VULCAN

Industrial Compact Enclosure (ICE)

Technical Manual

Arcom

Think Embedded. Think Arcom.

EUROTECH GROUP

Definitions

Arcom is the trading name for Arcom Control Systems Inc and Arcom Control Systems Ltd.

This product was known as the MERCURY until 30th June 2005. The internal (numeric) product codes used to identify this product and its variants have not changed. Please contact our sales team if you have any questions (see page 18).

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Revision History

Manual	PCB	Date	Comments
Issue A		11th June 2004	First full release of manual.
Issue B		6th September 2004	ICE and COMMs cable modifications.
Issue C		16th May 2005	Updated to reflect product name change.

Arcom operates a company-wide quality management system, which has been certified by the British Standards Institution (BSI) as compliant with ISO9001:2000

Contents

Introduction

The VULCAN ICE provides a comprehensive enclosure solution for Arcom's VULCAN single board computer. The enclosure can be configured to suit a complete range of embedded applications with options.

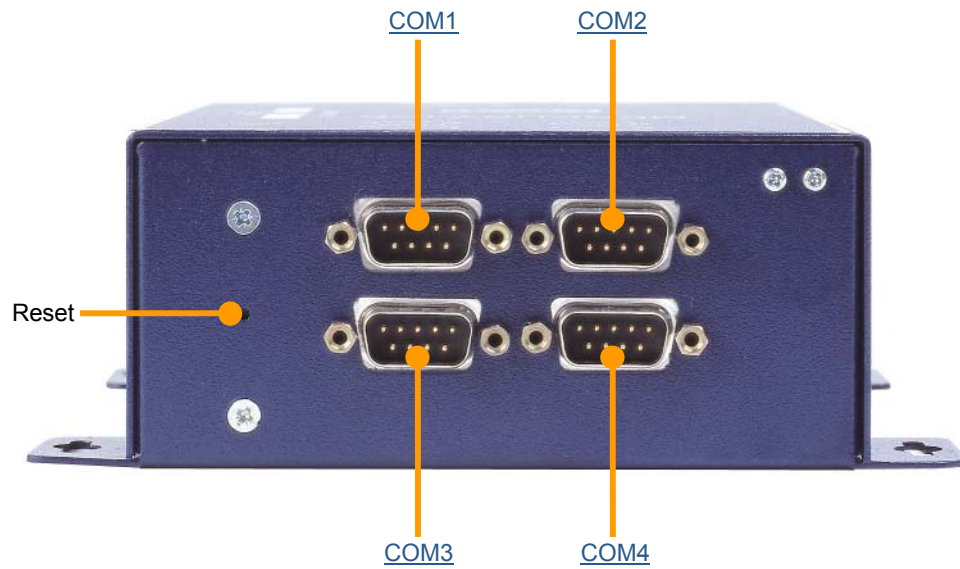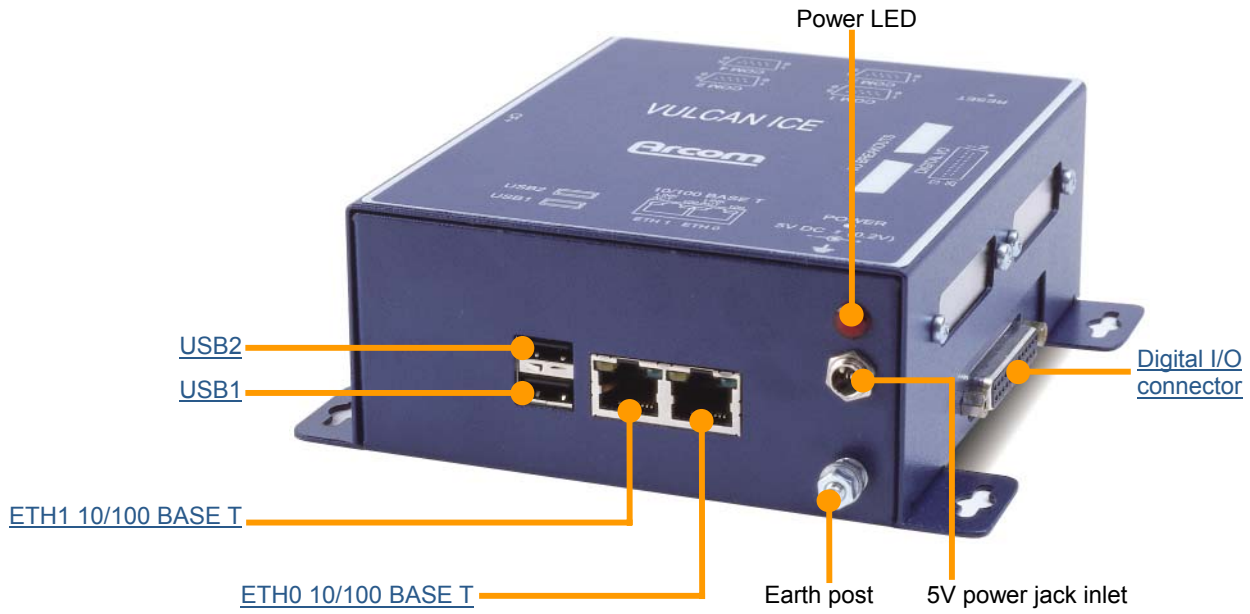The VULCAN ICE is fully CE compliant and is intended for use with all variants of the VULCAN board.

The enclosure contains a VULCAN single board computer with suitable break outs. It includes the following:

- Power input for +5V DC input.

- 3 RS232 serial ports (D type 9-way plugs).

- 1 RS422/485 serial port (D type 9-way plug).

- 1 digital I/O port (D type 25-way socket).

- 2 RJ45 Ethernet ports (10/100Base-T).

- 2 USB 2.0 type A ports.

- Reset button.

- CF+ socket break out.

- Expansion space for a PC/104 card with 2 additional I/O break outs.

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VULCAN ICE 'at a glance'

Power LED

USB2

USB1

ETH1 10/100 BASE T

ETH0 10/100 BASE T

Earth post

5V power jack inlet

Digital I/O connector

COM1   COM2

Reset

COM3   COM4

Handling your board safely

Anti-static handling

> The VULCAN fitted inside the VULCAN ICE contains CMOS devices. These could be damaged in the event of static electricity being discharged through them. At all times, please observe anti-static precautions when handling circuit boards. This includes storing boards in appropriate anti-static packaging and wearing a wrist strap when handling.

Packaging

> Should a board need to be returned to Arcom, please ensure that it is adequately packed, preferably in the original packing material.

About this manual

This manual describes the Industrial Compact Enclosure (ICE) and related interconnections.
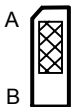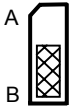
Related documents

The VULCAN ICE Technical Manual is normally supplied as part of the VULCAN Development Kit, which also includes the VULCAN Technical Manual and the Arcom Embedded Linux Quickstart Manual. Other manuals are referred to from time to time. These are provided on the CD-ROM that accompanies your Development Kit.

Conventions

Symbols

The following symbols are used in this guide:

Symbol	Explanation
	Note - information that requires your attention.
	Tip - a handy hint that may provide a useful alternative or save time.
	Caution – proceeding with a course of action may damage your equipment or result in loss of data.
	Jumper fitted on pin A.
	Jumper fitted on pin B.
	Jumper is fitted.
	Jumper is not fitted.

Overview of the VULCAN ICE ports

The VULCAN ICE has a number of ports. These are described below:

Power input jack   The VULCAN enclosure requires a 5V supply. This is connected via a 2.1mm jack. The typical current consumption is 700mA (VULCAN board only).

Ethernet   Two RJ45 Ethernet ports (10/100Base-T):

- 'LINK/ACT' yellow LED flashes when there is Ethernet traffic.

- '100' green LED comes on when a 100Base-T connection is made.

USB 2.0   2 A type USB2.0 ports.

COM1   9-way D type break out for COM1 (RS232).

COM2   9-way D type break out for COM2 (RS232).

COM3   9-way D type break out for COM3 (RS232).

COM4   9-way D type break out for COM4 (RS485/RS422).

Digital I/O   25-way D type break out for TTL digital I/O.

CF+   Break out for CF+ socket.

Spare I/O   It is possible to fit one PC/104 module in the VULCAN enclosure. Two spare locations are included to allow the module to be broken out. These locations are fitted with blanking plates as standard.

Connector details

This section describes the connectors that are included with the VULCAN ICE.

Communication ports

The following tables show the generic conversion from the 40-way box header connector on the VULCAN to the four 9-way D connectors that appear on the outside of the ICE.
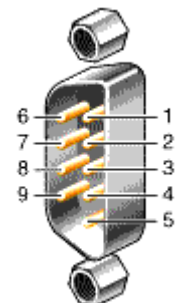
Communication port 1 (RS232)

J7 - VULCAN 40-way box header	Signal name	9-way D type plug
	N/C	1
33	Receive data (RX)	2
35	Transmit data (TX)	3
	N/C	4
39	Ground	5
	N/C	6
34	Request To Send (RTS)	7
36	Clear To Send (CTS)	8
	N/C	9
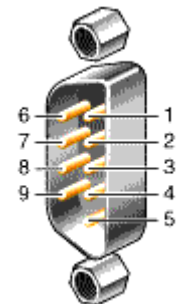
Communication port 2 (RS232)

J7 - VULCAN 40-way box header	Signal name	9-way D type plug
	N/C	1
13	Receive data (RX)	2
15	Transmit data (TX)	3
	N/C	4
17	Ground	5
	N/C	6
14	Request To Send (RTS)	7
16	Clear To Send (CTS)	8
	N/C	9

Communication port 3 (RS232)

J7 - VULCAN 40-way box header	Signal name	9-way D type plug
21	Data Carrier Detect (DCD)	1
23	Receive data (RX)	2
25	Transmit data (TX)	3
27	Data Terminal Ready (DTR)	4
29	Ground	5
22	Data Set Ready (DSR)	6
24	Request To Send (RTS)	7
26	Clear To Send (CTS)	8
28	Ring Indicator (RI)	9

Communication port 4 (RS485/RS422)

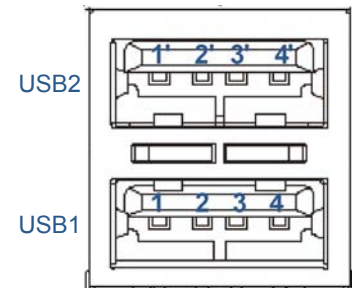| J7 - VULCAN 40-way box header	Signal name	9-way D type plug
	N/C	1
	N/C	2
5	RX/TX+	3
7	RX+	4
9	Ground	5
	N/C	6
6	RX/TX-	7
8	RX-	8
	N/C	9
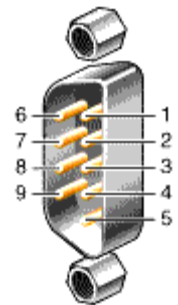
USB 2.0 ports

USB 2.0 uses the dual stacked USB A type receptacle.

The connector is fitted directly to the VULCAN board. Pin assignments are shown in the following table:

USB1	Signal name	USB2	Signal name
1	VBUS1	1'	VBUS2
2	D1-	2'	D2-
3	D1+	3'	D2+
4	GND	4'	GND

Ethernet (10/100Base-T) ports

Ethernet ports use dual shielded RJ45 connectors with LEDs. The connector is fitted directly to the VULCAN board. Pin assignment is shown in the following table:
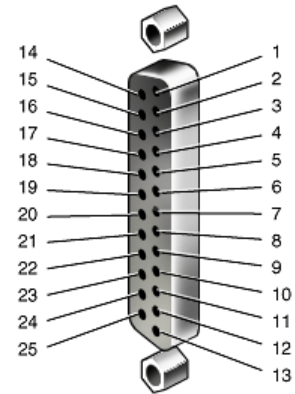
ETH0	Signal name	ETH1	Signal name
1B	TX0+	1A	TX1+
2B	TX0-	2A	TX1-
3B	RX0+	3A	RX1+
4B	N/C	4A	N/C
5B	N/C	5A	N/C
6B	RX0-	6A	RX1-
7B	N/C	7A	N/C
8B	N/C	8A	N/C
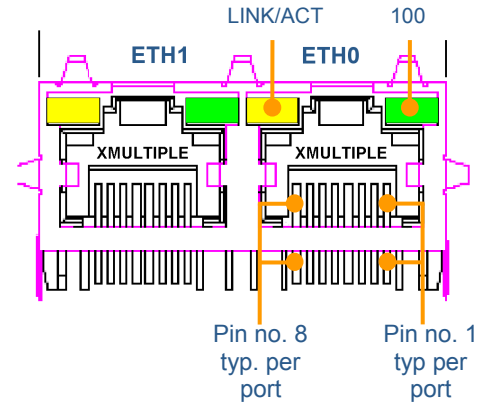
Digital I/O port

The following table shows the generic conversion from the 20-way header connector on the VULCAN to the 25-way D connector on the outside of the ICE:

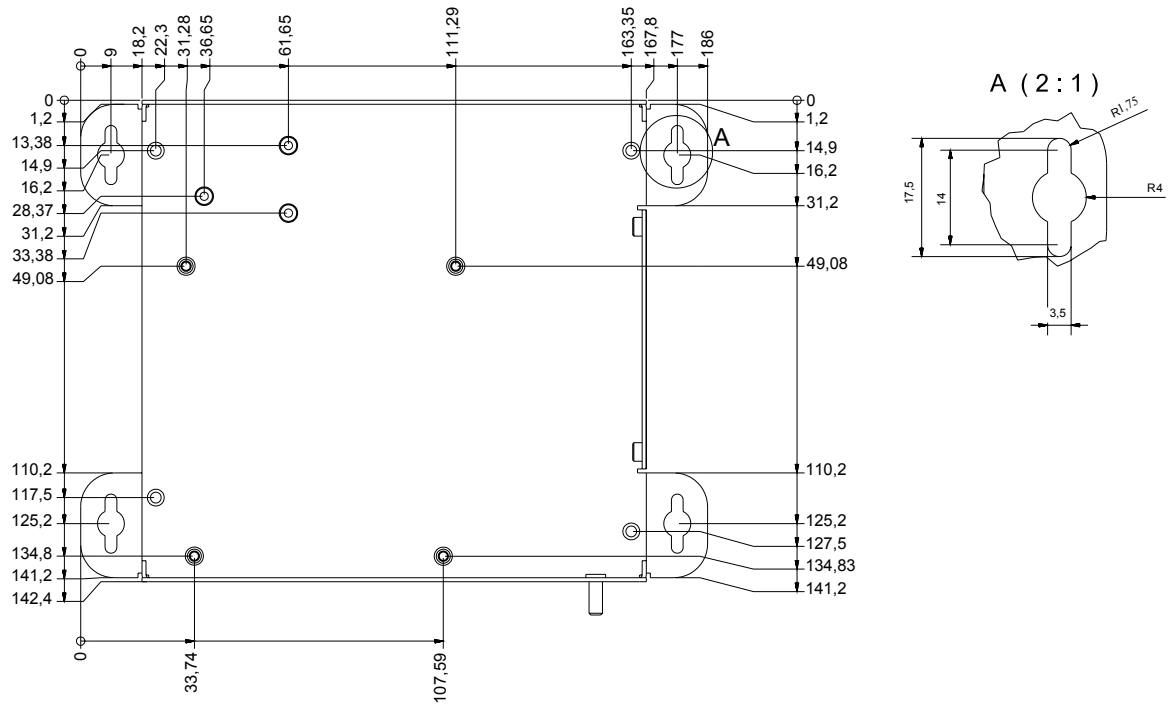| J3 - VULCAN 20-way header	Signal name	25-way D type
1	+5V	1
2	+5V	14
3	IN0	2
4	IN1	15
5	IN2	3
6	IN3	16
7	IN4	4
8	IN5	17
9	IN6	5
10	IN7	18
11	GND	6
12	GND	19
13	OUT0	7
14	OUT1	20
15	OUT2	8
16	OUT3	21
17	OUT4	9
18	OUT5	22
19	OUT6	10
20	OUT7	23
	N/C	11
	N/C	24
	N/C	12
	N/C	25
	N/C	13

Additional I/O break out

The ICE can be fitted with one PC104 I/O card designed to be broken out through the rear of the enclosure. Refer to the following table, which shows the generic conversion from the 50-way IDC connector to the two 25-way D connectors that appear on the outside of the ICE:

50-way IDC pin number	25-way pin number [B]	25-way pin number [A]	50-way IDC pin number	25-way pin number [B]	25-way pin number [A]
1	1		26		1
2	14		27		14
3	2		28		2
4	15		29		15
5	3		30		3
6	16		31		16
7	4		32		4
8	17		33		17
9	5		34		5
10	18		35		18
11	6		36		6
12	19		37		19
13	7		38		7
14	20		39		20
15	8		40		8
16	21		41		21
17	9		42		9
18	22		43		22
19	10		44		10
20	23		45		23
21	11		46		11
22	24		47		24
23	12		48		12
24	25		49		25
25	13		50		13

Mounting details

Front panel dimensions
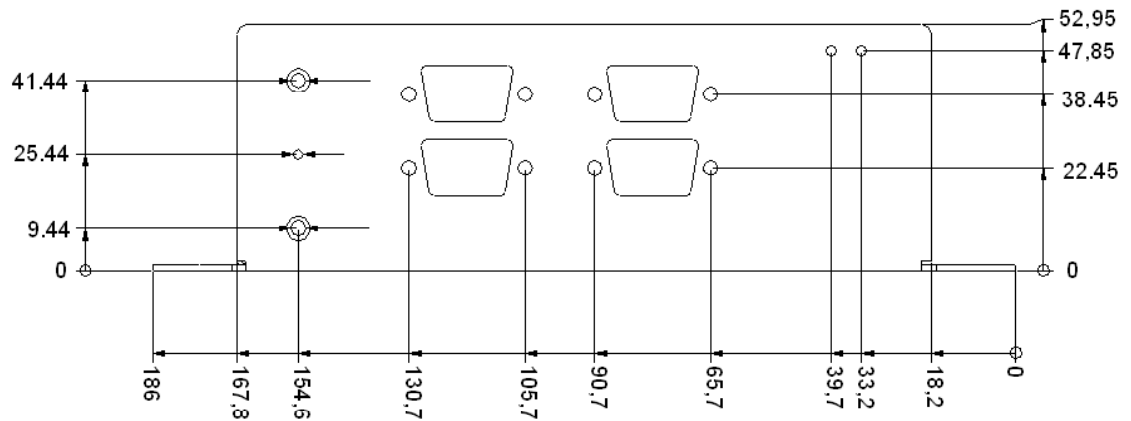
All dimensions in mm.

Back panel dimensions

Left hand side panel dimensions

6 X 'A' HOLES @■3,3

4 X B HOLES
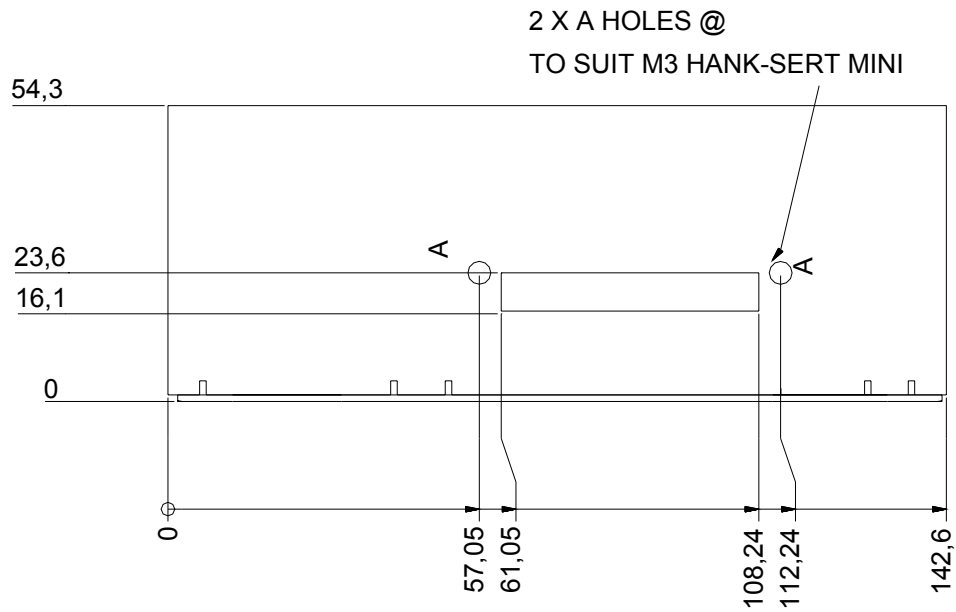25 WAY D PUNCH
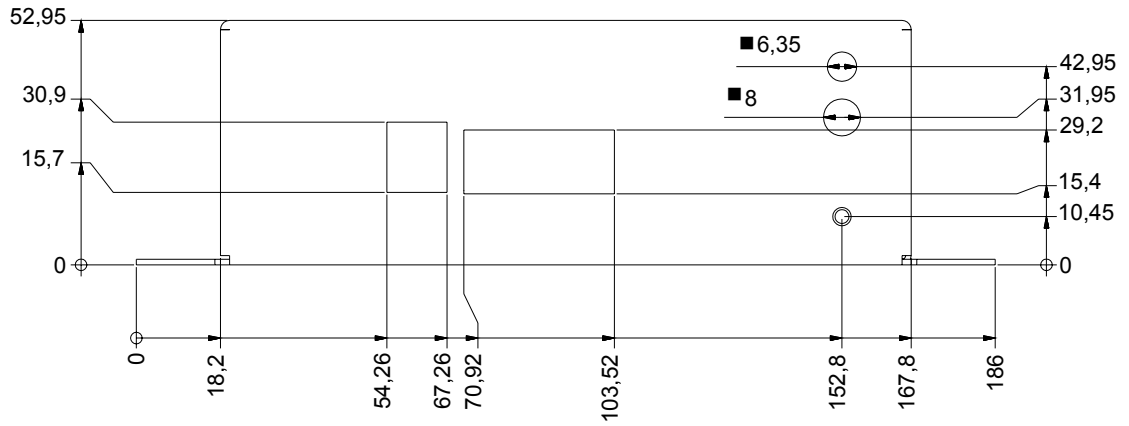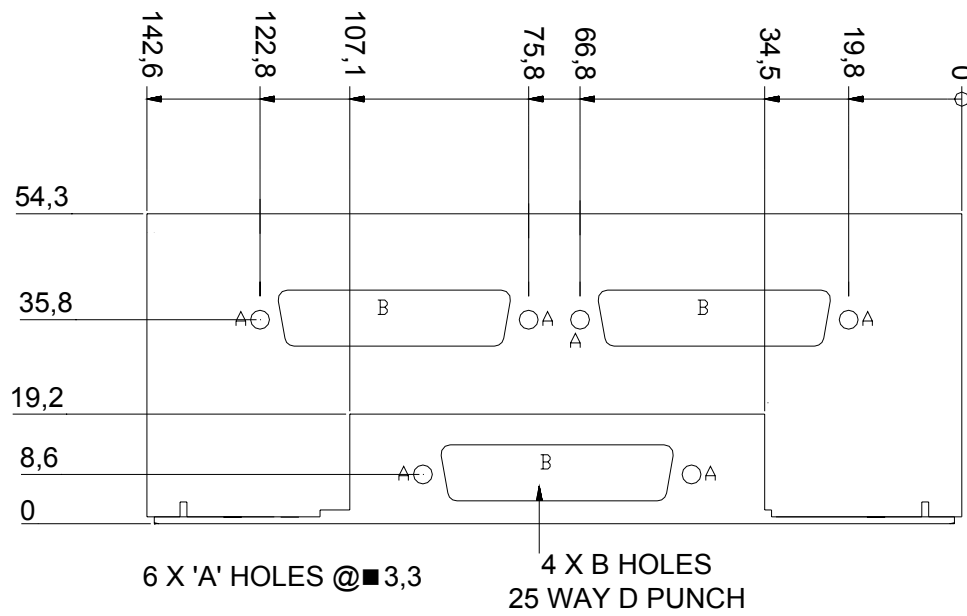
All dimensions in mm.

Right hand side panel dimensions

All dimensions in mm.

The size of the ICE will be increased on the next version of the enclosure. Contact the Arcom Sale team for further details.

Appendix A – Contacting Arcom

Arcom sales

Arcom's sales team is always available to assist you in choosing the board that best meets your requirements. Contact your local sales office or hotline.

Sales office US	*Sales office UK*
Arcom	Arcom
7500W 161st Street	Clifton Road
Overland Park	Cambridge
Kansas	CB1 7EA
66085	UK
USA	
	Tel: 01223 411 200
Tel: 913 549 1000	Fax: 01223 410 457
Fax: 913 549 1002	E-mail: sales@arcom.co.uk
E-mail: us-sales@arcom.com	

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Technical support

Arcom has a team of technical support engineers available to provide a quick *and free* response to your technical queries.

Technical support US	Technical support UK
Tel: 913 549 1010	Tel: +44 (0)1223 412 428
Fax: 913 549 1001	Fax: +44 (0)1223 403 409
E-mail: us-support@arcom.com	E-mail: euro-support@arcom.com

Appendix B – Specification

Power	4.5W maximum (VULCAN board only)
Input voltage	5V DC ± 5%
Temperature	Operating: $-20^{°}$ $(-4^{°}$F) to $+60^{°}$ C $(140^{°}$F)
	Storage: $-20^{°}$ $(-4^{°}$F) to $+85^{°}$ C $(185^{°}$F)
Humidity	10% to 90% RH (non-condensing)
Dimensions	Enclosure body: 120.75 x 142.6 x 53mm.
	Enclosure including mounting feet: 154 x 142.6 x 53mm.

Index