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Schneider Automation BootP Lite Ethernet IP Address Download Utility for Schneider Automation Ethernet Products Instruction Sheet

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CAUTION

Be sure to verify the MAC address of the target device before invoking this program. If you do not enter the correct parameters of the target controller, it will come up running in its old configuration. An incorrect MAC address may cause an unwanted change to another device and cause unexpected results.

Note: Where possible, we recommend that you install and operate BootP Lite and the target device on an isolated network. Also, verify that the target device has been correctly modified. This will prevent any unexpected results from affecting your network.

BootP Lite Software Decription

BootP Lite is a Windows-based software utility for downloading an Ethernet IP address, default router and subnet mask to Schneider Ethernet Products.

When used with the ENT Communication Adapter, the utility permanently changes the IP address in the adapter's flash memory.

When used with an M1 Ethernet Processor, the utility changes the IP address, default router and subnet mask of the processor. Optionally, it may cause the processor to enter Stopped mode on completion of power up. This is useful when inappropriate outbound network traffic might result if the processor immediately transitioned into Run mode after power up.

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BootP Lite Software Decription, continued

When used with a Quantum NOE communications module, the utility changes the IP address, default router, and the subnet mask of the processor. Optionally, it may cause the processor to enter “stopped” mode on completion of power up. This is useful when inappropriate outbound network traffic could result if the processor immediately transitioned into Run mode after power up.

When used with a Quantum 140 NOE 771 x0, the utility changes the IP address, default router, and the subnet mask of the NOE. These settings are volatile and are only intended to allow the user to connect to the NOE over Ethernet using a programming panel to configure the CPU.

Note: The BOOTP Lite utility will not configure and NOE when run on a PC, which already has a BOOTP server running. Either use BOOTP Server on the PC or use the BOOTP Lite utility on another PC

See the Responses to BootP Lite Commands section found later in this document.

BootP Lite Software Installation

Ensure that the following has been done.

- Copy “Bootplt.exe” to the directory from which you wish to execute the program.
- Your computer must be running Windows 95, Windows 98, or Windows NT.
- Your computer must provide a network connection, via an Ethernet Communications card, to the Ethernet network on which the target processor, or adapter is located.

Invoking BootP Lite

The utility is invoked from the DOS command line or the MS-DOS Prompt under Windows 95 or the Command Prompt under Windows NT.

You should be physically near the target device to power cycle it and to verify correct operation.

Step	Action
1	Invoke Bootp Lite is invoked from the command line (see the details in the following table).
2	Power cycle the target when prompted.
3	Diagnostic or error messages will be displayed as the process proceeds.
4	Check the LED blink pattern of the target hardware to confirm the success of the operation. Refer to section called “Responses to BootP Lite Commands”.

BootP Lite Commands

The following tables provide descriptions of the BootP Lite commands.

Command Name	**bootplt**
Description	This command invokes the utility and causes it to display the following information about itself.
Format	"bootplt" <enter>
Actions	No bootp messages are sent.

Output	The following message is displayed.
	`Schneider Automation Ethernet Adapter IP address change utility`
	`Win32 version for Windows 95/98 and NT`
	`V01.01 10/01/99`
	required required optional optional
	`usage: bootplt mac_address ip_address ip_router ip_mask`
	`eg bootplt 000054000001 198.202.138.77 192.202.138.254 255.255.255.0`
	
	`This program will assign an IP address Ethernet device. Remember to power cycle the Ethernet module WHILE the BOOTP messages are being sent out.`

Command Name	**bootplt ip_addr target_mac_addr**
Description	This command invokes the utility and sends the new network address (ip_addr) to the processor or adapter whose MAC address is given by target_mac_addr.
Format	bootplt target_mac_addr ip_addr where: *Bootplt* is the name of the utility. *target_mac_addr* is the existing MAC address of the target processor or adapter. It must be in hexadecimal format. This information is located on the end panel of both the ENT and M1 Ethernet module, and on the front panel of the NOE module. *ip_addr* is the new TCP/IP network address for the target processor or adapter (for example 198.202.138.77). It must be in dotted decimal format. **Example:** bootplt 000054000001 198.202.138.77

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BootP Lite Commands, continued

Command Name	**bootplt target_mac_addr** ip_addr **default_router subnet_mask**
Description	This command invokes the utility and sends the new network address (ip_addr) to the processor or adapter whose MAC address is given by target_mac_addr. Additionally, it updates the target's default router and subnet mask. Note that while the default router address and subnet mask are optional, if one is specified, both must be specified, in the order indicated here.
Format	booplt target_mac_addr ip_addr default_router subnet_mask, where: *Bootplt* is the name of the utility. *target_mac_addr* is the existing MAC address of the target processor or adapter. It must be in hexadecimal format. This information is located on the end panel of both the ENT and M1 Ethernet module, and on the front panel of the NOE module. *ip_addr* is the new TCP/IP network address for the target processor or adapter (for example 198.202.138.77). It must be in dotted decimal format. **Example:** bootplt 000054000001 198.202.138.77 *default_router* is the IP address of the default router to be used by the target (for example, 198.101.100.661). It must be in dotted decimal format. *subnet_mask* is the IP address of the subnet mask to be used by the target (for example, 198,101,000.000). It must be in dotted decimal format. **Example:** "bootplt 000054000001 198.202.138.77" 198.222.100.101 200.100.000.000"

Responses to BootP Lite Commands

When used with the ENT communications adapter

1. The new IP address is permanently stored in the adapter's flash memory.
2. To confirm that the download operation has been successful, check the condition of the following LED:
   Run LED is ON

When used with the M1 Ethernet Processor in "passive bootp" mode
If the target has been configured for "passive bootp" mode via the "Use IP" option in the Concept programming panel, on power up:

1. The processor will enter Stopped mode after power up is completed.
2. The new IP address may be used to communicate with the controller.
3. To confirm that the download operation has been successful, check the following LED's:
   LAN Status LED: ON
   Run LED: OFF

The downloaded IP address may be used to communicate with the processor. This new IP address, default router and subnet mask are volatile. You may use a programming panel (such as Concept V2.2 or greater) to permanently store this information.

When used with the M1 Ethernet Processor in "active bootp" mode
If the target has been configured for "active bootp" mode via the "Use BootP" option in the Concept programming panel, on power up:

1. The processor will transmit BootP requests until a BootP response is received.
2. The processor will Start on completion of power up, if it has been programmed to do so.
3. To confirm that the download operation has been successful, check the following LEDs:
   LAN Status LED: ON
   Run LED ON (if the processor has been programmed to start, otherwise OFF)

The downloaded IP address may be used to communicate with the processor. This new IP address, default router and subnet mask are volatile. You may use a programming panel (such as Concept V2.2 or greater) to permanently store this information.

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Responses to BootP Lite Commands, continued

When used with an un-configured M1 Ethernet Processor

If the target is un-configured, ie, contains no program, or contains no configuration extensions (this is the default as shipped from the factory), on power up:

1. The processor will enter Stopped mode after power up is completed;
2. The new IP address may be used to communicate with the controller
3. To confirm that the download operation has been successful, check the following LEDs:
   LAN Status LED: ON
   Run LED: OFF

The downloaded IP address may be used to communicate with the processor. This new IP address, default router and subnet mask are volatile. You may use a programming panel (such as Concept V2.2 or greater) to permanently store this information.

When used with a Quantum 100 megabit NOE module

1. The downloaded IP address may be used to communicate with the NOE.
2. To confirm that the download operation has been successful, check the following LEDs:
   Run LED: ON

The new IP address, default router and subnet mask are volatile. You may use a programming panel (such as Concept V2.2 or greater) to permanently store this information.

Progress Messages

During successful operation, the following sequence of messages will appear on your display.

```
Using MAC address nnnnnnnnnnnn and IP address nnn.nnn.nnn.nnn
Did you PING to prove that this IP address does not already
exist?
Enter Y to continue:
```

(If you answer 'Y', you will see the following)

```
Program aborted
```

(If you answer 'Y', you will see the following)

```
Continue BOOTP initialization

You should power cycle the Ethernet module now

Sending BootP message 1 of 10
Sending BootP message 2 of 10
Sending BootP message 3 of 10
Sending BootP message 4 of 10
Sending BootP message 5 of 10
Sending BootP message 7 of 10
Sending BootP message 8 of 10
Sending BootP message 9 of 10
Sending BootP message 10 of 10

BootP broadcast sequence complete
```

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Progress Messages, continued

(You will see one of the following messages, depending on the response from the target device)

```
Found node type = n: NOE2X1 Network Option Module
```

or

```
ENT Communication Adapter
```

or

```
M1 Ethernet PLC
```

or

```
NOE771-00 Network Option Module
```

or

```
ETY
```

or

```
CIP
```

or

```
NOE771-10 Network Option Module
```

or

```
CRA771-00 Network Option Module
```

or

```
UNKNOWN
```

(If the target is not an ENT adapter, you will see the following:)

```
Target node is not ENT type so this utility cannot save
current IPaddress to flashram.  You must connect to target
node using the proper programming tool to save current IP
address to flashram, if appropriate.
```

(If the target node is an ENT adapter, you will see the following:)

```
Do you wish to save this IP address to the ENT flashram?
Enter Y to continue:
```

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Progress Messages, continued

If you do not enter 'Y', you will see the following:

```
Program aborted
```

(If you do enter 'Y', you will see the following:)

```
Continue save IP to ENT flashram

Send of 'record IP address' request message complete
```

(If your target is an ENT adapter, you will see one of the following messages, depending on the version of the firmware in the adapter.)

```
Second connect failed. The ENT module has erased the previous
IP address contained in flashram and is now searching for IP
address. You must now invoke this procedure a second time to
complete the save to flashram process.
```

or

```
Second connect succeeded. The ENT module should now have the
desired IP address saved to flashram. To prove this, it is
best to power cycle the ENT one more time. Then, after the 20
second powerup initialization period has elapsed, you should
be able to PING the unit, and it should retain this ability
after all subsequent power failures.
```

Error Messages

Should an operational failure occur one or more of the following error messages will be displayed.

```
Schneider Automation Ethernet Adapter IP address change
utility Win32 version for Windows 95/98 and NT V01.00 7/01/99

                  required        required   optional      optional
usage: bootplt  mac_address   ip_addr   ip_router   ip_mask

eg bootplt 000054000001  198.202.138.77 192.202.138.254
255.255.255.0

This program will assign an IP address Ethernet device.
Remember to power cycle the Ethernet module WHILE the BOOTP
messages are being sent out.
```

This message will appear under one or more of the following conditions:

1. The mandatory IP address or MAC address is missing or mis-formed.
2. Either the default router or subnet mask is missing or mis-formed (applies only when these optional parameters are specified).

For requirements on command line format, refer to the section on command line descriptions.

The IP addresses (ip_addr, default_router, subnet_mask) must be in dotted decimal notation, consisting of four decimal numbers from 0 to 255 separated by dots. The MAC address must be in hexadecimal format, consisting of 12 contiguous hex digits.

```
Bad IP address - all fields must be 0-255
```
Each number in the IP address must be in the range from 0 to 255.

```
Bad Default Gateway address - all fields must be 0-255
```
Each number in the gateway address must be in the range from 0 to 255.

```
Bad Sub Network mask - all fields must be 0-255
```
Each number in the sub network mask must be in the range from 0 to 255.

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Error Messages, continued

`Cannot initialize WinSock`
The Windows communications socket cannot be initialized to send the message. Check that WIN32 Winsock services and a network connection are available.

`Bind returns nnn`
`Perhaps there is a BOOTP or DHCP server already be running`
You are running this program on Windows 9X or Windows NT and are also running a BootP server or a DHCP server on the same machine. Shut down the server.

`Setsockopt returns nnn`
`Could not get authority to BROADCAST messages`
The Windows communications socket could not broadcast the bootp message. Under Windows NT or 9x, a system administrator may have banned user programs from issuing broadcast messages. Check with your system administrator.

`Sendto returns nnn`
`Unexpected problem sending UDP datagram to target`
You may be experiencing network difficulty. Try PINGing the target to verify the network connection.

`Connect on port 502 returns nnn`
`Target IP address not found`
Attempt to establish a MODBUS/TCP connection failed. The target device does not appear to support MODBUS/TCP. Verify that the target is a MODBUS/TCP compliant product.

`Send - error n`
You were denied permission to send a message to the target requesting it's statistics (including module ID). Check with your system administrator.

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Error Messages, continued

```
Send() returned nnn
unexpected problem sending MODBUS message to target
```
You are experiencing a general network problem. Try PINGing the target.

```
No TCP response received
```
You may be experiencing a general network problem. Try PINGing the target.

```
Invalid network statistics response
```
Verify that the target you are addressing is a supported Schneider Automation Ethernet product.

```
Unexpected network statistics data
Found MAC address nnnnnnnnnnnn and IP address nnn.nnn.nnn.nnn
Connection to wrong Ethernet device is now aborted
```
Verify that the target you are addressing is a supported Schneider Automation Ethernet product.

```
Select returns nnn
Unexpected Winsock error occurred
```
You may be experiencing a general network problem. Try PINGing the target.

System Compatibility

BootP Lite is designed to work properly with the following Modicon products.

Product	Model Number	Firmware Version
NOE 100 Megabit Communications Module	140 NOE 771 00	1.0 or greater
NOE Factory Cast Communications Module	140 NOE 211 10	1.0 or greater
	140 NOE 711 10	
M1 Ethernet Processor	171 CCC 960 20	1.0 or greater
M1 Ethernet Processor	171 CCC 980 20	1.0 or greater
ENT Communications Adapter	170 ENT 110 00	1.0 or greater

System Requirements:

BootP Lite requires an IBM or compatible personal computer with an Ethernet network communications card, running a DOS session under one of the following operating systems:

- Windows 95
- Windows 98
- Windows NT

Further Information

For complete information concerning the M1 Ethernet Processors and the ENT Communications Adapter, obtain copies of the *Momentum M1 Hardware Manual* (840 USE 101 00). For information on the 100 Mbit NOE Communcations Module, obtain the *Quantum Ethernet 10/100 Megabit Ethernet Module User Guide* (840 USE 116 00).