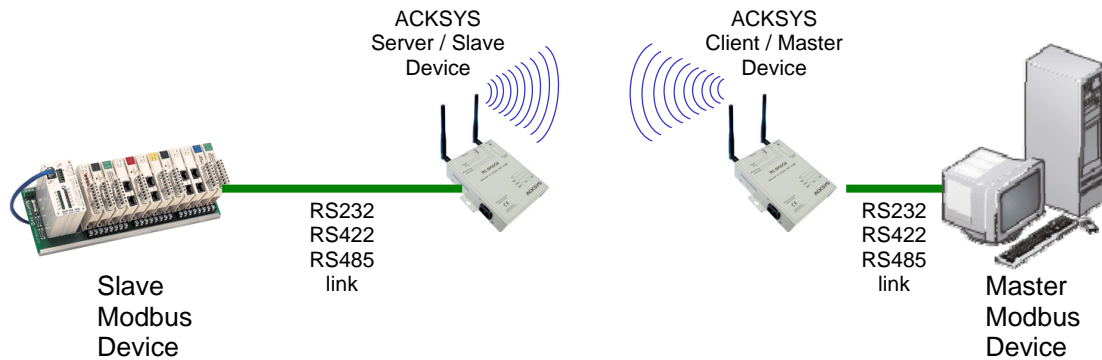


## APPLICATION NOTE

Ref APNUS006 rev. A-0,  
April 30, 2008

# Wireless Modbus configuration



This application note describes how to setup a connection between a Master Modbus device and a Slave Modbus device.

Two ACKSYS WiFi serial devices servers are required; one device should be set in MODBUS client master mode, the other one in MODBUS server slave mode.

### List of ACKSYS WiFi device servers supported:

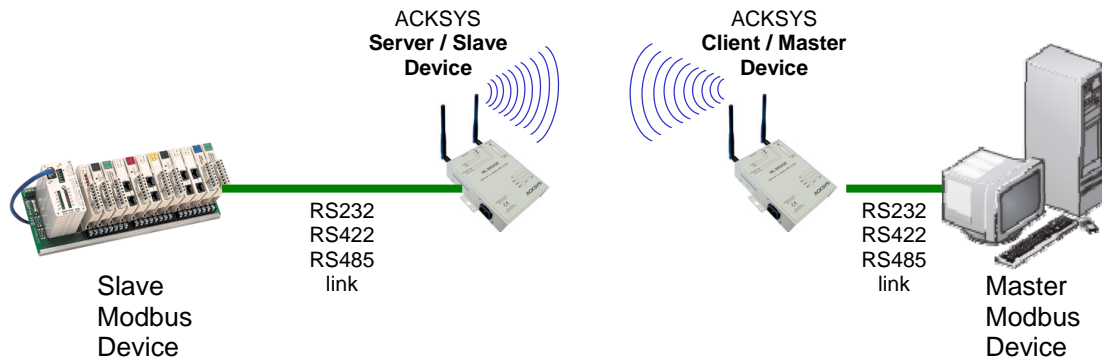
WL-COMETH  
WL-DONGLE  
WL-IDA/S  
WL-ABOARD/S



## STEP 1 : BASIC CONFIGURATION OF ACKSYS DEVICES

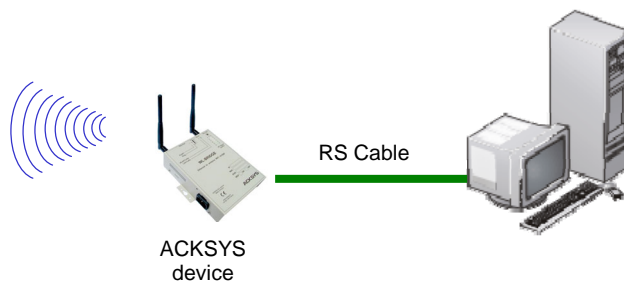
All instructions must be executed on each ACKSYS device, unless otherwise noted.

All further references to Client / Master Device and Server / Slave Device will be given according to the following diagram :



### Configure to admin mode

1. **Connect** power supply to device
2. **Set up** device to admin mode (thanks to a dedicated switch)
3. **Connect** ACKSYS device to the RS232 serial port of the PC (e.g. COM1) with the crossed cable shipped with the product:



4. **Run** a terminal emulator (e.g. HyperTerminal ...):  
Configure the PC COM port according to the following parameters:
  - Baud rate: 2400
  - Parity: None
  - Data Bits: 8
  - Stop Bits: 1
  - No handshake ( XON/XOFF, RTS/CTS)

In the terminal emulator window, hit the "enter" key to display the device admin prompt **root>**  
Now, ACKSYS device is ready to execute configuration commands.

## Install the MODBUS-TCP firmware to each device

Master and slave devices will both use the MODBUS-TCP firmware. Prior to use this firmware, it must be copied to the device's FLASH memory (caution, this operation will erase the SERVERCOM firmware or any other firmware previously written). The followings instructions have to be executed for both devices.

1. **Allow** upgrade  
`root> set upgradeperm allow`
2. **Save** configuration  
`root> save`  
`root> reset`
3. After reset, the administration mode does not work anymore. This is normal. **Configure** terminal to 115200 bauds, and type "C" (in upper case). "CLIENTSERVER" must appear in the terminal window. If you can see this text, close the terminal window. The ACKSYS device is now in SLIP mode.
4. **Make** on your P.C a new network connection, SLIP type, with IP address **192.168.2.1** or any address which is not already filtered by the routing table (use the **route PRINT** command under a dos prompt to display). It is a network connection with a serial port instead of a 10/100/1000 network controller. For further informations about SLIP, see the <WL-ComethUserGuide (DTUS044).pdf> documentation paragraph VIII.8.3.  
Warning, before installing a SLIP interface, disconnect all the others network connection. Disconnect the PC COM port in the HyperTerminal Window.
5. **Download** TCP client firmware into device's FLASH memory  
Run a dos prompt and type : `"tftp -i 192.168.2.254 put wIB_1v_modbus_vx.x.x.ftp /"`  
The IP address can be any address in the same netmask the SLIP IP address **but** must not be equal to it.  
Ftp file is supplied with ACKSYS CD or can be downloaded from ACKSYS web site.  
Don't forget the « / » character at the end of the command line.  
After downloading, ACKSYS device returns automatically to admin mode.
6. From your P.C, **disconnect** the SLIP interface and reconnect all your previously disconnected network connections

## Common configuration

1. Re-open a terminal emulator using the 4 steps described in the *Configure to admin mode* section.
2. Restore default parameters  
`root> set default`  
`root> save`  
`root> reset`
3. Set to AD-HOC mode  
`root> set net mode ad-hoc`
4. Choose the WIFI radio Channel (6 for example but any other channel can be selected)  
`root> set net channel 6`
5. Configure the SSID (acksys for example, any other name can be chosen)  
`root> set net ssid acksys`
6. Configure IP address (**x = 1 for client / master device, x = 2 for server / slave device**)  
`root > set net ip 192.168.0.x`  
`root > set net mask 255.255.255.0`
7. **Save** configuration  
`root> save`  
`root>reset`

### Server / Slave device configuration

1. **Set** the serial mode to server/slave  
**root> set serial mode slave**
2. **Set** the serial mode to ASCII or RTU  
  
If you use ASCII mode :  
**root> set serial mode ascii mode**  
  
If you use RTU mode :  
**root> set serial mode rtu mode**
3. **Set** the slaveid parameter  
**root> set net slaveid 0**

This parameter is used to configure the connection between the client/Master and the server/slave. Since we have only one server / slave device the 0 value is recommended. Check the ModbusTcp firmware guide (DTUS041) for more details.

4. **Save** configuration  
**root> save**  
**root> reset**

### Client / Master device configuration

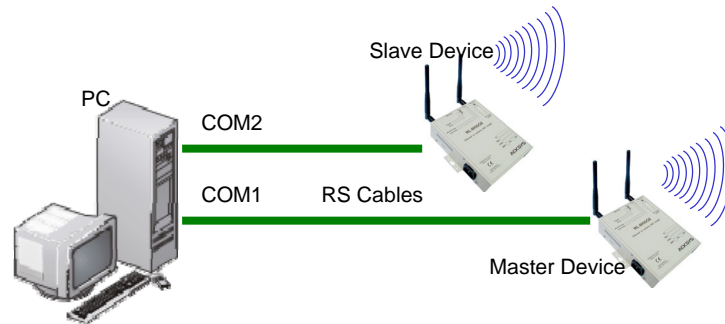
1. **Run** a terminal emulator as done in the 4 step of the “Configure to admin mode” section.
2. **Set** the serial mode to client/master  
**root> set serial mode master**
3. **Set** the serial mode to ASCII or RTU  
  
If you use ASCII mode :  
**root> set serial mode ascii**  
  
If you use RTU mode :  
**root> set serial mode rtu**
4. **Set** the slaveid parameter ( were fs, ls, fr are all equal to your slave modbus device ID )  
**root> set net slaveid fs ls fr 0 192.168.0.2**

This parameter is used to configure the connection between the client/Master and the server/slave. Since we have only one server / slave device, all the fs, ls and fr parameters are set to 0. Check the ModbusTcp firmware guide (DTUS041) for more details.

5. **Save** configuration  
**root> save**  
**root> reset**

## STEP 2 : RECOMMENDED CHECKING

1. **Verify** that the SLIP interface is disconnected
2. **Verify** that ACKSYS devices are set to normal mode (opposite to admin mode)
3. **Connect** each ACKSYS device on a PC port COM with the provided cable. Two PCs are necessary if only one COM port is available in your PC.



1. **Run** the *Modsim* and *Modscan* programs to simulate requests from a Modbus master device and responses from a Modbus slave device. You can download those programs from the following website : <http://www.win-tech.com/html/modbus1.htm>

2. If Modscan successfully read data from Modsim through the Acksys devices **go** to the next step

**If unsuccessful,**

- check RS cables
- check if COM port settings are matching ACKSYS device settings and PC COM port settings.
- Check the “diag” led on the client device. If the Diag led blinks five times per second, it indicates that connection is not established between the two devices. In this case, check network configuration of the two ACKSYS devices.

3. **Unplug** RS cables.

## STEP 3 : FINAL CONFIGURATION OF ACKSYS DEVICES

Now, you're ready to configure the serial interface of ACKSYS device according to the settings of the serial device.

1. **Run** the terminal emulator and configure to 2400 baud, 8 data bits, 1 stop bits, no parity, flow control disable (hardware and software).
2. **Set up** device to admin mode and reboot it

### Setting the electrical interface : RS232 or RS422 or RS485

RS232

```
root> set serial interface rs232
```

RS 422 (two RS422 serial interfaces can be selected : RS422 master or RS422 slave)

```
root> set serial interface rs422 master
```

or

```
root> set serial interface rs422 slave
```

RS422 master is used in point to point RS422 link or in multipoint RS422 link for the master only.

RS422 slave is used in multipoint RS422 link for the slaves only.

RS485 (RS485 can be selected with or without echo)

```
root> set serial interface rs485 noecho
```

or

```
root> set serial interface rs485 echo
```

### Setting the baudrate

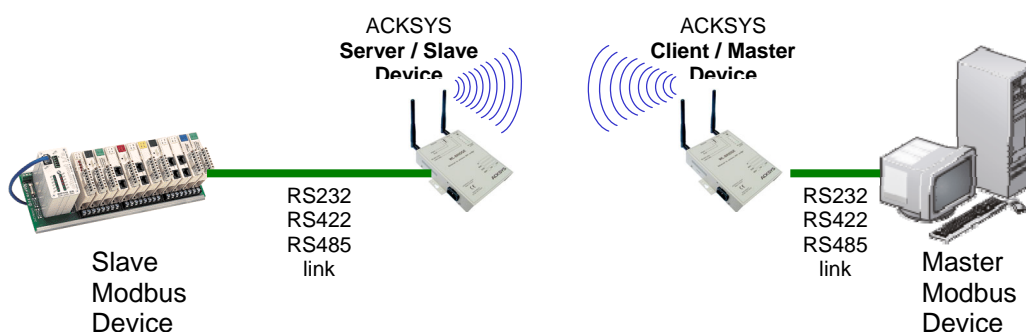
```
root> set serial baudrate value (by ex: set serial baudrate 9600)
```

### Setting the serial format

```
root> set serial format bytesize parity stops (by ex: set serial format 8 n 1)
```

### Installing the serial devices

Set up ACKSYS device to normal mode (opposite to admin mode)



#### Cabling :

If RS232 is selected, a crossed cable is necessary if your device is DTE and a straight cable if your device is DCE.

If RS422 or RS485 is selected, be careful about the +/- meaning. Use of A/B is preferred. There is no risk to destroy devices by inverting signals.

**If installation is correct, data can be transferred between the two Modbus devices through the wireless network.**