



Product Type: ASC/3

Reference: AN2120

Date: 1 October 2009

ASC/2M-1000 Ethernet Feature to Connect to ASC/3 Locals

Purpose

This application note discusses the necessary hardware components and procedures to use Ethernet-type communications to connect an ASC/2M-1000 Master Controller to ASC/3 Local Controllers.

Introduction

There are many factors involved in a successful implementation of an Ethernet-type Communications Network. Most of these factors are beyond the scope of this application note and are not included in this document. This note assumes that you are knowledgeable with the various Microsoft Windows® operating systems, administrative functions, and general LAN/WAN terminology and topologies. If you need assistance, please contact your Econolite Account Manager.

Figure 1 shows the basic design discussed in this document—an ASC/2M-1000 connected to four ASC/3 locals.

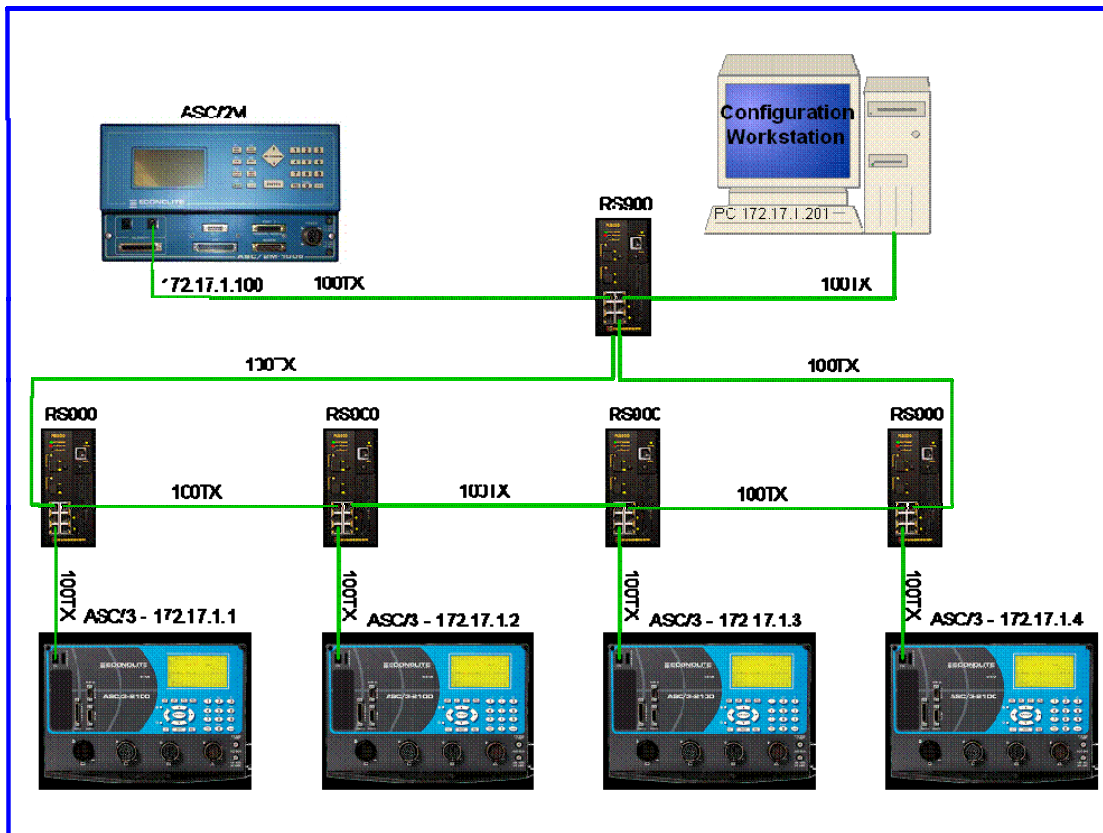


Figure 1. ASC/2M-1000 to ASC/3 Ethernet Connection

(For more information, contact Econolite Technical Support.)



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Hardware

The hardware listed here is shown in Figure 1 (not all hardware shown is listed).

- **ASC/2M-1000 Ethernet Communications Modules** – These modules are installed inside the ASC/2M-1000 master controller (one or two per ASC/2M-1000) and meet all its environmental specifications.
- **Switch:** The usual name for this is a “Layer 2 Switch” or a “Bridge.” Units are available from many different manufacturers such as Ruggedcom (pictured is an RS900), etc. and come in many different port configurations (4, 8, 10 port units are most common). It is necessary for switches installed in the traffic cabinet to be environmentally hardened to at least the NEMA specification of -35°C to +74°C.
- **Configuration Workstation:** Any common desktop or laptop can be used running any of the latest versions of the Microsoft Windows OS and an Ethernet port. Computer setup:
 - Set the IP address to agree with your LAN.
 - If you use XP or Vista, make sure that your windows firewall is turned OFF.

Controller #	MAC Address	IP Address*	Controller Address
1	00:40:81:2A:54:A8	172.17.1.1	1
2	00:40:81:2A:5E:A8	172.17.1.2	2
3	00:40:81:2A:54:25	172.17.1.3	3
4	00:40:81:2A:C7:D4	172.17.1.4	4

Record the MAC Address listed on each module in the ASC/2M-1000. You will need this information later when you configure the hardware. The sample tables shown here include some other necessary information that you will use later.

Controller	MAC Address	IP Address*	UDP Port
Master Ch1	00:40:9D:2A:5E:A8	172.17.1.100	2101

* The IP addresses in these tables are the same as the example in this document. They will probably be different in your particular deployment, because they will need to be the same as your current LAN/WAN infrastructure. Notice that the IP address assigned to each controller is unique.



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Design Considerations

Network: This application note is not intended to describe all of the variables that go into network design. If you need design assistance in this area, please call your Account Manager.

Specifically, this application note is intended to describe cabled infrastructure (Ethernet over fiber/copper) only. Please note, we have not yet tested the different wireless technologies.

Note: All devices on an Ethernet network must contain a unique IP address but the Subnet mask must be identical on each device.

Controllers: There are several ways to implement a closed loop system over IP (CL/IP). Five of these are listed below, each with its application note:

- This application note describes an *ASC/2M-1000* Master that uses an internal Ethernet module to talk to *ASC/3* locals.
- For *ASC/2S* locals, refer to AN2119, *ASC/2M-1000 Ethernet Feature to Connect to ASC/2S Locals*.
- If the *ASC/2M-1000* does NOT have the Ethernet feature (no front-panel Ethernet connectors):
 - To connect to *ASC/3* locals, refer to AN2116, *ASC/2M to ASC/3 Ethernet Connection using Digi PortServer TS2 H MEI*.
 - To connect to *ASC/2S* locals, refer to AN2106, *ASC/2M-1000 to ASC/2S Ethernet Connection using a Digi Portserver TS2 H MEI*.
 - If you have older *ASC/2* controllers and/or a mixture of *ASC/2* and *2S* controllers, refer to AN2107, *ASC/2M to ASC/2 Ethernet Connection Using Ruggedcom Terminal Servers*.

Aries®: You can also use a Digi Portserver to connect an *ASC/2M-1000* Master to *Aries*. Refer to the illustration below & application note, AN1063, *ASC/2M Ethernet Connection Using Digi PortServer TS1 H MEI*.

Telemetry Connectors

- Only connect to local controllers.
- Connect to an *internal* card cage to one or two optional modules.
- The top two connectors go to optional Ethernet modules that are installed in the *internal* card cage.



Terminal/Modem Connectors

- Use Port 2 to connect to *Aries* with Ethernet.
- To connect with Ethernet, you must route through an *external* Digi PortServer TS1 H MEI, as given in AN1063.

Notes:

- This application note assumes that you know how to set up a master-local communications channel, and therefore this procedure is not given here.
- If you have not connected your hardware yet, please do that now following the example in Figure 1 on Page 1.

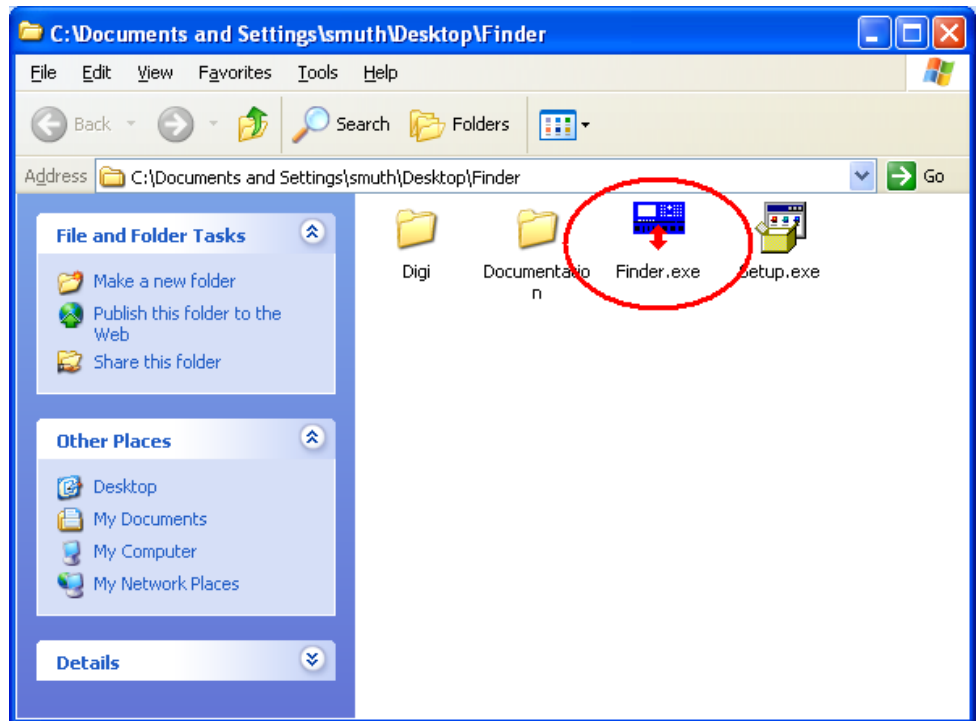


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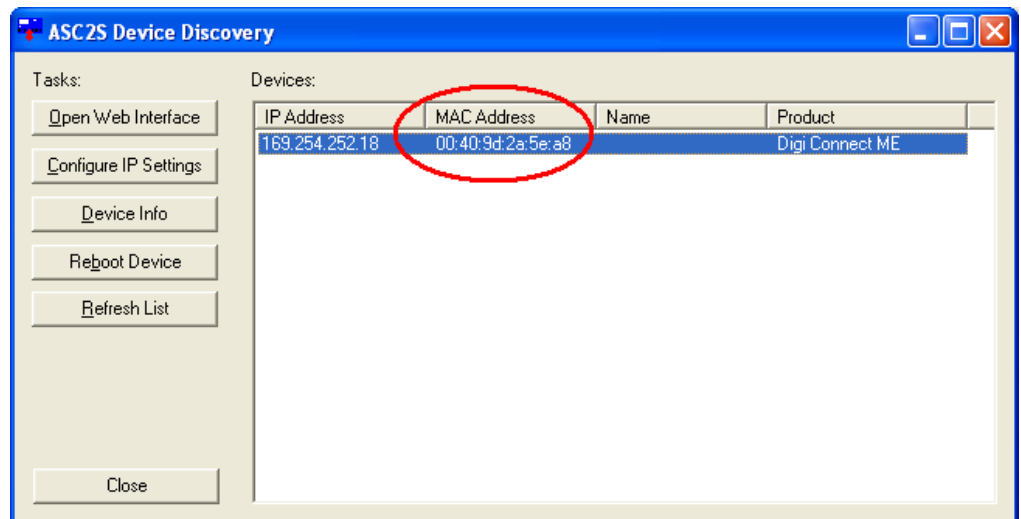
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Device Configuration: ASC/2M-1000 Ethernet module

1. Insert the CD that comes with the ASC/2M-1000.
2. Run the **Finder.exe** application.



3. You should see something similar to this screen with the MAC addresses that you recorded from the ASC/2M-1000; refer to Page 2.
4. Highlight the Ethernet device that is in the Masters Telemetry channel 1, (our example is 00:40:9d:2a:5e:a8) and click **Configure IP Settings**.





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5. Enter the IP settings recorded in your table. Enter the password for the Ethernet module (factory default password is “dbps”).
6. Click **Apply**.

Set IP Address

Assign an IP Address, subnet mask and gateway to your Digi device. Contact your network administrator if you do not know this information.

Product: Digi Connect ME
MAC Address: 00:40:9d:2a:5e:a8

Automatically obtain network settings via DHCP
 Manually configure network settings

IP Address: 172 . 17 . 1 . 100
Subnet Mask: 255 . 255 . 255 . 0
Default Gateway: 0 . 0 . 0 . 0

Password: [masked]

Apply **Cancel**

7. With the Masters Ethernet adapter still highlighted click **Reboot Device**.

ASC2S Device Discovery

Tasks:

- Open Web Interface
- Configure IP Settings
- Device Info
- Reboot Device**
- Refresh List

Close

Devices:

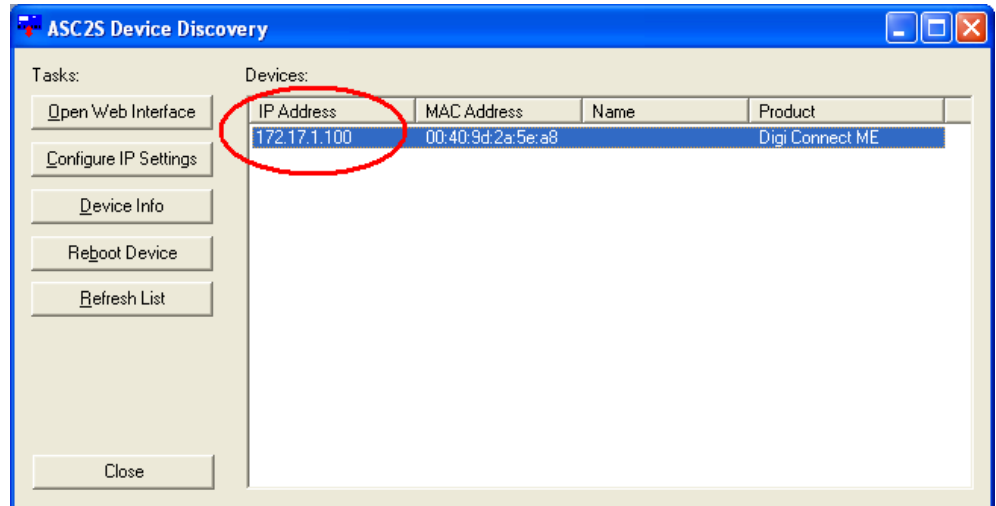
IP Address	MAC Address	Name	Product
169.254.252.18	00:40:9d:2a:5e:a8		Digi Connect ME



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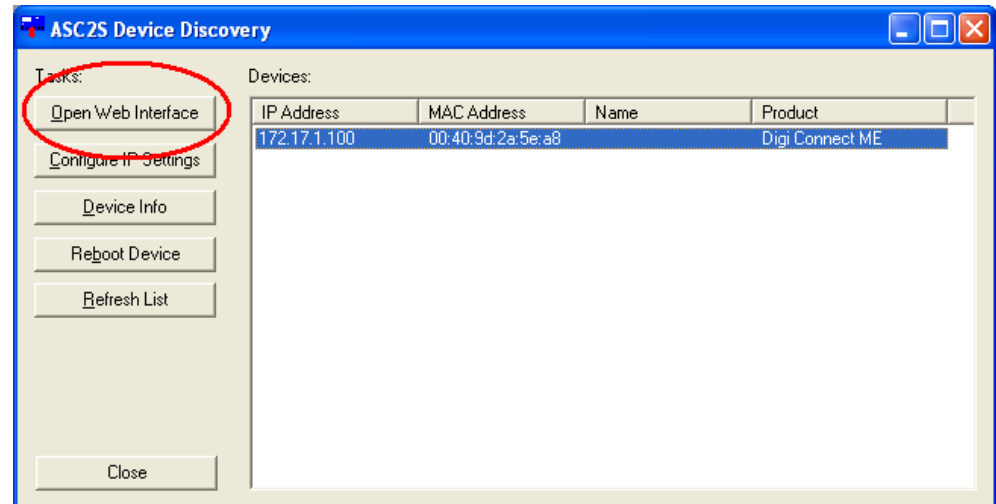
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8. Wait for the reboot (about one minute) and then click **Refresh List**. You should see the adapter in question with the correct IP address assigned.



9. When you have configured all of the IP settings with the discovery utility:

- A. Highlight the ASC/2M-1000 Ch1 Ethernet interface in the discovery utility.
- B. Click **Open Web Interface**.

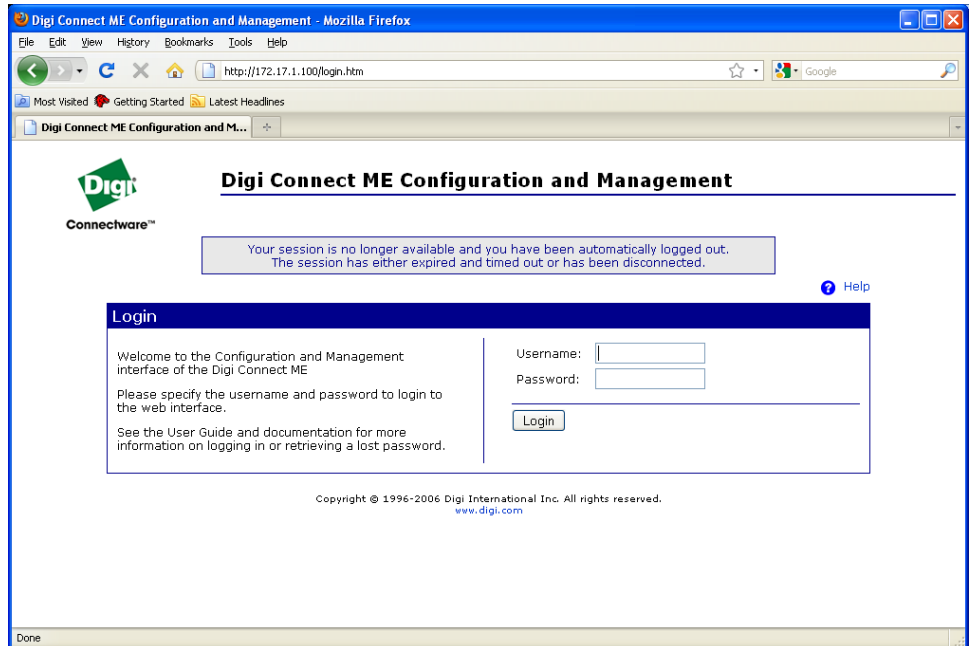




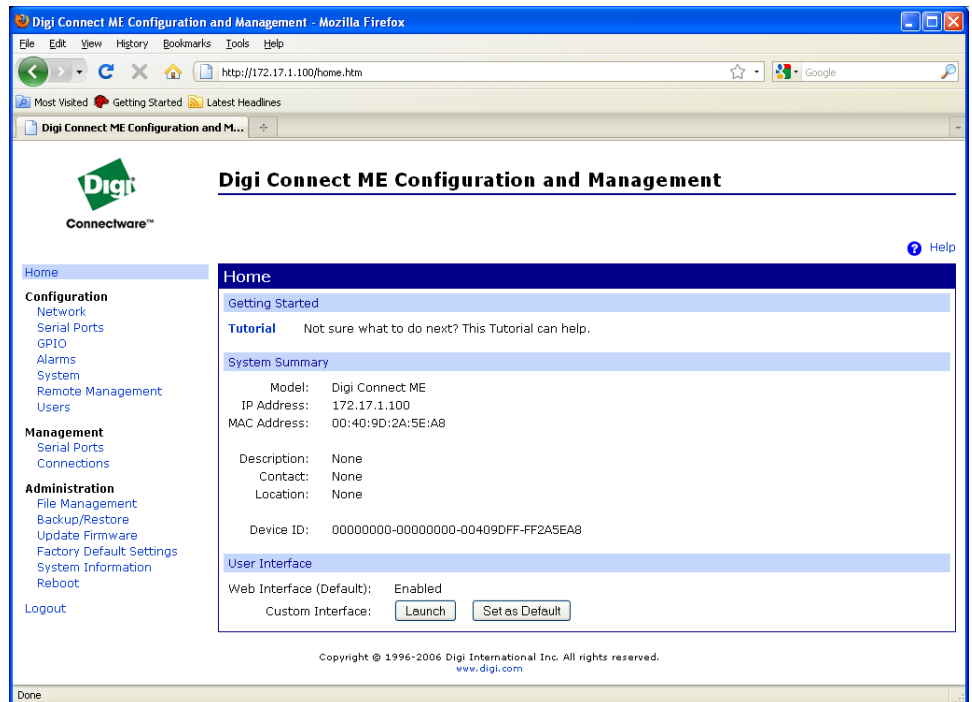
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10. This action should open a web browser and go to the Login screen of this Ethernet adapter. This example uses the web browser Mozilla Firefox. What you actually see depends on the software installed on your computer.
- A. Enter the Username and Password. Factory defaults are:
 Username: **root**
 Password: **dbps**
 - B. Click Login.



11. Under “Configuration,” select “Serial Ports.”





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12. Under
“Serial Port Configuration,”
select “Port 1.”

The screenshot shows a web browser window titled "Digi Connect ME Configuration and Management - Mozilla Firefox". The address bar shows the URL "http://172.17.1.100/config/ports/port_info.htm". The page content includes the Digi logo and a navigation menu on the left. The main content area is titled "Serial Port Configuration" and contains a table with the following data:

Port	Description	Profile	Serial Configuration
Port 1	None	<Unassigned>	9600 8N1

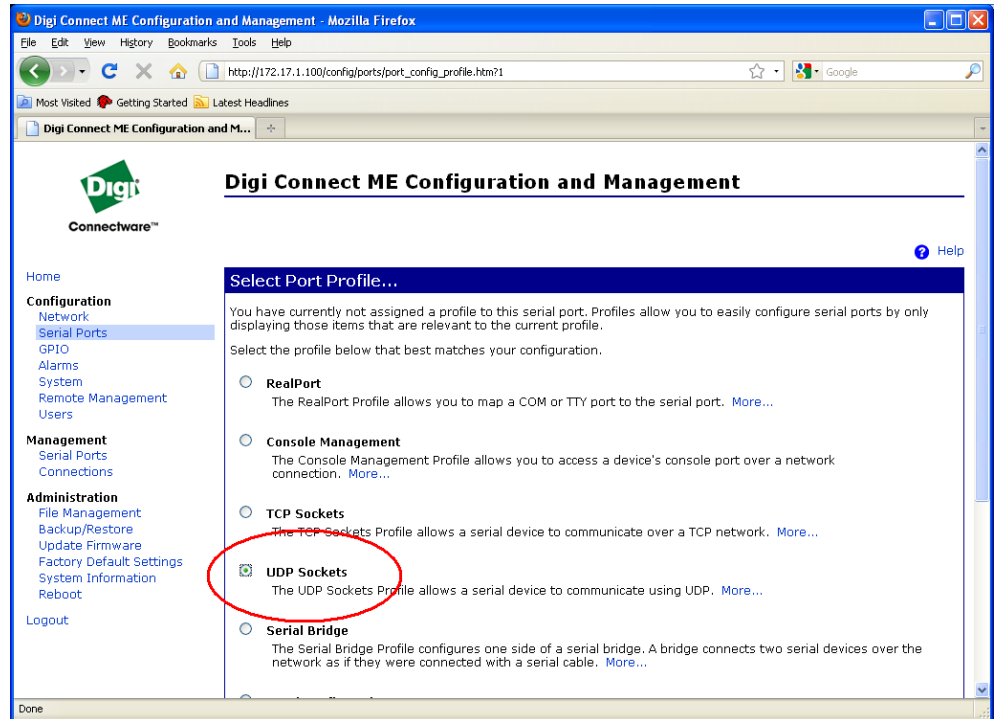


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13. Select the radio button “UDP Sockets.”

14. At the bottom of the page, click **Apply**.

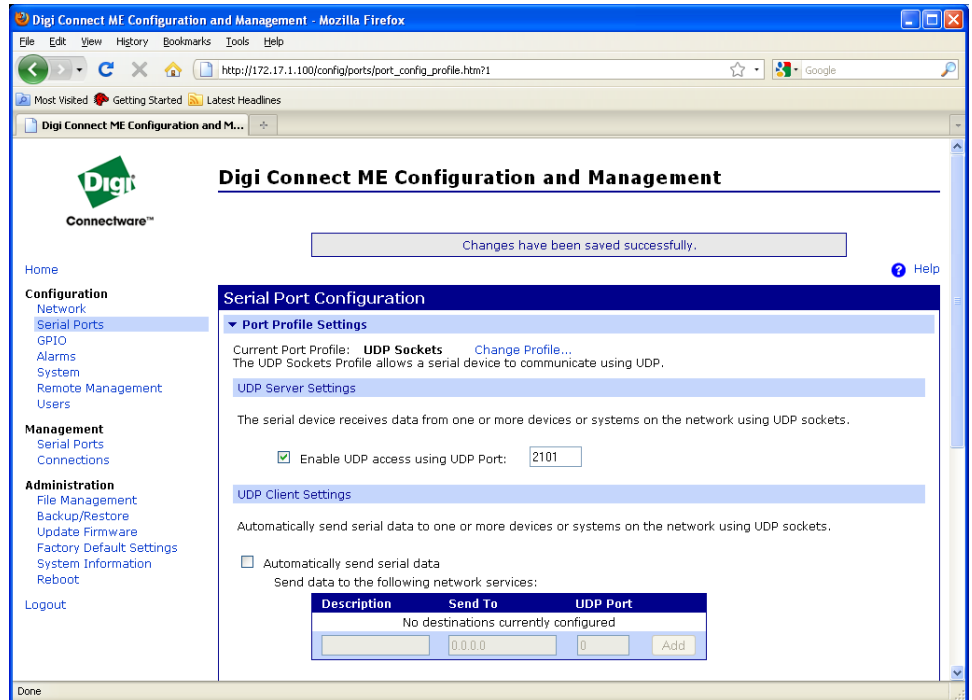




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15. Under “UDP Server Settings” change the UDP port number to match your table on Page 2.

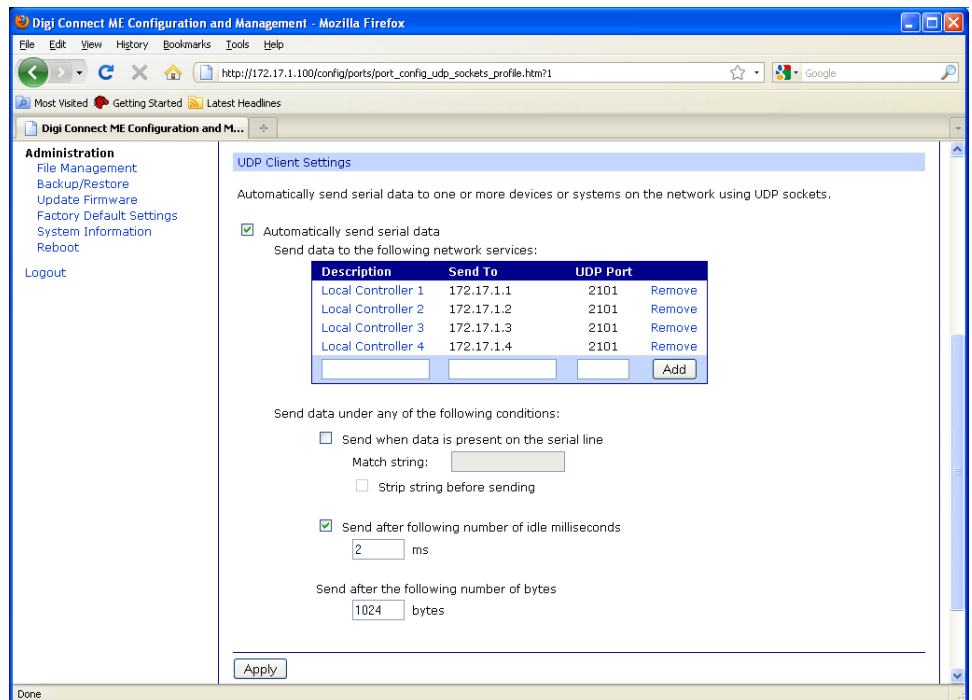


16. Under “UDP Client Settings” check the box “Automatically send serial data” and then, for each controller on the channel:

- A. Enter the Controller name, IP address and UDP Port number (2101 for the ASC/3) of each local controller on the Channel.
- B. Click **Add**.

17. Change the “Send data after the following number of idle milliseconds” field to 2 ms.

18. At the bottom of the page, click **Apply**.

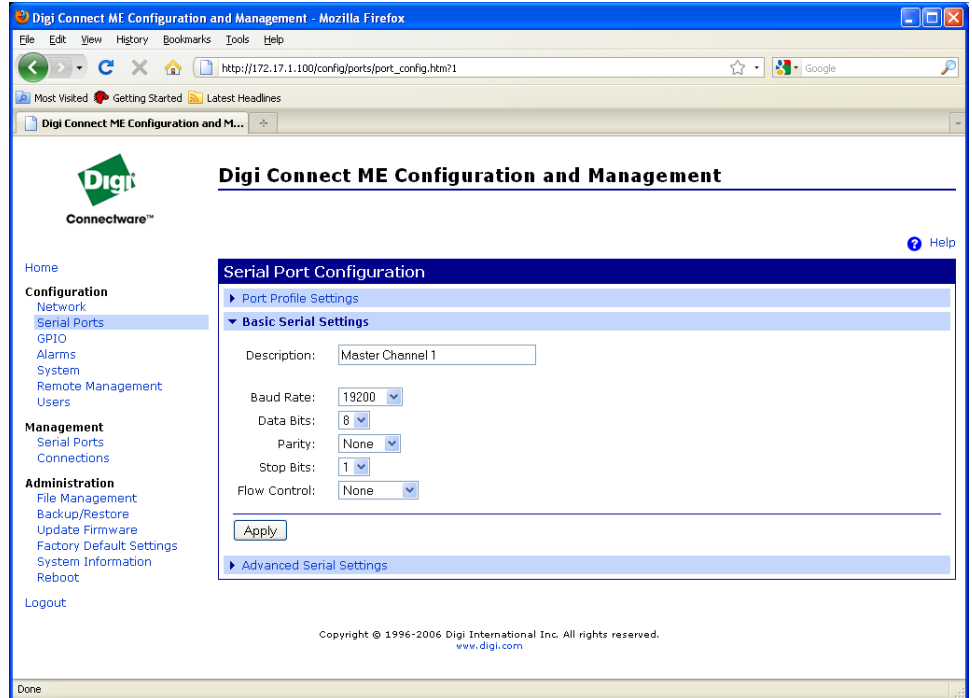




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19. At the bottom of the page, click “Basic Serial Settings.”
20. Make these settings the same as the telemetry port settings on the ASC/2M-1000 Master (MM-1-0-9). We recommend the settings shown.
21. Set “Flow Control” to “None.”
22. Click Apply.





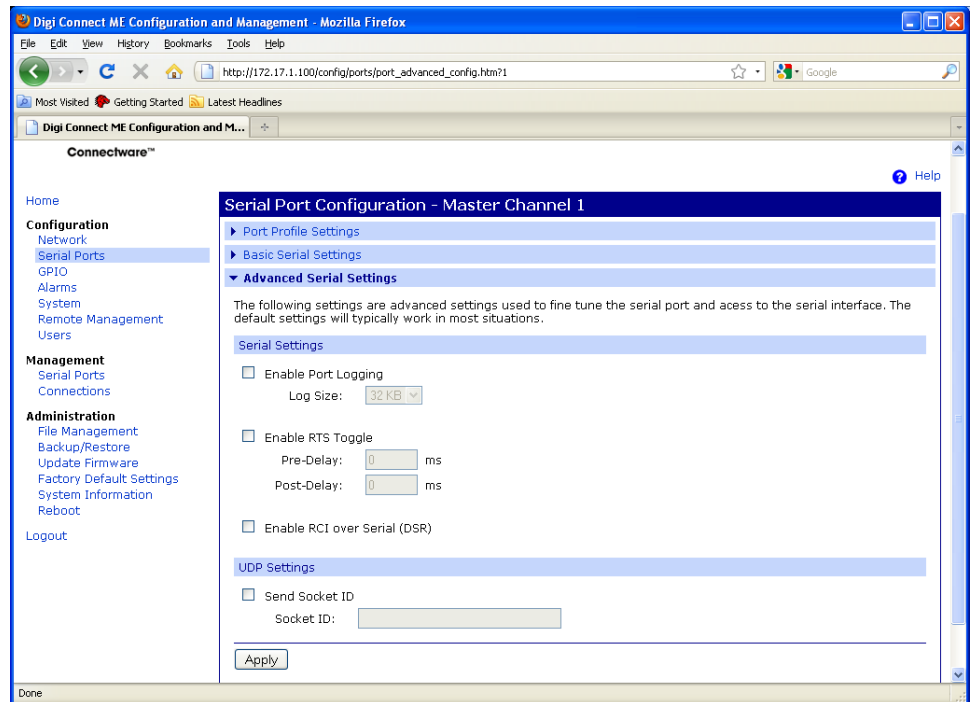
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23. Click “Advanced Serial Settings.”
24. Make sure that all boxes are unchecked on this page.
25. At the bottom of the page, click **Apply**.

This is the end of the configuration for the Ethernet adapter in Channel 1 of the ASC/2M-1000 Master Controller.

You can now Logout and close this window.





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Configuration of the Master

1. To configure the ASC/2M-1000 telemetry settings, go to MM-1-0-9.
2. Enter the settings shown.

TELEMETRY SETUP AND OPTIONS		
TELEMETRY SETUP		
	CH1	CH2
DATA RATE (bps).....	19.2K	****
DATA FRAMING (parity, stop)	8,N,1	****
COMMANDS / SECOND	25	****
COMMAND TIME	724	****
WINDOW	80	****

3. To enable devices in the ASC/2M-1000, go to MM-1-0-2.

Note: You will probably have more settings because of more locals than this example shows.

ENABLE DEVICES				
DEVICE#	SYSTEM DET.	CONT.	SPEEDTELEM. TRAP	CHAN.
1.....	.	X	.	X
2.....	.	X	.	.
3.....	.	X	.	.
4.....	.	X	.	.



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- To set up the Telemetry Sequence for Channel 1 in the ASC/2M-1000, go to MM-1-0-3.
Again, your settings will probably be different for your application.

TELEMETRY SEQUENCE CHANNEL 1						
(See HELP for caution.)						
LOCAL	CTR	AUX	SDA1	SDA2	SDB1	SDB2
TELEM	1-24	1-24	1-32	1-32	1-32	1-32
ADDRESS						
1...	1	1	1	0	0	0
2...	2	2	2	0	0	0
3...	3	3	3	0	0	0
4...	4	4	4	0	0	0



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Configuration of the ASC/3 Locals

Note: ASC/3s must be running 2.44.10 software or later.

On the ASC/3 controllers, we will configure IP information and the ECPIP Controller Address.

We will not configure a UDP port because ASC/3 code 2.44.xx or later is automatically listened on UDP port 2101 for ECPIP calls from an ASC2M-1000.

To configure IP information in the ASC/3:

1. Go to MM-1-5-1.

ETHERNET	MAC	00:40:81:xx:xx:xx
CONTROLLER IP.....		172. 17. 1. 1
SUBNET MASK		255.255.255.0
DEFAULT GATEWAY IP		172. 17. 1.254
SERVER IP.....		172. 17. 1. 99
LINK SPEED/DUPLEX		AUTO

2. Go to MM-1-5-6 and configure the controller address.

ECPIP	
CONTROLLER ADDRESS.....	1
EXPANDED SYSTEM DETECTORADDRESS.....	0

This concludes the ASC/3 configuration.



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Make sure of Master to Local Communications

1. To go to the “TELEMETRY RESPONSE STATUS” screen, in the master, go to MM-3-6.
2. If all has gone well, the screen should be similar to the screen shown here.

Note: Packet loss is <1%.

Depending on your communications architecture, you may want to adjust the telemetry response delay (either up or down) in the locals to get the packet loss as low as possible.

