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Overview

The **Control-it™ 5101** is a high speed, remote communication management board. It is installed in a PCI slot within your PC case and handles communications between the PC, and remote I/O boards on a RS485 serial line.

The **Control-it™ 5101** can provide communication at ten times the rate of data gathering via a COMMS serial port at 115k baud using an ASCII protocol.

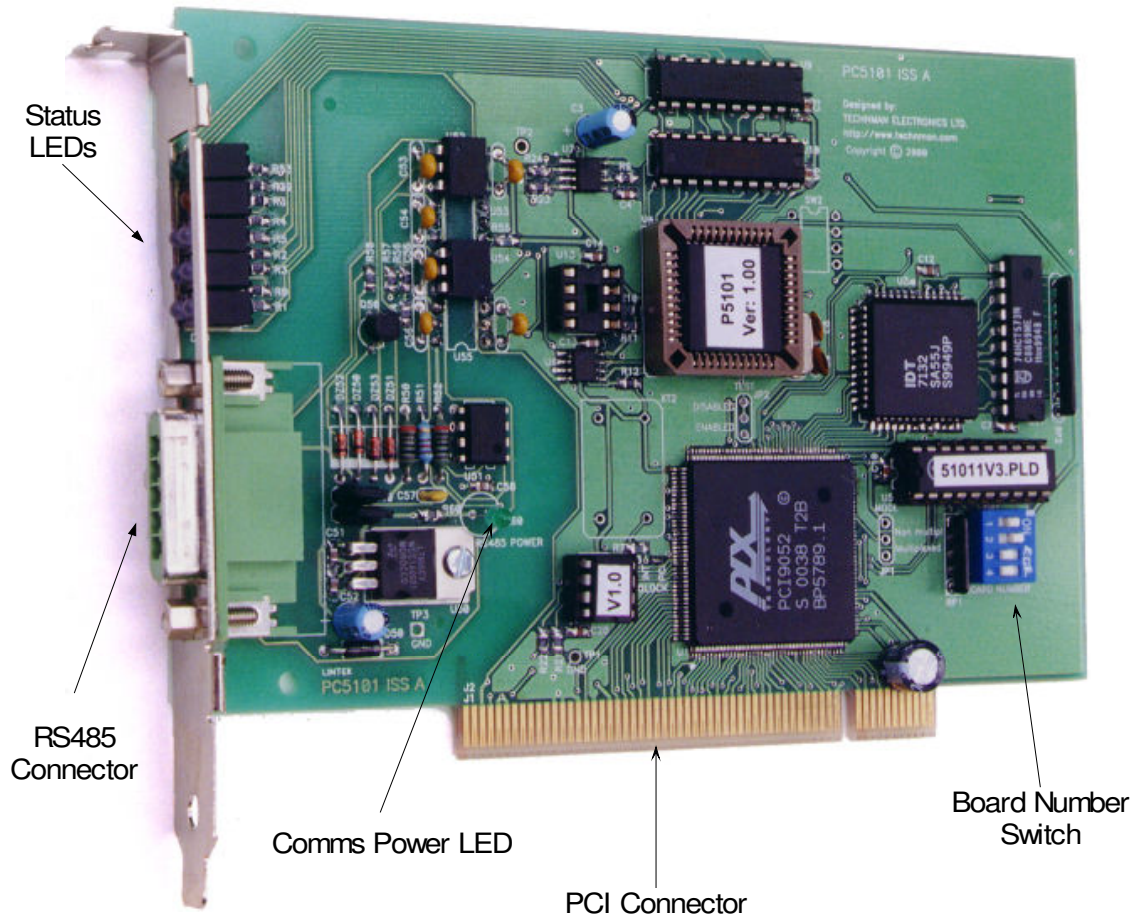
The **Control-it™ 5101** can identify which board types are connected on the remote cable, and is available to the user's program.

The **Control-it™ 5101** does not tie up any COMMS ports, interrupts or DMA. This simplifies the system set up process.

Features

- Plug and Play PCI architecture
- Co-processing to reduce load on Operating System
- Baud rates up to 690kb/s
- Supports 31 remote modules
- Scan rate of 4 modules per millisecond
- Error logging
- Automatic module identification
- Automatic polling
- Automatic communication retry if there is an error
- LEDs on rear panel to indicate
 - Transmitted & Received data
 - status of 6 modules in two colours
 - 5101 board being addressed

General Description



Box Contents

- A Control-it™ 5101 module
- Disk with demo software
- 5 way female connector with housing

Installation

To install the **Control-it™ 5101** board in your computer:

1. Before handling the interface card, touch the earthed metal frame of your computer casing to discharge any static build up in your body.
2. Remove the card from the antistatic bag and check that the Board Number switch is set to 0 (switch 1 and 2 set to OFF). (Refer to Board Number Setting, page 11, in this manual)
3. Turn off and unplug your computer from the power supply. Remove the computer casing. Look for an empty PCI slot, and insert the **Control-it™ 5101** board. Leave the case off your computer until the end of these tests.
4. Turn On your computer.
5. Windows will detect the presence of a new device and start the 'Add New Hardware Wizard'.

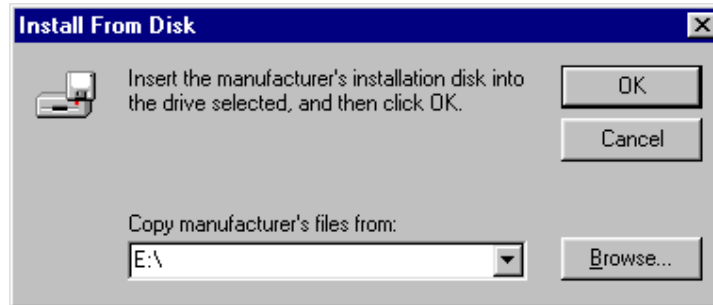
Press Next>

6. Select 'Display a list of all the drivers in a specific location, so you can select the driver you want.'



Press Next>

-
7. Select 'Other Detected Devices'
 8. Press Have Disk.
 9. Select the CD-ROM drive from the drop list in the text box and click 'OK'.

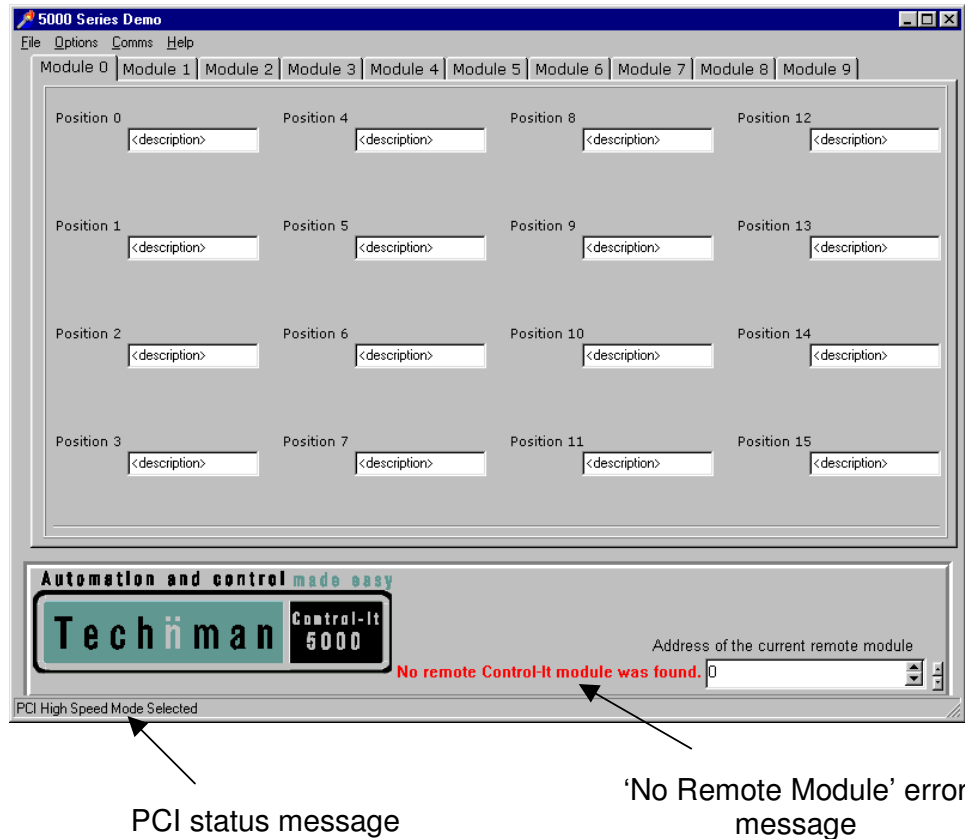


10. The 5101 will now appear highlighted in the Models box.
Press Next>
11. Windows is now ready to install.
Press Next>
12. Windows has finished installing.
Press Finish
13. Install all driver software including the P5000Demo.
 - a. Insert the Technman Electronics CD-ROM in your CD-Rom drive. If the CD does not auto-run, refer to **Troubleshooting** (page 11).
 - b. Click on "Install P5000 Demonstration Software and Drivers for 5101 cards" and follow the instructions.

Continued over page.

14. Run the demonstration program by clicking its icon on the desktop or in the Start menu.
 - When the program detects the PCI card, the message 'PCI High Speed Mode Selected' is displayed in the bottom left corner.

- Since no remote module is attached at this stage, the error message 'No remote Control-it module was found' is displayed at the bottom of the screen.
- If the PCI card is not installed correctly the message 'No functional 5101 High-Speed cards detected' is displayed in the bottom left corner and the program defaults to one of the other comms modes. If this occurs, refer to ***Troubleshooting***, (page 11).



Installation is now complete and confirmed.

RS485 Communications Connection

Data communication between the **Control-it™ 5101** board and **Control-it™** remote modules can be made via 4 conductors and a screen connected as per fig 1.

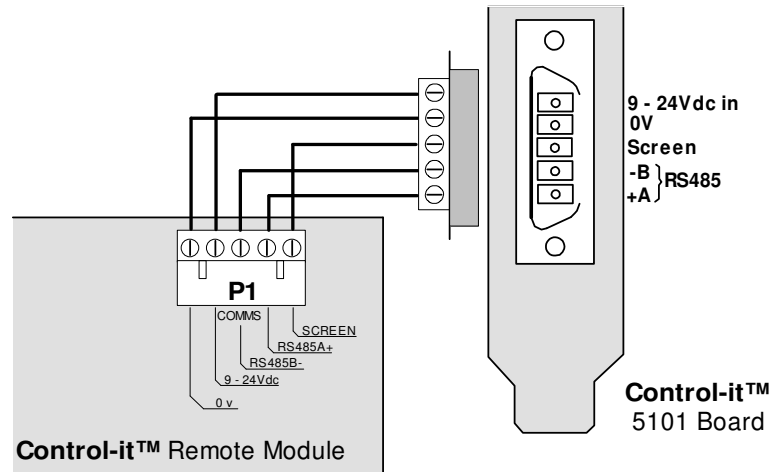


Figure 1 - RS485 Connections

The recommended cable is shielded 4-core twisted pair, 22-24 AWG.

Conductor Descriptions

- Screen

The cable shield/screen protects the communication lines from RF interference. It should be connected to the termination plugs at both ends and connected via a jumper lead to an electrical ground at one end only.

- RS485 A & B

These provide differential data transmission between modules. For best performance and to reduce RF interference these lines should always be a shielded twisted pair.



Warning - ensure that these conductors are correctly terminated (A to A & B to B) as reversal will prevent operation.

-
- 9-24Vdc

Supplies power to the **Control-it™ 5101** and subsequent **Control-it™ 50x0** communication sections.

- 0V

Provides return for communication section supply power.

Comms Power LED

Indicates that power is applied to the communications section via the RS485 connector.

Status LEDs

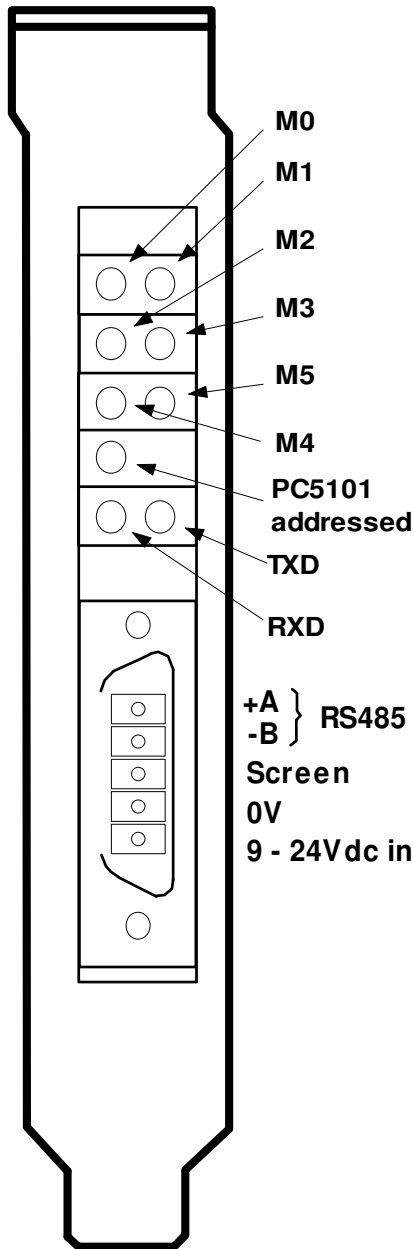


Figure 2 Status lights as viewed from the board rear.

M0 to M5

These bi-colour LED's indicate the status of the first 6 modules.

<u>LED off</u>	No module found
<u>Green</u>	All OK
<u>Green flashing</u>	Online- showing last error
<u>Red flashing</u>	Offline- showing last error

Error Codes

- 2 - Checksum error on receive.
- 6 - Module offline.

PC5101 addressed

Orange LED, flashes every time **Control-it™ 5101** is addressed by the PC.

TXD

Green LED is ON whenever the **Control-it™ 5101** board is transmitting data.

RXD

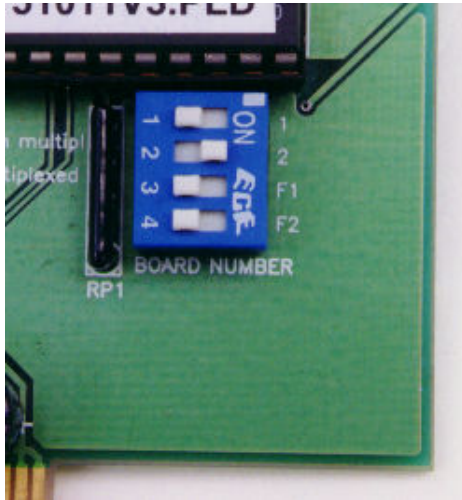
Green LED is ON whenever the **Control-it™ 5101** board is receiving data.

As the **Control-it™ 5101** board polls the remote board the TXD LED will be on. Responses from the remote board will light the RXD LED. When a module with address 0 is found then the M0 LED will be illuminated also.

Board Number Setting

The Board Number, which identifies the board, must be changed when installing more than one **Control-it™ 5101** into one computer.

The Board Number switch, located on the bottom right hand corner, uses switches 1 & 2 in combination to set a board number between 0 to 3.



The factory default Board Number is 0.

NB If only one **Control-it™ 5101** is installed switches 1 and 2 should be off.

Figure 3 The Board Number Switch set to number 2

Switches 1 & 2

These set the Board Number as per Table 1.

Table 1 - Board Number Settings		
Switch 1	Switch 2	Board Number
Off	Off	0
On	Off	1
Off	On	2
On	On	3

Switches F1 & F2

These are reserved. Leave OFF.

Troubleshooting

Windows does not detect new board on start up.

- Ensure the card is properly fitted in the PCI slot.
- Install the card in another empty PCI slot.
- Run demonstration program. If this starts without error the board is already installed.
- Use 'Add New Hardware' in the Control Panel to install manually.

Demonstration Program reports Board not Found

- As per Not Detected above.

Demonstration Program reports WinDriver not Found

- Ensure that the driver is installed on the system.
- Run **Setup.exe** from the disk supplied with the **Control-it™ 5101**.

Power LED on Control-it™ 5101 does not come on

- Check the COMMS SUPPLY jumpers J3 and J4 are in place on one **Control-it™ 50x0** module.
- Check wiring from **Control-it™ 5101** 5 way COMMS connector to the **Control-it™ 50x0**.

CD-ROM will not auto-start

- Double-click on My Computer.
- Right-click on your CD-ROM drive and choose 'Explore' from the drop-down menu.
- Double-click on 'Menu.exe'.

Specifications

General Specifications

Baud Rate (max)	690kb/s
Max Transmission Range	1.2Km
Modules Supported	Up to 31
Module Scan Rate	4 per mSec
Operating Mode	RS485
Software Support	C/C++, Visual Basic, Delphi

Electrical Specifications

RS485 supply	12V to 24Vdc	
Maximum Comms Section Current draw	12V	24V
	44mA	41mA
Comms Port Isolation	1.5kV max transient ¹	

Physical Specifications

Dimensions	154 x 108 mm
Weight	115 grams
Operating temperature	32° to 122° F (0° to 50°C)
Storage temperature	-4° to 158° F (-20° to 70° C)
Humidity	15 to 90% relative non condensing

¹ EN 60950 : 1992

Glossary

Control-it™	Trade mark of Technman Electronics Ltd.
b/s	Bits per second.
kb/s	Kilo bits per second.
I/O	Abbreviation of Input / Output.
Protocol	Communication language between units.
RS485	2 wire Industrial communication standard.
M0	Module 0.
TXD	Transmit Data.
RXD	Receive Data.
50x0	Control-it™ module with x representing a number e.g. 5020.
COMMS	Abbreviation for Communication.
24AWG	24 gauge American Wire Gauge.
Baud Rate	Communication speed measured in bits per second.
Position	A specific Input or Output of a module.

Declaration of Conformity 2001

Manufacturer's Name: Technman Electronics Ltd
Manufacturer's Address: PO Box 302 107, Auckland 1330, New Zealand

declares that the product

Product name: Control-it 5000 Series Distributed Input/ Output System
Model numbers: 5001, 5005, 5006, 5007, 5020, 5030, 5040, 5050, 5100, 5101
Product options: All

conforms to the following product specifications:

Safety Regulations: Low Voltage Directive 73/23/EEC 22 July 1993 and the UK Electrical Equipment Safety Regulations 1994.
EN 60950:1992+A1+A2+A3- Primary Circuit/ Double insulation
Model 5020- Primary circuit/ Reinforced insulation
Except when these modules are incorporated into a larger mechanical device, in which case a responsible person must ensure that all appropriate safety regulations are met.

EMC Regulations: EMC Directive 89/336/EEC 3 May 1989 and 92/31/EEC 28 April 1992, article 10.1.
EN 55022:1998 Class A Device
EN 55024:1998 I.T. Equipment
EN 50082-2:1995 Generic Industrial Device

The product herewith complies with the requirements of the following Directives and carries the CE marking accordingly:

Low Voltage Directive 73/23/EEC
EMC Directive 89/336/EEC

The product was tested in a typical configuration with a personal computer system.

For compliance information contact:

Director
Technman Electronics Ltd.
PO Box 302 107
Auckland 1330
New Zealand

or

Quality Assurance Director
Amplicon Liveline Ltd
Centery Industrial Estate
Hollingdean Road
Brighton
UK BN2 4AW

WARNING

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Rev F