Orbit PCI Mk 2 Network Card

User Manual

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1.0: Introduction

Introduction

The Orbit PCI Mk 2 Network Card provides an interface to two Solartron Orbit Networks. As well as being fully compatible with the Mk 1 card, it can be used with dynamic modules to take readings at up to 3906 (4k) readings per second. The card is designed to fit into a PCI slot on a computer motherboard. It has full Plug & Play capabilities.

This Manual

This manual describes the installation and preparation of the Orbit PCI Mk 2 Network Card, and the installation of the software drivers.

Safety Summary

Terms in this manual:

WARNING   statements identify conditions or practices that could result in personal injury or loss of life.

CAUTION   statements identify conditions or practices that could result in damage to the equipment or other property.

Symbols in this manual:

This symbol indicates where applicable cautionary or other information is to be found.

1.0: Introduction

WARNINGS:

Do not operate in an explosive atmosphere

To avoid explosion, do not operate this equipment in an explosive atmosphere.

NOTES:

This equipment contains no user serviceable parts

This equipment must be returned to a Solartron Dealer for all service and repair.

Low Voltage

This equipment operates at below the SELV and is therefore outside the scope of the Low Voltage Directive.

PC System Requirements

PC Hardware Requirements

- Personal or Multimedia computer with a Pentium processor running at 700MHz or above with 128 MB or more RAM,
- One available PCI slot,
- Microsoft Windows® 32 bit operating system (Windows® 98, Windows® ME, Windows® 2000, Windows® XP, Windows NT4® (SP6) or later),
- VGA or higher resolution video adaptor (Super VGA, 256-colour recommended),
- Microsoft Mouse or compatible pointing device.

Carton Contents

The Orbit PCI Network Card is supplied in a carton with the following accompanying items:

- Cable 2 metre long 9 way D-Type plug to socket.
- 9-Way D-Type Terminator plug.
- Driver and installation software.
- This operating manual.

2.0: Software Installation

Overview

Sections 2 and 3 will guide you through the steps required to prepare and install the Orbit PCI Network Card in a personal or multimedia computer or a compatible system.

Installing the Software

The Orbit Support Pack for Windows® software must be installed BEFORE FITTING any Orbit PCI Network Card(s) in to the computer.

Installing the Orbit Support Pack for Windows® Software

To install the software follow the steps below

1. Insert the **Orbit Measurement System Software & Documentation** CD into the appropriate drive.

2. Using Windows® **Start** button, select **Run**.

3. Select **Browse** and look for SETUP.EXE on the CD ROM drive. Select and click OK.

2.0: Software Installation

4.   Follow the on-screen instructions, until the 'InstallShield Wizard Completed' window is displayed.
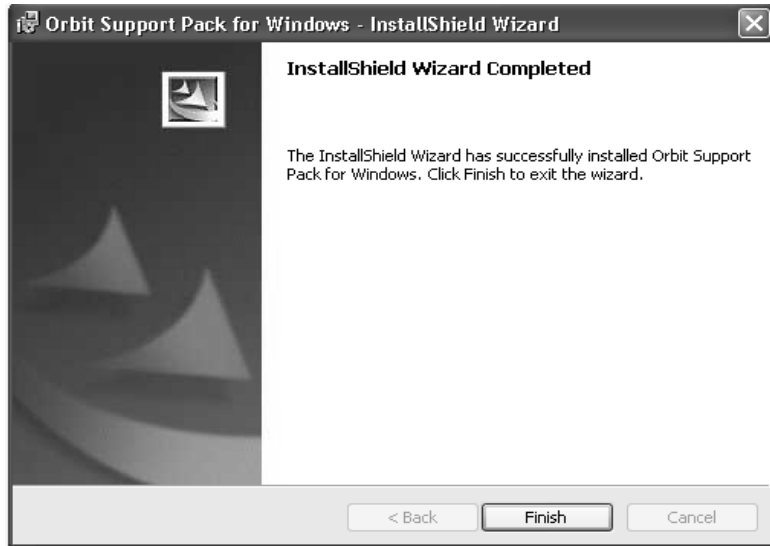
Select, **Finish**.

5.   Shut down the computer and fit the Orbit PCI Network Card, refer to section 3.0 Installation of the Hardware.

6.   Windows® will detect the Orbit PCI Network Card and automatically install the driver software.

Refer to the readme.txt file for details of where the Orbit Support Pack for Windows® files are installed onto your system.

3.0: Hardware Installation

Precautions

Before handling the Orbit PCI Network Card, read the following information.

Static Electricity

The Orbit Network Card contains components which can be damaged by static electricity. To reduce the risk of damage to the card, keep it in its conductive plastic packaging until it is required. When fitting the card, handle it by its free edges and do not touch the card edge connector.

High Voltages

Before opening the cabinet of the computer, switch the power off and disconnect the supply lead from the mains power supply. Do not operate the unit with the cover removed.

3.0: Hardware Installation

Card Installation

The Orbit PCI Network Card is designed to be installed into a PCI slot on the computer motherboard. Follow the steps below:

1. Before fitting the Orbit PCI Network Card, install the Orbit Support Pack for Windows®.
    Refer to section 2.0 Software Installation.

2. Turn off the power and remove the cover.

    For instructions on removing the outer casing or access panels, refer to the user manual of the computer being used. Be sure to follow any special instructions that may apply to installation of cards in the computer being used.

3. Look for an empty PCI slot and remove the slot's blanking plate screw.

4. Insert the Orbit PCI Network Card into one of the empty PCI slots of your computer. Press firmly as you insert the card, making certain the edge connector is seated in the slot. Using previously removed screw (refer to step 3), secure the Orbit Network card in place.

3.0: Hardware Installation

PCI Slot
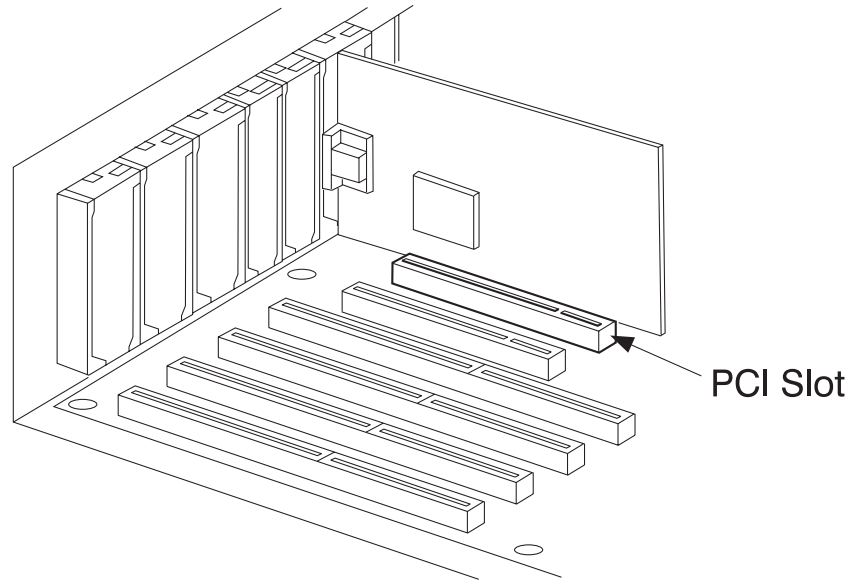
5. Replace the computer's cover and turn the power on.

6. Windows® will detect the Orbit PCI Network Card(s) and automatically install the driver software.

4.0: Orbit Software _____

After installing the Orbit Support Pack for Windows® the following components will have been loaded on the computer.

- A dynamic link library (Orbit_IF.dll) that provides the interface between a 32 bit application and the Orbit Network via a Solartron Orbit PCI Network Card, Orbit ISA Network Card and the RS232 Interface Module. The DLL supports most of the popular computer programming languages.

- The Orbit Network Registration program (OrbitRegistration.exe) which allows you to register your Orbit Controller hardware (RS232 Interface Module or Orbit ISA Network Card). The Orbit Network Registration program does not have to be run when using the Orbit PCI Network card. This program is activated using the Start menu at any time.

- Orbit Network Explorer (OrbitExplorer.exe). This is a simple application program that allows the user to test each of the Orbit commands with a network of probes and to observe how the probes respond to these commands. You can also use this application to give you confidence that your Orbit system is operating correctly.

- The Orbit COM Library, which gives a language independent interface to the Orbit Measurement System. See the Orbit COM Library Programmers Guide for further information

4.0: Orbit Software

Orbit Network Explorer

Multiple Orbit PCI Network Card(s) will be listed in Orbit Network Explorer as shown below

OrbitPCICard1.Channel1

OrbitPCICard1.Channel2

OrbitPCICard2.Channel1

OrbitPCICard2.Channel2.

etc....

Physically this means that PCICard1 will be the Orbit PCI Network Card nearest the PC PSU (Power Supply Unit). PCICard2 will be the next Orbit PCI Network Card fitted, and so on. Cards do not have to be fitted in adjacent PCI slots.

NOTE: If there is an Orbit ISA Network Card fitted it will be listed as shown below

OrbitCard1.Channel1

OrbitCard1.Channel2

etc....

5.0: Setting up the Orbit Measurement System _____

Orbit Introduction

This section gives some basic information on the connection of the various components of an Orbit Measurement Network. It is assumed that an Orbit PCI Network Card has been installed in a PC and that this PC will be used to provide power to the Orbit Network.

Connecting the Orbit Network

The Orbit Network must be fully connected before switching on the PC or other power supply. Using the 9 way 'D' type cable provided, connect between the appropriate channel on the Orbit Network Card and the Orbit Module(s). An example Orbit Network is shown below.
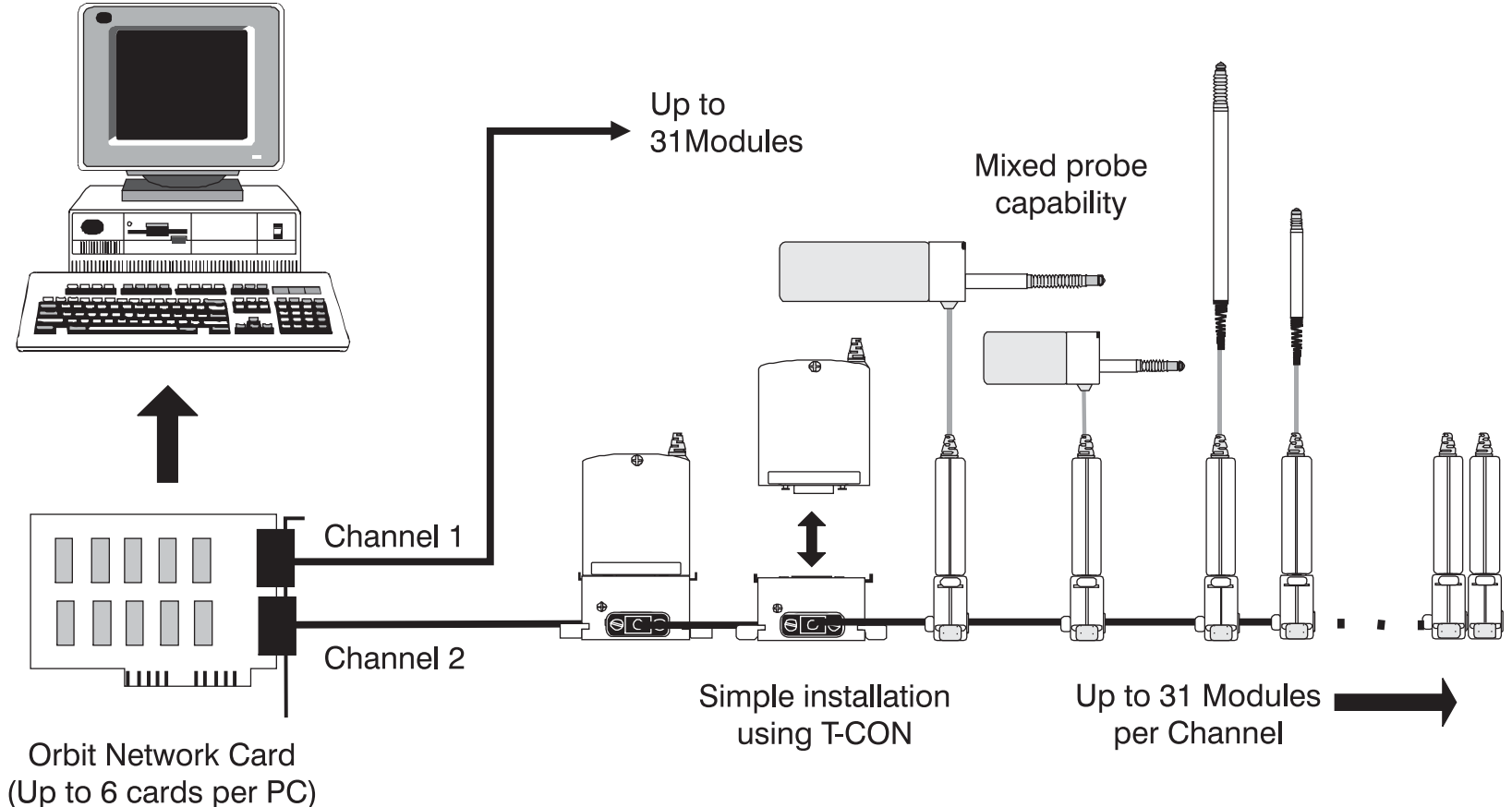
System Power Requirements

Because the Orbit Network obtains its power from the PC, the following factors should be taken into account to ensure correct operation. If this is not possible consult your Solartron Dealer for advice.

PC's +5V Power Supply Capacity

All PC's have a nominal +5.0 Volt regulated DC supply, which is available to the Orbit Network. This supply must have sufficient capacity to power the number of Orbit Modules required for the system. Although most PC's will have enough power supply capacity, it is worth checking the total system power requirement before switching the PC on. Note that An Orbit Network with 62 Orbit Modules connected will require about 4 Amps (typically 60 mA per Orbit Module plus

5.0: Setting up the Orbit Measurement System _____

120 mA for the Orbit Network Card). For power requirements of individual Orbit components, refer to sections relating to those modules.

Up to
31Modules

Mixed probe
capability

Channel 1

Channel 2

Orbit Network Card
(Up to 6 cards per PC)

Simple installation
using T-CON

Up to 31 Modules
per Channel
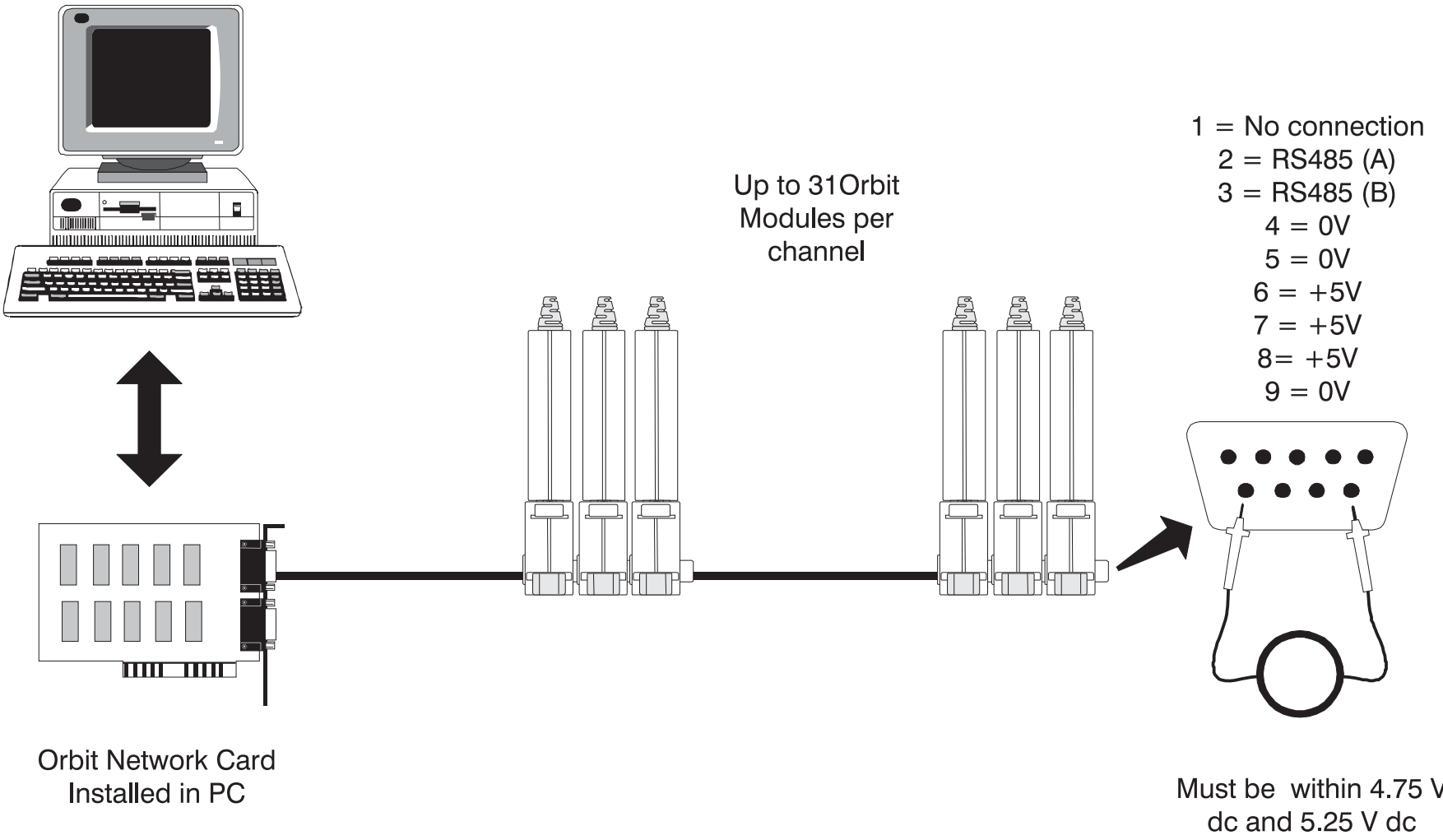
5.0: Setting up the Orbit Measurement System _____

Orbit Network Voltage Drop

All Orbit Modules are designed to work from a supply voltage of 4.75 V dc to 5.25 V dc and care must be taken to ensure that all modules, especially those furthest from the power supply, have the correct working voltage applied. When being used with a PC power supply, it is unlikely that the upper voltage limit will be exceeded, but the possibility of Orbit Module voltages dropping below the lower voltage limit can exist. Connecting cable length and resistance will contribute to a drop in voltage.

If any doubt exists, a digital voltmeter should be used to check the voltage at the last Orbit Module in the Orbit Network. This can be done by removing the terminator plug and measuring the voltage between pins 6 and 9 on the socket, as shown below.

If the voltage is below 4.75 V dc, a power supply (PSIM) may be required.

5.0: Setting up the Orbit Measurement System _____

Up to 31 Orbit
Modules per
channel

1 = No connection
2 = RS485 (A)
3 = RS485 (B)
4 = 0V
5 = 0V
6 = +5V
7 = +5V
8= +5V
9 = 0V

Orbit Network Card
Installed in PC

Must be within 4.75 V
dc and 5.25 V dc

5.0: Setting up the Orbit Measurement System _____

Cabling

For higher speed applications, it is recommended that enhanced Orbit cables are used to avoid any reduction in performance.

Contact your local supplier for additional information.

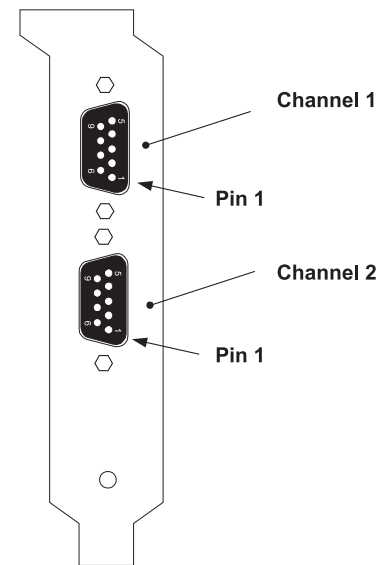# 6.0: Orbit Network Card Specification

Orbit Network Card Specification

Electrical

Power Consumption	120 mA max.(no Orbit Modules connected)
RS485 serial	two wire differential
Dual channel	9 way sub D (sockets fitted to PC card)
Network terminator	120R (between 2 and 3) of 9 way D-type

Parallel connected 9 way D-type connectors male and female are pin to pin connected on the network.

9 way D-type pin/socket designations

1	Not used	6	+5V
2	RS485 (A)	7	+5V
3	RS485 (B)	8	+5V
4	0V	9	0V
5	0V		

Channel 1

Pin 1

Channel 2

Pin 1

6.0: Orbit Network Card Specification _____

Orbit Network

The Orbit Measurement System communicates with multiple Orbit Modules, via an RS485 multi-drop network.

Communications Method	Asynchronous, half duplex, poll / response
Baud Rate	187.5 k Baud & 1.5 M Baud
Data Byte Structure	1 start, 8 data, 1 odd parity, 1 stop bit
Network	Reading rate of up to 3906 readings per second
Max. Number of Orbit Modules	31 addressed per channel (62 per PC card)
Max. Cards per System	6 off Orbit Network Cards giving Max. 372 Orbit Modules