



Solartron
Metrology



orbit³

DIGITAL NETWORK

Orbit[®]3 System Manual

AMETEK[®]
ULTRA PRECISION TECHNOLOGIES

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1.1 DOCUMENTATION CROSS REFERENCE

502914	Orbit3 Module manual	Details on installation and electrical requirements.
502989	Orbit3 Software manual	Details on programming and using the Orbit System with the Orbit Library
503094	Digital Probe, Orbit ACS and Linear Encoder User Leaflet	Detailing the specific requirements for using the Digital Probe (DP), Orbit ACS and Linear Encoder such as mounting details
502923	Digital Mini Probe User Leaflet	Detailing the specific requirements for using the Digital Mini Probe such as mounting details
502924	Digital Block Gauge User Leaflet	Detailing the specific requirements for using the Digital Block Gauge such as mounting details
502925	Digital Lever Probe User Leaflet	Detailing the specific requirements for using the Digital Lever Probe such as mounting details
502906	Digital Flexure Gauge User Leaflet	Detailing the specific requirements for using the Digital Flexure Gauge such as mounting details
503145	Orbit Laser Triangulation Probe (LT & LTA)	Detailing the specific requirements for using the LT & LTA Laser Probes such as product handling & configuration
503158	Orbit high performance Laser Triangulation Probe (LTH)	Detailing the specific requirements for using the LTH Laser Probe such as product handling & configuration
503184	Strain Gauge Input Module (SGIM)	User leaflet covers the specific requirements such as product handling & configuration
503301	Orbit Confocal System	User manual covers the specific requirements such as product handling & configuration

503899	Single Channel Conditioner Module (SC1-A & SCD1-A)	User manual covers the specific requirements such as product handling & configuration
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1.2 TRADEMARKS AND COPYRIGHTS

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1.3 CONTACT INFORMATION

For updated information, troubleshooting guide and to see our full range of products, visit our website:

<http://www.solartronmetrology.com>

2 INTRODUCTION

This manual specifically caters for Orbit Library based systems, including compatible Orbit Controllers.

For Orbit COM/DLL Library based systems and those using Serial commands, see the Orbit3 System manual (502913) and the Orbit3 Software manual (502915).

2.1 SCOPE

The Orbit[®]3 Measurement System for the Microsoft .NET Framework is a modular measurement system that can be put together quickly, easily and is cost effective. It allows different types of sensors to be easily mixed and integrated on a single network independent of sensor technology. In addition to linear probes and linear displacement transducers, third party sensors can easily be integrated, this, combined with programmable input and output modules for interfacing to external equipment makes the Orbit[®]3 Measurement System a flexible solution for measurement applications.

Typically an Orbit[®]3 Measurement System will consist of four elements, Measurements Modules with T-Connectors, Measurement System controllers, power supplies and cables. All of which can be obtained from the same supplier thus guaranteeing compatibility and accelerating system integration.

This document addresses, functionality, mechanical installation, electrical installation, controllers and then proceeds to show examples of Measurement Systems.

The Orbit[®]3 Measurement System also includes a range of readouts for stand alone measurement systems these also can be used as a basic interface to a PLC.

2.2 NAVIGATE THIS DOCUMENT

This is a large document, which is a useful reference when writing Orbit applications. Hyperlinks are included to aid navigation.



To return to the point where you have jumped from, most pdf readers have a 'Previous Page View' button, alternatively use the keyboard shortcut 'ALT' + left arrow key.

3 SAFETY SUMMARY

Products with their own manuals may contain additional safety information.

<p>WARNING statements identify conditions or practices that could result in personal injury or loss of life.</p> <p>CAUTION statements identify conditions or practices that could result in damage to the equipment or other property</p> <p>Symbols in this manual</p> <p> Indicates cautionary or other information</p>	<p>Warnings and Cautions</p> <p>Warning: Do not operate in an explosive atmosphere.</p> <p>Warning: this equipment is not intended for safety critical applications</p> <p>Warning: do not exceed maximum ratings as specified in this document under individual modules.</p> <p>Caution: Low Voltage This equipment operates below the SELV and is therefore outside the scope of the Low Voltage Directive</p> <p>Service and Repair</p> <p> CAUTION: This equipment contains no user serviceable parts. Return to supplier for all service and repair</p>
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All of the Orbit[®]3 Products are CE marked and comply with EN61000-6-3 Electrical Emissions and EN61000-6-2 Electrical Immunity

4 GLOSSARY OF TERMS AND BASIC SYSTEM INFORMATION

4.1 TERMS ASSOCIATED WITH THE ORBIT3 MEASUREMENT SYSTEM HARDWARE

Orbit3 Measurement System

A system of Orbit controllers, modules, cables and interface software, that are connected together, to form a Measuring System.

Orbit Module

An Orbit Module which can be connected to the Orbit system as part of a Network Channel. Orbit modules perform various measurement and interfaces to the external world.

Orbit Controller

Orbit hardware which controls a network of Orbit modules and is used for communicating with the modules. The controller provides the link between the Orbit Network and a PC or PLC.

Orbit Network

Term used to describe a group of Orbit Modules connected to one channel of an Orbit Controller. Networks are numbered within a measurement system from 0 to 11. A network may consist of a mixture of different Orbit Modules.

Digital Probe

A special case of Orbit product where a linear measurement probe , (usually a gauging probe) is permanently attached to an Orbit Module. This module is known as the Probe Interface Electronics (PIE).

TCON

A 3 way connector housed in a case which allows an Orbit Measurement System to be easily installed. The TCONS are connected together to form the backbone of a network and Orbit Modules plugged into the TCONS. See [MECHANICAL INSTALLATION](#) for more details.

Orbit[®]3 Support pack for Windows[®]

A suite of software, including the OrbitLibrary which allow the user to interface to the Orbit3 Measurement System using modern development systems in most common software languages.

See the Orbit3 Software manual for details on using the different Orbit3 Measurement Modes

4.2 THE DIFFERENT ORBIT MEASUREMENT SYSTEMS ORBIT1, ORBIT2 AND ORBIT3

Orbit1

The original Orbit[®] system which consisted of just Digital Probes and some controllers.

Orbit2

Introduced improved measurement capability, higher speeds and other Orbit[®] Modules

Orbit3

Orbit2 compatible but with many improved features.
-see ORBIT3 FEATURES

For details of compatibility between different products please refer to the 'Orbit Compatibility Roadmap' section in the Orbit3 Software manual.

Abbreviations

AIM	Analogue Input Module
DP	Digital Probe (e.g. DP10)
DIOM	Digital Input Output Module
DIOM2	Digital Input Output Module V2
EIM	Encoder Input Module
LE	Linear Encoder
LT	Laser Triangulation Probe
LTA	Laser Triangulation Probe
LTH	High performance Laser Triangulation Probe
DIM	Digimatic Interface Module
WCM	Wireless Connection Module
AGM-A	Air Gauge Module (with display)
AGM-B	Air Gauge Module (slimline, without display)
M	(Orbit) Module
PIE	Probe Interface Electronics
USBIM	USB Interface Module
RS232IM	RS232 Interface Controller
RS485IM	RS485 Interface Controller
ETHIM	Ethernet Interface Controller This term is used throughout the document to cover the ETHIM 2.0 product and the older ETHIM product
PIM	PLC to Orbit Interface
WIM	Bluetooth Wireless Interface Controller
ORBIT®	Orbit communication protocol
OSPW	Orbit Support Pack for Windows
SC1-A	Single channel conditioner
SCD1-A	Single channel conditioner with display

4.3 OVERVIEW OF ORBIT MODULES

MODULE	DESCRIPTION
Digital Probe (DP)	A Linear Measurement Probe hard wired to an Orbit [®] 3 Conditioning Module which provides improved accuracy and a simple method of constructing a Gauging System. The conditioning module that is fitted to the DP is called a PIE module.
Linear Encoder (LE)	An incremental encoder hard wired to an Orbit [®] 3 Conditioning Module which provides improved accuracy.
Laser Triangulation (LT, LTA & LTH)	A Laser Triangulation Sensor hard wired to an Orbit [®] 3 Conditioning Module allowing Laser non contacting sensor to be integrated into the Orbit Network
Confocal System	A non-contact optical sensor with its own controller that may be connected to the Orbit Network
Analogue Input Module (AIM)	A module that can take in 3 rd party sensors with either voltage or current outputs (E.g. pressure, load cells). A Special variant is available for a PT100 temperature sensor
Encoder Input Module (EIM)	A module that can take in a square wave signal from a rotary encoder or line scale. This allows angular position to be easily brought into the Orbit3 measurement system for profiling. The EIM can also act as a pseudo controller for Dynamic measurement applications.
Digital Input Output Module (DIOM)	This module can read discrete inputs and set discrete outputs for control functions.
Digital Input Output Module V2 (DIOM2)	This module can read discrete inputs and set discrete outputs for control functions. Enhanced DIOM
Wireless Connection Module (WCM)	This module allows Solartron Wireless devices to be connected to Orbit
Air Gauge Module - standard (AGM-A)	A module with integrated screen that can read pressure into Orbit
Air Gauge Module - slimline (AGM-B)	A module without integrated screen that can read pressure into Orbit
Digimatic Interface Module (DIM)	This module reads equipments with a Digimatic interface such as a Vernier Caliper.
Digital Displacement	A displacement sensor hard wired to an Orbit3 Conditioning Module, allowing Displacement sensors to be easily networked and data collected from them,
PSIM	Power Supply Interface Module used to power the Orbit3 Network.

For further information of the Orbit Modules refer to the Orbit Modules Documentation supplied as part of the OSPW suite.

Also, for updated information, troubleshooting guide and to see our full range of products, visit our website: <http://www.solartronmetrology.com>

OVERVIEW OF ORBIT[®]3 Microsoft .NET Framework Compatible CONTROLLERS

The Orbit3 Measurement System Controller Products which are suitable for different applications as summarized below

Controller Type	Description	Measurement Modes Supported	Orbit Bus Speed (Baud Rate)	Serial command capable
USB MK2 Controller	Connects to a USB port and can control one Orbit Measurement Channel.	Buffered Normal ReadBurst Dynamic2 Dynamic	187.5k 1.5MB 2.25MB	YES (Virtual COM Port)
USBIM LITE	As USB MK2 Controller, but limited to a maximum of 4 modules	As USBIM MK2	As USBIM MK2	As USBIM MK2
ETHIM Controller	Connects to an Ethernet port and can control one Orbit Measurement Channel.	As USBIM MK2	As USBIM MK2	YES (Virtual COM Port via sockets)
RS232 MK2 Interface Controller	Connects to a serial port and can control one Orbit Measurement Channel. (Often used with a PLC)	Buffered Normal ReadBurst	9600 187.5k 1.5MB	YES
RS485 MK2 Interface Controller	Uses same commands as RS232 but RS485 levels, for use with PLCs	Buffered Normal ReadBurst	9600 187.5k 1.5MB	YES
WIM Interface Controller	Connects via a Microsoft Bluetooth Stack and can control one Orbit Measurement Channel.	Buffered Normal ReadBurst	9600 187.5k 1.5MB	YES

Notes.

1. The Orbit ISA, PCI and PC104 Network cards and the original USBIM are not compatible with the Orbit Library.
2. The Original Orbit2 RS232IM and RS485IM are not compatible with the Orbit Library.

The USBIM MK2, ETHIM 2.0, ETHIM, WIM, RS232IM MK2 and RS485IM MK2 can control up to 200 modules on a single channel when used with the Orbit Library. Orbit3 Orbit COM/DLL Library based systems can control 100 modules per channel and Orbit 2 and lower can only accommodate 31 modules per channel. Refer to the network examples .EXAMPLES OF ORBIT NETWORKS

For further details of the controllers and how to use them, refer to the Orbit3 Software manual.

5 ORBIT3 FEATURES

The Orbit3 system provides many improvements over Orbit2, while still retaining backward compatibility.

- Orbit Library written using the Microsoft .NET Framework
- Up to 200 Modules per Orbit network.
- Readburst command
 - Fast and simple synchronised reads
- Dynamic2 command
 - Unrestricted number of Modules
- Orbit bus 'Ultraspeed' (2.25MB)

Also, the following:

5.1 MECHANICS

- DIN Rail Mounting on all Modules as standard.
- Improved Sealing
- Improved locking between TCON/PIE , resulting in improved performance in high vibration applications.
- New plastic construction is lighter by a third , reducing the weight of the overall system significantly.
- Optional Earthing arrangements, enabling the TCON bus to be isolated or non-isolated from ground.

5.2 ORBIT3 HOT SWAP

- Allows compatible models to be changed without the need to reconfigure the computer .
- TCON remembers the Probe address .
- PLC users can now easily configure their system beforehand with a PC.
- Diagnostic LEDs indicate HOT SWAP error.

Requires: OSPW Version 5 (or newer) and Orbit3 compatible TCONS and Modules.

A feature of Orbit3 is the ability to change a module in a network without having to edit the network configuration table.

A faulty module can be replaced by another, compatible module (e.g. DP2 can be replaced by DP2 but not a DP10), the original identity and address are 'assumed' by

the new module. This means that the operating software does not need to change, since all module identities are effectively the same.

A compatible module is the same module type and stroke. For example a 2mm Digital probe is only compatible with another 2mm Digital Probe. Incompatible modules indicate this by flashing the red status LED.

The hot swap feature is not strictly 'Plug and Play'. If a Module is plugged in to an currently powered Orbit network, it may not operate correctly. A power on-off cycle and an OrbitReset command is required.

5.3 DIAGNOSTICS

5.3.1 GENERAL STATUS INDICATION

The Orbit modules have a blue and red LED which is used to indicate the Module status.

STATUS	BLUE	RED
Orbit network Idle, No faults on modules	Off	Off
Orbit network active. No faults with modules For WIM, see WIM STATUS INDICATION	Blink. (for each command that is transmitted)	Off
Orbit Voltage Warning. (<4.7V) The Orbit voltage is low but the modules are still operating correctly.		Medium Flash 0.2 secs on 0.8 secs off
Orbit Voltage Error. (<4.5V) or (> 5.5) The Orbit voltage is outside of specification and the modules return an error code, they do continue to communicate unless the voltage becomes so low that they stop.		Slow Flash 0.8 secs on 0.2 secs off
Hardware Fault The modules return an error code		On

The red LED's which indicate a fault condition will stay active as long as the fault exists, they are not cleared by a reset or cycling the power unless the fault , itself, is cleared.

5.3.2 HOT SWAP ERROR INDICATION

STATUS	BLUE	RED
Not Present		
Faulty	Off	4 flashes per second
Module not compatible	Off	4 flashes per second

The Red LED will either fast flash if there is a Hot Swap error or stay on following an OrbitSetAddr command if there is a Hot Swap hardware error.

5.3.3 EIM ERROR INDICATION

The EIM is a special case and only has the Orbit Voltage Error indication.

5.3.4 WIM STATUS INDICATION

In addition to the normal operating mode, the WIM Blue LED provides indication of a Passcode being required.

- FLASHING, 2 times a second = Awaiting passcode (if activated)

5.3.5 AGM STATUS INDICATION

- AGM-A has an integral display. LED operation on its Interface module is as GENERAL STATUS INDICATION.
- AGM-B has no display. LED operation is as GENERAL STATUS INDICATION, with the addition of:

STATUS	BLUE	RED
Not mastered	Off	Mostly On. 2 brief flashes off per second

- The AGM-B Interface module does not have status LEDs, because the individual units have them. However, the Blue LED is lit to show the AGM system has power.

5.3.6 ETHIM 2.0 STATUS INDICATION

The ETHIM 2.0 is fitted with multi-colour Leds that enable it to indicate the Ethernet network status as well as the Orbit status.

The combined status is as below:

STATUS	OUTSIDE LED		INSIDE LED	
	BLUE	YELLOW	RED	GREEN

1	Orbit network Idle, No faults on controller	OFF	N/W Status	OFF	N/W Speed
2	Orbit network active. No faults on controller	BLINK *	OFF	OFF	N/W Speed
3	Orbit Voltage Warning. (<4.8V) The Orbit voltage is low but the modules are still operating correctly.	As 1 or 2	As 1 or 2	Medium Flash	OFF
4	Orbit Voltage Error. (<4.5V) or (> 5.3) The Orbit voltage is outside of specification and the modules return an error code, they do continue to communicate unless the voltage becomes so low that they stop.	As 1 or 2	As 1 or 2	Slow Flash	OFF

BLINK* = On when Orbit commands are being used, so can appear continuously on.

Medium Flash = 0.2 secs on 0.4 secs off

Slow Flash = 0.4 secs on 0.4 secs off

Ethernet N/W Status - Yellow (LED1)

Blinking = Link up & active

Steady = Link up but inactive

Off = Link is down

Ethernet N/W Speed - Green (LED2)

On = 100MHz connection

Off = 10MHz connection

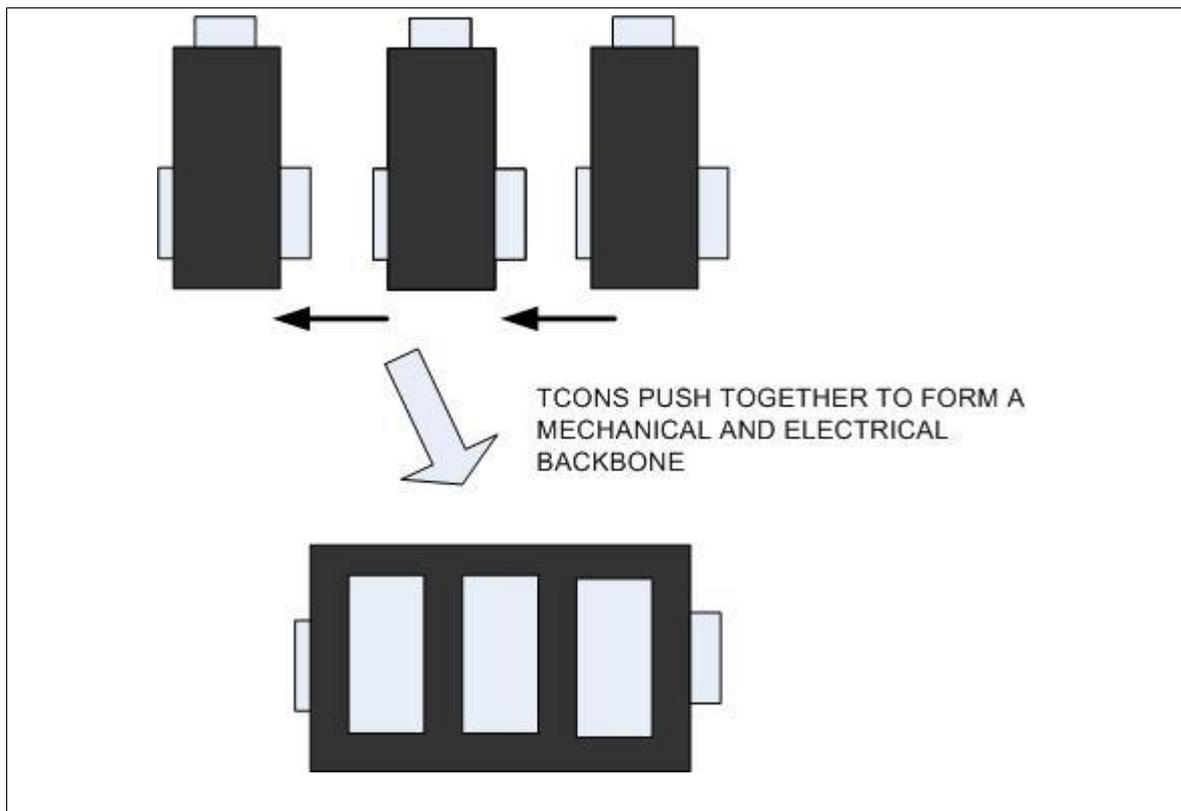
6 MECHANICAL INSTALLATION

All Orbit Modules comprise of an electronic module, sensors are either hard wired into the electronics module or a cable is provided for connection to external elements. The electronics modules are formed into an easy mechanical system using T-connectors ([TCONS](#)) for rapid installation and simple maintenance.

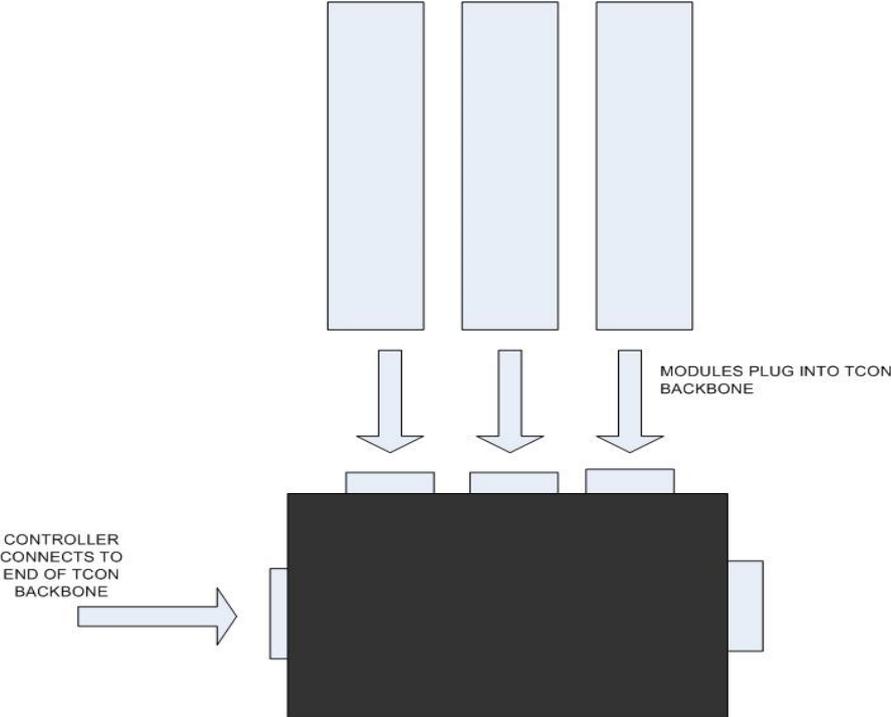
The Orbit Electronics Module comprises a plastic molding with a nine way D Type connector, two recesses for connection to a mating TCON and two diagnostic LED indicators.

The TCON contains three nine way D Type connectors for connection to other TCONS and to an Orbit Electronics Module. TCONS are plugged together to form a backbone for the Orbit Electronics Modules. The TCONS are designed to be [DIN Rail mounted](#) however the [DIN Rail mount may be removed](#) to allow the modules to be mounted via screws through the base or using feet.

6.1 BASIC TCON CONNECTION



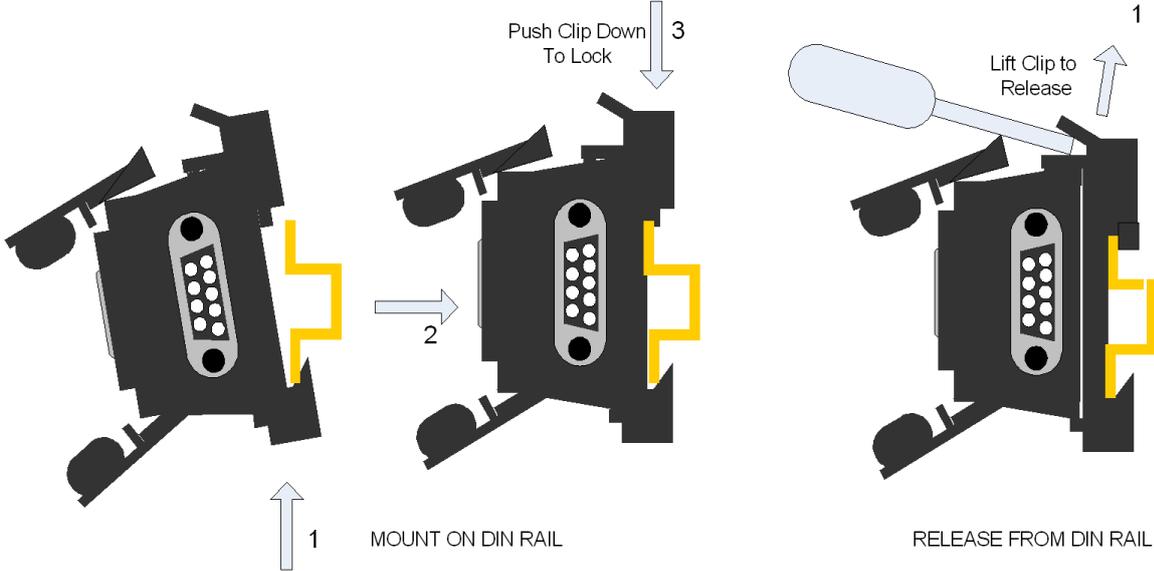
6.2 BASIC MODULE TO TCON MOUNTING (BACKBONE)



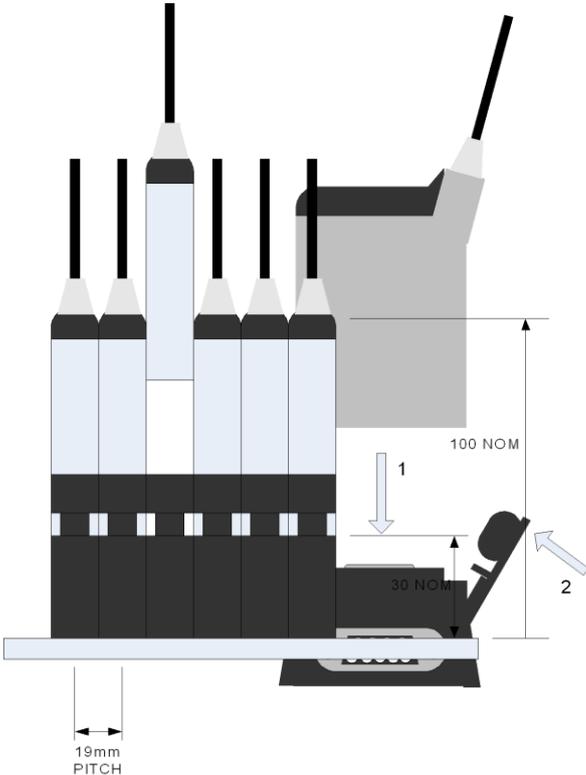
Please see the Orbit3 Catalogue for precise dimensions of the Orbit Modules and TCONS, (available on our website: <http://www.solartronmetrology.com>).

Detailed mounting guidelines are shown in the remainder of this section.

6.3 TCON DIN RAIL MOUNTING



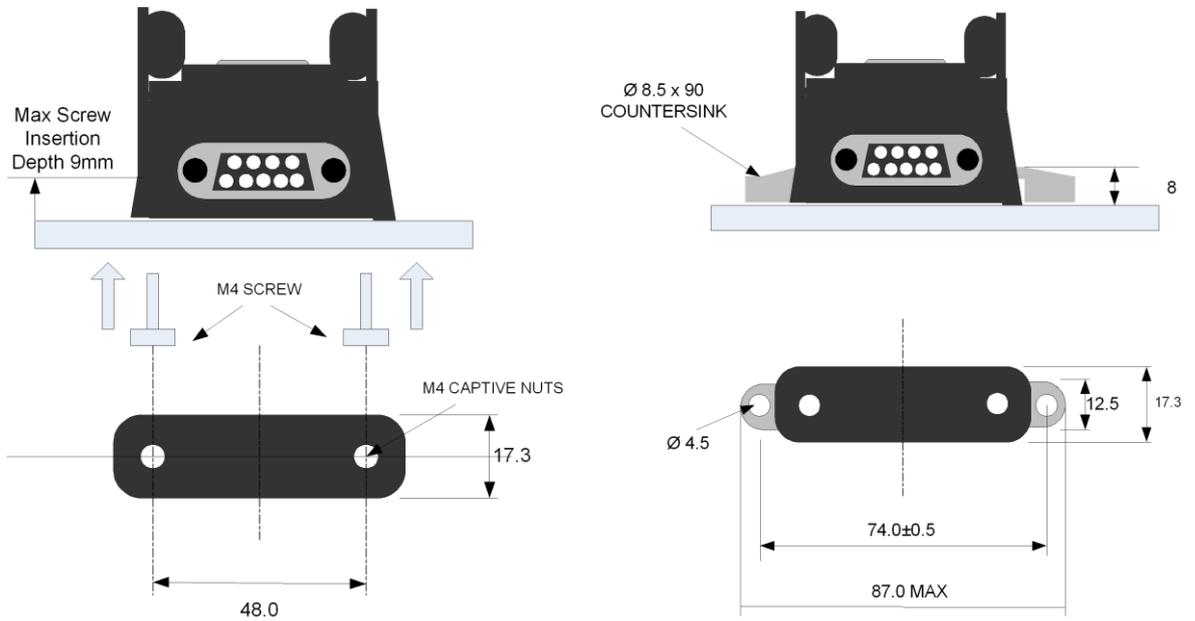
6.4 MODULE (OR PIE) TO TCON MOUNTING



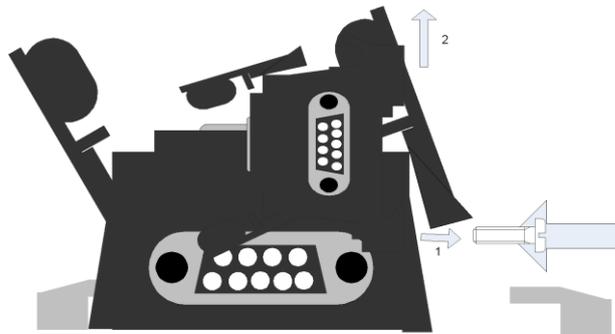
Note. The 19mm pitch also applies to fitting an Orbit3 TCON to an Orbit2 TCON.

Note. The Orbit2 TCON to Orbit2 TCON pitch is 17.8mm.

6.5 OPTIONAL SCREW MOUNTING (DIN RAIL REMOVED)



6.6 REMOVAL OF DIN RAIL FITTING OF FEET



Place foot into recess
and push down to
locate

3

7 ELECTRICAL INSTALLATION

This section describes power requirements, cables recommendations and grounding.

7.1 OPERATING VOLTAGE AND CURRENTS

The Orbit3 Measurement system operates from DC input voltage of 4.75V to 5.25V. It is essential that the correct operating voltage is maintained, so we recommend using special Orbit cables and PSIMs. For advice on checking the Orbit Voltage refer to [CHECKING ORBIT VOLTAGES](#)

The Orbit modules take different amounts of power; refer to the Orbit3 Modules manual for specification of specific modules or use the Orbit Network Power Calculator Spreadsheet supplied as part of the OSPW suite. This application allows Orbit networks to be simulated to calculate the number of PSIM modules needed and the effect of cable lengths.

The available Orbit Controllers have different power supply schemes as covered under the section on each controller.

All Orbit Modules are fitted with a 9 way D Type Connector with the Pin designation detailed below. This connector provides the interface to the Orbit Network.

Pin Number	Signal
1	Reserved
2	Serial Data (RS485)
3	Serial Data (RS485)
4	Auxiliary Power (Example +24V for laser)
5	0 V
6	+5 V
7	+5 V
8	Reserved
9	0 V

7.1.1 CHECKING ORBIT VOLTAGES

<p>If the status LEDs indicate a low operating voltage, this can be caused by</p> <ul style="list-style-type: none">• Insufficient power supply – PC for example cannot supply enough current if using USBIM.• Cable lengths too long.• Use of poor quality cables (recommend using cables designed for Orbit)• Insufficient number of PSIMs.• PSIM derating not being followed if ambient temperature is high <p>To check the Orbit Voltage, measure the voltage at the end of the TCON stack furthest from the power source for the stack which is indicating an Orbit Voltage problem.</p>	<p>RED LED INDICATES VOLTAGE OUT OF LIMIT</p> <p>VOLTAGE AT THIS POINT > 4.75V MEASURED AT FURTHEST POINT FROM POWER SOURCE</p> <p>6 7 8 9 1 2 3 4 5</p> <p>+VE (NOMINAL +5V) PINS 6 & 7 -VE (0V) PINS 5 & 9</p>
--	---

7.2 GROUNDING

It is advisable to provide a good ground point for an Orbit installation.

Grounding of the Orbit3 product can be achieved using two methods.

Grounding the system back to the primary power source or grounding the TCON stack using a special grounding bracket. The grounding bracket can be fitted to either end of the TCON backbone using the screw lock connections on the TCON.
Note.

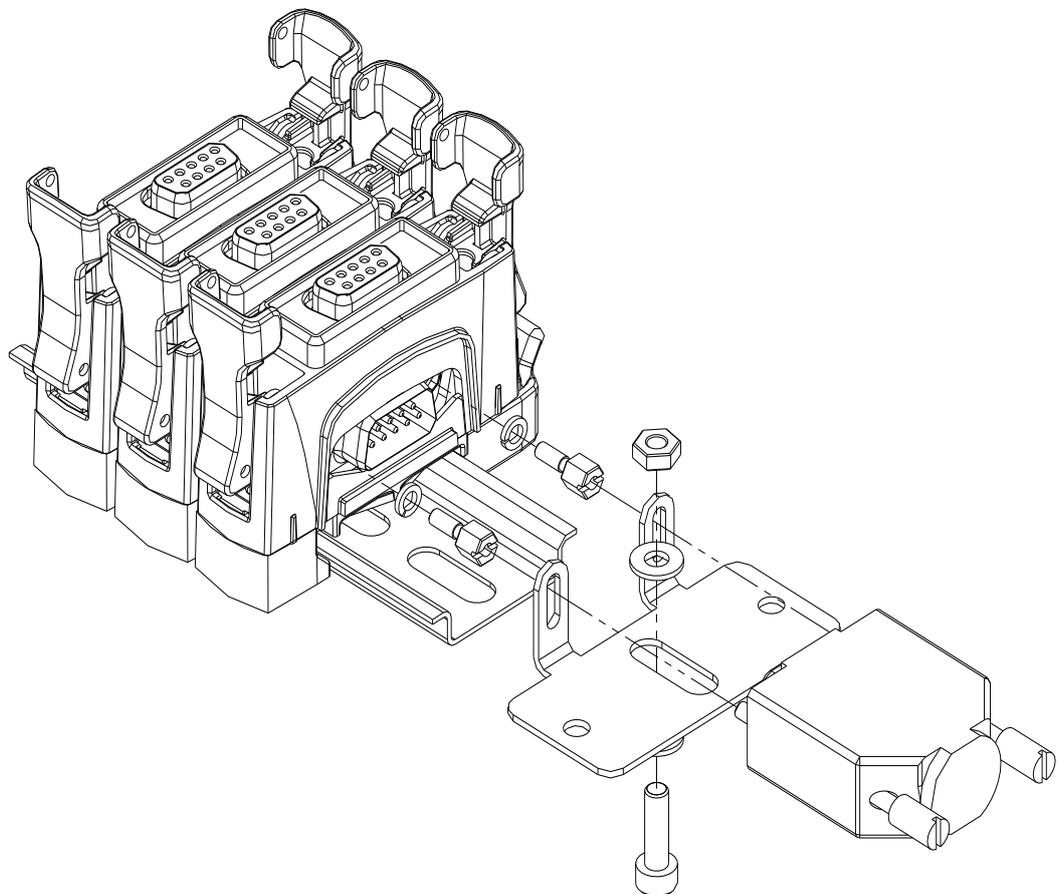
With Orbit3 there is no connection between the mounting screws on the TCON and the system ground. This has been done to allow alternative grounding schemes. (Previous versions of Orbit had metal TCONS and cases which forced earthing via the case).

The Digital Probes have their body connected to the cable screen. Therefore all parts of the system should be at ground potential.

7.2.1 Grounding with DIN rail installations

For DIN rail mounted applications the bracket provides a means of locking the stack in place on the DIN rail in applications where there may be vibration and/or a local ground point is required.

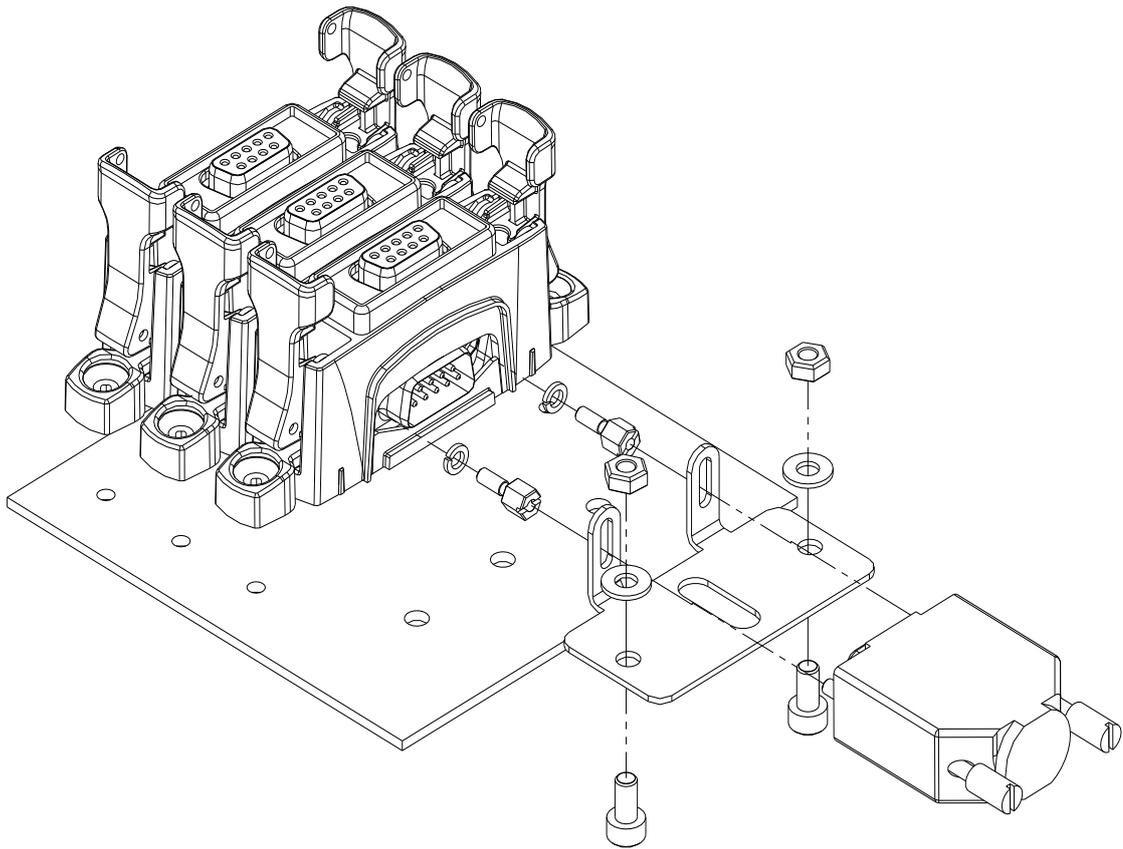
See below for assembly.



7.2.2 Grounding with non-DIN rail installations.

For non-DIN rail mounted applications the bracket provides a means of locking the stack in place on a surface in applications where there may be vibration and/or a local ground point is required.

See below for assembly.



7.3 CABLES

High performance cables, which are specifically made to reduce voltage drop and to provide adequate screening for compliance with the EMC directives are available. It is important to use these cables in noisy environments and for any of the high speed modes including Readburst and Dynamic mode.

See [ORBIT ACCESSORIES](#) for cables.

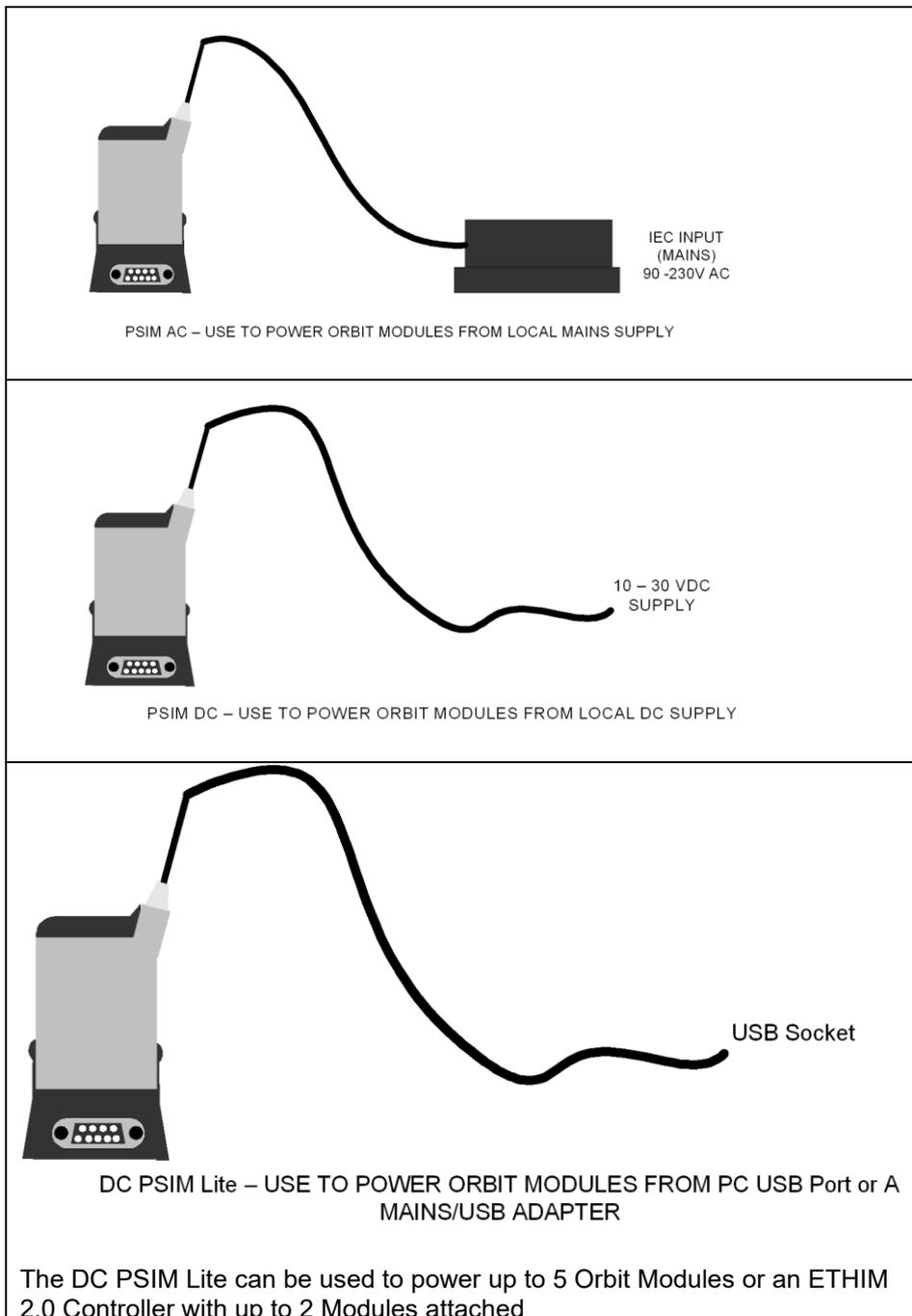
7.4 NETWORK TERMINATOR

A network terminator is supplied with each controller this should be placed at the end of the network.

7.5 POWER SUPPLY INTERFACE MODULES (PSIMs)

- Power Supply Modules (PSIMs) must be used with all Orbit controllers except the USB controller.
 - The USB controller itself can provide power for up to four Orbit modules, providing that the PC is capable of providing sufficient USB power and no auxiliary supply is required.
 - PSIMs are required for larger USB Controller based networks.
 - See [USBIM NETWORKS](#) for example networks.

- PSIMs provide a quiet supply for the Orbit bus and are designed to meet the EMC regulations.
 - We do not recommend using any third party power supplies as these may affect the performance of the system.
- The PSIM should ideally be located at the start of the TCON stack.
 - If this is not possible, the PSIM may be located up to 2 Metres from the stack as long as an Orbit extension cable is used, see [ORBIT ACCESSORIES](#).
 - Cables longer than 2 metres will limit the number of Orbit Modules that may be connected to the network.
- It is recommended that the Orbit Network Power Calculator Spreadsheet, (supplied as part of the OSPW suite), is used to determine the number of PSIMs required for a particular system.
- See [ETHIM, WIM, RS232IM & RS485IM NETWORKS](#) for an example network.



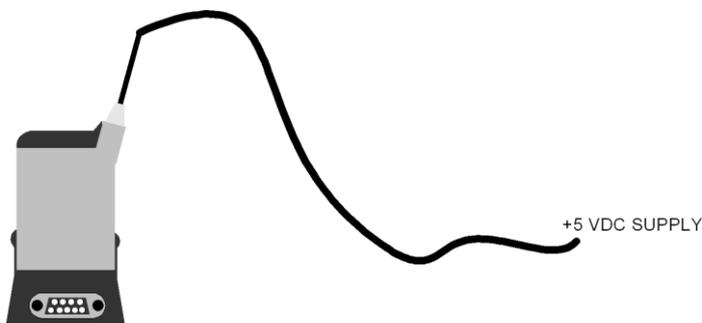
7.5.1 PSIMS that provide auxiliary supplies

Standard PSIM products provide a +5V DC supply that can power all Orbit Modules which do not require an auxiliary supply. Variants of the PSIM that provide an auxiliary supply that is required for some products like the laser (LT/LTA/LTH) are:

- AC PSIM/24/5 provides an auxiliary +24V DC supply in addition to the standard +5V DC supply.
- Auxiliary AC PSIM/24 provides an auxiliary +24V DC supply and passes the +5V through from the bus.
 - This product must be used along with an existing Orbit supply (PSIM or USBIM).
- DC PSIM/24/5 provides an auxiliary +24V DC supply in addition to the standard +5V DC supply. (Note this auxiliary supply will track the input supply to the PSIM, so if for example the PSIM is powered from +18V DC the auxiliary supply will be +18V DC.

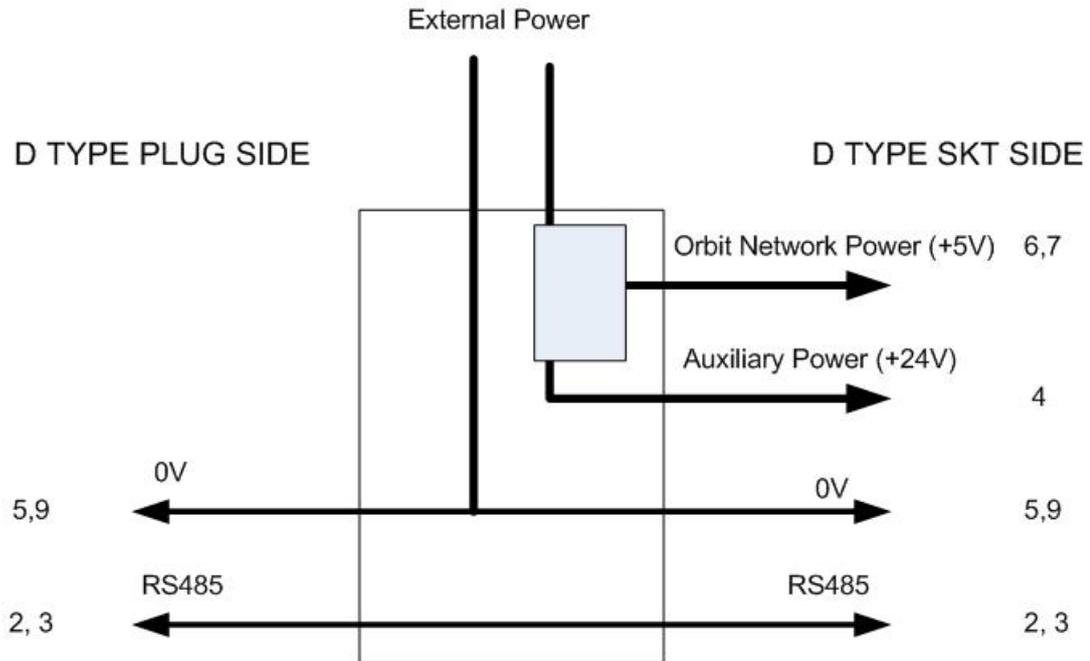
7.5.2 Orbit Power Supply Interface Protection Modules PSIM 5V

- The PSIM-5V is not a power supply, it solely provides over-voltage protection for the attached Orbit network.
- It is the responsibility of the user to provide the 5V supply (up to 5.25V maximum) to the input of the PSIM-5V.
- The number of modules that can be powered is very dependent on cable lengths, cable types and the input voltage.
- It is recommended that the user should use a fused supply for this product. The fuse should be fast and rated at 2 amps. By doing this, this fuse will trip in preference to the PSIM's internal one if the supply is set too high. This enables corrective action to be taken without having to return the unit for the internal fuse to be replaced.



PSIM 5V- USE TO POWER ORBIT MODULES FROM LOCAL 5V DC SUPPLY

7.5.3 PSIM Schematic and Pin-out



Pins 6,7, 8 and 4 not connected on Plug side

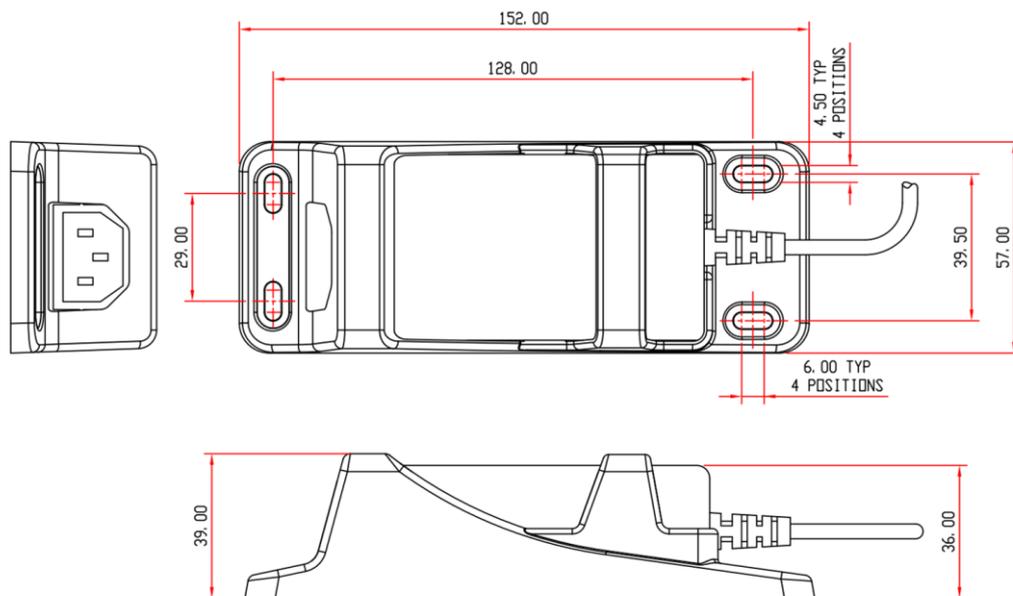
The +5 V power supply line from the network is isolated at the PSIM.

All modules after the PSIM are powered from the external power supply connected via the PSIM. 0V is common.

7.5.4 PSIM AC - Power Block Mounting Bracket

Dimensions and fixing hole positions of the PSIM AC power block.

See the Orbit3 Catalogue for dimensions of the PSIM AC Orbit Module and its TCON.



7.5.5 PSIM Installation tips

When installing a PSIM the following points should be considered.

- The PSIM AC Power block may be mounted in any direction
- The PSIM AC power block should not be exposed to fluids or excessive dust.
- Cooling of the PSIM AC power block is by convection; so allow some air flow around the unit.
- When installing the PSIM DC in large Networks, it is advisable to fit a TCON between the previous Orbit Module and the PSIM to allow for cooling. In hot environments fit a TCON either side to allow air flow around the DC PSIM.
- The PSIM output current must to be thermally derated from above 40°C, by 50% up to its maximum working temperature of 60 °C.

8 ORBIT CONTROLLER INSTALLATION AND USE

8.1.1.1 PC SYSTEM REQUIREMENTS

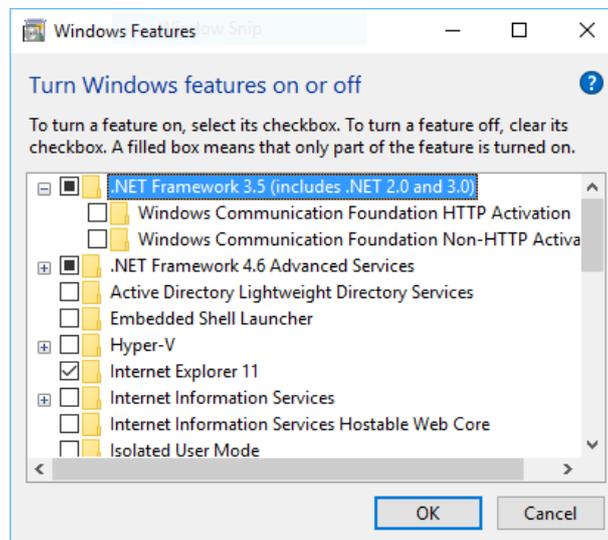
- PC with a minimum specification of Dual core Processor running at 1GHz or above with 2GB or more of RAM.
- Microsoft Windows®7, Windows®8 or Windows®10 operating systems; either 32 bit or 64 bit versions.
- Microsoft .NET Frameworks 3.5 & 4.0 (or higher) – see [MICROSOFT .NET FRAMEWORK](#)
- See specific Controller section for any extra requirements.

8.2 UPDATING WINDOWS DRIVERS

For optimum performance of the Orbit system, it is important to ensure that the PC has the latest Windows updates and the manufacturer's drivers for the motherboard and graphics card. This is particularly relevant to Windows Vista and Windows 7 operating systems, where there have been ongoing issues with driver incompatibilities; in particular with the 64 bit versions of the operating systems. It is advisable to use the Microsoft Update feature to ensure that you have their latest Windows and Office patches/fixes.

8.3 MICROSOFT .NET FRAMEWORK

- For Win 7 and above, make sure that the .NET Frameworks 3.5 & 4.0 (or higher) options in “Turn Windows features on or off” are checked (see below).



8.4 CONTROLLER TYPES

See [Controllers Overview](#)

8.5 INSTALLING THE ORBIT[®]3 SUPPORT PACK FOR WINDOWS[®] (OSPW)

The OSPW must be installed before connecting or fitting any of the Orbit Controllers

To install the OSPW, you must be an administrator on the PC.

Also, ensure the PC's power saving mode is not set to enter Standby (Sleep/Hibernate). If this occurs and then the system re-awakes, the Orbit Library will generate communications exceptions during the Suspend/Resume cycle.

This allows for the operating system to perform a Suspend cycle without the need to restart the Orbit Library.

To install the software, download the latest version from the 'Drivers and Software' section of the website: <http://www.solartronmetrology.com>

Run the 'Orbit3SPW.exe' file and follow on screen instructions.

After installing, a desktop shortcut to the 'Orbit3 Suite' dashboard will appear. The following key components, along with manuals are all available via the dashboard.

- Orbit Library
 - This provides a language independent interface to the Orbit3 Measurement System.
- Orbit Library Code Reference
 - Provides on screen help for the Orbit Library.
- Orbit3 Registration Program
 - For registering Ethernet and RS232 Controllers with the Orbit Library.
- Orbit3 Library Test application.
 - This includes examples of all Orbit Library commands.
 - The source code is included with full comments.
- Orbit GCS
 - Orbit GCS is an advanced gauging tool with multiple measuring dimensions which can perform multipoint or single point measurements at very high precisions when used with Solartron's Orbit Digital Measurement Network. Probes or modules can be algebraically combined with powerful maths and control formulas to display dimensions including roundness, run out etc.
 - Dimension values are displayed using bar charts and text readouts on user configurable layout screens. Values are logged to CSV files (free software registration required). Orbit GCS supports up to 150 modules per network. Input and Output via Orbit DIOM modules is supported for taking readings and displaying statuses such as logging readings and error conditions.

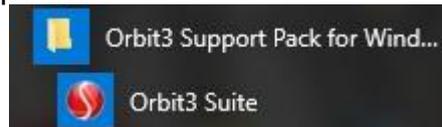
- **Orbit GCS is not installed with the Orbit Support Pack for Windows. The base version is available as a free download from the Solartron Website. Once installed it can be launched from the Orbit Suite.**
- Optional Upgrade Packages can be purchased from your Solartron Agent for additional functionality including multiple Orbit Network support, storing the measurement configuration of up to 1000 parts, user editable maths formulas, logging batches of parts in a single log file, Mastering, SPC and user diagrams.
- OrbMeasure Lite Program (retired)
 - This has been superseded by Orbit GCS which offers the functionality provided by Orb Measure Lite with many new features. The base version of Orbit GCS is a free download. Please see the Orbit GCS section of the software manual.
 - OrbMeasure Lite provided an 'out of the box' Orbit application, limited to 16 Orbit Modules.
- Orbit3 Reporter application.
 - A diagnostic aid that interrogates a system to determine the status of Orbit Modules & Controllers.
- Orbit3 Updater application
 - Enables firmware upgrading of Orbit Controllers (including MODIM), Orbit Modules, OrbitACS & PIM products. The Confocal System has a separate updater application, see below.
- Orbit3 Network Power Calculator
 - An Excel[®] spreadsheet tool that enables the correct number of PSIMs (power supplies) to be selected for an Orbit system. It also takes into consideration the effect of different extension cable lengths.
- Orbit3 Confocal Updater application
 - Enables firmware upgrading of Confocal Controllers (requires both an Orbit and Ethernet connection).
- OrbitACS Configurator
 - A utility for configuring multiple OrbitACS controllers with their attached Orbit3 modules
- Orbit3Gateway Configurator
 - A utility for configuring MODIM controllers with their attached PLC and Orbit3 networks
- PIM Utility
 - A utility for configuring PIM controllers with their attached PLC and Orbit3 networks
- WCM Configurator
 - A utility which configures WCMs and Wireless Device Settings

- WHT-M Maintenance Tool
 - A utility which reconfigures a WHT-M for replacement probes
- C# , C++ COM and Excel COM code examples.

8.5.1 Orbit3 Suite dashboard

The dashboard provides easy access to all of the Orbit applications, manuals and example programs.

After installing the Orbit[®]3 Support Pack for Windows[®], the 'Orbit3 Suite' dashboard will appear in the 'All apps' list:



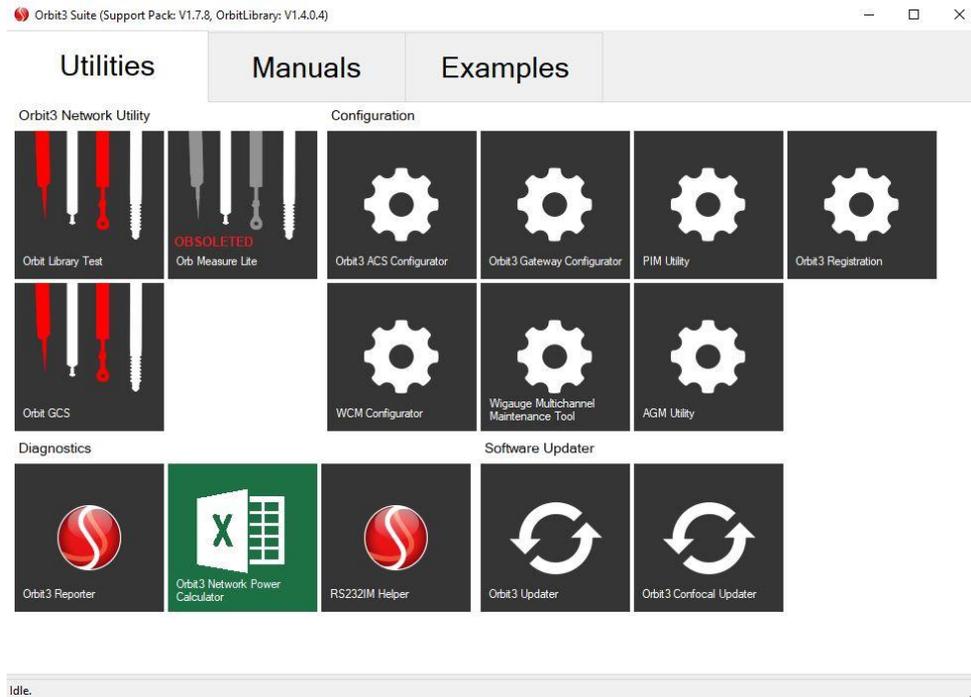
- Older versions of the support pack do not have this feature, instead a list of all of the Orbit programs & manuals appear here.

The Orbit3 Suite may be added as a shortcut by right clicking the mouse and clicking 'Pin to Start'.

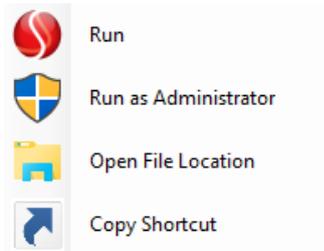


Now launch the dashboard...

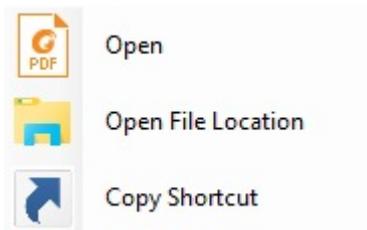
If you want to create a desktop shortcut to a particular application, right click the mouse and select 'copy Shortcut'.



For applications, the following will appear.



For manuals, the following will appear.



8.6 ORBIT3 REGISTRATION

This program is used to register Orbit ETHIMs (including ETHIM 2.0) and RS232IMs. Any ETHIMs or RS232IMs **must** be registered with this program in order to work with the Orbit Library. (This is not applicable to the RS485IM Controller which is designed primarily to interface with PLC's)

Notes

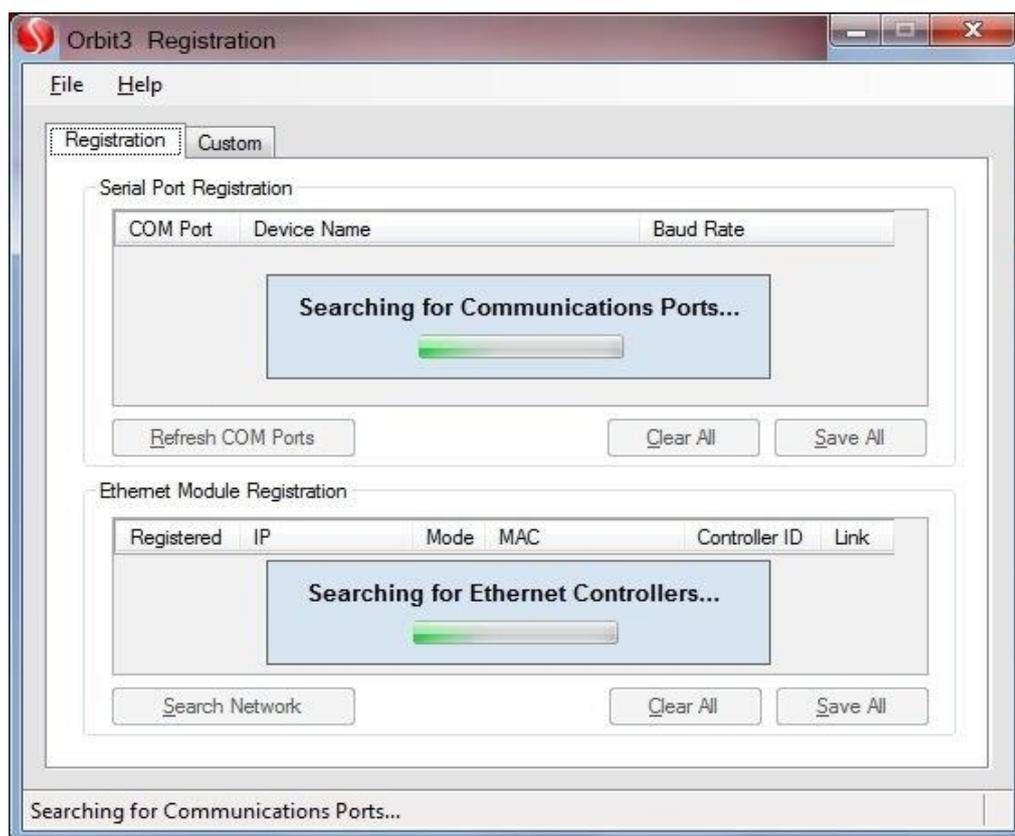
- There is no need to register any Orbit USBIMs or WIMs. These are handled automatically via 'Plug & Play' in Windows.

- This registration program is included when installing the ORBIT®3 SUPPORT PACK FOR WINDOWS®

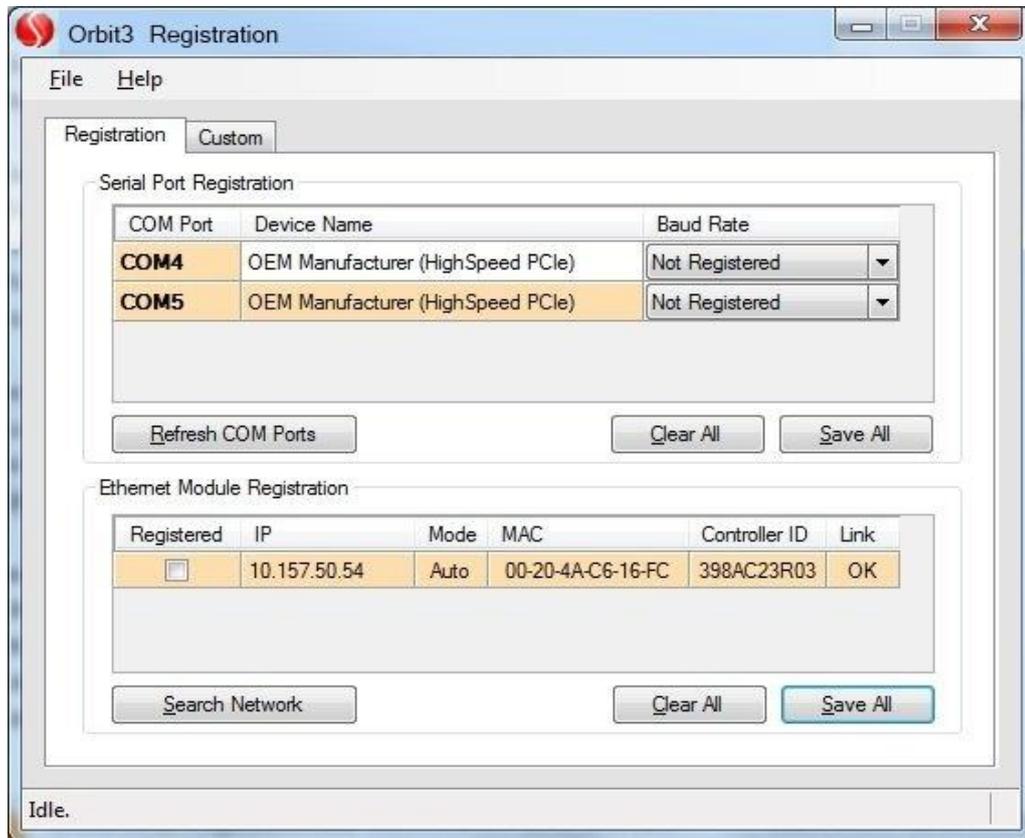
When Orbit connects, the program will scan for any registered ETHIMs and RS232IMs. If a device is registered, but not found, a time-out condition will eventually occur (which may take some time).

Therefore, to avoid this, remember to unregister all unused ETHIMs and RS232IMs. If all need to be unregistered, use the 'Clear All' button for each Controller type.

Click **Orbit3 Registration** to launch the registration program



The following screen will appear, showing available Orbit Ethernet Modules and RS232 COM ports.



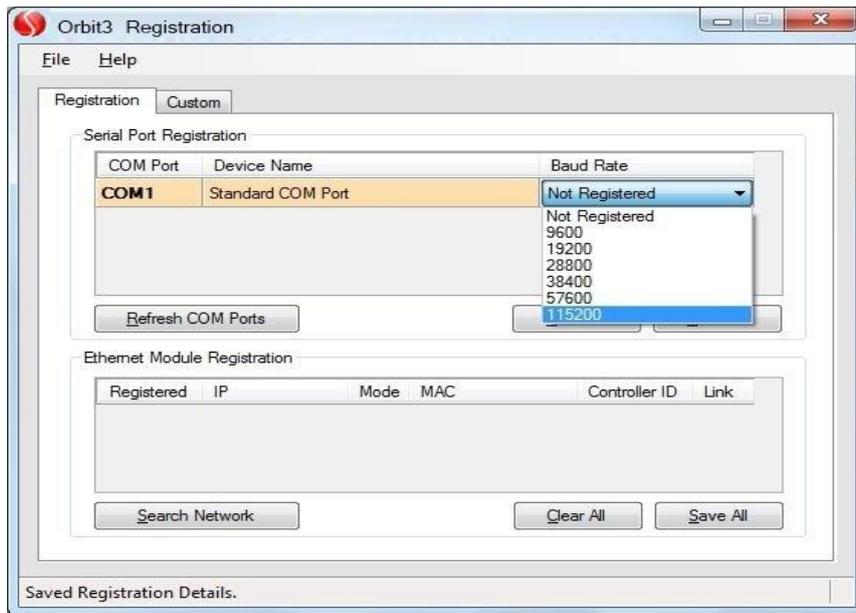
Note

The program lists all available COM ports on the PC. Care must be taken to only register those COM ports that have an Orbit RS232IM Controller attached. See section [Checking for valid COM Ports](#).

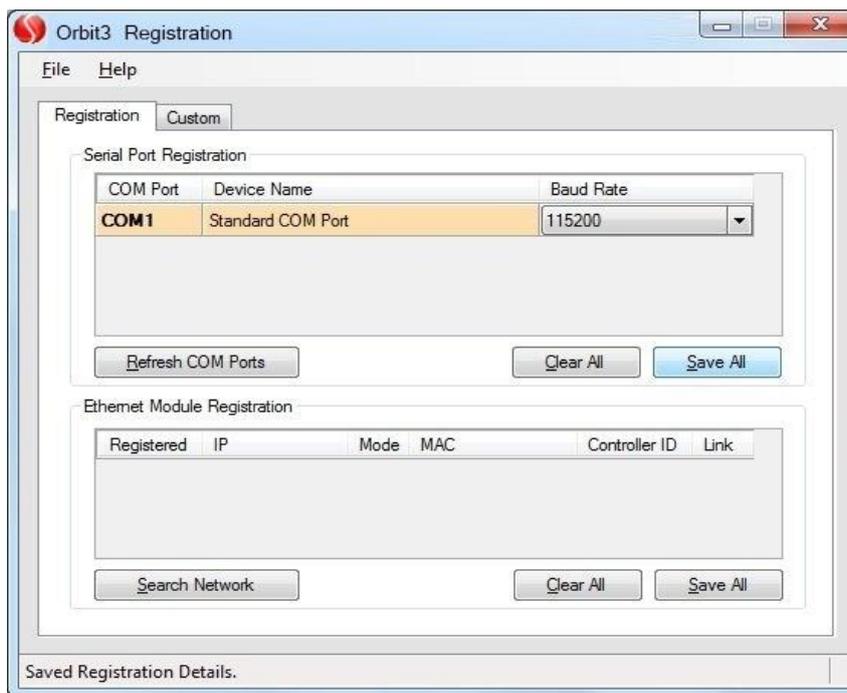
8.6.1 Registering RS232IM Controllers

The program lists all available COM ports on the PC. Care must be taken to only register those that have an Orbit RS232IM Controller attached. See section [Checking for valid COM Ports](#).

Select the COM port that you want to use and set up the RS232IM baud rate. Repeat for any other required COM ports.



Now click on 'Save All' in the 'Serial Port Registration' section to register the selected COM ports.

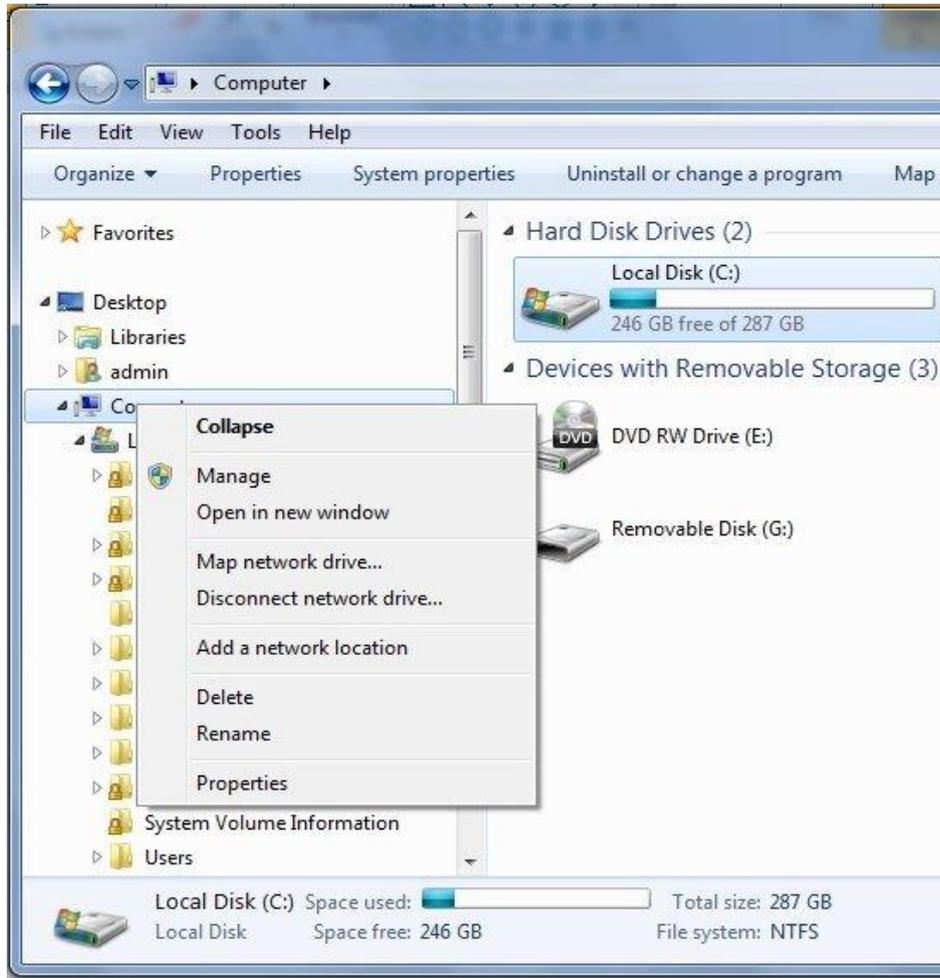


8.6.1.1 Checking for valid COM Ports

To check that you are registering the correct COM port, go to the Windows 'Device Manager' and check the list.

This can be accessed via the file manager.

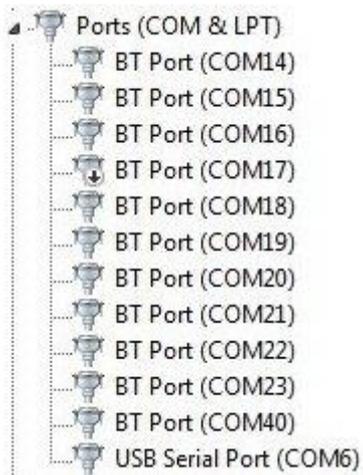
Go to 'Computer' and then right click the mouse and select 'Properties'



Now Select 'Device Manager'



Now select the 'Ports (COM & LPT)' section



You will note that in the above example the only relevant COM port is the 'USB Serial Port (COM6)', the rest are all reserved for Bluetooth devices, denoted by 'BT Port'. On other systems, other devices may reserved different COM ports.

8.6.2 Registering ETHIM Controllers

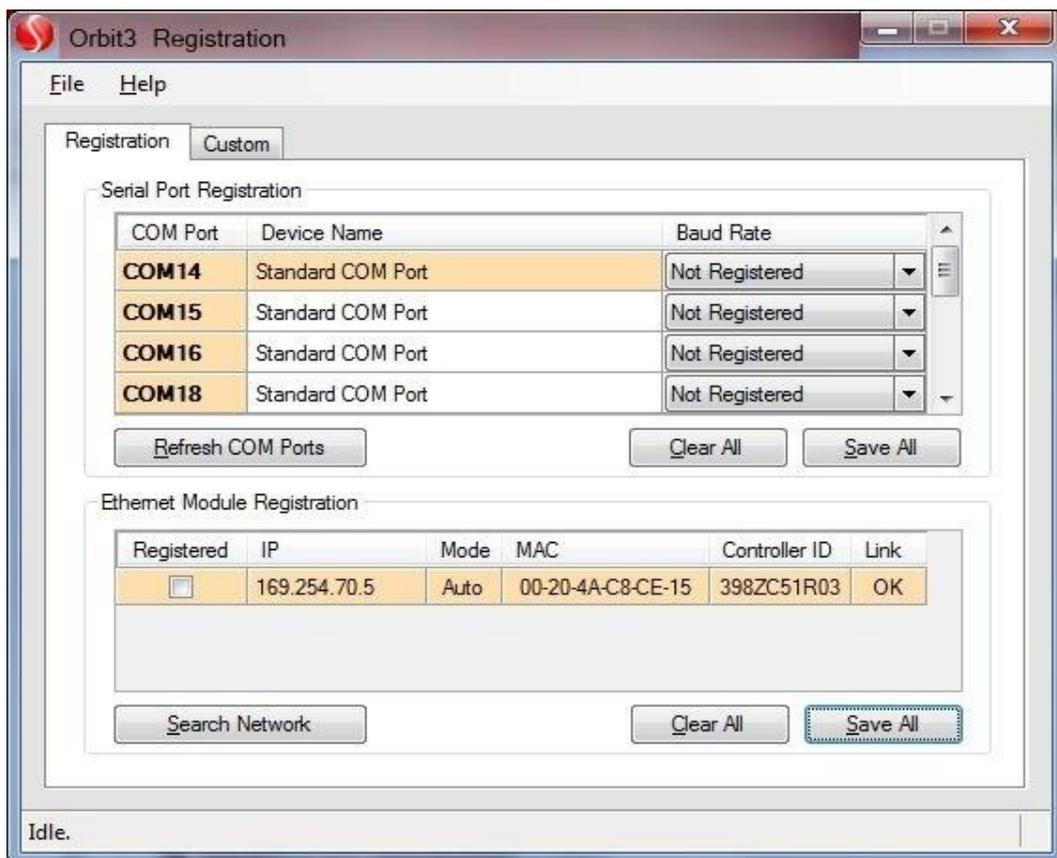
When run, the Orbit3 Registration program searches for any attached Orbit Ethernet Controllers. If there are any on a different IP sub-net, then it will take slightly longer.

If a device is registered, but not found, a time-out condition will eventually occur (which may take some time). Therefore, to avoid this, remember to unregister all unused ETHIMs. If all need to be unregistered, use the 'Clear All' button in the 'Ethernet Module Registration' section.

Notes.

- Windows Firewall and Anti-virus programs may block communication with the ETHIM if not set up correctly. See [Computer Firewall Programs](#).
- Don't forget to un-register any ETHIM modules that you no longer require to use, otherwise you will see long delays when first connecting to Orbit networks with the Orbit Library.

The program searches for any attached Orbit Ethernet Controllers any displays them in the list.



Once the available Controllers are listed, an an Automatic IP address or Static IP address needs to be selected for the required ETHIM Controller.

8.6.2.1 Explanation of displayed fields.

IP	IP address of device.
Mode	<i>options: Auto, Static</i> Selected IP mode. For setting a Static IP address, see Setting a Static IP address
MAC	ETHIM's unique MAC address. This is printed on the label on the side of the device's PIE case, eg. 00204ACC7193 See below:
Controller ID.	ETHIM's unique Orbit Identification number. eg. 388AD12R08 See below:



Link	<i>options: BUSY, OK, BAD, WAIT</i>
	BUSY = Orbit can not connect to the device, resulting in the Controller ID usually being set to 'unavailable'. Note. Sometimes, the Controller ID may be displayed as well. This can happen if initially the Controller was available, enabling the program to talk to it, but then another Orbit system started to talk to the Controller, rendering it 'Busy'. Reasons for 'BUSY': Controller either connected to another Orbit system or on an unreachable network path (possibly on a different sub-net).
	OK = Connects to the Controller OK.
	BAD = Controller fault. If this occurs, repeat 'Search Network' and if the problem occurs, return the Controller to the factory for repair.
	WAIT = Still trying to connect to the ETHIM.

8.6.2.2 Setting an Automatic IP address

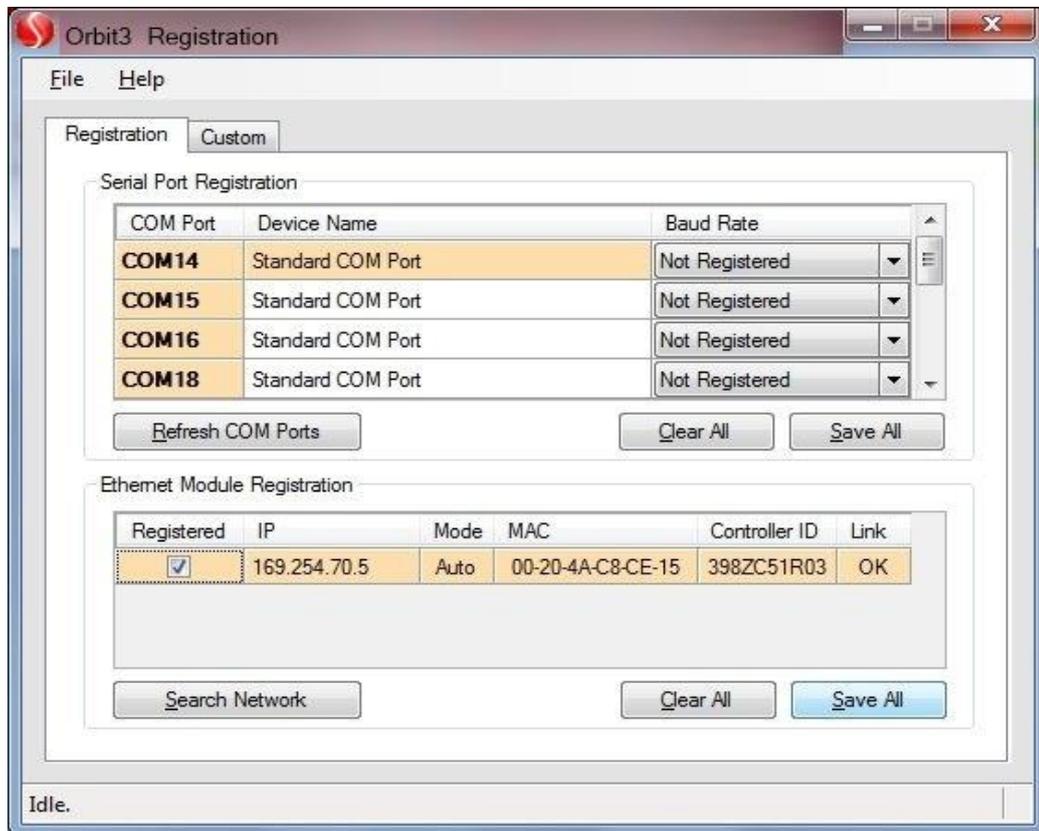
To ensure reliable operation of the ETHIM based Orbit network, we suggest setting a static IP where possible.

This is due to the fact the if Auto IP (i.e. IP address provided by a DHCP server) is used and then the power is cycled on the ETHIM Controller, the DHCP server may give the ETHIM Controller a different IP address. This could also happen if the DHCP lease expires.

In either of these cases, the Orbit system would not be able to re-connect to the ETHIM Controller. The remedy would be to re-run the Orbit ETHIM Registration program to add the ETHIM Controller (with its new IP address) to the Orbit system.

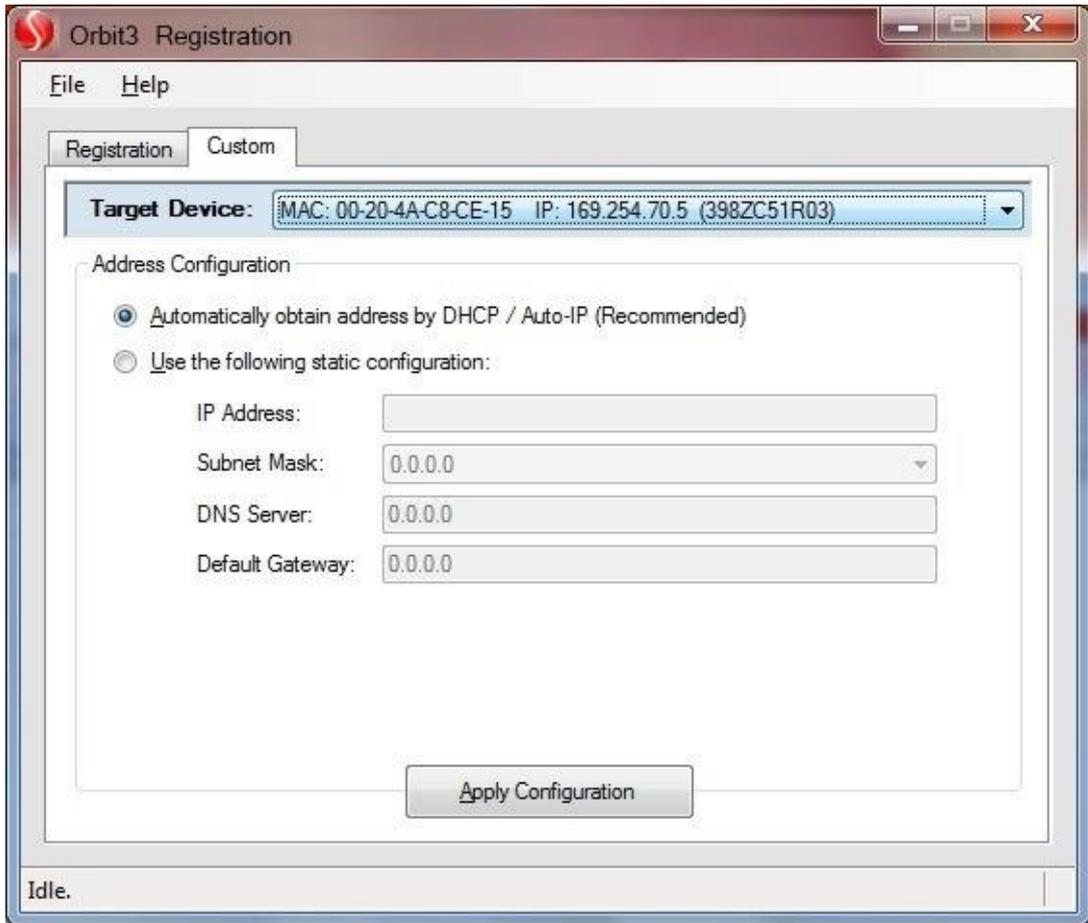
For Auto-IP, proceed as follows:

If the Controller was previously configured with Auto-IP, just click on its 'Registered' box and then select 'Save All' in the 'Ethernet Module Registration' section..



If the Controller was previously configured with a Static-IP, click on the 'Custom' tab, select the relevant Controller from the 'Target Device' list, then click on the 'Automatically Obtain Address by DHCP / Auto-IP (Recommended)' box and then select 'Apply Configuration'.

Note. Depending on the computer's Firewall settings, you may be prompted to 'Allow' or 'Block' access to the ETHIM device. Please click 'Allow' when prompted. See [Computer Firewall Programs](#).



Repeat for any other ETHIM Controllers that you need to register with Auto-IP, then exit the program.

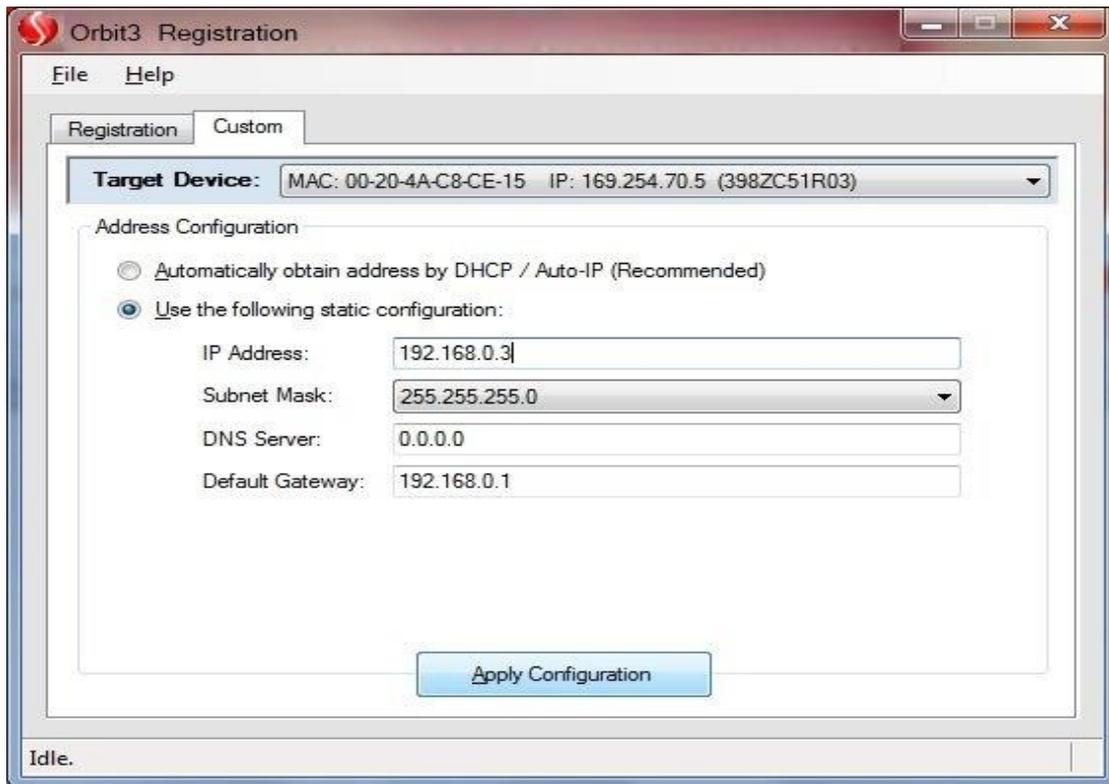
8.6.2.3 Setting a Static IP address

This is the recommended method for a continuous reliable Orbit network connection.

To set a static IP address, proceed as follows:

Click on the 'Custom' tab, select the relevant Controller from the 'Target Device' list.

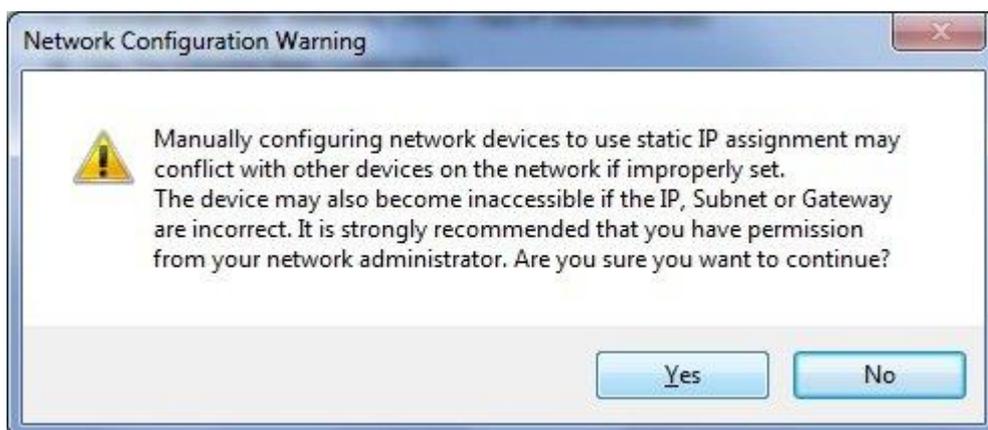
Now click on the 'Use The following Static Configuration' box and enter the required Fixed IP Address, along with the required 'Subnet Mask' (usually 255.255.255.0).



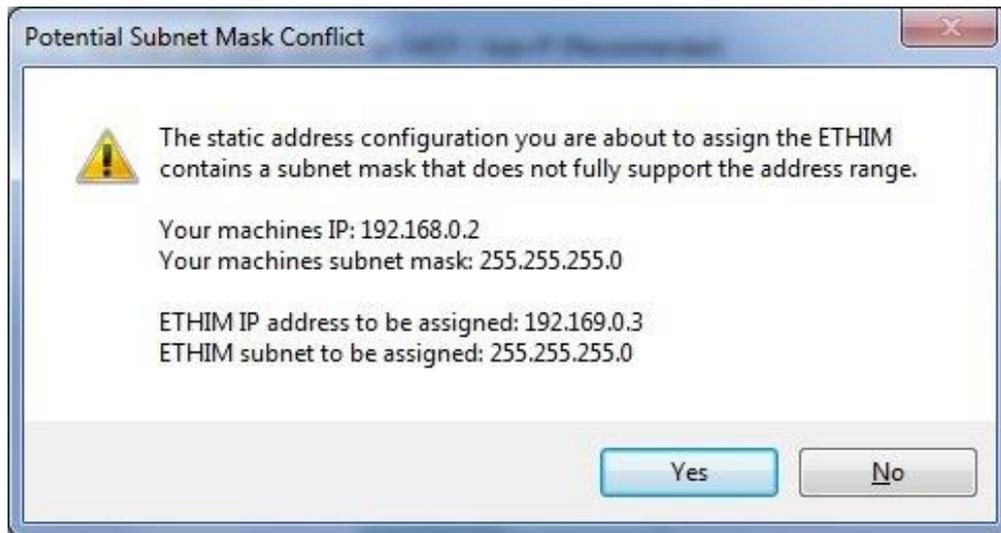
Now click on 'Apply Configuration'.

Note. Depending on the computer's Firewall settings, you may be prompted to 'Allow' or 'Block' access to the ETHIM device. Please click 'Allow' when prompted. See [Computer Firewall Programs](#).

A warning will always appear which reminds you that you are fixing an IP address which may cause network conflicts if set incorrectly and it is advisable to check that you have permission from your network administrator before continuing. If you are sure that the settings are correct, click 'Yes' to save them.



If you attempt to set an IP address and/or a SubNet mask that is different from your PC, the following warning message will appear.
eg.



Repeat the process for any other ETHIM Controllers that you need to register with Static-IP addresses. Then exit the program.

8.7 USB MK2 CONTROLLER

See [PC SYSTEM REQUIREMENTS](#) before installation.

Also required:

- PC requires a USB2 or USB3 Port

Carton Contents

- Orbit USB Interface Module (USBIM MK2)
- 9 Way Terminator Plug (used to terminate end of TCON backbone)
- Earthing and Mounting Bracket

8.7.1 Hardware Installation

1. Before using and connecting the USB controller install the ORBIT®3 SUPPORT PACK FOR WINDOWS®
2. Insert the USB plug into any USB Type A socket on the PC
3. The PC will recognize the USBIM (either USBIM or USBIM MK2) and on some operating systems report it has been connected.

Note. There may be a delay of a few seconds when plugging in a USB, while the PC enumerates.

8.7.2 Using the USBIM

The USBIM MK2 Controller provides a simple interface between personal computers and the Orbit Network.

It can also be used as a separate Virtual COM port for customers writing their own interface software.

When the USBIM is initially powered up (via PC power), Windows® will learn about its power requirements (bus power 500mA max) and assign the resources needed for it. If the host is not capable of supplying the required power, Windows® will display “not enough power message” and stop the assignment of resources.

Once the resources have been assigned the USBIM can be used with the Orbit Support Pack for Windows® to interface to all major programming languages.

The current drawn from the USBIM when controlling an Orbit Network depends on the number of Orbit modules and the type of Orbit Modules. The USBIM limits the power drawn to a maximum of 500mA. (includes the USBIM power)

The USBIM continually monitors the Orbit Network Voltage and if this drops below 4.75V then the USBIM abandons the Orbit Transfer and reports an error code to the application. For further details, see the Orbit3 Software manual.

Refer to the sections on [Orbit Networks with USB](#), [Measuring Orbit Voltage](#) and [Diagnostics](#) for further advice. For more information refer to the Section [Setting up an Orbit Measurement System](#).

8.7.3 USBIM MK2 as a Virtual Com Port

The driver software for using the USBIM Mk2 as a Virtual Com Port is automatically installed as part of the Orbit Support Pack for Windows installation.

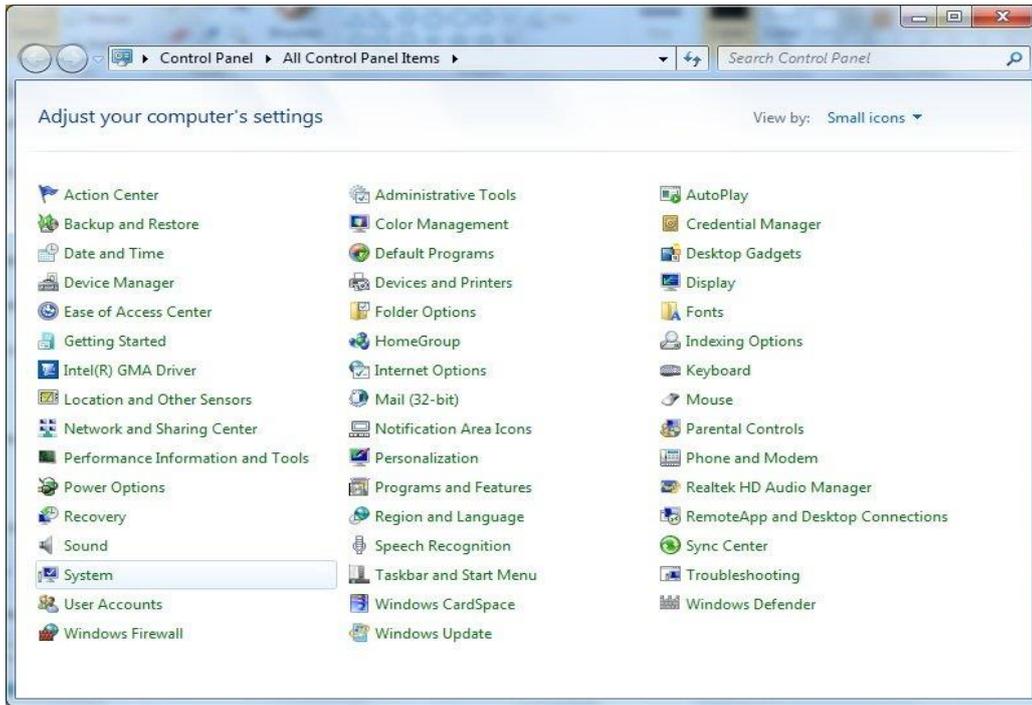
Note. 460800 Baud is the default Com Port baud rate for the USBIM MK2.

Once installed, the user needs to do two things:

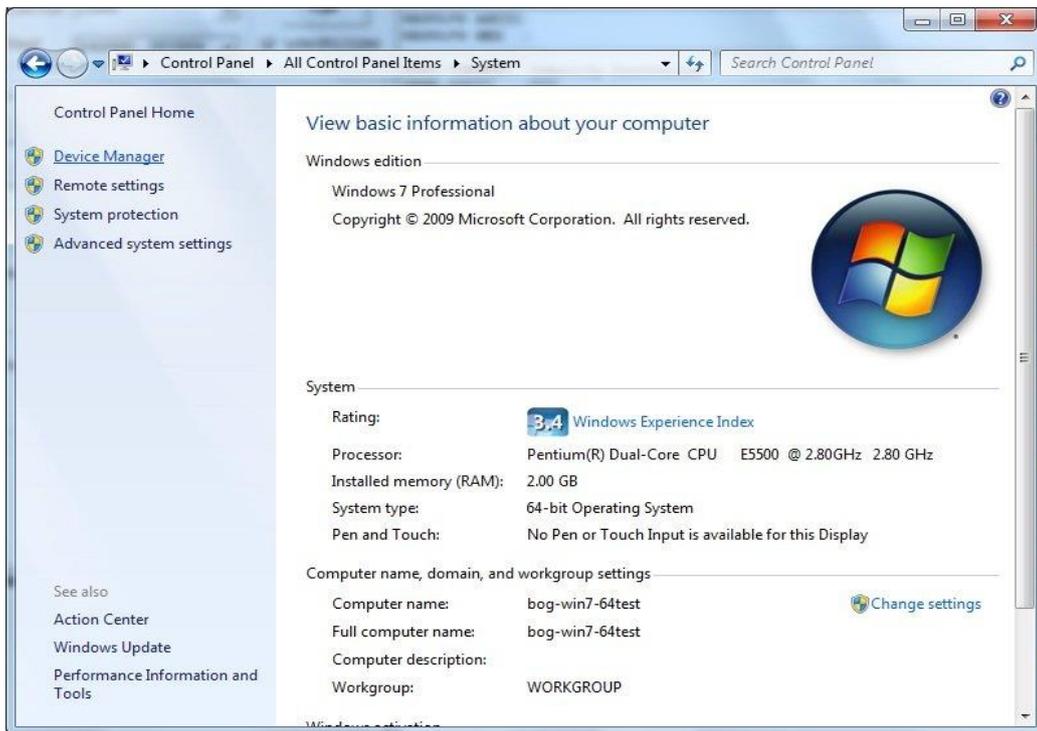
1. Find out which COM Port number has been assigned to the USBIM by the Windows operating system.
 - This is required for step 2 and for the user to communicate with the USBIM with their own software.
2. Optimize the USB settings for maximum performance.
 - If the settings are not optimized, the USBIM reading rate will be quite slow.

This can be done in the following way.

Go to Windows Control Panel / System

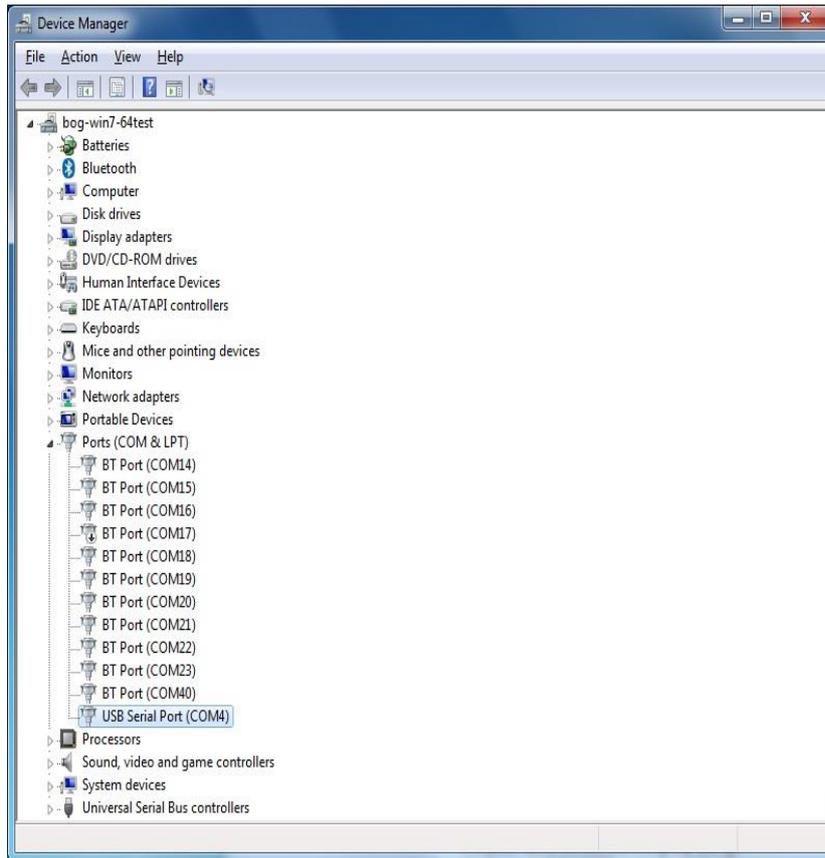


Now from 'System' select 'Device Manager'



Now select the relevant Com Port.

The Com Port will be under the heading ' USB Serial Port (Com_)'.
If there are multiple entries, you will need to select each one in turn and then check the driver that is used.

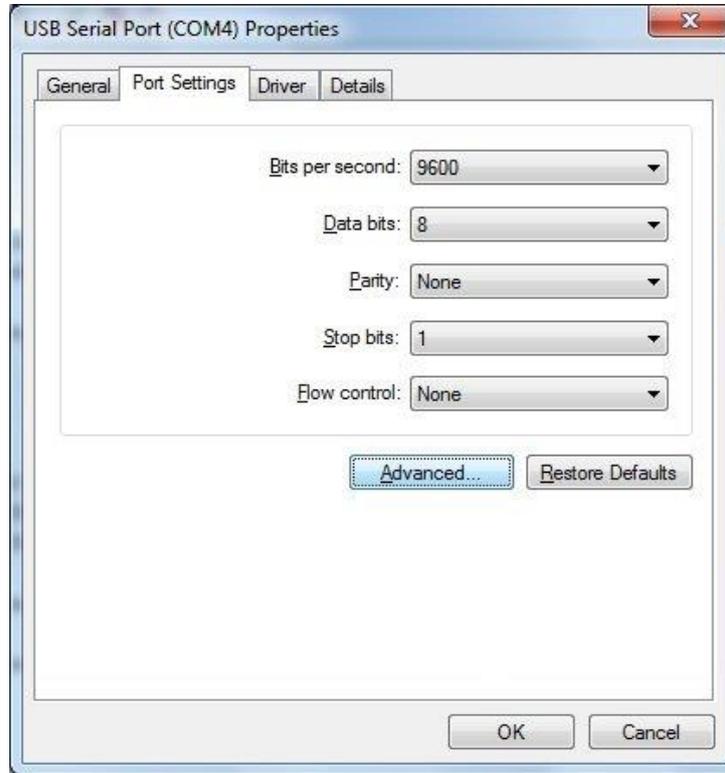


To check for the COM Port that is used by the USBIM, under the particular 'USB Serial Port' check that the 'Driver Provider' is 'FTDI' and that the Driver Version is 2.8.14.0 or greater.

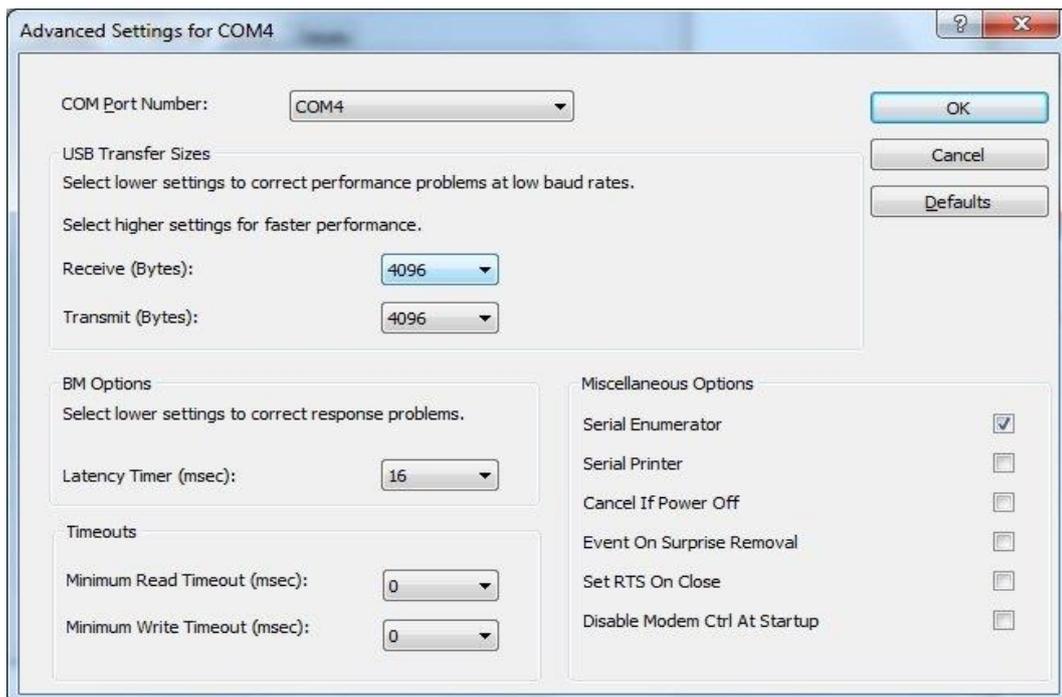


8.7.3.1 Optimizing USB Virtual Com Port settings

Go to 'Control Panel' / 'System' / 'Device Manager'
Then select 'Port Settings' on the relevant Com Port.

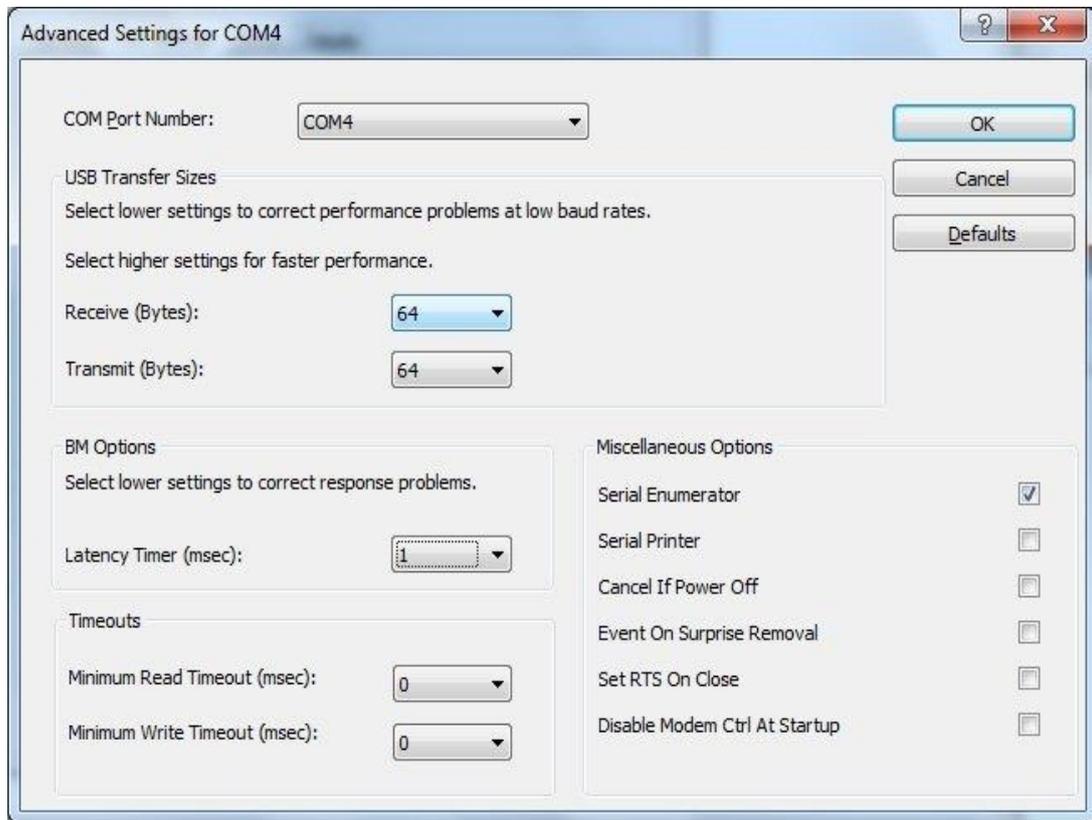


Now select 'Advanced'



Now change the USB Transfer Sizes to:
Receive (Bytes) = 64
Transmit (Bytes) = 64

Also, change the 'BM Options' to:
Latency Timer (msec) = 1



Now select 'OK' and exit the 'Control Panel' settings screens.
The USBIM MK2 is now configured correctly for Virtual Com Port use.

Don't forget that the USBIM MK2 default Com Port baud rate is 460800 Baud.

8.8 USBIM LITE

This operates in the same way as a USB MK2 CONTROLLER, but is limited to interface to a maximum of 4 modules.

8.9 RS232IM

See [PC SYSTEM REQUIREMENTS](#) before installation.

Also required:

- RS232 Serial Port.

Carton Contents

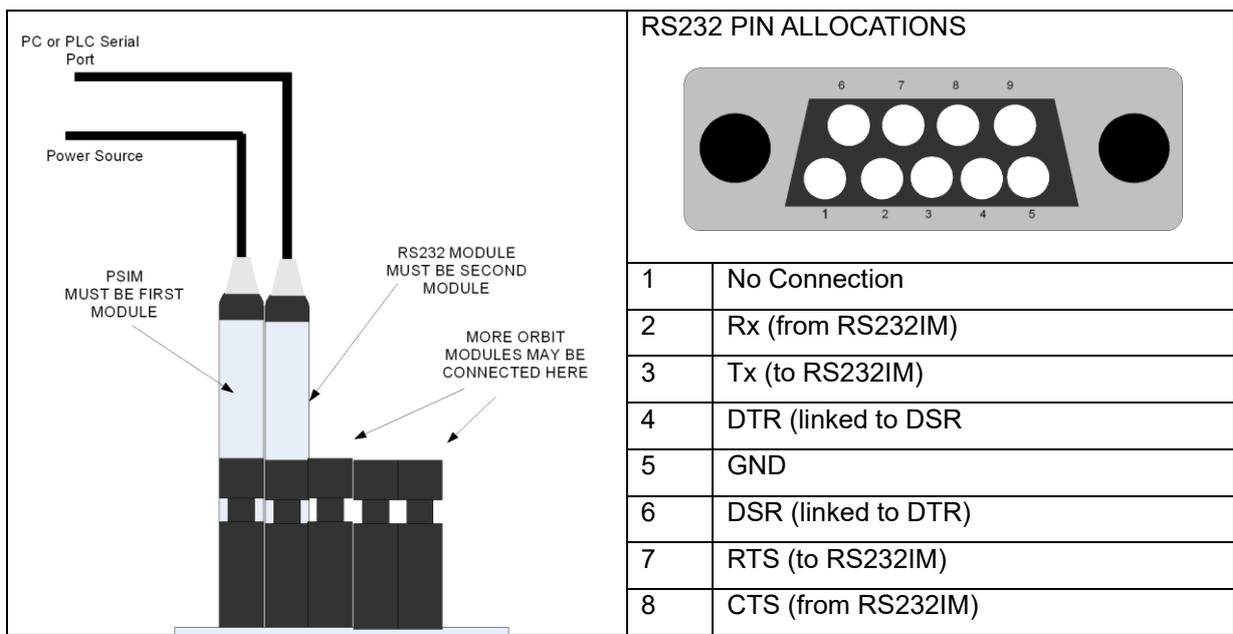
- Orbit RS232 Interface Module
- 9 Way Terminator Plug (used to terminate end of TCON backbone)
- Earthing and Mounting Bracket

8.9.1 Hardware Installation

To use the RS232IM with the Orbit Library, firstly install the ORBIT®3 SUPPORT PACK FOR WINDOWS®, then register the Controller using the ORBIT3 REGISTRATION program. A shortcut to this can be found in the "Orbit Support Pack for Windows" Folder under the start menu.

The RS232 module needs to be used with a PSIM which provides its power. It must be placed after the PSIM in the TCON backbone.

The RS232 module plugs directly into the PC serial port.



	9	No Connection
--	---	---------------

8.9.2 Operation

The RS232 module provides a bridge between the PC / PLC and the Orbit3 Measurement System. The RS232IM receives a command header string and an Orbit Command string from a PC or PLC. It then sends the Orbit Command string to the Orbit network.

The Orbit3 Measurement System processes the command and responds to the RS232IM, the RS232IM adds a header and sends the data back to the PC or PLC.

Command orders must be in accordance with the standard Orbit Protocol

For RS232 commands, please refer to the Orbit3 Software manual.

RS232IM Default Baud Rates

Standard RS232IM	9600 Baud on Power On
Variant part No 911301	57.6 kBaud on Power On
Variant part No 911338	115.2 kBaud on Power On

8.10 RS485IM

The RS485 Interface Module (RS485IM) is functionally the same as the RS232IM the difference being the electrical signal levels used which are RS485 levels. As with the RS232IM, the RS485IM requires power from the Orbit Backbone, hence a PSIM is always required.

The module is supplied with flying leads to enable connections to be made to terminal blocks.

Wire Colour	Signal	Direction
Red	Rx (A)	To RS485IM
Yellow	Rx (B)	
White	Tx (A)	From RS485IM
Blue	Tx (B)	
Black	0V	

8.11 ETHERNET CONTROLLER

There are 2 type of Ethernet controller: ETHIM 2.0 & ETHIM. These are connected & operate in the same way except the ETHIM 2.0 provides much higher reading rates and is Orbit Dynamic capable.

The term "ETHIM" is used throughout the document to cover the ETHIM 2.0 product and the older ETHIM product.

See [PC SYSTEM REQUIREMENTS](#) before installation.

Also required:

- Ethernet port – usually connect to the Ethernet network through a third party Ethernet switch.

Carton Content

- Orbit Ethernet Interface Controller (ETHIM 2.0 or ETHIM)
- 2 earthing and mounting brackets
- 9 Way Terminator Plug (used to terminate end of TCON backbone)

8.11.1 Hardware Installation

To use the ETHIM with the Orbit Library, firstly install the ORBIT®3 SUPPORT PACK FOR WINDOWS®, then register the Controller using the ORBIT3 REGISTRATION program. A shortcut to this can be found in the "Orbit Support Pack for Windows" Folder under the start menu.

Like the RS232IM, the ETHIM can also be controlled using serial commands. To send the serial commands, a SOCKET must be opened to the IP address of the ETHIM on port 10001. - See the Orbit3 Software manual for more details.

To communicate with the ETHIM, ideally your computer needs to be on the same network sub-net. Alternatively, it is possible to connect through a DNS server that will enable communication between 2 different sub-nets, as is the case with the Internet.

To initially check that the Orbit system is working correctly, we recommend that the auto-IP mode is used. This is the simplest way to connect to the ETHIM Controller over a network.

Once the system is operating correctly, we suggest setting a static IP

Notes.

- The ETHIM Controller needs to be used with a PSIM which provides its power. It must be placed after the PSIM in the TCON backbone.
- The Orbit COM/DLL Library does not require the Microsoft .NET Framework other than for the Ethernet Registration Program - no other controllers or configurations are affected.

- The ETHIM Controller is shipped with Auto-IP selected.

8.11.2 Computer Firewall Programs

Depending on the computer's Firewall settings, whenever you first use any of the Orbit programs, you may be prompted to 'Allow access' to the ETHIM device.

eg.



Note.

Other Firewalls will use similar terms.

Also, some Firewall programs prompt for 'Save my answer as a permanent rule' and then 'Allow for all'. If you forget to make the rule permanent, the Firewall program will prompt you again the next time the program is run.

8.12 WIM CONTROLLER

The WIM Controller provides a simple interface between personal computers and the Orbit Network. Once paired, it can be used in the same way as any other controller via the Orbit Library or it can also be used as a separate Virtual COM port for customers wishing to write their own interface software.

See [PC SYSTEM REQUIREMENTS](#) before installation.

Also required:

- PC requires the Microsoft Bluetooth Stack (installed automatically as part of Windows 7, 8 & 10) and a Bluetooth connection.

Carton Contents

- Orbit Wireless Interface Module (WIM)
- 9 Way Terminator Plug (used to terminate end of TCON backbone)
- Earthing and Mounting Bracket

To use the WIM with the Orbit Library, firstly install the **INSTALLING THE ORBIT®3 SUPPORT PACK FOR WINDOWS®**

The WIM module needs to be used with a PSIM which provides its power. It must be placed after the PSIM in the TCON backbone.

On Windows, Bluetooth communications are handled via hardware (e.g. a USB Bluetooth adapter). A suitable USB Bluetooth adapter is available for purchase, if required.

Ensure your Bluetooth hardware (radio) is switched on and enabled. In Windows 10, make sure Bluetooth is enabled – from Settings→Bluetooth:

Manage Bluetooth devices



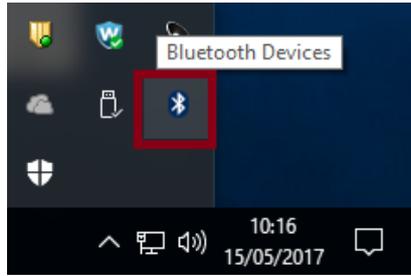
Allow 10 seconds after powering the WIM before starting the connection. But, before using the WIM, it should be *paired* with Windows by using the “Add a Device” Bluetooth functionality.

8.12.1 “Add a Device” / Pairing

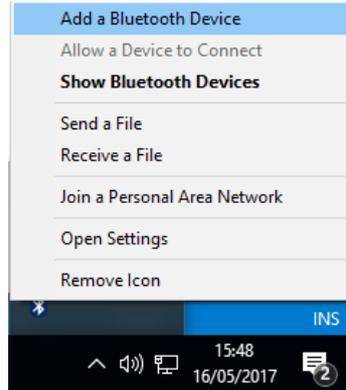
The pairing method varies depending on which Windows version is being used.

8.12.1.1 Windows 10

Adding the Bluetooth device by clicking on the System Tray Bluetooth symbol (highlighted, next)

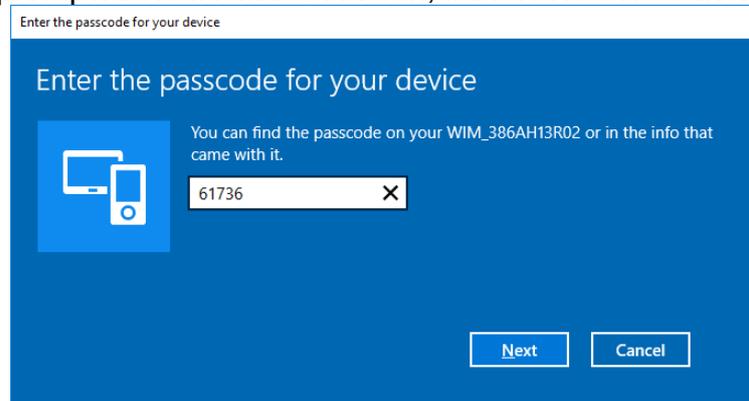


and then selecting add device

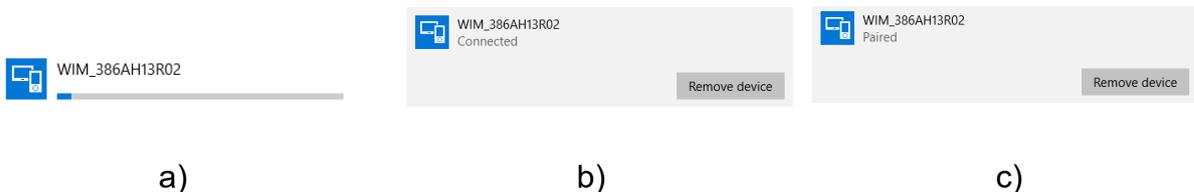


Find the desired WIM from the list and Pair with it. If the device is already paired, the status would indicate "Paired".

You may be prompted for a Pass Code/PIN, if so enter 61736 as shown, next:



Whilst pairing, a 'progress bar' (a) is displayed and the status changes from "Connected" (b) to finally, "Paired" (c).



8.12.2 Enhanced Security Function

The latest Bluetooth protocol no longer supports legacy pairing and therefore we have now introduced our own security protocol at the application layer. This is achieved by allowing a device to be passcode enabled, requiring a set passcode to be sent once connected, that will prevent it from communicating until the sent passcode has been verified. This feature is disabled by default in the latest devices to ensure backwards compatibility with existing applications.

Use the Configuration Manager to configure the passcode per device.

- See the separate Configuration Manager manual for details.
 - Installed as part of the Wireless Support Pack for Windows – available from the Solartron website).
- Our Orbit Library then handles sending the passcode automatically.

8.12.3 WIM as a Virtual Com Port

Like the RS232IM and ETHIM, the WIM can also be controlled using serial commands.

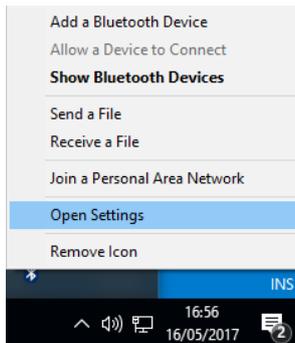
First of all, the WIM needs to be Paired – see [“Add a Device” / Pairing](#).

Once paired, a Com Port will have been assigned. In order to determine this, follow the steps detailed, next.

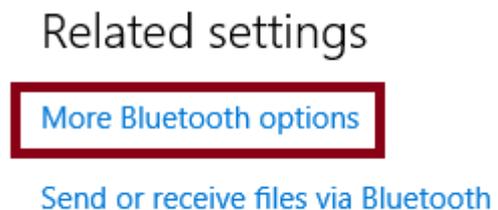
The steps for this on Windows 10 Operating System is described, next. Other versions of Windows will have a similar method.

8.12.3.1 Windows 10

Either click “Open Settings” (a) via the Bluetooth System Tray icon or click “More Bluetooth options” (b) from the Bluetooth Settings page.

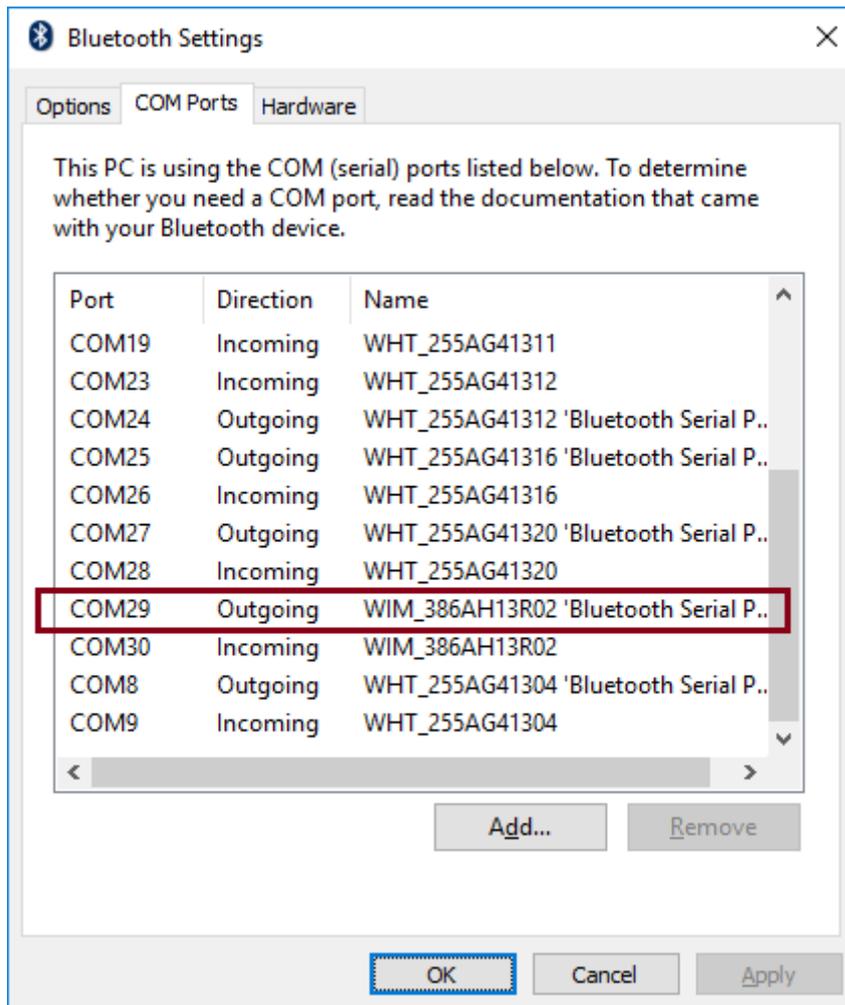


a)



b)

This will bring up the settings page. Select the “COM Ports” tab and find the desired WIM. Note down the “Outgoing” Port for this. In the example screenshot, next, COM29 has been assigned to WIM: 386AH13R02.



8.12.3.2 Next Step

Now that you have added the WIM as a Bluetooth device and identified its COM port number you may connect to it as a standard COM port at 115200 Baud and communicate with it as a standard RS232IM Controller.

8.13 WCM MODULE

The Wireless Connection Module (WCM) provides an interface between the Orbit® Measurement System and Bluetooth devices (e.g. Wireless handtools).

This removes the need for the devices to be connected to the PC via a Bluetooth dongle.

The WCM behaves as a standard Orbit Module and can be configured to connect via Bluetooth with up to 6 wireless devices and obtain readings from them.

Therefore as it is an Orbit Module, it is not detailed in this manual but is included in the Orbit Module manual which is included with the OSPW suite.

8.14 SETTING UP AN ORBIT MEASUREMENT SYSTEM

This section gives some basic set up information; it assumes that a controller has been successfully installed.

- The Orbit network must be connected before applying power to the PC or other power source.
- The TCON backbone (with modules) must be cabled to the controller.
- Ensure that there is an adequate power source available.
 - Evaluate the power requirements and use PSIMs (Refer to the [ELECTRICAL INSTALLATION](#) Section on Orbit Networks).
 - If using a USBIM only 4 modules can be powered without a PSIM.
 - If using any other Orbit controller, a PSIM must be used.
 -
- Consider Cable runs and cable lengths.

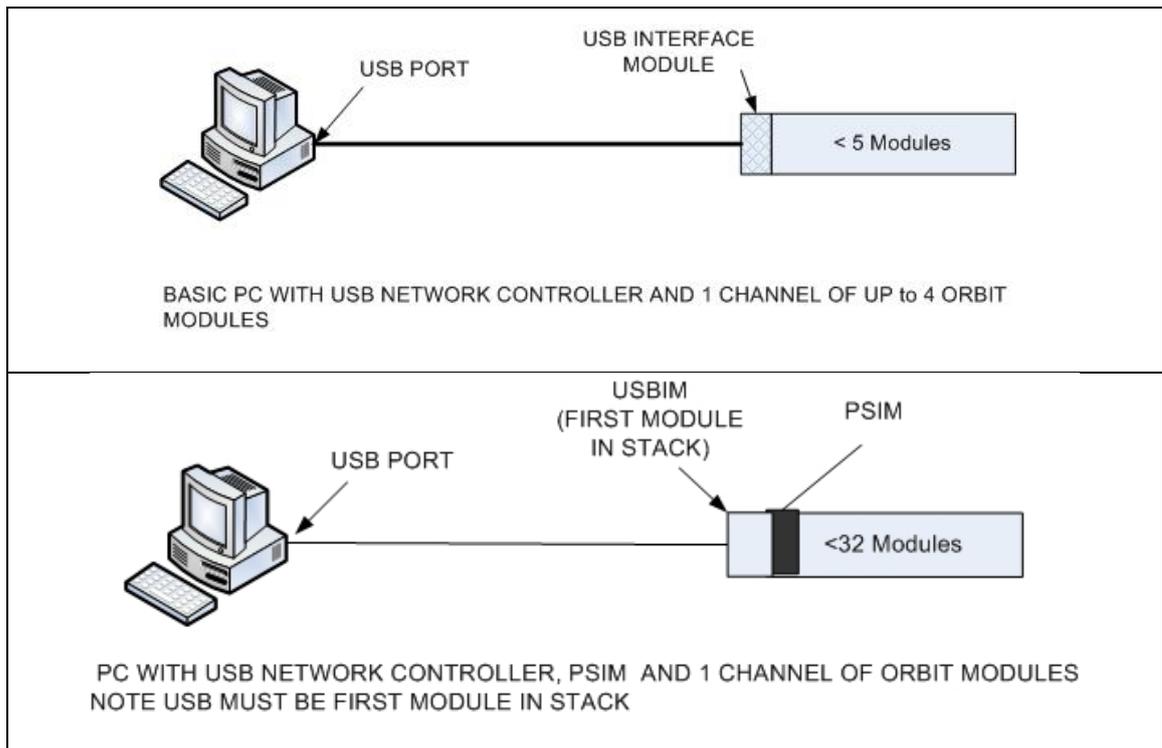
See the relevant sections of this manual for detailed information.

8.15 SINGLE CHANNEL CONDITIONER MODULE (SC1-A & SCD1-A)

This is a separate module with its own USB interface that allows readings to be obtained from a standard gauging probe (LVDT or Half-bridge). Although this does not conform to a standard Orbit module or controller, it connects to Orbit software via the OrbitLibrary and is treated as an Orbit controller with one module. See SCD1-A user manual (503899) for more details.

9 EXAMPLES OF ORBIT NETWORKS

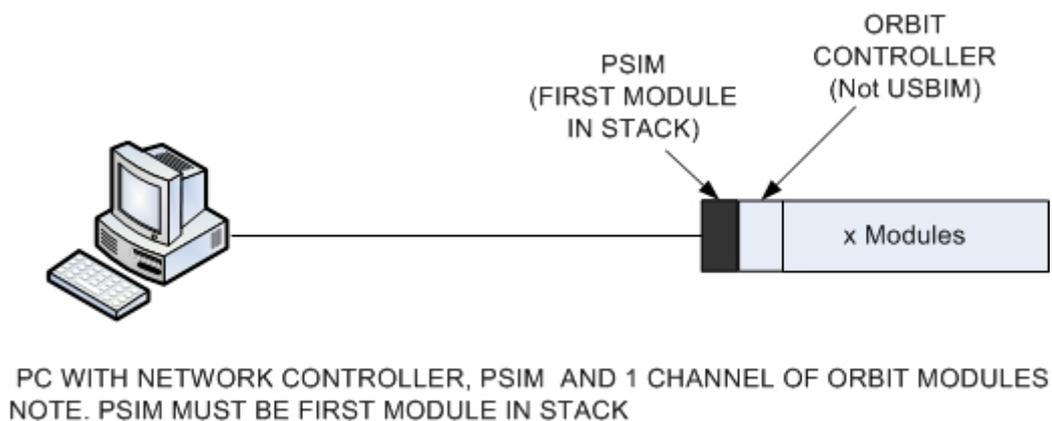
9.1 USBIM NETWORKS



9.2 ETHIM, WIM, RS232IM & RS485IM NETWORKS

All of these Orbit Controllers require the use of PSIMs.

Use the Orbit3 Network Power calculator to determine how many Modules are allowed with a particular Orbit Controller and extension cables.



10 COMMUNICATING WITH AN ORBIT NETWORK

Refer to the Orbit3 Software manual included with the OSPW suite.

11 ORBIT ACCESSORIES

Part Number	Description
806127-xxx	Orbit cables specifically designed to ensure good system performance. Available in various lengths.
804067-3	Screwlock kit (supplied with cables).
971000-3	TCON connector
209501	Orbit3 Earth and Mounting Bracket – used to mechanically lock the TCONS together in environments subject to vibration and to produce a good earth to chassis at the TCON backbone.
802968	Terminator Connector used to provide a matched impedance and to be connected at the end of the TCON backbone

12 REVISION HISTORY

REVISION	DATE	COMMENTS
1	13/06/11	Initial Issue
2	30/09/11	References to .NET updated
3	14/11/12	Linear Encoder (LE) added
4	18/02/13	Added Auxiliary PSIM
5	20/05/13	Orbit high performance Laser Triangulation (LTH) added
6	22/11/13	Wireless Interface Module (WIM) added
7	04/08/15	Updated Orbit3 Support Pack for Windows section 9.4
8	02/11/15	Confocal references added 1.1 & 9.4
9	24/05/16	9.3 Microsoft .NET Framework added.
10	14/10/16	Added note about Sleep/Hibernate 9.5
11	09/03/17	.NET 4.0 Framework requirement added to 9.3 and Orbit Dashboard added to 9.5
12	17/05/17	WIM CONTROLLER section updated
13	25/09/17	WIM Enhanced Security Function added
14	23/11/17	PSIM section updated
15	01/06/18	USBIM LITE added
16	27/09/18	WCM MODULE added
17	23/10/18	'Orbit3 channel' in Glossary of terms removed
18	27/02/19	Added references to DIOM2 & WCM
19	28/06/19	Orbit GCS added & OrbMeasureLite obsoleted
20	11/09/19	Added 6.3.5 AGM STATUS INDICATION
21	20/07/20	Network module limit increased from 150 to 200.

22	12/01/21	ETHIM 2.0 & DC PSIM Lite added
23	29/10/21	Orbit Laser Triangulation (LTA) added
24	28/11/23	Reference to SC1-A and SCD1-A added
25	28/08/24	Hyperlinks fixed. Win7 WIM instructions removed