BENTEK SYSTEMS
SCADA & Telemetry Solutions

SCADALink IP100

SCADA Terminal Server

QUICK START GUIDE

Revision 1.42

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www.scadalink.com

INTRODUCTION

Use this Quick Start Guide to configure a SCADALink IP100.

Full documentation is found under the IP100 GUI Software Help section.

The IP100 GUI Software has the most up-to-date information including details such as Connection modes, configuration parameters, adding I/O modules, firmware downloading, physical cables and troubleshooting.

Application Notes and other additional information can be found online at www.scadalink.com.

1. HARDWARE CONNECTION

Apply 10-30VDC Power to PWR and GND terminals.

Digital Input, Digital Output   Relay Output (Form C)

Power

Power Output

COM1 RS-232   1   8

9   16

Reserved

Hardware
Reset Button

LED's

Internal
I/O Bus

COM0 RS-232

Ethernet Port

COM2 RS-232   17   24

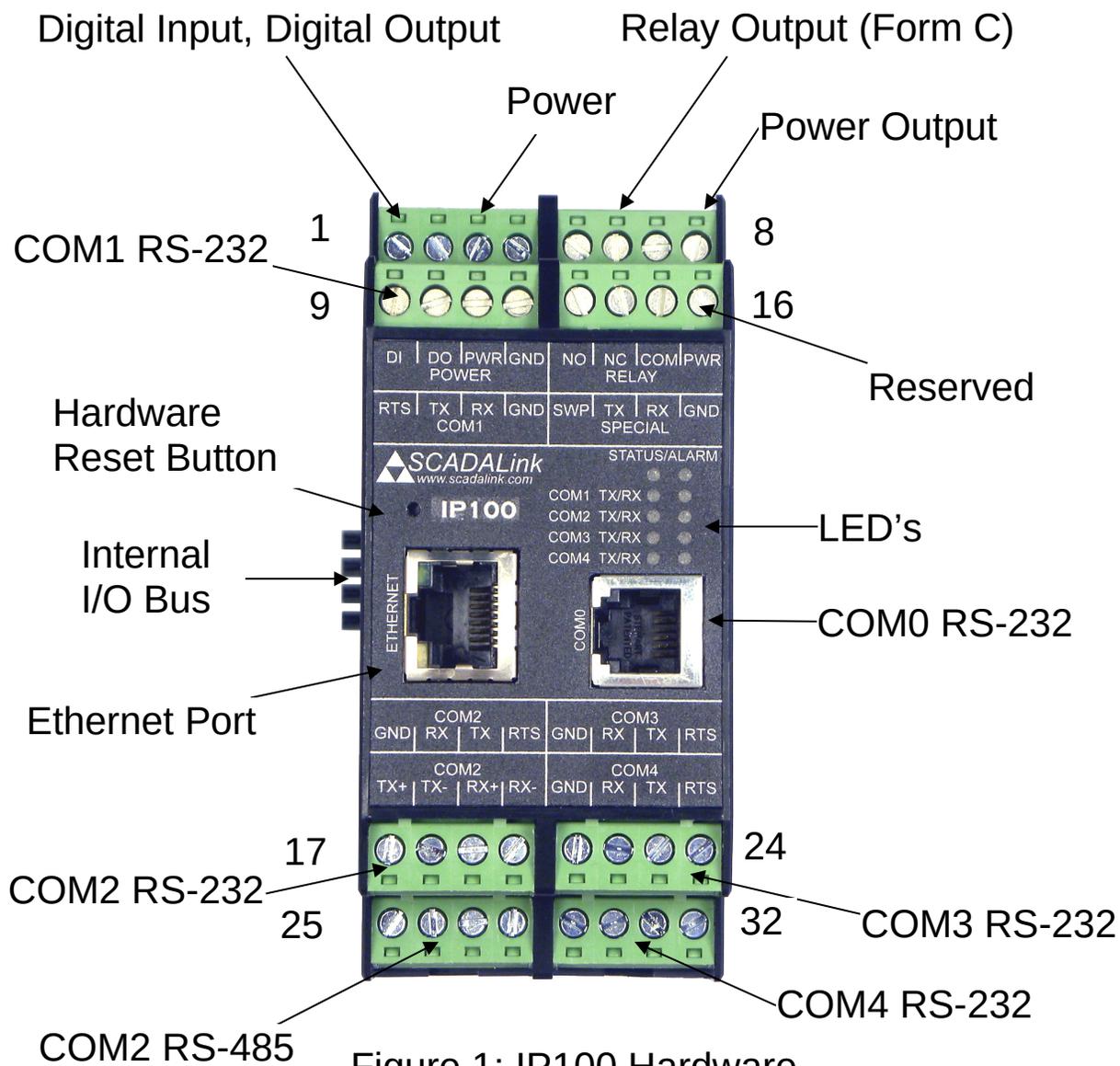25   32   COM3 RS-232

COM4 RS-232

COM2 RS-485   Figure 1: IP100 Hardware

2. SOFTWARE INSTALLATION

Install IP100 GUI software. This software is found on the IP100 CD or online at www.scadalink.com.

NOTE: When installing software from the website, save the installer file to your local drive first before running the installer.

3. CONNECTING TO THE IP100

For configuration or firmware loading, connect a cable between your PC and the IP100 COM0, COM1, or Ethernet port.

COM0

Table 1: COM0 Cables

Cable	Description
RJ11-DB9 User Cable	RS-232 3 wire serial connection used for general configuration and diagnostics
RJ11-DB9 Programming Cable	Special cable for firmware programming only (**NOTE:** only required for firmware version V2.3.4 or earlier)
RJ11-DB9 Switchable Cable	Custom cable from Bentek Systems with integrated switch allowing both User and Firmware programming capabilities

NOTE: Full cable pinouts are found in the GUI Help section

COM1

General configuration and diagnostics can be done through the COM1 terminal block using an RS232 3-wire (Tx,Rx,GND) connection. The GUI can connect to COM1 in two ways:

1. At start-up – The user has up to 15 second after a hardware reset to connect to COM1 via the GUI software. This state is indicated by all IP100 LED's turned on.
   NOTE: Run-time diagnostics are not available in Start-Up mode.
2. During run-time – At any time while the IP100 is operating, the user can connect to COM1
   NOTE: If COM1 has been previously configured as a data port, GUI can only access COM1 during Start-up condition.

Ethernet

Connection to the IP100 GUI can be made either remotely or locally via Ethernet. Both configuration and diagnostics functions can be used over IP.

If Ethernet communications are to be used, the IP address, subnet mask and gateway must be reprogrammed to correspond to the connected subnet in the field.

NOTE: A new factory IP100 ships with the following IP parameters:

- IP address: 192.168.0.110
- Subnet mask: 255.255.255.0
- Gateway: 192.168.0.1

Once hardware connection is established via one of the above methods, click on **Device > Connect** from the top menu bar in the GUI software. Choose either serial or Ethernet depending on the hardware connection type you are using. If connecting serially, choose the appropriate COM port used on your computer. If connecting over Ethernet, enter the IP address of the IP100 and the programmed password if applicable.

Troubleshooting

The most common connection problems arise due to mismatch between the GUI Software version (found in **Help > About**) and the IP100's installed firmware revision (found in **Device > Info**). Ensure:

- If firmware version is V2.3.4 or earlier, the GUI software revision must match the firmware version.
- All GUI software versions greater than V3.0.9 are cross compatible with all firmware versions greater than V3.0.9
- Proper cable, port and menu items have been chosen for configuration or firmware upload

The IP100 also has a diagnostic monitoring mode which provides users with a protocol analyzer for any serial port. Please refer to online Help manual for more information.

4. CONFIGURE DEVICE

After the appropriate cable and power is connected, run the GUI software and choose configuration parameters for the IP100.

The available configuration parameters are displayed in the Configuration Tree menu on the left hand side of the GUI.

The current configuration loaded in the IP100 can be retrieved by clicking **Device > Config > Read** from the top menu bar.

When finished setting up the desired configuration be sure to write the new configuration to the device by clicking   **Device > Config > Write**.

The first three sections are hardware configuration parameters.

General

- It is recommended to disable any unused features in the Power Options box.

- The Site Info box can be used to display the site location name or other useful information that can uniquely identify the unit.

Network

- IP Address, Subnet Mask and Gateway should be set within the range of the connected subnet.

- TCP/IP Timout should be set to 3 minutes by default

Serial

- Timeouts must be set to be greater than the typical response time of the connected serial device

- Integrated monitor can be used to determine response time

- RTS handshaking and RS-485 options can be configured in the Advanced Tab

For Firmware upgrade instructions, please consult the online Help menu.

The Table below shows the IP100's various Connection modes.

Table 2: Connection Table

Connection Types	Description
IP Mux	Used for most general terminal server functions where one or more IP hosts need access to poll through an available serial connection using Modbus/ROC/AB DF1 or similar protocols. **NOTE**: the IP100 will arbitrate multiple masters polling independently over the same IP mux connection (total allowed number of host socket connections per IP port set by the "count" parameter; max=8)
Serial Mux	Used to arbitrate multiple serial masters allowing them to share a single serial port when polling Modbus/ROC/AB DF1 or similar protocols. Serial mux destination port can also be shared with a IP mux port allowing combined arbitration of serial and IP polling.

Virtual Serial Server/Client	Used to provide a bi-directional dedicated connection between a single IP host and an available serial port. Virtual serial connections are full duplex and protocol independent.
Serial Master	Used to route incoming serial polls on an available COM port to various IP destinations based on the requested RTU address. Serial Master connections can only be used with Modbus RTU protocol.
Modbus Broadcast	Allows incoming serial or IP polls to be sent out multiple output serial ports simultaneously.
Connect Mode	This mode works in conjunction with Virtual Serial Server or Client and is used to create a link between 2 serial ports (a **source** and a **destination**) that is overidden by an IP connection when socket is established.

The GUI Help menu has detailed instructions and diagrams for each connection mode.

5. EXAMPLE CONFIGURATION

The following figure shows an example of a common configuration for the IP100. Figure 2 below shows how the IP100 can be configured as a terminal server to enable multiple IP masters to connect to serial devices on COM2 of the IP100.
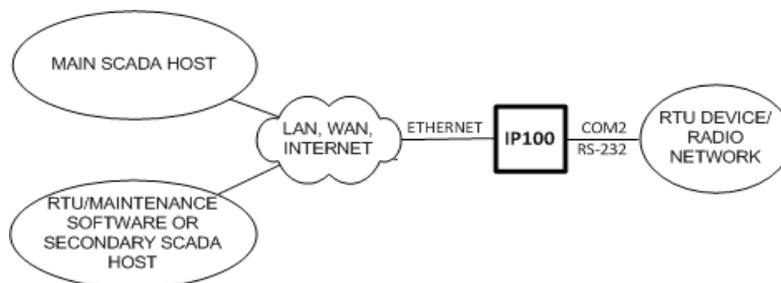

Figure 2: Multiple Modbus Masters

Step 1: Power-up IP100 and connect to computer via one of the following methods:

- User cable to COM0
- 3-wire cable to COM1

Step 2: Open IP100 GUI software and connect to device

Device > Connect > Serial

Step 3: Upload Current Configuration from device

Device > Config > Read

Step 4: Configure Network Settings. On the "Network" section of the left-hand tree, setup the IP address, Subnet Mask, and Gateway for the IP100 to correspond to the appropriate subnet of the network to be used in the field.

Step 5: Configure Serial Settings. On the "Serial" section of the left-hand tree, Adjust the Baud Rate and Data Format of the serial port on the IP100 you wish to connect to the field devices.

NOTE: Baud rate and format must match the settings used on the field devices/radio network etc.

Adjust the timeout setting for the desired port to be slightly longer than the expected response time of the field devices/serial network.

Step 6: Configure Connection Type. On the "IP Mux" section of the left-hand tree, enable the first Connection line by checking the box at the front of the line.

- Set desired IP protocol used by the IP Master (typically TCP).

- Set "Count" value to indicate the maximum number of simultaneous Masters allowed to communicate to the serial devices (3 in this example).
  NOTE: It is recommended to allow an extra connection for remote maintenance and troubleshooting of field devices.

- Set IP port number to be used by the IP Master to target the IP100 COM port (502 in this example).

- Set COM port to be used to connect to the serial devices/network (COM2 in this example).

Figure 3: IP Mux section, line 1 parameters