PEPPERL+FUCHS, INC.

Factory Automation

P+F RTS DeviceServer Manual

FACTORY AUTOMATION

P+F RTS DEVICESERVER MANUAL

1600 Entreprise Parkway
Phone 330.425.3555 • Fax 330.425.4607

Contents

1 Introduction…… 3
1.1 General Information……. 3
1.2 Simplified Command Structure for the P+F RTS DeviceServer……. 3

2 **Connectivity…… 4**
2.1 Setup…… 4
2.2 Example Setup Description…….. 4
2.3 Compatible ID Systems…… 5
2.4 Hardware Installation……..…. 6
2.4a Connecting to the Ethernet Connection……6
2.4b Serial Connection……7

3 RTS DeviceServer……9
3.1 Server Configuration……. 9
3.1a Parameters……..… 11
3.2 Configure Network…….….. 12
3.3 Configure Email Messages…….…... 14
3.4 Ports…….. 15
3.5 Global Parameters……. 16

4 Operations…… 18
4.1 Pass Though Operation……..18
4.2 Issuing a Command…….…….. 19
4.3 Network Timeout…….. 20
4.4 Command Reply……..…….. 20
4.5 Resends……..21
4.6 Serial Timeout……21

Table of Figures

Figure 1: Connection schematics for Pepperl+Fuchs, Inc. RTS DeviceServers…. 4
Figure 2: Examples of LED Locations of the Ethernet Connection…… 6
Figure 3: Example Ping Screen in Dos when pinging a IP address……7
Figure 4: Example of RJ45 PINOUTS…… 8
Figure 5 Example of DB9 PINOUTS……..8
Figure 6: U-P4-RX Base for IPT-FP R/W Head Communication Hardware……..8
Figure 7: Communication Hardware for MTT-S1, & MTT-S3…….…..9
Figure 8 User Name & Password screen to enter network……9
Figure 9: RTS DeviceServer Configuration…… 10
Figure 10: Example Flow Diagram of Connection Status to Ports……11
Figure 11: Network Configuration Page……12
Figure 12: Email Message Configuration……...14
Figure 13 Example Diagram of Port Mirroring…… 15
Figure 14: Port Configuration Edit…… 16
Figure 15: Administrative Port and PFT Parameters……17
Figure 16: Administrative Port…….…… 17
Figure 17: PFT Parameters…… 18
Table 1: RJ45 Connector Pinouts……7

1 Introduction

1.1 General Information

The RTS DeviceServer is an Ethernet solution for connecting P+F ID Systems and executing applications that can benefit from the performance of EtherNet. Using the RTS DeviceServer applications can be programmed to automate manufacturing steps and product tracking. EtherNet is a logical choice to provide total product visibility throughout the process.

The DeviceServer hardware in conjunction with the intelligent firmware allows direct connection to P+F identification systems to EtherNet. The P+F DeviceServer directly supports the low-cost Ident-I system P family and the high performance Ident-M System T. Integration is simplified via ActiveX components offered separately by Pepperl+Fuchs.

1.2 Simplified Command Structure for the P+F RTS DeviceServer

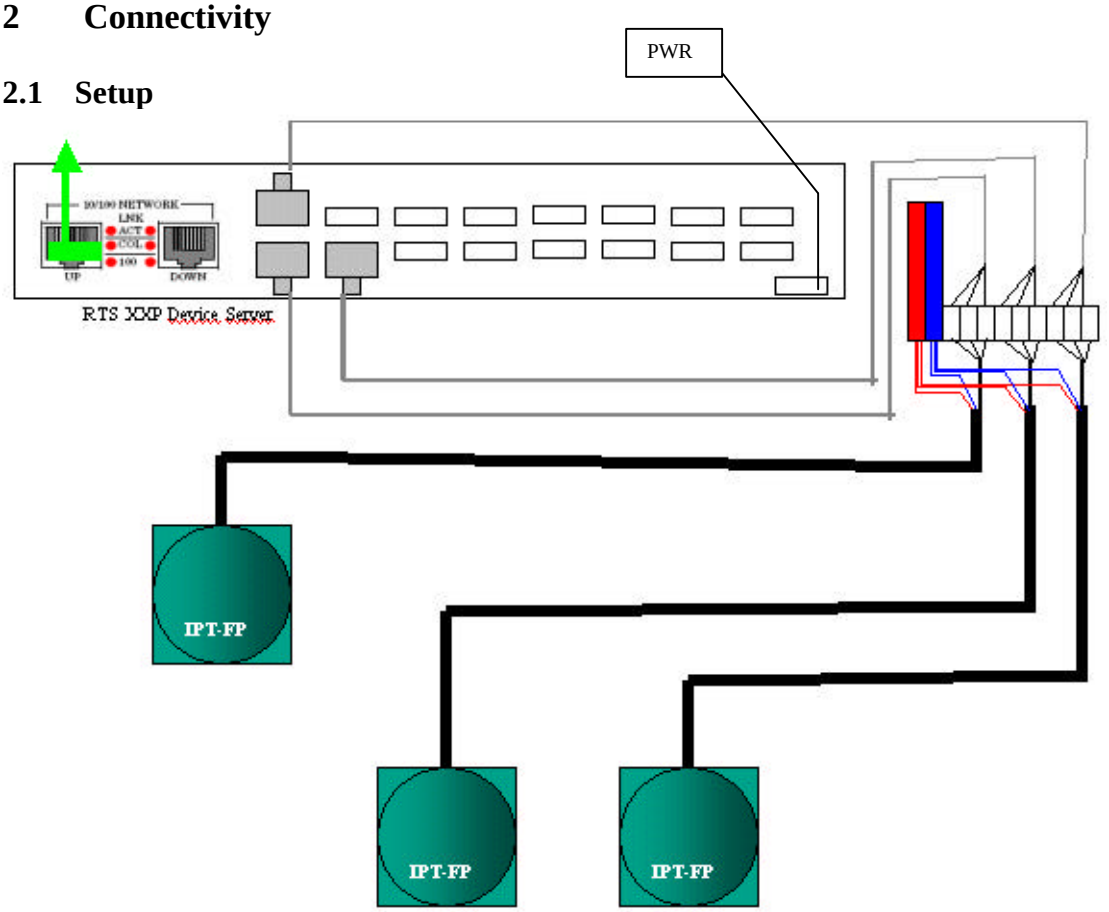
The native command structure of P+F ID systems requires all commands to be terminated by a checksum and an end of text character. These characters are provided for data security.

The simplified command structure for the RTS DeviceMaster removes the necessity to add checksum and ETX framing data to a command sent to the ID system. Instead, the RTS will handle the protocol relevant details. The user simply sends a short command message that includes only the information necessary to define the parameter necessary for the data change.

Additionally, the RTS DeviceServer evaluates any data coming from the ID system and automatically retries if an error is detected. In this manual it will explain how RTS DeviceServer performs automatic retries and which configuration parameters.

2 Connectivity

2.1 Setup



Wire terminal for all +24VDC connections (powered by external 24VDC power supply)

Wire terminal for all -24VDC connections (powered by external 24VDC power supply)

Three wire terminals for communication connection to IPT-FP (RX, TX and GND)

RJ45 connector used for communication connection between wire terminals and RTS xx DeviceServer

Multi-conductor cable (e.g. VAZ-8163) used to route power and communication to IPT-FP

In Line Connection to Ethernet

Figure 1(Connection schematics for Pepperl+Fuchs, Inc. RTS DeviceServers) RTS-16P

2.2 Example Setup Description

The Example Setup shown in figure 1 consists of:

- **RTS-16P DeviceServer**
  -This DeviceServer has16 available ports (RJ 45 Connections) for connections to the ID system read/write communicators (*only 3 ports used in example).

The communication connections are made to the IPT-FP read/write communicators though the 3 wire terminals via Rx, Tx, and Ground.
-The connection port labeled (Up) from the DeviceServer to the EtherNet network, channels data at speeds of 10/100 Mbps.

- **(3) IPT-FP**
  -The three IPT-FP read/write communicators from the Ident-I System P family connect to the +/- 24 volt wire terminals powered by a external 24VDC power supply.
  -The IPT-FP is used in combination with the base (U-P4-RX) for easy connection to the wire terminals Rx, Tx, Ground for connection to the RTS DeviceServer.

****Note:** *In figure 1, the multi-conductor cable VAZ-8163 is a cable used to route power (+/-24 volt wire terminals) and communication (Rx, Tx, GND) to the IPT-FP to the wire terminals to communicate with the DeviceServer.*

The available Models of the RTS DeviceServers are:
- **RTS 16P** (RJ 45 Connections, 16 Ports)
- **RTS 8P** (DB 9 Connections, 8 Ports)
- **RTS 4P** (DB 9 Connections, 4 Ports)

2.3 Compatible ID Systems

Shown Below is the ID systems that are suited for use with the RTS DeviceServer.

Ident-I System P

- **IPT-FP** Read/Write Communicator, and **U-P4-RX** Base for communication interface and power to the Read/Write Communicator
- System features are:
  -Field Mountable communicators
  -Read and/or Write Inductive code and data carriers for reading distances up to 80mm and write distance up to 45mm
  -Data and code carriers available in variety of size and styles, and can store data used to identify an item, provide information about it, or signal its location.
  -Low Cost
  -Can withstand operating temperatures –14º F to 158º F (-25º C to 70º C)

Ident-M System T

- **MTT-S1** and **MTT-S3** Read/Write Communicators
- System Features are:
  -Long range identification capability of code and data carriers over distances of up to 6meters, data carrier writing up to 0.5 meters

-Operates using Microwave signals
-Motion detection up to 8 meters
-High Data Rate Transfer
-Multiple communicators can read tags simultaneously
-I/O on the communicator
-Customer defined protocols
-Can be used in many industrial applications

2.4 Hardware Installation

2.4a Connecting to the Ethernet Connection

Use the following procedure to Install the RTS DeviceServer and connect it to your Ethernet hub, or Ethernet switch.

1. Connect the RTS DeviceServer to the Ethernet network using one of the methods below:
   - **Ethernet Hub or switch (10/100Base-T)**
     Connect to the port labeled UP on the RTS DeviceServer using a standard Ethernet cable.
   - **Daisy chaining** RTS DeviceServer **units**
     Connect the port labeled DOWN on the first RTS DeviceServer to the port labeled UP on the second RTS DeviceServer or other devices using a standard Ethernet cable.
     (Note: Do not connect multiple units until you have changed the default IP address because all RTS DeviceServer **have 172.18.30.200 as the default address (Host Name).**
   - **Connect directly to PC using cross over cable.**

2. Connect the AC power cord to the RTS DeviceServer and plug power adapter into a power source.

3. Verify that the network connection of the RTS is functioning properly:
   - The solid red PWR LED on the front panel of the RTS is lit, indicating that you have powered and it has completed the boot cycle. (Note: LED flashes for ten seconds during power up phase)
   - The blinking red LNK ACT LED is lit, indication that you have a working Ethernet connection.
   - The red 100 LED is lit, indicating a working 100 MB Ethernet connection.

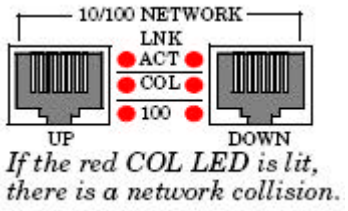


Figure 2 (Examples of LED Locations of the Ethernet Connection)

4. Ping the RTS DeviceServer default IP address 172.18.30.200

   Success- IP address is functional
   Failure-Request to ping IP address will timeout (Example shown in figure 3 of ping failure)

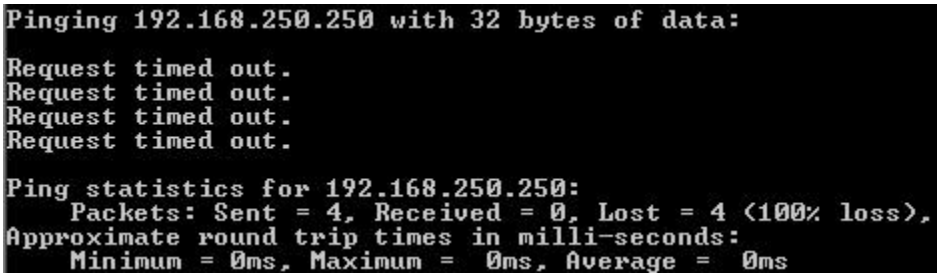


Figure 3 (Example Ping Screen in Dos when pinging a IP address)

2.4b Serial Connection

Use the following to connect Pepperl+Fuchs ID System serial devices to the RTS DeviceServer ports.

1. Connect ID read/write communicators to the appropriate port on the RTS DeviceServer using the appropriate cable. You can build your own cables using table 1 shown below.

Note: *Use the Pepperl+Fuchs, Inc. installation documentation if you need help with connector pinouts or cabling for the* ID system.

2. Verify that the devices are communicating properly:
   • The yellow Rx LED shows that the data receiver is connected to another RS-232 device or receiving.
   • The green Tx LED shows that the data is transmitting on that port to the serial device. (From the DeviceServer to the ID system)

RJ45 Connector Pinouts
Use the following pinout information for the RJ45 serial port connectors on the RTS DeviceServer.

Pin	RS-232
3	**Signal GND**
4	**TxD**
5	**RxD**

Table 1 (RJ45 Connector Pinouts)

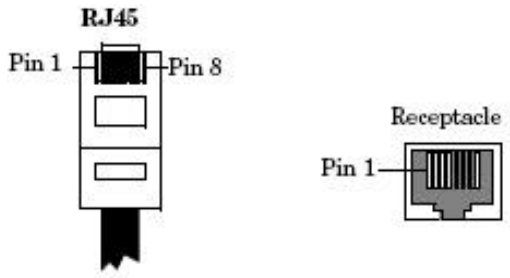


Figure 4 (Example of RJ45 PINOUTS)

DB9 Connector Pinouts

Use the following pinout information for the DB9
serial port connectors on the RTS DeviceServer (RTS 4P/8P DB9).

Pin	RS-232	RS-485
1	CD	Not used
2	RxD	Not used
3	TxD	TRX-
4	DTR	Not used
5	GND	Not used
6	DSR	Not used
7	RTS	TRX+
8	CTS	Not used
9	RI	Not used

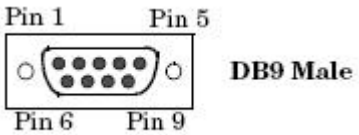


Figure 5 (Example of DB9 Pinouts)

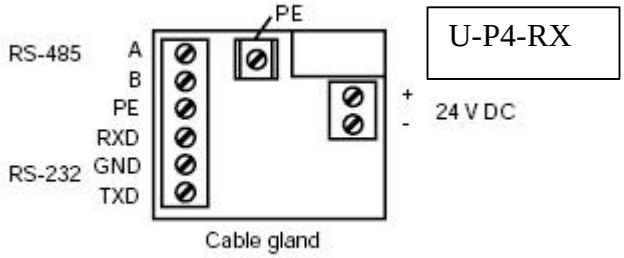
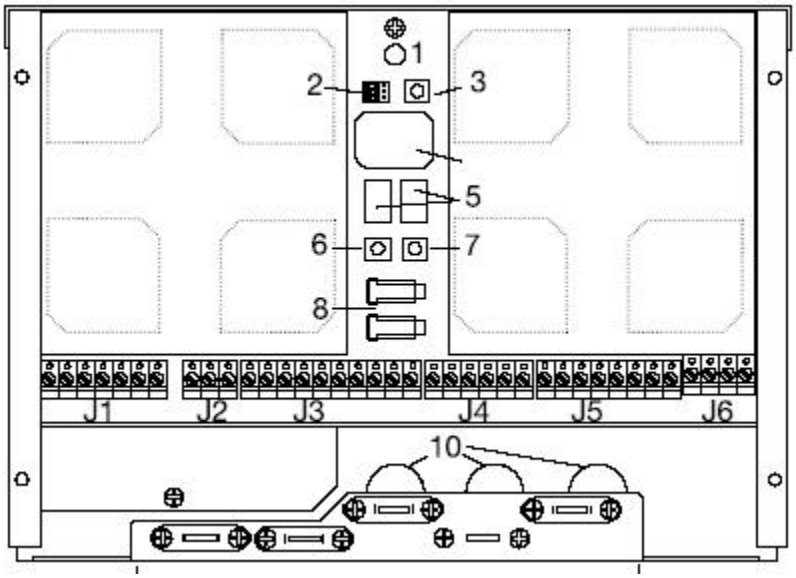


Figure 6 (U-P4-RX Base for IPT-FP R/W Head Communication Hardware)

-In figure 6 shown above, +/- 24 volts DC wire terminals on the right side of the base power the U-P4-RX base.
-The RS-232 connection shown in figure 6 above is the wire terminal communication connection to the IPT-FP (RXD, GND, and TXD).
-The RS-485 connection shown in figure 6 above is the wire terminal communication connection to the IPT-FP (PE, B, and A).

MTT-S1 or MTT-S3



The section labeled J2 above is the RS-232 (Tx, Rx, and GND) Port A connection
The section labeled J6 above is the connection terminals for the DC Supply voltage
The section labeled J3 above is the RS-232 (Tx, Rx, and GND) and RS-485 Port B connection

Figure 7 (Communication Hardware for MTT-S1, &MTT-S3)

3 RTS DeviceServer

3.1 Server Configuration

Configuration of the RTS DeviceServer is fast and intuitive using any web browser. Using the IP address of your server you can access the configuration on the RTS DeviceServer. An example of the RTS DeviceServer primary Server Configuration is shown in figure 9. A password will be required to enter the network configuration page as shown below in figure 8. (Default password is ***password***.)

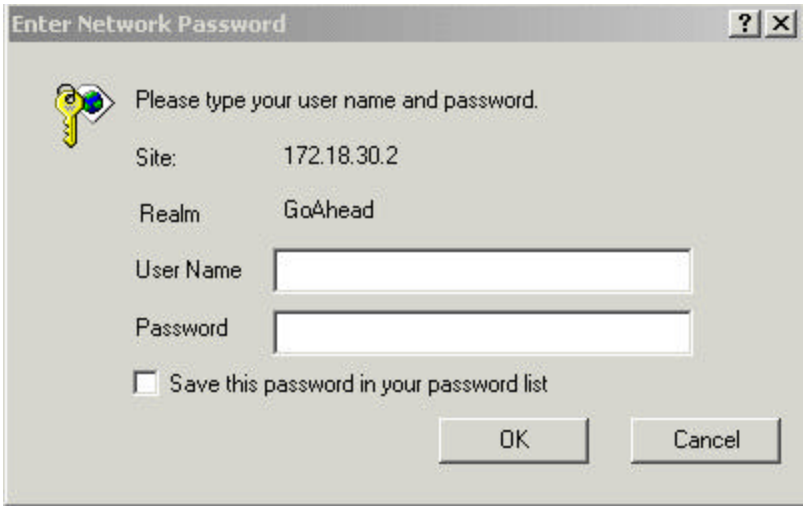


Figure 8 (Password screen to enter network)

Server Configuration

Software:	RTS SocketServer 1.35.3d
IP Configuration:	Static
IP Address:	172.18.30.2
IP Netmask:	255.255.0.0
IP Gateway:	172.18.0.253

Configure Network
Configure Email Messages

	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9	Port 10
Connection Status										
Enabled:	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	No
PFT Mode:	Yes	Yes	Yes	No	No	No	No	No	No	No
Local:	0.0.0.0:3001	0.0.0.0:3002	0.0.0.0:3003	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0
Remote:	172.18.100.33:4328	172.18.100.33:4329	172.18.100.33:4330	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0
Rx bytes:	10704534	4352645	71456	0	0	0	0	0	0	0
Tx bytes:	13624403	4355553	1062501	0	0	0	0	0	0	0
PFT Commands Sent:	1946334	870618	28477	0	0	0	0	0	0	0
PFT Resends:	12	0	4	0	0	0	0	0	0	0
Serial Status										
Mode:	RS-232	RS-232	RS-232	RS-232	RS-232	RS-232	RS-232	RS-232	RS-232	RS-232
Baud:	9600	9600	19200	9600	9600	9600	9600	9600	57600	9600
Parity:	none	none	none	none	none	none	none	none	none	none
Data Bits:	8	8	8	8	8	8	8	8	8	8
Stop Bits:	1	1	1	1	1	1	1	1	1	1
Flow:	none	none	none	none	none	none	none	none	none	none
DTR:	off	off	off	off	off	off	off	off	off	off
Connection Configuration										
Listen:	3001	3002	3003	3004	3005	3006	3007	3008	3009	3010
Connect To:	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0
Connect When:	never	never	never	never	never	never	never	never	never	never
Disconnect When:	never	never	never	never	never	never	never	never	never	never
Idle Timeout:	-	-	-	-	-	-	-	-	-	-
Mirror Port Configuration										
Mirror Port #1:	4001	4002	4003	4004	4005	4006	4007	4008	4009	4010
Remote :	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0
Mirror Port #2:	5001	5002	5003	5004	5005	5006	5007	5008	5009	5010
Remote :	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0	0.0.0.0:0

Global Parameters

Admin Port :	3000
Remote Admin:	0.0.0.0:0

PFT parameters :

Resends:	2
Serial Timeout (ms)	2000
Network Timeout (ms)	2000

Figure 9 (RTS DeviceServer Configuration)

As shown in **figure 9**, the web page is used to configure the P+F RTS DeviceServer

Shown on the Server Configuration page is the connection status. The Server Configuration page shows what port you are connected and the configuration of that port. Shown below in **figure 10** is an example of how connection status works:

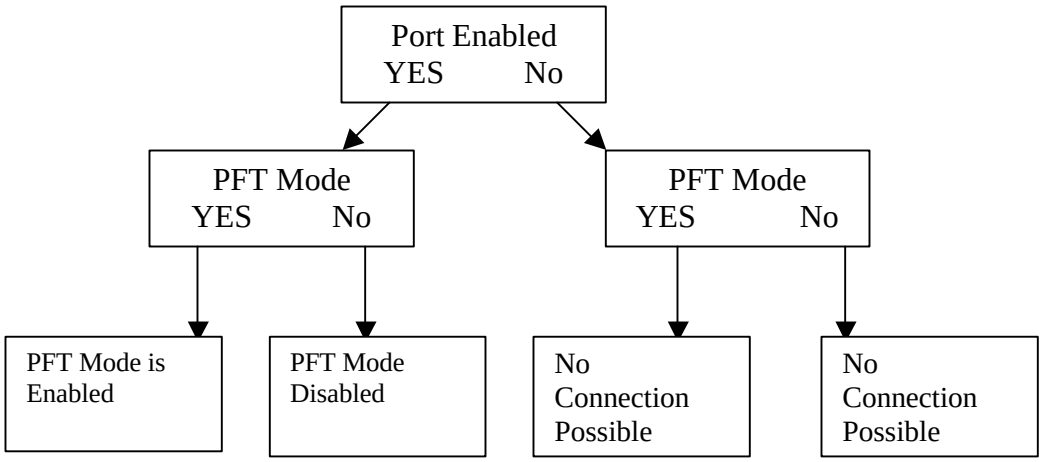


Figure 10 (Example Flow Diagram of Connection Status to Ports)

Suggested Configurations of ID Read/Write Communicators:

*Configuration for MTT-S1/S3- ModeRS-232, Baud Rate 9600, 8 data bits, 1 stop bit, and no parity
* Configuration for IPT-FP- ModeRS-232, Baud Rate 9600, 8 data bits, 1 stop bit, and no parity

-When the socket connection is established the Local and Remote data address will be displayed in the connection status section of the page.
-The connection status section also shows the number of bytes received (Rx bytes) over a port. For example, in **figure 9** it shows that 10,704,534 bytes of data were received over port 1.
-The connection status section also shows the number of bytes transmitted (Tx bytes) over a port. For example, in **figure 9** it shows that 13,624,403 bytes of data were transmitted over port 1.

3.1a Parameters

-The PFT Commands Sent section in **figure 9** displays the number of PFT commands sent over the PFT Mode.
-The PFT Resends section in **figure 9** displays how many times a PFT command was resent or repeated.

- The PFT mode supports a command structure in which:
  --When selected, the command structure is enabled and the RTS DeviceServer will perform the additional functions outlined in this document.

- A field to set the command response timeout is included on the web page:
  --When a command has been sent to the ID system and no reply has been received within the timeout period, the RTS DeviceServer will automatically repeat the command. The RTS DeviceServer will repeat up to 2 times in this example.

  --Setting this timeout value to zero disables this function, and the maximum value can be up to 200000.

- A field to set the number of resends is included in the configuration web page:
  --When the RTS DeviceServer repeats a command up to 2 times unsuccessfully a status message **(Status K)** is sent back to the client.
  --After the K status is sent, the RTS DeviceServer does not retry sending the command.

3.2 Configure Network

Shown below in **figure 11** is an example of the Network Configuration in which operation of the RTS DeviceServer should be set at. The link to the Network Configuration page can be found on the main server configuration at the top of the page.
NOTE: *It is recommended that the Enable SocketServer SSL (Secure Socket Layer) not be enabled.*

Network Configuration

IP Configuration:	○ Use DHCP ○ Disable IP networking ◉ Use static configuration below:
IP Address:	172.18.30.2
Netmask:	255.255.0.0
Gateway:	172.18.0.253
TCP Keepalive Timeout:	60
Enable SocketServer SSL:	☐

Undo Changes Save

Figure 11 (Network Configuration Page)

IP Address Configuration

.

1. Static Configuration via Webpage

IP Address: Contact your network administrator for a valid IP Address. A sample IP address is shown above in figure 11 but the default IP Address is 172.18.30.200.

Netmask: Contact network administrator for a valid netmask. The default netmask is shown in figure 11 (255.255.0.0).

Gateway: The gateway is a network point that acts as an entrance to another network. A default gateway address is shown in figure 1.8 (172.18.0.253).

TCP Keepalive Timeout: The TCP keepalive option is used to validate a connection between the server and the client. The example in figure 1.8 shows a default timeout length of 60 seconds. It is recommended that you do not select too short of a time less than 10 seconds.

3.3 Configure Mail Messages

Using the Configuration below you can have an email sent to your email address displaying the alert. For example, if the server was reset or stopped an email message would be sent to the email recipient entered into the configuration. Contact your network administrator to get the values for the configuration of the email message.

Figure 12 (Email Message Configuration)

3.4 Ports

The default port configuration of the RTS DeviceServer is shown in **figure 14**. Figure 14 shows the port configuration in which you can edit the serial and connection configurations. The example port shown in **figure 14** is port 1 and on the primary sever configuration page it displays the users input from the port configuration page including the connection status, serial status, connection configuration, and mirror port configuration as shown in **figure 9.** Typically the user should pick the RS232, and pick the particular baud rate the ID system is running at.

-In the serial configuration the parity, data bits, flow, DTR and stop bits should always be set at:

- none - (parity), 8 - (data bits), 1 - (stop bits), none – (flow), off – (DTR)

-In the connection configuration, enable and listen should be enabled and a port entered into the Enable on Port box.

-The Enable PF mode should be enabled unless the user would like to use Active-X, and in that case it should be disabled or off.

-An example mirror port configuration is shown in figure 2.2 in which:

- The user assigns ports from which to copy all packets (mirror port #1=4001) and (mirror port #2=5001).
- The physical port can send and receive packets back and forth
- Whatever is sent on the physical port is copied to the mirror ports 1 and 2.
- Figure 1.10 show an example diagram of how port #1(Physical Port) sends and receives packets back and forth and the data is mirrored over mirror ports 1 and 2.

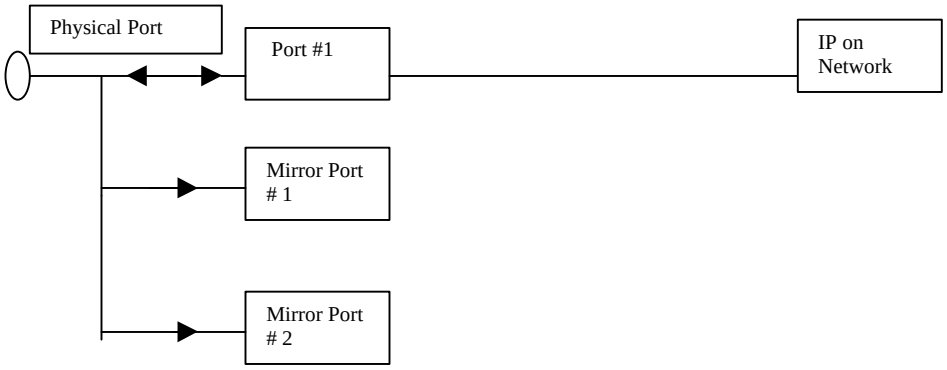


Figure 13 (Example Diagram of Port Mirroring)

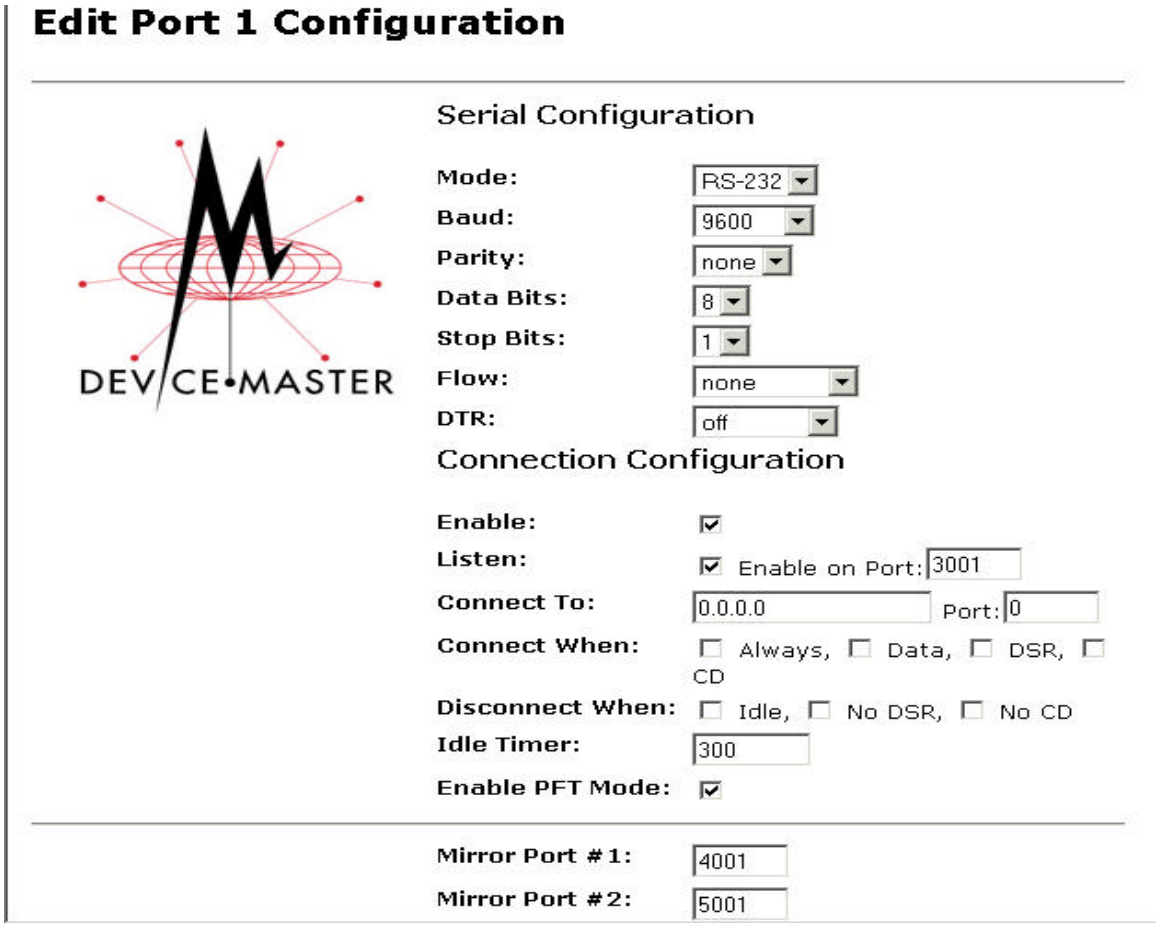


Figure 14 (Port Configuration Edit)

3.5 Global Parameters

The Global Parameters section is at the very bottom of the primary Server Configuration page. In which it includes the Admin Port, and the PFT parameter example values as shown in **figure 15**.

Admin Port

In figure 16 the default administrator port is 3000.

PFT parameter

The PFT parameters in this section consist of resends, serial timeout and network timeout. The Resends parameter consists of the number of times that the RTS DeviceServer will resend a command to the ID system if it does not receive the data.

The Serial Timeout parameter consists of the time in milli-seconds that the ports will timeout if it takes more time than the time entered for data to come to the ID system from the RTS DeviceServer. As soon as the DeviceServer sends a command to the

attached ID system, a timer is started. The DeviceMaster expects a reply from the ID system before this timer expires. If the timer expires the command is repeated.

The Network Timeout is the amount of time in milli-seconds that if command is sent over the server and only a portion of the command is not sent in the allowed time entered by the user then the server gives a timeout to the server.

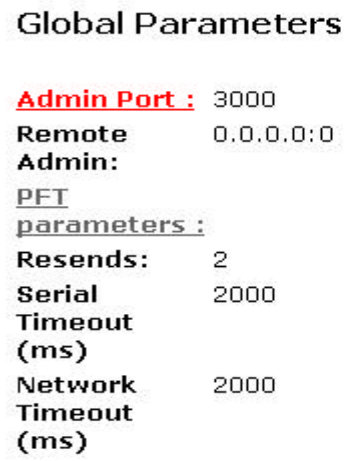


Figure 15 (Admin Port, and the PFT parameters)

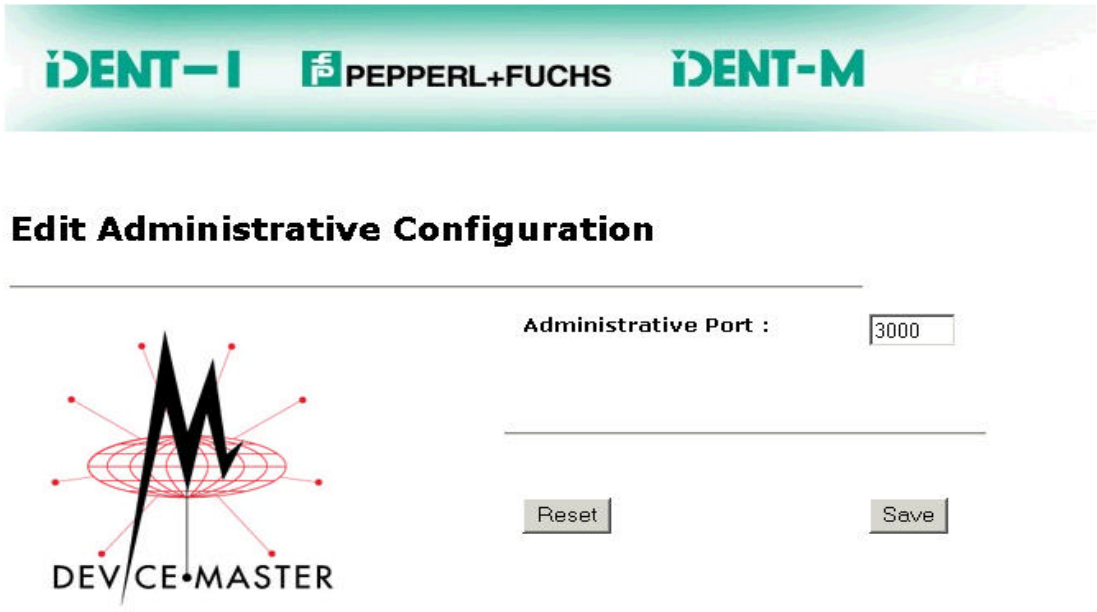


Figure 16 (Admin Port Configuration)

The PFT Parameters configuration is shown below in figure 17 in which you can edit the PFT resends allowed, command timeout (ms), and network timeout (ms). The example values are shown in the Edit PF Mode Parameter figure below.

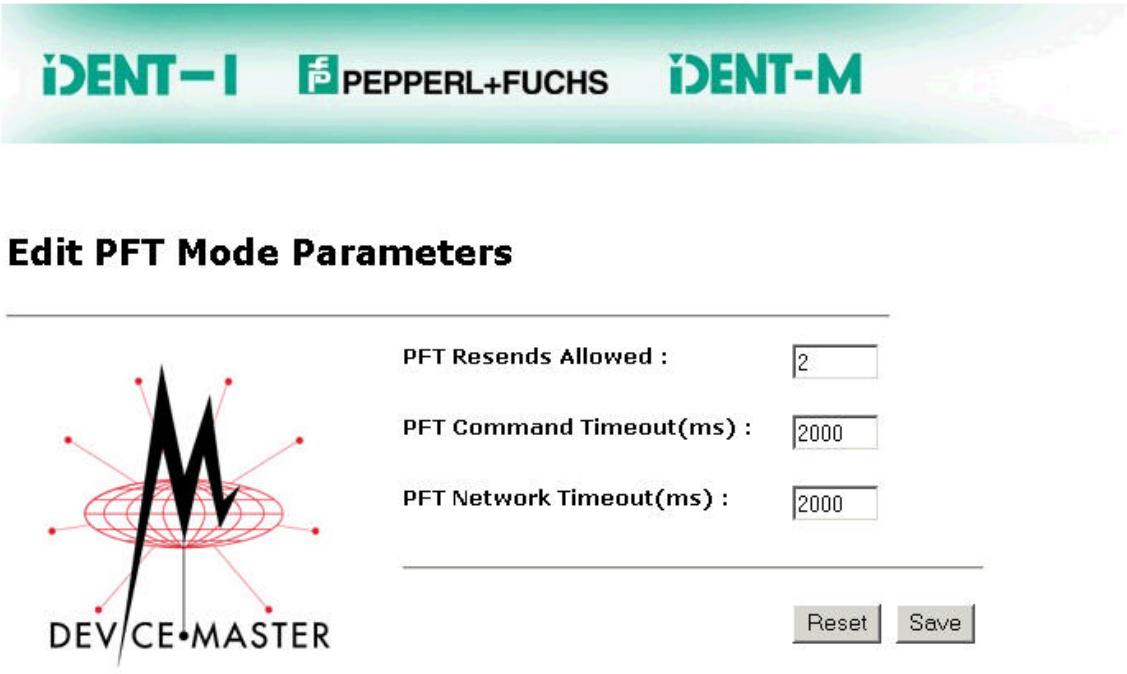


Figure 17 (PFT Parameters)

4 Operations

4.1 P+F Talk Protocol

The simplified command structure supports commands that are defined by the P+F Talk protocol.

- The P+F RTS DeviceServer will automatically retry commands. This not only simplifies the operation but also increases the performance of the system. Because the RTS Device Server detects any corrupt data before it is sent to the client. Counter measures (i.e. retries) can be issued without delay.
- The client does not have to append checksum (<CHCK>) and end of text (<ETX>) data.
- The DeviceServer does not have to verify data received by using checksum data is guaranteed.
- The client sends and receives the number of data bytes in the message explicitly. This significantly simplifies the exchange of data.
- All other enhanced monitoring features offered by the RTS DeviceServer are still supported.

4.2 Issuing a Command

To issue a command to the user must first select the type of operation (a few examples will be given). A three-byte ASCII code length precedes the command and all its necessary parameters. No checksum and ETX are needed.

- Issuing the Single Read command, reading 0x03 double words, staring at
  -Memory Address 0x0002
  -Command: SR000203
  -This String is preceded by a three-byte length (8 in this example)
  -The client now sends 008SR000203 to the connected port of the DeviceServer

- Issuing the Enhanced Buffer Write, writing 0x02 double word starting at
  -Memory Address 0x000A
  -Command: EW000A02testdate
  -This string is preceded by a three-byte length (16 in this example)
  -The client now sends 016SR000A02 to the appropriate IP port on the DeviceServer

Status "O"

The DeviceServer receives a command, a short handshake reply will be sent back to the client. This handshake consists of a status only (**Status = O.),** and a three-byte length precedes the length of the reply sent by the DeviceServer to the client.

Status "O" Example:

- Read 3 double words (DW) of data, starting a tag location 0 using the AutoRead command:
  Request: 008AR000003
  Response: 001O

  Once the ID system has data on the tag the following additional response will be sent

  Response: 0130{12 Bytes of data}

- Write 2 DW of data, starting a tag location 0 using the SingleWrite command:
  Request: 016SW000002{8 Bytes of data}
  Response: 001O
  If the tag can be written the following is sent back
  Response: 0010
  If the tag can not be written the following is sent back
  Response: 0015

- All other commands supported by the IPT-FP with U-P4-Rx are also supported. We strongly suggest implementing the driver to be able to deal

with a power up reply. This reply will occur unsolicited when the IPF-FP undergoes a power cycle.

Please note that the (currently) undocumented LS command can be issued to obtain the command status of the IPT-FP

Request 002LS
Response: 001O

If the IPT-FP is still looking for tags the following is sent back

Response: 001C

If the IPT-FP is not looking for tags the following is sent back

Response: 001D

Status "K"

When the RTS DeviceServer repeats a command up to 2 times unsuccessfully a status message **(Status K)** is sent back to the client. After the K status is sent, the RTS DeviceServer does not retry sending the command.

4.3 Network Timeout

Status "S"

The network timeout (**Figure 2.3**) option establishes a waiting period (in milli-seconds) for the operation in the DeviceServer that receives data from the network. If the period is exceeded, the operation fails and the client is disconnected from the application**.** A value of 0 indicates no timeout and is disabled. Also, if commands take longer to execute than what the timer reads the DeviceServer will send the 001K message to the client.

4.4 Command Reply

Once the P+F DeviceServer receives the command, a short handshake reply will be sent back to the client. This handshake consists of a status only (**Status = O.)** A three-byte length also precedes the length of the reply sent by the DeviceServer to the client.

- The handshake reply has the following format 001O

As soon as the DeviceServer has received data from the ID system, this data is evaluated and (if found to be without error) passed on to the client. The reply to the SingleRead in the above example is as follows.

- *Single Read* reply reading 0x03 double words
  0130testReadData, where 013 indicates the length of the remaining data, indicates the P+F talk status (i.e. No Error) and testReadData are the three double words requested from the tag.

- If no tag could be read the reply will be as follows
  0015, where 001 is the length of the remaining data and 5 indicates the P+F Talk status (i.e. no tag present or read/write error.)

After the ID system has performed the write operation the following messages may be passed on by the DeviceServer.

- *EnhancedBufferedWrit,* reply after attempting to write 0x02 double word, at memory address 0x000A

  0010, where 001 indicates the length of the remaining data and 0 indicates the P+F talk status (i.e. No Error.)

4.5 Resends

The P+F DeviceMaster evaluates every reply from the ID system. If the Checksum and ETX are correct the data is passed on to the client. If this evaluation detects an error in the ID system reply (due to noise) the last issued command is automatically repeated. A parameter on the DeviceServer web page allows the user to set how often this repeat mechanism will repeat a command before sending an error status to the client. The default is 2 repeats (for a total of three commands.) After two repeats the DeviceServer will send the 001K message to the client. 001 indicates the number of bytes to follow in the message and K indicated Chec**k**sum/ETX error. Since it is excitingly unlikely that three checksum errors will occur in row during normal operation, the installation must be checked.

4.6 Serial Timeout

As soon as the DeviceServer sends a command to the attached ID system, a timer is started. The DeviceMaster expects a reply from the ID system before this timer expires. If the timer expires the command is repeated. Setting this timer to 0 disables this feature. Also, if commands take longer to execute than what the timer reads the DeviceServer will send the 001K message to the client. When using one of the following commands, the time may have to be disabled since the time between sending a command and receiving a reply cannot be known.:

Reading Commands
- AR AutoRead
- BR BufferedRead (Recommended)

Writing Commands
- AW AutoWrite
- BR BufferedWrite

Reading Fixcode Command
- AF AutoReadFixcode
- BF BufferedReadFixcode