B064

Ethernet Network Module

for S080 or S090

Handbook   Version 0.9B

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Document History

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Version information The following versions of software and firmware were used in the production of this document:

S080 Software	1.4.2.265
B082S Device Version	11110
B082S Software Version	1.07
dB Broadcast Connection Wizard	3.9.82
Device Server Firmware	EM_363D.BIN

Contents

Introduction

The B064 Serial Ethernet Network Module

The B064 Serial Ethernet Network Module is intended to be used with a PC running S080, S090 or similar software to work with applicable products in the dB Broadcast Hawkeye range such as the B080 and B090 series modules.

The B064 is a compact device designed for installation at the back of a Vistek card rack containing one or more applicable Hawkeye cards.
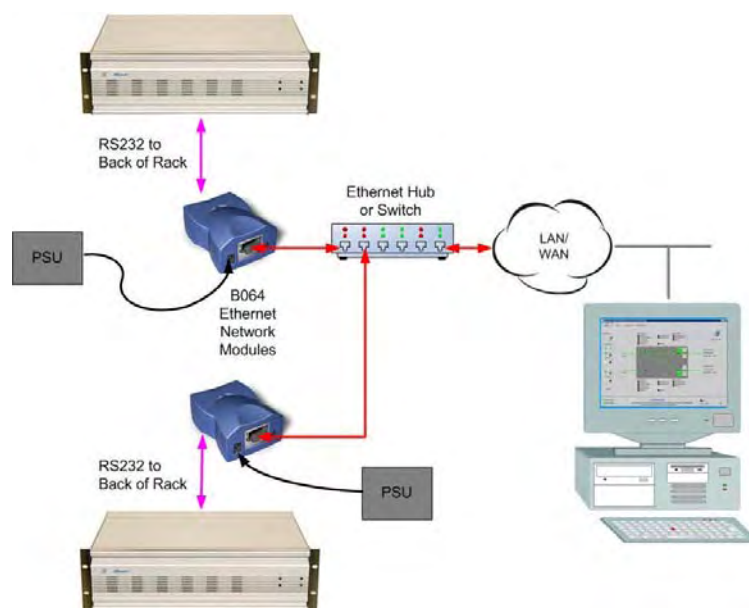
The device features are as follows:

- External dimensions - 60x47x30mm

- Power supply range - 10-25VDC (12vDC 500mA Power Adaptor provided)

- One 100/10 BaseT Ethernet port

- One virtual RS232 serial port

- Six display status LEDs

- DHCP client

- Internal firmware upgradeable through the serial port or network

- CE- and FCC-approved

Note: This manual is based on the use of the S080 software to control a B082 switcher/monitoring card via IP based Ethernet using the B064 as a Serial Device Server.

Quick Start Guide

This section explains the basic installation steps, which are as follows:

1) Connect a powered B064 unit to the same network as your workstation PC

2) Install the dB Broadcast software and assign an IP address

3) Install the Windows driver

4) Test the unit

Note: It is recommended to consult the person responsible for maintaining networks before assigning IP addresses.

Connecting the Unit

For the initial out-of-the-box setup, a PC or laptop needs to be connected to the unit either via a cross-connect cable* or via a simple hub to allow the DS Manager software to establish the correct internet protocol settings.
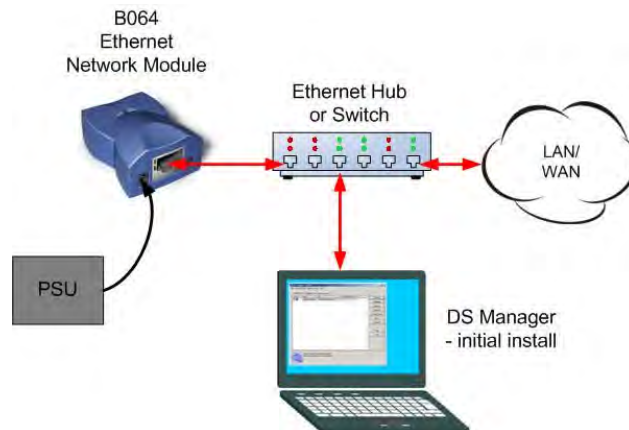
Note: An Ethernet cross-over can only be used with static IP addresses, not dynamic addresses that require a DHCP server accessible on the network.

Warning: Connection via an IP based router cannot be used for initial configuration as direct Ethernet frames need to be passed to the unit. Once internet protocol settings have been properly configured the unit will be accessible over an IP network including routers and firewalls.

Installing B064 Software

The B064 software is contained on the CD supplied with the unit. Install the CD and let it autorun. If it does not run, locate the setup file on the CD and run it.

Accept license and choose install folder

The InstallShield *Welcome* screen appears.

Click *Next*, then accept the license terms and choose a directory to install the required files.
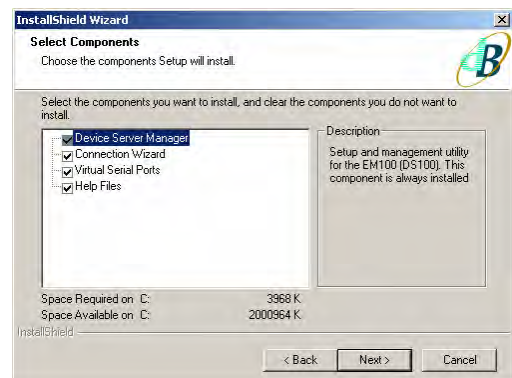
Then click *Next* again to display the *Select Components* screen.

Select components

Place a tick by each required component. All four are ticked by default. It is recommended to keep these settings.

Allow the wizard to load files and select *Yes* to the *Restart Computer* prompt.

Using the Connection Wizard

When the computer has finished re-booting, run the newly installed *Connection Wizard*.

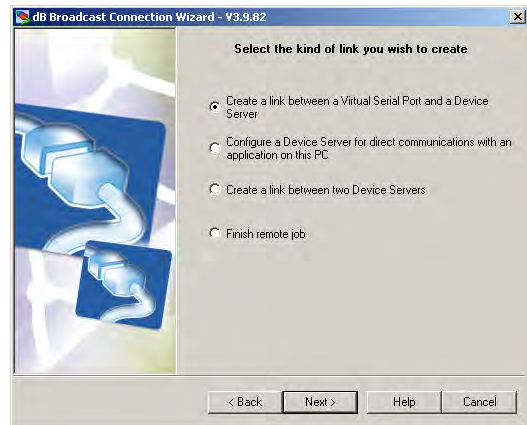Click *Next* to display the first step of the wizard.

Select link type

Select *Create Link between Virtual Serial Port and a Device Server*.

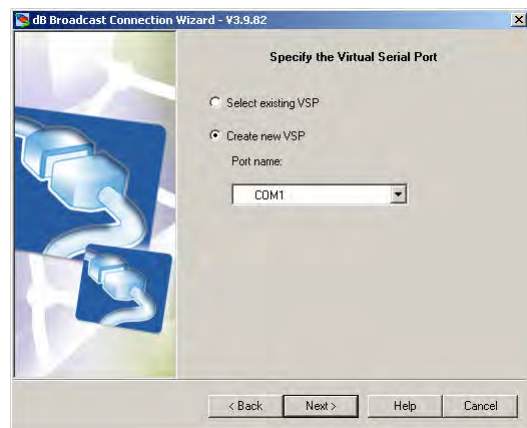This will allow the S080 or S090 to operate as if it were connected via a conventional serial port.

Click *Next* when done.

Select port

Check *Create new VSP*. Select a currently unused port, ensuring that is will not conflict with other devices such as a Bluetooth or USB serial port that isn't currently connected.
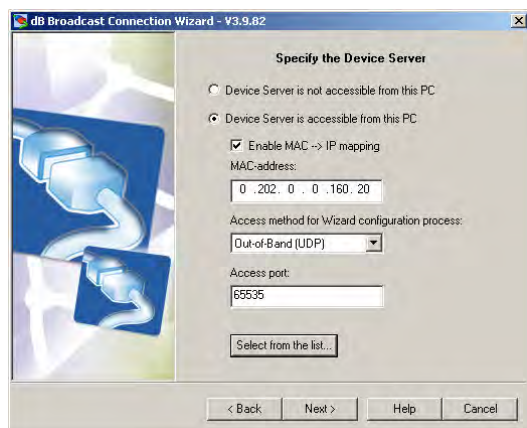
Click *Next* when done.

Specify Ethernet Network Module

The DS is initially identified by its MAC address.

Select *Enable MAC > IP Mapping*, *Out of Band (UDP)* for the access method and leave the port setting at its default of *65535*.

Then choose, *Select from list* to run the DS Manager*.

Tip: It is **strongly recommended** to attach a MAC address or reference label to modules and to record that information to avoid confusion when adding units to a larger network.

Using the DS Manager

The DS Manager provides an easy to use interface to manage B064 device servers. There are two tabs; an *address book* tab used to manually configure device servers and store and recall devices that have already been configured and an *auto discovery* tab used to find device servers on the local subnet using Ethernet broadcasts. The installer should open the DS Manager automatically when required during the installation process.

Note: Devices on different network segments cannot be auto-discovered, they should be manually configured using the *address book*.

Searching for B064 units

Click on the *Auto-Discovery* tab. A list of the device servers discovered on the local network segment should be shown.

If this is the first time the Wizard has been used and there are no configured device servers on the local net, the IP address may be wrong or set to 0:0:0:0.

If it's necessary to configure the network mask, default router or use a DHCP server select the *Settings* button.

Select *Change IP* and enter a unique IP address and select *Add.*
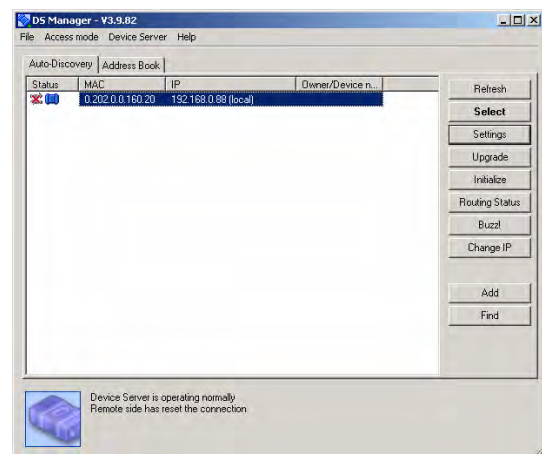
Double click on the *Device Server* icon for the installer to automatically input the settings. The selected IP address should appear. Click *Next* to test the connection to the B064 device server and continue its configuration.

Initialisation

Because the PC software always initialises the port and polls device servers, the virtual serial port should send data first.

Check *Virtual Serial Port* and click Next.
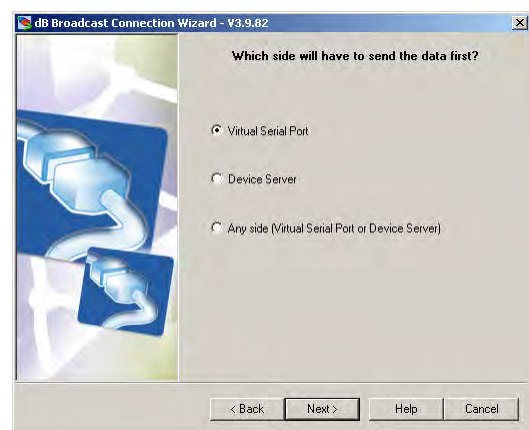
Network mask (optional)

The wizard suggests the default gateway and network mask don't need to be configured but when connecting to a corporate network they will be essential.

Tip: Use the back button to return to the DS Manager and select *Settings* to configure these details.

When done, click *Next* until the TCP/UDP port selection dialogue appears.
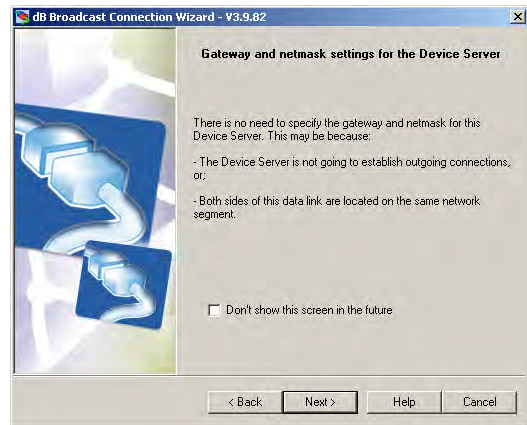
Transport protocol and ports

Select *TCP/IP* and type a port number for the device server to listen to commands.

TCP/IP is used because it is suitable for maintaining a polled serial stream.

Note: The connecting port on the PC application must match the listening port used on the device server or the connection between them will not be made.

Click *Next* when done.
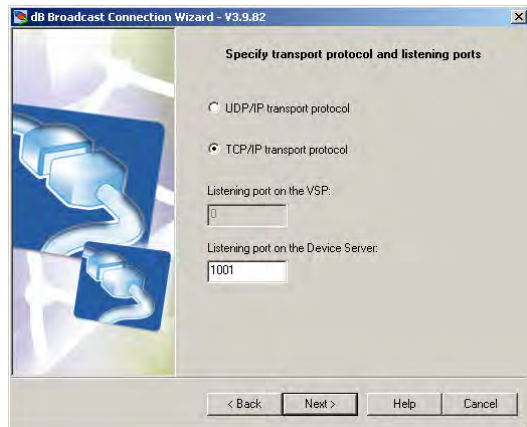
Tip: Consult a network administrator about the suitability of the port numbers used. Sometimes intermediate routers, firewalls or VPNs (virtual private networks) will only allow data through on authorised ports; silently discarding anything directed to other ports.

On the fly commands

Check *On-the-fly commands* to allow the serial parameters to be configured from the application running on the PC by passing details such as Baud rate and other serial configuration details.

This makes subsequent configuration of the device server much simpler so this option should be enabled.

Click *Next* when done.
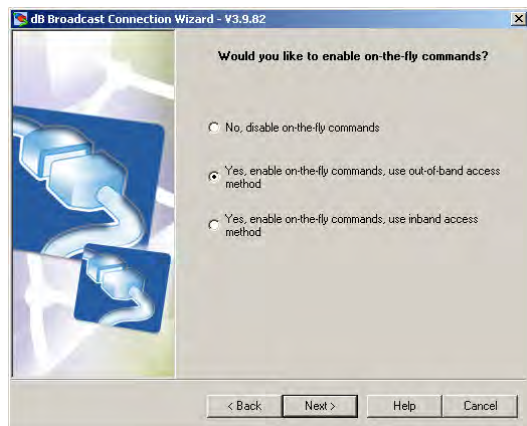
Serial settings

Because *On-the-fly* commands have been enabled there is no serial configuration to be done here.

Click *Next*.

Summary information

This is a summary of the configuration so far. It doesn't matter if the serial settings are incorrect as they will be configured by the application, but the IP settings will be required for future configuration of the PC (client) software.

Click *Finish* and the installation wizard will restart the device server and begin the device driver installation automatically.
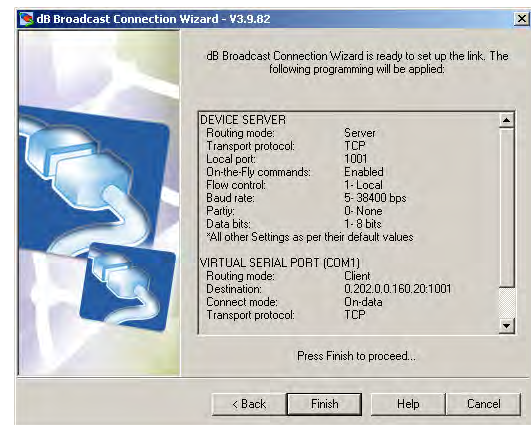
Installing the device driver

The PC device driver is unsigned but is essential on the client PC to connect to the B064 over the IP/Ethernet connection.

Click *Continue Anyway* and allow the device driver to install.

Review settings

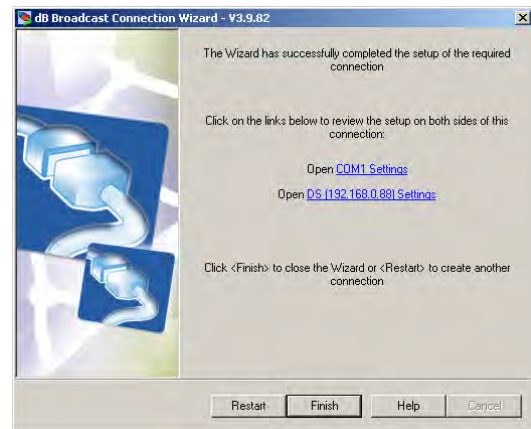When the wizard completes you can *Review* the settings or click *Finish* to close the wizard or *Restart* to create another connection.
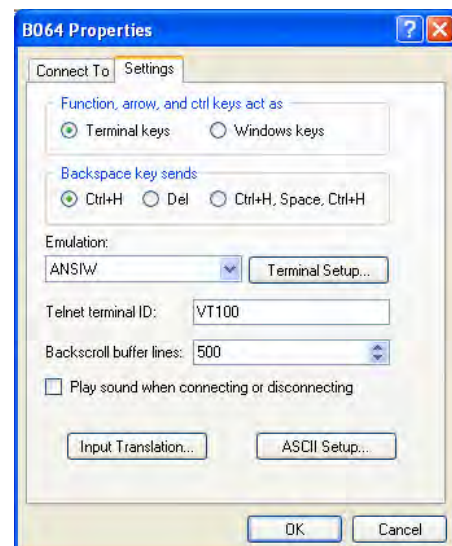

Note: the PC MUST be restarted after installing and configuring virtual serial port(s) to allow the configuration to take effect and to allow the S080 software installer to run.

Testing the Configuration
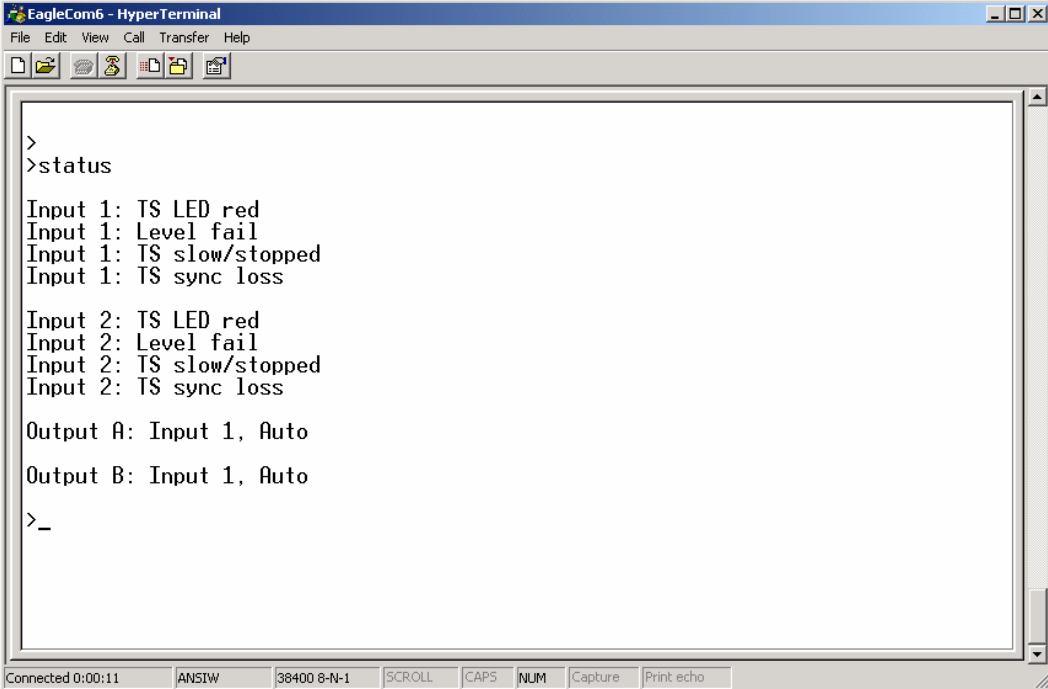
Once configured, the virtual serial port should be visible in the *Windows Device Manager* and can be used as a conventional serial port. It may be tested by running the S080/S090 control software to manage a suitable Hawkeye card.

Configure the S080/90 software to use the B064 virtual serial port as a regular serial port. The baud rate used must match that of the Hawkeye card under control. For reliable polling, use 38400 Baud; there is too much data for fast responses on 9600 Baud.

Alternatively, HyperTerminal may be used to access a serially controlled Hawkeye card using the following port and emulation settings…..
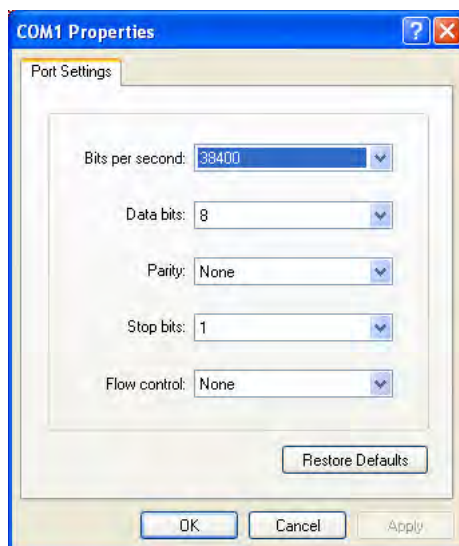
Press return to obtain a '>' prompt and enter appropriate commands:

```
EagleCom6 - HyperTerminal                                              _ □ ×
File  Edit  View  Call  Transfer  Help

>
>status

Input 1: TS LED red
Input 1: Level fail
Input 1: TS slow/stopped
Input 1: TS sync loss

Input 2: TS LED red
Input 2: Level fail
Input 2: TS slow/stopped
Input 2: TS sync loss

Output A: Input 1, Auto

Output B: Input 1, Auto

>_


Connected 0:00:11    ANSIW      38400 8-N-1    SCROLL   CAPS  NUM   Capture   Print echo
```
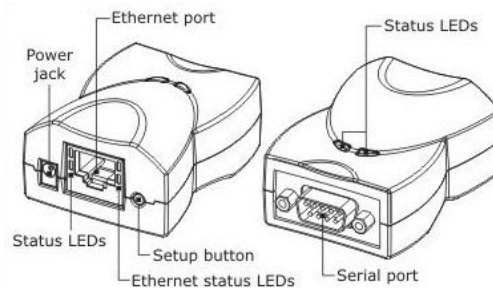
Hardware and Firmware

Power

The power jack accepts power connectors with a 3.5mm diameter. Acceptable power supply voltage range is 10-25VDC. Adaptor current rating should be at least 500mA. The central connector is positive.

It is recommended to use the power adaptor provided.

Connectors

The Ethernet connector is a standard RJ45 connector with the following pin assignment:

Pin	RJ45 connection
1	TX+
2	TX-
3	RX+
4	No Connection
5	No Connection
6	RX-
7	No Connection
8	No Connection

The serial connector is a standard RS232 9 pin male connector with the following pin assignment:

Pin	RS232 connection
1	No Connection
2	RX (input)
3	TX (output)
4	DTR (output)
5	GND
6	DSR (input)
7	RTS (output)
8	CTS (input)
9	No Connection

Reading Status LEDs
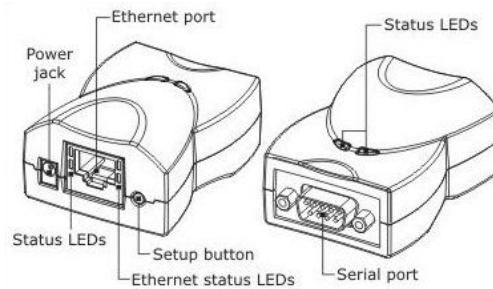
Ethernet LEDs

The Ethernet Network Module has two Ethernet Status LEDs- Green and Yellow- located on the Ethernet connector (right side):

- Link/Data LED (green) is turn on when a "live" Ethernet cable is plugged into the Module. It switches off whenever an Ethernet packet is received.

- 100BaseT LED (yellow) is turns on in 100Mb mode and is off in 10Mb mode.

General Status LEDs

There are a further two pairs of status LEDs: one pair is on the Ethernet connector itself (left side), and one pair is on top of the Device. Both pairs work in the same way and provide status information during power up as well as firmware upgrading and both normal or abnormal conditions.

These LEDs can usually be ignored except in the unlikely event that the unit misbehaves. If this occurs a dB Broadcast support engineer may ask the precise LED illumination sequence displayed.

Setup Button

The setup button is located next to the Ethernet port. It is used to select an operating mode:

Normal mode: When the unit powers up (without the button pressed) it proceeds to run its current application firmware and should work normally.

Setup mode: When the unit is powered up with the button pressed it enters a serial upgrade mode in which new application firmware file can be uploaded through the unit's serial port. See *Installing New Firmware*.

Installing New Firmware

If new firmware is required to be installed on the Ethernet Network Module, it will be provided by dB Broadcast in the form of a firmware file.

Use the *Serial Access* tab of the *DS Manager* to install new firmware.

Connect a serial port on the PC to the port on the Ethernet Network Module using a null modem* (cross-over) cable.

Select the PC serial port to which the Ethernet Network Module and press the "Upgrade" button.

You will be prompted for the location of the new firmware file.
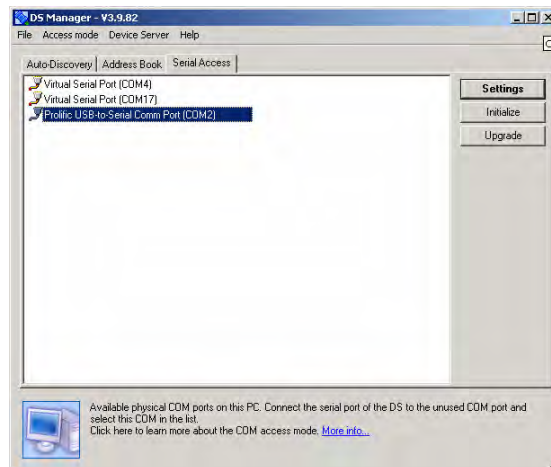
Power the Ethernet Network Module off, hold the setup button down and reapply power when requested to do so. The set up button is next to the Ethernet connector.

The upgrade will complete and its green LEDs with flash, until the power is cycled again.

Note: It is recommended that new firmware should only be installed if difficulty is encountered with the current firmware and when instructed to do so by dB Broadcast.

Specifications

Parameter	Ethernet Network Module B064
Ethernet interface	10/100BaseT Ethernet
Serial interface and I/O lines	RS232 (TX,RX,RTS,CTS,DTR,DSR)
Routing buffers size	12Kbytes x 2
Power requirements	DC 10-25V, 500mA
Operating temperature	-5 to +70 degrees C
Operating relative humidity	10-90%
Mechanical dimensions	60x47x30mm
Gross weight	110g

Trouble Shooting

The DS Manager can't see any Ethernet Network Modules; what's wrong?

Check that the modules are powered.

Check that at least one Module is connected on the same network as the PC running DS Manager. Check that no firewall is blocking module IP addresses or listening ports and that the PC can see other devices such as shared printers or other PCs.

If no units have been configured yet, ensure they are on the same local network segment as the PC. A small network can be configured using a hub, simple switch or crossover Ethernet cable. Once the internet protocol settings have been properly configured the module can be reachable over an IP network including routers and firewalls.

The S080/S090 software can't communicate with Hawkeye cards connected using Ethernet Network Modules; what's wrong?

Check that the DS Manager can see the associated Ethernet Network Modules. If not, proceed as per the answer to the previous question.

Check if the Hawkeye cards can be found using HyperTerminal.

Check that the S080/S090 software has the same serial port setting as the Hawkeye card under control; 38,400 Baud is recommended.

How should a DHCP server be configured?

It is recommended that, where possible, a DHCP server is configured using MAC addresses.

This will allow assigned IP addresses to remain the same for each device. If a DHCP server assigns addresses on a first come first served basis, new devices may get addresses previously assigned to B064 units; particularly if units are ever disconnected or unpowered.

What is a null-modem cable?

A null-modem cable allows two RS-232 'DTE' devices to communicate directly without modems or other communication devices. A simple RS232 null-modem cable has the wires on pins 2 and 3 crossed over so that the wire on pin 2 of one connector goes to pin 3 of the other and visa versa. A null-modem cable can be obtained from a general electronic spare parts supplier such as CPC or Maplin.

What is an Ethernet crossover cable?

A crossover cable directly connects two network devices of the same type to each other over Ethernet. It has the normally active rx and tx pairs crossed. It may also be known as an uplink cable and can be obtained from an IT accessory supplier.

How can I tell which modules are assigned to which IP addresses?

The Auto-Discovery tab of DS Manager will list all modules by MAC number (and IP number). It is strongly recommended to record the MAC numbers and preferably to attach labels with MAC numbers on the module themselves.

The MAC numbers are fixed hardware numbers, but IP numbers are assigned during initialisation and may vary. If DHCP is used a DHCP server will assign IP numbers dynamically.