Industrial Automation (Automação de Processos Industriais)

PLC Programming languages *Structured Text - Networking*

http://users.isr.ist.utl.pt/~jag/courses/api1718/api1718.html

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Structured Text

Networking (in Unity Pro)

Keywords: MODBUS, READ_VAR, WRITE_VAR

Modbus is a serial communications protocol originally published by Modicon (now Schneider Electric) in 1979 for use with its programmable logic controllers (PLCs). Simple and robust, it has since become a de facto standard communication protocol, and it is now a commonly available means of connecting industrial electronic devices.

Examples of Field Bus (IEC 61158) standards: MODBUS (Schneider), PROFIBUS (Field Bus type, Siemens), CAN bus (Controller Area Network, 1983 Robert Bosch GmbH), ...

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Modbus RTU — Binary representation of the data for protocol communication. Includes CRC. Modbus messages are framed (separated) by idle (silent) periods.

Modbus ASCII — Makes use of ASCII characters for protocol communication.

Modbus TCP/IP or Modbus TCP — Modbus variant for communications over TCP/IP networks, connecting over port 502.

RTU = Remote Terminal Unit

MTU = Main Terminal Unit

CRC = Cyclic Redundancy Check

TCP = Transmission Control Protocol

ASCII = American Standard Code for Information Interchange

Structured Text

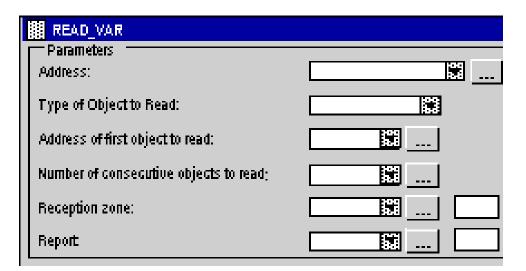
Networking (in Unity Pro)

Modbus	Function type	Function name / Function cod	de
Bit access	Physical Discrete Inputs	Read Discrete Inputs	2
	Internal Bits or Physical Coils	Read Coils	1
		Write Single Coil	5

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Address of first object to read:

The possible objects are of the DINT type (variables, constants, immediate value)

Number of consecutive objects to read:

The possible objects are of the INT type (variables, constants, immediate value)

Address: ADDR(STRING) ARRAY [0..5] OF INT

Type of object to read:

'%M' for reading internal bits '%MW' for reading internal words '%S' for reading system bits '%SW' for reading system words '%I' for reading input bits '%IW' for reading input words

Reception zone:

The reception zone is an integer array. The size of this array depends on the number of objects to read. This integer array can be located or not.

Report: The report is an array of 4 integers

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Structured Text Networking (in Unity Pro) – READ_VAR

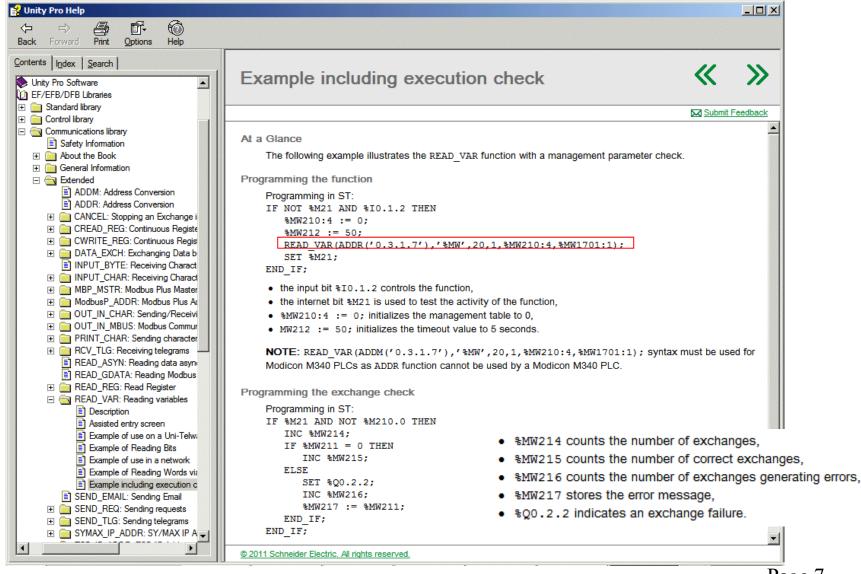
III READ_VAR			
Parameters			
Address:			
Type of Object to Read:			
Address of first object to read:	<u> </u>		
Number of consecutive objects to read:	<u> </u>		
Reception zone:			
Report			

Challenge: how to make READ_VAR non-blocking in an operating system without using processes nor threads?

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