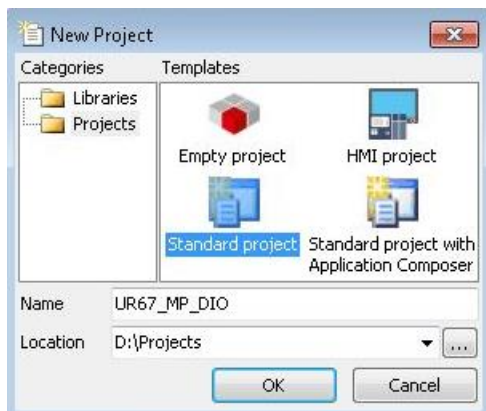
Downloads

Software [UR67 - GSDML V2.33 / EDS V3.21 / ESI V1.2 files](#)
[UR67 - GSDML V2.31 / EDS V3.9 / ESI V1.2 files](#)

2.3 Creation of a Codesys project

To create a Codesys project follow these steps:

- 1) Start Codesys 3.5.
- 2) Click on “New Project”.
- 3) In the pop-up window “New Project” select “Standard project”, chose a file name and storage location, then click on “OK”.

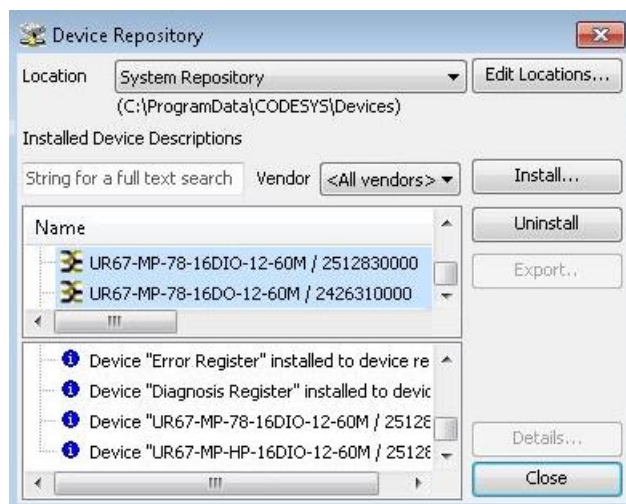


- 4) In the pop-up window “Standard Project” select the required type of PLC in the “Device” drop-down menu and the desired programming language in the “PLC_PRG in” drop-down menu, then click on “OK”.

2.4 Installation of the ESI file

To install the ESI file follow these steps:

- 1) Click on the “Tools” tab.
- 2) In the “Tools” drop-down select “Device Repository...”.
- 3) In the pop-up window “Device Repository” click on “Install...”.
- 4) In the pop-up window “Install Device description” browse to the folder where the UR67 device description bundle has been unpacked -> open the bundle folder -> open the “ESI” sub folder -> select the file “Weidmueller-UR67-Digital-IO.xml” and click on “Open”.
- 5) Wait for the devices to get installed, then click on “Close”.



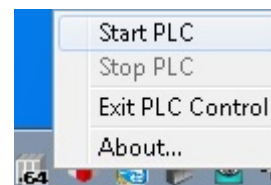
2.5 Codesys Communication Settings



Make sure the application is in a safe state and starting the PLC can't cause any damage to life or equipment.

For establishing a Communication in Codesys follow these steps:

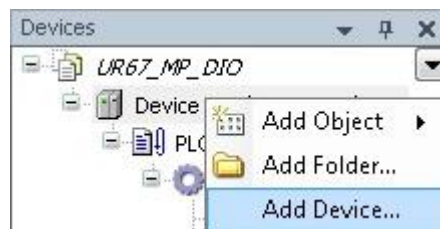
- 1) Start the Codesys PLC in the Windows Taskbar.
- 2) In Codesys, in the “Devices” project tree double-click on “Device ([Name of PLC])”.
- 3) In the “Device” editor click on the “Communication Settings” tab.
- 4) Click on “Scan Network”.
- 5) In the pop-up window “Select device” wait till the Codesys PLC is listed under “Gateway”, then select it and click on “OK”.
- 6) Now both the Gateway symbol and the PLC symbol should have a green circle at their bottom right.



2.6 Adding the EtherCAT Master

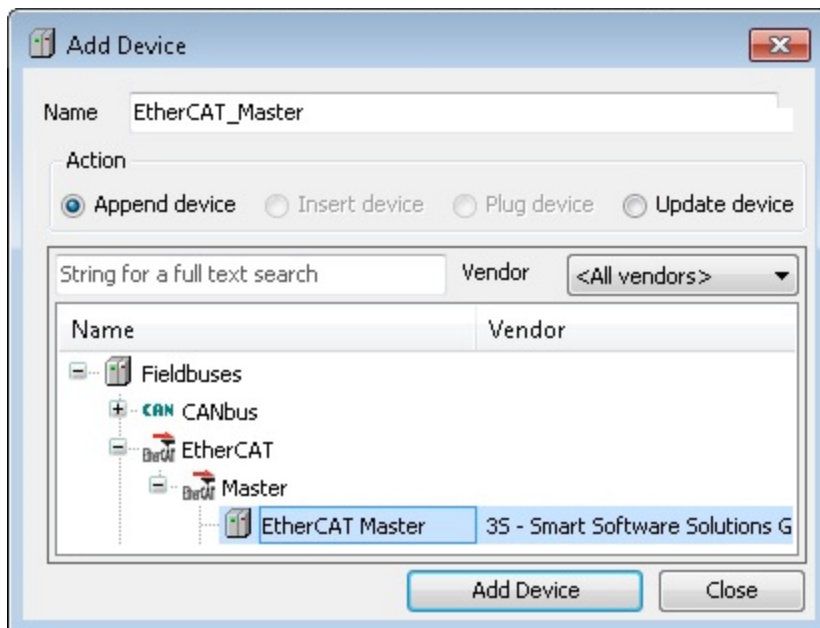
To add the EtherCAT Master follow these steps:

- 1) In the “Devices” project tree right-click on “Device ([Name of PLC])”.
- 2) In the context menu click on “Add Device...”

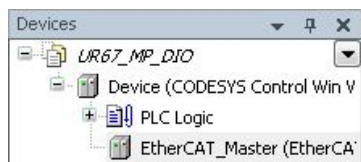


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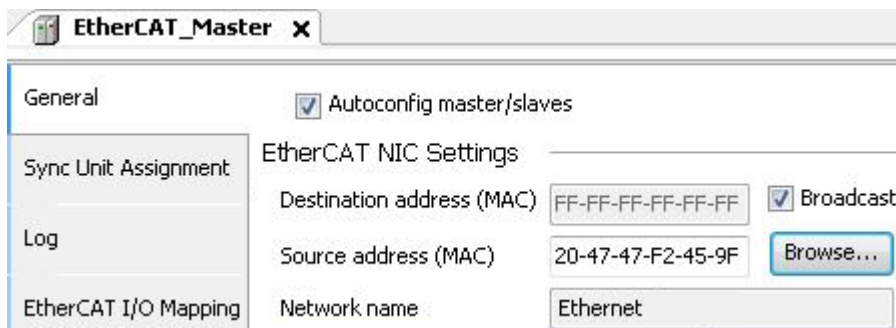
- 3) In the pop-up window “Add Device” open the branch “Fieldbuses” / “EtherCAT” / “Master” and select “EtherCAT Master”, then click on “Add device”.



- 4) In the “Devices” project tree double click-on “EtherCAT_Master”.



- 5) In the “EtherCAT_Master” editor click on the “General” tab.



- 6) At “Source address (MAC)” click on “Browse...”
- 7) In the pop-up window “Select Network Adapter” select the computers network card to which the UR67 module is connected, then click “OK”
- 8) Now the MAC address of the computers network card should be set as source address.



The network adapter can only be selected if the Communication Settings procedure has been completed (see chapter **Error! Reference source not found.**).

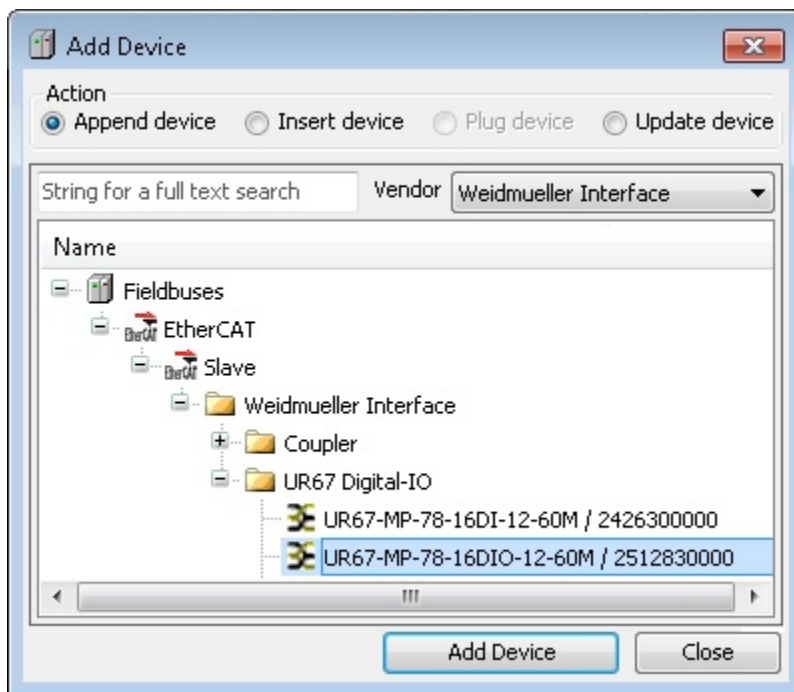
3 Implementation of the DIO module



DIO modules are not compatible to the Codesys “Scan for devices...” functionality. Although the modules will be detected, they will be marked as “not found in the repository”. Currently it is only possible to add UR67 DIO modules **offline** to a Codesys project.

To add the modules, follow these steps:

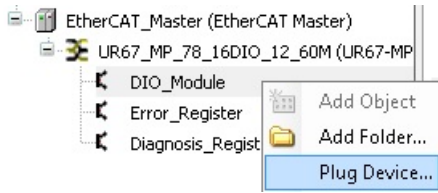
- 1) In the “Devices” project tree right-click on “EtherCAT_Master”.
- 2) In the context menu click on “Add Device...”.
- 3) Optional: In the pop-up window “Add Device” open the “Vendor” drop-down menu and select “Weidmueller Interface”.
- 4) Open the branch “Fieldbuses” / “EtherCAT” / “Slave” / “Weidmueller Interface” / “UR67 Digital-IO”.



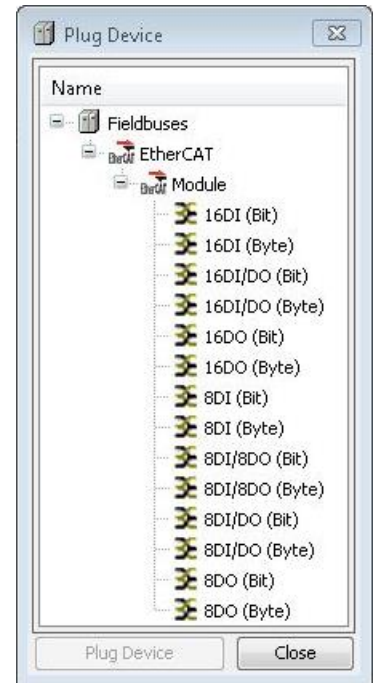
- 5) Select the respective DIO module, then click on “Add Device”, don’t close the “Add Device” window.
- 6) An instance of the UR67 module will be added to the “Devices” project tree with three subbranches “DIO_Module”, “Error_Register” and “Diagnosis_Register” which also need to have the correct instance of device to be added.

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- 7) In the “Devices” project tree select the first subbranch of the UR67 module “DIO_Module”, the pop-up window “Add Device” changes its name to “Plug Device”.



- 8) In the “Plug Device” window under the subbranch “Module” all available operation modes of the DIO Module are displayed.
- 9) Select the required mode of the DIO module, then click on “Plug Device”.
- 10) In the “Devices” project tree select the subbranch of the UR67 module “Error_Register”.
- 11) In the pop-up window “Plug Device” select “Error Register”, then click on “Plug Device”.
- 12) In the “Devices” project tree select the subbranch of the UR67 module “Diagnosis Register”.
- 13) In the pop-up window “Plug Device” select “Diagnosis Register”, click on “Plug Device”, then click on “Close”.



- 14) Now the formerly empty plug symbols in the three subbranches should be filled and a Weidmüller logo should be added to them.
- 15) Add your code, link the variables, build and log-in with download.



Codesys allows to build and download the project if one or more subbranches of the DIO module has been left empty. Commissioning of a DIO module, however, is only possible if all three devices have been added correctly to the subbranches.

- 16) Now the DIO module should be fault free and in Operational state (RUN LED lit green).

