Industrial Automation

(Automação de Processos Industriais)

PLC Programming languages

Structured Text - Networking

http://users.isr.ist.utl.pt/~jag/courses/api1819/api1819.html

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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

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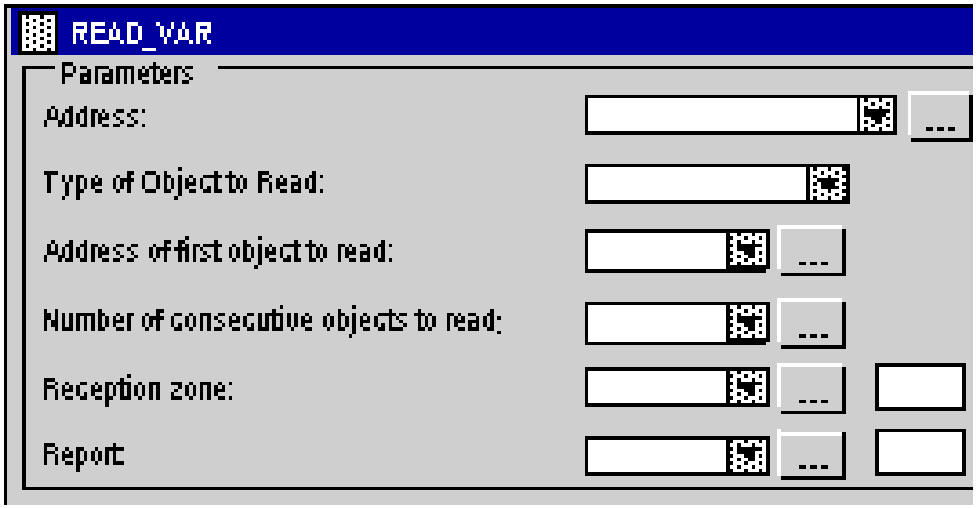
Networking (in Unity Pro)

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

Structured Text *Networking (in Unity Pro) – READ_VAR*



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

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)

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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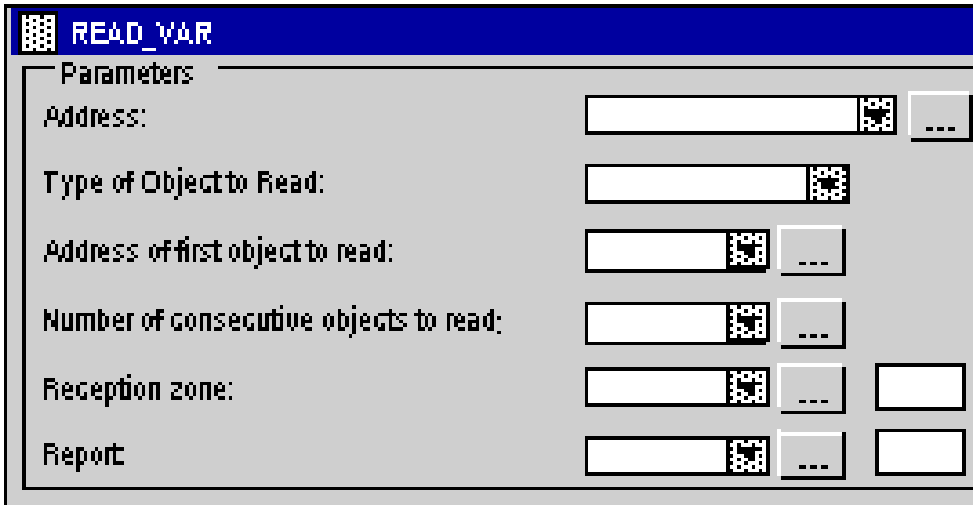

Challenge: how to make READ_VAR non-blocking in an operating system without using processes nor threads?

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