Anybus BACnet to Modbus Gateway
Using the Anybus Profile Builder

History

Revision	Date	Description	Author
1.00	September 2014	First release	SDa

Contents

1 Overview

The Anybus Profile Builder is an Excel tool for creating and editing profiles for use in the Anybus BACnet to Modbus Gateway. The tool generates the required files directly, which can then be verified with the Profile verification tool.

Poll YES/NO	Bacnet Object Name	Modbus Variable Type	1 to 65536 Data Format	Bit #	Low Actual	High Actual	Low Scale	High Scale	Read Only or R_W	Bacnet Type (AI etc.)	Bacnet Object Description	COV Increment	Unit Group	Unit Value	Grouping YES/NO	Update On Reconnect
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO
YES		_4_Holding_Register	16 Bit Unsigned Integer	None	0	1	0	1	R_Only	AI	Not Defined	0	Other	NO_UNITS	YES	NO

2 Overview of how to Build a Profile

1. Save the Anybus Profile Builder to a directory, as the tool will generate its own files here.
2. Start the Anybus Profile Builder.
3. Enable macros/content in Excel.
4. Enter a name and revision for the profile in the boxes at the upper left.
5. Enter the data in the relevant columns, referring to the descriptions below.
6. Click the button **Build LX File**. Two files will now be generated. The first is the documentation file (xls), and the other is the profile file (csv).
7. Check the profile file (.csv) created by the tool, using the Profile verification tool.
8. Upload the profile file (.csv) to the Anybus BACnet to Modbus Gateway.

3 Parameters

The following descriptions apply to the various columns in the Anybus Profile Builder.

3.1 General

Product Name contains the file name that will appear in the Anybus BACnet to Modbus Gateway droplist box. A maximum of 40 alphanumeric characters may be used, as well as the _ (underscore) character.

Rev Level is for the revision of the profile. Enter a vaue a-z.

3.2   Data fields

Data fields may not contain spaces or non-printable characters. Additionally, the following characters are not allowed: & : ' " All other cells in row 1 must be blank.

3.2.1   Column A (Poll YES/NO)

This value represents the polling flag and contains the word YES or NO, which are default conditions. The YES will be interpreted by the Anybus BCAnet to Modbus Gateway as a checked box to poll for the variable, while NO is an unchecked box indicating that polling will not occur.

3.2.2   Column B (BACnet Object Name)

This must be unique and contain 1-64 characters, with no commas. Note that the name will not be checked in the profile builder, but any duplicates will be detected when running the verification tool.

3.2.3   Column C (Modbus Variable Type)

This contains the Modbus data type, which is defined by an underscore followed by the Modbus data type (0, 1, 3 or 4), followed by a second underscore and a description. For example: _4_Holding_Register.

3.2.4   Column D (1 to 65535)

This column contains the Modbus register address.

3.2.5   Column E (Data format)

This is the data format for the Modbus register. The following formats are available:

- 16-Bit Unsigned Integer — 16 bits read as 0 to 65,535.
- 16-Bit Signed Integer — 16 bits read as –32,768 to 36,767.
- 32-Bit Unsigned Integer LO/HI — 32 bits read as 0 to 4,294,967,295, with the least significant word at the base address.
- 32-Bit Signed Integer LO/HI — 32 bits read as –2,147,483,648 to 2,147,483,647, with the least significant word at the base address.
- 32-Bit Unsigned Integer HI/LO — 32 bits read as 0 to 4,294,967,295, with the least significant word at the base address + 1.
- 32-Bit Signed Integer HI/LO — 32 bits read as –2,147,483,648 to 2,147,483,647, with the least significant word at the base address + 1.
- Floating Point LO/HI — 32 bits read as –3.4028235E+38 to 3.4028235E+38 with the least significant data at the base address.
- Floating Point HI/LO — 32 bits read as –3.4028235E+38 to 3.4028235E+38, with the least significant data at the base address +1.
- Bit16 — 16 bits read as 0 or 1 per bit, Bit number is specified in column K
- Bit32 LO/HI — 32 bits read as 0 or 1 per bit, Bit number is specified in column K with the least significant data at the base address.
- Bit32 HI/LO — 32 bits read as 0 or 1 per bit, Bit number is specified in column K with the least significant data at the base address +1.

3.2.6   Column F (Bit#)

Typically "None", this is for references to 0aaaaa and 1aaaaa and for the bit picking of 3aaaaa or 4aaaaa references. A 6–digit addressing scheme is used, with "aaaaa" representing an address in the range 1-65535.

If a bit pick is to occur, a value 0-15 (16 Bit), or 0-31 (32 Bit), is specified, with bit 0 being the least significant.

3.2.7   Columns G, H, I and J

These are for scaling of the incoming Modbus value. G and H represent two points (X_1 & X_2) on the Modbus input scale, while I and J represent two equivalent points (Y_1 & Y_2) of the scaled result that will be presented to BACnet. A linear relationship is assumed between the input values and the output values.

For example; the range of values in the Modbus register is 0-4800, representing a voltage, but the BACnet device should read 0-480.0. Set the value in Column G to 0, Column H to 1, Column I to 0 and Column J to .1 to scale the value. Any two points along the Modbus scale can be used while entering the equivalent BACnet values.

3.2.8   Column K (Read-only or R_W)

Determines if the value is read-only or also writeable.

3.2.9   Column L (BACnet object type)

The type is automatically selected according to the Modbus Variable type selected in Column C.

- BINARY_INPUT — for use with all 1aaaaa, 0aaaaa that will be read-only, bit-pick of all 3aaaaa, and bit-pick of 4aaaaa that are read-only.
- BINARY_OUTPUT — for use with 0aaaaa that are read-write and bit-pick of 4aaaaa that are read/write.
- ANALOG_INPUT — for all 3aaaaa and 4aaaaa that are read-only.
- ANALOG_OUTPUT — for all 4aaaaa that are read/write.

3.2.10   Column M (BACnet Object description)

This can contain 64 characters. An optional field in BACnet, but it should not be left blank.

3.2.11   Column N (Change of value (COV) increment).

For a binary (on/off) variable, this is always a 0, as a change of state is always transmitted if the host has established a COV connection. For an analog variable, the value can be 0 (every change will be transmitted), or some other value, such as 10, 20.56; etc., which will represent the COV increment.

3.2.12   Column O (Unit Group)

A pre-defined list of available units, e.g. area, currency, electrical, etc.

3.2.13   Column P (Unit Value)

Contains the BACnet valid unit of measure for the Unit Group. Enter **No_Units** in this column if the unit of measure is unknown, not required, or is not supported by BACnet.

3.2.14   Column Q (Grouping)

YES allows group reads of Modbus variables, assuming the variables are contiguous. NO disallows grouping.

3.2.15   Column R (Update on reconnect)

Contains a YES or NO, and pertains to Modbus output registers. YES allows the last value written to a Modbus register by BACnet to be re-transmitted when a Modbus device returns from an offline to an

online condition. For example, if the Modbus device was power-cycled and returned to service, the Anybus BACnet to Modbus Gateway will resume reading Modbus registers in the device. However, register outputs might not be updated to the same state when the Modbus device first went offline.

If continuity of the output state of a particular output register is important after a re-connection, set this bit to YES. If the default state of the Modbus register is preferred when re-connecting the Modbus device to the Anybus BACnet to Modbus Gateway set this value to NO. There will be no attempt to resend the last value of the selected Modbus register after a re-connection. The default value for this column is NO.