

# How to compile application including modbus Lib with LinPAC SDK on Windows?

Applies to:			No. L2-003
Platform	Software operating system	OS version	Classification
LP-8000/9000 Series LP-2000/5000 Series	All version	All version	Installation & Configuration

This article illustrates how to compile application including modbus library with LinPAC SDK on Windows platform, please follow the instructions below.



**libmodbus** is a free software library to send/receive data with a device which respects the Modbus protocol. This library is written in C and designed to run on Linux, Mac OS X, FreeBSD and QNX and Windows. Please visit the official website [www.libmodbus.org](http://www.libmodbus.org) to get more information.

## DOWNLOAD AND INSTALL

To compile Libmodbus under Windows, user need to install MinGW and MSYS then select the common packages (gcc, automake, libtool, etc) as below:

- **LinPAC AM335X SDK:** <https://www.icpdas.com/en/download/file.php?num=1551>
- **Libmodbus:** <https://github.com/stephane/libmodbus/releases>
- **MinGW for Windows Platform:** <https://sourceforge.net/projects/mingw/>
- **MSYS for Windows Platform :** <https://www.msys2.org/>

## ENVIRONMENT VARIABLE CONFIGURATION

The PATH variable defines the search path for running commands. Therefore, user need to modify the C:\msys64\etc\profile file, add the cross compile folder to environment variable "PATH".

```
PATH=$PATH:/c/cygwin/LinPAC_AM335x_SDK/Linaro_GCC_4.7/bin:/c/Cygwin/LinPAC_AM335x_SDK/Linaro_GCC_4.7/arm-linux-gnueabi/bin:/c/cygwin/LinPAC_AM335x_SDK/Linaro_GCC_4.7/arm-linux-gnueabi/libc/usr/lib/pkg/alternatives:/c/cygwin/LinPAC_AM335x_SDK/Linaro_GCC_4.7/arm-linux-gnueabi/libc/usr/lib/pkg/config'
```

Open mingw32.exe shell launcher (Click the 'Start' menu → 'MSYS2' → 'MSYSW MINGW32')

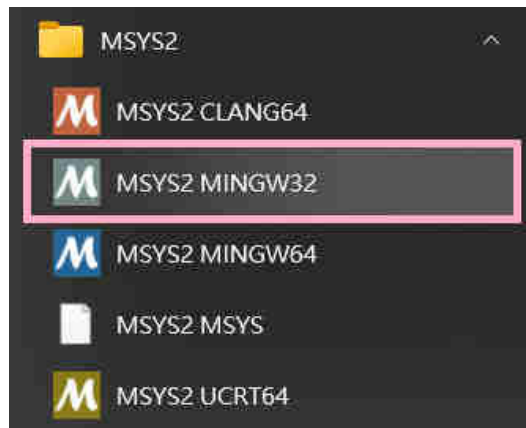


Figure 1

Or enter to C:\msys64\ directory, and click the mingw32.exe

Using the **export** command to check the environment variable of PATH.

```

Cindy@RD1-Freda-Chen MINGW32 ~
$ export |grep $PATH
declare -x PATH="/mingw32/bin:/usr/local/bin:/usr/bin:/bin:/c/windows/System32:/c/windows/System32/Wbem:/c/windows/System32/windowsPowerShell/v1.0/;/usr/bin/site_perl:/usr/bin/vendor_perl:/usr/bin/core_perl:/c/cygwin/LinPAC_ARM335x_SDK/Linaro_GCC_4.7/bin:/c/cygwin/LinPAC_ARM335x_SDK/Linaro_GCC_4.7/arm-linux-gnueabihf/bin:/c/cygwin/LinPAC_ARM335x_SDK/Linaro_GCC_4.7/arm-linux-gnueabihf/libc/usr/lib/opkg/alternatives:/c/cygwin/LinPAC_ARM335x_SDK/Linaro_GCC_4.7/arm-linux-gnueabihf/libc/usr/lib/pkgconfig"
Cindy@RD1-Freda-Chen MINGW32 ~
$

```

Figure 2

## COMPILE LIBMODBUS LIBRARY AND EXAMPLES

To go to the libmodbus-3.1.8 directory, and type:

```

Cindy@RD1-Freda-Chen MINGW32 /c/cygwin/LinPAC_ARM335x_SDK/libmodbus-3.1.8
$ mkdir linpac

```

```

Cindy@RD1-Freda-Chen MINGW32 /c/cygwin/LinPAC_ARM335x_SDK/libmodbus-3.1.8
$ sh configure CC=arm-linux-gnueabihf-gcc --host=arm-linux-gnueabihf --enable-static
--prefix=$(pwd)/linpac

```

Here is the result of complete installing libmodbus-3.1.8 on Windows platform.

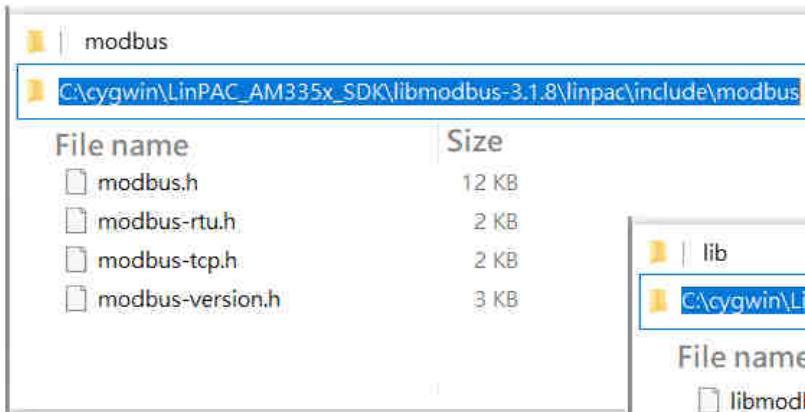


Figure 3

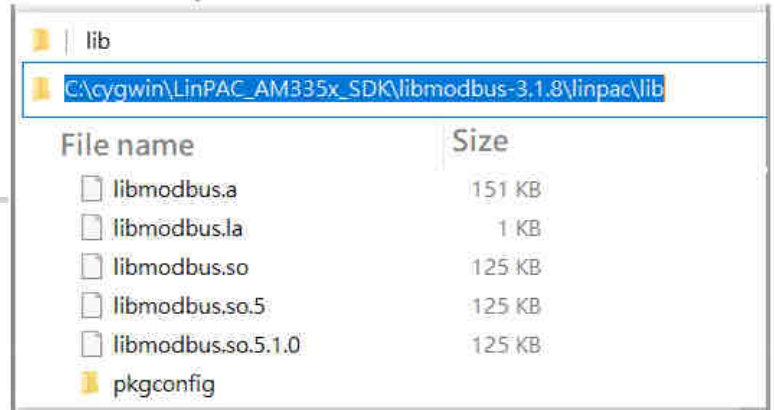


Figure 4

Compile modbus program with the following command manually:

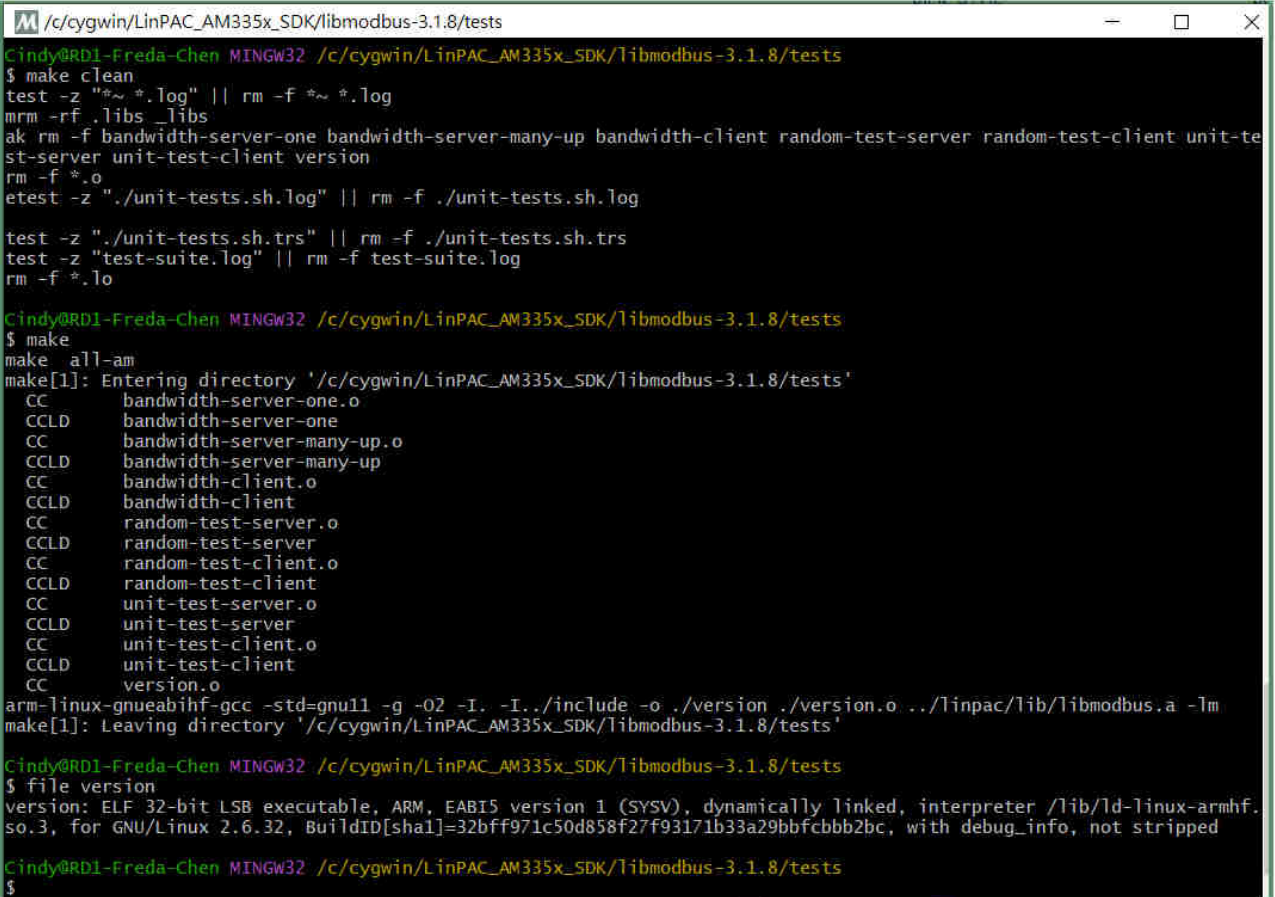
```
Cindy@RD1-Freda-Chen MINGW32 /c/cygwin/LinPAC_AM335x_SDK/libmodbus-3.1.8/tests
$ arm-linux-gnueabi-gcc -I../linpac/include/modbus -lm -o random-test-server.exe
random-test-server.c ../linpac/lib/libmodbus.a
```

Makefile shall call make manually to build a target in tests directory. User can modify the **Makefile** file, add the following code:

- LDFLAGS = -lm
- CFLAGS = -g -O2 -I. -I../include
- LIBS = ../linpac/lib/libmodbus.a
- Change syntax of a makefile's contents --- 'version' for example.

```
676 #version$(EXEEXT): $(version_OBJECTS) $(version_DEPENDENCIES) $(EXTRA_version_DEPENDENCIES)
677 # @rm -f version$(EXEEXT)
678 # $(AM_V_CCLD)$@ $(LINK) $(version_OBJECTS) $(version_LDADD) $(LIBS)
679
680 version: ./version.o
681 $(CC) $(CFLAGS) -o ./version.o $(LIBS) $(LDFLAGS)
682 @rm -f ./version.o
```

Figure 5 shows the result of running **make** command from tests directory.



```

M /c/cygwin/LinPAC_AM335x_SDK/libmodbus-3.1.8/tests
Cindy@RD1-Freda-Chen MINGW32 /c/cygwin/LinPAC_AM335x_SDK/libmodbus-3.1.8/tests
1 → $ make clean
test -z "*~*.log" || rm -f *~*.log
rmm -rf *.libs *.libs
ak rm -f bandwidth-server-one bandwidth-server-many-up bandwidth-client random-test-server random-test-client unit-test-server unit-test-client version
rm -f *.o
etest -z "/unit-tests.sh.log" || rm -f ./unit-tests.sh.log

test -z "/unit-tests.sh.trs" || rm -f ./unit-tests.sh.trs
test -z "test-suite.log" || rm -f test-suite.log
rm -f *.lo

Cindy@RD1-Freda-Chen MINGW32 /c/cygwin/LinPAC_AM335x_SDK/libmodbus-3.1.8/tests
2 → $ make
make all-am
make[1]: Entering directory '/c/cygwin/LinPAC_AM335x_SDK/libmodbus-3.1.8/tests'
CC      bandwidth-server-one.o
CCLD   bandwidth-server-one
CC      bandwidth-server-many-up.o
CCLD   bandwidth-server-many-up
CC      bandwidth-client.o
CCLD   bandwidth-client
CC      random-test-server.o
CCLD   random-test-server
CC      random-test-client.o
CCLD   random-test-client
CC      unit-test-server.o
CCLD   unit-test-server
CC      unit-test-client.o
CCLD   unit-test-client
CC      version.o
arm-linux-gnueabihf-gcc -std=gnu11 -g -O2 -I. -I../include -o ./version ./version.o ../linpac/lib/libmodbus.a -lm
make[1]: Leaving directory '/c/cygwin/LinPAC_AM335x_SDK/libmodbus-3.1.8/tests'

Cindy@RD1-Freda-Chen MINGW32 /c/cygwin/LinPAC_AM335x_SDK/libmodbus-3.1.8/tests
3 → $ file version
version: ELF 32-bit LSB executable, ARM, EABI5 version 1 (SYSV), dynamically linked, interpreter /lib/ld-linux-armhf.so.3, for GNU/Linux 2.6.32, BuildID[sha1]=32bff971c50d858f27f93171b33a29bbfcb2b2bc, with debug_info, not stripped

Cindy@RD1-Freda-Chen MINGW32 /c/cygwin/LinPAC_AM335x_SDK/libmodbus-3.1.8/tests
$

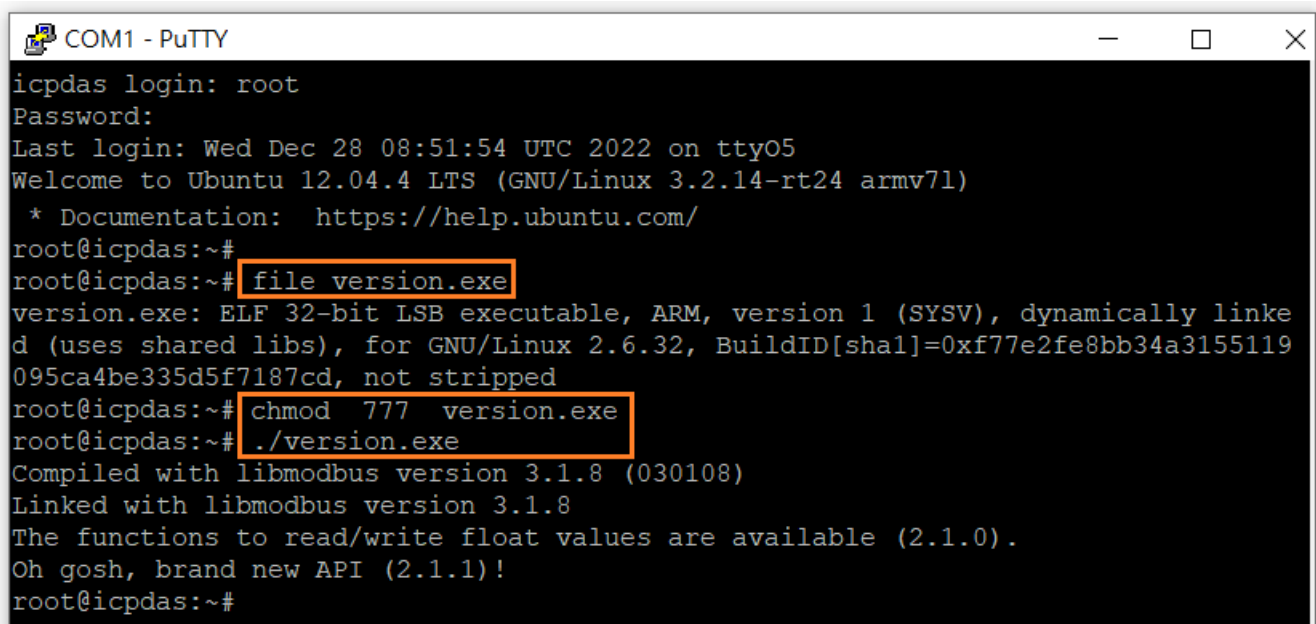
```

Figure 5

## UPLOAD EXECUTABLE FILE TO THE LINPAC

**libmodbus** provides some tests in **tests** directory, user can run them to test or edit them to fit the needs.

Figure 6 shows the result of running **version.c** program from tests directory.



```

COM1 - PuTTY
icpdas login: root
Password:
Last login: Wed Dec 28 08:51:54 UTC 2022 on ttyO5
Welcome to Ubuntu 12.04.4 LTS (GNU/Linux 3.2.14-rt24 armv7l)
 * Documentation:  https://help.ubuntu.com/
root@icpdas:~#
root@icpdas:~# file version.exe
version.exe: ELF 32-bit LSB executable, ARM, version 1 (SYSV), dynamically linked (uses shared libs), for GNU/Linux 2.6.32, BuildID[sha1]=0xf77e2fe8bb34a3155119095ca4be335d5f7187cd, not stripped
root@icpdas:~# chmod 777 version.exe
root@icpdas:~# ./version.exe
Compiled with libmodbus version 3.1.8 (030108)
Linked with libmodbus version 3.1.8
The functions to read/write float values are available (2.1.0).
Oh gosh, brand new API (2.1.1)!
root@icpdas:~#

```

Figure 6