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Serial / USB Communications

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Serial / USB Communications for the Industrial World

Robust Features & Reliable Performance for Rugged Applications

Bridging the connectivity gap

In the hazardous industrial world, equipment investment often rely on standard serial interfaces to communicate. Advantech connectivity solutions are designed with features that allow them to operate successfully in challenging environments. These devices help industrial equipment communicate reliably with each other while protecting them from damaging and costly power spikes, surges and transients.

Advantech serial and USB protocol devices have been supporting data communications and protecting mission critical applications for more than 30 years. Advantech's USB devices are reliably implemented on many factory floors with features such as high data transfer rates, isolation protection, Ethernet conversion, high retention USB ports, and more.

ULI series and ADAM-4500 modules are suitable for establishing cost effective industrial networks. ULI serial and USB converters/repeaters are the best solution for converting RS-232, RS-422, RS-485 and USB, and extending the range of data communication in rugged conditions.

Advantech also has complete range of industrial communication cards-PCI/PCIE series that use the RS-232/422/485 and CAN interfaces. With industrial-grade certification and protection, Advantech serial communication cards are designed for various industrial automation applications.

Features of ULI series, ADAM-4500, and industrial communication cards:

Isolation protection – Isolates data lines from electrical noise

Surge protection – Suppresses and dissipates power line surges

ESD protection – Safeguards against ESD transients

Wide operating temperature – Performance in extreme environments

Port powering – No separate power supply needed

High retention USB ports – Secures USB cables in high vibration use

Modbus support – Widely used industrial device protocol

Approvals, directives, standards – Tested to global compliance standards



Serial Converters, Isolators and Repeaters



Model		ULI-211C	ULI-211CI	ULI-212CI	ULI-213CI
P/N to Order		BB-FOSTCDR	BB-FOSTCDRi	BB-FOSTCDRI-ST	BB-FOSTCDRI-SC
INTERFACE 1	Interface	RS-232, RS-422/485	RS-232, RS-422/485	RS-232, RS-422/485	RS-232, RS-422/485
	Connector	Terminal block	Terminal block	Terminal block	Terminal block
	Port/s	1	1	1	1
INTERFACE 2	Interface	Fiber Optic	Fiber Optic	Fiber Optic	Fiber Optic
	Connector	MM, ST	MM, ST	SM, ST	SM, SC
	Port/s	1	1	1	1
Operating Temperature		-40 to +80°C	-40 to +80°C	-40 to +80°C	-40 to +80°C
Protection		Isolation: 2kV	Isolation: 2kV	Isolation: 2kV	Isolation: 2kV
Power Input		10-30 V _{DC}	10-48 V _{DC}	10-48 V _{DC}	10-48 V _{DC}
Mounting		DIN Rail	DIN Rail	DIN Rail	DIN Rail
Certificates		CE, FCC, KCC UL Recognized (backward R)	CE, FCC, UL C1/D2	CE, FCC, UL 508	CE, FCC, UL 508



Model		ULI-223D	ULI-223T	ULI-224D	ULI-224T
P/N to Order		BB-422PP9R	BB-422PP9TB	BB-4WSD9R	BB-4WSD9TB
INTERFACE 1	Interface	RS-232	RS-232	RS-232	RS-232
	Connector	DB9 female	DB9 female	DB9 female	DB9 female
	Port/s	1	1	1	1
INTERFACE 2	Interface	RS-422	RS-422	RS-422/485 (2&4W)	RS-422/485 (2&4W)
	Connector	DB9 female	Terminal block	DB9 female	Terminal block
	Port/s	1	1	1	1
Operating Temperature		0 to +70°C	0 to +70°C	0 to +70°C	0 to +70°C
Protection		–	–	–	–
Power Input		Port-powered from RS-232	Port-powered from RS-232 (Optional external 12-16 V _{DC} power supply)	Port-powered from RS-232 (Optional external 12 V _{DC} power supply)	Port-powered from RS-232 (Optional external 12 V _{DC} power supply)
Mounting		Inline installation	Inline installation	Inline installation	Inline installation
Certificates		CE, FCC	CE, FCC	CE, FCC	CE, FCC

✓ : supported, – : not supported, △ : optional

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Serial Converters, Isolators and Repeaters



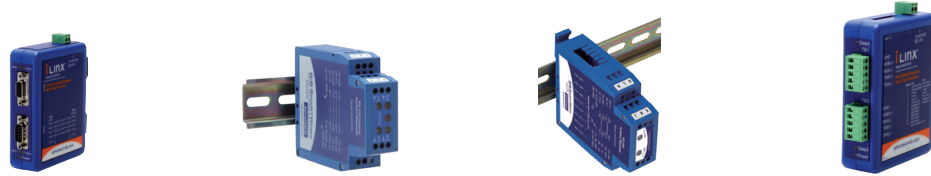
Model		ULI-224TC	ULI-224TCI	ULI-224TCL	ULI-226D
P/N to Order		BB-485LDRC9	BB-485DRCI	BB-4WSD9OTB	BB-485SD9R
INTERFACE 1	Interface	RS-232	RS-232	RS-232	RS-232
	Connector	DB9 female & Terminal block	DB9 female	DB9 female	DB9 female
	Port/s	1	1	1	1
INTERFACE 2	Interface	RS-422/485	RS-422/485	RS-422/485	RS-485
	Connector	Terminal blocks	Terminal block	Terminal block	DB9 female
	Port/s	1	1	1	1
Operating Temperature		-40 to +80°C	-40 to +80°C	0 to +70°C	0 to +70°C
Protection		Isolation: 2kV	Isolation: 2kV	Isolation: 2kV	–
Power Input		10-30 V _{DC}	10-48 V _{DC}	10-48 V _{DC}	Port-powered from RS-232
Mounting		DIN Rail	DIN Rail	Inline installation	Inline installation
Certificates		CE, FCC, cULus, UL508	CE, FCC, KCC, UL C1/D2, UL508	CE, FCC	CE, FCC



Model		ULI-226J	ULI-226T	ULI-227D3	ULI-227D5
P/N to Order		BB-485SD9RJ	BB-485SD9TB	BB-232LPTTL33	BB-232LPTTL
INTERFACE 1	Interface	RS-232	RS-232	RS-232	RS-232
	Connector	DB9 female	DB9 female	DB9 female	DB9 female
	Port/s	1	1	1	1
INTERFACE 2	Interface	RS-485	RS-485	3.3 V _{DC} TTL	5 V _{DC} TTL
	Connector	RJ11 female	Terminal block	DB9 male	DB9 male
	Port/s	1	1	1	1
Operating Temperature		0 to +70°C	0 to +70°C	0 to +70°C	0 to +70°C
Protection		–	–	–	–
Power Input		Port-powered from RS-232	Port-powered from RS-232 (Optional external 12 V _{DC} power supply)	Port-powered from RS-232	Port-powered from RS-232
Mounting		Inline installation	Inline installation	Inline installation	Inline installation
Certificates		CE, FCC	CE, FCC	CE, FCC	CE, FCC

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Serial Isolators and Repeaters



Model	ULI-232DC	ULI-232TC	ULI-234TC	ULI-234TCI
P/N to Order	BB-232OPDRI	BB-232OPDR	BB-485OPDR	BB-485OPDRI
Interface	RS-232	RS-232	RS-422/485	RS-422/485
Connector	DB9 female, DB9 male	Terminal block	Terminal block	(2) Terminal block
Operating Temperature	-40 to +80°C	-40 to +80°C	-40 to +80°C	-40 to +80°C
Protection	Isolation: 2kV on input/output/ power ESD: 8kV	Isolation: 2kV	Isolation: 2kV Surge: 6.5 bi-directional avalanche breakdown device 500W peak power dissipation	Isolation: 2kV on input/output/ power Surge: 600W peak power dissipation
Power Input	10-48 V _{DC}	10-30 V _{DC}	10-30 V _{DC}	10-48 V _{DC}
Enclosure	IP30, plastic	IP30, plastic	IP20, plastic	IP20, plastic
Mounting	DIN rail	DIN rail	DIN rail	DIN rail
Certificates	CE, FCC, KCC, UL C1/D2, UL508	CE, FCC, cULus Listed, UL508	CE, FCC, KCC, cULus Listed, UL508, UL Recognized	CE, FCC, KCC, UL C1/D2

Serial Surge Suppressor and Data Tap/ Splitter



Model	ULI-244TI
P/N to Order	BB-HESP4DR
Serial Technology	Interface
	RS-422/485
	Lines Protected
	(5) RS-422/485
	Connectors, line
	5-position terminal blocks
	Connectors, Equipment
Surge Suppression	5-position terminal blocks
	Grounding
	Dedicated chassis ground lug
	Connections
	Protected signal ground connection Rugged terminal block connections
	Power Input
	No power required
	Clamping Voltage
	72 V _{DC} , minimum
	- stage 1: Gas Discharge Tube
	108 V _{DC} , maximum
	Series Resistance - stage 2: Series Resistor
	2.7 Ohms
	Clamping Voltage
	6.45 V _{DC} , minimum
	- stage 3: Transient Voltage Suppressor
	7.14 V _{DC} , maximum
	Clamping Time
	Less than 5 x10-9 seconds
	Operating Temperature
	-40 to 80°C
	Mounting
	DIN Rail
	Certifications
	CE

Model	ULI-252D	ULI-262D
P/N to Order	BB-9PCDT	BB-9PMDS
Interface	RS-232	RS-232
Connector	DB9 male	DB9 male
Operating Temperature	0 to +70°C	0 to +70°C
Type	RS-232 Data Tap	RS-232 Data Splitter
Power Input	No power required	No power required
Enclosure	plastic	plastic
Mounting	Inline installation	Inline installation
Certificates	CE, FCC	CE, FCC

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Serial Communication

USB Converters and Isolators



Model		ULI-321D	ULI-321DC	ULI-341TC	ULI-341TCK
P/N to Order		BB-232USB9M	BB-USO9ML2-A	BB-USOPTL4	BB-USOPTL4-LS
INTERFACE 1	Interface	USB	USB	USB	USB
	Connector	Type B (Type B to Type A, cable included)	Type B (Type B to Type A, cable included)	Type B (Type B to Type A, cable included)	Type B (Type B to Type A, cable included)
	Port/s	1	1	1	1
	High Retention	–	✓	✓	✓
INTERFACE 2	Interface	RS-232	RS-232	RS-422/485	RS-422/485
	Connector	DB9 male	DB9 male	Terminal block	Terminal block
	Port/s	1	1	1	1
Operating Temperature		0 to +70°C	0 to +70°C	0 to +70°C	0 to +70°C
Protection		–	Isolation: 2kV ESD: 4 kV Contact, 8 kV Air	Isolation: 2kV	Isolation: 2kV
Locked serial Number		–	–	–	✓
Power Input		USB 5 V _{DC}	USB 5 V _{DC}	USB 5 V _{DC}	USB 5 V _{DC}
Mounting		Inline installation	Inline installation	Inline installation	Inline installation
Certificates		CE, FCC	CE, FCC	CE, FCC	CE, FCC



Model		ULI-342TC	ULI-361D	ULI-361T	ULI-361TK
P/N to Order		BB-USOPTL4DR-2	BB-485USB9F-2W	BB-485USBTB-2W-A	BB-485USBTB2WLS-A
INTERFACE 1	Interface	USB	USB	USB	USB
	Connector	Type B (Type B to Type A, cable included)	Type B (Type B to Type A, cable included)	Type B (Type B to Type A, cable included)	Type B (Type B to Type A, cable included)
	Port/s	1	1	1	1
	High Retention	✓	✓	✓	✓
INTERFACE 2	Interface	RS-422/485	RS-485	RS-485	RS-485
	Connector	Terminal block	DB9 Female	Terminal block	Terminal block
	Port/s	2	1	1	1
Operating Temperature		0 to +70°C	0 to +70°C	0 to +70°C	0 to +70°C
Protection		Isolation: 3kV	–	–	–
Locked serial Number		–	–	–	✓
Power Input		USB 5 V _{DC}	USB 5 V _{DC}	USB 5 V _{DC}	USB 5 V _{DC}
Mounting		DIN Rail	Inline installation	Inline installation	Inline installation
Certificates		CE, FCC	CE, FCC	CE, FCC	CE, FCC

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USB Isolators and Hubs



Model		ULI-414CI	ULI-414H	ULI-414I	ULI-414LI
P/N to Order		BB-UHR304	BB-USH204	BB-UHR204	BB-UH104
USB Type		USB 2.0	USB 3.0	USB 2.0	USB 2.0
Downstream	Interface	4	4	4	4
	Type	Type A female	Type A female	Type A female	Type A female
	High Retention	✓	–	✓	✓
Operating Temperature		-40 to +80°C	0 to +40°C	-40 to +80°C	-40 to +80°C
Protection		Isolation: 4kV ESD: 15 kV air, 8kV contact	ESD: 8kV contact	ESD: 15 kV air, 8kV contact	ESD: 15 kV air, 8kV contact
Power Input		10-30 V _{DC}	9-24 V _{DC}	10-30 V _{DC}	USB 5V
Enclosure		IP30, metal	Metal	IP30, metal	IP30, plastic
Mounting		DIN Rail, Desk, Panel	DIN rail	DIN Rail, Desk, Panel	Panel
Certificates		CE, FCC, KCC, UL C1/D2	CE, FCC, KCC	CE, FCC, KCC	CE, FCC



Model		ULI-414LIB	ULI-417CI	ULI-417H	ULI-421CL
P/N to Order		BB-USBHUB4OEM	BB-UHR307	BB-USH207	BB-UH401
USB Type		USB 2.0	USB 2.0	USB 3.0	USB 2.0
Downstream	Interface	4	7	7	1
	Type	Type A female	Type A female	Type A female	Type A female
	High Retention	✓	✓	–	✓
Operating Temperature		-40 to +80°C	-40 to +80°C	0 to +40°C	-40 to +80°C
Protection		ESD: 15 kV air, 8kV contact	Isolation: 4kV ESD: 15 kV air, 8kV contact	ESD: 8kV contact	Isolation: 4kV ESD: 15 kV air, 8kV contact
Power Input		USB 5V	10-30 V _{DC}	9-24 V _{DC}	USB 5V
Enclosure		Open board	IP30, metal	Metal	IP30, plastic
Mounting		OEM	DIN Rail, Desk, Panel	DIN rail	Inline
Certificates		CE, FCC	CE, FCC, KCC, UL C1/D2	CE, FCC, KCC	CE, FCC

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USB Isolators



Model		ULI-422C
P/N to Order		BB-UHR402
Product Series		2-port, 4kV, 12 Mbps Ruggedized
USB Ports	Number of Ports	2
	High Retention USB	✓
	Upstream Port	1 Type B, High Retention
	Downstream Port	2 Type A, High Retention
	Downstream Power	500 mA
	Speed	Smart-selectable: 12 Mbps (full speed) or 1.5 Mbps (low speed)
	USB Protocol	1.1, 2.0
Protection	Isolation	4kV
	ESD Protection (Level 4)	8 kV Contact, 15 kV Air
Specifications	Temperature	0 to +50°C
	Power Input	10 to 30 V _{DC} , external
	DIN Rail Mount	Yes (w/ optional DIN adapter clips)
	Panel Mount	✓
	Shock/Vibration/ Drop	✓
	Certifications	FCC, CE, KCC



Model		USB-4630
P/N to Order		USB-4630-BE
Product Series		USB Hub
Usb Ports	Number of Ports	4
	High Retention USB	–
	Upstream Port	1 Type B
	Downstream Port	4 Type A
	Downstream Power	Ext. Power: 900mA per port BUS Powered: 700mA max., shared by all ports
	Speed	5Gbps (shared by all downstream ports)
	USB Protocol	3.0
Protection	Isolation	2500 V _{DC}
	ESD Protection (Level 4)	8kV (contact) 15kV (air)
Specifications	Temperature	0 ~ 60°C
	Power Input	10 to 30 V _{DC}
	DIN Rail Mount	✓
	Panel Mount	✓
	Shock/Vibration/ Drop	✓
	Certifications	CE/FCC

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Serial Communication Cards

Serial Communication Cards



Bus		PCI Express						
Part Number		PCI-1602	PCI-1604	PCI-1610	PCI-1612	PCI-1620	PCI-1622	PCI-1680U
I/O Ports		2	2	4	4	8	8	2
Communication Interfaces	RS-232	✓	✓	✓	✓	✓	✓	–
	RS-422	✓	–	–	✓	–	✓	–
	RS-485	✓	–	–	✓	–	✓	–
	CAN	–	–	–	–	–	–	✓
Drivers		Windows XP/7/8/10 and Linux						
Protection	ESD	15 kV (air), 8 kV (contact)						
	Isolation	3,000 V _{DC}	3,000 V _{DC}	3,000 V _{DC}	3,000 V _{DC}	–	3,000 V _{DC}	8 kV (air), 4 kV (contact) 1,000 V _{DC}



Bus		PCI Express						
Part Number		PCIE-1602	PCIE-1604	PCIE-1610	PCIE-1612	PCIE-1620	PCIE-1622	PCIE-1680
I/O Ports		2	2	4	4	8	8	2
Communication Interfaces	RS-232	✓	✓	✓	✓	✓	✓	–
	RS-422	✓	–	–	✓	–	✓	–
	RS-485	✓	–	–	✓	–	✓	–
	CAN	–	–	–	–	–	–	✓
Drivers		Windows XP/7/8/10 and Linux						
Protection	ESD	15 kV (air), 8 kV (contact)						
	Isolation	3,000 V _{DC}	3,000 V _{DC}	–	3,000 V _{DC}	–	3,000 V _{DC}	2,500 V _{DC}

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Serial Communication Cards

PC/104 Communication Modules



Bus		PC/104
Part Number		 PCM-3680
I/O Ports		2
Communication Interfaces	Ethernet	–
	RS-232	–
	RS-422	–
	RS-485	–
	CAN	✓
Protection	ESD	8 kV (air), 4 kV (contact)
	Isolation	2,500 V _{DC}

Accessories



Part Number		1700018791-11	OPT4A	OPT8C	 OPT8H	 OPT8J	 OPT1-DB9E
Length		30 cm	30 cm	1 m	1 m	1 m	–
Communication Interfaces	Connector Type	DB37 Male	DB37 Male	DB62 Male	DB62 Male	DB78 Male	DB9 Female
	Qty	1	1	1	1	1	1
	Connector Type	DB25 Male	DB9 Male	DB25 Male	DB9 Male	DB9 Male	10pin Screw Terminal
	Qty	4	4	8	8	8	1
Applications		PCI-1610B, PCI-1610C, PCI-1612B, PCI-1612C, PCIE-1610B, PCIE-1612B, PCIE-1612C	PCI-1610B, PCI-1610C, PCI-1612B, PCI-1612C, PCIE-1610B, PCIE-1612B, PCIE-1612C	PCI-1620A, PCI-1620B, PCIE-1620A, PCIE-1622B	PCI-1620A, PCI-1620B, PCIE-1620A, PCIE-1622B	PCI-1622C, PCIE-1622C	PCI-1602, PCI-1604, PCIE-1602, PCIE-1604, PCI-1610B, PCI-1610C, PCI-1612B, PCI-1612C, PCIE-1610B, PCIE-1612B, PCIE-1612C, PCI-1620A, PCI-1620B, PCIE-1620A, PCIE-1622B, PCI-1680, PCIE-1680, MIOE-3680

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