

**ULI-421CL** BB-UH401  
**ULI-421C** BB-UHR401  
**ULI-422C** BB-UHR402

**Industrial USB 2.0 Isolators**



**Features**

- 4 kV isolation protection for equipment and data
- ESD protection – 15 kV air, 8 kV contact
- 12 Mbps full speed
- USB 1.1 or 2.0 (by model)
- High retention USB connector ports
- One or two port models
- USB cable included
- USB bus or external power (by model)
- Panel, DIN rail or in-line installation (by model)

Advantech one and two port ruggedized USB isolators meet heavy industrial EMC standards. 4 kV isolation between upstream and downstream ports protects equipment and data from ground loops, surges and spikes. The isolators operate in unfriendly electrical environments – near variable frequency drives, motor control centers, welding and other large electrical loads. Downstream port(s) provide 500 mA power to connected USB devices. “High retention” USB connectors hold standard USB cables tight requiring up to 1.45kg (3.2lb) force to disconnect them – perfect for high vibration applications.

**Specifications**

**USB Technology**

| Model #:   | Upstream Port:                    | Downstream Ports:                 | Data Rate:        | Standards: |
|------------|-----------------------------------|-----------------------------------|-------------------|------------|
| ULI-421CL* |                                   | (1) Type A female, high retention | 12 Mbps           | 2.0, 1.1   |
| ULI-421C†  | (1) Type B female, high retention | (1) Type A female, high retention | 1.5 Mbps, 12 Mbps |            |
| ULI-422C†  |                                   | (2) Type A female, high retention | 1.5 Mbps, 12 Mbps |            |

\* Device is transparent to operating system, software drivers not required, and will not be enumerated in device manager.  
 † Speed: 12 Mbps multi-transaction translator, 1 per port.

**Isolation & ESD Protections**

| Model #:  | Optical Isolation:            | ESD Protection:         |
|-----------|-------------------------------|-------------------------|
| ULI-421CL | 4 kV (upstream to downstream) | 15 kV air, 8 kV contact |
| ULI-421C  |                               |                         |
| ULI-422C  |                               |                         |

**Power**

**LED Indicators**

Power, Port/s Beady

| Model #:  | Source:                  | Input Voltage: | Connector:                    | Consumption: | Downstream, per port:                                   |
|-----------|--------------------------|----------------|-------------------------------|--------------|---|
| ULI-421CL | USB Bus                  | 5 Vdc          | –                             | –            | Up to 100mA (with full-power 500mA upstream connection) |
| ULI-421C  | External PSU‡ (required) | 10-30 Vdc      | Threaded barrel jack, center+ | 4 W          | 500 mA  |
| ULI-422C  |                          |                |                               | 7 W          |   |

‡ Included PSU: 110–240 Vac input; 12 Vdc output; 50/60 Hz; US, EU, UK blades included.

**Environmental**

| Model #:  | Operating Temperature: | Storage Temperature: | Humidity:                |
|-----------|------------------------|----------------------|--------------------------|
| ULI-421CL | -40 to +80 °C          | -40 to +85 °C        | 0 to +95, non-condensing |
| ULI-421C* | 0 to +50 °C            |                      |                          |
| ULI-422C* |                        |                      |                          |

\*Temperature rating limited due to included Power Supply Unit. Without PSU, rating is -40 to 85 °C

**Mechanical**

| Model #:  | Enclosure:    | Mounting:       | Dimensions, mm:    | Weight, gm: | USB Cable:      |
|-----------|---------------|-----------------|--------------------|-------------|-----------------|
| ULI-421CL | IP30, plastic | In-line         | 43.2 x 50.8 x 20.3 | 22.7        | Included, 0.9 m |
| ULI-421C  |               | Panel, DIN rail | 79 x 54 x 27       | 80          | Included, 1.8 m |
| ULI-422C  |               |                 |                    |             |                 |

**Meantime Between Failures (MTBF)**

**Calculation Method**

MIL217F Parts Count Reliability Prediction

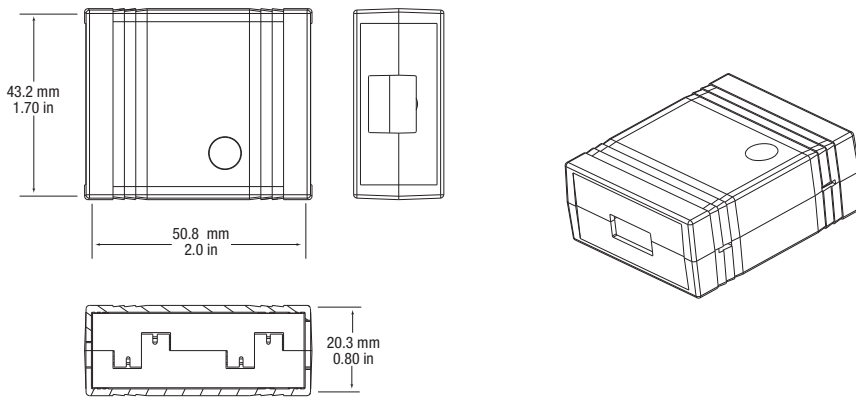
| Model #:  | Hours:  |
|-----------|---------|
| ULI-421CL | 1049851 |
| ULI-421C  | 375842  |
| ULI-422C  | 353807  |

### Regulatory/Approvals/Certifications

| Model #:  | Approvals:   | CE Directives:   | CE Standards:  | Standards - other:  |
|-----------|--|--|--|---|
| ULI-421CL | FCC Class A, CISPR 32, CE, KCC MSIP ID#: MSIP-REI-AAD-BB-UH401               | 2014/30/EU – Electromagnetic Compatibility Directive<br><br>2011/65/EU amended by 2015/863/EU – Reduction of Hazardous Substances Directive (RoHS) | EMC:<br>EN 55032 + AC, Class A – Information Technology Equipment<br>EN 61000-6-4 – Generic Emissions Standard for (Heavy) Industrial Environments<br>EN61000-6-2 Generic Immunity Standard for (Heavy) Industrial Environments  | –   |
| ULI-421C  | FCC, CE, KCC R(MSIP) ID#: MSIP-REM-AKO-UHR401 (Models BB-UHR-401, BB-UHR402) | 2012/19/EU – Waste Electrical and Electronic Equipment Directive (WEEE)  | EMC:<br>EN 55032 Class B – Electromagnetic Compatibility of Multimedia Equipment - Emission Requirements<br>EN 55024 – Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement<br>EN 61000-6-4 +A1 – Generic Emission Standard for Industrial Environments<br>EN 61000-6-2 – Generic Immunity Standard for Industrial Environments | IEC60068-2-27 – (Shock) 50G Peak, 11 ms, 3 axes<br>IEC60068-2-6 – (Vibration) 4G, 140-500 Hz, 3 axes<br>IEC60068-2-32 – (Drop) 10 drops from sides, corner, edges |

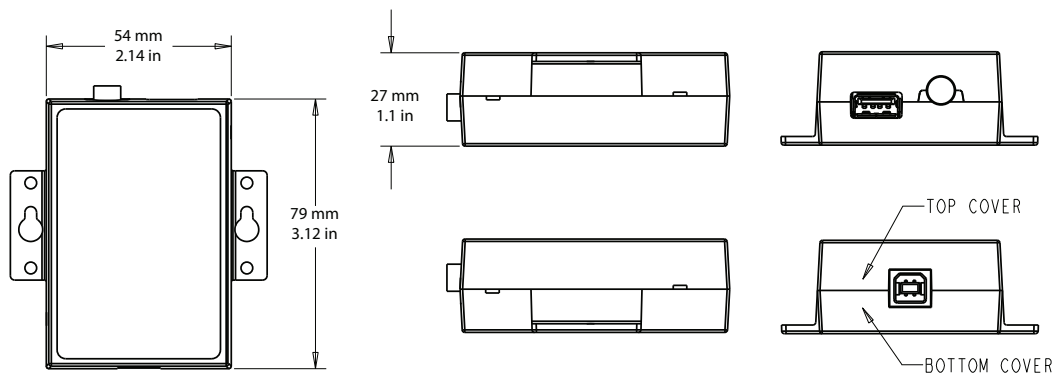
### Dimensions - ULI-421CL

Unit = mm / in



### Dimensions - ULI-421C, ULI-422C

Unit = mm / in



### Ordering Information

| Model Number | Part Number to Order | Description   |
|--------------|----------------------|---|
| ULI-421CL    | BB-UH401             | Industrial USB 2.0 Isolator, 1-port, USB port power. (0.9 m USB cable included.)                                  |
| ULI-421C     | BB-UHR401            | Industrial USB 2.0 Isolator, 1-port, External power. (1.8 m USB cable included; 12 Vdc wall plug-in PSU included) |
| ULI-422C     | BB-UHR402            | Industrial USB 2.0 Isolator, 2-port, External power. (1.8 m USB cable included; 12 Vdc wall plug-in PSU included) |

# ULI-421 Series Selection Guide

## Industrial USB 2.0 Isolators



### Common Features

- 4 kV isolation protection for equipment and data
- ESD protection – 15 kV air, 8 kV contact
- 12 Mbps full speed
- USB 1.1 or 2.0 (by model)
- High retention USB connector ports
- One or two port models
- USB cable included
- USB bus or external power (by model)
- Panel, DIN rail or in-line installation (by model)

### Industrial USB 2.0 Isolators Comparison Table

| Model Number                            | ULI-421CL  | ULI-421C  | ULI-422C  |  |
|---|--|---|---|--|
| Part Number to Order                    | BB-UH401   | BB-UHR401   | BB-UHR402   |  |
| Description                             | USB 2.0 Industrial Isolators   |   |   |  |
| Upstream Port                           | 1  |   |   |  |
| Upstream Connector                      | USB Type B (Female), high retention  |   |   |  |
| Downstream Port/s                       | 1  |   | 2   |  |
| Downstream Connector                    | USB Type A (Female), high retention  |   |   |  |
| Data Rate, max.                         | 12 Mbps<br>*UH401 has a fixed data rate of 12 Mbps   | 1.5 Mbps, 12 Mbps   |   |  |
| USB Standards                           | 2.0, 1.1   |   |   |  |
| LED Indicators                          | Power  | Power Port/s Ready  |   |  |
| ESD Protection                          | 15 kV air, 8 kV contact  |   |   |  |
| Optical Isolation                       | 4 kV (upstream to downstream)  |   |   |  |
| Operating Temperature                   | -40 to +80 °C  | 0 to +50 °C<br>* Temperature rating limited due to included Power Supply Unit. Without PSU, rating is -40 to 85 °C  |   |  |
| Power Source                            | USB port   | External PSU (required, included)   |   |  |
| Power Input                             | 5 Vdc  | 10-30 Vdc   |   |  |
| Power Connector                         | –  | Locking barrel jack, threaded, center positive  |   |  |
| Power Consumption                       | –  | 4 W (external PSU)  | 7 W (external PSU)  |  |
| Downstream Power                        | 100 mA<br>(with full-power 500mA upstream connection)  | 500 mA  |   |  |
| Enclosure                               | IP30, plastic  |   |   |  |
| Mounting Installation                   | In-line  | DIN rail, panel   |   |  |
| Dimensions, mm                          | 43.2 x 50.8 x 20.3   | 79 x 54 x 27  |   |  |
| MTBF (MIL217F), hours                   | 1049851  | 375842  | 353807  |  |
| Regulatory / Approvals / Certifications | FCC Class A, CISPR32, CE, KCC MSIP ID#: MSIP-REI-AAD-BB-UH401<br>2014/30/EU – Electromagnetic Compatibility Directive<br>2011/65/EU amended by 2015/863/ EU – Reduction of Hazardous Substances Directive (RoHS)<br>2012/19/EU – Waste Electrical and Electronic Equipment Directive (WEEE)<br>EMC:<br>EN 55032 + AC, Class A – Information Technology Equipment<br>EN 61000-6-4 – Generic Emissions Standard for (Heavy) Industrial Environments<br>EN61000-6-2 – Generic Immunity Standard for (Heavy) Industrial Environments | FCC, CE, KCC R(MSIP) ID#:MSIP-REM-AKO- UHR401 (Models BBUHR-401, BB-UHR402)<br>EMC:<br>EN 55032 Class B – Electromagnetic Compatibility of Multimedia Equipment - Emission Requirements<br>EN 55024 – Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement<br>EN 61000-6-4 +A1 – Generic Emission Standard for Industrial Environments<br>EN 61000-6-2 – Generic Immunity Standard for Industrial Environments | IEC60068-2-27 – (Shock) 50G Peak, 11 ms, 3 axes<br>IEC60068-2-6 – (Vibration) 4G, 140-500 Hz, 3 axes<br>IEC60068-2-32 – (Drop) 10 drops from sides, corner, edges |  |