

Protakal
User's Guide

CONTENTS

1.SERIAL COMMUNICATION.....	Page	3
1.1 COMMUNICATION OVERVIEW		
1.2 COM PORT SETTINGS		
2.CHANNEL & DEVICE.....	Page	4
2.1 GENERAL DESCRIPTION		
2.2 CHANNEL SETTINGS		
3.MODBUS PROTOCOL.....	Page	5
3.1 OVERVIEW		
3.2 MODBUS PARAMETERS		
4.GRAPHING.....	Page	6
4.1 COLORIZING GRAPHICS		
4.2 GRAPHING CHANNELS TOGETHER		
5.LOGGING, EXPORTING AND IMPORTING.....	Page	7
5.1 LOGGING SETTINGS		
5.2 IMPORTING AND EXPORTING LOG FILE		
6.PRINTING.....	Page	9
6.1 OPTIMIZING PRINT QUALITY		

1. SERIAL COMMUNICATION

1.1 Overview

A large number of devices communicate with the PC using either the serial (RS232 / 422/ 485) port and a communication protocol.

The protocol is the language that the device talks, while the port is the media that carries that communications. You can think of it like telephone communications. You can talk to someone over a landline phone or a cell phone. In both cases you are talking the same language (the protocol), but you are using a different technology (the port). To communicate with someone you must choose which language to speak and which method to contact the person with whom you'd like to speak. When communicating with an external device from your PC you do the same thing. You must choose whether to communicate over the serial port, and which protocol to use.

1.2 COM Port Settings

The image shows a dialog box for configuring serial communication. It is divided into two main sections: 'Comm Parameters' and 'Comm Protocol'.
In the 'Comm Parameters' section, there are five dropdown menus:

- ComPort: COM1
- BaudRate: 9600
- ByteSize: 8
- Parity: No
- StopBits: 1

In the 'Comm Protocol' section, there are two radio buttons:

- Modbus RTU (selected)
- Modbus ASCII

At the bottom of the dialog box, there are two buttons: 'OK' and 'Cancel'.

Protocol: the language used to communicate with your device. For example, ModbusRTU.

ComPort: connected serial port name. Make sure another program is not using the port.

BaudRate: the baud rate for communications on the COM port. This and the next three items are the standard serial port parameters*.

Byte Size: the number of bits per byte used in communications.

Parity: the type of parity bit used in communications.

Stop Bits: the number of stop bits used in communications.

***Note:** Check the documentation for the device you are connecting to for the proper settings. If these parameters are incorrect you will either get no communications or garbled communications. The improper setting of these parameters is the most common difficulty with serial communications.

2. CHANNEL & DEVICE

2.1 General Description

Channels provide an identifier for your data. A Channel typically is a single I/O point, be it input, output, string, spectral data or even an image. To make life easier, the details of which I/O channel number and device correspond to what channel only need be entered once. Each channel is given a name, and after defining the I/O associated with that name, only this name is required throughout the rest of the program. For instance, there is no need to remember that ambient_temperature channel is attached to Acme I/O board, device #3, channel #2!

2.2 Channel Settings

The screenshot shows a software window titled 'Channel Settings'. At the top, there are navigation icons (back, forward, home, play, stop) and a close button (X). Below the icons are four tabs: 'Channel & Device', 'Modbus', 'Chart', and 'Logging'. The 'Channel & Device' tab is selected. The main area contains five labeled input fields: 'Channel Name' (ESM-7750 PT1), 'Group Name' (Temperature Controllers), 'Read Interval' (1,000) (sec), 'Response Time' (300) (msec), and 'Timeout' (500) (msec).

Channel Name: This contains the name of this channel which will be referenced through Protakal for displaying and logging data.

Group Name: This determines which group the channel belongs to. Channel grouping only affects on channel tree and have no effect on the rest of Protakal.

Read Interval*: This value determines how often an input channel is read. The units of timing are in seconds. You can enter pointed value for milliseconds accuracy. For example the minimum read interval is 0,050 second that means 50 milliseconds.

Response Time: The number of milliseconds to **sleep** for a read / write request to complete. This will depend on the response time of your device. We recommend keeping this between 50 and 1000 milliseconds. Longer values are appropriate when working with slow devices or low baud rates, but will result in a latency in a comm failure condition. If you are using Protakal on a slow system this feature will help you to share your sources fair with other softwares.

Timeout:** The number of milliseconds to **wait** for a read / write request to complete.

***Note 1:** If you are using RS-485 communication, the minimum read interval time depends other device's timeout values.

****Note 2:** Total Timeout = Response Time + Timeout.

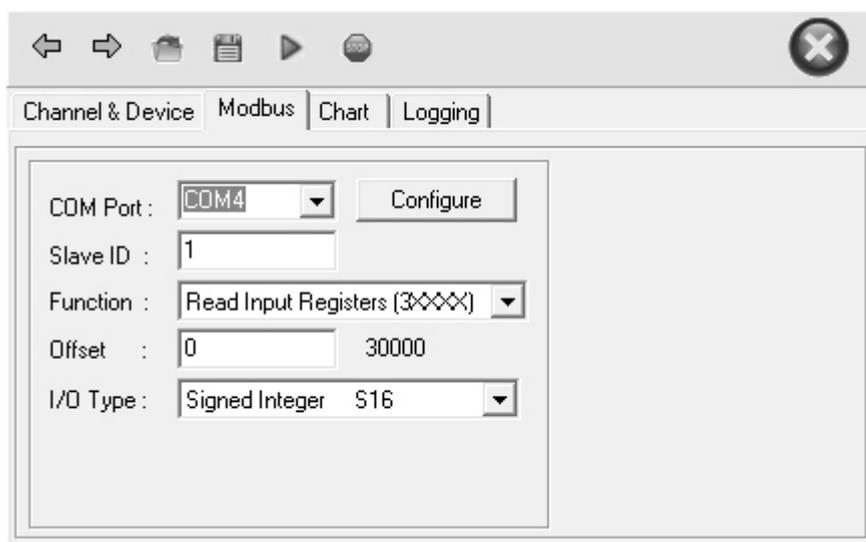
3. MODBUS PROTOCOL

3.1 Overview

The Modbus protocol is actually made up of two similar protocols, ModbusASCII and ModbusRTU. These protocols are almost identical except for the method used to communicate and the functions available. ModbusASCII uses ASCII to pass the Modbus commands. ModbusRTU uses binary. Check your device to determine which mode it prefers.

There are two basic formats for the device functions, input and output. Input functions take the ID of the device you wish to communicate with, the starting address, and the number of points to read. Input functions return an array of values corresponding to the data read. Output functions also take the ID and starting address, but then take an array of values to set your memory locations to. Output functions do not return anything.

3.2 Modbus Parameters



The image shows a software window titled 'Modbus' with a toolbar at the top containing navigation icons (back, forward, home, refresh, play, stop) and a close button. Below the toolbar are four tabs: 'Channel & Device', 'Modbus', 'Chart', and 'Logging'. The 'Modbus' tab is active. The configuration area contains the following fields:

- COM Port: A dropdown menu showing 'COM4' and a 'Configure' button.
- Slave ID: A text input field containing '1'.
- Function: A dropdown menu showing 'Read Input Registers (3xxxxx)'.
- Offset: Two text input fields, the first containing '0' and the second containing '30000'.
- I/O Type: A dropdown menu showing 'Signed Integer S16'.

COM Port: The communication channel which your device is connected.

Slave ID: The ID of the unit you are trying to communicate with as the device number.

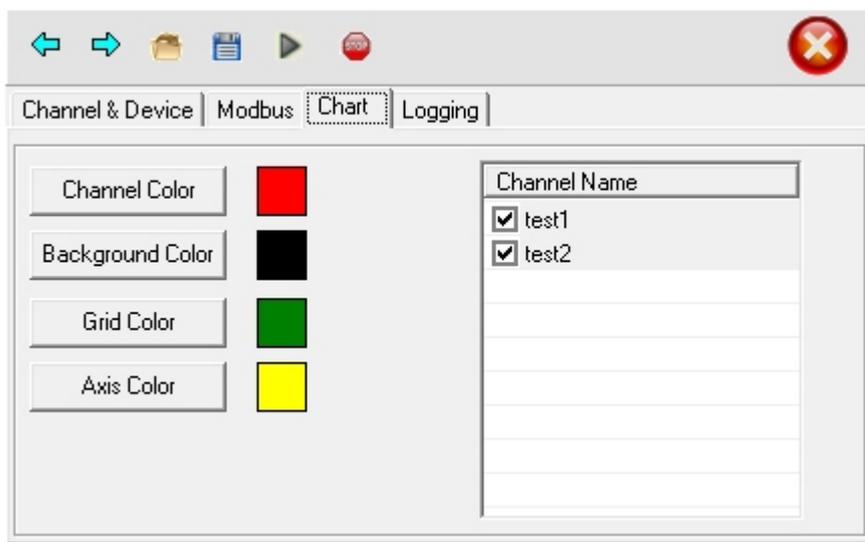
Function: Choose if you want to read Input Registers or Holding Registers.

Offset: I/O start address. Unfortunately some manufacturers 30,000 index their address and the others use 30,001 notation. Protakal is using 0 index now.

I/O Type: This helps define the class of data being received and has different meanings depending on your device. For example, if your device is a counter, I/O types generally 32 bit unsigned long types which range from 0 to about 4 billion. This type is designed to efficiently store counter data or any other 32 bit type data. Float type is designed to store scientific 7-digit precision values which represents very sensitive temperature values.

4. GRAPHING

4.1 Colorizing Graphics



Channel Color: This determines the color of the data points.

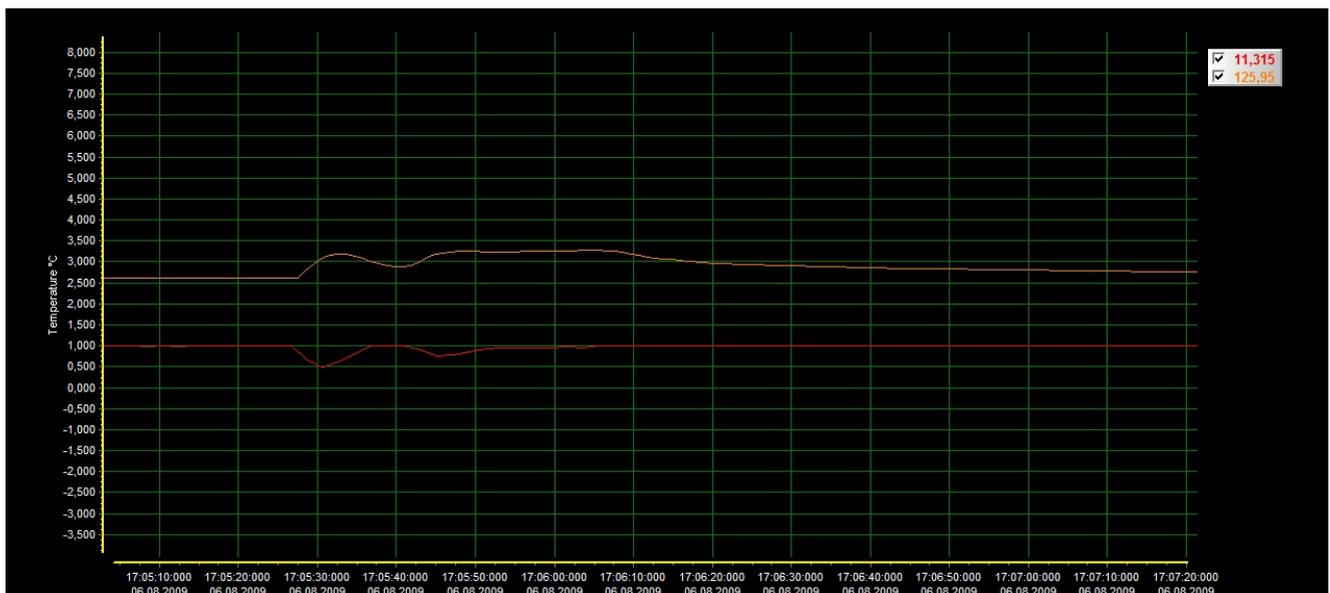
Background Color: Color of the the screen area between axis.

Grid Color: Color of the axis lines at every axis label position.

Axis Color: This determines the color of the left and bottom axis line.

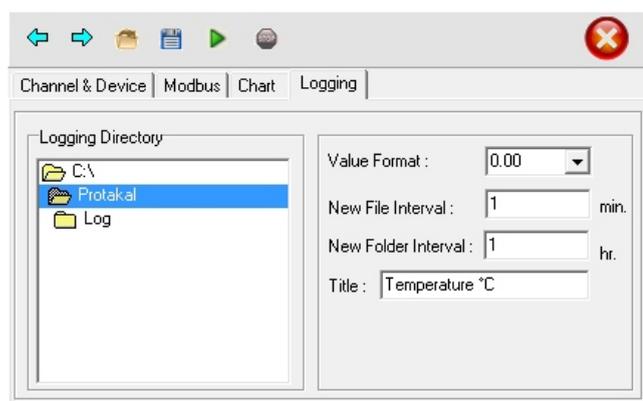
4.2 Graphing Channels Together

The picture above belongs to settings window of test2. To graph test1 on the chart of test2, tick the check box in front of test1 and press the start button.



5. LOGGING, IMPORTING AND EXPORTING

5.1 Logging Settings



Logging Directory: The path you would like to log data to. The exact file name will be "Logging Directory//Channel Name_xxx.txt".

Value Format: Electronic devices usually stores the input data as the number of counts. For example device measures 12,43 °C but stores the data as 1243 and send us 1243 via Modbus. So if we choose "0.00 Value Format" then we will see 12,43 on the graph screen.

New File Interval: Determines how often in minutes new file is created.

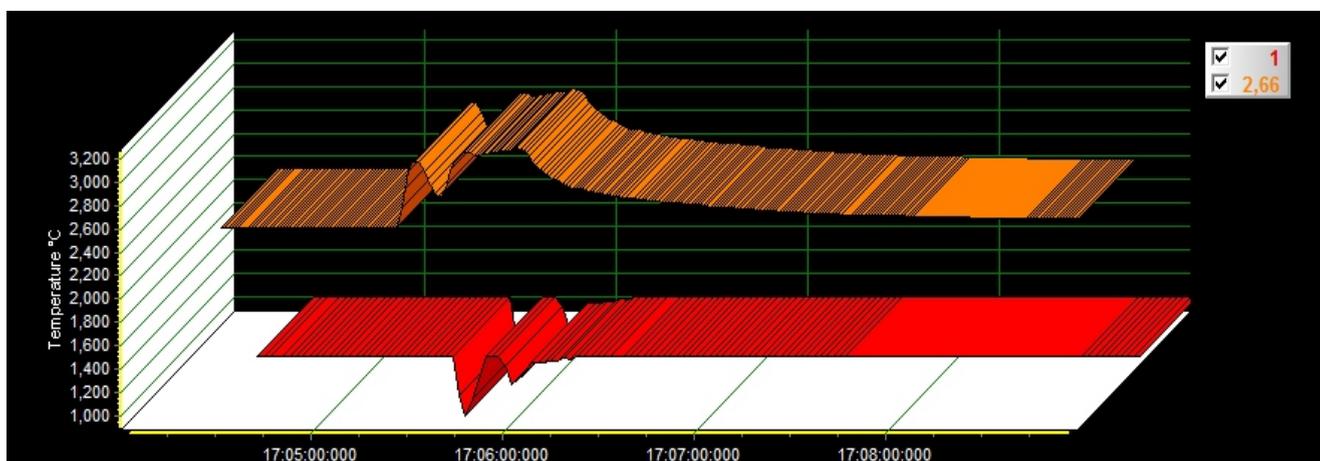
New Folder Interval: Determines how often in hour new folder is created.

Title: The title which is shown on the left side of graph screen.

5.2 Importing and Exporting Log File

- 1-)Click "Open Log File" button.
- 2-)Then click "Import" button.
- 3-)And then select the file which you want to import*.

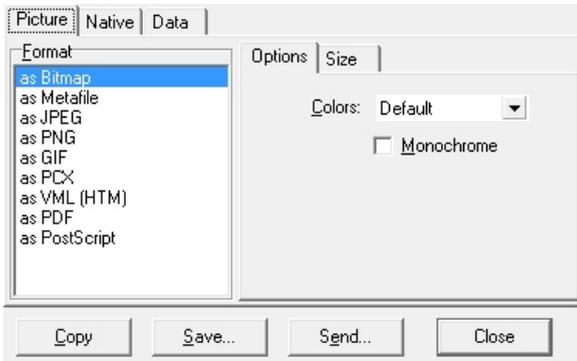
*You can open multiple files which belongs the same channel or another channel.



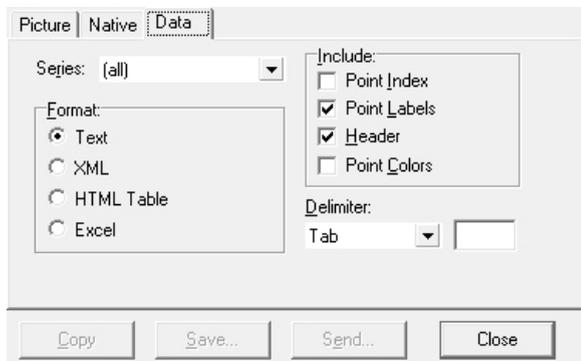
5. LOGGING, IMPORTING AND EXPORTING

To export the graphic as other picture and data formats;

Click “Export“ button.



Picture export types; bitmap, metafile, JPEG, PNG, GIF, PCX, VML(HTM), PDF, PostScript and **Native Binary*** format.



Other export formats; Delimiter text, **XML***, HTML table and Excel

***Note :** Real time logging file format is delimited ASCII. Delimited ASCII files can be read by most every windows data analysis package such as Excel and so is a very flexible format. It is also easily opened and edited in other software packages, even notepad. Because of this, the file format can easily be repaired if some sort of damage was to occur to part of the file.

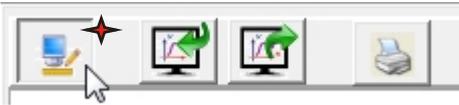
If you want to convert this format first you should import the data by Protakal and then export via Protakal. XML is the recommended format for saving your data because all new generation database softwares support XML.

Protakal imports only three type data format; default ASCII delimited file format, XML and native binary format.

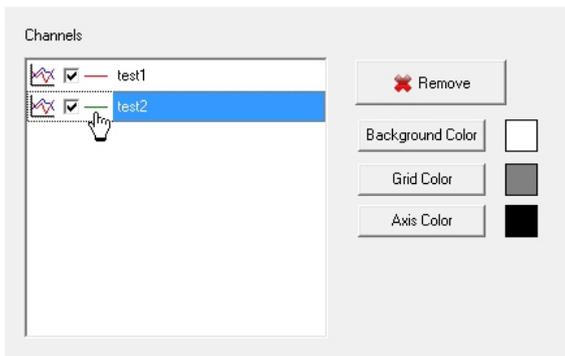
6. PRINTING

6.1 Optimizing Print Quality

Change color settings for a good print quality;

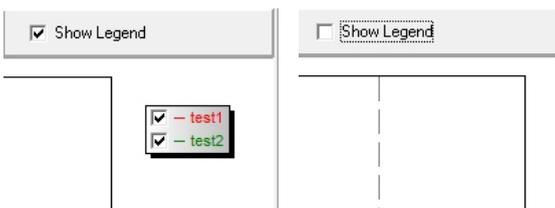


Click "Screen" button.



To change color of data line, double click the pointed line and select the color.

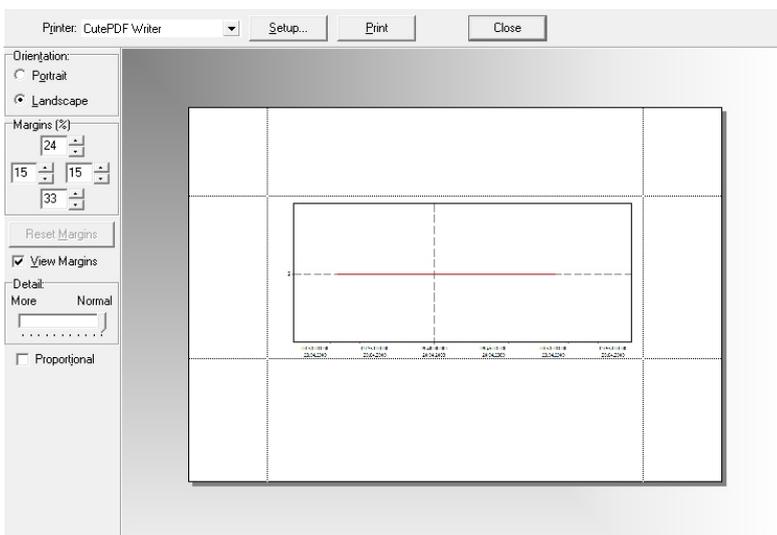
We recommend for a good quality; white background, gray grid and black axis.



You can remove the legend if you do not want to see on printing.



Click "Print Preview" button.



Do the last check and finally click "Print" button.