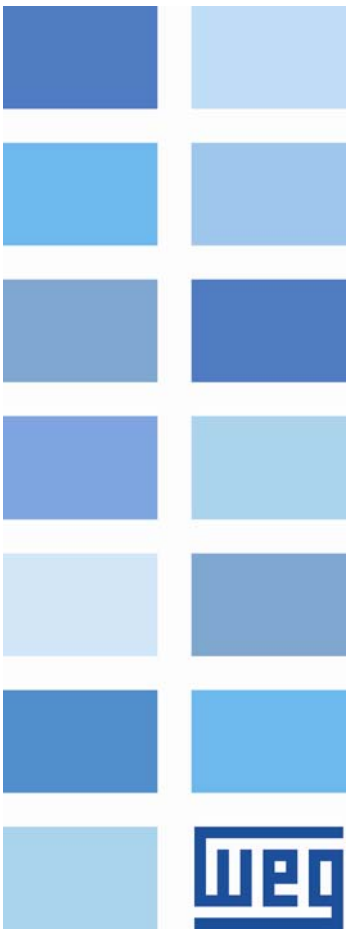
CFW-11 configuration in an EtherNet/IP network using Rockwell RSLogix5000

Application Note



Application Note – EtherNet/IP

Series: CFW-11

Language: English

Publication Date: 07/2011

CONTENTS

CFW-11 WITH ETHERNET/IP INTERFACE

The CFW-11 is a high-end general purpose frequency inverter, with excellent performance for speed and torque control, besides integrated PLC functions for positioning. Among its features, several accessories for communication are available, which allow its use in different systems and applications.

The presented document describes how to use CFW-11 frequency inverter with Anybus-CC for EtherNet/IP accessory. The following material has been used to configure and operate CFW-11 in the EtherNet/IP network.

Hardware:
ControlLogix platform with EtherNet/IP scanner:
- Power Supply
- Rack (7 slots)
- CPU Logix 5555 (1756-L55/A revision 16.3)
- EtherNet/IP scanner (1756-ENBT/A revision 3.9.1)

D-Link Ethernet Switch DES-1008D
CFW-11 frequency inverter with Anybus-CC for EtherNet/IP accessory

Software:
RSLogix5000 version 16.00
Anybus IPConfig V1.5.1.1 (supplied in the CFW-11 CD-ROM)

Documents:
Installation, Configuration and Operation Guide for Anybus-CC
CFW-11 Programming Manual
Anybus-CC User's Guide for CFW-11

NOTE!
Several options and procedures for using the necessary software for PLC programming are not described in this document. The user is required to have good knowledge about this software in order to follow the described steps.

STEP 1: INSTALL ETHERNET/IP INTERFACE AND CONFIGURE CFW-11 PARAMETERS

In order to install EtherNet/IP module in CFW-11, follow the procedures described at "Installation, Configuration and Operation Guide for Anybus-CC".

***Figure 1:** Anybus-CC Installation*

Only after the installation, the parameters related to Anybus-CC interface are available via keypad. Some important parameters[1] for Anybus-CC communication in CFW-11 are:

- P0723 Anybus Identification: read only parameter to verify if Anybus-CC accessory is properly installed and the model of Anybus-CC interface detected.
- P0724 Anybus Communication Status: read only parameter to check the communication status between drive and EtherNet/IP scanner (master).
- P0727 Anybus I/O Words: parameter to program the number of I/O words for cyclic data exchange with the master.
- P0728 to P0733 Anybus Read Words: parameters to program which data should be available at input area (CFW-11 sends to scanner).
- P0734 to P0739 Anybus Write Words: parameters to program which data should be available at output area (scanner sends to CFW-11).

NOTE!
If any of these parameters are changed, it is important to power the drive off and on again.

[1] For the detailed description of these parameters, as well some other important parameters for drive communication, refer to Anybus-CC User's Guide for CFW-11.

STEP 2: MAKE ETHERNET CONNECTIONS AND SET IP ADDRESS

The following figure describes the devices connected to EtherNet/IP network.

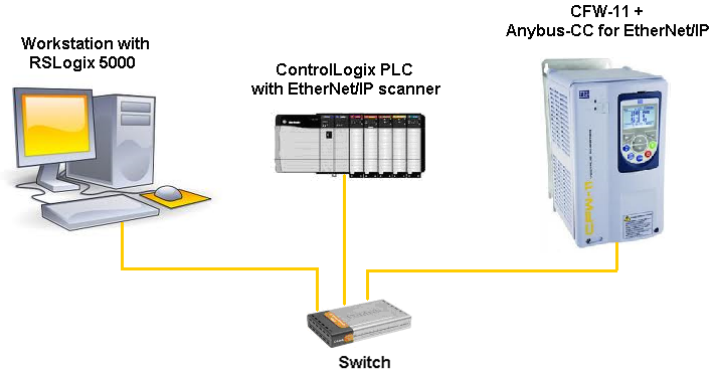


Figure 2: *PROFINET Topology*

To set the IP address for Anybus-CC it is necessary to use the Anybus IPconfig software. Once the PC is connected to the network, just install and run the software and it will show a list with all detected Anybus-CC modules. Double click the desired module and it will be possible to change the IP address and other properties, like the subnet and DHCP.

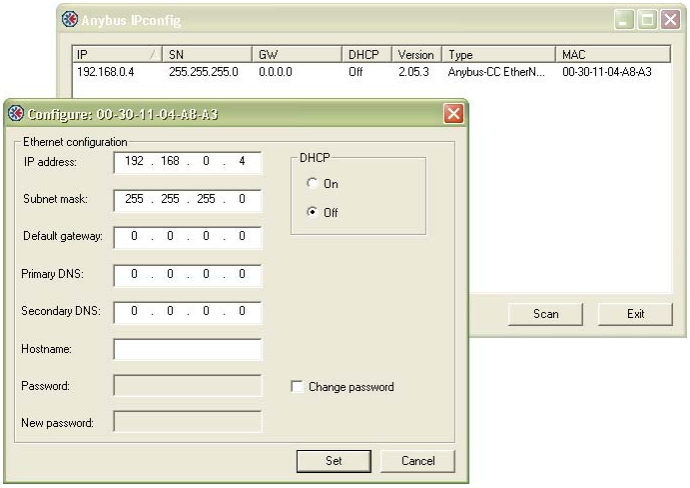


Figure 3: *Anybus IPconfig software*

With the IP address it is possible, for instance, to use a WEB browser to check I/O data for CFW-11.

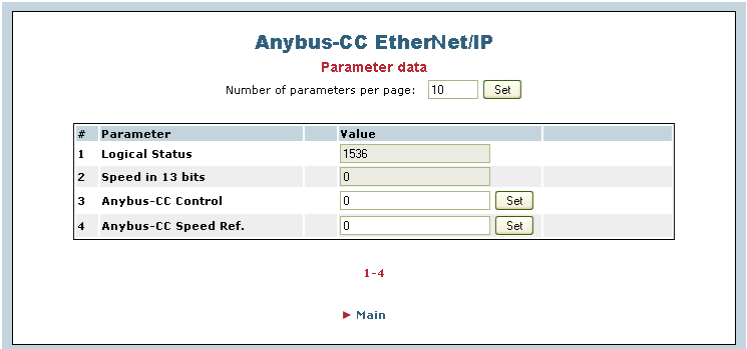


Figure 4: *WEB page with I/O data for CFW-11*

STEP 3: CONFIGURE PLC

Using RSLogix 500, create a new project and select the desired type of PLC – in this case, 1756-L55. In the I/O Configuration, select the communication module for EtherNet/IP interface – 1756-ENBT/A.

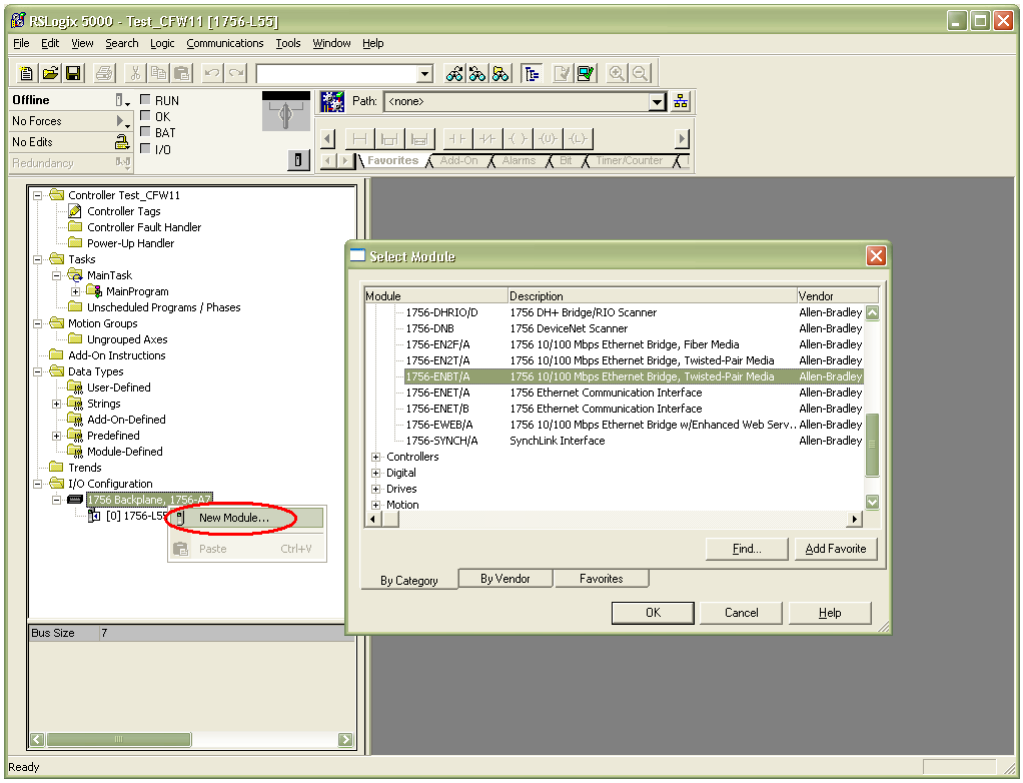


***Figure 5:** PLC configuration*

Select the module properties, including the IP address, and an EtherNet/IP interface for the PLC will be created.

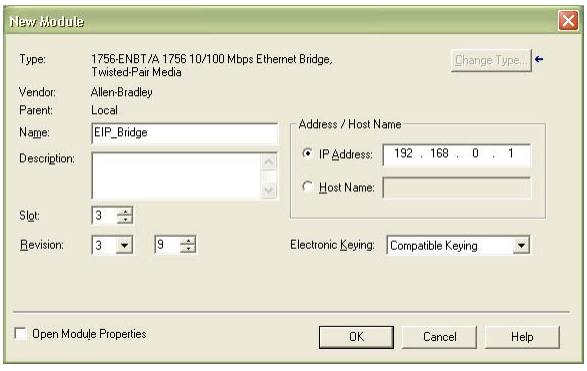


***Figure 6:** EtherNet/IP Bridge Properties*

STEP 4: ADD NEW ETHERNET/IP SLAVE

With the Ethernet interface, configure the devices connected to it. To do that, on the EtherNet/IP Bridge, right click and add a new module representing the Anybus-CC for EtherNet/IP. The module type for CFW-11 with Anybus-CC is “Generic Ethernet Module”, on the “Communications” category. No EDS file is needed for this configuration.

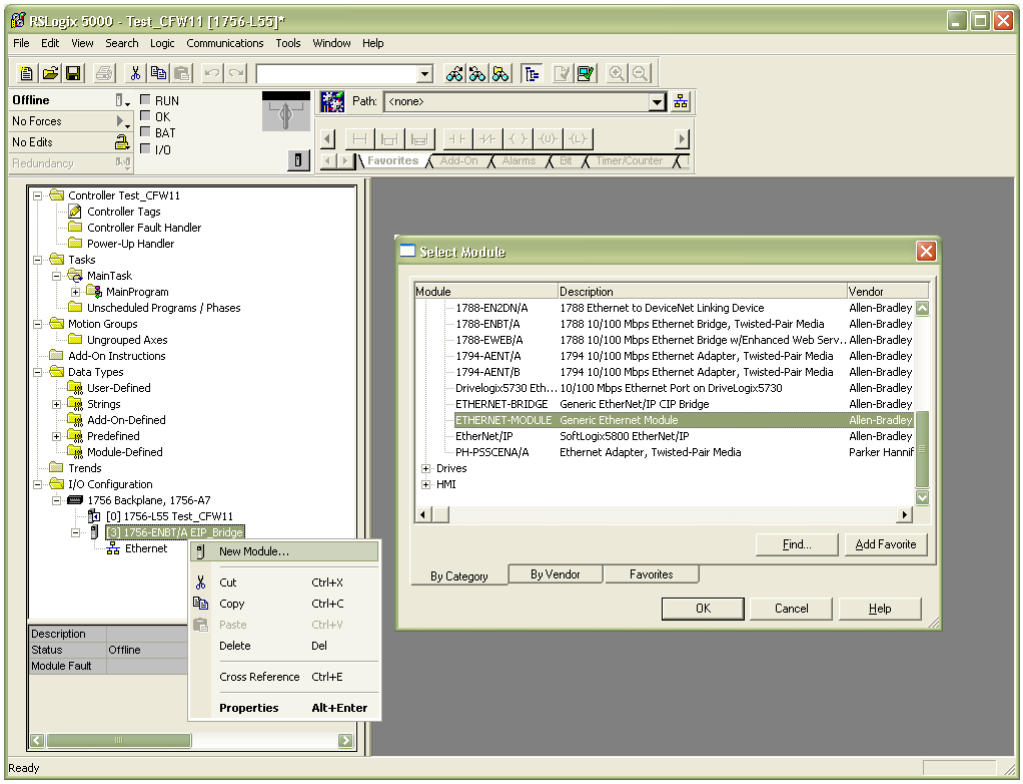


***Figure 7:** Adding new module representing CFW-11*

In the next dialog, configure the properties for the module. The following fields are necessary:

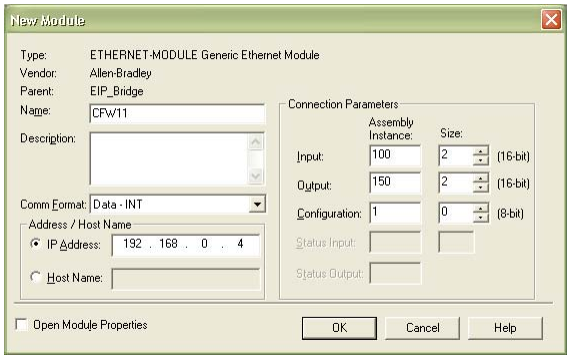


***Figure 8:** Configuration of IP address and I/O data for CFW-11*

- Name: just enter the desired name for the device in the application.
- Comm Format: it represents the format for the CFW-11 I/O data. The I/O area is composed by drive parameters, which are always 1 word (16 bits) in size, so select “Data – INT”, that represents this type of data.
- IP Address: enter the IP address configured for the Anybus module using Anybus IPconfig software.

- I/O Assembly Instances: I/O data is accessed in input instance 100 and output instance 150, so these values have to be entered as the instance values for input and output.
- I/O Size: the I/O data size programmed at P0727, in words. For this project, we are using 2 words of input and 2 words of output.
- Configuration: module does not have a configuration assembly instance by default, but RSLogix5000 requires a value for this anyway; any non-zero value will work. The configuration size, however, must be zero.

Once the module is configured, just download the configuration to PLC to start communicating with CFW-11. To download the configuration, open the “Who Active” tool to select the communication path, find the CPU and download the project.

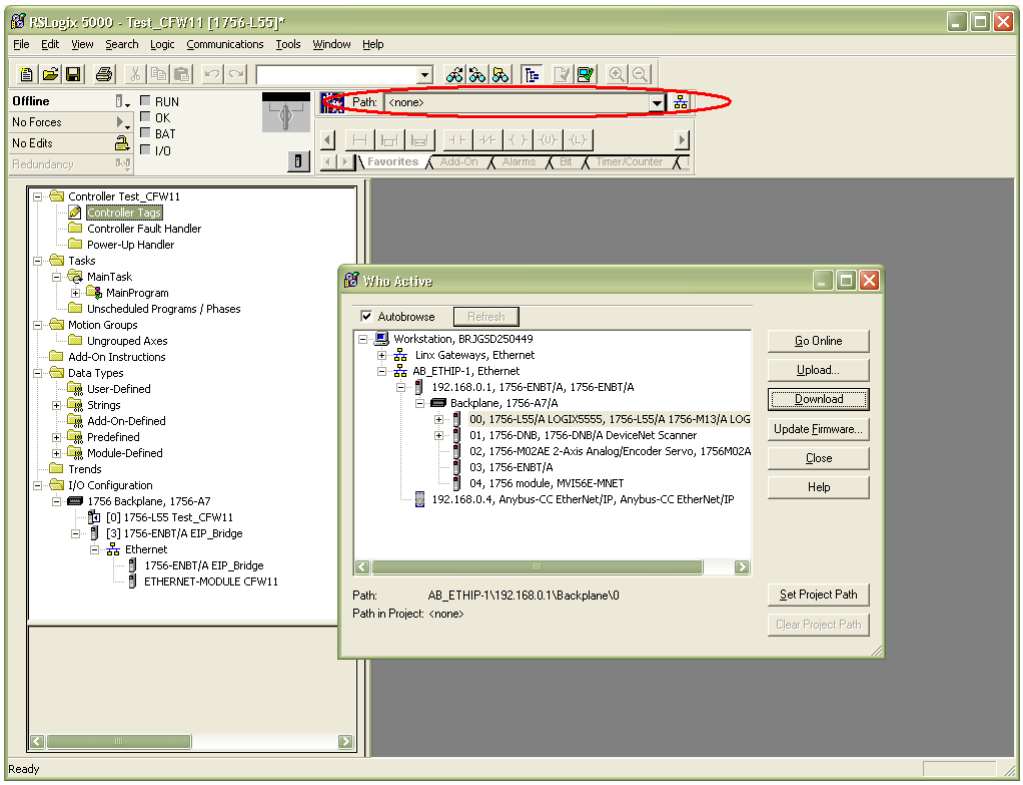


***Figure 9:** Download configuration*

With the project downloaded and the CPU in RUN mode, the communication status indicated at P0724 should go to “Online”. This indicates there is cyclic communication between the EtherNet/IP scanner and CFW-11.

STEP 4: ACCESS I/O DATA FOR DEVICE MONITORING AND CONTROLLING

In online mode it is possible to access the CFW-11 I/O data directly, using the “Controller Tags” structure. Here, it is possible to monitor the 2 input words, for status and motor speed, and control the 2 output words, for command and speed reference.

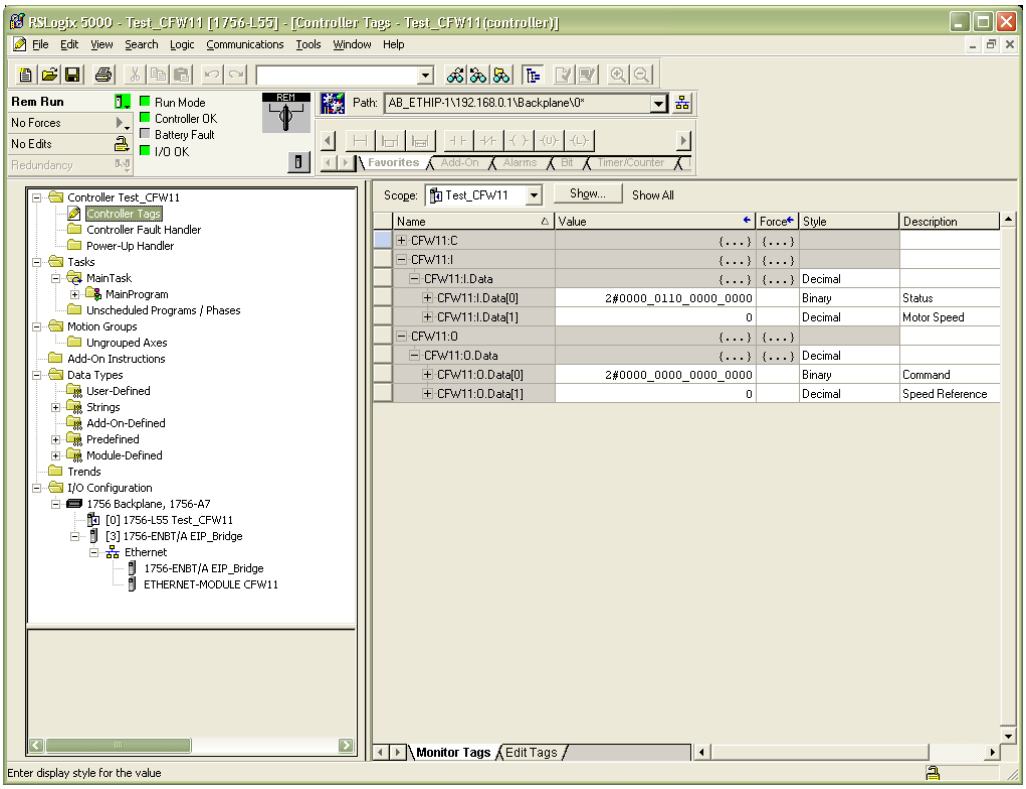


***Figure 10:** Monitor and control I/O data*

Using this structure, it's possible to monitor the received values or manually change the transmitted values to the drive. The presented tags should be used by the ladder software to control the drive as requested by the application.

STEP 5: ACYCLIC REQUESTS

Besides the I/O data exchange with CFW-11, it is possible to send acyclic requests to access other drive parameters via EtherNet/IP, using CIP explicit messages.

Firstly, on the controller tags, it is necessary to edit and create a new tag of "MESSAGE" data type. This tag, named here as "acyclic_msg", will be used by the "MSG" block, on the Main Routine.

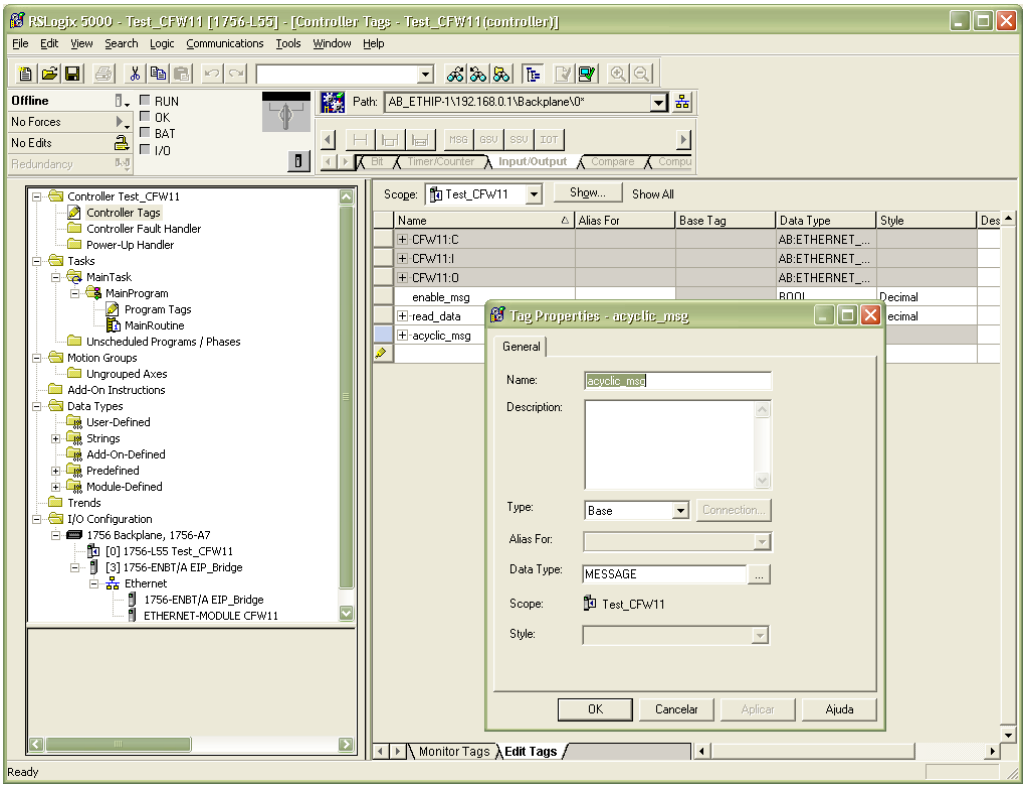


***Figure 11:** Tag creation for acyclic messages*

On the configuration of the "acyclic_msg", the following fields must be defined:

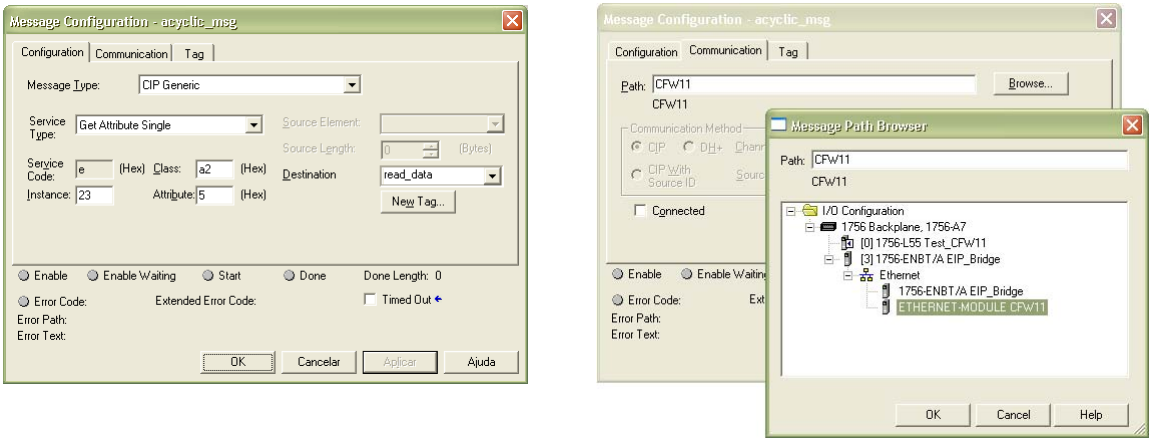


***Figure 12:** Message configuration for parameter access*

- **Message Type:** CIP Generic.
- **Service Type:** to access the drive parameters, 2 services are available:

  - Get Attribute Single, to read drive parameters.
  - Set Attribute Single, to write drive parameters.
- **Class, instance and attribute:** these fields represent the object path for parameter access, as defined by the Anybus-CC user's guide. For CFW-11, the following values must be used:
  - Class: 0xA2.
  - Instance: represents the parameter number to access. In this case, we will read the content of P0023 – Software Version.
- Attribute: 0x05.
- **Source element:** for write access, it represents the tag with data to write to the parameter. Only one parameter can be read by each request.
- **Source Length:** the length of the source element, in bytes. Any drive parameter has the size of 1 word (2 bytes), so this length must be 2.
- **Destination:** for read access, it represents the tag where the read data will be stored. For this example, the "read_data" tag will receive the value read from P0023.
- **Communication Path:** select the path for the device you want to send the message.

Once the message configuration is defined, on the Main Routine, program a "MSG" block using the created "acyclic_msg" tag. Every time the input of "MSG" block is activated, the EtherNet/IP controller will send an acyclic request message to the drive, according to configured.

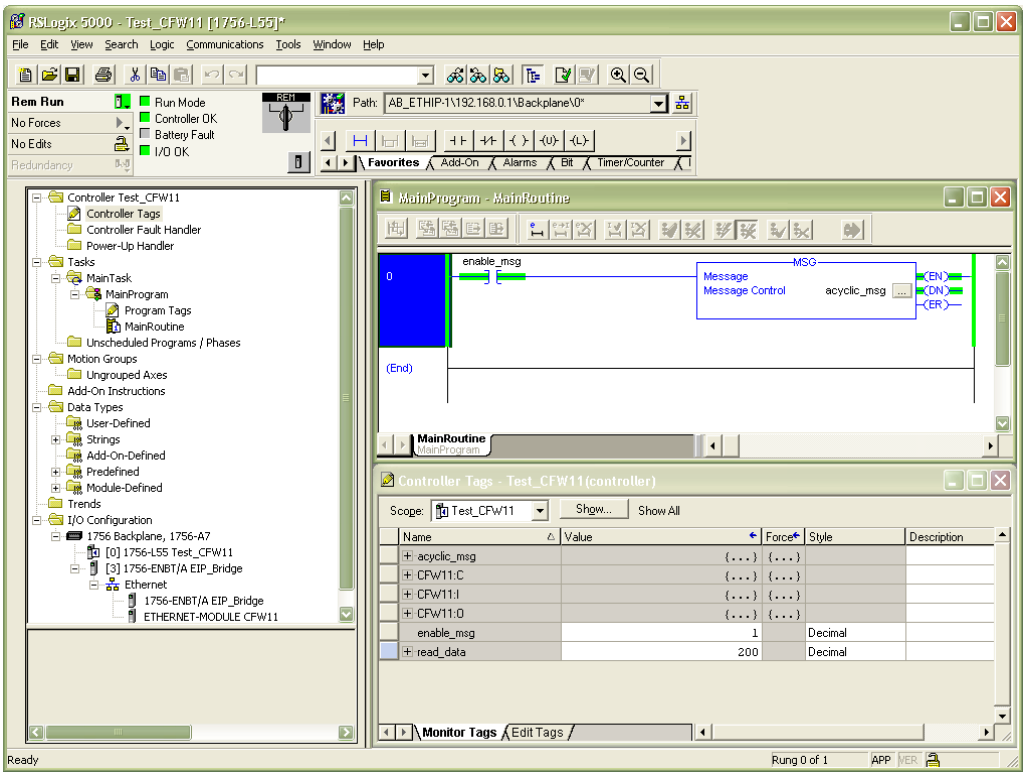


***Figure 13:** Acyclic write request*

For this example, an acyclic request has been sent to read the value of P0023 – Software Version. The value was stored at "read_data" tag. The read or write values are always transmitted as an integer value, with no decimal representation. So, for this example, the value 200 for P0023 represents the software version V2.00.

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