FeABPLC

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User Manual
Windows software for TCP/IP communication with Allen Bradley PLCs.

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FeABPLC – User Manual

Introduction

FeABPLC is a Windows based, DDE Server, TCP/IP communication program designed to allow access to multiple remote Allen Bradley PLCs, and to be able to share the data with other DDE Clients.

The software is based on the library **libplctag** from **github.com** (*https://github.com/libplctag/libplctag*). It is an open source code that can be uploaded and used in other projects. The library was used in a .dll file and it was adapted to work with a DDE server. Extensive testing was done with PLC5, SLC500, Micrologix, CompactLogix and ControlLogix PLCs to read, write, or read/write tags.

This manual will cover the following topics:

1. Starting the program
2. Program configuration
3. PLC Clients Configuration
4. Tags definition
5. Conclusions

1) Starting the program

Create a new folder and copy the files *FeABPLC.exe*, *jlibplc32.dll* and *FeABPLC.lic* in it. If you do not have the file *FeABPLC.lic*, run the program *FeABPLC.exe*. You will get a message that the license file was not found and another message that the license is not valid. The program will end after it will create a new file *Hardware.lic*. This file should be sent to the software provider, who will generate a *FeABPLC.lic* file to match your hardware.
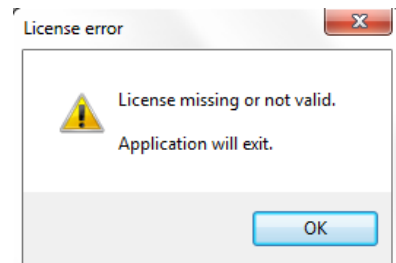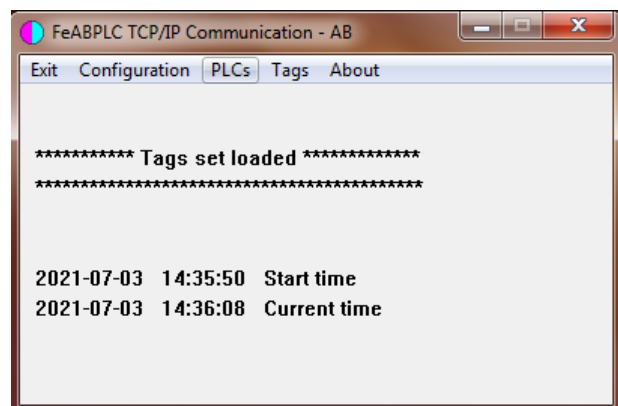
If you have the right license the program will start and it will create a default *AB.ini* configuration file. The main screen of the program is showing the menu: *Exit*, *Configuration*, *PLCs*, *Tags*, and *About*.

It will also show if tags are defined and loaded into memory.

The next step is to configure the program. For this select menu **Configuration**.

2) Program configuration

The configuration dialog is shown in the picture below. In the dialog window there are settings for:

- **Tags File Name** – defines the file from where the program will read the tags, if the check box **Auto load at start-up** is checked;
- **Client File Name** – defines the file from where the program will load the PLC connections to be made, if the check box **Auto load at start-up** is checked.
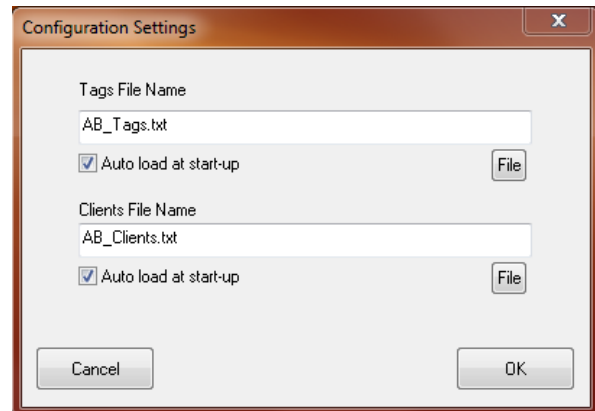

The names *AB_Tags.txt* and *AB_Client.txt* can be changed to suit the needs of the project.

3) PLC Clients Configuration

To start the PLC connection settings dialog, select menu **PLCs**. The **PLC List** is on top of the window. You can edit the **Server IP Address** field, select the **cpu type**, write the **Path** for communication, give a name in the **Server Name**, and click the **Add** button, to add a new PLC to the list. You can add multiple PLCs.

The communication **Path** is used for CompactLogix and ControlLogix PLCs. The format is x,y, where x is the backplane port which is always 1, and y is the slot number of the Ethernet communication module.

Every line in the **PLC List** represents a new TCP/IP connection with a remote PLC. To modify the settings, select the line, edit the changes in the **TCP/IP Connection** settings group, and press the **Modify** button. You can delete a selected line with the **Del** button.
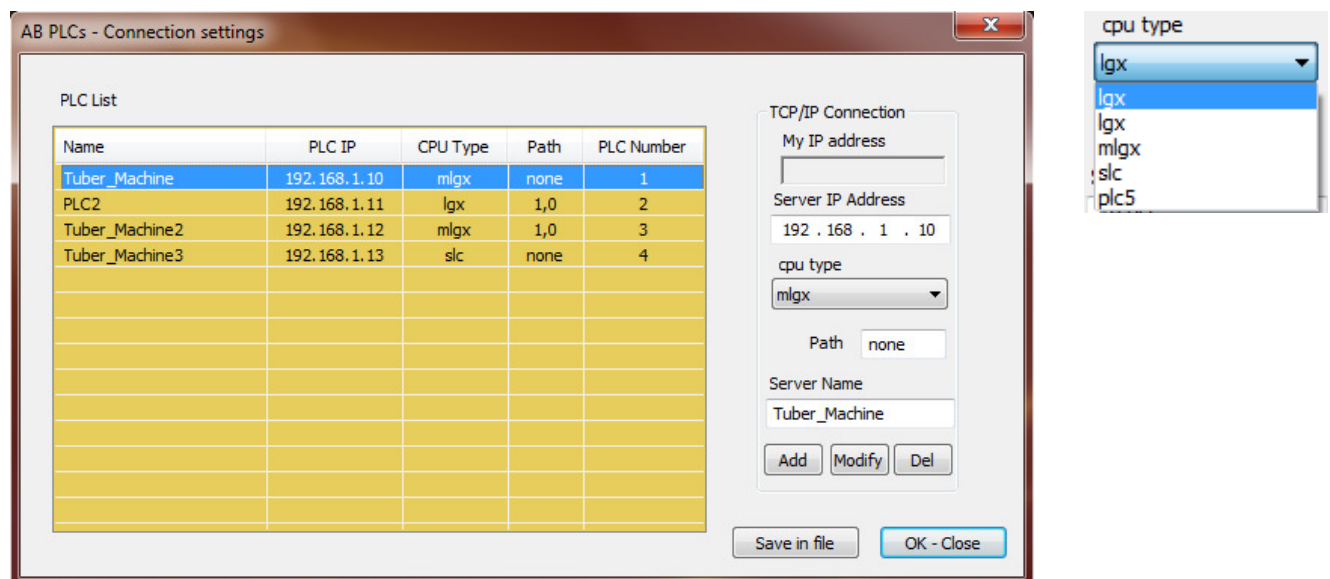
4) Tags definition

The tags in *FeABPLC* program are used for DDE communication. *FeABPLC* is a DDE Server with the default settings: DDE Application = "AB", DDE Topic = "TAGS" and DDE Item = "TagName", where "TagName" is the name of any tag defined by the user.

If *FeABPLC* is running and the user wants to start another instance of it, the following message will announce that the program is already running. The program will not start. This is because of the DDE Server status. The DDE Application + DDE Topic ("AB" + "TAGS") has to be a unique identifier. Another instance of the *FeABPLC* can be started with a command line like: "FeABPLC.exe AB2". In this case the DDE Application will be "AB2" and the DDE Topic will remain "TAGS". This way it is possible to have multiple instances of the *FeABPLC* program running in the same time, but with different DDE Application names.
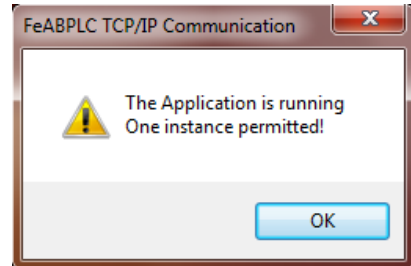
To start the setup dialog for the tags definition, select **Tags** from the menu (see picture below). To add a tag, type the DDE tag name in **DDE Tag Name** edit box, type the PLC tag name in **PLC Tag Name** text box, type the **PLC Number** to associate the tag with, type the cycle time for update in **Update Cycle [ms]**, select the **Data Type** (*Byte8*, *Int16*, *Word16*, *Int32*, *Long32*, *Float32*, *String*), select the **Update Type** (Read, Write, or Read/Write) and press the **Add** button.
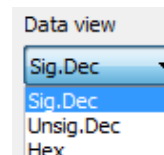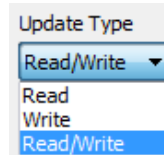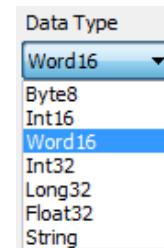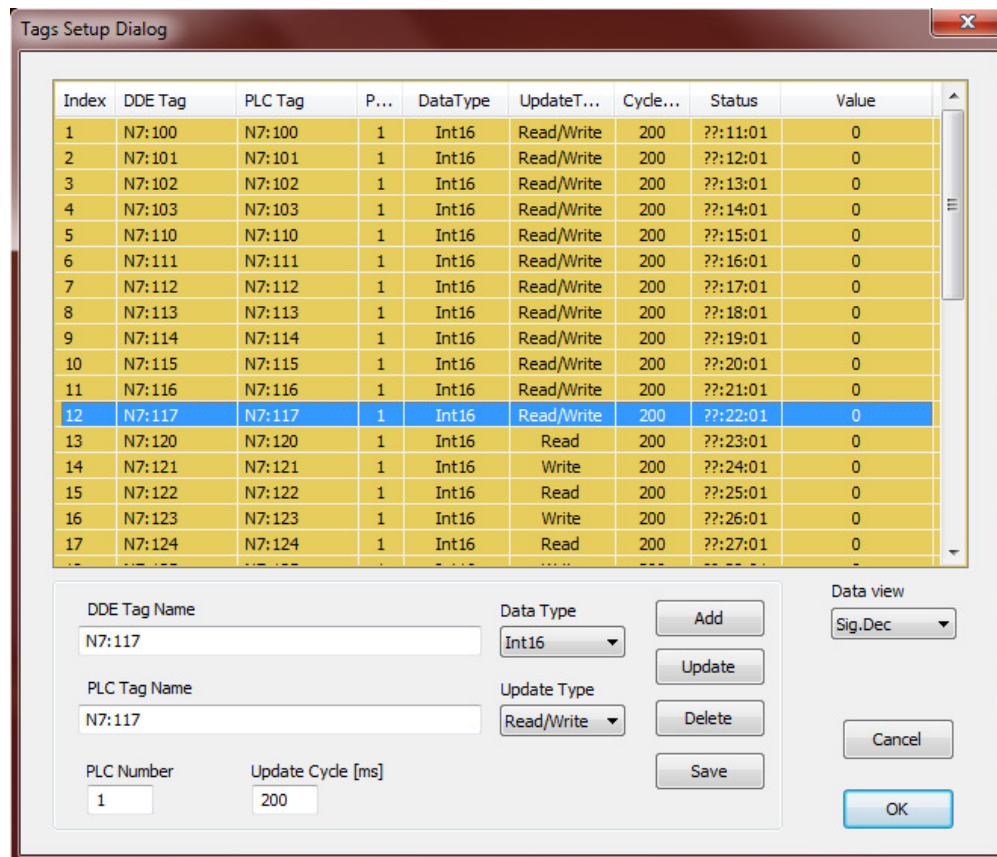
Byte8 is an 8 bit integer with no sign. *Int16* is a 16 bit integer with sign. *Word16* is a 16 bit integer with no sign. The *Int32* is defined as 32 bit integer with sign. The *Long32* is a 32 bit integer with no sign. For the data types *Int32*, *Long32*, and *Float32* the program is reading 2 consecutive 16 bits registers. The *String* data type is maximum 100 bytes, zero value terminated.

To change the settings of a tag, click on the tag line from the tags list, change the settings and press **Update** button to memorize in the list. You can double click some of the list fields to edit in-place. To save the tags in file press **Save** button. You have to restart the program for the changes to take effect.

You can sort tags in the **Tags List** by clicking on the column headers. For example: one click on **DDE Tag** column header will arrange all the tags alfabetically, increasing. A second click will arange the tags alfabetically, decreasing. The same is true for other column headers: **PLC Tag**, **PLC no.**, **Data Type**, **Update Type**, **Cycle[ms]**, **Status**. You have to save the tags list if you sort the tags in a desired way and you want to keep the order when the program will restart. By default the tags are sorted in the order of their creation/definition. You have to restart the program for the **Value** column to become active.

The **Status** colum is giving information about the tag, in the format: **XX:YY:ZZ**.

- **XX** is giving information about the tag creation, If negative (<0) then it was an error when the tag was created. If XX = '??', then it is a connection error with the PLC, or no change in the tag value for a long time, so it was not transmitted.
- **YY** is the number of the tag as it was created. The indexing is starting from 11 (12, 13, …).
- **ZZ** is showing the status of the tag, like in the table below, 00 is OK, 01 operation pending.

PLCTAG_ERR_ABORT	(-1)		PLCTAG_ERR_NOT_IMPLEMENTED	(-20)
PLCTAG_ERR_BAD_CONFIG	(-2)		PLCTAG_ERR_NO_DATA	(-21)
PLCTAG_ERR_BAD_CONNECTION	(-3)		PLCTAG_ERR_NO_MATCH	(-22)
PLCTAG_ERR_BAD_DATA	(-4)		PLCTAG_ERR_NO_MEM	(-23)
PLCTAG_ERR_BAD_DEVICE	(-5)		PLCTAG_ERR_NO_RESOURCES	(-24)
PLCTAG_ERR_BAD_GATEWAY	(-6)		PLCTAG_ERR_NULL_PTR	(-25)
PLCTAG_ERR_BAD_PARAM	(-7)		PLCTAG_ERR_OPEN	(-26)
PLCTAG_ERR_BAD_REPLY	(-8)		PLCTAG_ERR_OUT_OF_BOUNDS	(-27)
PLCTAG_ERR_BAD_STATUS	(-9)		PLCTAG_ERR_READ	(-28)
PLCTAG_ERR_CLOSE	(-10)		PLCTAG_ERR_REMOTE_ERR	(-29)
PLCTAG_ERR_CREATE	(-11)		PLCTAG_ERR_THREAD_CREATE	(-30)
PLCTAG_ERR_DUPLICATE	(-12)		PLCTAG_ERR_THREAD_JOIN	(-31)
PLCTAG_ERR_ENCODE	(-13)		PLCTAG_ERR_TIMEOUT	(-32)
PLCTAG_ERR_MUTEX_DESTROY	(-14)		PLCTAG_ERR_TOO_LARGE	(-33)
PLCTAG_ERR_MUTEX_INIT	(-15)		PLCTAG_ERR_TOO_SMALL	(-34)
PLCTAG_ERR_MUTEX_LOCK	(-16)		PLCTAG_ERR_UNSUPPORTED	(-35)
PLCTAG_ERR_MUTEX_UNLOCK	(-17)		PLCTAG_ERR_WINSOCK	(-36)
PLCTAG_ERR_NOT_ALLOWED	(-18)		PLCTAG_ERR_WRITE	(-37)
PLCTAG_ERR_NOT_FOUND	(-19)		PLCTAG_ERR_PARTIAL	(-38)

5) Conclusions

FeABPLC program is a versatile tool for communicating with different Allen Bradley PLCs. The program is a DDE Server for any DDE Client that is running on the same computer. For every PLC there can be defined multiple tags that can be setup to read, write or read/write from/to PLC in a cyclic mode. There is no software limit for the number of tags or of PLC connections that the program can open.