Thrane & Thrane A/S

Swift64 and H$^+$ Data Service

Supplement to
AVIATOR 700 and Aero-HSD$^+$
User Manual

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Safety summary

The following general safety precautions must be observed during all phases of operation, service and repair of this equipment. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture and intended use of the equipment. Thrane & Thrane assumes no liability for the customer's failure to comply with these requirements.

> ⚠️ **RADIATION WARNING**
>
> During transmission this system radiates Microwave power from all sides of the satcom antenna unit. High levels of radio frequency radiation are considered harmful to health. Although no single value has been agreed upon by all countries, the American National Standards Institute (ANSI/IEEE C95.1-1992) recommends that people should not be exposed to radiation stronger than 1 milli Watt per square centimeter at the frequencies used in this system. Accordingly, the operator of the system should ensure that no person should approach within 1 meter of the satcom antenna when the system is transmitting.

Disposal

Old electrical and electronic equipment marked with this symbol can contain substances hazardous to human beings and the environment. Never dispose these items together with unsorted municipal waste (household waste). In order to protect the environment and ensure the correct recycling of old equipment as well as the re-utilization of individual components, use either public collection or private collection by the local distributor of old electrical and electronic equipment marked with this symbol.

Contact the local distributor for information about what type of return system to use.

About the manual

Intended readers

This manual is a supplement to the user manual for the satcom system. The readers of this manual include aircraft personnel and passengers who want to use Swift64 services.

Manual overview

The manual contains the following chapters:

- *Introduction* - an overview of the Swift64 service.

- *Using a computer* – a description of how to connect and set up a computer for using Swift64 data services, including ISDN and MPDS connections, PPPoE and analog modem connection.

This manual may not always reflect the latest software functionality of your satcom system. To obtain the latest version of the manual, please enter the Thrane & Thrane web site at: http://www.thrane.com and download the latest version, or acquire it from your distributor.

Typography

In this manual, typography is used as indicated below:

Bold is used for the following purposes:

- To emphasize words.
  Example: "Do **not** touch the antenna".

- To indicate what the user should select in the user interface.
  Example: "Select **SETTINGS** > **LAN**".

Italic is used to emphasize the paragraph title in cross-references.

Example: "For further information, see *Connecting Cables* on page...".

Table of contents

Swift64 services

This manual describes how to connect a satcom system to Swift64 data services available on I3 satellites. For detailed information on services and coverage maps see the user manual for the satcom system.

The Inmarsat Swift64 (also called High Speed Data or HSD) services are available on four I3 satellites. This service is used as a fallback solution when the primary data service, SwiftBroadband, is not available.

Note The ISDN (Integrated Services Digital Network) and MPDS (Mobile Packet Data Service) services are only available when the aircraft is positioned inside an area with Spot Beam coverage.

Introduction to Swift64

The **64 kbps UDI** (Unrestricted Digital Information) service enables bi-directional transmission of data to and from terrestrial 64 kbps **ISDN** networks. The **56 kbps Data** service is similarly used to make a connection to 56 kbps ISDN networks, which are primarily used in North America.

The **Speech** and **3.1 kHz audio** services make it possible to establish high quality analogue connections with quality equal to terrestrial analogue connections via digital networks/switches. The **Speech** service is used for high quality voice connections, whereas **3.1 kHz audio** can be used to transfer analogue signals between fax machines and modems with an analogue 2-wire interface. The 3.1 kHz audio service is transparent, and is suitable for all analogue applications including secure telephones.

The **MPDS service** is a packet data service where the tariff depends on the amount of data transmitted. This service is a more cost-effective solution for web browsing, and other applications where there is no need for constant transmission of data in both directions. It is also suitable for applications where a constant connection is required, because the user is no longer charged the "per minute rate".

Setup and use

Using a computer over Swift64

> **Note** In the standard setup data services are provided by SwiftBroadband. This service is available exclusively on I4 satellites. For areas where there is no I4 coverage the satcom system uses Swift64 as a fallback solution for data services.

ISDN and MPDS connections

> **Note** ISDN and MPDS services are only available when the aircraft is positioned inside an area with Spot Beam coverage

Mobile Packet Data Service (MPDS) and Integrated Services Digital Network (ISDN) are both services that enable the mobile user to connect to the Internet. The maximum data transfer rate is 64 kbps (optionally 128 kbps).

The main difference between ISDN and MPDS is that with ISDN you are charged for connection time and with MPDS you are charged for Mbits transferred.

This means that for applications like web browsing, mail services, IP/LAN connectivity and small to medium size file transfer, the MPDS will be the most economic and convenient solution.

If, however, you need to transfer large files, ISDN is the better solution, because the connection is reserved for your purposes as long as you are connected. This means that in most cases you will get a faster file transfer.

While in MPDS or ISDN mode the terminal is flagged busy in the Inmarsat network, i.e. it is not able to receive any ISDN calls, until it returns to normal idle mode.

For information on how to set up the computer and transceiver for an **MPDS** connection, see *Setting up MPDS via Ethernet and PPPoE* on page 5.

For information on how to set up the computer and transceiver for an **ISDN** connection, see *Setting up an ISDN connection* on page 14.

MPDS Ethernet hardware connection

For an MPDS over Ethernet session, connect a LAN cable between the Ethernet port of the computer and the Ethernet connector of the aircraft (connected to the Ethernet port on the satcom system).

Below is an example of where the Ethernet connector of the aircraft could be placed.

Ethernet connector

ISDN hardware connection

| Important | Pay special attention to equipment that automatically establishes a connection. This type of equipment should be configured correctly in order to minimize unnecessary call expenses. |

An example of the above equipment could be a router configured to dial up automatically at the request of the connected device(s). This could be a device that regularly contacts the Internet to adjust the system time, or a number of Windows PCs contacting Windows Update for the latest updates.

Connecting to the ISDN port

To establish an ISDN connection, do as follows:

- If you have an **internal ISDN modem** (PC Card) in your computer, connect an ISDN cable between the ISDN modem PC Card in your computer and the ISDN connector of the aircraft (which must be connected to the ISDN port of the ^{satcom} System).

- If you have an **external ISDN modem**, connect the modem to the computer. See the manufacturer's installation guide for details on how to do this. Then connect an ISDN cable between the modem and the ISDN connector of the aircraft, which must be connected to the ISDN port of the satcom System.

The appropriate modem driver must be installed on the computer. See the manufacturer's installation guide for details on how to do this.

Connecting to the RS-422

To establish an ISDN data connection via RS-422, do as follows:

Connect your PC to an RS-422 connector in the aircraft, which must be connected to the MPDS RS-422 port of the SDU in the satcom System. Where necessary, use an RS-422/RS-232 converter.

Note that you need to use the Aero-SDU Configuration Program to set up your connection. For further information, see *Setting up ISDN data via RS-422* on page 26.

Setting up MPDS via Ethernet and PPPoE

This section describes the set-up and operation of MPDS connections via Ethernet and PPPoE using various PPPoE clients.
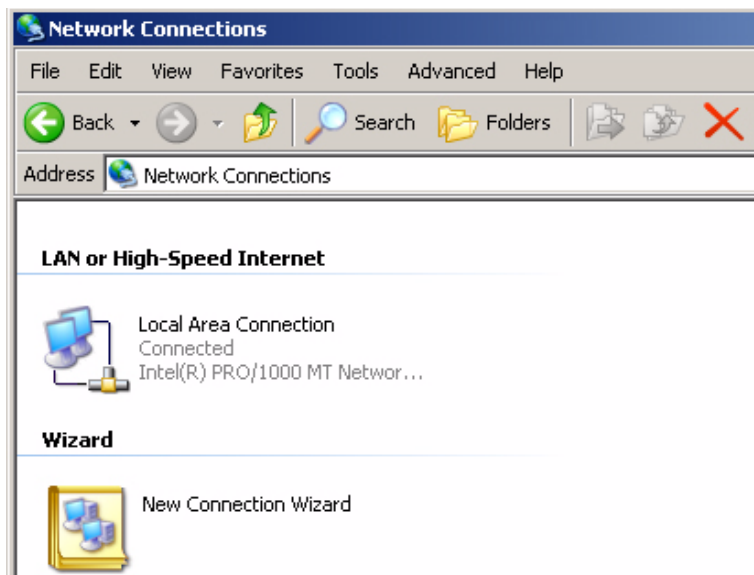
## Windows® XP with built-in PPPoE client

Prerequisites

The PC must have an Ethernet adapter and Windows XP installed and both must be operational. There must be a network connection between the PC and the satcom system.
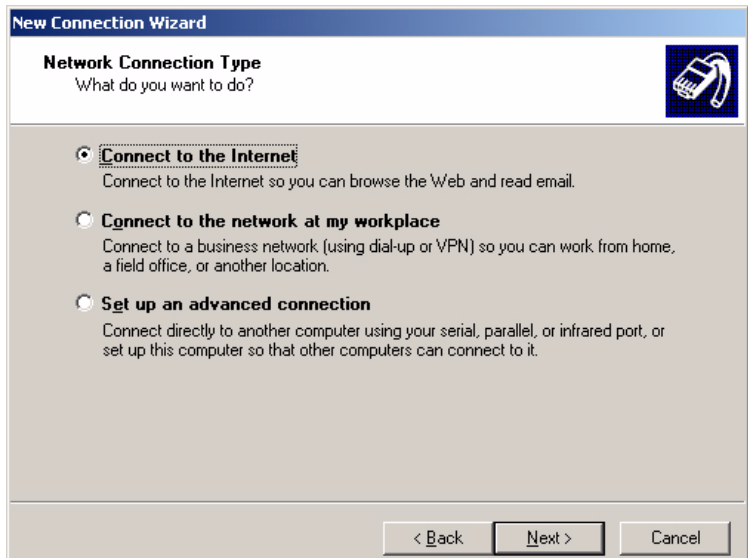
Setting up the Connection

1. From the **Start** menu select **Settings > Control Panel**.

2. Double-click **Network Connections**.

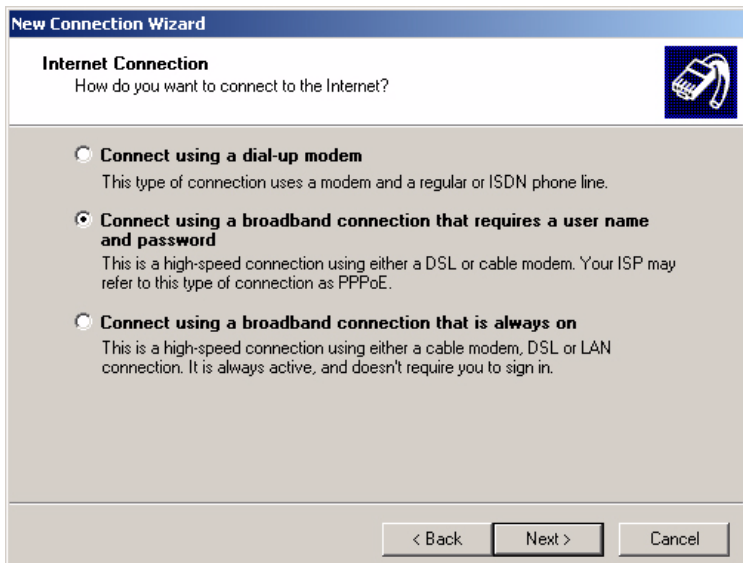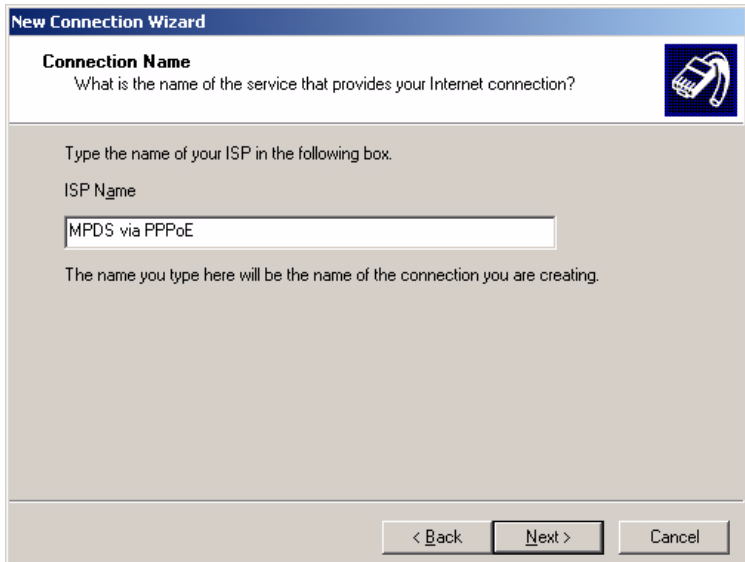3. Double-click **New Connection Wizard**.
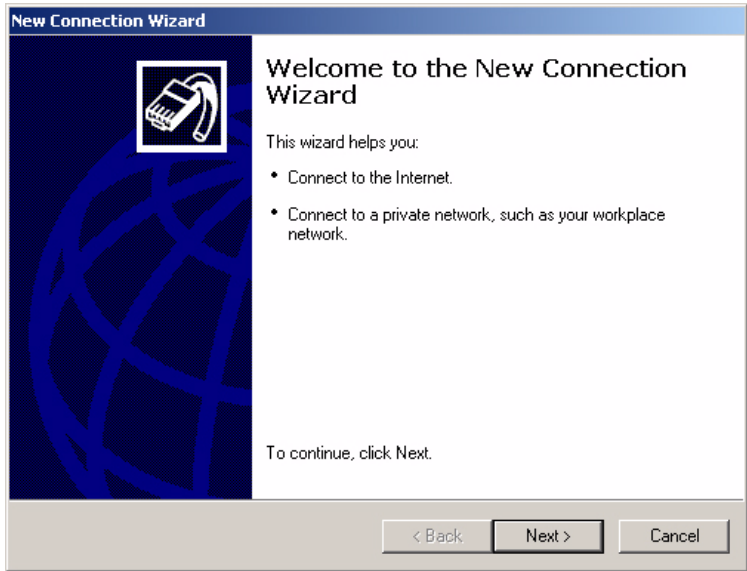
4. Click **Next >**.

5. Select **Connect to the Internet** and click **Next >**.

6. Select **Setup my connection manually** and click **Next >**.

7. Select **Connect using a broadband connection that requires a user name and password** and click **Next >**.

8. Type a name for the connection, e.g.**MPDS via PPPoE** and click **Next >**.

9. Select **Anyone's use** and click **Next >**.

10. Type the user name and password received from the Inmarsat service provider.
    If no user name and password is provided, type in a random user name and password.
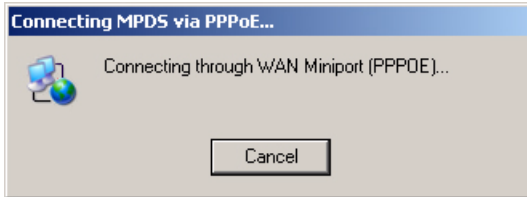
11. Click **Next >**.

Setup and use

12. Select the shortcut on desktop option.

13. Click **Finish**.

14. From the desktop, open the new shortcut named **MPDS via PPPoE**.

15. Enter the user name and password received from your Service provider.

16. Click **Connect**.

   The satcom system should now connect to MPDS.

| Note | Because of the relatively long setup time for an MPDS connection, the PPPoE connection may some times time out.

Wait for HSD C/No to go below 60 and then try again.

You can see the HSD C/No in the handset menu, using Status > Channels. |

Alternatively, you may use WinPoET, described in the next section.

Windows 2000/XP and WinPoET™ PPPoE client

(Tested under MS Windows 2000)

The MPDS connection via Ethernet and PPPoE can be established using various PPPoE clients. For this example WinPoET client was used.

Prerequisites

- The computer must have a working Ethernet adapter.

- Windows Dial-Up Networking (DUN) must be installed.

- The WinPoET program must be available. You may acquire it free of charge from Thrane & Thrane. Email:aerosupport@thrane.com.

Installation

The WinPoET program is contained in a self extracting zip-file.

1. Double click the icon, and installation begins.

2. Click **OK** and **Next >** a few times to accept license agreement and accept rebooting the computer (only older Windows versions).

3. To establish the first connection with WinPoET, click the **Start** button, then find and open the new program folder **WinPoET Broadband Connection Manager**.
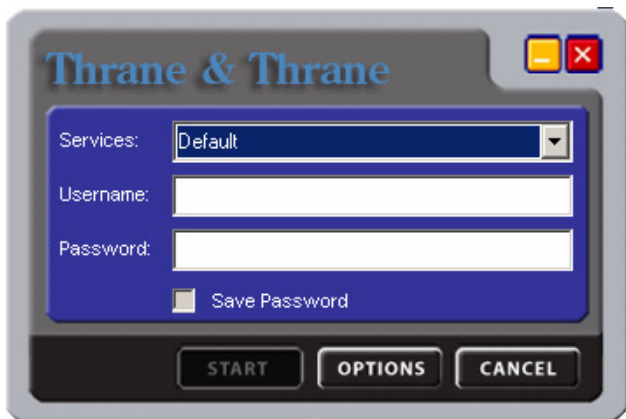
4. Type in the username and password received from your Service Provider.

5. Click **Start**.
   The system now establishes an MPDS connection to the network.
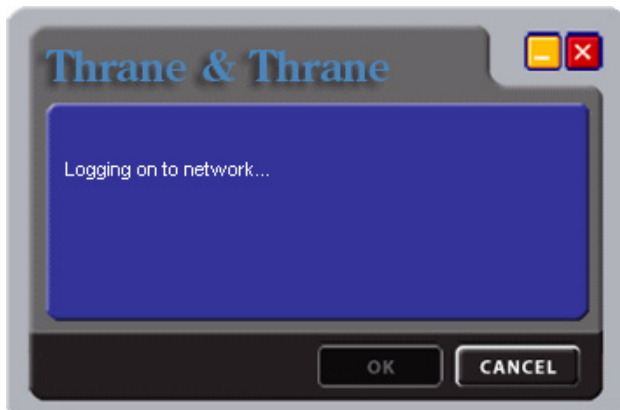
When the connection is established, this window is closed and a message shows that you are now connected.

After the first connection, WinPoET creates a 'WinPoET Connection' in the 'Network and dial-up connections' folder that can be used with the standard Windows DUN system (Automatic dialling and disconnection etc.).

Setting up an ISDN connection

There are two methods of setting up ISDN:

- using the ISDN port and an ISDN modem or
- using the RS-422 port.

Setting up ISDN data via ISDN port

The satcom transceiver is connected to ISDN equipment via an ISDN cable.

The example below shows how to set up an Internet connection via ISDN.

Follow the modem manufacturer's installation instructions for the appropriate operating system.

In the following example, a Diva 850 modem is installed under Windows XP. If you are using a different operating system, please refer to the documentation for your operating system.
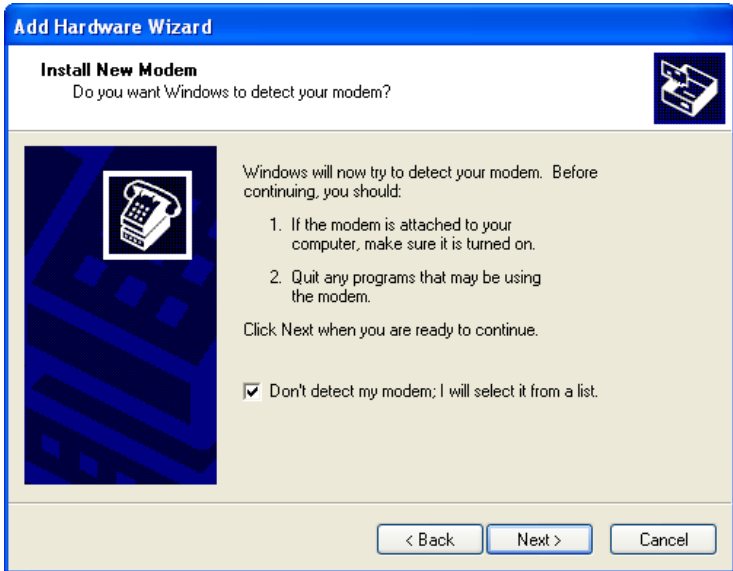
Step 1: Installing a modem

1. From the **Start** menu, select **Control Panel** > **Phone and Modem Options**.
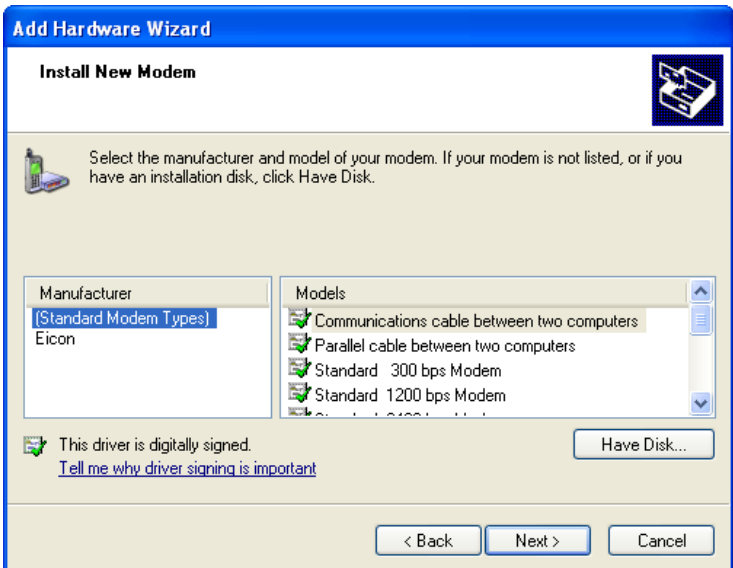
   > **Note** The Find Location window will appear if you have not previously installed a modem. Do not change anything here. Just click OK to continue.

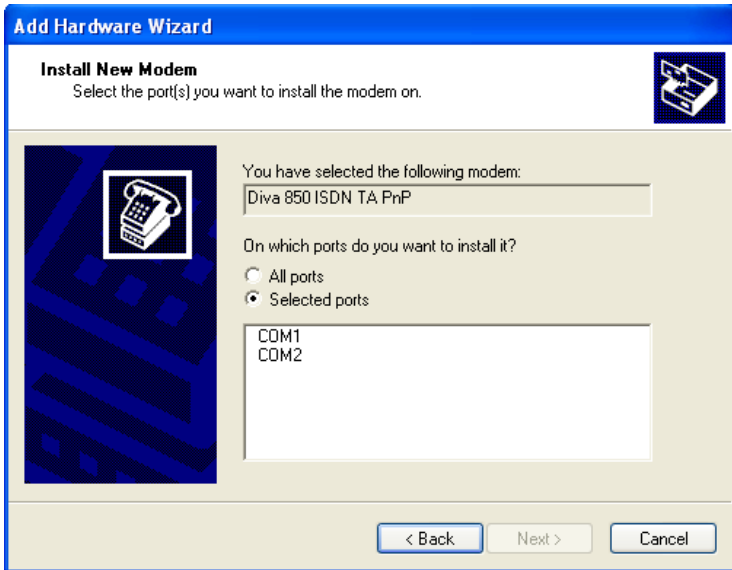2. Select the **Modems** tab.
3. Click **Add...**

4. If you do **not** want the modem to be detected automatically, check the box.

Add Hardware Wizard

Install New Modem
Do you want Windows to detect your modem?

Windows will now try to detect your modem. Before continuing, you should:

1. If the modem is attached to your computer, make sure it is turned on.

2. Quit any programs that may be using the modem.

Click Next when you are ready to continue.

☑ Don't detect my modem; I will select it from a list.

[< Back] [Next >] [Cancel]

5. Click **Next >**.

Add Hardware Wizard

Install New Modem

Select the manufacturer and model of your modem. If your modem is not listed, or if you have an installation disk, click Have Disk.

Manufacturer	Models
(Standard Modem Types)	Communications cable between two computers
Eicon	Parallel cable between two computers
	Standard 300 bps Modem
	Standard 1200 bps Modem

This driver is digitally signed.
Tell me why driver signing is important

[Have Disk...]

[< Back] [Next >] [Cancel]

6. If the modem is not listed, click **Have Disk** and browse to the modem.
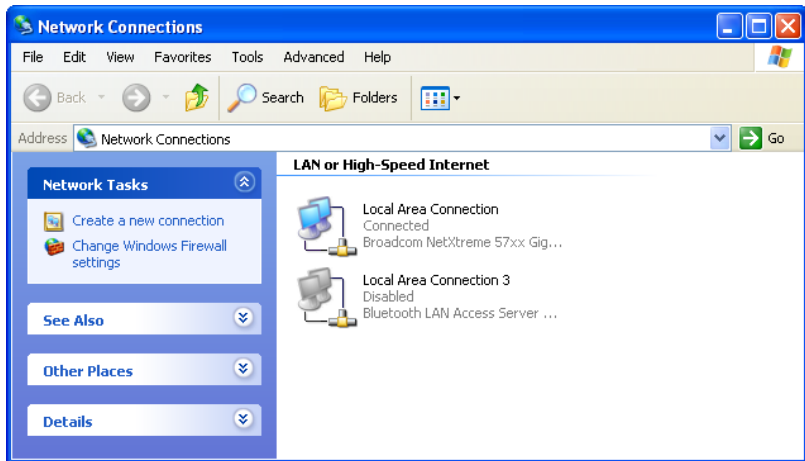
7. Select the modem and click **Next >**.

8. Choose **Selected ports** and select the port the modem is connected to. You may be informed that these drivers are not signed by Microsoft.

9. Click **Yes** to accept the driver.

10. Click **Finish**.

11. Restart the computer and verify that the modem is installed.

Step 2: Creating an ISDN dial-up connection for the Internet

Windows XP is used in the description below. If you are using a different operating system, please refer to the documentation for your operating system.

1. Connect the PC with the ISDN interface of the aircraft, as described in *ISDN hardware connection* on page 4.

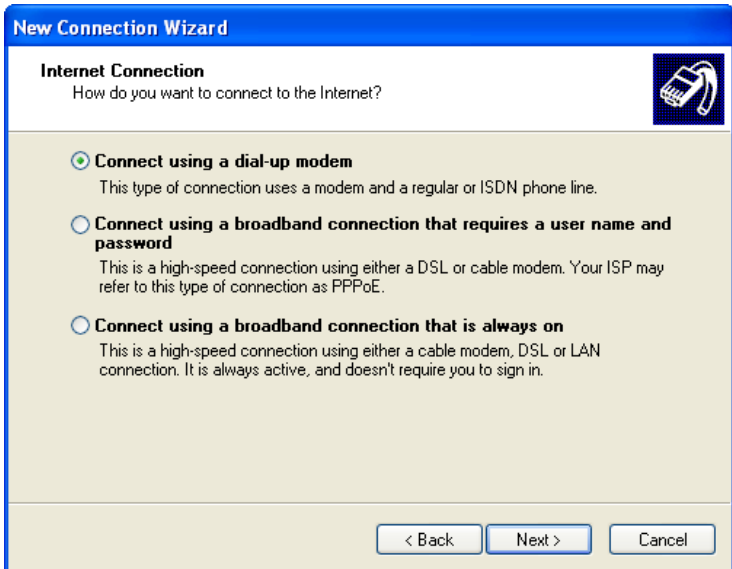2. From the **Start** menu, select **Control Panel** and then **Network Connections**.

3. Click **Create a new connection** and click **Next >**.
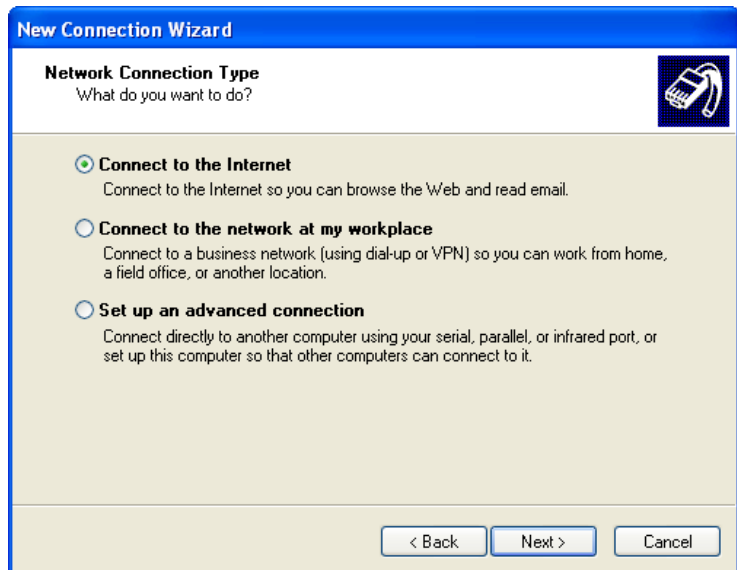
4. Select **Connect to the Internet** and click **Next >**.

5. Select **Set up my connection manually** and click **Next >**.

New Connection Wizard

Internet Connection
How do you want to connect to the Internet?

⦿ **Connect using a dial-up modem**
This type of connection uses a modem and a regular or ISDN phone line.

○ **Connect using a broadband connection that requires a user name and password**
This is a high-speed connection using either a DSL or cable modem. Your ISP may refer to this type of connection as PPPoE.

○ **Connect using a broadband connection that is always on**
This is a high-speed connection using either a cable modem, DSL or LAN connection. It is always active, and doesn't require you to sign in.

[< Back] [Next >] [Cancel]

6. Select **Connect using a dial-up modem** and click **Next >**.

7. If you have more than one dial-up device on your computer, you may be asked to select the device to use for this connection. Select the modem you installed in Step 1.

8. Click **Next >**.
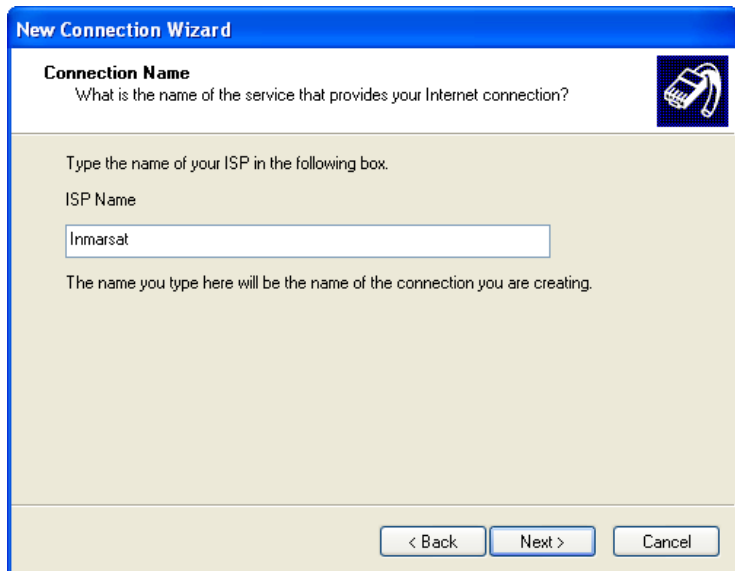
9. Type in the ISP name. This will be the name used for the connection.

10. Click **Next >**.
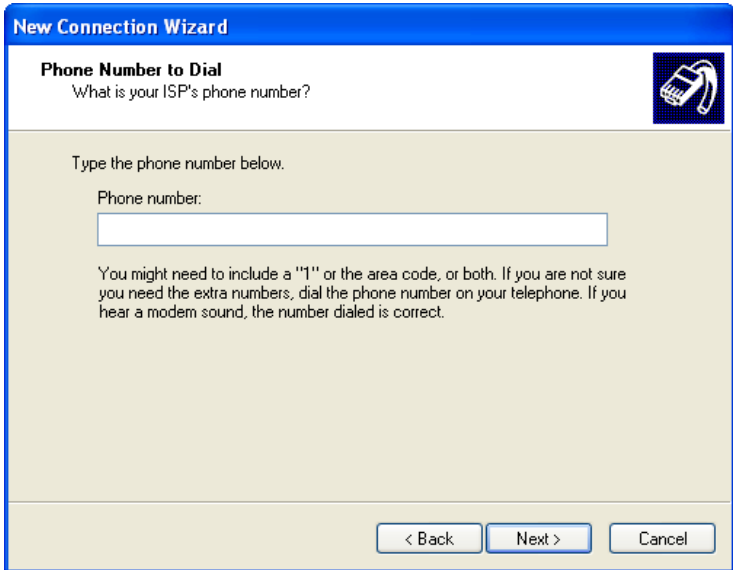
11. Type the dial-in phone number provided by your ISP in the Phone number field.
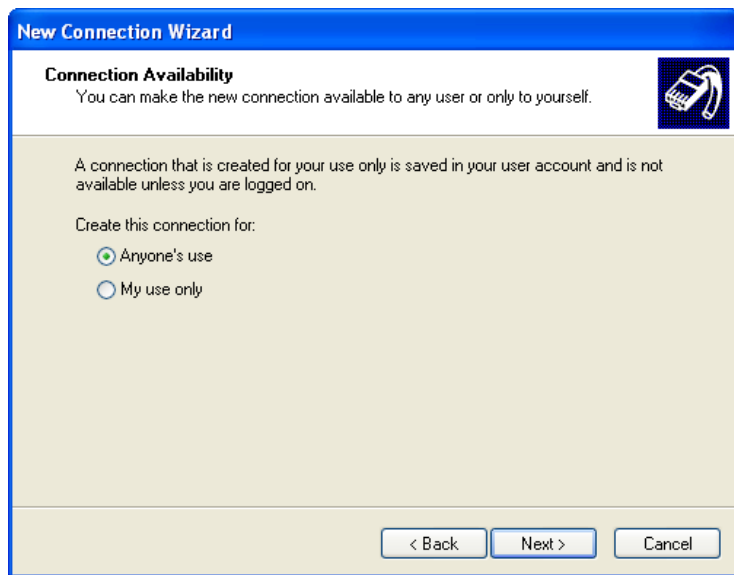
    If you do not have such a number, please contact your ISP.

Note	Most ISPs support the use of the short code 28# to access the internet via a modem pool in the LES.

    To use this service, type 28# instead of the dial-in phone number.

Setup and use

12. Click **Next >**.

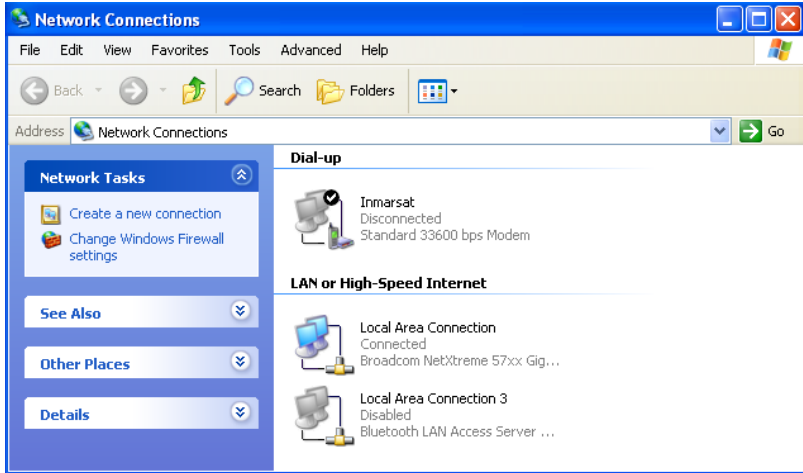13. Click **Anyone's use** or **My use only** and click **Next >**.

14. Type the user name and password received from the Inmarsat service provider.
    If no user name and password is provided, type in a random user name and password.
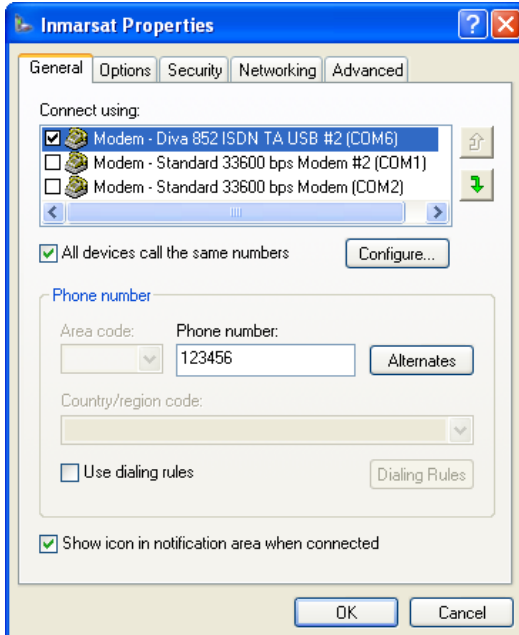
15. Click **Next >**.

16. Click **Finish**.

17. From the **Start** menu, select **Control Panel > Network Connections** again.
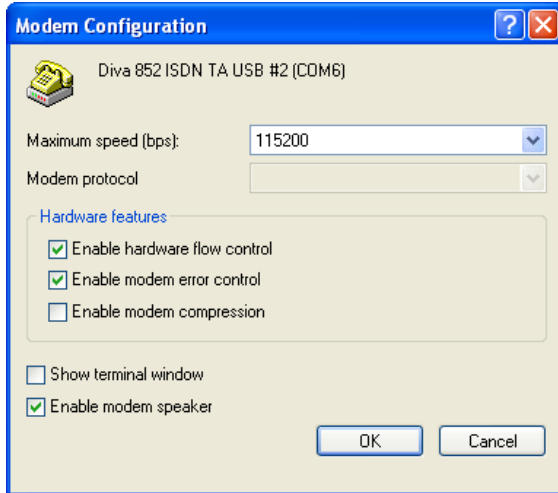

A new icon has appeared with the connection name you gave it in step 9.

18. Right-click the new icon and select **Properties**.

19. Select the modem you have just installed and click **Configure**.

In the Modem Configuration window, make sure that **Enable Modem Compression** is **deselected**, and that your hardware settings are as below.

20. Click **OK** and close the **Properties** window.

Your modem is now ready for use with the Internet.

After this, you can make the connection as described in the section *Dial-up connection to the network* on page 33.

> **Important** Pay special attention to equipment that automatically establishes a connection. This type of equipment should be configured correctly in order to minimize unnecessary call expenses.

An example of the above equipment could be a router configured to dial up automatically at the request of the connected device(s). This could be a device that regularly contacts the Internet to adjust the system time, or a number of Windows PCs contacting Windows Update for the latest updates.

Setting up ISDN data via RS-422

Overview

As an alternative to a "regular" ISDN connection using an ISDN modem, you may use RS-422 to set up an ISDN data connection.

There are three steps involved when setting up an ISDN connection via RS-422: Configuration, installation of modem and creation of a dial-up connection.

Windows XP is used in the descriptions in Step 2 and 3 below. If you are using a different operating system, please refer to the documentation for your operating system.

Step 1: Configuration

Do as follows:

1. Enter the Aero-SDU Configuration Program.

2. Select **Installation** > **Call Routing** from the left navigation pane.

3. Select the **Outgoing Routing** tab.
   In the **Data** section, locate **RS422**. and select **SCPC (UDI)** in the **1st Priority** column.
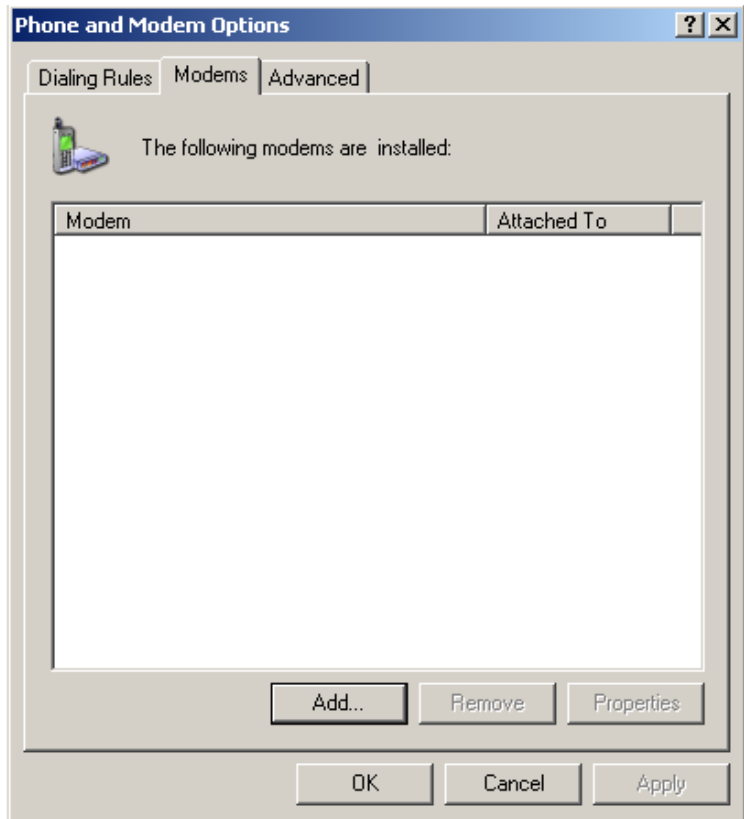
Step 2: Installing a modem

Do as follows:

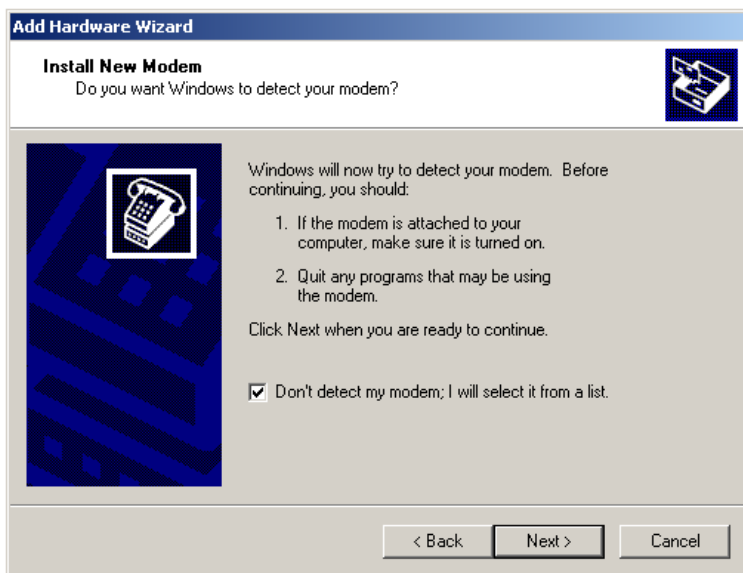1. From the **Start** menu, select **Control Panel** > **Phone and Modem Options**.

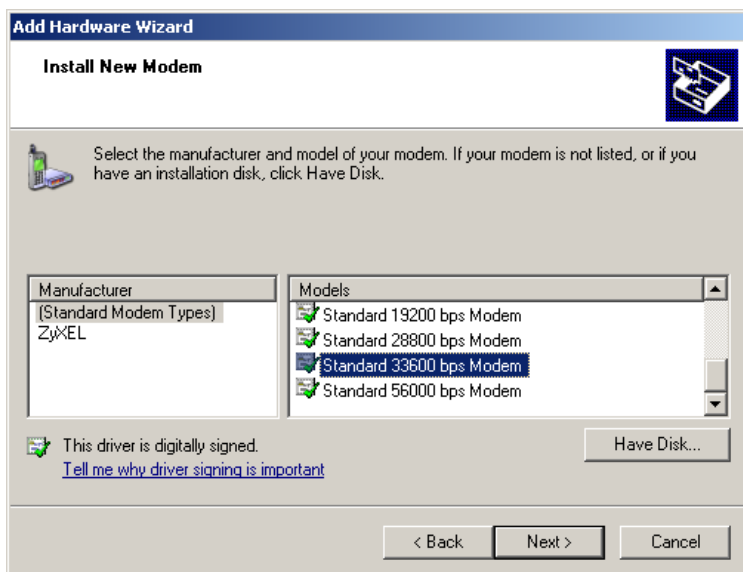 | Note | The Find Location window will appear if you have not previously installed a modem. Do not change anything here. Just click OK to continue. |

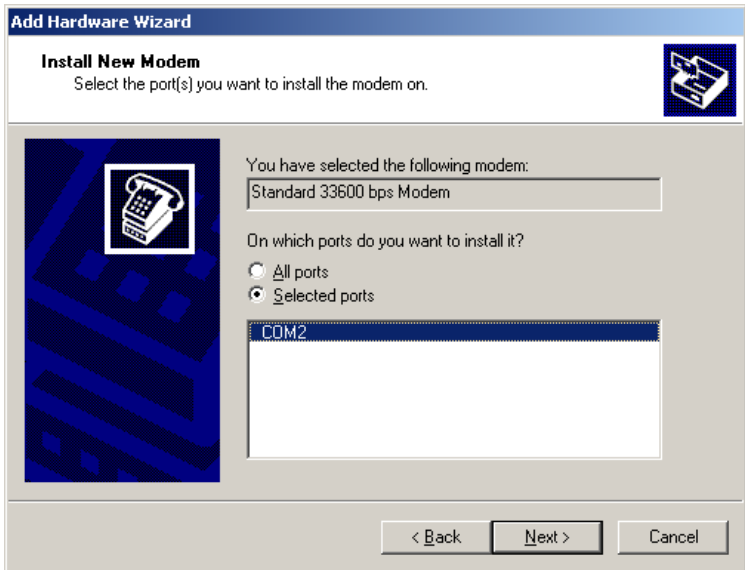2. Select the **Modems** tab and click **Add...**

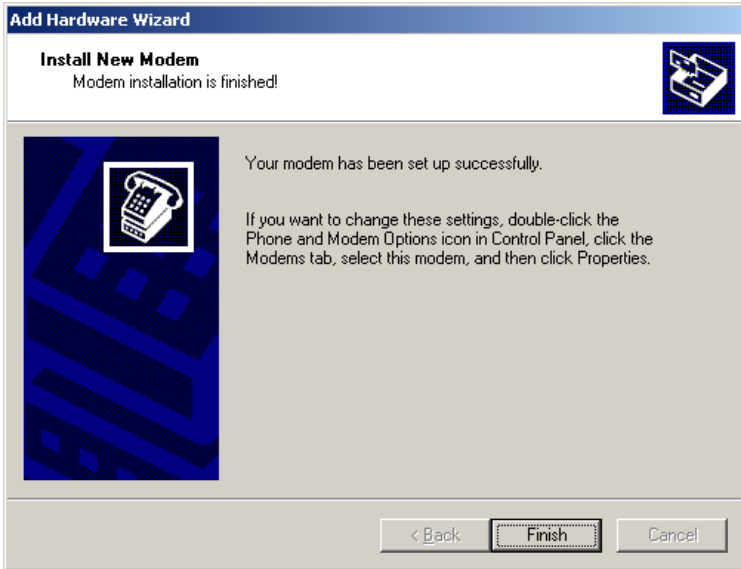3. Select **Don't detect my modem; I will select it from a list.**

4. Click **Next >**.

5. Under **Manufacturer,** select **Standard Modem Types**.

6. Under **Models**, select **Standard 33600 bps Modem** and click **Next >**.

7. Select the PC com port you want to use for your connection and click
   Next >.

8. Click **Finish**.

9. Click **OK**.

Step 3: Creating a dial-up connection for the Internet

Follow the same procedure as for an ISDN modem:

1. Connect the PC with the RS-422 interface as described in *Connecting to the RS-422* on page 5.

2. Proceed as described in *Step 2: Creating an ISDN dial-up connection for the Internet* on page 17, **except for selection of the modem**. If you are asked to select the modem from the list, select the Standard modem installed in the previous section.

Using a computer with H$^+$ data

H$^+$ modem hardware connection

Important ▶ H$^+$ data is an old technology that relies on early models of analog modems that might not be available any longer. This solution should not be used for new designs. Furthermore, routing of ground to air data calls might not be supported. Please contact your service provider for more information on this.

For an H$^+$ modem connection, do as follows:

If you have an internal modem (PC Card) in your computer, connect the modem PC Card in your computer to one of the POTS connectors of the satcom System.

If you have an external modem, connect the modem to the computer. See the manufacturer's installation guide for details on how to do this. Then connect the modem to one of the POTS connectors of the satcom System (Satcom #5 or #6).

The appropriate modem driver must be installed on the computer. See the manufacturer's installation guide for details.

Analog modem connection

With the satcom modem connection, you can use any application supporting modem speeds at 2400 bit/s and a satellite delay of 200 ms.

Step 1: Installing an analog modem

An analog modem is installed the same way as the ISDN modem. See *Step 1: Installing a modem* on page 14.

Step 2: Creating a dial-up connection for the Internet

Follow the same procedure as for an ISDN modem, except when typing the phone number.

| Important | For an analog modem connection, the prefix 00 must be replaced by 02 to indicate a data connection. |

1. Connect the PC and modem with one of the POTS interfaces as described in *H+ modem hardware connection* on page 31.

2. Proceed as described in *Step 2: Creating an ISDN dial-up connection for the Internet* on page 17, **except for the phone number** which must have the prefix **02**, and be terminated with #.

    Also, if you are asked to select a device, select the analog modem you installed in Step 1.

Advanced settings for the modem connection

Using a terminal program, enter the AT command relevant for your modem to set the following parameters:

*   Communication protocol: V22bis and V42bis

*   Error correction: LAPM

*   Guard tone: OFF (if possible)

| Note | AT commands can be pre-programmed in nearly all modems. Contact your modem manufacturer or consult the modem manual for further information. |

Dial-up connection to the network

To establish a dial-up connection automatically

A connection can be started automatically by an application like Internet Explorer or Outlook® Express. The connection can also be established manually.

To establish the dial-up connection manually

Do as follows:

1. In Windows XP, click **Control Panel > Network Connections** from the **Start** menu and double-click your dial-up connection.

2. Enter username and password if necessary and click **Dial**.

Wait for the connection to be completed, indicated by a 'Dial-up Networking' icon in the task bar tray.

A

ANSI   American National Standards Institute, facilitates the voluntary
                establishment of standards.

D

DUN   Dial-Up Networking

H

HSD   High-Speed Data

I

IMSO   International Maritime Satellite Organisation. An
                intergovernmental body established to ensure that Inmarsat
                continues to meet its public service obligations.

IP   Internet Protocol

ISDN   Integrated Services Digital Network

L

LAN   Local Area Network

M

MPDS   Mobile Packet Data Service

P

PC Card   Personal Computer memory Card. Modems or external hard disk
                drives, that can be plugged into notebook computers.

PPPoE   Point-to-Point Protocol over Ethernet

S

SCPC   Single Channel Per Carrier, a VSAT satellite transmission system
             that uses a separate carrier for each of its channels. SCPC is used
             for broadcast data and full-duplex audio/video communications.

U

UDI   Unrestricted Digital Information

Speech, 1
Swift64 data connection, 3
Swift64 service, 1

V

voice
  HSD, 1

W

warning
  radiation, iii
web browsing, Swift64, 3