Profinet Connection to easYgen3000XT

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Requirements:

- easYgen3000XT
- Anybus Profinet converter AB7013-C [it's successor is HMS ABC3013] *** this manual hasn't been updated yet and represents AB7013-C ***

1.0 Introduction

This Article describes the Profinet connection on easYgen3000XT genset controller via Anybus Modbus/Profinet converter. This application note covers the basic functions, which are required. The Modbus functionality is a subset of features in the easYgen3000XT. This application description consists of two sections:

1. how to connect and configured easYgen3000XT for use of Modbus-RTU together with the Anybus converter.

2. configuration of the Anybus AB7013-C converter

1.1 General remarks to the configuration

The configuration of Modbus-RTU basically consider the following frame conditions:

- RS485 Interface
- Baudrate
- Stop bits
- Connection Mode
- Modbus Slave ID
- Replay Time
- Password Protection
- Modbusregister list

2.0 Configuration

2.1 Define requested Modbus parameter

Open the user manual from easYgen3000XT an navigate the the Modbus protocol appendix. (eg. manual of easYgen3200XT - chapter "9.2.4 Protocol 5010 [Basic Visualization])

Inside the manual the required register can be chosen.

Parameter for this application note

easYgen3200XT Protocol: 5010

Register	Count	Description
50009	13	Generator values
50022	2	Busbar values
50030	11	Mains values
50051	8	Analog values
50099	2	Controller mode
50102	5	Controller bits
50108	1	Relay outputs
50110	1	IKD1M outputs
50115	1	General alarm
50120	1	Engine alarm
50126	1	Generator alarm
50128	1	Generator alarm2
50132	1	Mains alarm
50191	7	ECU Alarm
50201	108	ECU values

2.2 Setup the easYgen3200XT für modbus communication

2.2.1 Connect to easYgen3200XT via Toolkit

Start Toolkit



Select the configuration for your easygen3000XT (in this case easYgen3200XT) device.

In this example we use parameter file 8440-2082-L

You can download the easYgen3200XT toolkit configuration from the easygen device or from the Woodward support page.

Required information:
Partnumder: 8440-2082
Revision: L
Application type: Toolkit

After installing the configuration you can choose the configuration. If the correct configuration is selected, Toolkit will show the following screen:



Now you can click on connect and choose your favorite connection type “USB” or Ethernet and click on 'Connect'.

After connection to the easYgen3200XT device you have to enter the user and the password.

User: CL05
Password: CL0500



Enter the Parameter an click on Log In.

Now you are able to configure the Modbus parameter

First we have to change the RS485 interface setting this can be done in the parameter section.

PARAMETER -> Configure Interface -> Configure RS485 Interface









Change the following parameter on this screen.

3173 Full-, halfduplex mode -> halfduplex

9128 Password Protection -> off

All other parameter can remain as they are.

As a next step it is required to set the data protocol for the interface,

PARAMETER -> Configure Interface -> Modbus Protocol









Change the following Parameter:

3184 Modbus protocol number -> 5010

The configuration on easYgen3200XT side is finished.

2.1.2 Wiring for RS485 connection



Wiring description

Pin easYgen3200XT	**Pin Anybus 7013-C conveter**
RS485.6 (Z)	Sub-D 9Pol connector Pin 9
RS485.5 (Y)	Sub-D 9Pol connector pin 8
On last easYgen on your bus install 120 ohm resistor.	Between 8 and 9 install 120Ohm resistor

2.1.2 configuring Anybus converter 7013-C

With the register table we can create our easYgen3200XT Tempate in anybus configuration software

Let’s start to build the template:

Start Anybus configuration software

Next – choose “Wizrad – Modbus RTU Master”, click on OK.

The Wizard starts and you can go ahead with he configuration.

First chose the communication from your scada or PLC system in our Example Profinet-IO

Click on 'Next'

On this screen you have to choose the IO settings, let this on automatic, so the converter will do this calculation.

Change the Sub-D 9-Pol interface setting to fit the easYgen settings:

Description	From	To
Physical Standard:	RS232	RS485
Bitrate	9600	19200
Parity	None	None
Data bits	8	8
Stop bit	1	1

Click on 'Next'

Inside the following mask you can create your device template, this is helpful if you have the same device on different gensets, so you can import the template to the Anybus software.

First we choose the name of the device template: “easygen3200XT2-12-1” -> this file is attached to this article

Now click on create Parameter, this will insert one row in which you can add the first register and the register count and register type.

The number “four” at the beginning of the register number descript the modbus commend.

Example: 50009 + 400000(read holding register area) = 450009

Read/Write	First number of register	Function Code	Register Type
Read	0	01	Read Coil Status
Read	1	02	Read Input Status
Read	4	03	Read Holding Registers
Read	3	04	Read Input Registers
Write	Not used	05	Write Single Coil
Write	Not used	06	Write Single Holding Register
Write	0	15	Write Multiple Coils
Write	4	16	Write Multiple Holding Registers

This step can be repeat until all requested registers are created.



Click on "Save Device", then you are able to save the template from your created list.

Click on 'Next'.

Inside the following screen we create our subnetwork, this means the connection from Anybus converter to easYgen.



Click on 'Create node', this will add a device to your subnetwork, the only thing you have to do is to write a name, set the device ModbusID number and choose your prepared template.



Click on 'Next'.

The screen below shows the requested register inside you previous created node.



Now you have to add all register from your template to this list. Click on 'Add Parameter' and insert all Parameters





Repeat this until all Parameters are added.



Click on 'Next'.

Now you can save you configuration as text file or print your configuration.



Click on 'Next' -> now you have finished you configuration!

2.1.2 transfer parameter to Anybus converter 7013-C

First connect your RS232 interface with anybus converter for transferring Parameter

choose 'Tools'-> 'Port'-> (your RS232 com Port)



Click on Connect Icon



If the connection is successfully established, this will be shown with a connection symbol and a green circle on the right side of the bottom.

Click on “download to communicator RS232/422/485“ to send the parameter to the converter.



Now you are able to set a name for this configuration and you can add an encryption password.



Click on 'OK' and the transmission will start.

Once the transfer finished you'll be ready to enable the communication between the easYgen and the Anybus converter.

To do this click on subnet monitor.



On the subnet monitor you have to click on 'File'-> 'Start Network', this will enable the communication between the easYgen and the Anybus converter.



Please make sure to take a note of the shown bytes in your converter!
This is required to calculate the block configuration for the SCADA engineer.

The Anybus converter configuration is finished ant the converter is ready for use!

2.1.3 LED description







3.0 Profibus Block calculation

On page 26 there is a byte count shown, this count has a number of 326.

Calculation example 1:

Lets ay we use a configuration staring the 16 byte blocks.



Rest of 6 bytes

Now we use a block of 4 bytes



Rest of 2 bytes

Now we use a block of 2 bytes



The calculation is finished

This is our calculated configuration for Profinet

16F 16F 16F 16F 16F 16F 16F 16F 16F 16F 16F 16F 16F 16F 16F 16F 16F 16F 16F 4F 2F

Calculation example 2:

Lets use ab lock with 256 bytes for beginning.



Rest of 70 bytes

Now we use a block of 64 bytes



Rest of 6 bytes

Now we use a lock of 4 bytes



Rest of 2 bytes

Now we use a block of 2 bytes



The calculation is finished

This is our calculated configuration for Profinet

256F 64F 4F 2F

4.0 Recommended Downloads Links

Anybus downloads

Link GSD-file:
https://www.anybus.com/docs/librariesprovider7/default-document-library/firmware-software/hms-xml-abc-prt.zip?sfvrsn=6f9dabd6_9

Link Anybus Tool:
https://www.anybus.com/docs/librariesprovider7/default-document-library/software/hms-scm-1204-169.zip?sfvrsn=f1eaa9d6_14

Link Anybus IP-Tool:
https://www.anybus.com/docs/librariesprovider7/default-document-library/software/ipconfigtool.zip?sfvrsn=6e1142d7_59

Woodward downloads

Woodward Toolkit
https://www.woodward.com/en/support/software%20assets/service%20tool/2021/10/19/20/57/9927-1226-dr

Woodard configuration files
https://www.woodward.com/en/support/industrial/technical-help-desk/control-configuration-files