



# CooLinkBridge for ActronAir

## User Manual

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# Table of Contents

<b>1. Introduction</b>	<b>3</b>
1.1 Compatibility	3
<b>2. Overview</b>	<b>4</b>
2.1 Conventions	4
2.2 Revisions History	4
2.3 Related Documentation	5
2.4 Acronyms and Abbreviations	5
<b>3. System Layout and Connectivity</b>	<b>6</b>
3.1 Power	6
3.2 Device Layout and Connectivity	6
3.2.1 Mini USB Device Connector	6
3.2.2 RS232 I/O Connector	7
3.2.3 Power, HVAC, Modbus Connector	7
3.2.4 ETH Connector	8
3.2.5 LCD Screen	9
<b>4. Installation Guidelines</b>	<b>10</b>
4.1 How to connect	10
4.1.1 Connection of CoolLinkBridge to ICAMIB-MOD	10
4.1.2 Connection of CoolLinkBridge to ICUNO-MOD	11
4.2 Functional Limitations	12
<b>5. Configuration</b>	<b>13</b>
5.1 Network Configuration	13
5.1.1 Query network settings	14
5.1.2 Configure fixed IP and Gateway	14
5.1.3 Configure DHCP client operation	14
5.1.4 Disable Ethernet	14
<b>6. Specifications</b>	<b>15</b>

# 1. Introduction

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This User Manual (UM) provides the information necessary, for installers and integrators, to effectively use the CoolLinkBridge for connecting with ActronAir systems.

## 1.1 Compatibility

CoolLinkBridge Model	Zone controller Manufacturer	Models	Notes
CoolLinkBridge ACT	ActronAir	ESP Plus Series 1 & 2 ESP Ultima Series 1 & 2 ESP Platinum Plus ESP Platinum Ultima Classic models (except SRA230 and SRA260) manufactured after October 2013	ICAMIB-MOD "BMS MODBUS 485" Adapter Required
CoolLinkBridge ACT	ActronAir	Classic Series 2	Classic Series 2 ICUNO-MOD Adapter required

## 2. Overview

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The CoolLinkBridge enables integration of the ActronAir systems with Home Automation and BMS (Building Management System) controllers.

When controlling the ActronAir systems through the CoolLinkBridge, the user is able to control the AC unit and each zone as if it was a separate Indoor unit.

The CoolLinkBridge comprise of the following capabilities and interfaces:

- RS232 (ASCII)
- RS485 Modbus RTU (according to the EIA/TIA-485 standard), BACnet MSTP
- Ethernet (ASCII, Modbus IP, REST, BACnet IP) for control and monitoring of the HVAC system's operation
- KNX (Optional).
- Remote access via smart phone, tablet or PC using the CoolRemote cloud application

### 2.1 Conventions

This document provides screen prints and corresponding narrative to describe how to use the CoolLinkBridge.

When an action is required on the part of the reader, it is indicated by a line beginning with the word "Action:" For example:

**Action:** Click on OK.

Fields or buttons to be acted upon are indicated in bold italics in the Action statement; links to be acted upon are indicated as links in underlined blue text in the Action statement.

**Note:** The term 'user' is used throughout this document to refer to a person who requires and/or has acquired access to the CoolLinkBridge.

### 2.2 Revisions History

Version Number	Date	Author/Owner	Description of Change
0.1	15/9/2019	CA	Preliminary CoolLinkBridge <i>ACR</i> manual

Table 1 - Record of Changes to document

## 2.3 Related Documentation

Document Name	Document Location and/or URL
BACnet integration guidelines	<a href="https://coolautomation.com/lib/doc/CoolMasterNet/manual/CoolMasterNet-BACnet-guidelines.pdf">https://coolautomation.com/lib/doc/CoolMasterNet/manual/CoolMasterNet-BACnet-guidelines.pdf</a>
Modbus Integration Guidelines	<a href="http://coolautomation.com/lib/doc/manual/Modbus-guidelines.pdf">http://coolautomation.com/lib/doc/manual/Modbus-guidelines.pdf</a>

Table 2 - Referenced Documents

## 2.4 Acronyms and Abbreviations

Acronym	Literal Translation
DTE	Data Terminal Equipment
GPIO	General Purpose Input / Output
HVAC	Heating Ventilation and Air Conditioning
N.C.	Not Connected
TBD	To Be Defined

Table 3 – Acronyms and Abbreviations

## 3. System Layout and Connectivity

The following sub-sections provide details on the different connectivity options of the system and how to use the various functions of the CoolLinkBridge.

### 3.1 Power

The CoolLinkBridge can be powered by one of the following methods:

- AC/DC adapter via VDC+ and VDC- terminals
- 12-24V DC from HVAC or other equipment via VDC+ and VDC- terminals
- USB device port

**Note:** Unit is shipped without power adapter.

### 3.2 Device Layout and Connectivity

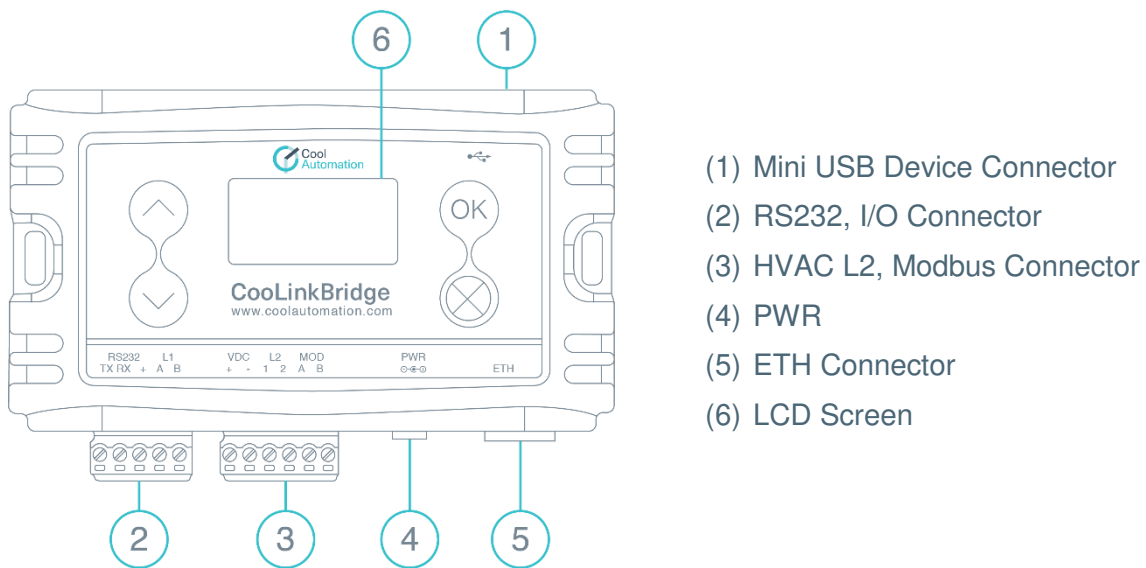


Figure 2 – Device Layout

#### 3.2.1 Mini USB Device Connector

Used to connect the CoolLinkBridge to the PC USB Host for firmware updates and maintenance operations.

### 3.2.2 RS232 I/O Connector

The RS232 Interface in CoolLinkBridge is available from the RS232 I/O connector. An adapter cable routes RS232 signals to the DB9 connector according to the table below:

RS232/I/O Pin	Pin Name	DP9 Pin	Signal Level	Function Description
1	RS232_TX	2	±12V	TxD Data from CoolLinkBridge
2	RS232_RX	3	±12V	RxD Data to CoolLinkBridge
3	VDC-	5	GND	Ground
4	L1 A			
5	L1 B			

Table 4 – RS232 I/O connector – RS232 to DB9 pin mapping

The length of the RS232 cable should not exceed 25m.

The default CoolLinkBridge RS232 port settings are:

Parameter	Value
Baud Rate	9600
Data Bits	8
Parity Control	None
Stop Bits	1
Flow Control	None

Table 5 – RS232 port settings

By default, the RS232 interface is dedicated for the ASCII I/F protocol.

### 3.2.3 Power, HVAC, Modbus Connector

Pin Number	Pin Name	Function
1	VDC+	Input Voltage (optional)
2	VDC-	Ground (optional)
3	L2 1	BMS port on Modbus Adaptor (ICAMIB-MOD or ICUNO-MOD)
4	L2 2	BMS port on Modbus Adaptor (ICAMIB-MOD or ICUNO-MOD)
5	MOD_A	Modbus A(+) Terminal
6	MOD_B	Modbus B(-) Terminal

Table 6 - Power, HVAC, Modbus Connector

By default, terminals MOD A and MOD B are used as an RS485 Interface line for DTE connection. CoolLinkBridge supports the following RS485-based protocol:

- Modbus RTU (Slave mode)
- BACnet MSTP

### 3.2.4 ETH Connector

The CoolLinkBridge incorporates an IEEE 802.3 compatible 10/100 Mb/s Ethernet port via an RJ45 connector. Below are the main port features.

Parameter	Value	Notes
Max Ethernet cable length	137m	CAT5 twisted pair cable
Bit Rate	10/100 Mb/s	
Supported Ethernet Protocols	10BASE-T/100BASE-TX	
Protocol Auto-Negotiation	Enabled	Against Link Partner

Table 7 - Ethernet port features

The RJ45 connector comprises Link and Activity indication LEDs used as specified below.

LED	Color	Function
Link LED	Green	ON for good link OFF for no link
Activity LED	Orange	BLINK for Tx/Rx activity

Table 8 - Ethernet activity indication LED

The Ethernet interface is used by a number of protocols available in the CoolLinkBridge

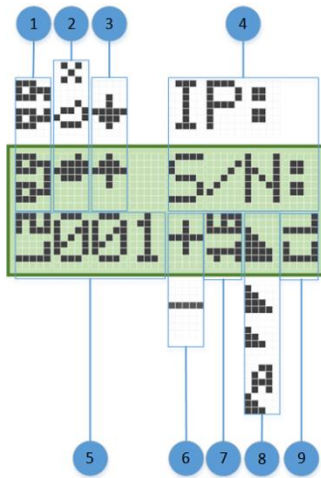
- ASCII I/F (via the ASCII I/F IP server)
- CoolRemote (cloud integration)
- Modbus IP
- BACnet IP
- REST API

**Network settings** of the CoolLinkBridge are controlled using the [\*ifconfig command\*](#).



### 3.2.5 LCD Screen

The CoolLinkBridge is equipped with an alphanumeric 8x2 characters LCD that presents important device parametric and status information.



- (1) ETH network connection status: Disconnected, Connected
- (2) CoolRemote cloud connection status: Not connected, Connected, communication in progress
- (3) HVAC line communication status: RX, TX
- (4) IP address (if acquired) and S/N are displayed (1 min toggle)
- (5) Indoor unit UID (L2.001 on this picture)
- (6) Indoor unit status: ON, OFF
- (7) Set temperature
- (8) Fan speed: High, Medium, Low, Auto
- (9) Operation mode: CL - Cool, HT - Heat, FA - Fan, DR - Dry, AU - Auto

## 4. Installation Guidelines

### 4.1 How to connect

#### 4.1.1 Connection of CoolLinkBridge to ICAMIB-MOD

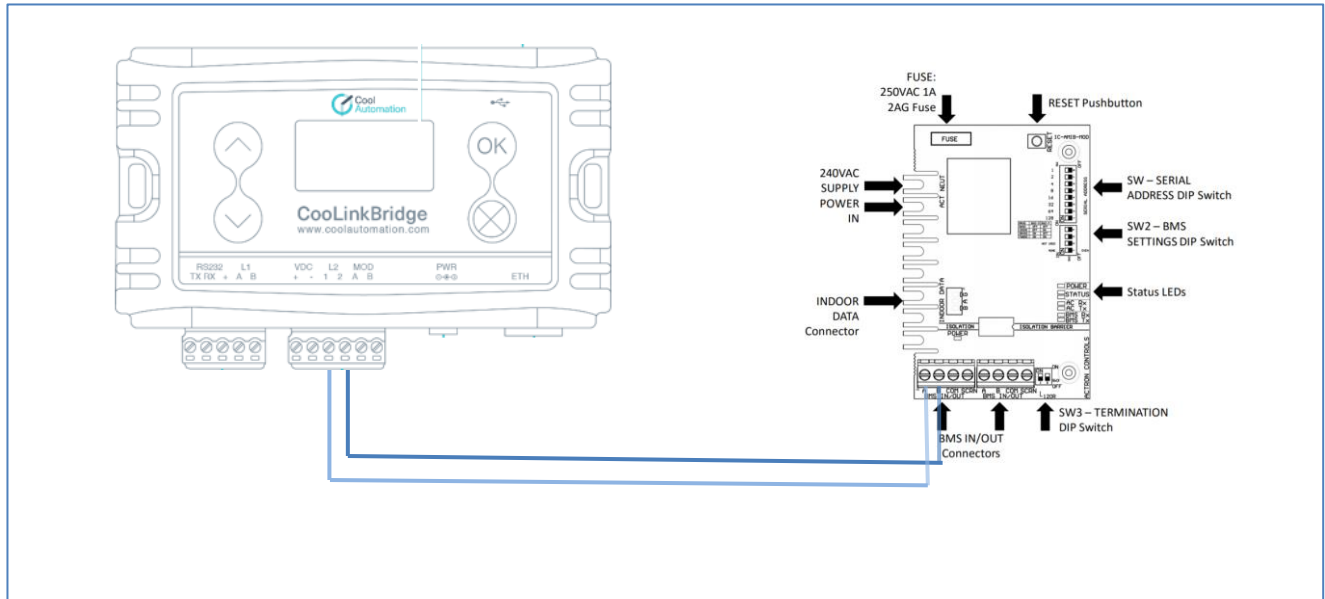


Figure 1 - Installation diagram using ICAMIB-MOD

- The CoolLinkBridge is connected to the ActronAir systems through the ICAMIB-MOD (Modbus 485) adaptor. Please refer to ActronAir documentation for more information on this adaptor.
- The ICAMB-MOD should be set to Baud rate - 9600, Parity - None (refer to configuration guidelines of the device).
- Connect **L2 Terminals 1,2** on the CoolLinkBridge to the **BMS IN/OUT A,B terminals** on the ICAMIB-MOD adaptor.
- Connect the CoolLinkBridge to power through one of the options as indicated in section [3.2.3 above](#).
- Once connected you can integrate with your preferred automation system or BMS over the related interface/protocol and start controlling the zones.
- You can also control the zones through the CoolRemote application. You only have to connect the CoolLinkBridge to the internet, scan the QR-Code at the bottom of the device and follow the registration procedure.

## 4.1.2 Connection of CoolLinkBridge to ICUNO-MOD

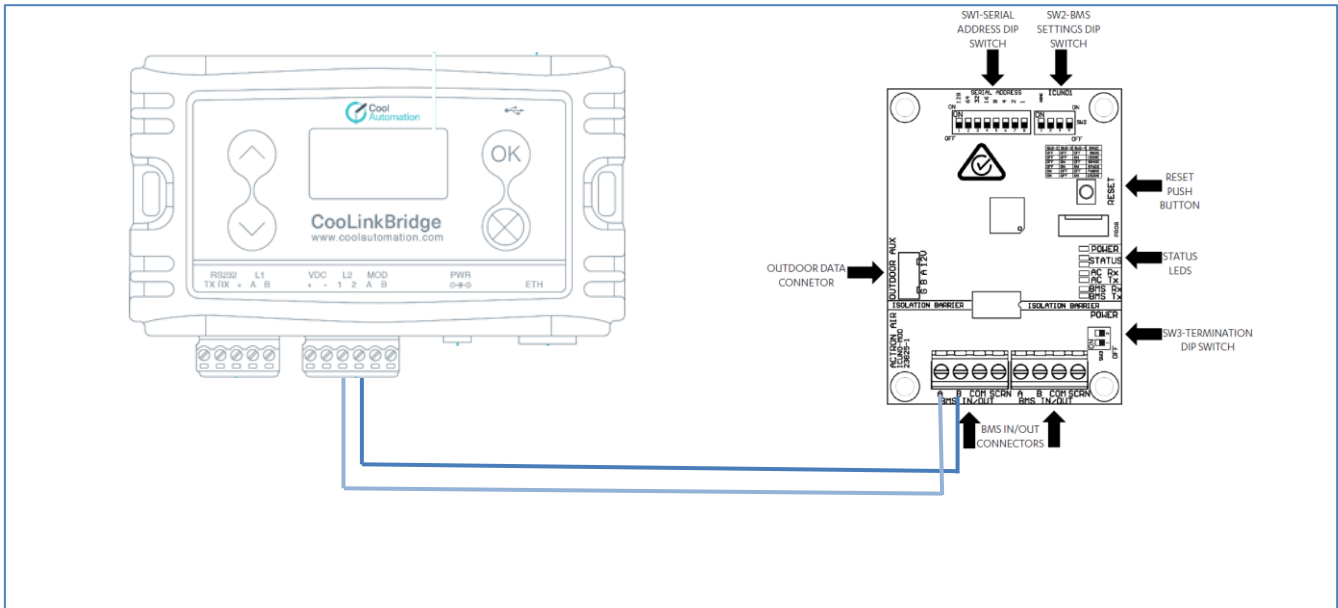


Figure 2 - Installation diagram using ICUNO-MOD

- The CoolLinkBridge is connected to the ActronAir systems through the ICUNO-MOD (Modbus 485) adaptor. Please refer to ActronAir documentation for more information on this adaptor.
- The ICUNO-MOD should be set to Baud rate - 9600, Parity - Even (refer to configuration guidelines of the device).
- Connect **L2 Terminals 1,2** on the CoolLinkBridge to the **BMS IN/OUT A,B terminals** on the ICUNO-MOD adaptor.
- Connect the CoolLinkBridge to power through one of the options as indicated in section [3.2.3 above](#) .
- Once connected you can integrate with your preferred automation system or BMS over the related interface/protocol and start controlling the zones.
- You can also control the zones through the CoolRemote application. You only have to connect the CoolLinkBridge to the internet, scan the QR-Code at the bottom of the device and follow the registration procedure.
- Indoor IUD shows "L2.XXY".
  - XX = If a unit has a slave ID of 1, unit will appear as L2.01Y.
  - Note: For IDs above 99, a hexadecimal character is used to represent the upper two decimal digits. For example, a Slave ID of 127 will display as "C7".
  - Y = Zone number. E.g. L2.011 controls Zone 1 for Unit 1.

## 4.2 Functional Limitations

The following limitations should be considered when installing and integrating with the CoolLinkBridge ACN:

- Mode of operation can only be set for the AC indoor unit and not for the zones. The zone's mode will follow the AC unit's mode
- Setpoint can only be set for the AC indoor unit and not for the zones. The zone's setpoint will follow the AC unit's setpoint
- Zones have only ON/OFF control
- When using CoolRemote application:
  - Temperatures of the zones will be shown as 0C
- Before turning on the system, you have to turn on at least one zone.

## 5. Configuration

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### 5.1 Network Configuration

Network configuration is made using the `ifconfig` command as described below.

#### SYNOPSIS

```
ifconfig
```

```
ifconfig <PROPERTY> <VALUE>
```

```
ifconfig enable | disable
```

#### DESCRIPTION

Query or configure Ethernet network settings. Without parameters, the **ifconfig** command lists the current configuration. To change the configuration, use the format with the parameters **<PROPERTY>** and **<VALUE>**. Parameter **IP** can be set to **DHCP** (DHCP client) or fixed IP number. In case of DHCP - Netmask and Gateway values are provided by the DHCP server. By default, CoolLinkBridge DKZ is configured for DHCP client operation. The CoolLinkBridge DKZ Ethernet module can be enabled or disabled with the corresponding command.

## EXAMPLE

### 5.1.1 Query network settings

```
>ifconfig
```

```
MAC : 28:3B:96:FF:FF:FE
```

```
Link : Up
```

```
IP : 192.168.1.109 (DHCP)
```

```
Netmask: 255.255.255.0
```

```
Gateway: 192.168.1.1
```

```
OK
```

### 5.1.2 Configure fixed IP and Gateway

```
>ifconfig IP 192.168.1.102
```

```
OK, Boot Required!
```

```
>ifconfig Gateway 192.168.1.0
```

```
OK, Boot Required!
```

### 5.1.3 Configure DHCP client operation

```
>ifconfig IP DHCP
```

```
OK
```

### 5.1.4 Disable Ethernet

```
>ifconfig disable
```

```
OK, Boot Required!
```

## 6. Specifications

Parameter		Data
Power supply	Min load*	5VDC/60mA (via mini USB); 12VDC/35mA; 24VDC/20mA
	Max load**	5VDC/100mA (via mini USB); 12VDC/70mA; 24VDC/40mA
Mounting		Magnet
Operating conditions	Ambient temperature	-10°C ~ 60°C / 14°F ~ 140°F
	Humidity	0% ~ 96% non-condensing
Storage conditions	Ambient temperature	-20°C ~ 70°C / -4°F ~ 158°F
	Humidity	0 % ~ 98 % non-condensing
Dimensions	H x W x D	65 x 115 x 31 [mm] / 2.56 x 4.50 x 1.22 ["]
LCD	Size / color / interface	2 x 8 / grey / HD44780
Communication functions	Direct HVAC connection	Connection to the ActronAir interface card
	MODBUS (A / B)	RS-485 communication line
	Ethernet	100 Mbps
	RS-232	9600Bps, ASCII
	USB Device	12 Mbps
Maximal allowable wiring length (to BMS) over RS232		25 [m] / 82 [ft]
Maximal allowable wiring length (to BMS) over RS485		1000 [m] / 3300 [ft]
Maximal allowable wiring length (to router) over Ethernet		137 [m] / 450 [ft]

Table 9 – Specifications