EAGLEHAWK Controller

Product Data



GENERAL

EAGLEHAWK is a BACnet-compliant heating, ventilation, air conditioning (HVAC) building controller.
It runs the CentraLine Niagara framework, integrating all trades in a building.
Thus, EAGLEHAWK is the ideal solution for HVAC controls requiring combination with lighting, shading, access control, and security applications.

It provides unparalleled energy efficiency through the use of a vast HVAC Application Library.

EAGLEHAWK enables uniform graphical operation, control, data logging, alarming, scheduling, and network management functions for HVAC and non-HVAC applications. Through its integrated web server, it allows real-time access to all information through web-based graphical views.

EAGLEHAWK supports full remote engineering, including changes to the control program and the graphical user interface. This greatly supports reduction of life cycle and maintenance cost.

OPERATION IN IP NETWORKS

When operating EAGLEHAWK in IP networks, either private (e.g., VPN) networks must be used or protection against the open Internet (e.g., by means of external firewalls) must be ensured. See "Network Security" on pg. 8.

3RD-PARTY SOFTWARE LICENSES

This product contains software provided by third parties. See also EAGLEHAWK Controller – Third-Party Software Licenses (Product Literature No.: EN2Z-1007GE51).

FEATURES

- **Reduced total installed cost:** Existing standard Ethernet/LAN infrastructure is used for communication between EAGLEHAWK controllers, 3rd-party BACnet® controllers, and BACnet® front-ends. Costs are further reduced by the flexible and optional use of Panel Bus I/Os (which allow manual override independent of the controller, thus obviating the need for external switches) and of onboard I/Os.
  Panel Bus I/Os allow for wiring lengths of up to 800 m, thus obviating the need to lay wire from field devices all the way back to the controller.
- **Reduced life cycle cost:** EAGLEHAWK supports the highly reliable CentraLine Panel Bus I/O modules, which allow for plugging and replacing without any need for re-wiring or engineering, thus minimizing system down-time. The Panel Bus is polarity-insensitive, thus reducing potential wiring errors. Furthermore, Panel Bus I/O modules allow the predefinition of output safety positions, ensuring safe operation even if communication with EAGLEHAWK is disrupted.
- **Universal operation:** Via Internet browser, EAGLEHAWK can be operated from any place, from any PC and/or mobile device connected to the (EAGLEHAWK) network! An integrated web-server allows local and remote operation by standard browsers.
- **Vendor independence:** Multiple international communication standards are supported, e.g.: BACnet/IP (ISO 16484-5); BACnet MS/TP (ISO 16484-5); LONWORKS (ISO 14908); Modbus RTU and Modbus TCP; M-Bus (EN 1434-3); oBIX; SNMP; etc.
- **Trending:** Datapoints can be trended and historical values stored and viewed.
- **Reliable control performance:** Embedded LINUX ensures reliable, independent, and secure operation, especially for systems with Internet access.
- **Embedded e-mail alarming:** Configurable e-mail alarming options allow alarms to be sent (via network or Internet-DSL connection) to e-mail accounts and thus also to mobile device using SMTP protocol.
- **Optional SMS alarming:** SMS alarming via GSM modem using the optional SMS driver.
- **CentraLine application library:** Enables highly-effective application generation for optimal energy-efficient control applications.
- **Flexible mounting options:** Mounting onto wall or onto panel back wall, into panel door, onto panel rail, and into sub-panels (fuse boxes).
- **Direct 24 VAC power supply:** No batteries, no movable parts – thus does not require regular maintenance.

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OPERATOR INTERFACE

EAGLEHAWK is operated via a standard browser. By default, an integrated web-server provides all freely programmable operation pages for full browser-based operation.

Through the consistent use of software standards, any PC platform can be used as an operator interface (client), including laptops, desktops PCs, or touch screen PCs for direct flush mounting into electrical panel doors (IP65).



Fig. 1. EAGLEHAWK PC homepage (example)

For mobile devices, there is a separate corresponding operator interface.



Fig. 2. EAGLEHAWK mobile device homepage (example)

Programming

EAGLEHAWK is freely programmable using the graphic COACH$_{AX}$ Engineering Tool and is thus ideal for all Integration, Building Control, and Building Management tasks.

Password Protection

EAGLEHAWK allows the definition of a large number of user levels. Each user level can be assigned different read and write rights. Several users with individual passwords can be defined for each user level. And different views can be assigned to the individual users.

COMMUNICATION PROTOCOLS

BACnet/IP – ISO 16484-5 and EN 13321-1

Communication with other EAGLEHAWK and EAGLE controllers, 3rd-party BACnet devices and ARENA$_{AX}$ Supervisors is possible.

EAGLEHAWK conforms to the BACnet Building Controller (B-BC) profile. For details on BACnet Interoperability, see the EAGLEHAWK Protocol Implementation Conformance Statement (PICS) (Product Literature No.: EN0Z-1011GE51).

BACnet MS/TP – ISO 16484-5 and EN 13321-1

Communication with other BACnet controllers is based on the international BACnet Protocol. Optionally, one or both of the onboard RS485 interfaces can be used for communication via BACnet MS/TP.

LonTalk® - ISO 14908

Optionally, communication with physical I/O modules, with room and zone controllers, and with CentraLine PANTHER, TIGER, and LION controllers can utilize LonTalk.

With the IF-LON, a Free Topology Transceiver (FTT-10A or FT-X1) allows a communication speed of 78 Kbaud. Max. cable lengths are 320 m to 2,200 m, depending upon the given wiring topology.

By default, the IF-LON comprises the LonMark® node object, plus application-specific LONWORKS objects.

Modbus

Optionally, the two onboard RS485 interfaces can be used (even simultaneously) for communication via Modbus RTU. Modbus TCP communication is supported via the onboard Ethernet RJ45 interface. See also EAGLEHAWK – Installation & Commissioning Instructions (Product Literature No.: EN1Z-1005GE51) for details.

M-Bus – EN 1434-3

Optionally, M-Bus communication is possible via the onboard RS232 interface. See also EAGLEHAWK – Installation & Commissioning Instructions (Product Literature No.: EN1Z-1005GE51) for details.

Panel Bus

Optionally, one or both of the onboard RS485 interfaces can be used for Panel Bus communication with CentraLine Panel Bus I/O modules.

HTTP

EAGLEHAWK can be operated with Internet browsers with any desired resolution.

HTTPS

Secure web browser communication is supported for web access via standard web browsers.

SMTP

Simple Mail Transfer Protocol is used for e-mail alarming via network and Internet-DSL connection.

Open Niagara Drivers

Optionally, all available interfaces can also be used with any open Niagara driver. For example: KNX driver can be used via the TCP/IP – KNX interface.

BUS AND PORT CONNECTIONS

⚠ WARNING

Risk of electric shock or equipment damage!

- ► Do not touch any live parts in the cabinet!
- ► Disconnect the power supply before making connections to or removing connections from terminals of the EAGLEHAWK Controller or Panel Bus I/O modules.
- ► Do not reconnect the power supply until you have completed installation.
- ► Due to the risk of short-circuiting (see Fig. 8), it is strongly recommended that the EAGLEHAWK controller be supplied with power from a dedicated transformer. However, if the EAGLEHAWK controller is to be supplied by the same transformer powering other controllers or devices (e.g., the PW M-Bus Adapter), care must be taken to ensure that correct polarity is observed.
- ► Observe the rules regarding electrostatic discharge.

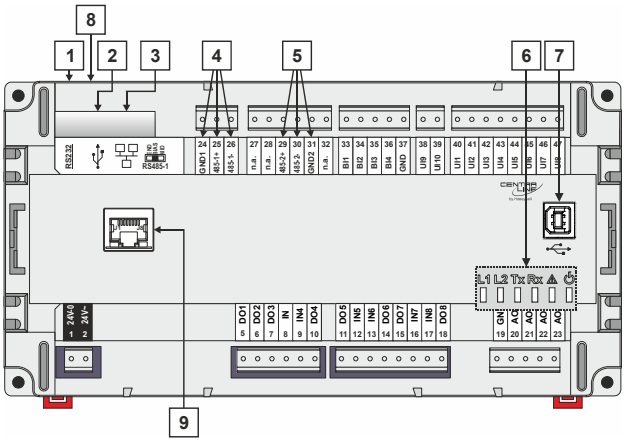


Fig. 3. Top view (shown: model with onboard I/Os)

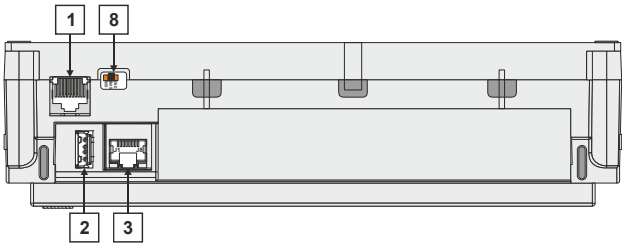


Fig. 4. Side view

Legend

1 RS232 / RJ45 socket (for connection of M-Bus and other RS232-based protocols; factory debugging)

2 USB 2.0 Host Interface (for connection of the IF-LON); max. 500 mA, high speed

3 Ethernet / RJ45 socket (for BACnet IP communication); 10/100 Mbit/s; 1 "link" LED and 1 "activity" LED

4 RS485-1* (isolated; for BACnet MS/TP, Panel Bus, Modbus RTU communication, etc.)

5 RS485-2* (non-isolated; for BACnet MS/TP, Panel Bus, Modbus RTU communication, etc.)

6 LEDs

7 USB 2.0 Device Interface (for connection to COACH$_{AX}$ web browsers, and 3rd-party touch panels)

8 Three-position slide switch (for setting bias and termination resistance of RS485-1)

9 Future functionality

*Modbus RTU Master/Slave communication is possible on the two RS485 interfaces.

⚠ WARNING

Risk of electric shock or equipment damage!

- ► It is prohibited to connect any of the RJ45 sockets of the EAGLEHAWK Controller to a so-called PoE-enabled device ("**P**ower **o**ver **E**thernet").

M-Bus Connection

The EAGLEHAWK controller supports M-Bus Master functionality via its onboard RS232 / RJ45 socket. It uses standard PW3/PW20/PW60 converters to connect to the M-Bus devices.

Wiring Topology

Max. bus length is 350 meters. M-Bus devices are connected to the bus cable in parallel.

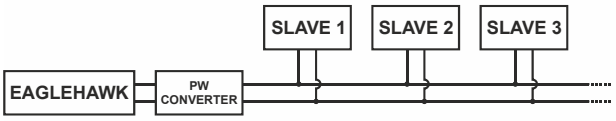


Fig. 5. Allowed M-Bus wiring topology

Cables

See section "M-Bus Connection" in EAGLEHAWK Controller – Installation & Commissioning Instructions (EN1Z-1005GE51).

Use shielded, twisted pair cable J-Y-(St)-Y 2 x 2 x 0,8.

Shielding

Shielding is especially recommended when the M-Bus cable is installed in areas with expected or actual electromagnetic noise. Avoiding such areas is to be preferred.

Use shielded, twisted pair cable J-Y-(St)-Y 2 x 2 x 0,8 and connect the shield to a noise-free earth ground – only once per M-Bus connection.

M-Bus Repeaters

The M-Bus can be extended to 1,000 meters, depending on the baud rate, and provided that the electrical limitations are observed. For details refer to the EAGLEHAWK Controller – Installation & Commissioning Instructions (EN1Z-1005GE51).

For bus length extension, M-Bus repeaters can be used, but have not been tested by Honeywell. Hence, it is the responsibility of the installing / commissioning personnel to ensure proper functioning.

M-Bus Master Specifications

For a detailed description of the M-Bus functionality, please refer to the M-Bus Online Help.

Physical Layer

RS232 to PW3/PW20/PW60

Physical connector:	RS232 / RJ45 socket (see Fig. 4)
Cable order number:	XW586
Communication rates:	300, 2,400, and 9,600 Baud are supported, individually per M-Bus slave.
Max. no. of devices:	60 (excluding the EAGLEHAWK controller)

Cable and wiring specifications: See EAGLEHAWK – Installation Instructions (EN1Z-1005GE51).

Address Range

M-Bus slaves can have a primary address between 1 and 250.

Measurement Cycle

Individually per M-Bus slave, the measurement cycle can be configured from 1 to 604,800 sec (i.e., 1 second to 7 days).

Modbus Connection

The EAGLEHAWK controller can function as a Modbus Master/Slave.

For Modbus RTU, the RS485 wiring rules must be followed.

Wiring Topology

Only daisy-chain wiring topology is allowed.

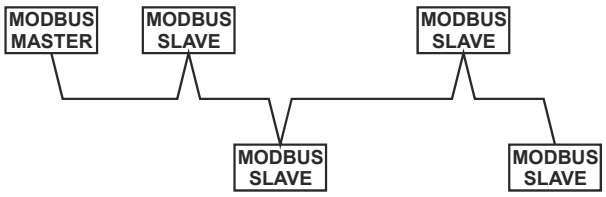


Fig. 6. Allowed Modbus wiring topology

Other wiring topologies (e.g., star wiring, or mixed star wiring and daisy chain wiring) are prohibited; this is to avoid communication problems of the physical layer.

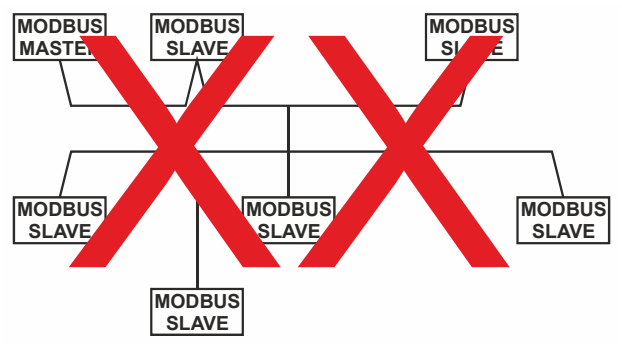


Fig. 7. Prohibited Modbus wiring topology (example)

Cables

See section "EIA 485 Cable Specifications" in EAGLEHAWK Controller – Installation & Commissioning Instructions (EN1Z-1005GE51).

Use shielded, twisted pair cable J-Y-(St)-Y 2 x 2 x 0,8.

You ***must*** use three wires:

- One wire for D1 = Modbus +
- One wire for D0 = Modbus –
- One wire for the signal common

When using one pair for D1 and D0 and one wire of another pair for the signal common, CAT5 cable may also be used.

For connection details, see EAGLEHAWK Controller – Installation & Commissioning Instructions (EN1Z-1005GE51).

Shielding

Shielding is especially recommended when the Modbus cable is installed in areas with expected or actual electromagnetic noise. Avoiding such areas is to be preferred.

Use shielded, twisted pair cable J-Y-(St)-Y 2 x 2 x 0,8 and connect the shield to a noise-free earth ground – only once per Modbus connection.

RS485 Repeaters

RS485 repeaters are possible, but have not been tested by Honeywell. Hence, it is the responsibility of the installing / commissioning personnel to ensure proper functioning.

NOTE: Each Modbus segment requires its own line polarization and line termination.

Modbus Specifications

For Modbus RTU and TCP specifications, please refer to the COACH$_{AX}$ document entitled Niagara$^{AX-3.x}$ Modbus Guide.

CONTROLLER SPECIFICATIONS

General

Table 1. Controller specifications

Ambient temperature	0 … 40 °C (wall-mounting) 0 … 50 °C (cabinet/door mounting)
Storage temperature	-20 … +70 °C
Humidity	5 … 95% r.h. non-condensing
Dimensions	See Fig. 9 and Fig. 10.
Degree of protection	IP20 (mounted on walls, with two accessory MVC-80-AC1 covers) IP30 (mounted in cabinet doors, with accessory MVC-80-AC2)
Fire class	V0
Shock protection	Class II
Pollution degree	2
Installation	Class 3
Rated impulse voltage	330 V for SELV, 2500 V for relay outputs
Overvoltage category	II
Automatic action	Type 1.C
Software class	Class A
Ball-pressure test temperature	housing parts >75°C terminals >125°C

Standards, Approvals, etc.

- Device meets EN 60730-1, EN 60730-2-9, UL60730, and UL916.
- The device complies with Ethernet Protocol versions IEEEC 802.3.
- The device supports BACnet IP and BACnet MS/TP communications as per ANSI / ASHRAE 135-2008.

Electrical Data

Table 2. Electrical data

Power supply	19 … 29 VAC, 50/60 Hz, or 20 … 30 VDC
Power consumption	typically dc: 5 W; max. 6 W typically ac: 9 VA; max. 11 VA
Heat dissipation	Max. 6 W at dc power supply max. 11 W at ac power supply
Current consumption	typically dc: 210 mA; max. 240 mA typically ac: 370 mA; max. 410 mA

Due to the risk of short-circuiting (see Fig. 8), it is strongly recommended that the EAGLEHAWK controller be supplied with power from a dedicated transformer. However, if the EAGLEHAWK controller is to be supplied by the same transformer powering other controllers or devices (e.g., the PW M-Bus Adapter), care must be taken to ensure that correct polarity is observed.

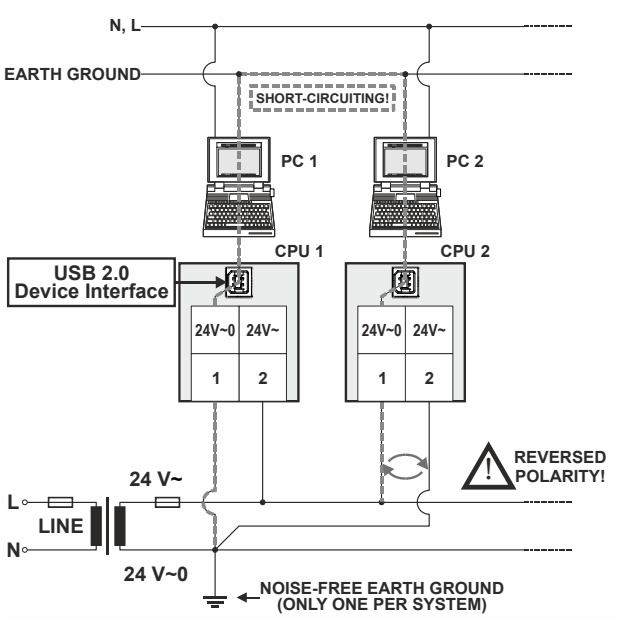


Fig. 8. Incorrect polarity → SHORT-CIRCUITING!

Mechanical Data

Housing Dimensions (L x B x T): 215.5 x 110 x 61 mm
Housing Material: ABS blend; flame retardant V0
Weight: 400 g (without packaging)
Protection Class: IP 20

CPU

Processor

- ARM 9 32-bit processor, 450 MHz

Operating System

- LINUX

Memory

- 512 MB DDR2-RAM
- 512 KB MRAM
- 1 GB Flash Memory

Real-Time Clock

- accuracy: ± 2 minutes per year (at, typically, 25 °C)
- buffered typically for 72 h by gold capacitor

Mounting

The EAGLEHAWK Controller is suitable for mounting as follows:

► in cabinets;

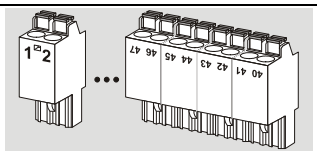
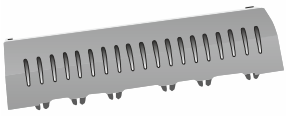
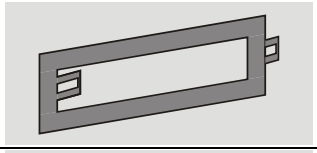
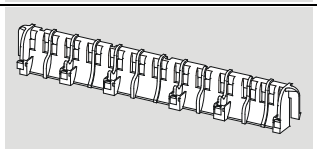
► in fuse boxes conforming with standard DIN43880, and having a slot height of max. 45 mm;

► on walls (using accessory MVC-80-AC1 covers);

► in cabinet front doors (using accessory MVC-80-AC2).

Extra Parts

Table 3. Extra parts

	order no.	description
	**XS830**	Set of ten terminals. Each package consists of two groups of nine internally connected push-in terminals, for distributing signals / power.
	**XS831**	Set of ten terminals. Each package consists of two groups of four pairs of push-in terminals (each with a 499 Ω resistor), for converting 0…20 mA signals into 0…10 VDC signals, and one push-in ground terminal per group.
	**TPU-11-01**	Removable terminal plugs, push-in type; complete set of 3 plugs (for terminals 1, 2, 24-32); for the CLAXEH00ND100A.
	TPU-45-01	Removable terminal plugs, push-in type; complete set of 9 plugs (for terminals 1 - 47); for the CLAXEH14ND100A and CLAXEH26ND100A.
	**MVC-80-AC1**	Terminal cover (color: RAL9011); package of ten.
	**MVC-80-AC2**	Front door mounting accessory (color: RAL9011); package of ten.
	**MVC-40-AC3**	Strain relief; package of ten.

MODELS

- CLAXEH00ND100A: without onboard I/Os
- CLAXEH14ND100A: with 14 onboard I/Os
- CLAXEH26ND100A: with 26 onboard I/Os

Table 4. Overview of models

feature	description		max. cable length	order no.		
				CLAXEH00ND100A	CLAXEH14ND100A	CLAXEH26ND100A
UI	NTC10kΩ / NTC20kΩ / 0…10V / slow BI, 0.4 Hz		400 m	--	4	8
	NTC10kΩ / NTC20kΩ / 0…10V fix pull-up / slow BI, 0.4 Hz		400 m	--	-	2
BI	open = 24 V / closed 2.0 mA / totalizer 15 Hz		400 m	--	4	4
AO	0..11 V (max. 1 mA)		400 m	--	2	4
BO	Relay N.O. contact: 3 A, 250 VAC, 30 VDC		400 m	--	3	4
	Relay N.O. contact (high in-rush): 10 A, 250 VAC, 30 VDC		400 m	--	1	1
	Relay N.O. contact with one common: 3 A, 250 VAC, 30 VDC		400 m	--	-	3
bus interfaces	RS485-1, isolated, BACnet MS/TP, Panel Bus, or Modbus RTU Master or Slave communication		[1)]1200 m	1	1	1
	RS485-2, non-isolated, BACnet MS/TP, Panel Bus, or Modbus RTU Master or Slave communication		[1)]1200 m	1	1	1
	Ethernet Interface	e-mail communication, browser access	100 m	1	1	1
		BACnet IP communication	100 m	1	1	1
	USB 2.0 Device Interface (as Network Interface)		3 m	1	1	1
	USB 2.0 Host Interface (max. 500 mA)		3 m	1	1	1
	RS232 M-Bus communication via PW3 / PW20 / PW60 converters		[1)]1000 m	1	1	1
LEDs	power LED (green)		--	1	1	1
	status LED (red, controllable by firmware)		--	1	1	1
	LED L1 (yellow) Heartbeat LED indicating platform is running		--	1	1	1
	LED L2 (yellow) indicating that station is starting up		--	1	1	1
	bus status LEDs (for isolated RS485-1 interface)		--	2	2	2

[1)] Depending upon baud rate. For max. cable lengths, refer to the EAGLEHAWK – Installation & Commissioning Instructions (EN1Z-1005GE51).

Software Licenses and Upgrades

Table 5. Software Licenses and Upgrades

model	Honeywell Panel Bus devices	onboard I/O and Honeywell Panel Bus points	integrated devices	integrated points
CLAXEH00ND100A (EAGLEHAWK hardware with base license; no onboard I/Os, no display)	128	102	5	25
CLAXEH14ND100A (EAGLEHAWK hardware with 14 onboard I/O, with base license; no display)	128	102	5	25
CLAXEH26ND100A (EAGLEHAWK hardware with 26 onboard I/O, with base license; no display)	128	102	5	25
CLAXEHPB100UP (EAGLEHAWK upgrade license for an additional 102 Panel Bus points)	128	+102	--	--
CLAXEH3PTY25UP (EAGLEHAWK upgrade license for an additional 25 integrated points)	--	--	+5	+25
CLAXEHRLON150UP (EAGLEHAWK upgrade license for an additional 30 Honeywell / CentraLine LONWORKS controllers with 150 LONWORKS points)	--	--	30	150
CLAXEHRBAC150UP (EAGLEHAWK upgrade license for an additional 30 Honeywell / CentraLine BACnet controllers with 150 BACnet points)	--	--	30	150

NOTE: The maximum permitted number of Honeywell Panel Bus points is 400. The maximum recommended number of integrated points is 400. The maximum recommended number of total points is 400.

For more details on the licenses, please refer to the Release Bulletin.

⚠ WARNING

NETWORK SECURITY

Honeywell hereby expressly states that the EAGLEHAWK is not inherently protected against cyber attacks from the Internet and that it is therefore intended solely for use in private, protected networks.
Unprotected Internet connections can expose the EAGLEHAWK to cyber attacks from third parties who can then damage it and connected facility components or cause them to malfunction, or who can misuse it for illegal purposes for which the operator may then be held liable.
When directly connected to the Internet, the EAGLEHAWK automatically becomes a potential target for cyber attacks. Corresponding protective measures are therefore essential if safe and reliable operation is to be ensured.
If it is not necessary for the EAGLEHAWK to be accessible from the Internet, the EAGLEHAWK should be isolated from the Internet via a suitable firewall.
If it is necessary for the EAGLEHAWK to be accessible from the Internet (e.g., in order to perform remote maintenance), the use of a coded VPN connection is indispensable. Suitable VPN routers are available from numerous third-party manufacturers in a wide variety of designs, for operation at 230 V or 24 V.

DIMENSIONS

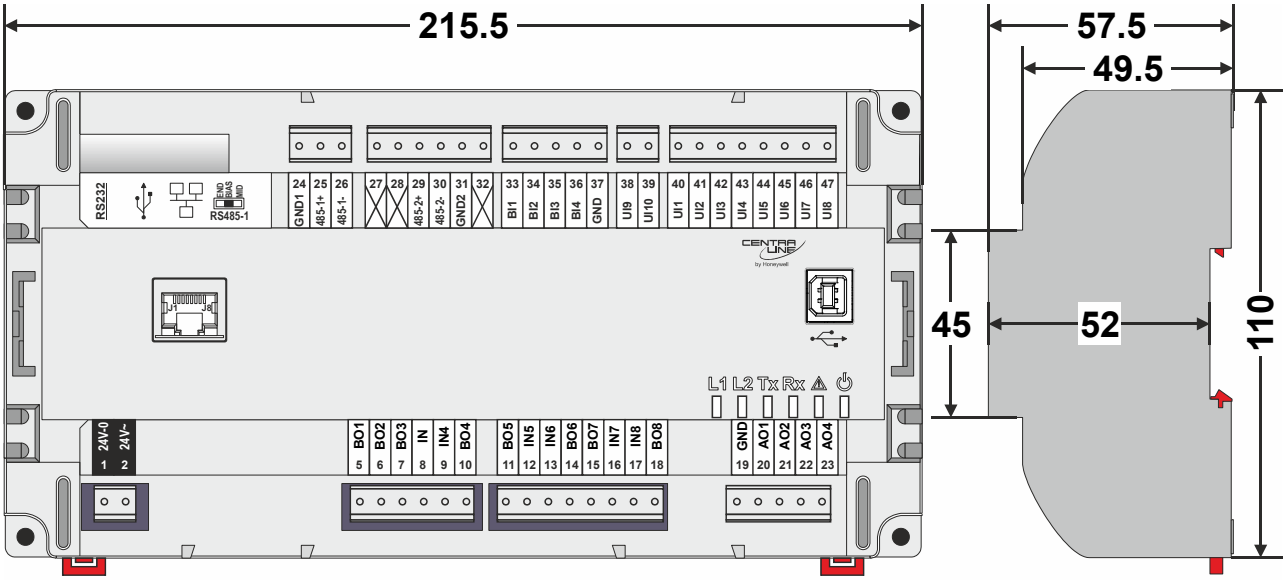


Fig. 9. EAGLEHAWK Controller (shown: model with onboard I/Os), dimensions (in mm)

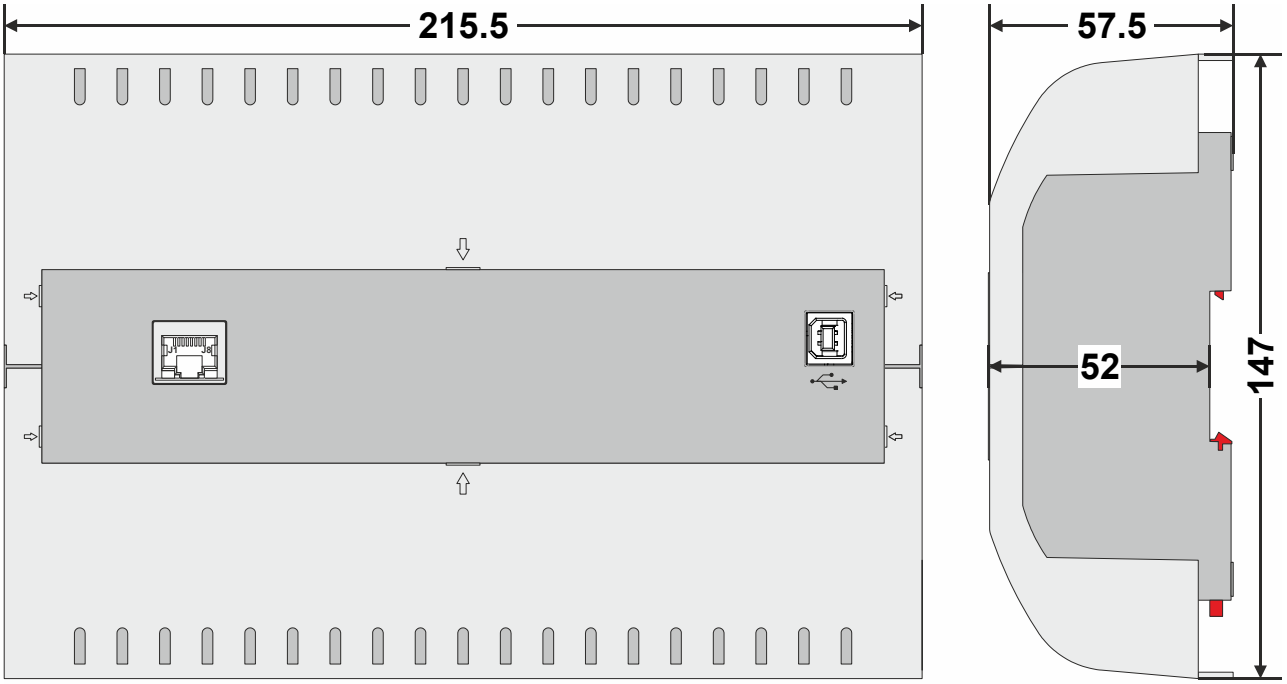


Fig. 10. EAGLEHAWK Controller with covers, dimensions (in mm)

NOTE: Use of the covers (MVC-80-AC1) will obstruct access to the Ethernet, USB 2.0, and RS232 interfaces.

Manufactured for and on behalf of the Environmental & Energy Solutions Division of Honeywell Technologies Sàrl, Rolle, Z.A. La Pièce 16, Switzerland by its Authorized Representative:

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