

# Tango3Remote — Evaluation Software for Windows

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## Introduction

Tango3Remote is a Windows program that communicates with the Tango3 embedded monitor described in application note AN2777, *Tango3 Monitor for the MC9S08RG60 MCU*. It provides a simple way to configure a Tango3 RF module to allow testing and measurement of its parameters. Tango3Remote allows the user to control Tango3 using on-screen controls, or using script files.

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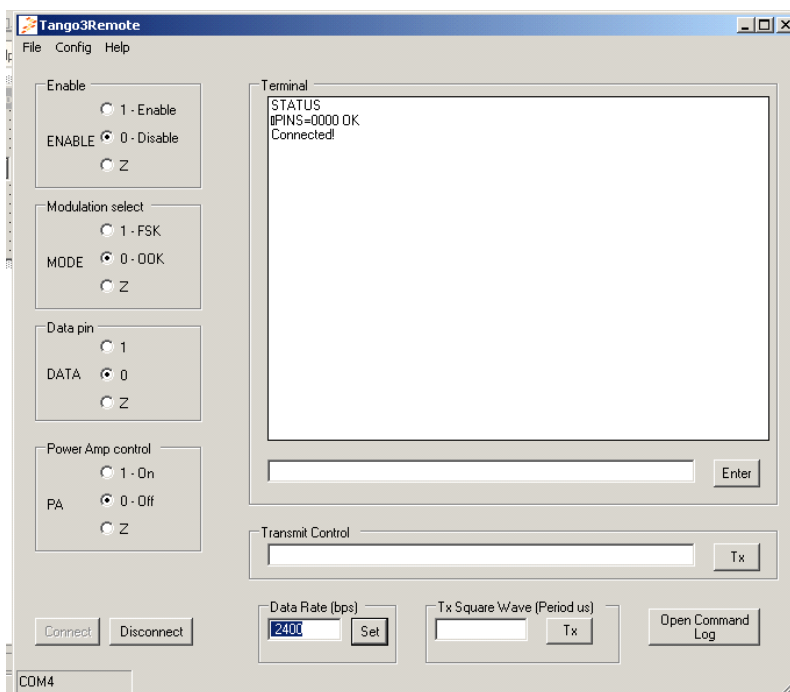
## Getting Started

To use Tango3Remote, you will need the following:

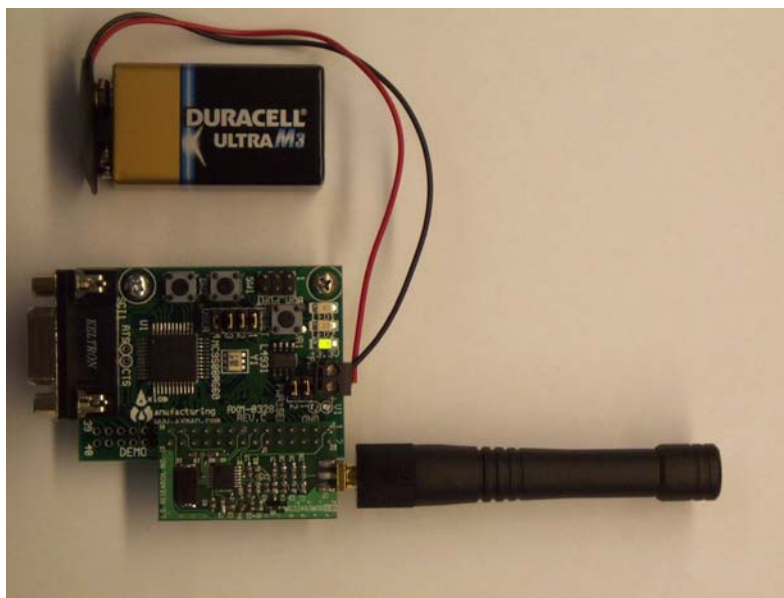
- 1 x MC9S08RG60 demo board (part no. DEMO9S08RG60)
- 1 x Tango RF module (part no. MC33493MOD315 or MC33493MOD434 (others may be available))
- 1 x PC running Windows 98, Windows 2000, or Windows XP

## Getting Started

The MC9S08RG60 demo board and Tango RF module must be configured as described in application note AN2777, and must be programmed with the embedded monitor program supplied with application note AN2777.



**Figure 1. Tango3Remote Screenshot**



**Figure 2. Hardware Setup**

## Installation

To install Tango3Remote:

1. Download file AN2951SW.zip from [www.freescale.com](http://www.freescale.com).
2. Unzip the contents of AN2951SW.zip.
3. Double-click on the Setup.exe file to begin the installation process.
4. Follow the on-screen instructions to install the Tango3Remote package.

### NOTE

*The Microsoft .Net framework must be installed for Tango3Remote to work. This is installed by default on newer versions of Windows XP. Older versions of Windows (98, 2000, and XP) do not have .Net installed by default. The Tango3Remote installer will check to see if .Net is installed, and will provide a link to a download site if it is not installed.*

## Startup

The MC9S08RG60 demo board and Tango RF module must be configured as described in application note AN2777, and must be programmed with the embedded monitor program supplied with application note AN2777. [Figure 2](#) shows hardware correctly configured.

1. Connect the MC9S08RG60 demo board to a PC COM port using a serial cable.
2. Start Tango3Remote from the Windows Start menu using Start->Tango3Remote. You should now see the window shown in [Figure 1](#).
3. Select the correct COM port using the Config->ComPort... menu option.
4. Click OK. Tango3Remote will remember the last used COM port.
5. Click the Connect button.

Tango3Remote should now connect to the MCU board and initialize the Tango3 RF module. You will see a series of commands and replies in Tango3Remote's Terminal window.

If communication was successful, you will see "Connected!" in the terminal window at the end of initialization.

If communication was not successful, press the reset button on the MCU board, then click the Connect button on Tango3Remote again to retry. Typical reasons for communications failure are:

- COM port being used by another application. Shut down any other applications using the COM port, or change COM ports.
- MCU board not programmed with the Tango3 embedded monitor. Ensure that the MC9S08RG60 demo board and Tango RF module are configured as described in application note AN2777.

## Controls and Commands

### Connect, Disconnect

These buttons are used to connect and disconnect the MCU board to and from the chosen COM port. The selected COM port is shown in the status bar below the buttons.

### I/O Controls — Enable, Mode, Data, Pa

Tango3's four control pins can be controlled directly by ticking the appropriate boxes on screen. Each pin can be set to logic high, logic low, or high-impedance ("Z").

The high-impedance setting allows external test equipment such as signal generators to be connected to Tango3's pins without causing conflict with the MCU's I/O pins.

### Terminal

The Terminal area displays the communications between the MCU board and Tango3Remote. Communications use the commands defined in application note AN2777.

The Terminal area can also be used to send commands to the MCU board; type any Tango3 monitor command (except the BAUD command) into the text box below the main terminal display and press return (or click the Enter button on-screen). [Figure 3](#) and [Figure 4](#) show an example of sending the Help command, which displays all available Tango3 embedded monitor commands.

#### NOTE

*Using the BAUD command will change the baud rate used by the MC9S08RG60 demo board's serial port. This will cause communications with Tango3Remote to fail.*

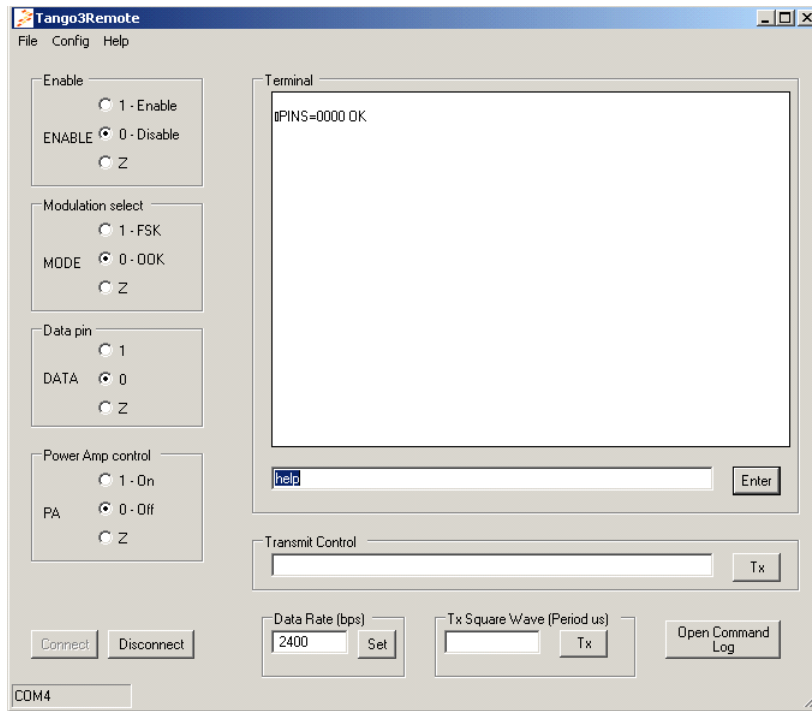


Figure 3. Before Help Command

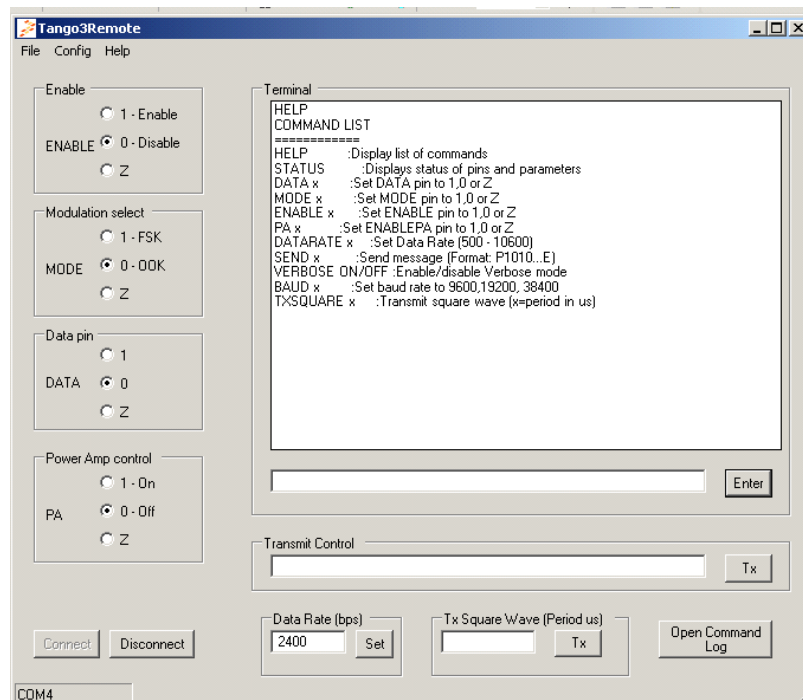


Figure 4. After Help Command

## Controls and Commands

### Data Rate

The MCU's transmit data rate can be set using the Data Rate box. Enter a value in the range 500–10200 baud and press return (or click the Set button).

### Tx Square Wave

The TX Square Wave box allows the user to set up the MCU board to generate a square wave on Tango3's Data pin. Enter the period of the square wave in microseconds in the box, then press enter, or click the Tx button. To stop transmission, press return or click the Tx button again.

This feature is useful when measuring the output spectrum, especially when using FSK modulation

#### NOTE

*To make Tango3 transmit the square wave, its other I/O pins must be configured correctly, that is, MODE must select the required modulation (OOK or FSK), ENABLE must be set to 1, and PA must be set to 1 if the external power amplifier is used.*

### Transmit Control

The Transmit Control area allows the user to set up a message frame for transmission. The message can then be retransmitted any number of times by clicking the Tx button (or by pressing return when the Transmit Control box is selected).

#### NOTE

*To make Tango3 transmit the message, its other I/O pins must be configured correctly, that is, MODE must select the required modulation (OOK or FSK), ENABLE must be set to 1, and PA must be set to 1 if the external power amplifier is used.*

Tip: To reduce delays between transmission of frames, send the first frame by clicking the Tx button, then send subsequent frames by clicking on the Enter button in the Terminal area and clicking Enter on each frame.

### Open Command Log

This button allows the user to store all commands executed in a script file. The script file can then be loaded at any time to repeat the commands. Command logging can be halted at any time. A more detailed discussion of script files is given below.

### Saving the Screen Setup

The current screen configuration can be saved to a script file using the File->Save option. This creates a script file containing a list of commands, which can be reloaded later.

## Setting the COM Port

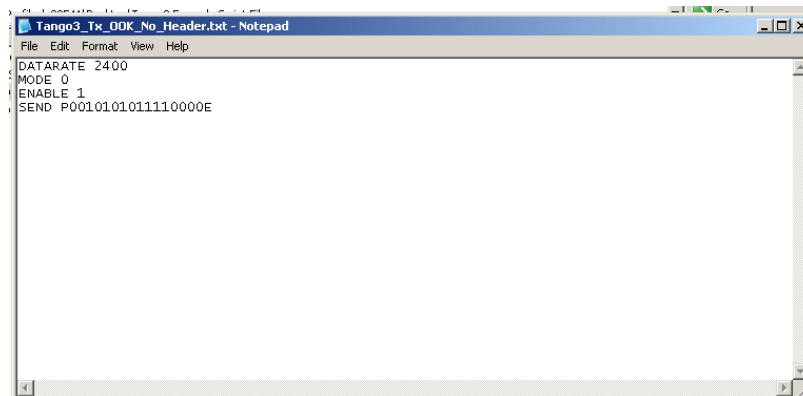
The Config->ComPort... menu item allows the user to set the COM port used to communicate with the MCU board.

### NOTE

*Tango3Remote must be disconnected from the MCU board (click the Disconnect button) before this option becomes active.*

## Script Files

A script file is a text file containing a list of Tango3 embedded monitor commands. Tango3Remote can load these files and execute the commands. [Figure 5](#) shows an example of a script file that configures Tango3 to transmit an OOK modulated message.



**Figure 5. Example Script File**

A Tango3 embedded monitor command can be used in a script file. See application note AN2777 for a full list of commands.

Script files can be executed using the File->Open->Script option.

Script files have a .txt file extension by default. Any text editor (for example, Notepad) can be used to create script files. Tango3Remote's Open Command Log, and Save options can also be used to generate script files.

### NOTE

*Using the BAUD command in a script will change the baud rate used by the MC9S08RG60 demo board's serial port. This will cause communications with Tango3Remote to fail. Do not use the BAUD command.*

## Example Script Files

A set of example script files is supplied with Tango3Remote in file AN2951SW.zip. These script files match the example setups shown in application note AN2777.

### How to Reach Us:

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