Tech-note

ABB CoDeSys Ethernet driver for JMobile

This documents describes how to use the special variation of the CoDeSys Ethernet driver for ABB controllers.

Sitek S.p.A.
Ptn370
Ver. 1.00

Contents

ABB CoDeSys Ethernet Driver

The ABB CoDeSys ETH communication driver for Ethernet has been specifically designed to support communication with ABB controllers series AC500 designed for standardized IEC 61131-3 programming, based on the CoDeSys V2.3 system.
Please note that changes in the controller protocol or hardware, which may interfere with the functionality of this driver, may have occurred since this documentation was created. Therefore, always test and verify the functionality of the application. To accommodate developments in the controller protocol and hardware, drivers are continuously updated. Accordingly, always ensure that the latest driver is used in the application.

Settings

The chapter describes settings for the driver to be applied in the Studio and on the PLC programming software in case anything is required to ensure proper connection between HMI and target device(s).

Protocol Editor Settings

To configure the driver select the “ABB CoDeSys ETH” communication protocol from the list of available driver in the protocol editor.

The ABB CoDeSys ETH driver supports three different protocol types:

- Tcp/Ip Level2 Route
- ABB Tcp/Ip Level2 rounte AC
- Tcp/Ip

The protocol type can be selected from the dedicated combo box in the dialog.

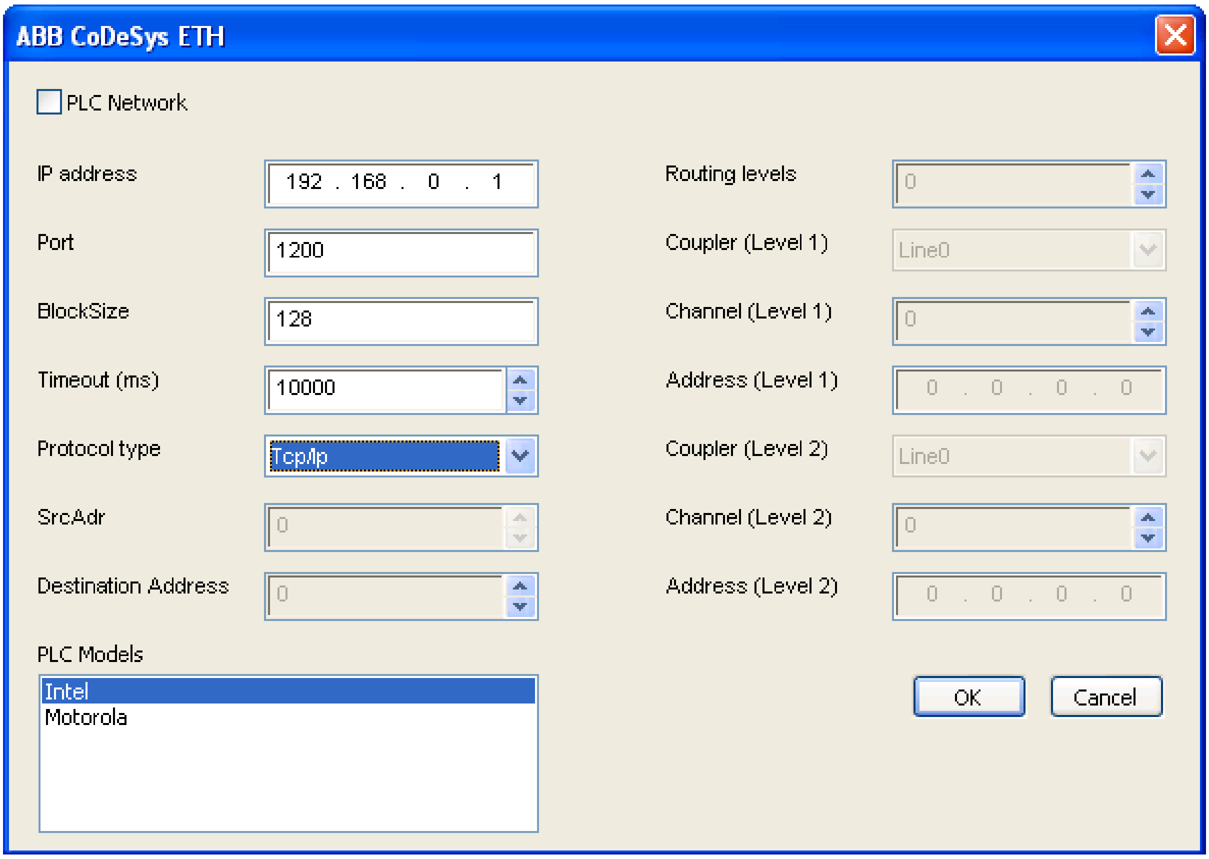

Figure 1

Some of the parameters of the dialog are common to the different protocol types, some others are specific.
The common parameters are the following:

IP address	Ethernet IP address of the controller
Port	This parameter allows changing the port number used for the communication. Default value for this parameter is set to 1200 for ABB drivers. For AC500 and 3S drivers select port 1201.
Block Size	Enter the max block size supported by your controller.
Timeout	The number of milliseconds between retries when communication fails.
PLC Model	Defines the byte order that will be used by the communication driver when sending communication frames to the PLC; Intel is also commonly referred as “little-endian”, Motorola as “big-endian” Select “Motorola” for AC500.
Protocol type	Shows a list with the available protocol variants. Please make sure you check what protocol variant is supported by the CoDeSys run-time you want to connect.
PLC Network	The protocol allows the connection of multiple controllers to one operator panel. To set-up multiple connections, check “Access Multiple PLC’s” checkbox and enter IP Address for all controllers.

The **Tcp/Ip** protocol type corresponds to the 3S Level 4 driver. It does require additional setup except for the common parameters.

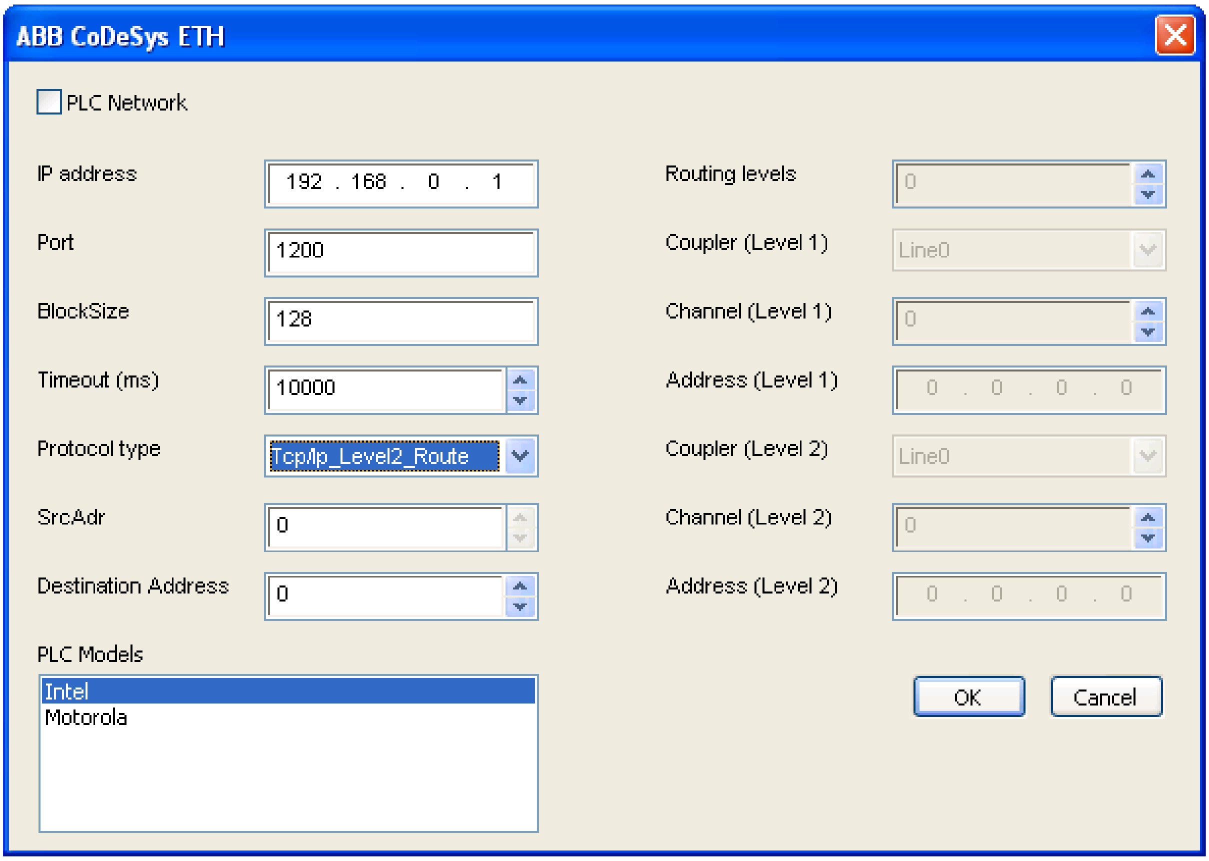

Figure 2

The **Tcp/IP Level2 Route** protocol type corresponds to the standard 3S Level 2 Route driver. For this protocol Type two additional parameters are requested:

Source Address (SrcAdr) & Destination Address	The Destination is the node of the PLC and allows the protocol to read variables in a sub-network. The address is used to read variables when multiple PLCs are connected in a sub-network (serial network) but only one of it has the Ethernet interface. This is currently not applicable for AC500 PLCs.

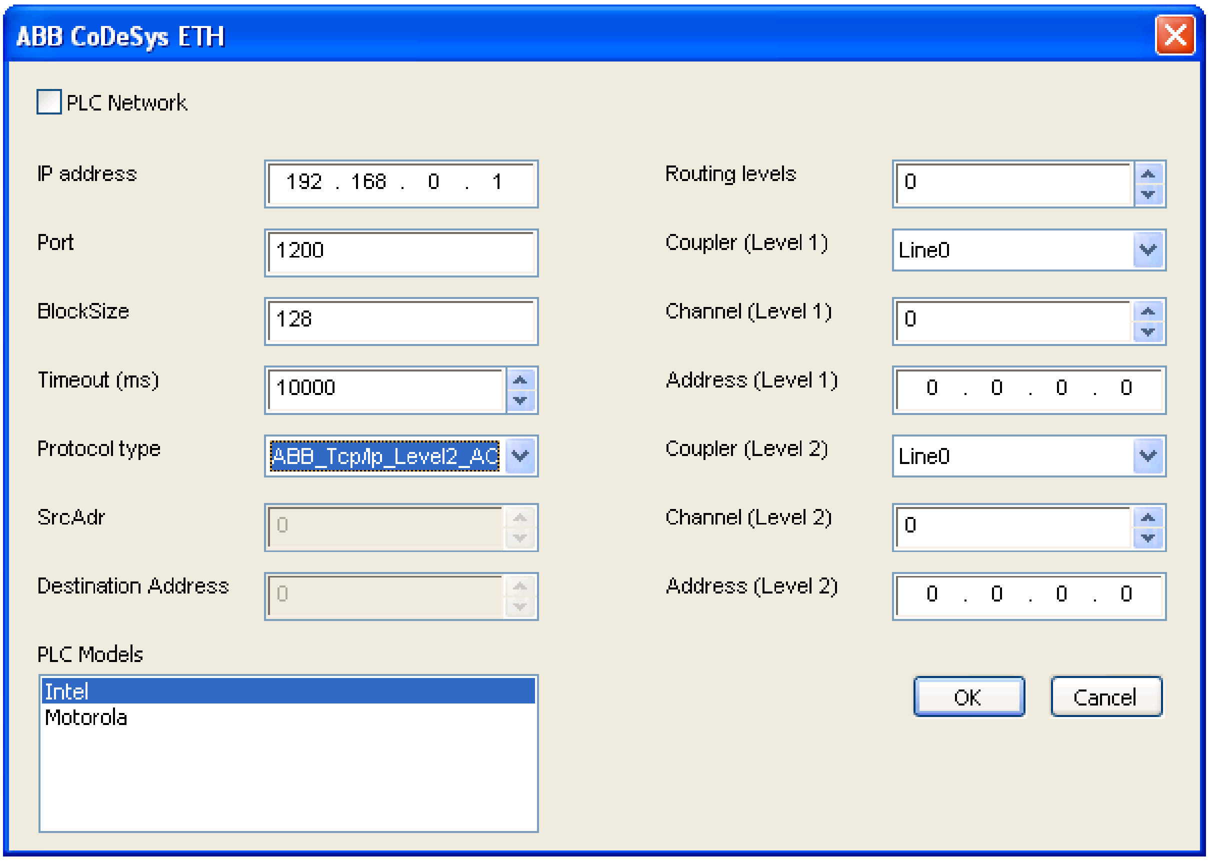

Figure 3

The **ABB Tcp/Ip Level2 AC** protocol type implements a specific variation of the standard Level 2 protocol with the additional use of a routing driver; this protocol type is normally used to connect to PLCs via other PLCs acting as gateways.

This protocol type requires the proper settings of the following additional parameters:

- Routing Levels
- Coupler (Level 1)
- Channel (Level 1)
- Address (Level 1)
- Coupler (Level 2)
- Channel (Level 2)
- Address (Level 2)

For detailed information we refer to the AC500 and Control Builder documentation, chapter "Programming interfaces to the AC500 used by the Control Builder".

CoDeSys Software Settings

When creating the project in CoDeSys, the option Download Symbol File (under Target Settings/General) must be checked.

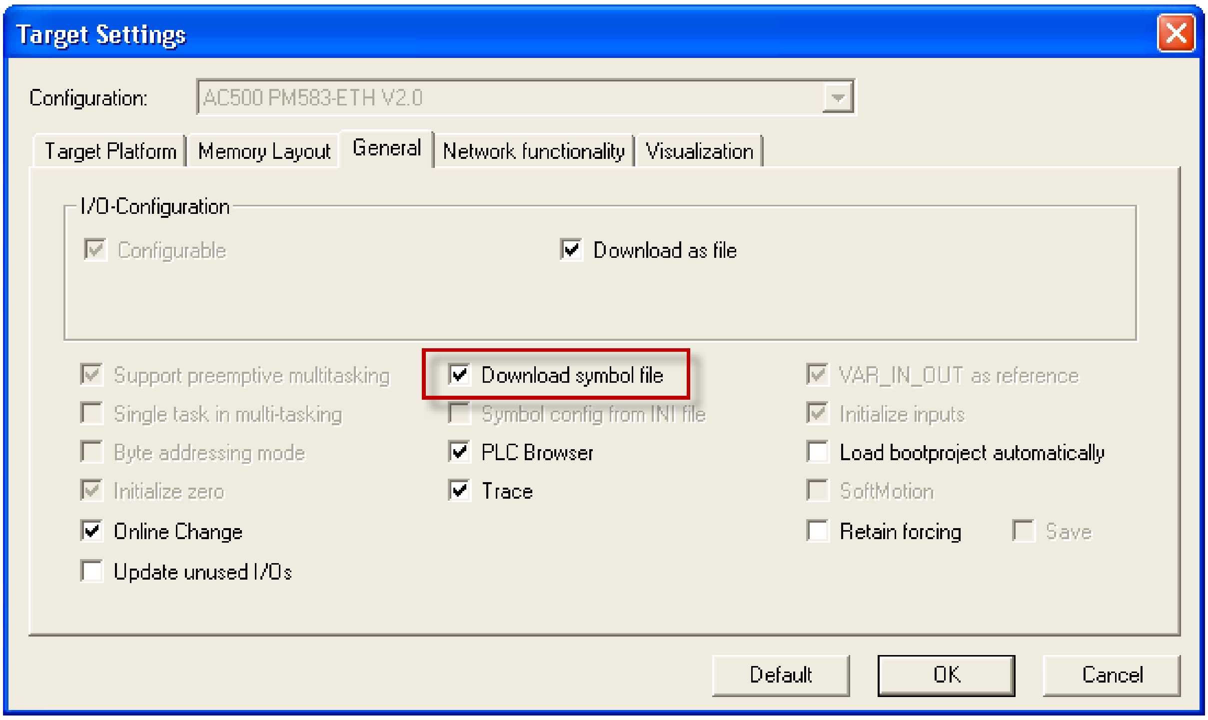

Figure 4

Note: ABB CoDeSys Ethernet driver supports the automatic symbol file (SDB) upload from the controller; any change in the tag offset due to new compilation on PLC software side does not require a symbol file re-import. The Tag file has to be re-imported only in case of tag renaming or addition of new tags.

Tag List Import

When configuring the PLC using the manufacturer’s configuration software, make sure to enable Symbol file creation (file with .SYM extension). It can be done under the CoDeSys programming software, by selecting “Project\Option\Symbol configuration” and mark the check box “Dump symbol entries” as shown in the picture below.

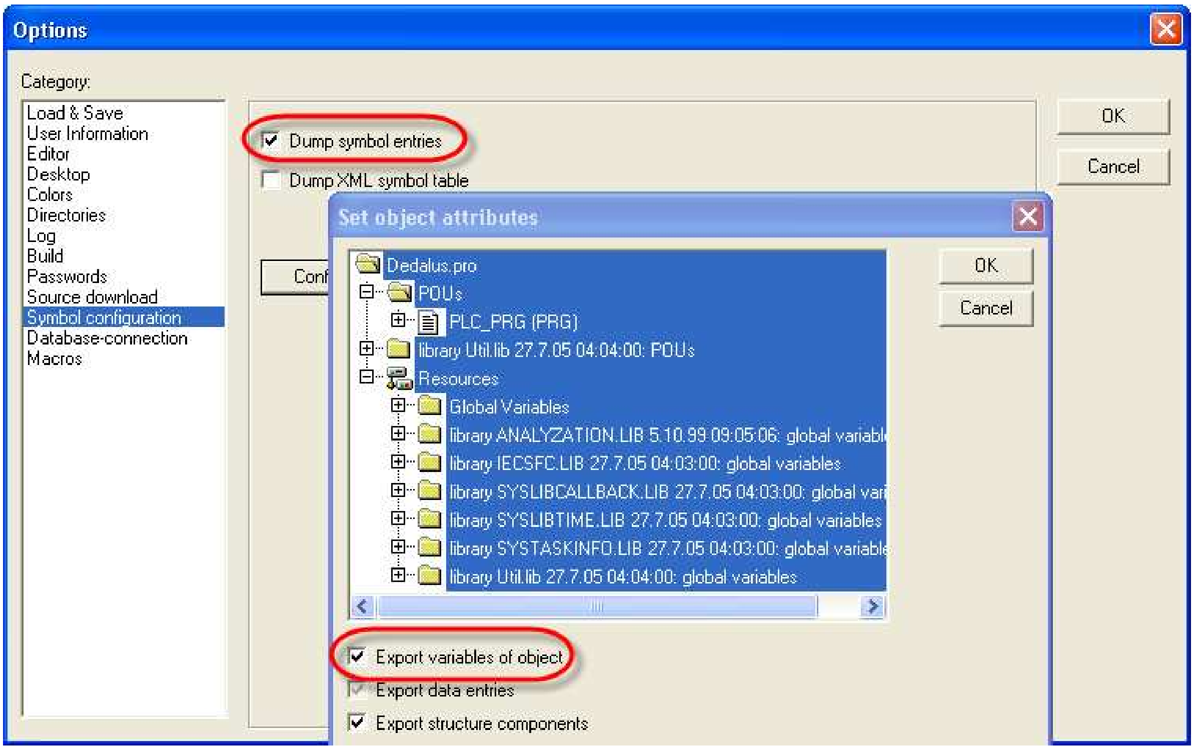

Figure 5

Click then on the “Configure symbol file…” button and make sure the “Export variables of object” check box is marked as shown in the following picture.
We recommend to un-check the check box and mark it again to be sure about the proper settings.

Data Types

The import module supports variables of standard data types and user defined data types.

Standard Data Types

The following data types in the CoDeSys programming tool are considered as standard data types by the import module:

BOOL
WORD
DWORD
INT
UINT
UDINT
DINT
STRING
REAL
TIME
DATE & TIME

and a 1-dimensional ARRAY of the types above.

The 64-bit data types LWORD, LINT and LREAL are not supported.

The string length of a STRING variable in the PLC should be max 80 characters. Declare a STRING variable either with a specifed size (str:STRING(35)) or default size (str:STRING) which is 80 characters.

Limitations

CoDeSys Level 4 is not supported. The max block size is 1024.

Communication Status

The current communication status can be displayed using the dedicated system variables. Please refer to the chapter “system variables” about available types and their use.

The codes supported for this communication driver are:

Error	Notes
Symbol file not present	Check Symbol file and download again the PLC program
“tag” not present in Symbol file	Check if the Tag is present in the PLC project
Time out on Acknowledge	Controller didn’t send acknowledge
Time out on last Acknoledge	Controller didn’t send last acknowledge
Time out on data receiving	Controlled does not reply with data
Connection timeout	Device not connected