What's New in Digi One IAP Release "E"

**Keywords**: IA, DOIAP, DORPIA, upgrade, ASCII, Rockwell, Modbus

Abstract: This document summarizes the major changes in the latest Digi One IAP (protocol-aware, multi-master) firmware release E, as well as the benefits of the new features. This document also includes step-by-step instructions for upgrading the older firmware in a Digi One IA RealPort to the new Digi One IAP.

1   New Features Summary

- ASCII import/export capabilities for Modbus and Allen-Bradley protocols

- Protocol bridging capabilities (for example, DF1 to ModbusTCP or Modbus to Ethernet/IP) allow cross-platform communications

- Better support for Ethernet/IP:
  - Full conformance to latest ODVA tests
  - Both connected (CM3) and unconnected (UCMM) messaging
  - Ethernet/IP client (outgoing) supports CIP connection path

- Peer-to-peer communications for Allen-Bradley

- Supports full routing or destination tables from serial or network master

- New Custom protocol with better timing handling, as well as support for transmit or receive only.

- Increased socket connections from 32 to 64

- DUET WebUI and configuration wizard provide easier configuration

1.1   ASCII Import / Export

Allows Allen-Bradley or Modbus PLCs to use protocol READs to poll for input from ASCII devices such as barcode and RFID readers, scales, motion control devices, and operator panels. Also allows the PLC to WRITE output to display signs, printers, and so on, from PLCs.
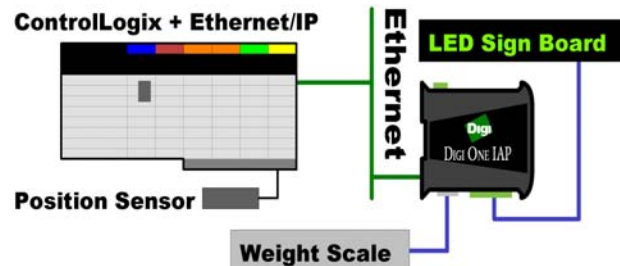
Feature: Incoming Modbus and A-B protocols can query for ASCII messages as and the response is returned as ASCII data packed within register data.

Benefit: Most Modbus and A-B PLCs allow *only* their own protocols using Ethernet or serial. This feature allows the use of these protocols to import (or export) ASCII strings by register reads/writes.

1.2   Protocol bridging capabilities

Enables simple read/write conversion between certain IA protocols; for example, a Rockwell PLC polling Modbus/RTU slaves or a Modbus/TCP master polling Rockwell ControlLogix.

Feature: Digi One IAP can map Modbus to/from AB protocols

Benefits: Allows a Modbus/TCP master to poll an AB PLC or an AB protocol Master to poll a Modbus/RTU device. A key benefit over competing solutions on the market:

- Enables Ethernet PLC without the need for a second UTP cable, IP address, and hub/switch. The Ethernet PLC uses only its main Ethernet port with native IA protocols.

- Enables Serial PLC without blocking access to the serial PLC by native protocols. In other words, a DF1 PLC can be polled by Modbus concurrently to being accessed by RSLinx.

   For both Ethernet PLC and Serial PLC, enables concurrent access by both native and mapped protocols.

- The Digi One IAP is significantly less expensive.
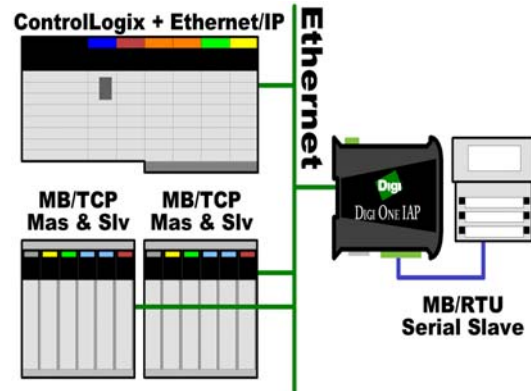
1.3   Network to Network Routing

Feature: The Digi One IAP allows messages from any Master to be routed through destination tables. Previous, firmware allowed this only for serial Masters.

Benefit: Allows protocol bridging and mapping between Network Masters and Network Slaves. The serial port can even be ignored. Some examples:

- Modbus/RTU on a PC using RealPort polling Modbus/TCP PLC using Ethernet.
- ControlLogix using EtherNet/IP to query older AB/Ethernet (CSP) only PLC.
- AB/Ethernet (CSP) ActiveX controls polling a ControlLogix PLC.
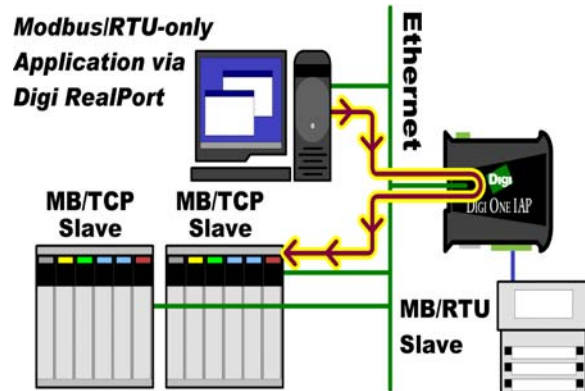
1.4 Better support for Ethernet/IP

Feature: Ethernet/IP with conformance to latest ODVA tests (Winter 2004)

Benefit: Meeting conformance test has an obvious value

Feature: Support for both connected and unconnected messaging

Benefit: Allows full client or server access to either ControlLogix or the Rockwell 1761-NET-ENI. Previous firmware did not support connected messaging in or out, and many Rockwell products support only connected messaging when they originate a connection to the Digi One IAP.

**Feature**: Ethernet/IP client (outgoing) supports CIP connection path

Benefit: The CIP connection path allows a DF1 Master to move messages through the ControlLogix backplane to one of many processors in any slot.

1.5 Peer-to-peer Communications for Allen-Bradley

Feature: Allows multiple A-B PLCs to communicate as peers without interfering with RSLinx or OPC access.

Benefit: Previous Digi One IA RealPort firmware forced AB PLC to be either Master or Slave; it did not allow RSLinx or OPC to access the PLC concurrently to the PLC issuing MSG blocks. Now the PLC can act as Master and Slave at same time.

Benefit: Many new applications and system designs can be supported. This also makes the Digi One IAP behave more like the Rockwell 1761-NET-ENI. However, because the Digi One IAP supports up to 64 incoming/outgoing sockets, this design is much more powerful in real world systems over the two guaranteed peer-to-peer connections in the ENI.
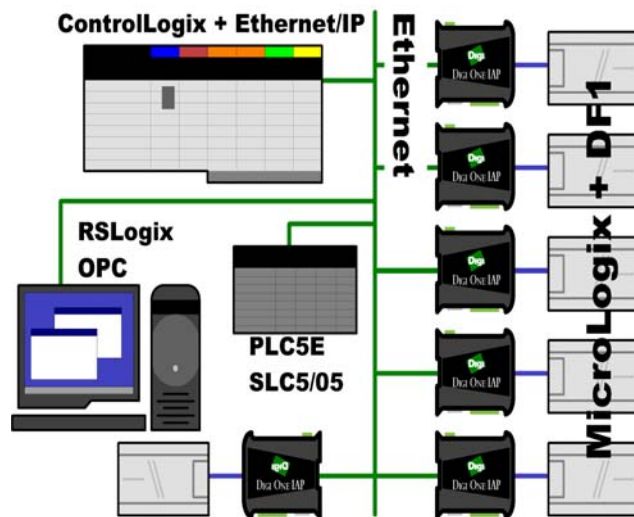
1.6 New Custom Protocol

Feature: New Custom protocol with better timing handling than the user-defined protocol, and support for Simplex (transmit-only or receive-only).

Benefit: Allows Digi One IAP to act as concentrator; for example, allows:

- 64 Digi One SP + barcode readers connected to one Digi One IAP to gracefully interleave messages at a single serial port

- Up to 64 clients to connect to a Digi One IAP, all seeing a copy of any serial data received at the serial port

## 1.7 Increased socket connections from 32 to 64

Feature: Supports up to 64 incoming or outgoing sockets

Benefit: Some OPC servers attempt to open one socket per RS-485 slave, so 32 RS-485 devices expect 32 sockets. The Digi One IAP allows 64 sockets, so a second OPC server can access for faster recovery if the first OPC fails and needs to reopen 32 sockets ASAP. Overcomes limitation with the CEV in which only eight sockets are supported and Schneider tells users not to put more than four RS-485 slaves on a CEV. The same conservative design with a Digi One IAP allows 32 RS-485 slaves.

1.8 New WebUI and Configuration Wizard

Features: New built-in WebUI uses profiles; matches the rest of the Digi terminal/device server product lines; Configuration Wizard program provides step-by-step configuration.

Benefits: Provides easier installation and configuration
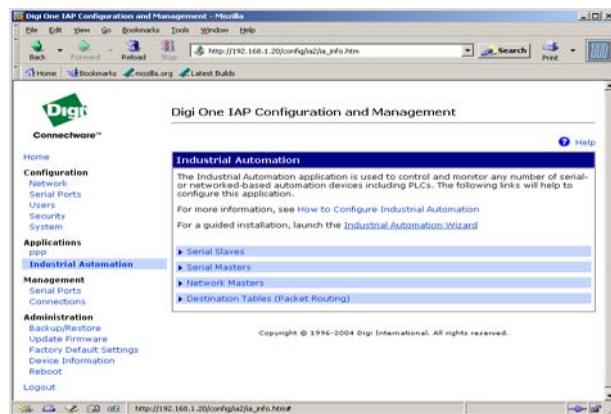

2 Protocol Bridging

|	SLAVE	MB/RTU	MB/ASCII	MB/TCP	MB/UDP	DF1 FD	DF1 HD	ABEnet	Enet/IP	ASCII
MASTER										
MB/RTU		n/a	yes	yes	yes	yes	yes	yes	yes	yes
MB/ASCII		yes	n/a	yes	yes	yes	yes	yes	yes	yes
MB/TCP		yes	yes	n/a	yes	yes	yes	yes	yes	yes
MB/UDP		yes	yes	yes	n/a	yes	yes	yes	yes	yes
DF1 FD		yes	yes	yes	yes	n/a	yes	yes	yes	yes
DF1 HD		yes	yes	yes	yes	yes	n/a	yes	yes	yes
ABEnet		yes	yes	yes	yes	yes	yes	n/a	yes	yes
Enet/IP		yes	yes	yes	yes	yes	yes	yes	n/a	yes
ASCII		no	no	no	no	no	no	no	no	n/a

3 Upgrading Old Digi One IA RealPort or IAP units

3.1 What version do I have?

Starting your Web browser and logging into the Digi One IAP (or IA RealPort) brings you to the page shown next. The Firmware version shown here is **82000770_D1** (or release **D1**).
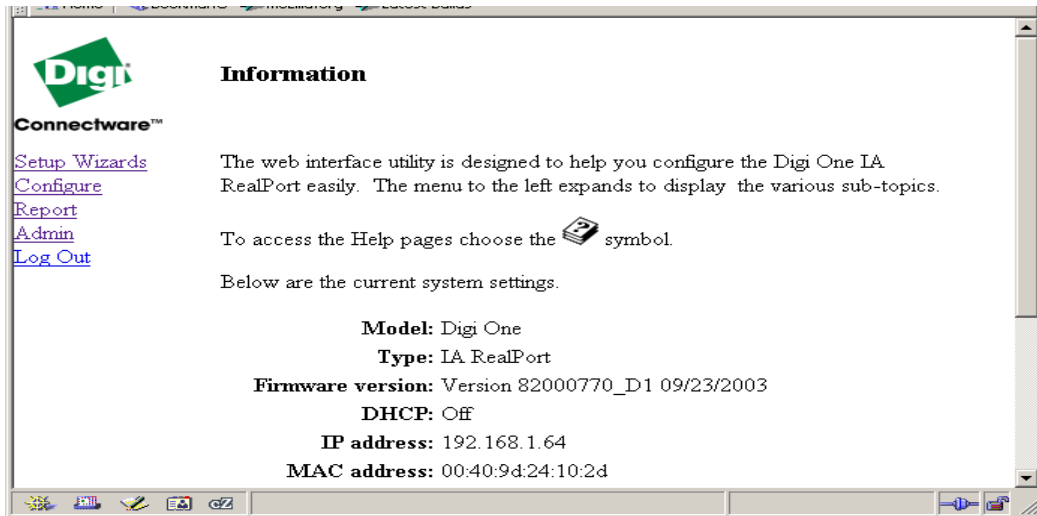
If you have the new Web UI shown next, you probably don't need to upgrade. To see the **Firmware Version**, click **Device Information**. The final firmware version will be listed as 82000770_E. An example beta firmware will be listed as 82000770_E_SA7, where this is System Assurance build 7 – the higher the number the better. Any other form (such as that show below) represents an unofficial build which should rarely bee seen in the field.
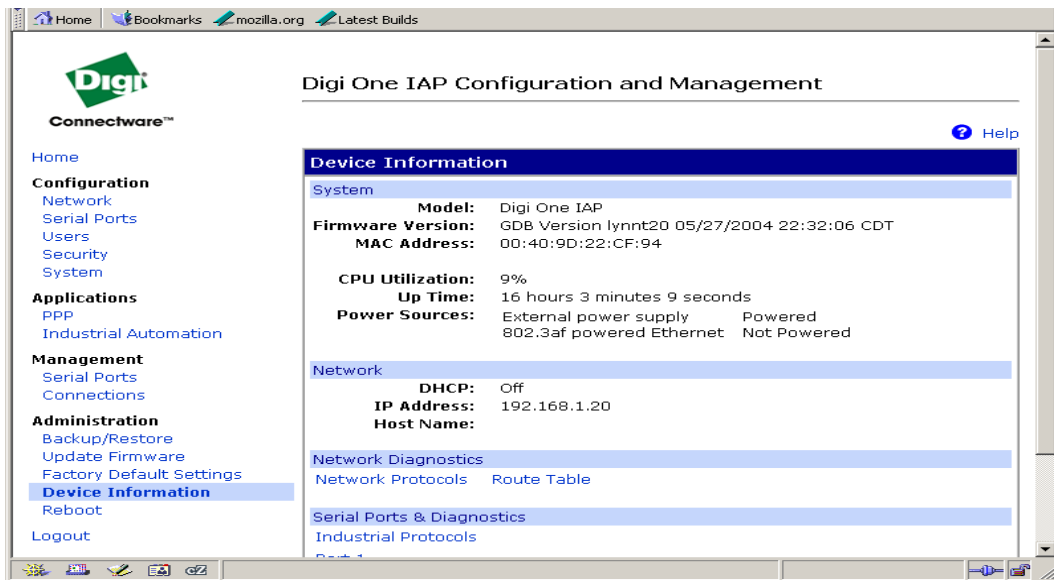
3.2   What do I need to upgrade?

You need two files:

- The POST file, which you can think of as a BIOS or loader. The POST file you need is named **82000779_D.bin** (or 82000779_D.pos). It is critical to load this file first, before you load the new firmware. Loading the POST file a second time is not a problem, so if you're in doubt, reload it.

- The EOS file, which is the application firmware. The EOS file you need is named **82000770_E.bin**. If you have a Beta or prelease version, it is named 82000770_E_SA5.bin, where "SA5" indicates the version of the Beta. The final firmware will lose the "SA5" extension and become 82000770_E.bin. (Lynn, possible to get rid of all this naming convention stuff?)

3.3   Reset Config

Before you upgrade reset your configuration. Your old IA settings will not be saved during the upgrade.

1. At the left of the window, click ,and then click **Reset Config**
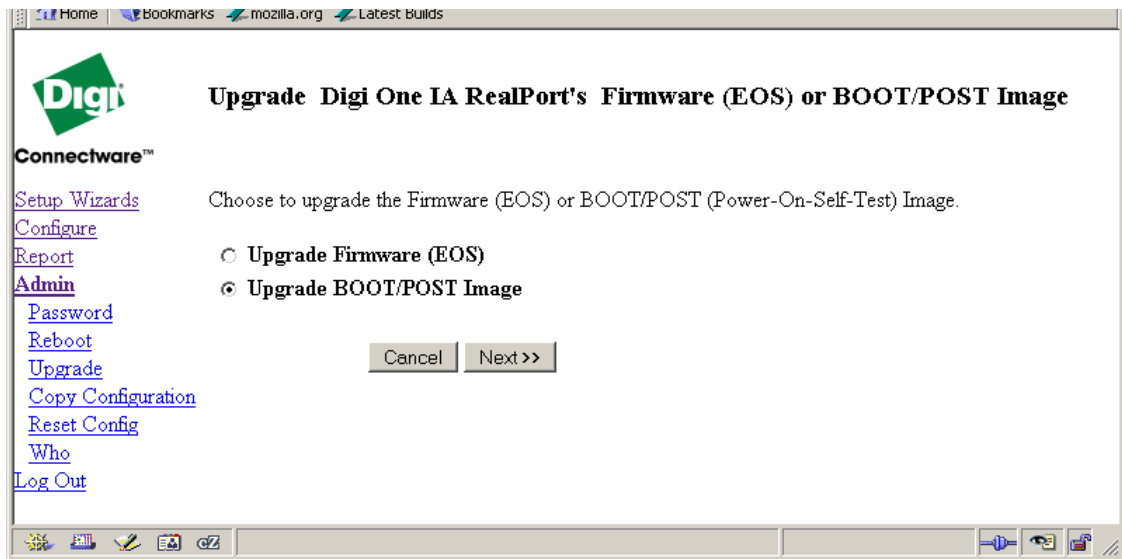
2. To reset, click **Continue**.
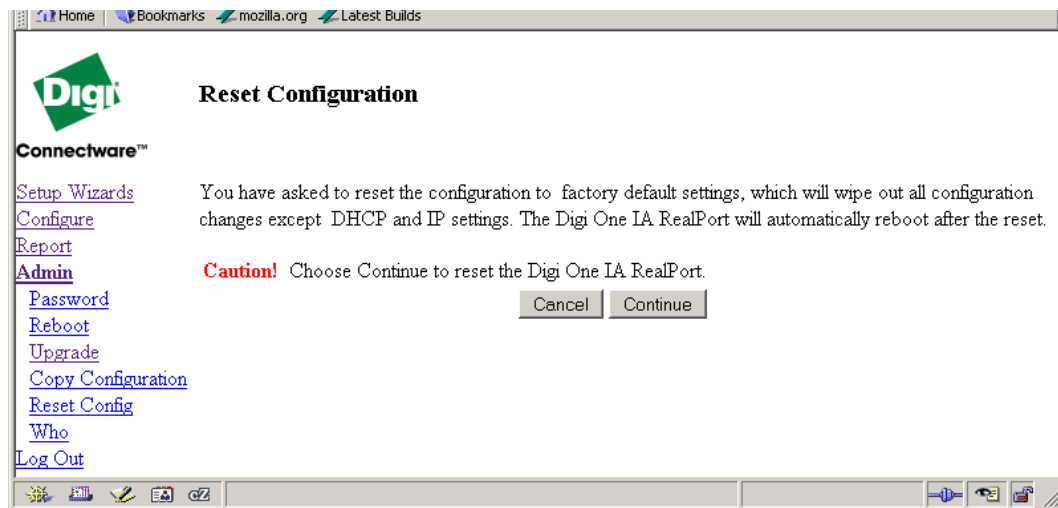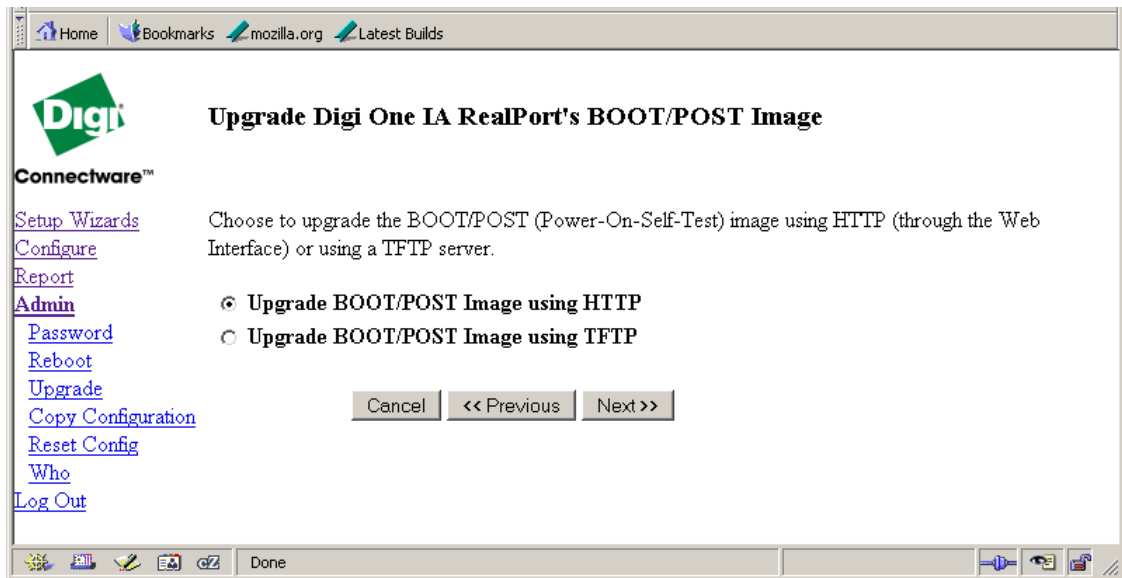
3.4   Upgrading the POST

1. Click **Upgrade** under the **Admin** heading.

2. Click **Upgrade BOOT/POST image**.

    You *must* upgrade the POST first; accidentally reloading the new POST a second time will *not* cause a problem, so if you are not sure it has been upgraded, then upgrade it again.

3. Click **Next>>**.

You can upgrade using HTTP (that is, your Web browser); click **Next>>**.

1. Click **Browse**, and browse to the new POST file from your hard disk: **82000779_D.bin.** (Lynn: how about something like: "You might want to name...?") but I like to rename mine .pos just to distinguish them from the EOS/firmware .bin files)

2. Click **Upgrade Now.**

   The upgrade takes a few seconds. Be sure not to power down or disturb the Digi One IA RealPort during this process.
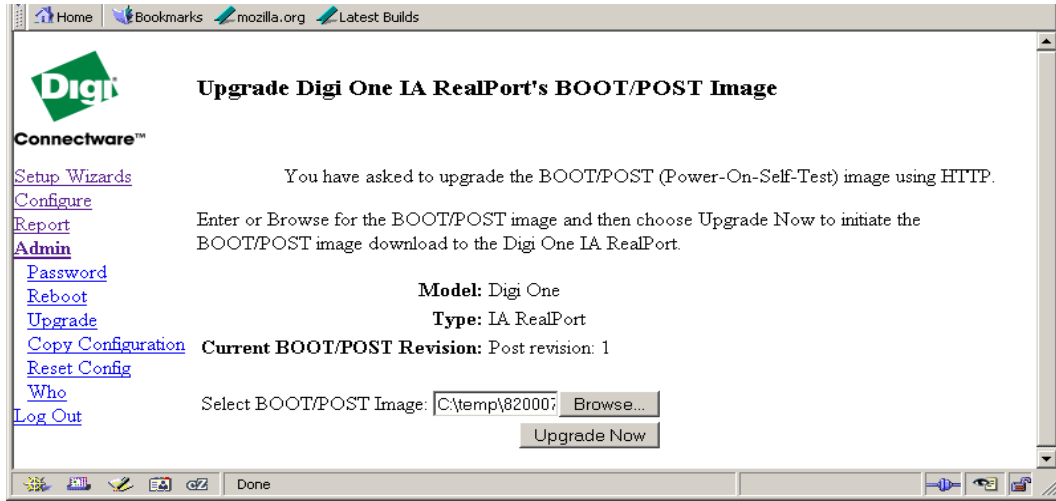
When you see this Web page, you are finished. You will see an error message if any errors occurred, if the file was corrupt, or if it was of an incorrect type. Click **Reboot**. In about a minute your Web browser can access the Digi One IAP.
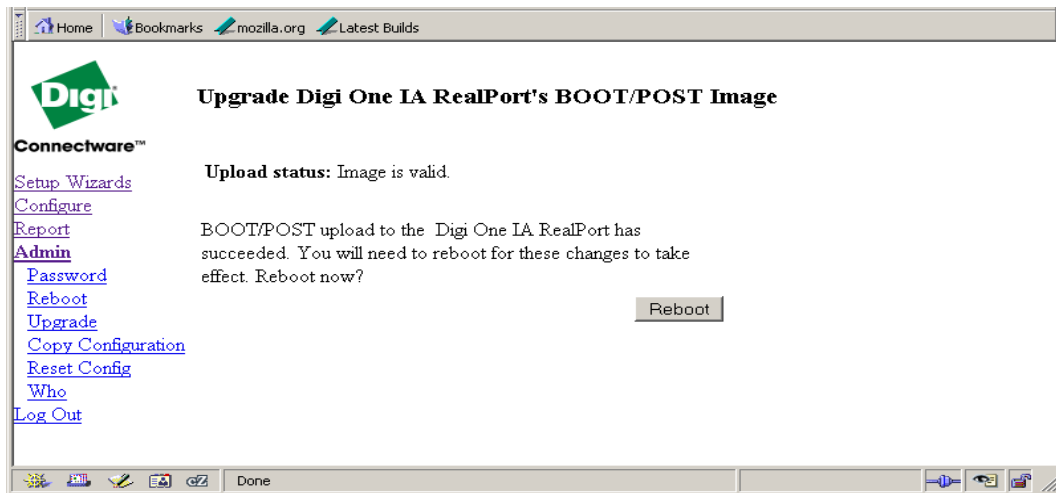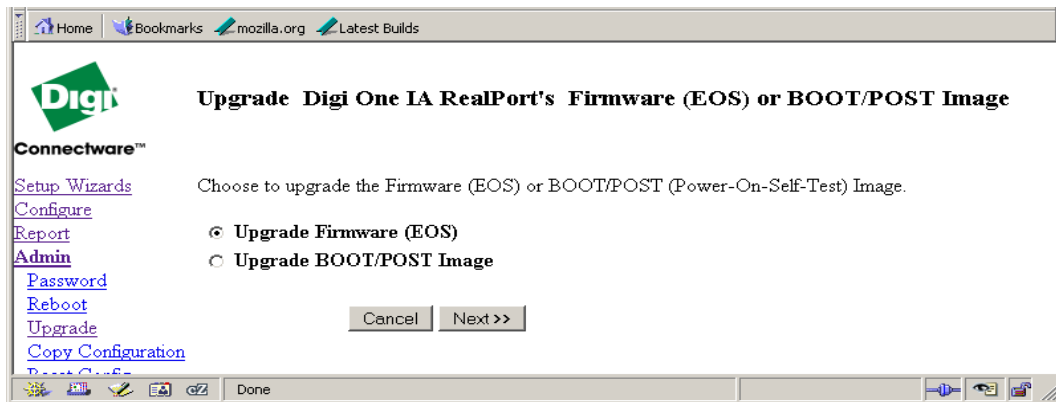
3.5   Upgrading the EOS (firmware)

You end up back at the main Web page. You won't see any difference, but the new POST is now running.

1. Click **Admin Upgrade.**

2. Leave **Upgrade Formware (EOS)** selected.

3. Click **Next>>**.

Basically. you go through the same steps as before.

1. When you are prompted to upgrade using HTTP, click **Next>>**.

2. To select the EOS file, click **Browse** and navigate to the EOS file on your system. The released version is named **82000770_E.bin**.

3. Click **Upgrade Now.**

   The upgrade takes place.

   Be sure not to power down or disturb the Digi One IA RealPort during this process.This step takes longer than the POST upgrade because the EOS is much larger.
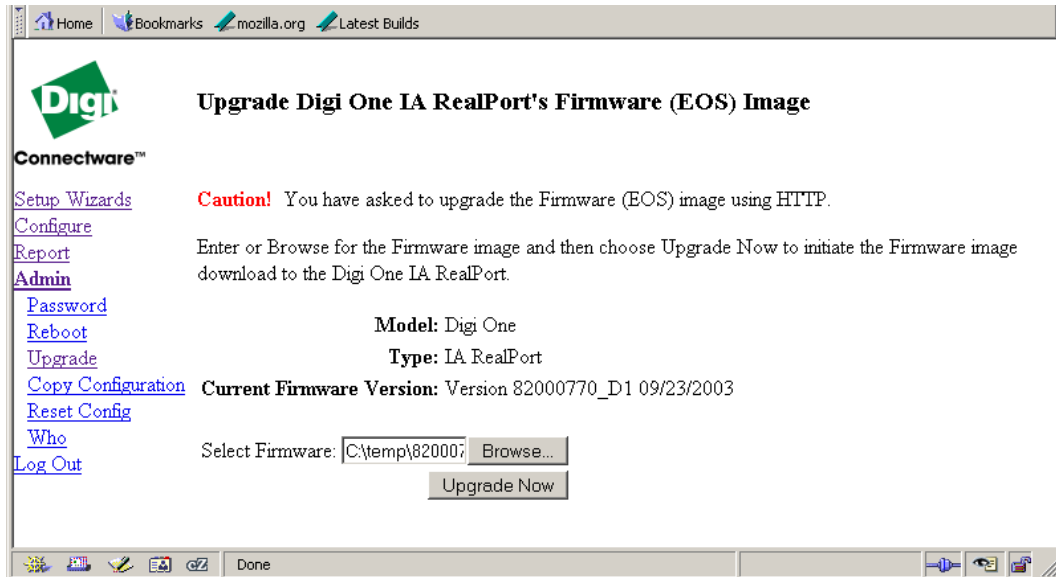
You want to see the message Image is valid. Click **Reboot,** and wait a minute for the result.

3.6 The result

After the upgraded unit reboots, log in and see the new home page.