Kyland MaVIEW IDE & RTE Example How-to develop a Modbus TCP Server program

!!! In case of support needed, feel free to reach us out directly **!!!**

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Prerequisites:

1. a Win7/Win10 PC (Host_PC) with >2GB free space to install MaVIEW IDE (Integrated Development Environment) and to develop the virtual PLC program

2. a x86/x64 based Linux PC (Target_PC) with >500MB free space to operate MaVIEW RTE (Run Time Environment) and execute the virtual PLC program developed from 1, so the Target_PC would work as a PLC

3. connection between Host_PC and Target_PC

The whole process may take 2-3 hours in total:

A. Install MaVIEW RTE in a x86/x64 Linux PC (Target_PC) (10mins)

B. Install MaVIEW IDE in a Win7/Win10 (Host_PC) and develop the virtual PLC program (30-60mins)

* a simple 'Modbus-TCP Server' program example is illustrated in this example

C. Test the virtual PLC program (10mins)

D. Fill up the feedback form and attach your program (10mins)

Appendix. Install and setup Ubuntu Linux (60-90mins)

A. Install MaVIEW RTE in a x86/x64 Linux (Target_PC) (10mins)

maview-rte.tgz download link: <u>https://www.kyland.com/maview22/maview-rte.tgz</u>

1. download maview-rte.tgz directly from Target_PC console,

kydemo@ubuntu:~\$ wget https://www.kyland.com/maview22/maview-rte.tgz

or use a USB pen drive to copy the file from Host_PC to Target_PC,

or use a SFTP software to transfer maview-rte.tgz from Host_PC to Target_PC

a. check if **Target_PC** has 'openssh-server' package installed, otherwise install it (internet accessibility is needed)

kydemo@ubuntu:~\$ apt-get update

kydemo@ubuntu:~\$ apt-get install openssh-server

b. use WinSCP (freeware) in Host_PC to connect to the Target_PC (e.g. 192.168.0.136)

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c. transfer maview-rte.tgz to the Target_PC

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2. in **Target_PC**, untar (unzip) maview-rte.tgz and execute the installrte script and then reboot (so to auto-execute LinuxRTE program at start-up)

kydemo@ubuntu:~\$ tar -xf maview-rte.tgz

kydemo@ubuntu:~\$ cd maview-rte/

kydemo@ubuntu:~\$ sudo ./installrte

kydemo@ubuntu:~\$ sudo reboot

* if you prefer to operate everything from your Host_PC, you may a SSH terminal tool like 'putty' (freeware) to connect from Host_PC to Target_PC

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B. Install MaVIEW IDE in a Win7/Win10 (Host_PC) and develop the virtual PLC program (30-60mins)

* a simple 'Modbus-TCP Server' program example is illustrated in this example

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2. drag a device from 'Device Management' into the work area (if there's only standard I/O interface like Ethernet in **Target_PC**, simply use any device from the 'Kyland Industry Server' list)



3. change the IP address of the Target_PC



4. double click the new device to launch the CPU view and drag a virtual PLC into a virtual CPU

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5. change the IP address of the virtual PLC

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6. 'Save All' to save the project and select the new virtual $\ensuremath{\mathsf{PLC}}$



7. under the 'VPLC_1', 'Global Variable' panel, add a new variable via 'Add Variable'

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8. change the 'SlaveAddr' to '400001'

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9. under the 'Program' panel, add a new POU with 'LD' language





10. 'Save All' and add an external variable via 'Add VarExternal', select the attribute as the Global Variable just added before



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11. drag a 'PowerRail' into the working area



12. drag an 'ADD' operator next to the 'PowerRail'

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13. 'Save All' and double click 'a'

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15. double click 'b', enter the name as '#1' and select Data Type 'INT'



16. double click output and select 'NEWGVAR1.enginValue'



17. under the 'VPLC_1', 'PLC' task, drag the above ladder program to the cycle task

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18. 'Save all' and 'Compile PLC'

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19. get 'Online' and then 'Coverage Download'

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20. launch the sample program via 'Algorithm Start'

 $\ensuremath{^*}$ the 'program' will be downloaded and auto-executed at Target_PC start-up

	File Edit View Build Debug Search	Help task.tk - modbustcp-server-demo1 (Workspace) - Kyland MaVIEW [Administrator]	-	٥	\times
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0	0 ▲ 0 VPLC 1 Stopped			UTF-8	

C. Test the virtual PLC program (10mins)

* use 'Modbus Poll' tool (free for trial) to test our Modbus-TCP Server sample program https://www.modbustools.com/download.html

없 Modbus Poll - Mbpoll1		×
File Edit Connection Setup Functions	Display View Window Help	
File Edit Connection Setup Functions Image: Setup Image: S	Connection Setup Connection Setup Connection Modbus TCP/IP Cancel Serial Settings COM1 9600 Baud Y B Data bits Y Even Parity Y 1 Stop Bit Advanced Pelay Between Pols 20 [ms] Pelay Between Pols 20 [ms] Server Port Server Port Server Port Connect Timeout () IPv6	
For Help, press F1.	[192.168.0.136]: 502	

1. setup the connection IP address as the Target_PC (192.168.0.136)

2. poll the Modbus Slave Address of 400001 (address 0)

😯 Modbus Poll - Mbpoll1	_	
File Edit Connection Setup Functions Display View Window Help		
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Name 00000	_	
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For Help, press F1. [192.168.0.136]: 502		//

D. Fill up the feedback form and attach your program (10mins)

- 1. compress (zip) your project in the Host_PC, and rename it as 'your_name.zip'
- 2. fill up your feedback form and attach your project file:

Appendix. Install and setup Ubuntu Linux (60-90mins)

1. download Ubuntu Linux ISO image

For example, an earlier version (smaller and stabler) of 16.04.7 server can be downloaded here:

https://releases.ubuntu.com/xenial/

https://releases.ubuntu.com/xenial/ubuntu-16.04.7-server-amd64.iso (880MB, without GUI) https://releases.ubuntu.com/xenial/ubuntu-16.04.7-desktop-amd64.iso (1.6GB, with GUI)

2. create a bootable USB drive via Rufus (freeware):

https://ubuntu.com/tutorials/create-a-usb-stick-on-windows#1-overview

3. boot the Target_PC via the USB drive and follow the installation instruction

4. edit the /etc/network/interfaces to change the Target_PC IP address permanently at start-up kydemo@ubuntu:~\$ sudo vi /etc/network/interfaces



* 'enp13s0' is the Ethernet interface of the Target_PC connecting to Host_PC

* under vi, type 'o' to add a new line, press 'Esc' and then type ':wq' to save the file (reboot to make it effective)