



# Modbus Communications for PanelView Terminals

## Introduction

This document describes how to connect and configure communications for the Modbus versions of the PanelView terminals. This document provides supplemental information for the PanelBuilder32 manuals.

<b>For more information about:</b>	<b>Go to page:</b>
Related Publications	2
Before using this Guide	2
Modbus Protocol	3
Modbus PanelView Terminals	3
Typical Modbus Network	4
Connector Pinout Definitions	7
Serial Port Connection	8
Modifying Modbus Settings from Terminal	9
Setting up Communications using PanelBuilder32	11
Modbus Address Spaces	14
Modbus Controller Data Table	15
Data Formats	16
Tag Editor	16
Downloading Applications over a Serial Link	19
Error Messages and Codes	20
Glossary	24

## Related publications

The following documentation provides additional information on installing, configuring and using your PanelView terminals.

<b>Publication Titles</b>	<b>Number</b>
PanelBuilder32 Getting Results Manual	2711-6.19
PanelBuilder32 Quick Start Manual	2711-6.20
PanelView Operator Terminal Manual	2711-6.1

The Modicon website provides information and product descriptions of Modbus products at:

**[www.modicon.com](http://www.modicon.com)**

## Before using this guide

We assume that you are familiar with Modbus communications. Since we cannot provide specific information about every type of application the PanelView might be used in, the information provided in this document is general, rather than specific.

Refer to glossary at the end of this publication for definitions of unfamiliar terms.

## Modbus protocol

Modbus protocol links Modicon Programmable Controllers and devices emulating Modicon Programmable Controllers in a wide variety of applications. Modbus protocol defines a message structure that controllers can use regardless of the network type over which they communicate.

Modbus is a half-duplex, master-slave communications protocol. The network master (PanelView) reads and writes coils and registers as if it was a Modicon controller. Every device on a Modbus communication link emulates the coils and registers of a Modicon Programmable Controller. Modbus allows a host to read and write coils/registers and obtain diagnostic information.

Modbus protocol allows a single master to communicate with a maximum of 255 slave devices. The master device on a Modbus network is not assigned an address.

## Modbus PanelView Terminals

Modbus terminals are identified by a 14 at the end of the catalog number, for example 2711-K9C14.

The Modbus terminals have:

- Modbus communication port
- RS-232 printer/file transfer port

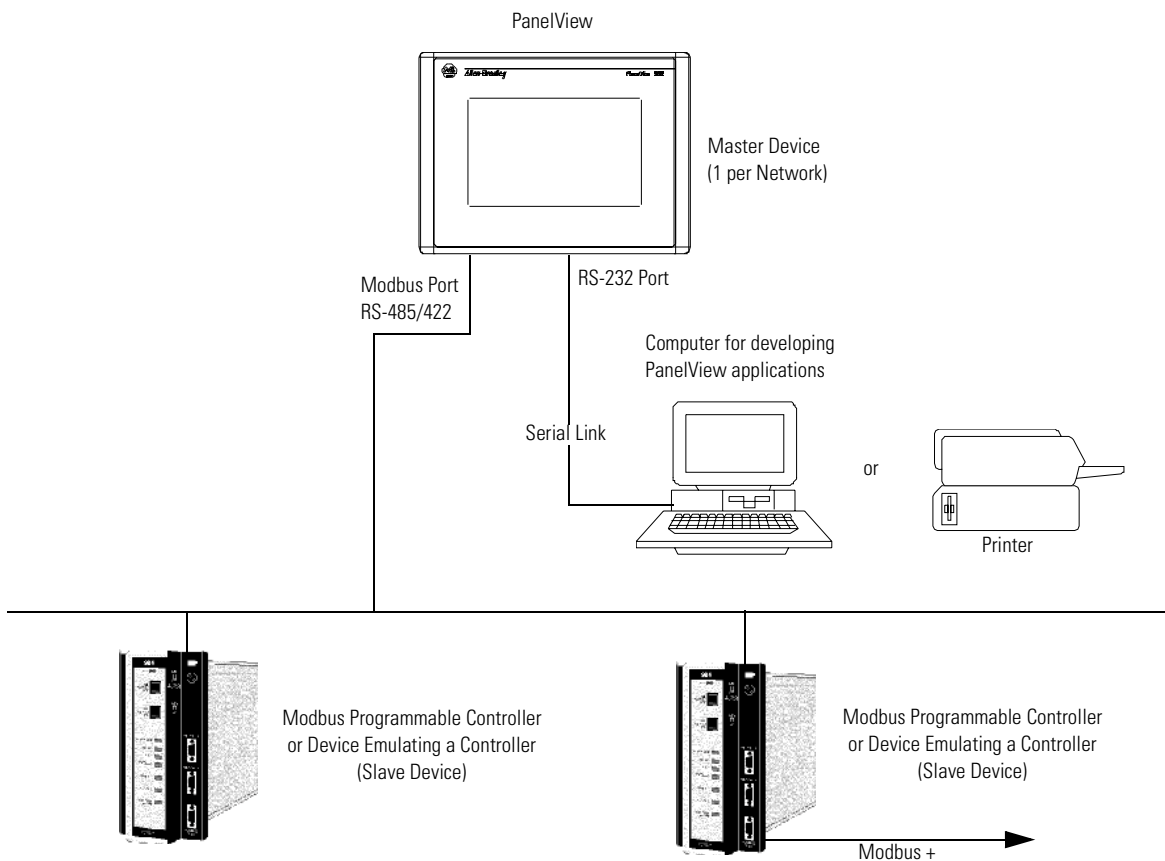
In addition, each terminal is available with either:

- AC or DC power

The characters L1 at the end of the catalog number designate a terminal with DC power (e.g. -T9A14L1).

## Typical Modbus Network

Shown below is a typical Modbus network with Modbus Controllers installed on two of the network drops.

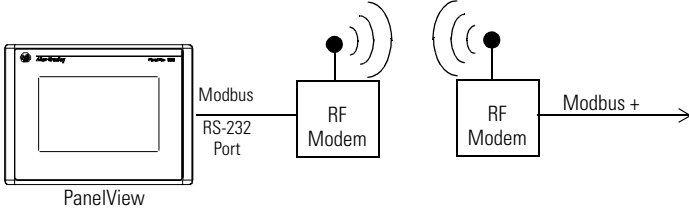
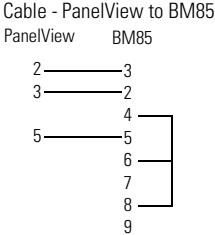
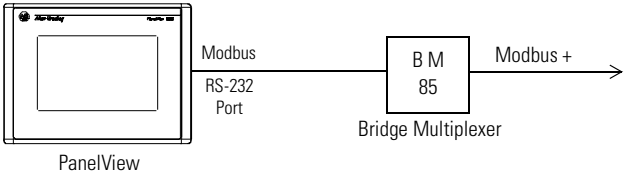


# Connection to a Modbus Plus Network

Using a Bridge Multiplexer (BM85) or an RF modem, the Modbus PanelView can be connected to a Modbus Plus network.

Modbus Plus is a local area network supporting up to 64 nodes at a data transfer rate of 1,000,000 bits/second. Modbus Plus provides host level peer-to-peer communication for network devices. The network also provides distributed input/output (DIO) communications.

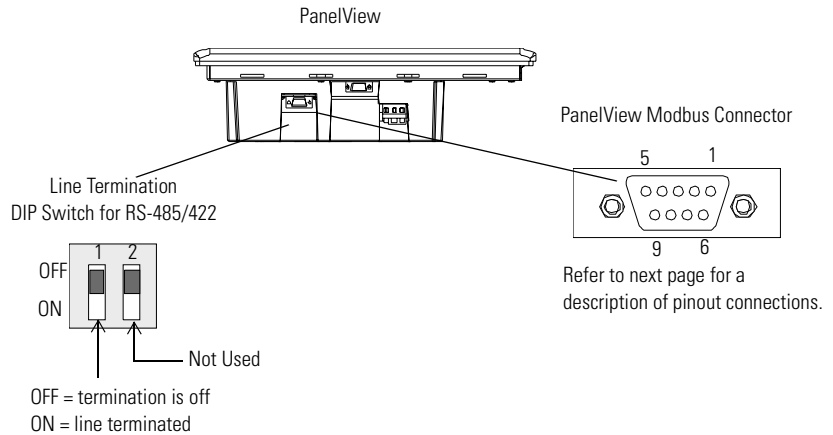
The BM85 Bridge Multiplexer provides connection to a Modbus Plus network through the PanelView Modbus RS-232 serial port.



## Making Modbus Connections

The PanelView Modbus protocol communicates with other devices over an RS-232 (point-to-point) or RS-485/RS-422 (multi-drop) serial link. Refer to the following pinout information to connect the PanelView to a Modbus network.

**Important:** Follow the Modbus network layout and design as specified by the user manual for your programmable controller.



### Line Termination

The device at each end of an RS-485/422 network should be terminated. A termination switch is provided on the PanelView (see figure above). Enabling line termination provides an RC line termination of .01mF and 120Ω. Do not use line termination for RS-232 communications. Do not terminate devices between the network ends.

#### ATTENTION



Use a nonconducting probe to change the line termination switch. Do not use a graphite pencil or other conductive material. Failure to use a nonconducting tool, may result in damage to the PanelView.

## Connector Pinout Definitions

The communication type is downloaded with an application or is set on the terminal configuration screen. The PanelView supports RS-232, RS-485 and RS-422 communication standards. The Modbus 9-pin male D shell connector has the following pin definitions for each standard.

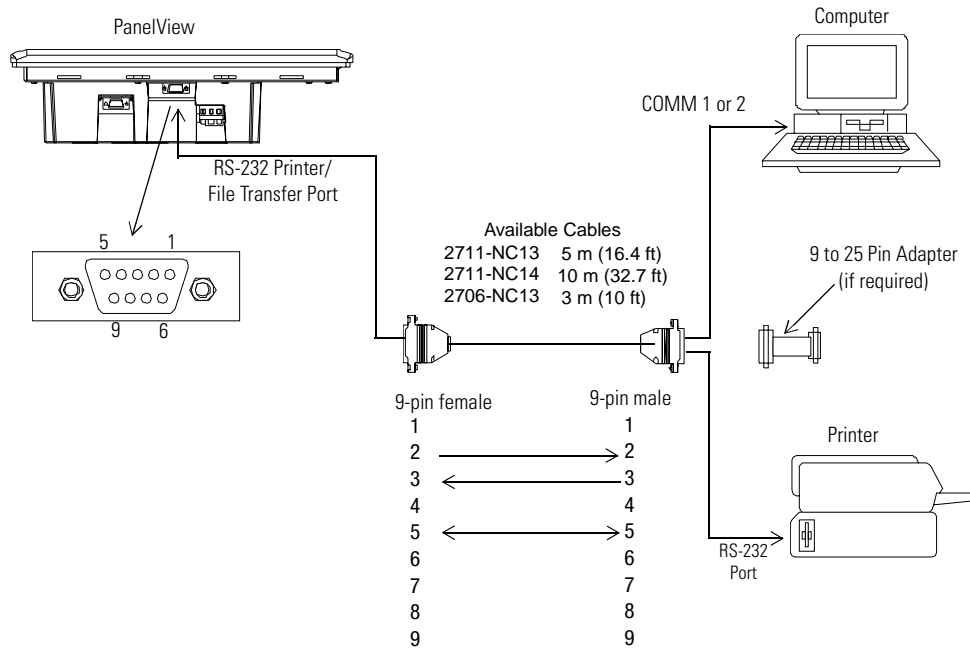
Pin Number	Function	
	RS-232	RS-485/RS-422
1	Shield	Shield
2	RXD	RXD <sup>1,2</sup>
3	TXD	TXD
4	DTR	See note <sup>3</sup>
5	COMMON	COMMON
6	DSR	See note <sup>3</sup>
7	RTS	TXD
8	CTS	RXD <sup>1,2</sup>
9	No Connection	No Connection

1. In RS-485 mode, pin 2 and pin 3 require an external jumper to electrically connect pins 2 and 3.
2. In RS-485 mode, pin 7 and 8 require an external jumper to electrically connect pins 7 and 8.
3. These pins must remain unconnected.

## Making Serial Port Connections

Use the RS-232 serial port on the PanelView terminal to:

- download/upload applications over a serial link
- or to connect a printer



**PV550 Printer Port (DCE)**  
9-pin male

- 1 NC
- 2 RXD or RX1 (Data Receive)
- 3 TXD or TX1 (Data Transmit)
- 4 NC
- 5 COM
- 6 DSR (pulled high to +12V)
- 7 NC
- 8 CTS (pulled high to +12V)
- 9 NC

**PV300/600/900/1000/1400 Printer Port (DCE)**  
9-pin male

- 1 NC
- 2 RXD or TR1 (Data Receive)
- 3 TXD or TX1 (Data Transmit)
- 4 NC
- 5 COM
- 6 DSR (pulled high to +12V)
- 7 RTS or RX2 (Data Receive)
- 8 CTS or TX2 (Data Transmit)
- 9 NC

**Printer/Computer Port (DTE)**  
9-pin female

- 1 DCD
- 2 RXD (Data Receive)
- 3 TXD (Data Transmit)
- 4 DTR
- 5 COM
- 6 DSR
- 7 RTS
- 8 CTS
- 9 NC

**Upload/Download or Printer Cable without Hardware Handshaking**

**PV550 Printer Port (DCE)**  
9-pin male

- 2 RXD or RX1 (Data Receive)
- 3 TXD or TX1 (Data Transmit)
- 5 COM

**Printer/Computer Port (DTE)**  
9-pin 25-pin

- |   |   |                     |
|---|---|---------------------|
| 2 | 3 | RXD (Data Receive)  |
| 3 | 2 | TXD (Data Transmit) |
| 5 | 7 | TXD COM             |



## Modifying Modbus Settings from the Terminal

You can display or modify Modbus settings directly from the terminal. From the Configuration Mode menu of the terminal, select Serial Communication Setup. The screen below appears.

### ATTENTION



Settings downloaded with a Modbus application have priority over terminal settings. Modbus settings take effect immediately after an application is downloaded.

```

MODBUS RTU MASTER
#####
      Baud:          9600
Data Bits/Parity:   8/Odd
Response Timeout (ms):  ####
Port/Modem Handshake:  Modem
      RTS TX Delay (ms):  ####
      RTS Off Delay (ms):  ####
      CTS Timeout (ms):  ####

Restart Terminal      Error - ##
                        ###
Exit

```

### Reset Terminal [F1]

Resets the terminal.

### Baud Rate [F2]

Steps through the available baud rates: 300, 1200, 4800, 9600, 19200, 28800, and 38400 with each key (or screen) press. A selected baud rate takes effect immediately.

### Parity/Data Bits [F3]

Steps through the available options:

- 8 EVEN
- 8 ODD
- 8 NONE (Default Setting)

**Note:** All communications occur with 1 stop bit.

### Response Timeout (ms) [F4]

Opens the numeric entry scratchpad. Provide a timeout value of 20 to 5000 milliseconds. The timeout specifies the time, after a command is sent by the PanelView terminal, that an error is indicated by no response from the slave device.

### **Port/Modem Handshake [F5]**

Steps through the available options:

- MODEM
- RS-232
- RS-422
- RS-485

**Note:** The following delays (RTS TX, RTS Off, and CTS Timeout) facilitate modem communications. Refer to your modem user manual for information on the recommended delay values.

### **RTS TX Delay (ms) [F6]**

Opens the numeric entry scratchpad. Provide a delay value of 0 to 2000 milliseconds. The RTS TX delay specifies the delay between the assertion of the RTS signal and the transmission of the first character of the Modbus message.

### **RTS Off Delay (ms) [F7]**

Opens the numeric entry scratchpad. Provide a delay value of 0 to 2000 milliseconds. The RTS Off delay specifies the delay between the transmission of the last character of the Modbus message and the assertion of the RTS signal.

### **CTS Timeout (ms) [F8]**

Opens the numeric entry scratchpad. Provide a timeout between 0 to 2000 milliseconds. The CTS timeout specifies the maximum allowable delay between the assertion of the RTS signal by the PanelView terminal and the assertion of the CTS signal by the modem.

### **Exit [F10] or [F16]**

Returns to the Configuration Mode menu.

## Setting up Communications

Setting up Modbus communications for an application includes:

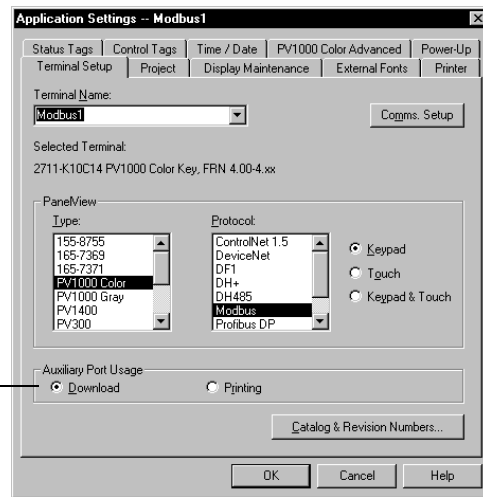
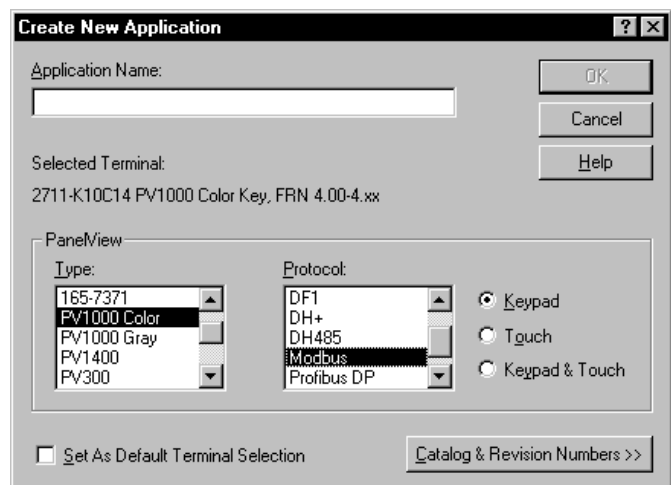
- selecting a Modbus terminal when creating the application.
- configuring communication parameters for the terminal on the Modbus link.

## Selecting a Modbus PanelView Terminal

Select a Modbus terminal for a PanelView application from:

- Create New Application dialog or the
- Terminal Setup tab of the Application Settings dialog when converting the application to run in another terminal.

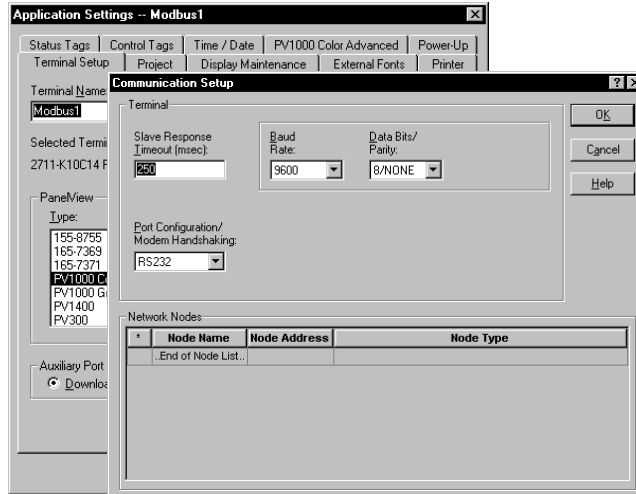
Any catalog number with 14 as the last number (2711-xx14) is a Modbus terminal.



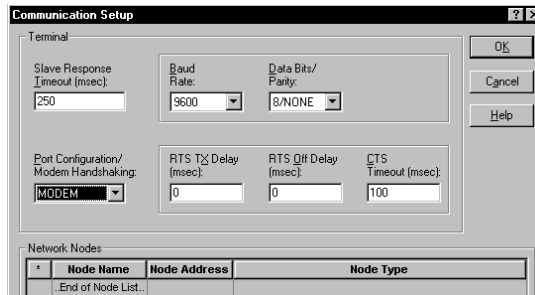
Indicates RS-232 port is set  
for downloading  
applications not printing

## Configuring Modbus Communications

Modbus communication parameters are accessed from the Terminal Setup dialog. To open the Terminal Setup dialog, choose Terminal Setup from the PanelBuilder32 Application menu.



**If RS232, RS422, or RS422 Port Configuration is selected**



**If Modem Handshaking is selected**

1. Click the Comms. Setup button from the Terminal Setup dialog.
2. Under Network Devices, edit the following parameters:

Specify:	To:
Node Name	Either select a previously defined network node name or enter a new name of up to 32 characters. The name is validated when you click the OK to make sure it has not been previously assigned to another PanelView in the same project.
Node Address	Select the address (1 to 255) of the slave device on the Modbus link. This address is associated with the network device selected in the Name field (above). Each node on the network should be assigned a unique address.
Type	Select Modbus as the type. You cannot create or modify the configuration of a device with a Type defined as Other (not Modbus).

3. Under Terminal, edit the following parameters:

<b>Specify:</b>	<b>To:</b>
Slave Response Timeout (msec)	Enter a value between 20 and 5000 milliseconds. The default is 250. This timeout specifies the time, after a command is sent by the PanelView terminal, that an error is indicated by no response from the slave device.
Baud Rate	Select the baud rate of the Modbus link. The available baud rates are: 300 1200 4800 9600 (Default Setting) 19200 28800 38400
Data Bits/Parity	Select Number of Data Bits and Parity: 8/ODD 8/EVEN 8/NONE (Default Setting)  <b>Note:</b> Serial communications occur with 1 stop bit.
Port Configuration/ Modem Handshaking	Select the communication port option: RS232 (Default) Modem RS422 RS485
<b>The Following Only Appear when Modem is Selected</b>	
RTS TX Delay (msec)	Enter a value between 0 and 2000 milliseconds. The default is 0. This delay occurs between the asserting of RTS and the transmission of the first character of data.
RTS Off Delay (msec)	Enter a value between 0 and 2000 milliseconds. The default is 0. This delay occurs between the last data character transmitted and the deasserting of RTS.
CTS Timeout (msec)	Enter a value between 0 and 2000 milliseconds. The default is 100. This timeout specifies the delay between the assertion of the RTS signal by the PanelView terminal and assertion of the CTS signal by the modem.

4. Click OK to exit and return to the Terminal Setup dialog.

## Modbus Address Spaces

The PanelView reads and writes data into other Modbus devices on the same network. The Node Address specifies the device (node) and the Address Type specifies the address space. The following address types are supported:

- Input Status (status of Modicon controller discrete input)
- Output Coil (status of Modicon controller discrete output)
- Input Register (contents of input register in Modicon controller)
- Holding Register (contents of holding register in Modicon controller)

Modbus devices can contain four distinct address spaces. Two spaces are reserved for Coil data and two are reserved for Register data. The PanelView terminal can read from any of the four address spaces. However, the PanelView terminal can only write to the Output Coil and Holding Register address spaces.

## Coil Addressing

### In Write Tags

If Output Coil address type is specified in a write tag, the data is written to the Coil address using Modbus Function Code 5 (single coil) or Function Code 15 (multiple coils).

### In Read Tags

If either Coil address type is specified in a read tag, data is read from the appropriate Coil address. For Input Status Coils, the status of the discrete input is read using a Modbus Function Code 2. For Output Coils, the status of the discrete output is read using Function Code 1.

## Register Addressing

### In Write Tags

If Holding Register address type is specified in a write tag, data is written to the Register address using Modbus Function Code 6 (single register) or Function Code 16 (multiple registers).

### In Read Tags

If an Input Register or Holding Register is selected in a read tag, data is read from the appropriate Register address using Modbus Function Code 3 (holding register) or Function Code 4 (input register).

## Data and Address Types

Not all of the data types are compatible with every address type. The following table shows the Address Type available based on the selected data type.

Data Type	Compatible Address Type(s)
Bit	Input Status, Output Coil
4BCD	All Address types
Unsigned Integer	Input Register, Holding Register
Signed Integer	Input Register, Holding Register
IEEE Float	Input Register, Holding Register
Bit Array	Input Status, Output Coil
Character Array	Input Register, Holding Register

## Modicon Controller Data Table

Modicon controllers store read and write address spaces in the following data table locations.

**Note:** The PanelView does not require data addresses that conform to the address ranges provided in the following table. For each address type, the PanelView terminal supports address ranges from 0 to 65535. For example, for a discrete input status at address 40000, the full address representation would be 140000.

Address	Address Type	Data Access	Description
0xxxx	Discrete Output or Coil (Internal)	Bit Read or Write	Use to drive a real output through an output module or to set one or more internal coils. A coil can be used to drive multiple contacts.
1xxxx	Discrete Input Status	Bit Read Only	Use to drive contacts in the logic program. The Input state is controlled by an input module.
3xxxx	Input Register	Word Read Only	Holds numeric inputs from an external source (for example, a thumb wheel entry, an analog signal or data from a high speed counter). A 3x register can also store 16 contiguous discrete signals that are entered into the register in either binary or binary coded decimal (BCD) formats.
4xxxx	Output Holding Register	Word Read and Write	Use to store numerical (decimal or binary) information or to send the information to an output module.
6xxxx	Extended Memory Register	Access through Logic Program only	Use to store information in an extended memory area. Only available in PLCs with 24 bit CPUs that support extended memory such as the 984B, E984–785 and Quantum series of PLCs.

## Data Format

Modicon controllers communicate in either ASCII or RTU (Remote Terminal Unit) transmission mode. The PanelView only supports RTU mode. In RTU mode, each 8-bit byte contains 2 four-bit hexadecimal characters. The following is supported:

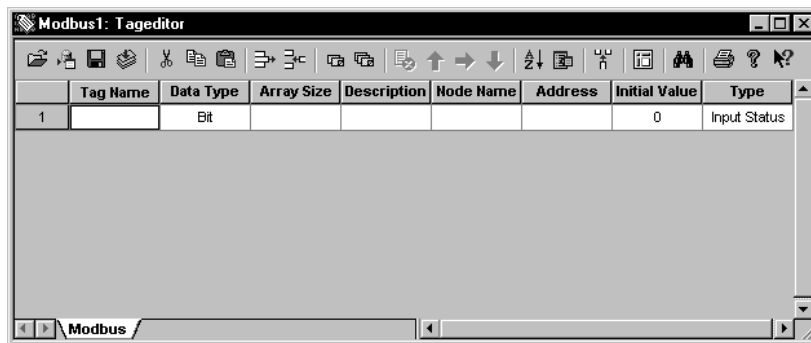
- 1 start bit
- 8 data bits (least significant bit first)
- 1 bit for even/odd parity, no bit for no parity
- 1 stop bit if parity used, 2 bits if no parity selected

## PanelBuilder32 Tag Editor

Use the Tag Editor or the Tag Form dialog (accessed from the object's dialog) to enter tags. There are 2 types of tags:

- digital - for bit data types
- register - for all other data types

Tag Editor



Register Tag Form Dialog

Bit Tag Form Dialog



## Tag Editor Fields

Field	Description	Valid Characters	Notes
Tag Name	Name of tag.	Maximum characters = 32 A-Z, a-z, 0-9 hyphen (-), underscore (_), percent (%)	<ul style="list-style-type: none"> <li>- Tag name must be unique.</li> <li>- Can't start with 0-9, hyphen, or percent</li> <li>- Tag names are not case sensitive.</li> <li>- Do not use blanks, tabs, carriage returns or non-printable characters.</li> </ul>
Data Type	Data format of tag.	Select one of the following: Bit 4BCD Unsigned Integer Signed Integer IEEE Float Bit Array Character Array	Data type must be compatible with the data format selected in the object's dialog.
Array Size	Size of array.	Character arrays are 1-128 characters Bit arrays are 1-16 bits	<ul style="list-style-type: none"> <li>- Displays only if Bit Array or Character Array are selected.</li> <li>- Array size must be an integer.</li> <li>- A Modbus bit array can start at any input or coil address regardless of the word boundaries.</li> <li>- Do not use blanks, tabs, carriage returns or non-printable characters.</li> </ul>
Description	Description of tag.	Maximum characters = 255 Any printable character	Do not use tabs, carriage returns or non-printable characters.
Node Name	Name of node (device) assigned to tag.	Pull down list of previously defined nodes.	Each node name is associated with a node address.
Tag Initial Value	The starting value for the current tag in engineering units (used only for write tags).	Maximum characters = 24 0 - 9 e, E, +, - and period 0 or 1 for bit data type	<ul style="list-style-type: none"> <li>- Do not use blanks, tabs, carriage returns or non-printable characters.</li> <li>- Maximum precision is 6 places to the right of the decimal point for non-floating point values.</li> <li>- If present, a sign (+ or -) for the number must be first (+ is default).</li> <li>- If present, a sign for the exponent must immediately follow the e or E.</li> <li>- No entry = default of 0.</li> </ul>
Tag Address	Address of the data in the slave device.	0 to 65535	<ul style="list-style-type: none"> <li>- Do not use blanks, tabs, carriage returns or non-printable characters.</li> <li>- A Modbus bit array can start at any input or coil address regardless of the word boundaries.</li> </ul>

Field	Description	Valid Characters	Notes
Type	Determines address of the data in the slave device.	Options are: Input Status Output Coil Input Register Holding Register	Address Type may support some or all of the data types. Refer to page 15.
Scaling Scale: 'm' in $y = mx + b$ Offset: 'b' in $y = mx + b$	Values you want to use to convert the current tag's processor integer value ('x') to engineering units ('y').	Maximum characters = 12 0 - 9 e, E, +, and period	<ul style="list-style-type: none"> <li>- Do not use blanks, tabs, carriage returns or non-printable characters.</li> <li>- Maximum precision for scale is 6 places to right of decimal point.</li> <li>- Maximum precision for offset is 6 places to right of decimal point.</li> <li>- If present, a sign (+ or -) for the number must be first (+ is default).</li> <li>- If present, a sign for the exponent must immediately follow the e or E.</li> </ul>
Data Entry Limits Minimum Maximum	Minimum and maximum values that can be assigned to the tag.	Maximum characters = 12 0 - 9 e, E, +, and period	<ul style="list-style-type: none"> <li>- Do not use blanks, tabs, carriage returns or non-printable characters.</li> <li>- Maximum precision is 6 places to right of decimal point.</li> <li>- If present, a sign (+ or -) for the number must be first (+ is default).</li> <li>- If present, a sign for the exponent must immediately follow the e or E.</li> </ul>

## Downloading Applications over a Serial Link

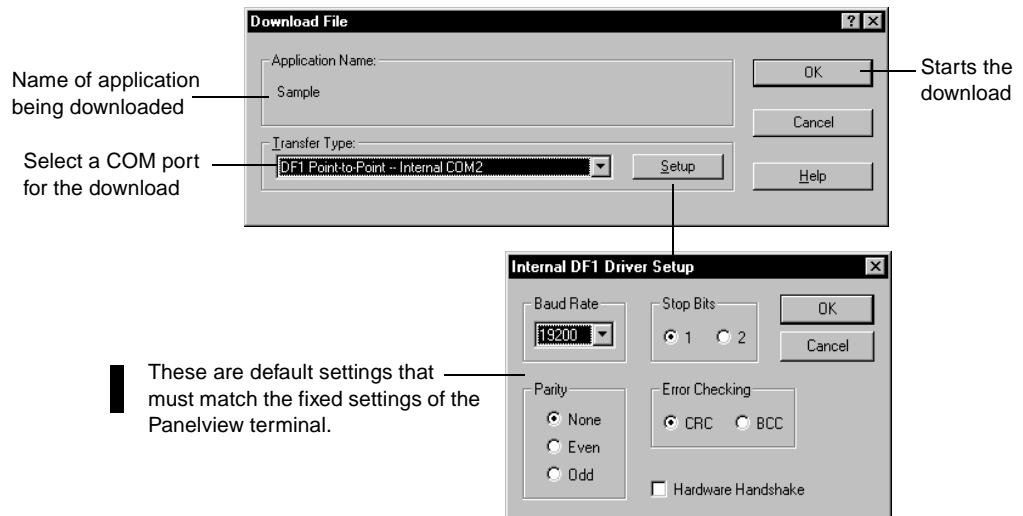
To download a Modbus application from your computer to the PanelView terminal over an RS-232 link:

- connect computer to RS-232 port of PanelView terminal
- download application from the PanelBuilder32 File menu

### Downloading Application using the Internal DF1 Driver

This section shows how to download an application from a serial COM port on your computer to the RS-232/DF1 port of the PanelView terminal using a point-to-point connection. The download uses the internal DF1 driver on your computer's COM1- COM9 port. This driver uses fixed DF1 settings that match those of the RS-232 port of the terminal. Use the 2711-NC13 cable (9-pin connector) for the point-to-point connection. Check the cable connections before starting the download.

Open the application you want to download and select **File>Download**. The application is validated during the download. Any errors that occur during validation must be corrected before you can proceed with the download.



When the download is complete, the terminal resets, verifies and starts the application.

**Modbus Application Report** The application printout for Modbus provides the following information:

- configuration data
- tag data

**Error Messages and Codes** The following tables lists error messages and codes specific to Modbus communications. For all other messages, refer to the PanelView Operator Interface manual or the PanelBuilder32 online help.

### PanelBuilder32 Tag Error Messages

Message	Recommended Action
Tag Address is invalid, number must be between 0 and 65535.	Enter appropriate value (0–65535) in Tag Editor.
Character Array Size is invalid, must be between 1 and 128.	Enter appropriate value (1–128) in Tag Editor.
Maximum separation of coil tags in an alarm must be less than 1024 coils.	In Alarm Setup, change the alarm callout tags so that their addresses are within the specified number of coils/registers of the alarm trigger tag address.
Maximum separation of register tags in an alarm must be less than 64 registers.	In Alarm Setup, change the alarm callout tags so that their addresses are within the specified number of coils/registers of the alarm trigger tag address.
All tags in an alarm must reference the same network node address.	In Alarm Setup, change the alarm trigger tag and corresponding alarm callout tags to correct the error condition.
All tags in an alarm must have the same Modbus address type.	In Alarm Setup, change the alarm trigger tag and corresponding alarm callout tags to correct the error condition.
All tags in an alarm must be in the same direction to/from the network node.	In Alarm Setup, change the alarm trigger tag and corresponding alarm callout tags to correct the error condition.
There cannot be more than one tag in an alarm if the data direction is to the network node.	In Alarm Setup, change the alarm trigger tag and corresponding alarm callout tags to correct the error condition.
Cannot write to an input register or input status address.	Use an output tag for an object or change the tag addresses in the Tag Editor to an output register or coil.
Not enough network address space to support a tag of this data type.	Change the tag address to reference a lower numbered discrete address or register.

The following errors are not specific to Modbus but may appear when you exit the Tag Editor.

<b>Message</b>	<b>Recommended Action</b>
Minimum Value is invalid, must be between 0 and 9999	Enter appropriate value in Tag Editor.
Minimum Value is invalid, must be between 0 and 65535	Enter appropriate value in Tag Editor.
Minimum Value is invalid, must be between -32768 and 32767	Enter appropriate value in Tag Editor.
Minimum Value is invalid, must be between -99999997952 and 999999995904	Enter appropriate value in Tag Editor.
Maximum Value is invalid, must be between 0 and 9999	Enter appropriate value in Tag Editor.
Maximum Value is invalid, must be between 0 and 65535	Enter appropriate value in Tag Editor.
Maximum Value is invalid, must be between -32768 and 32767	Enter appropriate value in Tag Editor.
Maximum Value is invalid, must be between 0 and 9999	Enter appropriate value in Tag Editor.
Scale Value is invalid, must be between -99.999997952e9 and 999.999995904e9	Enter appropriate value in Tag Editor.
Offset Value is invalid, must be between -99.999997952e9 and 999.999995904e9	Enter appropriate value in Tag Editor.

### PanelBuilder32 Node Error Messages

<b>Message</b>	<b>Recommended Action</b>
Slave Response Timeout is invalid, must be between 20 and 50000.	Correct value in the Communications Setup Dialog.
RTS TX Delay is invalid, must be between 0 and 2000.	Correct value in the Communications Setup Dialog.
RTS Off Delay is invalid, must be between 0 and 2000.	Correct value in the Communications Setup Dialog.
CTS Timeout is invalid, must be between 0 and 2000.	Correct value in the Communications Setup Dialog.
Node Address is invalid, must be between 1 and 255	Correct value in the Communications Setup Dialog.
Data Bits / Parity is invalid.	Correct value in the Communications Setup Dialog.
Port Configuration / Modem Handshaking is invalid.	Correct value in the Communications Setup Dialog.
Baud Rate is invalid.	Correct value in the Communications Setup Dialog.
Terminal node not configured.	Configure the node in the Communications Setup Dialog.
Network node is invalid, must be Modbus type.	Configure the node in the Communications Setup Dialog.

### PanelBuilder32 Translation Error Messages

<b>Message</b>	<b>Recommended Action</b>
Not enough network node address space to support a tag of this data type.	Change the tag address to reference a lower numbered discrete address or register.
Not enough RAM on Daughtercard to support the size of this user application file.	Group tag addresses together as much as possible, otherwise remove screen objects.
Translation Failure	Contact Allen-Bradley for technical support.

## Communication Status Error Messages

These errors appear as a banner at the top of an application screen (error #634 in upper left corner) or as a status display on the terminal configuration screen.

**Note:** Since the PanelView is configured as a master device, communication status is not updated until the PanelView requests information. If communications are lost, the PanelView displays the last communication status.

Errors numbered less than 7 are considered minor fault conditions and will clear automatically when corrected. Errors numbered 7 and above require that the terminal be reset to clear the error.

Code	Indicates	Recommended Action
1	No connections established. Occurs on power-up until a device connection is established on the network.	Establish a connection over Modbus to the PanelView.
2	Invalid Messages (Parity Error). The Parity received by the PanelView is invalid.	Check that the parity of both the PanelView terminal and Modbus device are set the same.
3	Error Reply Messages (Application Error). Error indicates that the Modbus device does not support a coil or register address requested by the PanelView terminal.	Verify the coil and register addresses used in the application.
4	Error Detect Failures (CRC Error). Indicates that the messages from a Modbus device contain an invalid Cyclic Redundancy Check.	Verify the address of each Modbus device and cabling to each device.
5	Loss of Communications (Rx Timeout). Indicates Modbus device is not responding.	Verify that the Modbus device supports RTU communications.
6	Modem Failure (CTS Timeout Failure). Indicates that the modem failed to assert the CTS line within the time specified on the configuration screen.	Check the cabling and, if necessary, increase the CTS timeout on the communications configuration screen.
7-22	Internal Errors	Reset Terminal, Contact Allen-Bradley technical support if problem reoccurs.

# Glossary

## Coil

Bit location in a a Modbus device.

## Digital Tag

A bit address.

## Inputs

Data which is received by the logic controller from other devices.

## Master

Device which sends messages (queries) to one or more slave devices.

## Modicon Controller

Refers to the 184/384, 484, 584, 884, M84 (micro), or 984 family of Modicon logic controllers.

## Outputs

Data which is sent by a logic controller to other devices.

## Register

16 bit unsigned value residing in a Modbus device.

## RTU

Acronym for Remote Terminal Unit, one of 2 possible transmission formats supported by Modbus. PanelView terminals only support RTU.

## Slave

Device which receives queries from the master and provides a response.

---

### Reach us now at [www.rockwellautomation.com](http://www.rockwellautomation.com)

Wherever you need us, Rockwell Automation brings together leading brands in industrial automation including Allen-Bradley controls, Reliance Electric power transmission products, Dodge mechanical power transmission components, and Rockwell Software. Rockwell Automation's unique, flexible approach to helping customers achieve a competitive advantage is supported by thousands of authorized partners, distributors and system integrators around the world.

**Americas Headquarters**, 1201 South Second Street, Milwaukee, WI 53204, USA, Tel: (1) 414 382-2000, Fax: (1) 414 382-4444

**European Headquarters SA/NV**, avenue Herrmann Debroux, 46, 1160 Brussels, Belgium, Tel: (32) 2 663 06 00, Fax: (32) 2 663 06 40

**Asia Pacific Headquarters**, 27/F Citicorp Centre, 18 Whitfield Road, Causeway Bay, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Publication 2711-6.9 - March 2000

Supersedes Publication 2711-6.9 - October 1997



**Rockwell  
Automation**

40061-386-01(B)

© Copyright 2000 Rockwell International Corporation. Printed in the U.S.A.