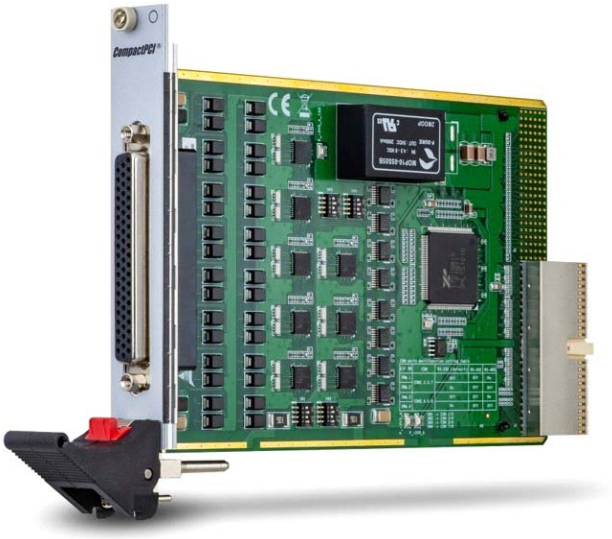
cPCI-3548

3U CompactPCI® 8-port Serial Communication Module

User's Manual



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Part No: 50M-00030-1000

LEADING EDGE COMPUTING

Revision History

Revision	Release Date	Description of Change(s)
1.0	2022-11-14	Initial release

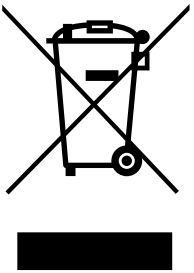
Preface

Disclaimer

The information in this document is subject to change without prior notice in order to improve reliability, design, and function and does not represent a commitment on the part of the manufacturer.

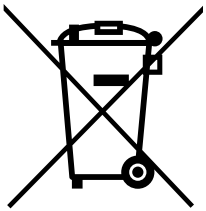
In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

Environmental Responsibility



ADLINK is committed to fulfill its social responsibility to global environmental preservation through compliance with the European Union's Restriction of Hazardous Substances (RoHS) directive and Waste Electrical and Electronic Equipment (WEEE) directive. Environmental protection is a top priority for ADLINK. We have enforced measures to ensure that our products, manufacturing processes, components, and raw materials have as little impact on the environment as possible. When products are at their end of life, our customers are encouraged to dispose of them in accordance with the product disposal and/or recovery programs prescribed by their nation or company.

Battery Labels



California Proposition 65 Warning

WARNING: This product can expose you to chemicals including acrylamide, arsenic, benzene, cadmium, Tris(1,3-dichloro-2-propyl) phosphate (TDCPP), 1,4-Dioxane, formaldehyde, lead, DEHP, styrene, DINP, BBP, PVC, and vinyl materials, which are known to the State of California to cause cancer, and acrylamide, benzene, cadmium, lead, mercury, phthalates, toluene, DEHP, DIDP, DnHP, DBP, BBP, PVC, and vinyl materials, which are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Trademarks

Product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective companies.

Conventions

Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.

Additional information, aids, and tips that help users perform tasks.

Information to prevent ***minor*** physical injury, component damage, data loss, and/or program corruption when trying to complete a task.

Information to prevent ***serious*** physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.

Table of Contents

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List of Figures

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List of Tables

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1 Introduction

1.1 Overview

The cPCI-3548 is a 3U CompactPCI 8-port RS-232/422/485 communication peripheral module with external I/O connected from the front panel using a 62-pin connector or using the module's rear IO. It is compliant with the PICMG 2.0 R3.0 CompactPCI specification.

1.2 Features

- Supports 32-bit/33MHz CompactPCI bus
- 16C550A compatible serial communication controller
- Eight RS-232/422/485 asynchronous communications ports with intelligent buffer
- 2500 VDC signal to ground isolation voltage
- Auto-flow control; change mode by dip switch
- Plug-and-play, IRQ & I/O address automatically assigned by PCI BIOS, shared IRQ
- Surge protectors; rugged DB-62 front I/O connector

1.3 Specifications

PCI Bus Architecture	• PICMG compliance: PICMG 2.0 R3.0 • Bus interface: PCI V2.3, 32-bit/33MHz • I/O operating voltage: 5 V
UART Controller	• MaxLinear XR17D158IV-F • 16C550A compatible
System I/O Mapping	• Assigned by PCI BIOS • Shared IRQ
Flow Control	• RTS/CTS or DTR/DSR Flow Control • Xon/Xoff Software Flow Control
Port Capabilities	• Eight independent RS-232C compatible ports • Max. ports per system: 16 (2 modules)
Isolation Voltage:	• 2500 VDC
Baud Rate	• Each port can be configured to 50-115,200 bps
Connector	• DB62 female connector
OS Support	• Microsoft Windows 7 • Linux 2.6.31
Environmental	• Operating Temperature: 0°C to 60°C • Storage Temperature: -40°C to 85°C • Humidity: 95% @70°C, non-condensing
Dimensions	• 149 mm x 74 mm x 10 mm (L x W x H)

Table 1-1: cPCI-3548 Module Specifications

1.4 UART Controller

MaxLinear XR17D158IV-F

The MaxLinear XR17D158IV-F is an octal PCI to Universal Asynchronous Receiver and Transmitter (UART) controller. The UART has its own 16C550 compatible set of configuration registers, transmit and receive FIFOs of 64 bytes, fully programmable transmit and receive FIFO level trigger levels, transmit and receive FIFO level counters, automatic RTS/CTS or DTR/DSR hardware flow control with programmable hysteresis levels, and automatic software flow control.

1.5 Block Diagram

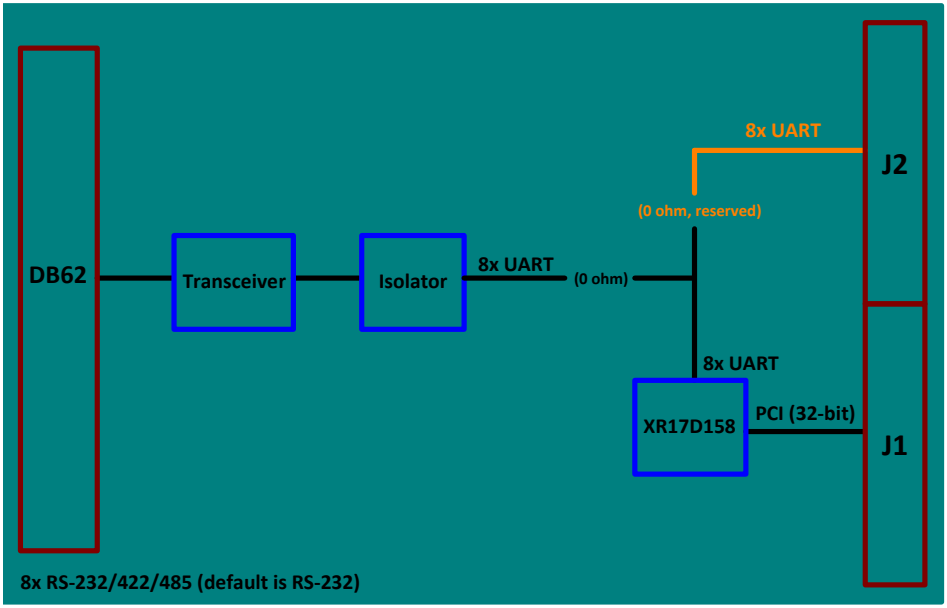


Figure 1-1: cPCI-3548 Module Functional Block Diagram

1.6 Package Contents

The cPCI-3548 is packaged with the following components. If any of the following items are missing or damaged, retain the shipping carton and packing material and contact the dealer for inspection. Please obtain authorization before returning any product to ADLINK. The packing contents of cPCI-3548 non-standard configurations will vary depending on customer requests.

CompactPCI Module

- The cPCI-3548 Module


NOTE:

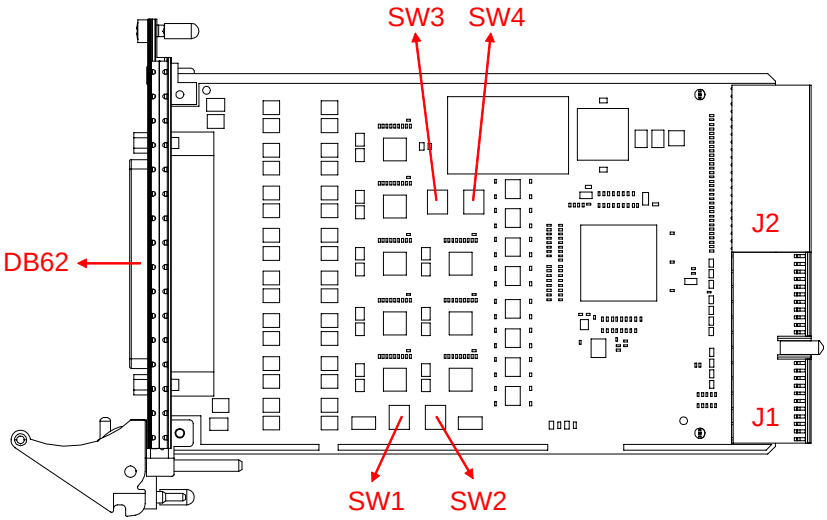
The contents of non-standard cPCI-3548 configurations may vary depending on the customer's requirements.


CAUTION:

This product must be protected from static discharge and physical shock. Never remove any of the components except at a static-free workstation. Use the anti-static bag shipped with the product when putting the board on a surface. Wear an anti-static wrist strap properly grounded on one of the system's ESD ground jacks when installing or servicing system components.

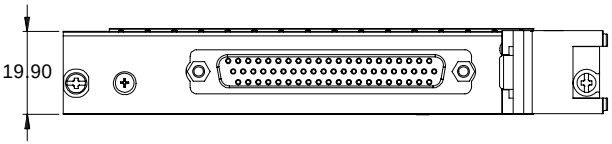
2 Board Interfaces

2.1 Connector and Switch Layout



J1/J2	CompactPCI connectors
SW1-4	COM mode switches
DB62	Front I/O connector

Figure 2-1: cPCI-3548 Connector and Switch Layout



Dimensions: mm

Figure 2-2: cPCI-3548 Front Panel

2.2 Connectors

CompactPCI J1 Connector

Pin	Z	A	B	C	D	E	F
25	GND	+5V	+5V	V(I/O)	V(I/O)	+5V	GND
24	GND	AD1	+5V	V(I/O)	AD0	+5V	GND
23	GND	3.3V	AD4	AD3	+5V	AD2	GND
22	GND	AD7	GND	3.3V	AD6	AD5	GND
21	GND	3.3V	AD9	AD8	M66EN	CBE_L0	GND
20	GND	AD12	GND	V(I/O)	AD11	AD10	GND
19	GND	3.3V	AD15	AD14	GND	AD13	GND
18	GND	SERR_L	GND	3.3V	CPCI_PAR	CPCI_CBE_L1	GND
17	GND	3.3V	IPMB_PWR	IPMB_PWR	GND	PERR_L	GND
16	GND	DEVSEL_L	GND	V(I/O)	STOP_L	NC	GND
15	GND	3.3V	FRAME_L	IRDY_L	BDSEL#	IRDY_L	GND
12-14	Key						
11	GND	AD18	AD17	AD16	GND	CBE_L2	GND
10	GND	AD21	GND	3.3V	AD20	AD19	GND
9	GND	CBE_L3	IDSEL	AD23	GND	AD22	GND
8	GND	AD26	GND	V(I/O)	AD25	AD24	GND
7	GND	AD30	AD29	AD28	GND	AD27	GND
6	GND	NC	GND	3.3V	CPCI_CLK0	AD31	GND
5	GND	NC	NC	RESET_L	GND	NC	GND
4	GND	IPMB_PWR	HEALTHY#	V(I/O)	V(I/O)	V(I/O)	GND
3	GND	INTA#	NC	NC	+5V	NC	GND
2	GND	TCK	+5V	TMS	NC	TDI	GND
1	GND	+5V	NC	TRST#	NC	+5V	GND

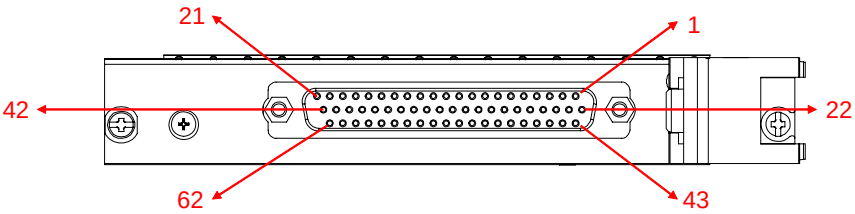
Table 2-1: CompactPCI J1 Connector Pin Definition

CompactPCI J2 Connector

Pin	Z	A	B	C	D	E	F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	NC	GND	NC	NC	NC	GND
20	GND	NC	GND	NC	GND	NC	GND
19	GND	GND	GND	NC	NC	NC	GND
18	GND	NC	NC	NC	GND	NC	GND
17	GND	UART_R_TXD8	GND	UART_R_DTR-L8	UART_R_RTS-L8	NC	GND
16	GND	UART_R_RXD8	UART_R_DSR-L8	UART_R_CTS-L8	GND	UART_R_DCD-L8	GND
15	GND	UART_R_TXD7	GND	UART_R_DTR-L7	UART_R_RTS-L7	NC	GND
14	GND	UART_R_RXD7	UART_R_DSR-L7	UART_R_CTS-L7	GND	UART_R_DCD-L7	GND
13	GND	UART_R_TXD6	GND	CPCI_VIO	UART_R_DTR-L6	UART_R_RTS-L6	GND
12	GND	UART_R_RXD6	UART_R_DSR-L6	UART_R_CTS-L6	GND	UART_R_DCD-L6	GND
11	GND	UART_R_TXD5	GND	CPCI_VIO	UART_R_DTR-L5	UART_R_RTS-L5	GND
10	GND	UART_R_RXD5	UART_R_DSR-L5	UART_R_CTS-L5	GND	UART_R_DCD-L5	GND
9	GND	UART_R_TXD4	GND	CPCI_VIO	UART_R_DTR-L4	UART_R_RTS-L4	GND
8	GND	UART_R_RXD4	UART_R_DSR-L4	UART_R_CTS-L4	GND	UART_R_DCD-L4	GND
7	GND	UART_R_TXD3	GND	CPCI_VIO	UART_R_DTR-L3	UART_R_RTS-L3	GND
6	GND	UART_R_RXD3	UART_R_DSR-L3	UART_R_CTS-L3	GND	UART_R_DCD-L3	GND
5	GND	UART_R_DCD-L2	GND	CPCI_VIO	UART_R_TXD2	UART_R_DTR-L2	GND
4	GND	CPCI_VIO	UART_R_RXD2	UART_R_DSR-L2	GND	UART_R_CTS-L2	GND
3	GND	UART_R_TXD1	GND	UART_R_DTR-L1	UART_R_RTS-L1	UART_R_RTS-L2	GND
2	GND	UART_R_RXD1	UART_R_DSR-L1	CPCI_SYSEN-L	UART_R_CTS-L1	UART_R_DCD-L1	GND
1	GND	+5V	GND	+3V3	+3V3	+5V	GND

Table 2-2: CompactPCI J2 Connector Pin Definition

DB-62 Front I/O Connector (DB62)



Pin	Signal Name	Function
1	TXD_RX+_COM1	TXD (RS-232), RX+ (RS422)
2	DTR-L_RX-_COM1	DTR-L (RS-232), RX- (RS422)
3	RXD_TX+_D+_COM2	RXD (RS-232), TX+ (RS422), D+ (RS-485)
4	DSR-L_COM2	DSR-L (RS-232)
5	DCD-L_TX-_D-_COM2	DCD-L (RS-232), TX- (RS422), D- (RS-485)
6	TXD_RX+_COM3	TXD (RS-232), RX+ (RS422)
7	DTR-L_RX-_COM3	DTR-L (RS-232), RX- (RS422)
8	RXD_TX+_D+_COM4	RXD (RS-232), TX+ (RS422), D+ (RS-485)
9	DSR-L_COM4	DSR-L (RS-232)
10	DCD-L_TX-_D-_COM4	DCD-L (RS-232), TX- (RS422), D- (RS-485)
11	RXD_TX+_D+_COM5	RXD (RS-232), TX+ (RS422), D+ (RS-485)
12	DSR-L_COM5	DSR-L (RS-232)
13	DCD-L_TX-_D-_COM5	DCD-L (RS-232), TX- (RS422), D- (RS-485)
14	TXD_RX+_COM6	TXD (RS-232), RX+ (RS422)
15	DTR-L_RX-_COM6	DTR-L (RS-232), RX- (RS422)
16	RXD_TX+_D+_COM7	RXD (RS-232), TX+ (RS422), D+ (RS-485)
17	DSR-L_COM7	DSR-L (RS-232)
18	DCD-L_TX-_D-_COM7	DCD-L (RS-232), TX- (RS422), D- (RS-485)
19	RXD_TX+_D+_COM8	RXD (RS-232), TX+ (RS422), D+ (RS-485)
20	DSR-L_COM8	DSR-L (RS-232)
21	DCD-L_TX-_D-_COM8	DCD-L (RS-232), TX- (RS422), D- (RS-485)
22	RXD_TX+_D+_COM1	RXD (RS-232), TX+ (RS422), D+ (RS-485)
23	DSR-L_COM1	DSR-L (RS-232)
24	DCD-L_TX-_D-_COM1	DCD-L (RS-232), TX- (RS422), D- (RS-485)

Table 2-3: DB-62 Front I/O Connector Pin Definition

Pin	Signal Name	Function
25	TXD_RX+_COM2	TXD (RS-232), RX+ (RS422)
26	DTR-L_RX-_COM2	DTR-L (RS-232), RX- (RS422)
27	RXD_TX+_D+_COM3	RXD (RS-232), TX+ (RS422), D+ (RS-485)
28	DSR-L_COM3	DSR-L (RS-232)
29	DCD-L_TX-_D-_COM3	DCD-L (RS-232), TX- (RS422), D- (RS-485)
30	TXD_RX+_COM4	TXD (RS-232), RX+ (RS422)
31	DTR-L_RX-_COM4	DTR-L (RS-232), RX- (RS422)
32	GND	Ground
33	TXD_RX+_COM5	TXD (RS-232), RX+ (RS422)
34	DTR-L_RX-_COM5	DTR-L (RS-232), RX- (RS422)
35	RXD_TX+_D+_COM6	RXD (RS-232), TX+ (RS422), D+ (RS-485)
36	DSR-L_COM6	DSR-L (RS-232)
37	DCD-L_TX-_D-_COM6	DCD-L (RS-232), TX- (RS422), D- (RS-485)
38	TXD_RX+_COM7	TXD (RS-232), RX+ (RS422)
39	DTR-L_RX-_COM7	DTR-L (RS-232), RX- (RS422)
40	GND	Ground
41	TXD_RX+_COM8	TXD (RS-232), RX+ (RS422)
42	DTR-L_RX-_COM8	DTR-L (RS-232), RX- (RS422)
43	CTS-L_COM1	CTS-L (RS-232)
44	RTS-L_COM1	RTS-L (RS-232)
45	GND	Ground
46	CTS-L_COM2	CTS-L (RS-232)
47	RTS-L_COM2	RTS-L (RS-232)
48	CTS-L_COM3	CTS-L (RS-232)
49	RTS-L_COM3	RTS-L (RS-232)
50	GND	Ground
51	CTS-L_COM4	CTS-L (RS-232)
52	RTS-L_COM4	RTS-L (RS-232)
53	CTS-L_COM5	CTS-L (RS-232)
54	RTS-L_COM5	RTS-L (RS-232)
55	GND	Ground
56	CTS-L_COM6	CTS-L (RS-232)
57	RTS-L_COM6	RTS-L (RS-232)

Table 2-3: DB-62 Front I/O Connector Pin Definition

Pin	Signal Name	Function
58	GND	Ground
59	CTS-L_COM7	CTS-L (RS-232)
60	RTS-L_COM7	RTS-L (RS-232)
61	CTS-L_COM8	CTS-L (RS-232)
62	RTS-L_COM8	RTS-L (RS-232)

Table 2-3: DB-62 Front I/O Connector Pin Definition

COM Port Signal Definitions

RS-232			
TX	Transmit Data	RX	Receive Data
RTS	Request to Send	CTS	Clear to Send
DSR	Data Set Ready	SG	Signal Ground
DCD	Data Carrier Detect	DTR	Data Terminal Ready

RS-422			
TXD+	Transmit Data Positive	RXD+	Receive Data Positive
TXD-	Transmit Data Negative	RXD-	Receive Data Negative

RS-422			
D+	Data Signal Positive	D-	Data Signal Negative

2.3 COM Mode Switch Settings

The cPCI-3548 has four DIP switches (SW1-4) to set the COM mode to RS-232/422/485. The default setting is RS-232.

COM1/2 Mode Switch Settings

COM Port	SW1	RS-232	RS-422	RS-485
1	Pin 1	Off	Off	On
	Pin 2	On	Off	Off
2	Pin 3	Off	Off	On
	Pin 4	On	Off	Off

COM3/4 Mode Switch Settings

COM Port	SW2	RS-232	RS-422	RS-485
3	Pin 1	Off	Off	On
	Pin 2	On	Off	Off
4	Pin 3	Off	Off	On
	Pin 4	On	Off	Off

COM5/6 Mode Switch Settings

COM Port	SW3	RS-232	RS-422	RS-485
5	Pin 1	Off	Off	On
	Pin 2	On	Off	Off
6	Pin 3	Off	Off	On
	Pin 4	On	Off	Off

COM7/8 Mode Switch Settings

COM Port	SW4	RS-232	RS-422	RS-485
7	Pin 1	Off	Off	On
	Pin 2	On	Off	Off
8	Pin 3	Off	Off	On
	Pin 4	On	Off	Off

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3 Driver Installation

3.1 Windows Driver

Please download the Windows drivers from the ADLINK website at https://www.adlinktech.com/Products/CompactPCI/Peripherals_Accessories/cPCI-3548. The following describes the cPCI-3548 driver installation procedures for Windows 7. Install the Windows operating system before installing any driver. Most standard I/O device drivers are installed during Windows installation. Extract the following files and execute the program to install the corresponding driver.

Windows 7 64-bit:

\cPCI-3548_1.0.0_amd64 (Win7)\cPCI-3548_1.0.0_amd64.exe

Windows 7 32-bit:

\cPCI-3548_1.0.0_x86 (Win7)\cPCI-3548_1.0.0_x86.exe

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Important Safety Instructions

For user safety, please read and follow all **instructions**, **WARNINGS**, **CAUTIONS,** and **NOTES** marked in this manual and on the associated equipment before handling/operating the equipment.

- Read these safety instructions carefully.
- Keep this user's manual for future reference.
- Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- When installing/mounting or uninstalling/removing equipment:
  - Turn off power and unplug any power cords/cables.
- To avoid electrical shock and/or damage to equipment:
  - Keep equipment away from water or liquid sources;
  - Keep equipment away from high heat or high humidity;
  - Keep equipment properly ventilated (do not block or cover ventilation openings);
  - Make sure to use recommended voltage and power source settings;
  - Always install and operate equipment near an easily accessible electrical socket-outlet;
  - Secure the power cord (do not place any object on/over the power cord);
  - Only install/attach and operate equipment on stable surfaces and/or recommended mountings; and,
  - If the equipment will not be used for long periods of time, turn off and unplug the equipment from its power source.

- Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.

A Lithium-type battery may be provided for uninterrupted, backup or emergency power.

Risk of explosion if battery is replaced with one of an incorrect type. Dispose of used batteries appropriately.

- Equipment must be serviced by authorized technicians when:
  - The power cord or plug is damaged;
  - Liquid has penetrated the equipment;
  - It has been exposed to high humidity/moisture;
  - It is not functioning or does not function according to the user's manual;
  - It has been dropped and/or damaged; and/or,
  - It has an obvious sign of breakage.

Getting Service

Ask an Expert: http://askanexpert.adlinktech.com

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