Synergis Cloud Link Hardware Installation Guide 3.0

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You can send your comments, corrections, and suggestions about this guide to documentation@genetec.com.

About this guide

This guide explains how to assemble and install the Synergis Cloud Link appliance and associated hardware components.

For a list of all Security Center and AutoVu™ documentation, go to the GTAP Documents page.

AutoVu can be customized in a number of ways, but only the tasks for a SharpV fixed deployment are provided in the order to be performed. Depending on your deployment requirements, you may not need to perform all of the tasks listed. Refer to the *Security Center Administrator Guide* for more advanced configuration tasks and detailed reference information.

WARNING: Only AutoVu-certified personnel should setup and install AutoVu systems. Read all of the procedures in this guide before installing an AutoVu fixed or mobile system. Failure to follow the supplied instructions or information may result in loss of data or damage to hardware and will void the warranty.

Notes and notices

The following notes and notices might appear in this guide:

- **Tip**. Suggests how to apply the information in a topic or step.
- **Note**. Explains a special case, or expands on an important point.
- **Important**. Points out critical information concerning a topic or step.
- **Caution**. Indicates that an action or step can cause loss of data, security problems, or performance issues.
- **Warning**. Indicates that an action or step can result in physical harm, or cause damage to hardware.

IMPORTANT: Topics appearing in this guide that reference information found on third-party websites were accurate at the time of publication, however, this information is subject to change without prior notice to Genetec Inc.

Contents

1

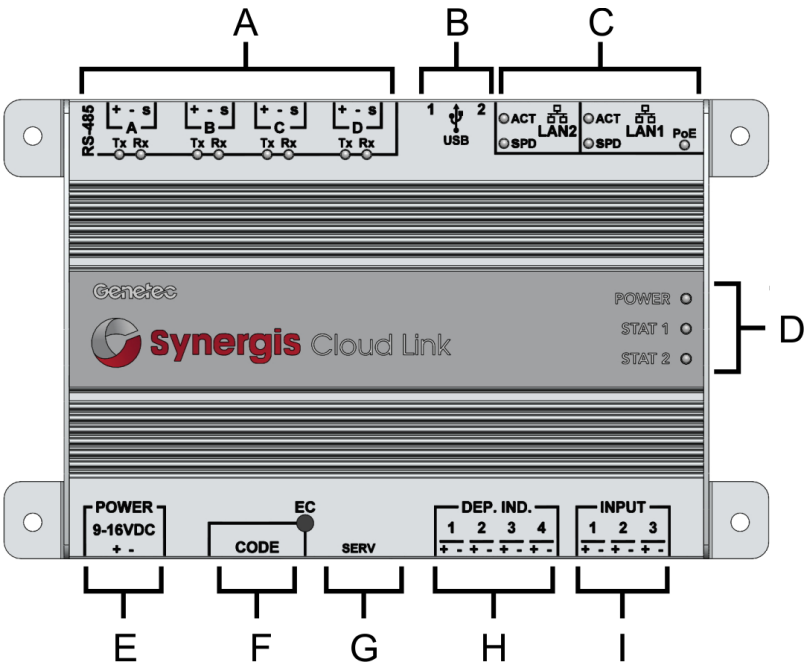
Introduction to Synergis Cloud Link

This section includes the following topics:

What is Synergis™ Cloud Link?

Synergis™ Cloud Link is an intelligent and PoE-enabled access control appliance of Genetec Inc. that supports a variety of third-party interface modules over IP and RS-485. Synergis™ Cloud Link is seamlessly integrated with Security Center and is capable of making access control decisions independently of the Access Manager.

Synergis™ Cloud Link and accessories can be housed inside an enclosure that are part of a *Synergis™ IP access control system*.



	Hardware feature	What you should know
A	RS-485	Four embedded RS-485 communication ports (or channels) named A, B, C, and D. The number of interface modules you can connect to each channel depends on the type of hardware you have. In configurations where interface modules only use an IP connection, the four RS-485 ports are not needed. **NOTE:** When you start an RS-485 bus from the Synergis™ Cloud Link for HID module communication, you must set the associated termination DIP switch to ON. You must also set the termination jumper on the last connected module on the RS-485 bus.
B	USB1 and USB2	For maintenance use. If the system requires additional RS-485 ports, a four-port RS-485 module can be connected to the USB1 port. Contact us for more information. **NOTE:** This connection has not been evaluated by UL and is not to be used if UL Listed access control system compliance is required and is to be maintained.

	Hardware feature	What you should know
C	LAN1 and LAN2	Two Ethernet LAN ports are provided for connection to the IP network. **NOTE:** Synergis™ Cloud Link can be powered using an Ethernet connection (PoE). For more information, see Powering Synergis™ Cloud Link using PoE on page 78. **NOTE:** Connecting to Security Center through the LAN 2 port has not been evaluated by UL and is for supplementary use only.
D	Status LEDs	Synergis™ Cloud Link LED feedback on page 82.
E	Power	Connect Synergis™ Cloud Link to an external 12 VDC (nominal) power supply. For more information, refer to the power supply requirements and information on connecting the power supply.
F	Code DIP switches	Set a command code with the DIP switches, and run the command by holding the **EC** button for one second. If the code is valid, the status LEDs will flash green for the process of the command, otherwise they flash red for one second. Synergis™ Cloud Link automatically performs a software restart after you have run a command. See DIP switch command codes for Synergis™ Cloud Link on page 3.
G	Service port	Internal use only.
H	DEP. IND.	Deported indicators were not evaluated by UL, and are not to be used if UL Listed access control system compliance is required and is to be maintained.
I	Monitoring inputs	Monitoring inputs were not evaluated by UL, and are not to be used if UL Listed access control system compliance is required and is to be maintained.

Related Topics
Synergis Cloud Link connections on page 36

DIP switch command codes for Synergis™ Cloud Link

You can use the DIP switches on the Synergis™ Cloud Link to run hardware commands.

Available DIP switch commands

There are four DIP switches on the Synergis™ Cloud Link labelled 1 to 4. To run a command, set the DIP switches as indicated in the table below and press the **EC** button for one second. If the code is valid, the status LEDs will flash green for the process of the command, otherwise they flash red for one second. Synergis™ Cloud Link automatically performs a software restart after you have run a command.

S1	S2	S3	S4	Command description
OFF	OFF	OFF	OFF	Resets the Synergis™ Appliance Portal logon password to factory default (`softwire`).
ON	OFF	OFF	OFF	Resets all settings to factory default. This command has the following effects: • Resets the Synergis™ Appliance Portal logon password to factory default (`softwire`). • Resets the network addressing mode to DHCP. • Resets the discovery port to 2000. • Deletes all hardware (connected interface modules) configurations. • Deletes all cardholder (credentials and access rules) configurations. • Resets all unit-wide settings. • Clears all logging options **NOTE:** The unit firmware is not affected by this command.

IMPORTANT: Do not power cycle or power down the Synergis™ Cloud Link unit while the status LEDs are flashing green.

Resetting the Synergis™ Cloud Link

Using the DIP switch command codes, you can reset the Synergis™ Cloud Link to its factory default settings.

What you should know

To reset the Synergis™ Cloud Link, the unit must be running Synergis™ Softwire 10.5 or later.

To reset the unit to its factory default settings:

1 Locate the four **Code** DIP switches on the Synergis™ Cloud Link labelled **1** to **4**.

2 Set the following DIP switch code:

S1	S2	S3	S4	Command description
ON	OFF	OFF	OFF	Resets all settings to factory default. This command has the following effects: • Resets the Synergis™ Appliance Portal logon password to factory default (`softwire`). • Resets the network addressing mode to DHCP. • Resets the discovery port to 2000. • Deletes all hardware (connected interface modules) configurations. • Deletes all cardholder (credentials and access rules) configurations. • Resets all unit-wide settings. • Clears all logging options **NOTE:** The unit firmware is not affected by this command.

3 Press and hold the **EC** button for one second.

BEST PRACTICE: Always set the DIP switches back to the (ON ON ON ON) position after running a command to prevent accidental configuration reset.

The status LEDs flash green, and the unit resets to factory default settings.

UL listed Synergis™ Cloud Link equipment and subassemblies

Some specific pre-wired assemblies of the Synergis™ Cloud Link product line are UL-listed. You can use the UL-listed subassemblies to create a UL-compliant system.

UL Listed Synergis™ Cloud Link equipment

Hardware module	Description	AC input voltage	Manufacturer	Type of listing
SY-8RDHIDPW-B-EU-KIT	8-reader pre-wired Large enclosure for EMEA	230 VAC	Genetec Inc.	Equipment
SY-8RDHIDPW-B-NA-KIT	8-reader pre-wired Large enclosure for North America	120 VAC	Genetec Inc.	Equipment
SY-4RDHIDPW-B-EU-KIT	4-reader pre-wired Small enclosure for EMEA	230 VAC	Genetec Inc.	Equipment
SY-4RDHIDPW-B-NA-KIT	4-reader pre-wired Small enclosure for North America	120 VAC	Genetec Inc.	Equipment
SY-SCLV200PW-B-KIT	V200 pre-wired Small enclosure for North America	120 VAC	Genetec Inc.	Equipment

UL Listed Synergis™ Cloud Link subassemblies

Hardware module	Description	AC input voltage	Manufacturer	Type of listing
SY-CLOUDLINK	Synergis™ Cloud Link electronic access controller kit	Not applicable	Genetec Inc.	Subassembly
SY-6APS-B-EU-KIT	Power supply kit for EMEA (PSU, fuse block, and cabling)	230 VAC	Kit: Genetec Inc. Power supply unit: LifeSafety Power	Subassembly
SY-6APS-B-NA-KIT	Power supply kit for North America (PSU, fuse block, and cabling)	120 VAC	Kit: Genetec Inc. Power supply unit: LifeSafety Power	Subassembly

Hardware module	Description	AC input voltage	Manufacturer	Type of listing
SY-29X23ENC-KIT	Large metallic enclosure kit	Not applicable	Genetec Inc.	Subassembly
SY-21X23ENC-KIT	Small metallic enclosure kit	Not applicable	Genetec Inc.	Subassembly
SY-SCLENC-B-FA	Fuse assembly: 6-fuse DIN rail assembly	Not applicable	Genetec Inc.	Subassembly

UL classifications

UL-listed equipment and subassemblies are compliant to the following standards and levels:

- ULC S319 System Class I
- UL 294, Destructive Attack Level I
- UL 294, Line Security Level I
- UL 294, Endurance Level IV
- UL 294, Standby Power Level II

Related Topics

Requirements for UL-certified Synergis Cloud Link installations on page 7

Requirements for UL-certified Synergis™ Cloud Link installations

For UL-certified Synergis™ Cloud Link systems, there are several requirements that must be followed when installing pre-wired assemblies or when using subassemblies to create a UL-compliant system.

Wiring requirements:

- Wiring methods shall be in accordance with the National Electrical Code (ANSI/NFPA70), Canadian Electrical Code (CSA C22.1), local codes, and the authorities having jurisdiction.
- Running the 12V regulated power supply wiring outside of the enclosure will void the UL certification of the assembly.
- Line voltage must not be wired through the same conduit as any low voltage wiring.
- For UL Listed subassemblies, to ensure the proper wire insulation, you must use the wires provided by Genetec with the power supply kit (SY-6APS-B-EU-KIT or SY-6APS-B-NA-KIT).
- Pre-wired Synergis™ Cloud Link kits use shielded wiring as required for UL certification. All reader and RS-485 cables extending outside the enclosure (including installations where the Synergis™ Cloud Link kit is in a third-party enclosure) must be shielded and must have their drain wire grounded using the appropriate terminal for this usage.

Power supply requirements:

- You can supply power to the Synergis access control enclosure using a third-party power supply that is installed in a separate enclosure. For an example of this type of system, see Synergis enclosures with interface modules and a fuse assembly on page 12.

  To comply with the UL certification provided by Genetec, the power supply assembly, enclosure, and cabling must be ULC-S319 or UL294 certified, with power-limited output, with 30 minutes of standby power @ 6 A max. load, and with a nominal output voltage range within 11.5 to 12 VDC.
- For UL installations, PoE cannot be used to power system components.

General requirements:

- The product must not impair the intended operation of panic hardware used in conjunction with it.
- When removing the door of the enclosure, be careful not to damage the AC ON indicator that is connected to the enclosure door. The AC ON indicator must be connected for all UL-listed installations.
- All interconnecting devices must be UL Listed, low-voltage Class 2 power limited. This is especially important for locks.
- Synergis™ Cloud Link is UL certified as a stand-alone system. Installation of Synergis™ Cloud Link other than as a stand-alone system has not been evaluated by UL.
- For UL certification, you must use Genetec-provided hardware including the UL-listed subassembly enclosure. If you install the system in a third-party enclosure, the UL certification provided by Genetec is not applicable.
- For UL-certified installations, the installation environment for the UL-listed equipment and UL-listed subassemblies must conform to the following:
  - Temperature: 0°C to 49°C
  - Relative humidity: maximum 93%
- For UL-294 certified installations, readers installed outdoors must meet the following environmental ratings:
  - Temperature: -35°C to 66°C
  - Relative humidity: maximum 93%

- For ULC-S319 certified installations, readers installed outdoors must meet the following environmental ratings:
  - Temperature: -40°C to 66°C
  - Relative humidity: maximum 93%

Related Topics

UL listed Synergis Cloud Link equipment and subassemblies on page 5

Types of Synergis enclosure assemblies

The Synergis™ Cloud Link appliance and related accessories are housed inside lockable metal cabinets called Synergis enclosures.

There are two types of enclosures:

- **Enclosure with Synergis™ Cloud Link and interface modules:** These enclosures contain the Synergis™ Cloud Link appliance as well as interface modules managed over an RS-485 connection (for an example, see the diagram for Synergis™ Cloud Link with interface modules).
- **Enclosure with interface modules only:** You can use an enclosure to house only interface modules and a fuse assembly. This may be required if you need to connect interface modules to a Synergis™ Cloud Link that is located in a separate enclosure. An empty Synergis enclosure includes all of the required cable management and fasteners to assemble this type of enclosure in the field. For an example, see the diagram for interface modules only.

NOTE:

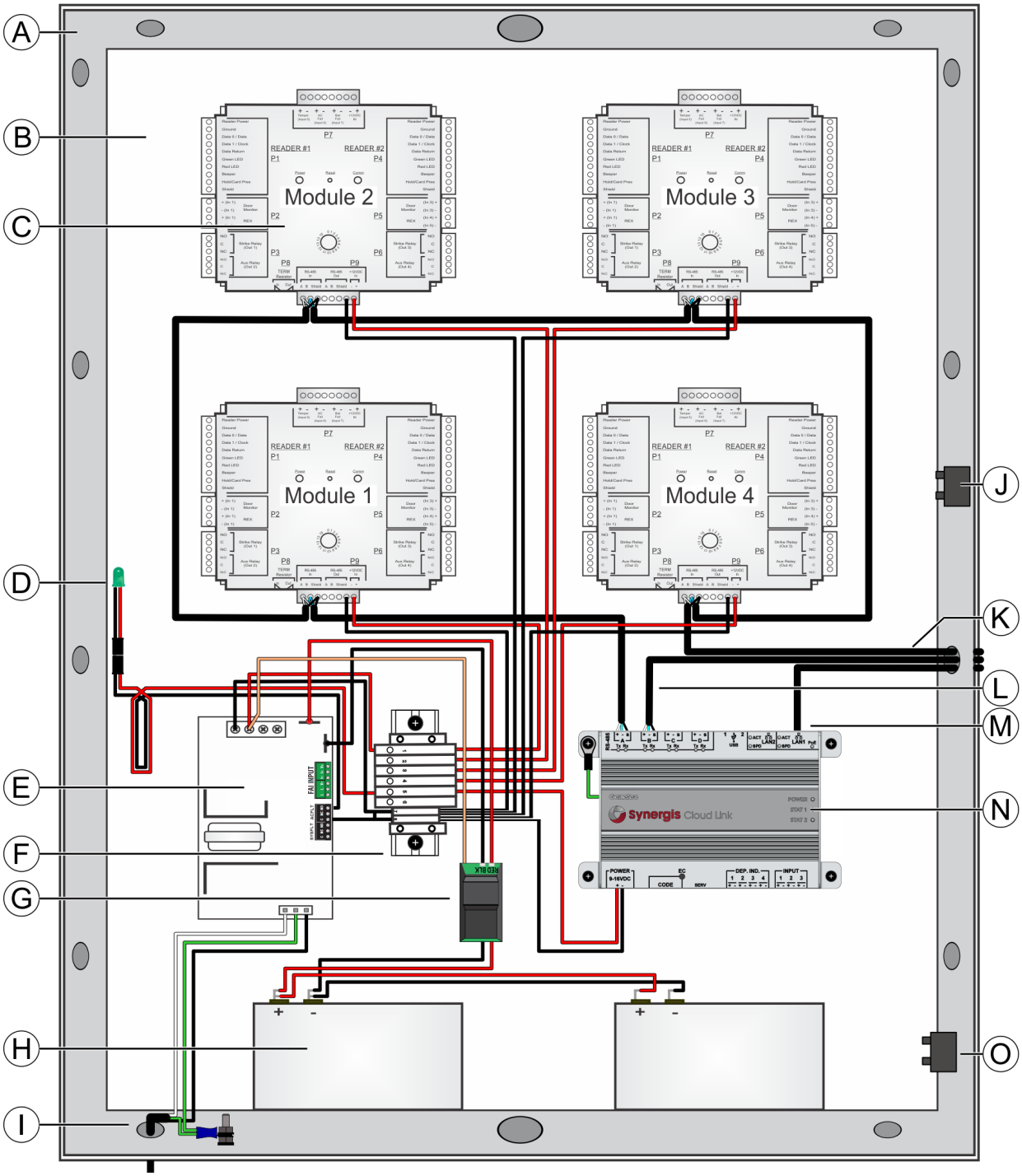
- For a list of pre-assembled kits, see Synergis part numbers: pre-wired kits on page 20.
- In addition to the Synergis enclosures listed here, you can also install the Synergis™ Cloud Link kit in a suitable third-party enclosure.
- Synergis™ Cloud Link systems must be installed indoors, within the protected premises. This excludes all-weather readers connected to the system.
- For a list of individual components that can be ordered from Genetec and assembled on-site, see Synergis part numbers: components on page 21.

Related Topics

Mounting Synergis enclosures on page 66

Enclosures with Synergis™ Cloud Link and interface modules

The backplate of the Synergis enclosure includes the holes required to mount a system that includes Synergis™ Cloud Link, access control modules, a power supply, a fuse assembly, and backup batteries.

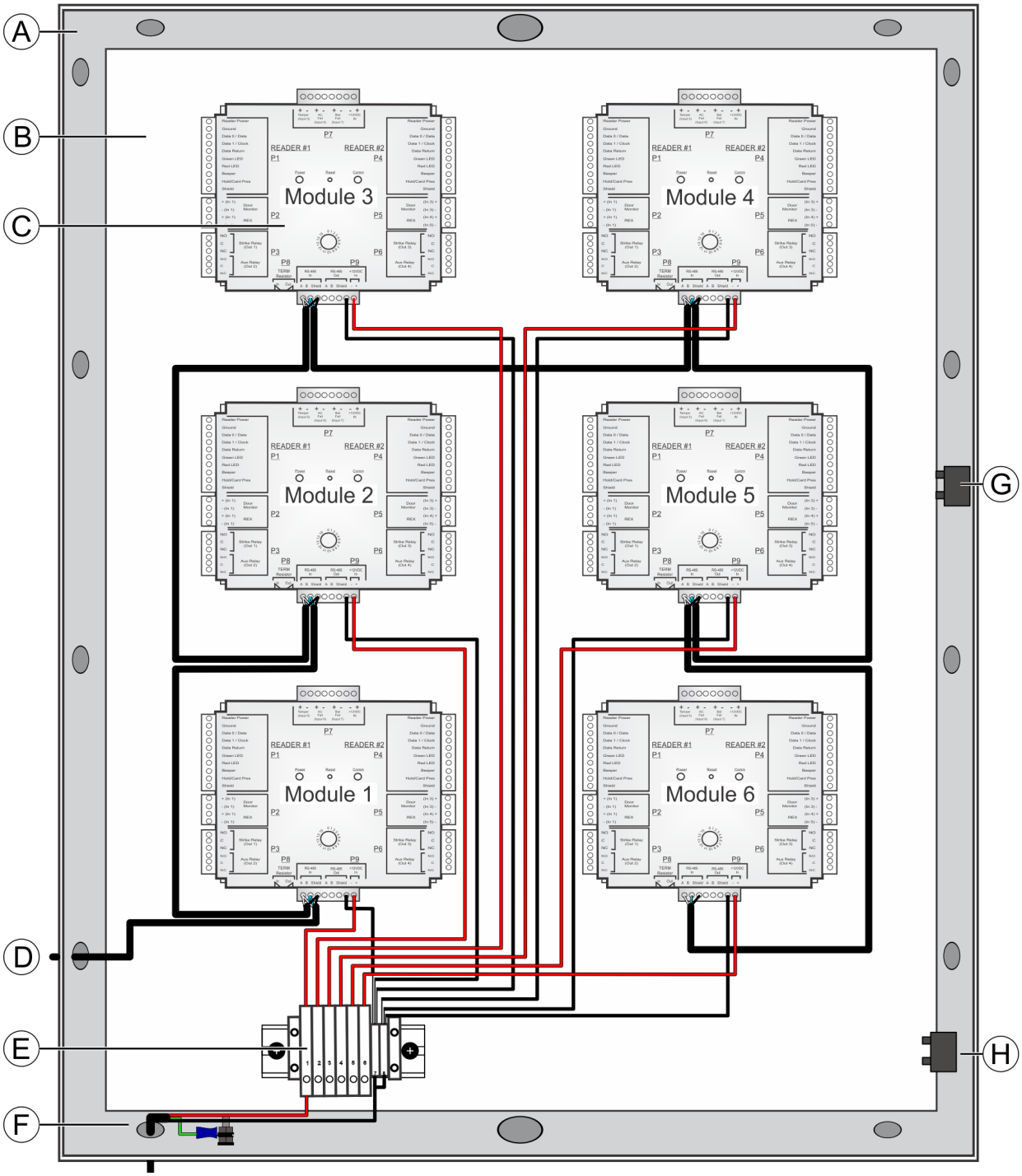


A	Enclosure	Metal cabinet with lockable door (large enclosure shown).

B	Backplate	Hardware components are mounted to the enclosure's backplate.
C	Interface modules	These modules transmit card-read and I/O data to Synergis™ Cloud Link over an RS-485 connection (HID VertX V100 shown).
D	AC ON indicator	Attached to the enclosure door, visible when door is closed. Allows you to verify the presence of AC current in the enclosure.
E	Power supply	Power supply converts 120/230 VAC into 12 VDC for distribution to the controller and modules. The power supply also functions as the battery charger and switchover for battery backup in the event of an AC power outage.
F	Fuse assembly	Provides circuit protection against over-current or short-circuit. Shipped fully assembled and includes a jumper wire between ground block 7 and 8.
G	Battery Disconnect Module	The Battery Disconnect Module (BDM) protects the battery from damage caused by deep discharge. The BDM is only mandatory for ULC-S319 compliant installations. For information on connecting standby backup batteries to the power supply in Synergis enclosures that do not include a BDM, see Battery connections for Synergis enclosures that do not include a Battery Disconnect Module on page 71.
H	Batteries	One or more optional batteries provide backup power.
I	External power	External power connection to power supply.
J	Door tamper switch	Door-tamper signal connects to interface module.
K	External RS-485 connection	You can extend daisy-chain configurations to interface modules outside the enclosure. If the chain ends within a single enclosure, you must terminate the bus on the last module in the RS-485 chain. Refer to manufacturer's documentation for information on line termination.
L	RS-485 ports	You can use the other available RS-485 ports to connect to interface modules located outside the enclosure.
M	Ethernet	Ethernet connection to network.
N	Synergis™ Cloud Link	Genetec's intelligent and PoE-enabled access control appliance with IP capability, pre-loaded with the controller firmware and a web-based administration tool, (Synergis™ Appliance Portal).
O	Wall tamper switch	Wall tamper signal connects to interface module.

Synergis enclosures with interface modules and a fuse assembly

The backplate of the Synergis enclosure includes the holes required to mount a system that includes only access control modules and a fuse assembly.



A	Enclosure	Metal cabinet with lockable door (large enclosure shown).

B	Backplate	Hardware components are mounted to the enclosure's backplate.
C	Interface modules	HID VertX V100 shown.
D	External RS-485 connection	Interface modules are connected to Synergis™ Cloud Link located outside the enclosure.
E	Fuse Assembly	Provides circuit protection against over-current or short-circuit. Shipped fully assembled and includes a jumper wire between ground block 7 and 8.
F	External 12 VDC power	Provides power for modules from an external 12 VDC source.
G	Door tamper switch	Door tamper signal connects to interface module.
H	Wall tamper switch	Wall tamper signal connects to interface module.

Synergis enclosure sizes

Synergis enclosures are available in large and small formats.

Format	Dimensions (H x W x D) - Centimeters	Dimensions (H x W x D) - Inches
Large	73.7 x 58.4 x 12.1	29 x 23 x 4.75
Small	53.3 x 58.4 x 12.1	21 x 23 x 4.75

Power supply requirements for Synergis enclosures

To power the components of the Synergis enclosure, you must calculate the total power budget of the installation and ensure that the limits of the Synergis™ Cloud Link and interface modules are respected.

IMPORTANT: Power ratings for third-party hardware were valid at the time this document was published. You should always refer to the manufacturer's website to obtain up-to-date information.

NOTE:

- You can supply power to the Synergis™ Cloud Link appliance using the Ethernet connection (PoE). For more information, see Powering Synergis™ Cloud Link using PoE on page 78 (Use of Power-Over-Ethernet is not permitted for UL or ULC Listed systems).
- You can supply power to the Synergis access control enclosure using a third-party power supply that is installed in a separate enclosure.

  IMPORTANT: To comply with the UL certification provided by Genetec, the power supply assembly, enclosure, and cabling must be ULC-S319 or UL294 certified, with power-limited output, with 30 minutes of standby power @ 6 A max. load, and with a nominal output voltage range within 11.5 to 12 VDC.
- If you are installing high-power card readers or modules, you can provide power directly from the fuse block of the Synergis™ Cloud Link enclosure. For more information, see Adding high-power readers to Synergis™ Cloud Link installations on page 35.
- You must ensure that the card readers you have selected are compatible with the interface modules.

The power supply provided by Genetec is the FlexPower FPO75 made by LifeSafety Power. It is a 6A power supply used for both large and small enclosures. Standby battery power can provide backup when AC power fails (one or two 12V 7 Ahr sealed lead-acid batteries).

The small enclosure comes with only one standby backup battery. If the total power consumption of all modules installed inside the enclosure is higher than 3.75A, then a second battery must be added in order to comply with the 30-minute standby time required by UL. For more information, see Component locations for small Synergis enclosures on page 26. For more information on testing, maintenance, and replacement of standby backup batteries, see About the standby backup batteries on page 110.

For more information on the FlexPower FPO75 power supply, refer to the printed LifeSafety Power Installation Manual included with the power supply, or go to the LifeSafety Power website at www.lifesafetypower.com.

All Genetec pre-wired enclosures that include the LifeSafety power supply have the following mains power rating:

- **North America.:** 120 VAC 50/60Hz 2.0A
- **EMEA.:** 230 VAC 50/60Hz 1.1A

Other power supplies can be used as long as they provide 12 VDC, and satisfy the following power requirements:

NOTE: If you install a power supply that is not provided by Genetec, the UL certification provided by Genetec is not applicable.

Synergis™ Cloud Link power consumption

Synergis™ Cloud Link	Voltage	Average operating current	Peak operating current
During normal operation and bootup	12 VDC	500 mA	875 mA

Interface module power consumption (12 VDC)

Interface module	Nominal Input voltage	Average operating current	Peak operating current	Reader ports	Reader port output voltage range[a]	Maximum output current per reader port
HID V100	12 VDC	60 mA (plus reader current)[b]	1000 mA[c]	2	8.5 – 16 VDC	250 mA
HID V200	12 VDC	60 mA	200 mA	N/A	N/A	N/A
HID V300	12 VDC	60 mA	200 mA	N/A	N/A	N/A
Mercury MR16in	12 VDC	300 mA	350 mA	N/A	N/A	N/A
Mercury MR16out	12 VDC	850 mA	1100 mA	N/A	N/A	N/A
Mercury MR50	12 VDC	110 mA (plus reader current)[b]	150 mA (plus reader current)	1	11.5 – 12 VDC	The output current is pass-through.[d]
Mercury MR52	12 VDC	450 mA (plus reader current)[b]	800 mA[c]	2	6.5 – 15.2 VDC	125 mA
Mercury EP1501	12 VDC	200 mA (plus reader current)[b]	900 mA[c]	1 or 2[e]	9.8 – 12.6 VDC[f]	150 mA
Mercury EP1502	12 VDC	250 mA (plus reader current)[b]	800 mA[c]	2	11.5 – 13.2 VDC	150 mA
Mercury EP2500	12 VDC	240 mA	300 mA	N/A	N/A	N/A

[a] This output voltage range is used for reader compatibility reasons.

[b] The average operating current depends on the reader model. For more information, refer to *Card reader power consumption* below.

[c] Peak operating current includes the maximum reader port(s) output current stated by the manufacturer.

[d] A maximum current draw of 250 mA is recommended.

[e] One of the ports can be used for RS-485 communication. For more information, see EP1501 connections on page 99.

[f] This output rating is for the first reader port. The second reader port (Auxiliary output) has a rating of 10.7 – 13.0 VDC.

Electrical ratings for dry contact relay outputs

Interface module	Circuit	Voltage	Current
HID V100	Dry contact relays	30 VDC	2A, inductive 0.6 PF

Interface module	Circuit	Voltage	Current
HID V200	Dry contact relays	30 VDC	2A, inductive 0.6 PF
HID V300	Dry contact relays	30 VDC	2A, inductive 0.6 PF
Mercury MR50	Relay 1. Dry contact relay	30 VDC	5A inductive, 0.6 PF
	Relay 2. Dry contact relay	30 VDC	1A inductive, 0.6 PF
Mercury MR52	Dry contact relays	28 VDC	5A inductive, 0.6 PF
Mercury MR16in	Dry contact relays	28 VDC	5A inductive, 0.6 PF
Mercury MR16out	Dry contact relays	28 VDC	5A inductive, 0.6 PF
Mercury EP1501	Dry contact relays	30 VDC	2A inductive, 0.6 PF
Mercury EP1502	Dry contact relays	30 VDC	5A inductive, 0.6 PF
HID M2000	Dry contact relays	28 VDC	5A resistive

Authentication module power consumption

pivCLASS Authentication Module (PAM)	Nominal Input voltage	Input current	Output voltage for readers	Readers supported	Max. output current (for each reader)
M2000	12 VDC	1.2A	11.5V	2	300 mA

Card reader power consumption

NOTE:

- If you are installing readers that were purchased before March 2014, confirm the current consumption.
- If you are using a reader in RS-485 mode, add 30 mA to reader currents shown in the table.
- If you are using a reader with Indala proximity, add 35 mA to the *Standby average current* and 50 mA to the *Read average current* shown in the table.

HID card reader	Standby average current [a]	Reading average current [b]	Peak current [c]
R10, R15	60 mA	95 mA	200 mA
R30, R40	65 mA	95 mA	200 mA
RK40	85 mA	100 mA	220 mA
R90	110 mA	130 mA	300 mA
RP10, RP15	75 mA	100 mA	200 mA
RP30, RP40	85 mA	100 mA	200 mA
RPK40	95 mA	105 mA	220 mA

HID card reader	Standby average current [a]	Reading average current [b]	Peak current [c]
RM40, RMK40, RMP40, RMPK40	130 mA	165 mA	220 mA
RKCL40, RPKCL40	150 mA	185 mA	250 mA
RKCLB40[d], RPKCLB40[d]	165 mA	215 mA	275 mA
HID card reader prefixes: R: contactless reader, P: proximity interpreter, K: keypad, M: magnetic stripe, C: contact reader, L: LCD display, B: biometrics			

[a] Standby average current: RMS current draw without a card in the RF field.

[b] Read average current: RMS current draw during continuous card reads. Not evaluated by UL.

[c] Peak current: highest instantaneous current draw during RF communication.

[d] This reader model cannot be used if CAN/ULC-S319 compliance is needed.

NOTE: The following access card formats are compatible with Synergis™ Cloud Link: Standard Wiegand 26-bit, HID H10306 34-bit, HID H10302 37-bit, HID H10304 37-bit, HID Corporate 1000 35-bit, and HID Corporate 1000 48-bit.

Card readers for outdoor installations

For ULC-S319 certified outdoor installations, only the following reader models can be used:

Reader family	Model
iCLASS SE	R10, R15, R30, R40, RM40, RK40, RPK40
multiCLASS SE	RP10, RP15, RP30, RP40, RMP40
pivCLASS	R10, R15, R40, RK40, RKCL40

Fuse requirements:

All Synergis enclosures (pre-wired or wired in the field) use the same fuse to provide 12V to the different modules from the fuse assembly:

- 5x20mm type, time-lag, 250VAC, 1.6A

2

Synergis enclosure assembly

Synergis enclosures can be ordered as assembled or unassembled kits, or as individual components you can assemble according to your needs. This section lists part numbers for the pre-wired kits and components, and provides basic assembly instructions.

This section includes the following topics:

Synergis part numbers: pre-wired kits

Synergis access control systems with the Synergis™ Cloud Link appliance can be ordered as pre-assembled and pre-wired kits.

For the latest listing, refer to the Security Center/Synergis price list.

Kit description	Part number	Components
• Synergis™ Cloud Link V200 Kit (pre-wired)	• SY-SCLV200PW-B-KIT **NOTE:** This kit is available in 120 VAC only.	Enclosure: 53.3 cm x 58.4 cm x 12.1 cm (21 in. x 23 in. x 4.75 in.) 6A power supply Synergis™ Cloud Link One V200 interface module Fuse assembly
• 4-reader HID Kit (pre-wired) for EMEA • 4-reader HID Kit (pre-wired) for North America	• SY-4RDHIDPW-B-EU-KIT • SY-4RDHIDPW-B-NA-KIT	Enclosure: 53.3 cm x 58.4 cm x 12.1 cm (21 in. x 23 in. x 4.75 in.) 6A power supply Synergis™ Cloud Link Two HID V100 interface modules Fuse assembly
• 8-reader HID Kit (pre-wired) for EMEA • 8-reader HID Kit (pre-wired) for North America	• SY-8RDHIDPW-B-EU-KIT • SY-8RDHIDPW-B-NA-KIT	Enclosure: 73.7 cm x 58.4 cm x 12.1 cm (29 in. x 23 in. x 4.75 in.) 6A power supply Synergis™ Cloud Link Four HID V100 interface modules Fuse assembly

Synergis part numbers: components

If you are assembling a Synergis Cloud Link-based system, the number of modules that can be included depends on the size of the enclosure.

The following tables list the part numbers and quantities needed to assemble Synergis enclosures.

Synergis Cloud Link system with HID/Mercury modules:

Item	Part number	Large enclosure	Small enclosure
Large enclosure[a]	SY-29X23ENC-KIT	1	
Small enclosure[b]	SY-21X23ENC-KIT		1
Synergis Cloud Link Kit with 2GB of RAM, 16GB on-board SSD (flash), image installed with OS, SQL CE, and Synergis AC Firmware. Includes four integrated RS-485 ports. Includes fasteners for Synergis and third-party enclosures.	SY-CLOUDLINK	1	1
Interface modules: HID V100 / V200 / V300	N/A	4	2
Controllers: Mercury EP1501 / EP1502 / EP2500	N/A	1	1
Interface modules: Mercury MR52	N/A	3	1
Interface modules: Mercury MR50 **NOTE:** Requires adapter kit: SY-MR50MOUNT. Two MR50 modules can be mounted on each adapter kit.	N/A	6	2
Interface modules: Mercury MR16in/MR16out	N/A	3	1
6A Power Supply Kit for EMEA (230 VAC/ 50/60Hz @ 1.1A input, 12 VDC @ 6A output). Includes fuse assembly and required fasteners.	SY-6APS-B-EU-KIT[c]	1	1
6A Power Supply Kit for North America (120VAC/60Hz @ 2.0A input, 12 VDC @ 6A output). Includes fuse assembly and required fasteners.	SY-6APS-B-NA-KIT [c]		
Battery: 12 V sealed lead-acid 7.2Ah: 9.4 x 6.5 x 15.1 cm (3.7 x 2.6 x 5.9 in.) 12Ah: 9.4 x 9.8 x 15.1 cm (3.7 x 3.9 x 5.9 in.)	Commercially available	2	1[d]
Cable ties, etc	Commercially available	As needed	As needed
Bag of 100 fasteners for HID (optional)[e]	SY-100HID-SS	As needed	As needed
Bag of 100 standoffs Mercury/PSU (optional)[e]	SY-100MR-SS	As needed	As needed

[a] 73.7 cm x 58.4 cm x 12.1 cm (29 in. x 23 in. x 4.75 in.), lock/key, tamper, AC ON LED, cable management ducts, and backplate.

[b] 53.3 cm x 58.4 cm x 12.1 cm (21 in. x 23 in. x 4.75 in.), lock/key, tamper, AC ON LED, cable management ducts, and backplate.

[c] You require only one of the available power supplies, depending on where you are installing the Synergis enclosure (North America or EMEA).

[d] A second battery can be added. Requires an additional battery cover: SY-BATTCOVERENC.

NOTE: For small Synergis enclosures, adding an additional battery requires the removal one of the enclosure's cable ducts. For more information, see Component locations for small Synergis enclosures on page 26.

[e] All required fasteners are included with the Synergis enclosure.

Enclosure with HID/Mercury modules only:

Item	Part number	Large enclosure	Small enclosure
Large Enclosure[a]	SY-29X23ENC-KIT	1	
Small Enclosure[b]	SY-21X23ENC-KIT		1
Interface Modules: HID V100	N/A	6	4
Interface Modules: Mercury MR52 / MR16in / MR16out	N/A	5	3
Controller: Mercury EP1501 / EP1502 / EP2500	N/A	1	1
Fuse assembly: 6-fuse DIN rail assembly[c]	SY-SCLENC-B-FA	1	1
Cable ties, etc	Commercially available	As needed	As needed
Bag of 100 fasteners for HID	SY-100HID-SS	As needed	As needed
Bag of 100 standoffs Mercury/PSU	SY-100MR-SS	As needed	As needed

[a] 73.7 cm x 58.4 cm x 12.1 cm (29 in. x 23 in. x 4.75 in.), lock/key, tamper, AC ON LED, cable management ducts, and backplate.

[b] 53.3 cm x 58.4 cm x 12.1 cm (21 in. x 23 in. x 4.75 in.), lock/key, tamper, AC ON LED, cable management ducts, and backplate.

[c] If you are using Genetec's UL-listed subassembly power supply kit (SY-6APS-B-[EU,NA]-KIT), the fuse assembly is already included in the kit.

Assembly hardware for Synergis™ Cloud Link enclosures

If you are assembling a Synergis™ Cloud Link enclosure in the field, mounting hardware is included for the modules and the other components of the enclosure.

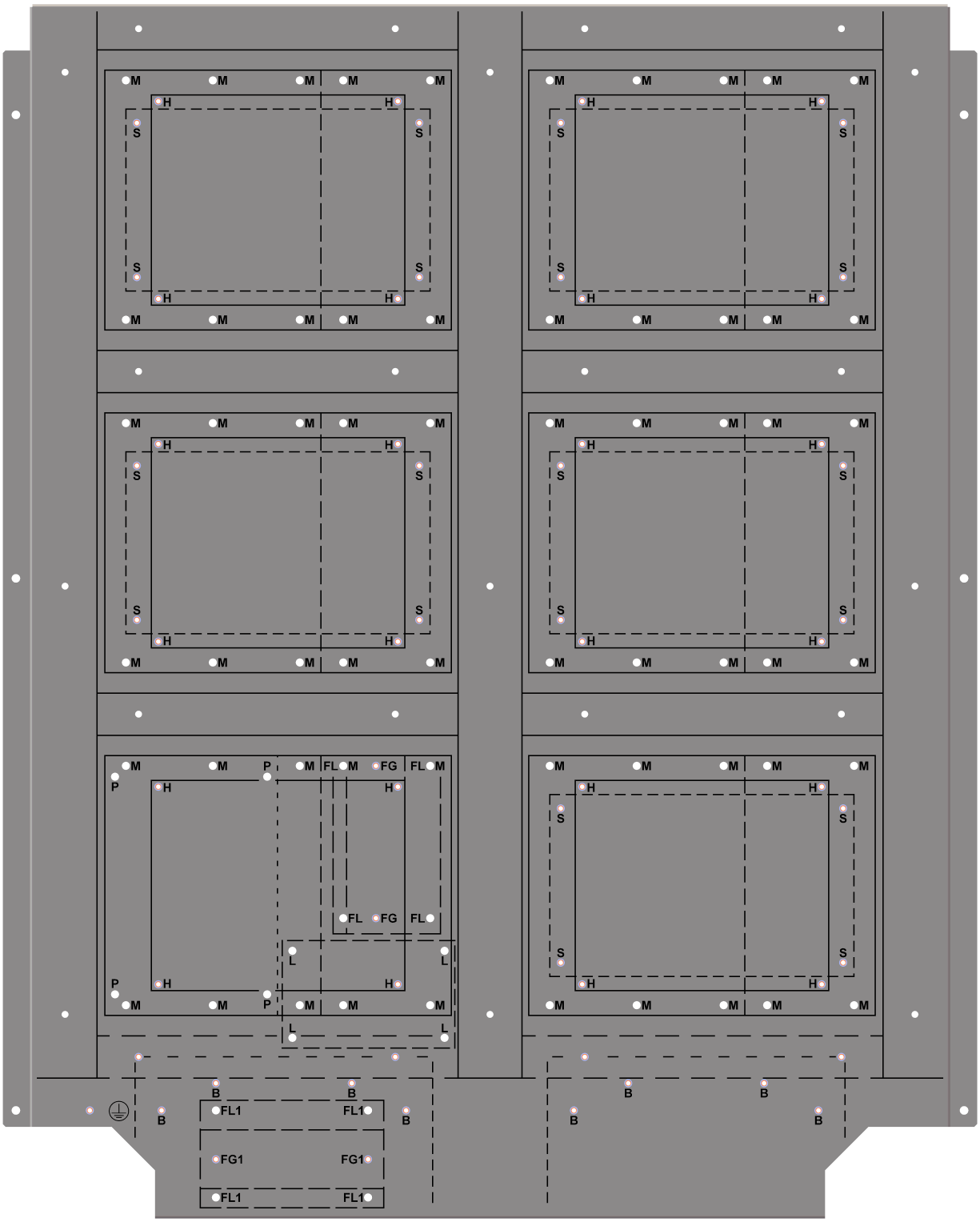
Mount the components of the enclosure using the following hardware according to the configuration of the enclosure you are assembling.

Module	Part	Quantity	Description
Synergis™ Cloud Link (in a new Synergis enclosure)		4	Phillips pan head screw 6-32 x 0.375in
Synergis™ Cloud Link (SMC retrofit or third-party enclosure)		4	Self-drilling screw, hex washer head, 6-20 x 0.375in, steel, zinc plated
Power supply		4	Nylon Locking Standoff, height 0.375in
Fuse assembly		2	Phillips Pan Head Screw 6-32 x 0.375in
		2	Flat washer #6
HID modules (V100, V200, V300, M2000, V1000[a], V2000[a])		4	Phillips pan head screw 6-32 x 0.875in
Mercury modules (MR52, MR16IN, MR16OUT, EP1502)		8	Nylon locking standoff, height 0.375in
Mercury modules (EP2500)		6	Nylon locking standoff, height 0.375in
Mercury modules (EP1501, MR51e[a])		1	Adapter kit for EP1501 and MR51e
Mercury modules (MR50)		1	Adapter kit for MR50

[a] This product was not evaluated by UL. If included in the system, the UL certification provided by Genetec is not applicable.

Component locations for large Synergis enclosures

The locations of the components are defined by the hole patterns on the backplate of the large enclosure.



Hole pattern	Component
B	Battery cover
FG or FG1	Genetec fuse assembly
FL or FL1	LifeSafety Power Distribution Modules (fuse boards): • D8[a, d], F8[a, d]
H	HID VertX interface modules: • V100, V200, V300 • V1000[d], V2000[d] • M2000 (PAM)
L	LifeSafety NL LAN modules: • NL2[a, d], NL4[a, d]
M	Mercury EP and MR panels: • EP2500[a], EP1501[b], EP1502[a] • MR50[c], MR51e[b, d], MR52[a] • MR16in[a], MR16out[a]
P	LifeSafety FPO75 power supply
S	Synergis™ Cloud Link. Large enclosure backplates can support up to 5 Synergis™ Cloud Link appliances.

[a] Direct mount with snap-in standoff.

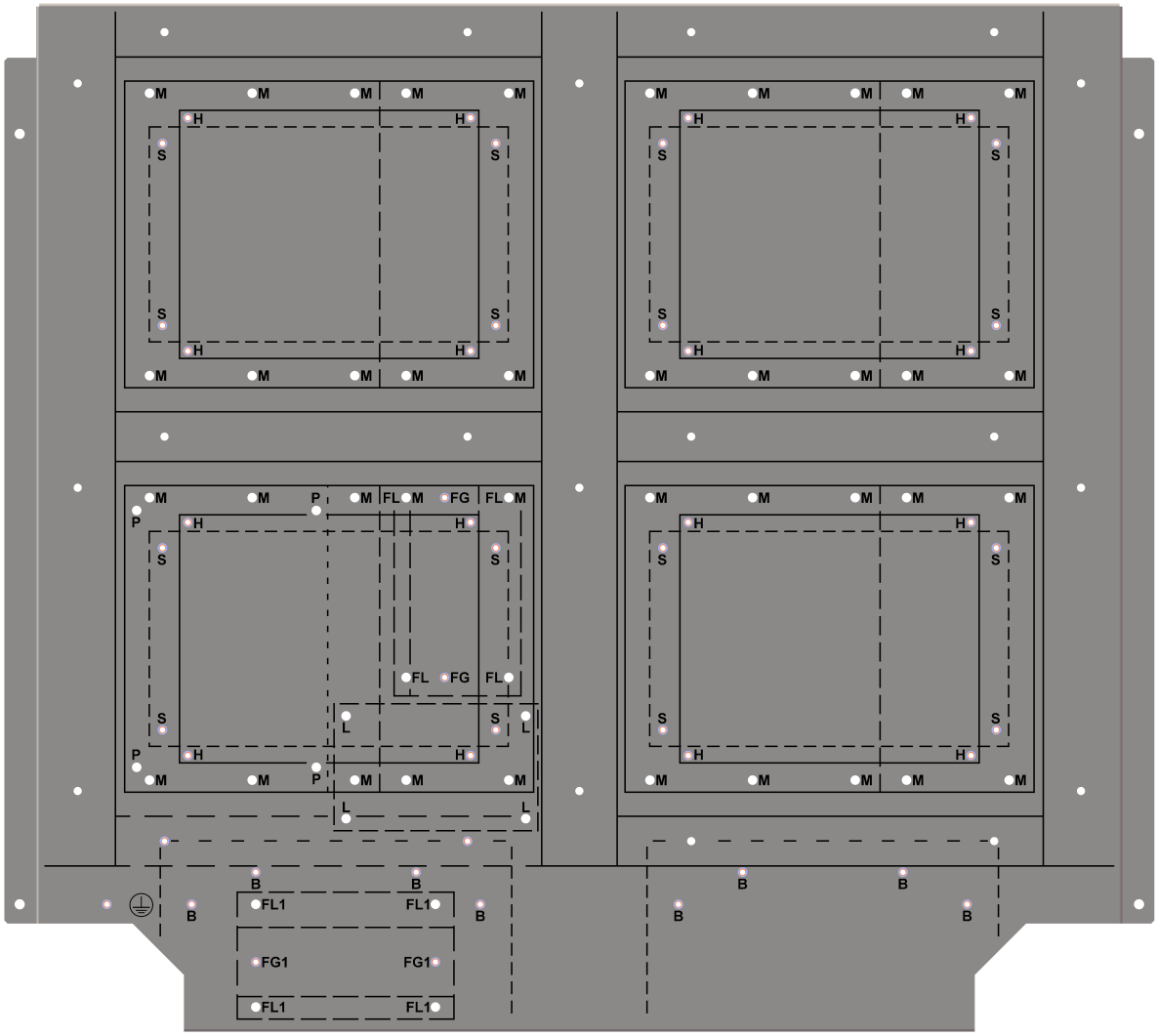
[b] Requires adapter kit: SY-EP1501MOUNT.

[c] Requires adapter kit: SY-MR50MOUNT. Two MR50 modules can be mounted on each adapter.

[d] This product was not evaluated by UL. If included in the system, the UL certification provided by Genetec is not applicable.

Component locations for small Synergis enclosures

The locations of the components are defined by the hole patterns on the backplate of the small enclosure.



Hole pattern	Component
B	Battery cover[a]
FG or FG1	Genetec fuse assembly
FL or FL1	LifeSafety Power Distribution Modules (fuse boards): • D8[b, e], F8[b, e]
H	HID VertX interface modules: • V100, V200, V300 • V1000[e], V2000[e] • M2000 (PAM)

Hole pattern	Component
L	LifeSafety NL LAN modules: • NL2[b, e], NL4[b, e]
M	Mercury EP and MR panels: • EP2500[b], EP1501[c], EP1502[b] • MR50[d], MR51e[c, e], MR52[b] • MR16in[b], MR16out[b]
P	LifeSafety FPO75 power supply
S	Synergis™ Cloud Link. Small enclosure backplates can support up to 4 Synergis™ Cloud Link appliances.

[a] Small enclosures (both pre-wired and enclosure kits) come with only one battery cover on the left side. By adding an additional battery cover to the right side, you can install a second battery in the enclosure. To install the second battery cover, you must remove the lower-right horizontal cable duct. Using a drill and an 8-9mm (11/32 in) drill bit, remove the two metal rivets that attach the cable duct to the backplate. After removing the rivets and the duct, clear any metal filings from the enclosure.

[b] Direct mount with snap-in standoff.

[c] Requires adapter kit: SY-EP1501MOUNT.

[d] Requires adapter kit: SY-MR50MOUNT. Two MR50 modules can be mounted on each adapter.

[e] This product was not evaluated by UL. If included in the system, the UL certification provided by Genetec is not applicable.

Removing the door from Synergis enclosures

During installation or maintenance, it is often more convenient to remove the enclosure door.

What you should know

WARNING: If removing the door while the enclosure is horizontal (for example, laying on a table), be careful not to let the door swing open. The following instructions assume the enclosure is in a vertical position.

1 Open the enclosure door.

2 Remove the grounding cable attached to the door.

IMPORTANT: Disconnect the grounding cable where it attaches to the door. Disconnecting the grounding cable from the main grounding lug will unground the entire enclosure.

3 Gently pull some more of the AC ON indicator supply cable out of the wire duct and disconnect the AC ON indicator from the AC ON indicator supply cable using the in-line connector marked “B” on the diagram "Connecting the AC ON indicator".

4 Lift the door to slide the hinges off of the hinge pins.

Assembling components on the Synergis backplate

If you are not using a pre-assembled and pre-wired Synergis™ Cloud Link kit, you can assemble the required components on a Synergis backplate.

Before you begin

Each enclosure has mounting holes for the components.

- For large enclosures, refer to the component locations diagram.
- For small enclosures, refer to the component locations diagram.

What you should know

- Synergis enclosures must only be assembled by certified Synergis installers.
- Installers must use anti-static wrist straps when handling and installing the electronic components. Failure to do so may result in electrostatic discharge and damage to the components.

To assemble components on the backplate:

1 Locate mounting holes for the components on the backplate.

2 Install standoffs as needed.

- Snap-in nylon standoffs are included for Mercury modules and the power supply. HID modules don't require standoffs. You can screw them directly to the backplate.
- The recommended torque for Synergis™ Cloud Link mounting screws is 90 cN*m (8 lbf*in).

  NOTE: Certain hardware versions include a green chassis ground wire which must be connected to the top-left leg of the Synergis™ Cloud Link when mounting the appliance to the Synergis enclosure backplate. If this wire is not present, the appliance is internally grounded, and no action is required. For more information, see Synergis™ Cloud Link connections on page 36.

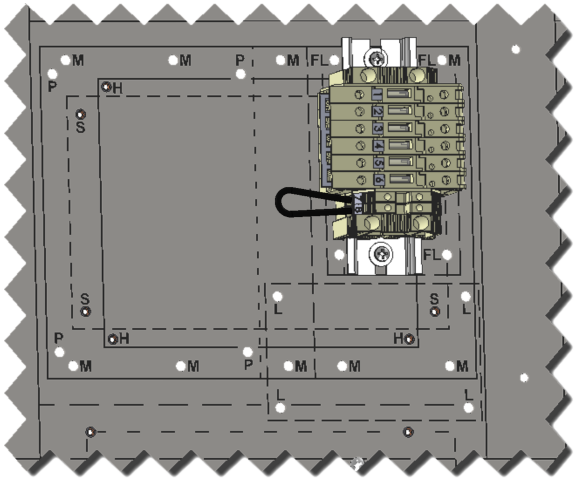
3 Align components and seat components on standoffs.

- For standoff requirements for large enclosures, refer to the component locations diagram.
- For standoff requirements for small enclosures, refer to the component locations diagram.

4 Secure components as needed.

5 Install the DIN rail and attached fuse assembly to the enclosure.

Screw the DIN rail (using a 3mm slotted head screwdriver) to the Synergis enclosure backplate using 90 cN*m (8 lbf*in) torque. The letter "FG" or "FG1" on the backplate indicates where you can install the DIN rail.



For more information on where to install, see the component locations diagram for large enclosures, and the component locations diagram for small enclosures.

NOTE: The backplates are for Genetec enclosures. If you're installing the fuse assembly in a third-party enclosure, refer to the enclosure manufacturer's documentation for more information on proper installation.

After you finish

Install internal wiring and secure wires inside the wire ducts.

- Review the wiring guidelines.
- Install the wiring for the components according to the wiring diagram.

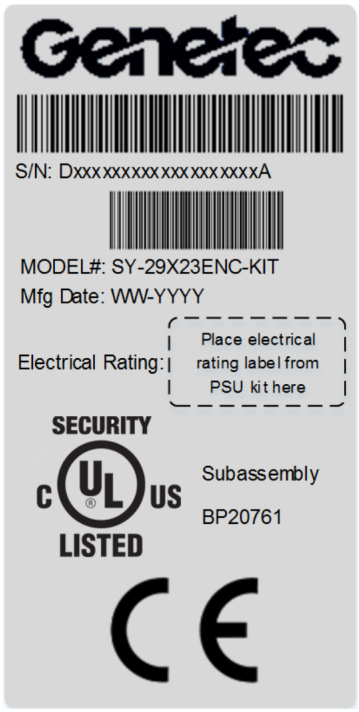
Electrical rating specifications of UL installations implemented with Synergis enclosure kits and power supply kits

All Synergis enclosure kits (SY-29X23ENC-KIT and SY-21X23ENC-KIT) come with their correspondent main identification label. Because the enclosure kits do not come with a power supply included, there is no electrical rating shown on this label.

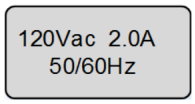
The power supply kits provided by Genetec (SY-6APS-B-NA-KIT and SY-6APS-B-EU-KIT) include an electrical rating label that must be placed in a reserved space of the enclosure kit's main identification label. This space is marked as *"Place electrical rating label from PSU kit here"*.

Any UL installation that uses the UL-listed subassemblies enclosure kits and power supply kits to implement a system shall have the electrical rating label from the PSU kit affixed to the enclosure kit's main identification label (see the following example).

NOTE: It is the responsibility of the installer to ensure that the electrical rating label is properly applied for a UL-compliant installation.



Enclosure kits' main identification label (large enclosure kit shown)



Electrical rating label included with the PSU kits (North American model shown)

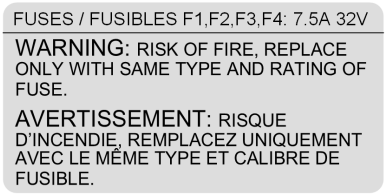
Fuses rating labels for Synergis™ Cloud Link products

All power supply kits provided by Genetec (SY-6APS-B-NA-KIT and SY-6APS-B-EU-KIT) include two (2) fuse rating labels. One corresponds to the power supply and the other to the fuse assembly.

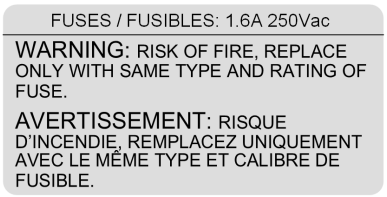
Any UL installation that uses the UL-listed subassemby enclosure kits and power supply kits to implement a system shall have the following labels placed in close proximity to their correspondent module.

NOTE: It is the responsibility of the installer to ensure that the fuse rating labels are properly applied for a UL-compliant installation.

For the power supply:



For the fuse assembly:



3

Synergis enclosure wiring

This section includes the following topics:

Wiring guidelines for Synergis enclosures

To avoid injury, you should follow specific guidelines when you wire a Synergis enclosure.

- Wiring must be installed by someone who has been trained to wire the controllers, interface modules, and other components housed in the enclosure.
- Installers must use anti-static devices such as proper wrist straps when wiring the components. Failure to do so may result in electrostatic discharge (ESD) and damage to the components.
- Grounding of the enclosure and cabling must comply with your Local Electrical Code or National Electrical Code.
- A maximum 20A AC circuit can be used to wire the enclosure.
- The knockout used for the AC power entry into the enclosure must not be used for any low-voltage wiring.
- It is highly recommended to use one of the two knockouts on the lower left corner of the enclosure to input the AC cable. These knockouts are closest to the power supply. This will allow you to wire the AC directly to the power supply without the use of the cable ducts.
- After the AC cable has been connected, ensure that there is a minimum distance of 6.5mm (1/4 in.) between the AC wires and any low voltage wire inside the enclosure.
- For RS-485 shielding, have ONE device providing ground (connect the shield to a single location, preferably to the master device). This provides a return path for common mode noise, and avoids DC ground loop current flow.

  NOTE: Certain interface modules include a “shield” terminal. If you use this terminal to propagate the drain wire connection (shield grounding), keep in mind that by doing so you may be providing ground at multiple places.
- When running the RS-485 bus between enclosures, only ground one end of the cable. When running the RS-485 bus within the enclosure, you can ground one end, or both ends of the cable.
- Each HID VertX module includes an address dial for setting the interface module address. For more information, see the *Synergis Softwire Integration Guide for HID VertX Interface Modules*.
- Each Mercury module includes a dip switch for setting the interface module address.For more information, see the *Synergis Softwire Integration Guide for Mercury Interface Modules*.
- For up-to-date information about HID or Mercury interface modules, see the HID or Mercury websites.
- The fuse assembly outputs shall not be used in parallel.

Related Topics

Enclosures with Synergis Cloud Link and interface modules on page 10
Synergis enclosures with interface modules and a fuse assembly on page 12

Recommended wire gauges for Synergis enclosures

When connecting modules in a Synergis enclosure, use the wire gauges recommended by Genetec.

NOTE: For UL installations, all wiring shall be UL certified Appliance Wiring Material (AWM).

Function	Specification
Readers	ALPHA 1299C, 22 AWG, 9-conductor, stranded, overall shield or equivalent 22AWG or 24AWG shielded multi-conductor cable. **NOTE:** Fewer conductors needed if not all control lines are used.
RS-485	Belden 3105A or 9841 shielded cable or equivalent 22 AWG (maximum length of 4000 ft (1219 m) or 24 AWG (maximum length of 2500 ft (762 m)) shielded communications cable with a characteristic impedance of 120 ohm.
12 Volt (Power supply to fuse assembly)	16 AWG
Ground (Power supply to fuse assembly)	16 AWG
12 Volt (Fuse assembly to Synergis™ Cloud Link and interface modules)	20 AWG
Ground (Fuse assembly to Synergis™ Cloud Link and interface modules)	20 AWG

NOTE: For UL installations, the use of shielded cable for RS-485 and readers is required for UL 294 and ULC-S319 compliance.

Adding high-power readers to Synergis™ Cloud Link installations

If the readers you have selected require more power than can be supplied by the interface module, you must provide power to the reader directly from the fuse block of the Synergis access control enclosure.

What you should know

IMPORTANT:

- When connecting high-power readers to the fuse block, the load for each fuse shall not be higher than 1.2A. The total current draw for all 6 fuse positions shall not be higher than 6A.
- By connecting multiple readers directly to the fuse block using the following instructions, in the event that the fuse on the fuse block blows, all of the connected readers will be offline. To avoid this issue, you can add in-line fuses to the reader cable power wire (as close as possible to the fuse block).
- When adding high-power readers to the system, you must respect the power budget of the power supply (6A).

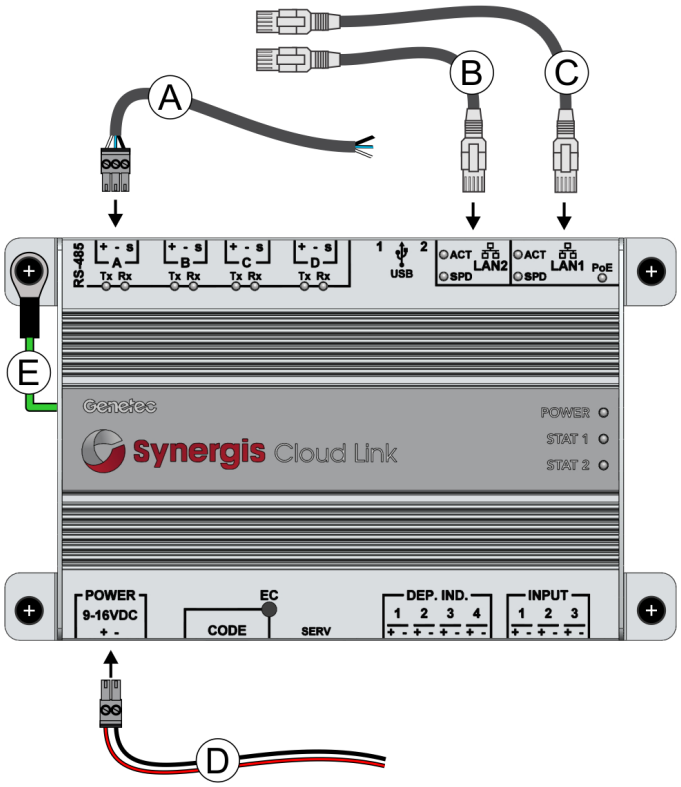
NOTE: For information on the power consumption for HID readers, see Power supply requirements for Synergis enclosures on page 15.

To connect a reader directly to the fuse block:

1. Calculate the wire run from the reader connection on the reader interface module to the fuse block (typically fuse 6) in the Synergis™ Cloud Link enclosure.
2. Skin the reader cable so that the red power wire will reach the fuse block.
3. Cut the communication wires and ground wire close to the interface module's reader connection.
4. Connect the communication wires and ground according to the wiring instructions.
5. Run the red power wire to the fuse block and connect the wire to an empty fuse.

Synergis™ Cloud Link connections

The Synergis™ Cloud Link appliance must be grounded and connected to a power cable, Ethernet cable, and to any modules that require RS-485 communication.



	Hardware feature	What you should know
A	RS-485 cable	Connect Synergis™ Cloud Link to any modules that require RS-485 communication. You can also continue the RS-485 data daisy chain to interface modules outside enclosure.
B	Ethernet cable	Use the LAN2 port to connect to IP interfaces inside the enclosure, for example, a Mercury EP1502 controller.
C	Ethernet cable	Use the LAN1 port to connect to the building's LAN or other IP interfaces outside the enclosure. **NOTE:** If you are powering Synergis™ Cloud Link over the LAN (PoE), you must use the LAN1 port. For more information see Powering Synergis™ Cloud Link using PoE on page 78.

	Hardware feature	What you should know
D	DC power cable	Connect Synergis™ Cloud Link to a 12 VDC (nominal) power supply. For more information, refer to: • Power supply requirements for Synergis enclosures on page 15 • Connecting external 12 VDC power supply for Synergis™ Cloud Link on page 80
E	Chassis ground wire	Certain hardware versions include a green chassis ground wire which must be connected to the top-left leg of the Synergis™ Cloud Link when mounting the appliance to the Synergis enclosure backplate. If this wire is not present, the appliance is internally grounded, and no action is required.

Voltage information:

- Nominal input voltage: 12 VDC (UL/ULC compliance)
- Minimum input voltage for guaranteed power-up = 10.1 V
- Minimum input voltage before guaranteed automatic shut-off = 9 V
- Maximum input voltage to guarantee no automatic shut-off = 16 V

Earth grounding the Synergis™ Cloud Link:

When installed in a Synergis enclosure, the Synergis™ Cloud Link is grounded to the enclosure's metal backplate. If you are not installing the Synergis™ Cloud Link in a Synergis enclosure, you must ensure that the appliance is mounted on a grounded metal backplate. Alternatively, you can connect an earth ground wire to one of the appliance's legs.

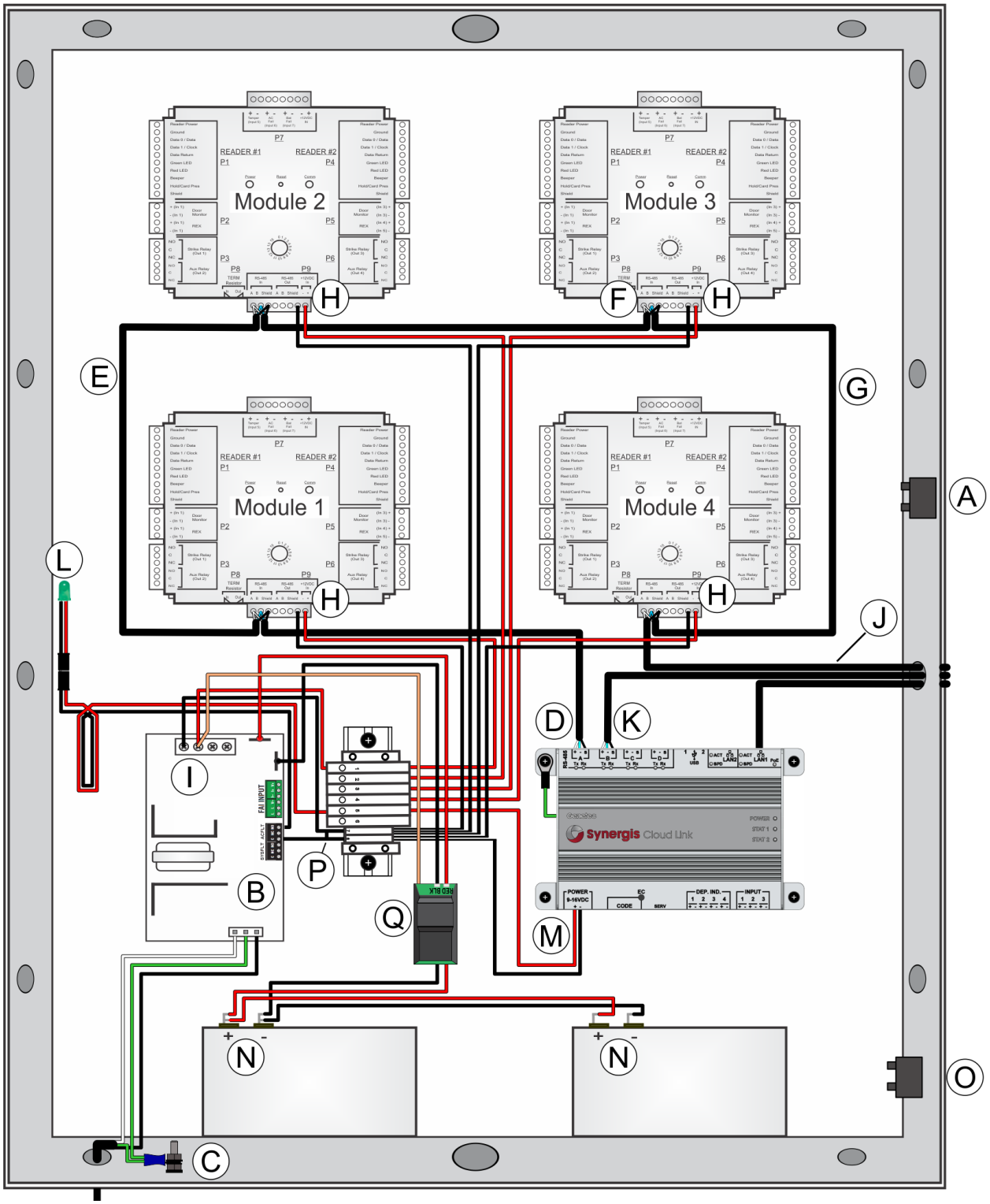
NOTE: If you are using an earth ground wire, and if the Synergis™ Cloud Link also includes a green chassis ground wire (refer to "E" in the overview diagram), you must connect both grounding wires to the top-left leg of the Synergis™ Cloud Link.

Related Topics

Wiring guidelines for Synergis enclosures on page 33

Synergis wiring diagram: 4 HID modules with Synergis™ Cloud Link, fuse assembly, and power supply

Before installing the Synergis enclosure and its components, familiarize yourself with how to wire four HID modules with the Synergis™ Cloud Link, fuse assembly, and power supply in a large enclosure.



	Function	From location	To location	Wire information
A	Door tamper signal	Door tamper switch	Interface module tamper input	• Red to (+) • Black to (-)
B	AC Power	External AC power	Power supply • AC input (J9)	• Green/yellow to earth ground • Black - Hot • White - Neutral
C	Ground wire	Ground lug	Power supply	• Green/yellow to earth ground
D	Origin of RS-485 data[d]	Synergis™ Cloud Link • RS-485 port A	Interface module 1 • P9 RS-485 In	• White to A • Blue to B • Black (bare wire)[a]
E	RS-485 data daisy chain[b]	Interface module 1 • P9 RS-485 In	Interface module 2 • P9 RS-485 In	• White to A • Blue to B • Black (bare wire) block[a]
F	RS-485 data daisy chain[b]	Interface module 2 • P9 RS-485 In	Interface module 3 • P9 RS-485 In	• White to A • Blue to B • Black (bare wire) block[a]
G	RS-485 data daisy chain (end of chain)[c]	Interface module 3 • P9 RS-485 In	Interface module 4 • P9 RS-485 In	• White to A • Blue to B • Black (bare wire) block[a]
H	Interface modules to fuse assembly	Interface modules	Fuse assembly	• Red to open fuse block 1 to 4 • Black to ground block 7 or 8
I	Power supply to fuse assembly	12 VDC power supply	Fuse assembly	• Red (+) to 1 • Black (-) to 7 or 8
J	(Optional) Continue RS-485 data daisy chain to interface modules outside enclosure.[a] **NOTE:** Use the last module's RS-485 ground terminal to propagate the cable's shield for the rest of the chain.			

	Function	From location	To location	Wire information
K	(Optional) Connect RS-485 module COM ports B, C, or D to interface modules outside enclosure.			
L	AC ON indicator	12 VDC power supply	Fuse assembly	• Red (+) to 5 • Black (-) to 7 or 8 via NO relay
M	Synergis Cloud Link to fuse assembly	Synergis™ Cloud Link	Fuse assembly (see Synergis™ Cloud Link connections on page 36)	• Red (+) to 5 • Black (-) to 7 or 8
N	Backup battery	Battery Disconnect Module	Backup battery (see Installing standby backup batteries for Synergis enclosures on page 69)	• Red to Battery (+) • Black to Battery (-)
O	Wall tamper signal	Wall tamper switch	Interface module tamper input	• Red to (+) • Black to (-)
P	Ground jumper wire	Fuse assembly	Fuse assembly	• Ground block 7 to 8
Q	Battery Disconnect Module	Battery Disconnect Module	Power supply (see Installing standby backup batteries for Synergis enclosures on page 69).	• RED to BAT+ • BLK to BAT- • Orange to DC1+

[a] When running the RS-485 bus between enclosures, only ground one end of the cable. When running the RS-485 bus within the enclosure, you can ground one end, or both ends of the cable. For additional shielding information, see Wiring guidelines for Synergis enclosures on page 33.

[b] In a daisy-chain configuration, connect both RS-485 wires to the “In” location of the P9 terminal block, otherwise. If you connect RS-485 wires to the “In” and “Out” locations, a loss of power will result in a loss of RS-485 data from downstream V100 modules.

[c] Install a terminating jumper on the “In” position of the interface module at the end of the RS-485 bus. See Connections for HID interface modules on page 86.

[d]Set the DIP switch for this RS-485 port to the ON position.

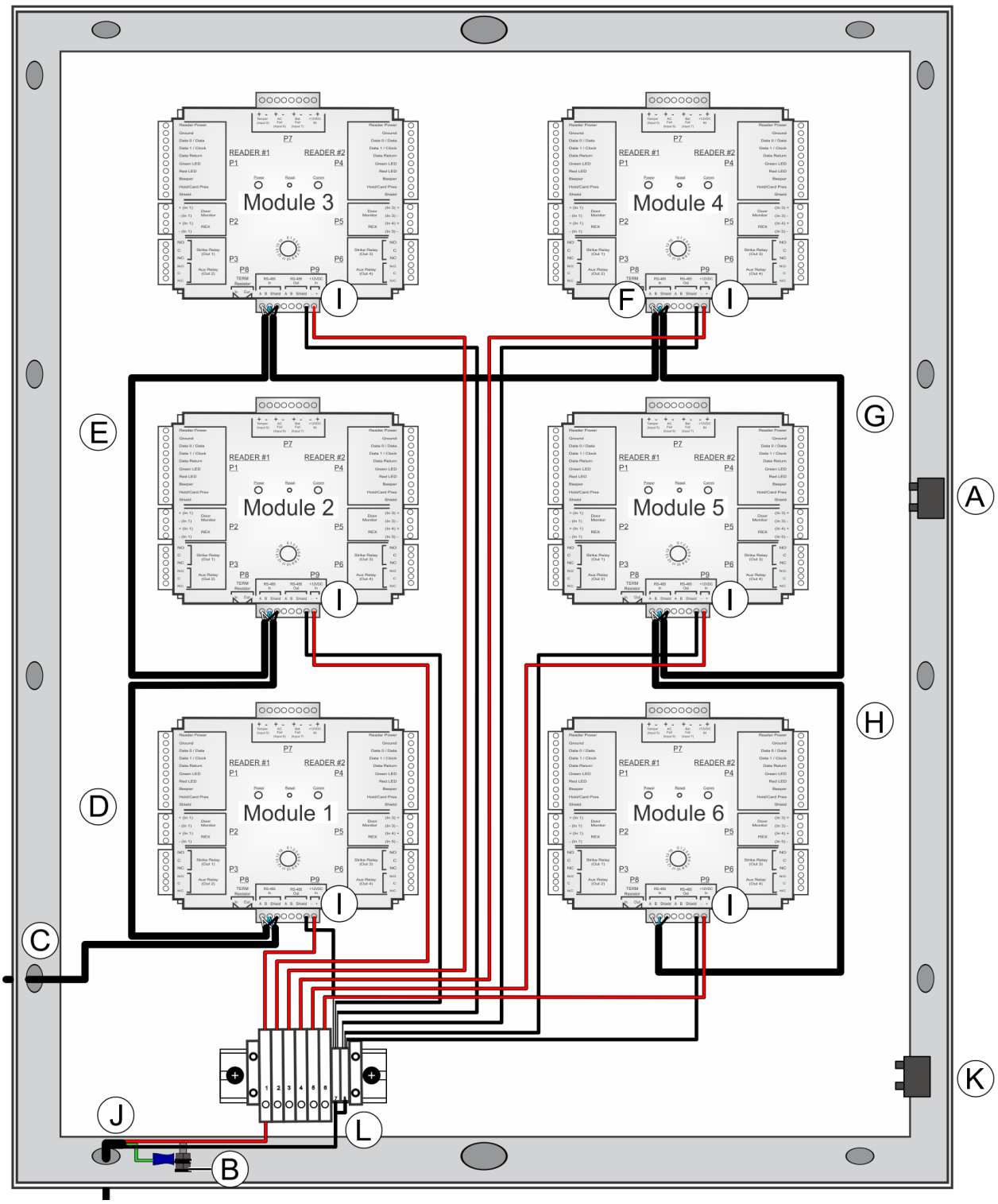
Related Topics

Synergis part numbers: pre-wired kits on page 20
Component locations for large Synergis enclosures on page 24
Assembling components on the Synergis backplate on page 29
Wiring guidelines for Synergis enclosures on page 33

Synergis wiring diagram: 6 HID modules with fuse assembly

Before installing the Synergis enclosure and its components, familiarize yourself with how to wire six HID modules with a fuse assembly in a large enclosure.

NOTE: If the enclosure does not include a power supply unit, you must repurpose the AC ON indicator on the enclosure door. See How to repurpose the AC ON indicator for Synergis enclosures on page 76.



	Function	From location	To location	Wire information
A	Door tamper signal	Door tamper switch	Interface module tamper input	• Red to + • Black to -

	Function	From location	To location	Wire information
B	Ground wire	Ground lug	External power supply	• Green/yellow to earth ground
C	Origin of RS-485 data[e]	Synergis™ Cloud Link[b]	Interface module 1 • P9 RS-485 In	• White to A • Blue to B • Black (bare wire)[a]
D	RS-485 data daisy chain[c]	Interface module 1 • P9 RS-485 In	Interface module 2 • P9 RS-485 In	• White to A • Blue to B • Black (bare wire)[a]
E	RS-485 data daisy chain[c]	Interface module 2 • P9 RS-485 In	Interface module 3 • P9 RS-485 In	• White to A • Blue to B • Black (bare wire)[a]
F	RS-485 data daisy chain[c]	Interface module 3 • P9 RS-485 In	Interface module 4 • P9 RS-485 In	• White to A • Blue to B • Black (bare wire)[a]
G	RS-485 data daisy chain[c]	Interface module 4 • P9 RS-485 In	Interface module 5 • P9 RS-485 In	• White to A • Blue to B • Black (bare wire)[a]
H	RS-485 data daisy chain (end of chain)[d]	Interface module 5 • P9 RS-485 In	Interface module 6 • P9 RS-485 In	• White to A • Blue to B • Black (bare wire)[a]
I	Interface modules to fuse assembly	Interface modules	Fuse assembly	• Red to open fuse block 1 to 6 • Black to ground block 7 or 8
J	External DC power to fuse assembly	External 12 VDC power supply	Fuse assembly	• Red to 1 • Black to 7 or 8

	Function	From location	To location	Wire information
K	Wall tamper signal	Wall tamper switch	Interface module tamper input	• Red to + • Black to -
L	Ground jumper wire	Fuse assembly	Fuse assembly	• Ground block 7 to 8

[a] When running the RS-485 bus between enclosures, only ground one end of the cable. When running the RS-485 bus within the enclosure, you can ground one end, or both ends of the cable. For additional shielding information, see Wiring guidelines for Synergis enclosures on page 33.

[b] In this example, Synergis™ Cloud Link is located outside the enclosure.

[c] In a daisy-chain configuration, connect the RS-485 wires to the “In” location of the P9 terminal block. If you connect RS-485 wires to the “In” and “Out” locations, a loss of power will result in a loss of RS-485 data from downstream V100 modules.

[d] Install a terminating jumper on the “In” position of the interface module at the end of the RS-485 bus. See Connections for HID interface modules on page 86.

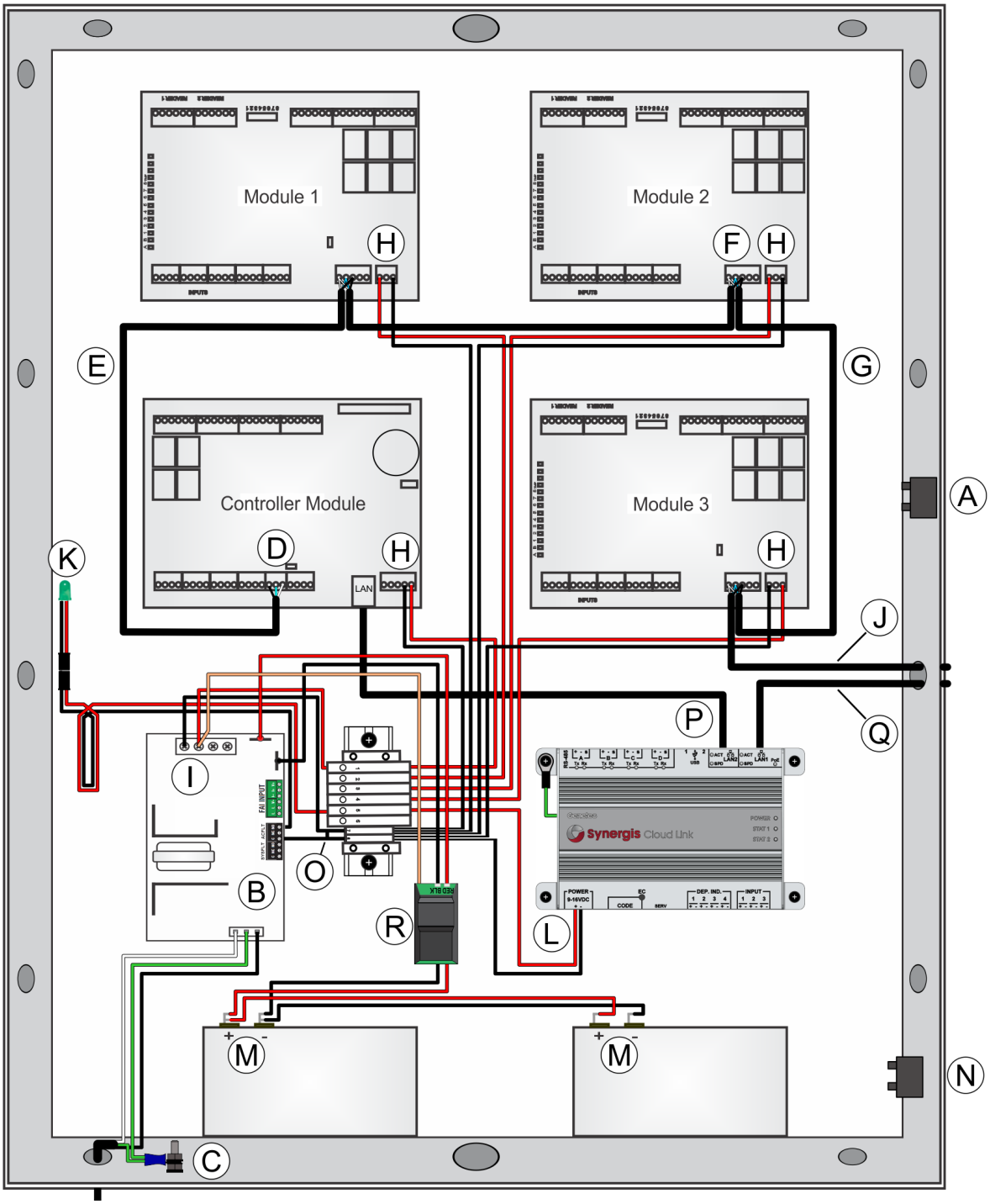
[e]Set the DIP switch for this RS-485 port to the ON position.

Related Topics

Component locations for large Synergis enclosures on page 24
Assembling components on the Synergis backplate on page 29
Wiring guidelines for Synergis enclosures on page 33

Synergis wiring diagram: 3 Mercury modules with Mercury controller, Synergis™ Cloud Link, fuse assembly, and power supply

Before installing the Synergis enclosure and its components, familiarize yourself with how to wire three Mercury modules with a Synergis™ Cloud Link, Mercury controller module, fuse assembly, and power supply in a large enclosure. Depending on the hardware installed, this configuration can support up to eight readers: two on the controller module, and six on the reader modules.



	Function	From location	To location	Wire information
A	Door tamper signal	Door tamper switch	Interface module tamper input	• Red to I1 • Black to I1
B	AC Power	External AC power	Power supply • AC input (J9)	• Green/yellow earth ground • Black - Hot • White - Neutral
C	Ground wire	Ground lug	Power supply	• Green/yellow to earth ground
D	Origin of RS-485 data[b]	Mercury EP1502 • TB3	Interface module 1 • TB6	• White to TR+ • Blue to TR- • Black (bare wire) block[a]
E	RS-485 data daisy chain	Mercury EP1502 • TB3	Interface module 1 • TB6	• White to TR+ • Blue to TR- • Black (bare wire) block[a]
F	RS-485 data daisy chain	Interface module 1 • TB6	Interface module 2 • TB6	• White to TR+ • Blue to TR- • Black (bare wire) block[a]
G	RS-485 data daisy chain (end of chain)[b]	Interface module 2 • TB6	Interface module 3 • TB6	• White to TR+ • Blue to TR- • Black (bare wire) block[a]
H	Interface modules to fuse assembly	Interface modules	Fuse assembly	• Red to open fuse block 1 to 4 • Black to ground block 7 or 8
I	Power supply to fuse assembly	12 VDC power supply	Fuse assembly	• Red (+) to 1 • Black (-) to 7 or 8
J	(Optional) Continue RS-485 data daisy chain to interface modules outside enclosure. **NOTE:** Use the last module's RS-485 ground terminal to propagate the cable's shield for the rest of the chain.			

	Function	From location	To location	Wire information
K	AC ON indicator	12 VDC power supply	Fuse assembly	• Red (+) to 5 • Black (-) to 7 or 8 via NO relay
L	Synergis Cloud Link to fuse assembly	Synergis™ Cloud Link	Fuse assembly (see Synergis™ Cloud Link connections on page 36)	• Red (+) to 5 • Black (-) to 7 or 8
M	Backup battery	Battery Disconnect Module	Backup battery (see Installing standby backup batteries for Synergis enclosures on page 69)	• Red to Battery (+) • Black to Battery (-)
N	Wall tamper signal	Wall tamper switch	Interface module tamper input	• Red to I1 • Black to I1
O	Ground jumper wire	Fuse assembly	Fuse assembly	• Ground block 7 to 8
P	Synergis™ Cloud Link to EP1502 controller	Synergis™ Cloud Link LAN2 port	EP1502 LAN port	CAT5e LAN cable
Q	LAN	Synergis™ Cloud Link LAN1 port	LAN[c]	CAT5e LAN cable
R	Battery Disconnect Module	Battery Disconnect Module	Power supply (see Installing standby backup batteries for Synergis enclosures on page 69).	• RED to BAT+ • BLK to BAT- • Orange to DC1+

[a] When running the RS-485 bus between enclosures, only ground one end of the cable. When running the RS-485 bus within the enclosure, you can ground one end, or both ends of the cable. For additional shielding information, see Wiring guidelines for Synergis enclosures on page 33.

[b]Install the terminating jumper on the controller module at the beginning of the RS-485 bus, and on the reader module at the end of the RS-485 bus.

[c]Communication with local network and other IP interfaces outside the enclosure. Note: If you are powering Synergis™ Cloud Link over the LAN (PoE), you must use the LAN1 port. For more information see Powering Synergis™ Cloud Link using PoE on page 78.

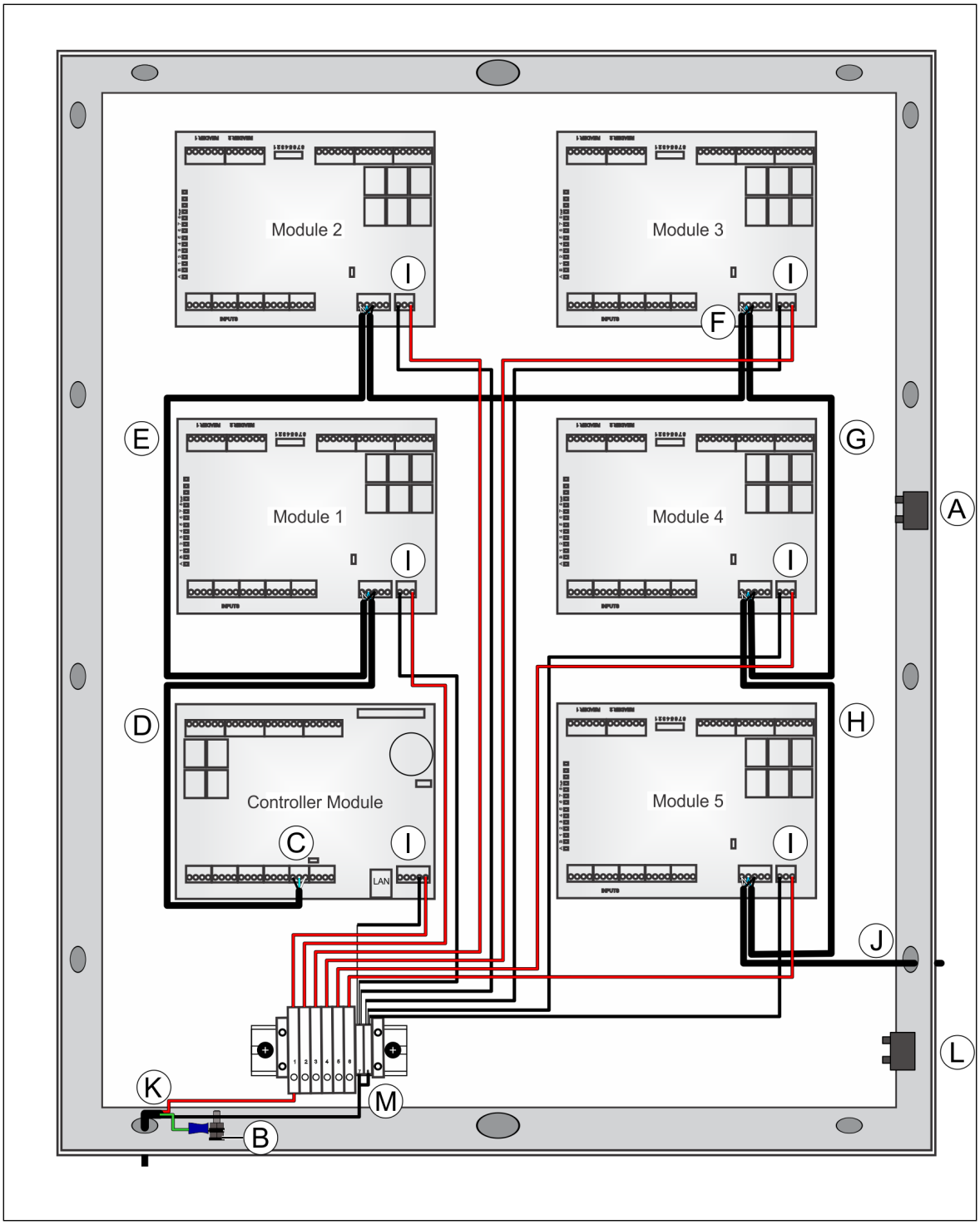
Related Topics

Component locations for large Synergis enclosures on page 24
Assembling components on the Synergis backplate on page 29
Wiring guidelines for Synergis enclosures on page 33

Synergis wiring diagram: 5 Mercury modules with Mercury controller and fuse assembly

Before installing the Synergis enclosure and its components, familiarize yourself with how to wire five Mercury modules with a Mercury controller module and fuse assembly in a large enclosure.

NOTE: If the enclosure does not include a power supply unit, you must repurpose the AC ON indicator on the enclosure door. See How to repurpose the AC ON indicator for Synergis enclosures on page 76.



	Function	From location	To location	Wire information
A	Door tamper signal	Door tamper switch	Interface module 5 • TB1	• Red to I1 • Black to I1
B	Ground wire	Ground lug	External power supply	• Green/yellow to earth ground

	Function	From location	To location	Wire information
C	Origin of RS-485 data[b]	Mercury EP1502 • TB3	Interface module 1 • TB6	• White to TR+ • Blue to TR- • Black (bare wire) block[a]
D	RS-485 data daisy chain	Mercury EP1502 • TB3	Interface module 1 • TB6	• White to TR+ • Blue to TR- • Black (bare wire) block[a]
E	RS-485 data daisy chain	Interface module 1 • TB6	Interface module 2 • TB6	• White to TR+ • Blue to TR- • Black (bare wire) block[a]
F	RS-485 data daisy chain	Interface module 2 • TB6	Interface module 3 • TB6	• White to TR+ • Blue to TR- • Black (bare wire) block[a]
G	RS-485 data daisy chain	Interface module 3 • TB6	Interface module 4 • TB6	• White to TR+ • Blue to TR- • Black (bare wire) block[a]
H	RS-485 data daisy chain (end of chain)[b]	Interface module 4 • TB6	Interface module 5 • TB6	• White to TR+ • Blue to TR- • Black (bare wire) block[a]
I	Interface modules to fuse assembly	Interface modules	Fuse assembly	• Red to open fuse block 1 to 6 • Black to ground block 7 or 8
J	(Optional) Continue RS-485 data daisy chain to interface modules outside enclosure. **NOTE:** Use the last module's RS-485 ground terminal to propagate the cable's shield for the rest of the chain.			
K	External DC power to fuse assembly	External 12 VDC power supply	Fuse assembly	• Red to 1 • Black to 7 or 8

	Function	From location	To location	Wire information
L	Wall tamper signal	Wall tamper switch	Interface module tamper input	• Red to I1 • Black to I1
M	Ground jumper wire	Fuse assembly	Fuse assembly	• Ground block 7 to 8

[a] When running the RS-485 bus between enclosures, only ground one end of the cable. When running the RS-485 bus within the enclosure, you can ground one end, or both ends of the cable. For additional shielding information, see Wiring guidelines for Synergis enclosures on page 33.

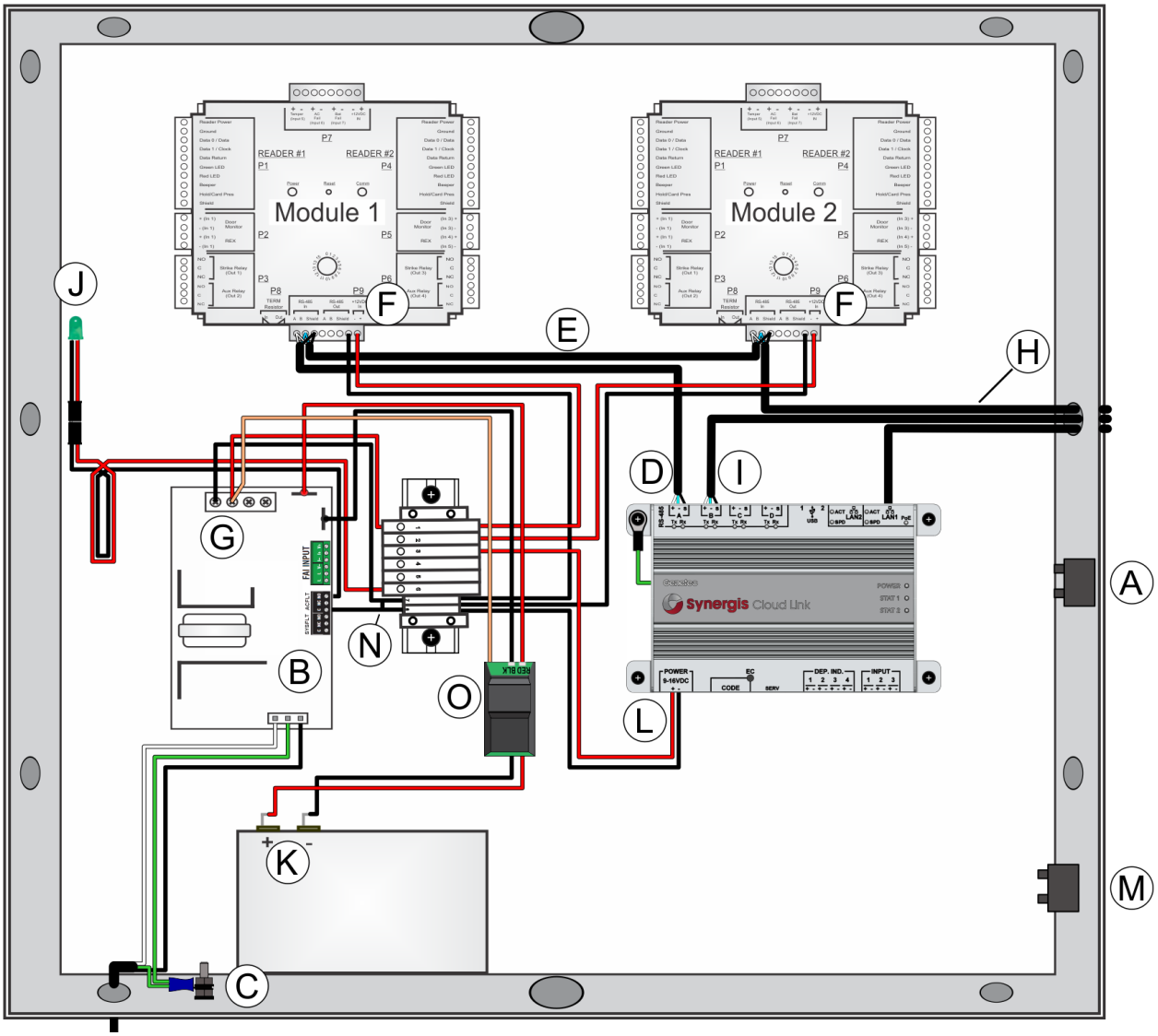
[b] Install the terminating jumper on the controller module at the beginning of the RS-485 bus, and on the reader module at the end of the RS-485 bus.

Related Topics

Component locations for large Synergis enclosures on page 24
Assembling components on the Synergis backplate on page 29
Wiring guidelines for Synergis enclosures on page 33

Synergis wiring diagram: 2 HID modules with Synergis™ Cloud Link, fuse assembly, and power supply

Before installing the Synergis enclosure and its components, familiarize yourself with how to wire two HID modules with a Synergis™ Cloud Link, fuse assembly, and power supply in a small enclosure.



	Function	From location	To location	Wire information
A	Door tamper signal	Door tamper switch	Interface module tamper input	• Red to + • Black to -
B	AC power	External AC power	Power supply • AC input (J9)	• Green/yellow to earth ground • Black - Hot • White - Neutral

	Function	From location	To location	Wire information
C	Ground wire	Ground lug	Power supply	• Green/yellow to earth ground
D	Origin of RS-485 data[c]	Synergis™ Cloud Link • RS-485 port A	Interface module 1 • P9 RS-485 In	• White to A • Blue to B • Black (bare wire) block[a]
E	RS-485 data daisy chain (end of chain)[b]	Interface module 1 • P9 RS-485 In	Interface module 2 • P9 RS-485 In	• White to A • Blue to B • Black (bare wire) block[a]
F	Interface modules to fuse assembly	Interface modules	Fuse assembly	• Red to open fuse block 1 to 2 • Black to ground block 7 or 8
G	Power supply to fuse assembly	12 VDC power supply	Fuse assembly	• Red (+) to 1 • Black (-) to 7 or 8
H	(Optional) Continue RS-485 data daisy chain to interface modules outside enclosure. **NOTE:** Use the last module's RS-485 ground terminal to propagate the cable's shield for the rest of the chain.			
I	(Optional) Connect RS-485 module COM ports B, C, or D to interface modules outside enclosure.			
J	AC ON indicator	12 VDC power supply	Fuse assembly	• Red (+) to 6 • Black (-) to 7 or 8 via NO relay
K	Backup battery	Battery Disconnect Module	Backup battery (see Installing standby backup batteries for Synergis enclosures on page 69)	• Red to Battery (+) • Black to Battery (-)
L	Synergis Cloud Link to fuse assembly	Synergis™ Cloud Link	Fuse assembly (see Synergis™ Cloud Link connections on page 36)	• Red (+) to 5 • Black (-) to 8
M	Wall tamper signal	Wall tamper switch	Interface module tamper input	• Red to + • Black to -

	Function	From location	To location	Wire information
N	Ground jumper wire	Fuse assembly	Fuse assembly	• Ground block 7 to 8
O	Battery Disconnect Module	Battery Disconnect Module	Power supply (see Installing standby backup batteries for Synergis enclosures on page 69).	• RED to BAT+ • BLK to BAT- • Orange to DC1+

[a] When running the RS-485 bus between enclosures, only ground one end of the cable. When running the RS-485 bus within the enclosure, you can ground one end, or both ends of the cable. For additional shielding information, see Wiring guidelines for Synergis enclosures on page 33.

[b] Install a terminating jumper on the “In” position of the interface module at the end of the RS-485 bus. See Connections for HID interface modules on page 86.

[c] Set the DIP switch for this RS-485 port to the ON position.

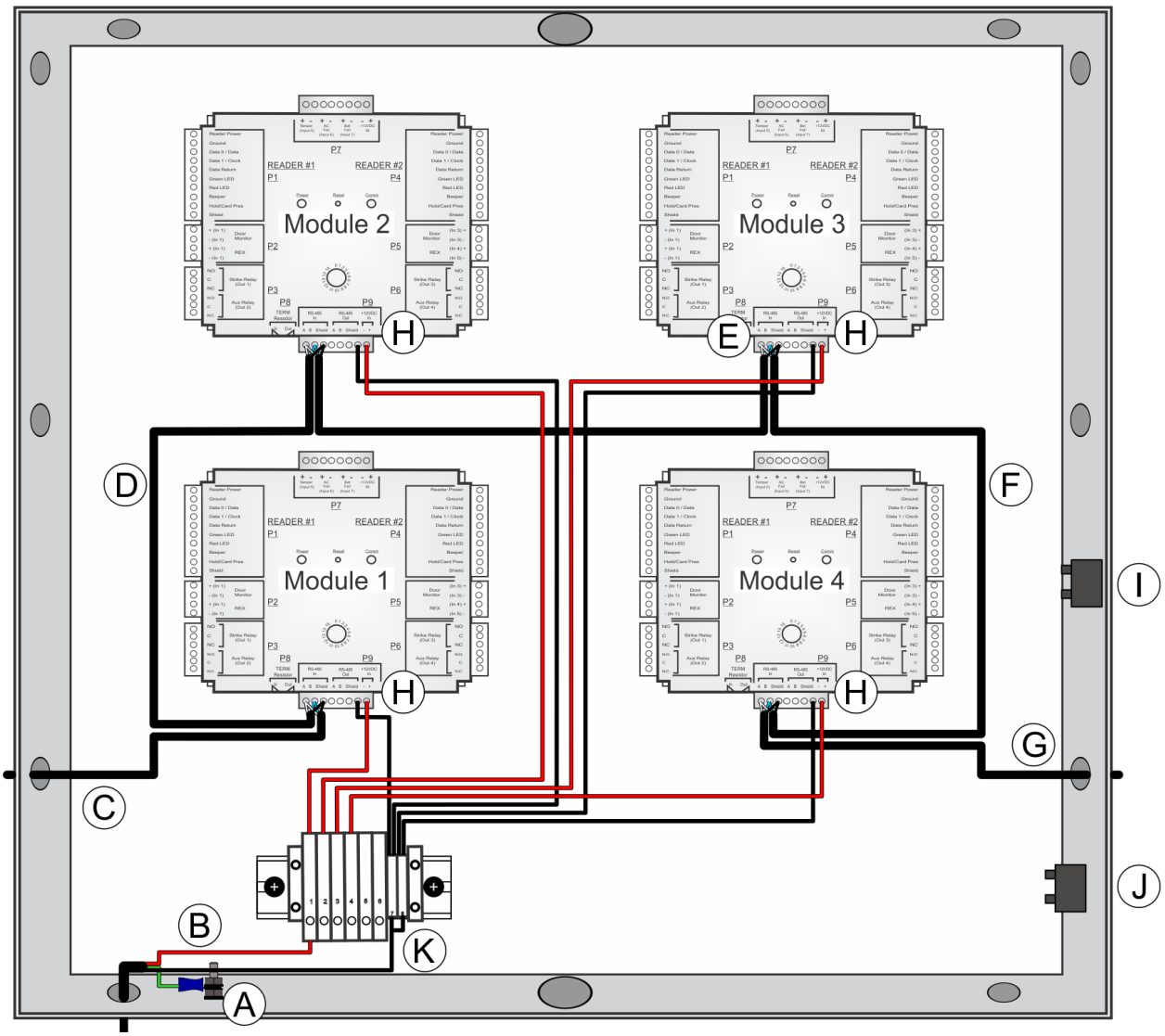
Related Topics

Synergis part numbers: pre-wired kits on page 20
Component locations for small Synergis enclosures on page 26
Assembling components on the Synergis backplate on page 29
Wiring guidelines for Synergis enclosures on page 33

Synergis wiring diagram: 4 HID modules with fuse assembly

Before installing the Synergis enclosure and its components, familiarize yourself with how to wire four HID modules in a small enclosure.

NOTE: If the enclosure does not include a power supply unit, you must repurpose the AC ON indicator on the enclosure door. See How to repurpose the AC ON indicator for Synergis enclosures on page 76.



	Function	From location	To location	Wire information
A	Ground wire	Ground lug	External power supply	• Green/yellow to earth ground
B	External DC power to fuse assembly	External 12 VDC power supply	Fuse assembly	• Red to 1 • Black to 7 or 8

	Function	From location	To location	Wire information
C	Origin of RS-485 data[e]	Synergis™ Cloud Link[b]	Interface module 1 • P9 RS-485 In	• White to A • Blue to B • Black (bare wire)[a]
D	RS-485 data daisy chain[c]	Interface module 1 • P9 RS-485 In	Interface module 2 • P9 RS-485 In	• White to A • Blue to B • Black (bare wire)[a]
E	RS-485 data daisy chain[c]	Interface module 2 • P9 RS-485 In	Interface module 3 • P9 RS-485 In	• White to A • Blue to B • Black (bare wire)[a]
F	RS-485 data daisy chain (end of chain)[d]	Interface module 3 • P9 RS-485 In	Interface module 4 • P9 RS-485 In	• White to A • Blue to B • Black (bare wire)[a]
G	(Optional) Continue RS-485 data daisy chain to interface modules outside enclosure.[a] **NOTE:** Use the last module's RS-485 ground terminal to propagate the cable's shield for the rest of the chain.			
H	Interface modules to fuse assembly	Interface modules	Fuse assembly	• Red to open fuse block 1 to 4 • Black to ground block 7 or 8
I	Door tamper signal	Door tamper switch	Interface module tamper input	• Red to + • Black to -
J	Wall tamper signal	Wall tamper switch	Interface module tamper input	• Red to + • Black to -
K	Ground jumper wire	Fuse assembly	Fuse assembly	• Ground block 7 to 8

[a] When running the RS-485 bus between enclosures, only ground one end of the cable. When running the RS-485 bus within the enclosure, you can ground one end, or both ends of the cable. For additional shielding information, see Wiring guidelines for Synergis enclosures on page 33.

[b] In this example, Synergis™ Cloud Link is located outside the enclosure.

[c] In a daisy-chain configuration, connect the RS-485 wires to the “In” location of the P9 terminal block. If you connect RS-485 wires to the “In” and “Out” locations, a loss of power will result in a loss of RS-485 data from downstream V100 modules.

[d]Install a terminating jumper on the “In” position of the interface module at the end of the RS-485 bus. See Connections for HID interface modules on page 86.

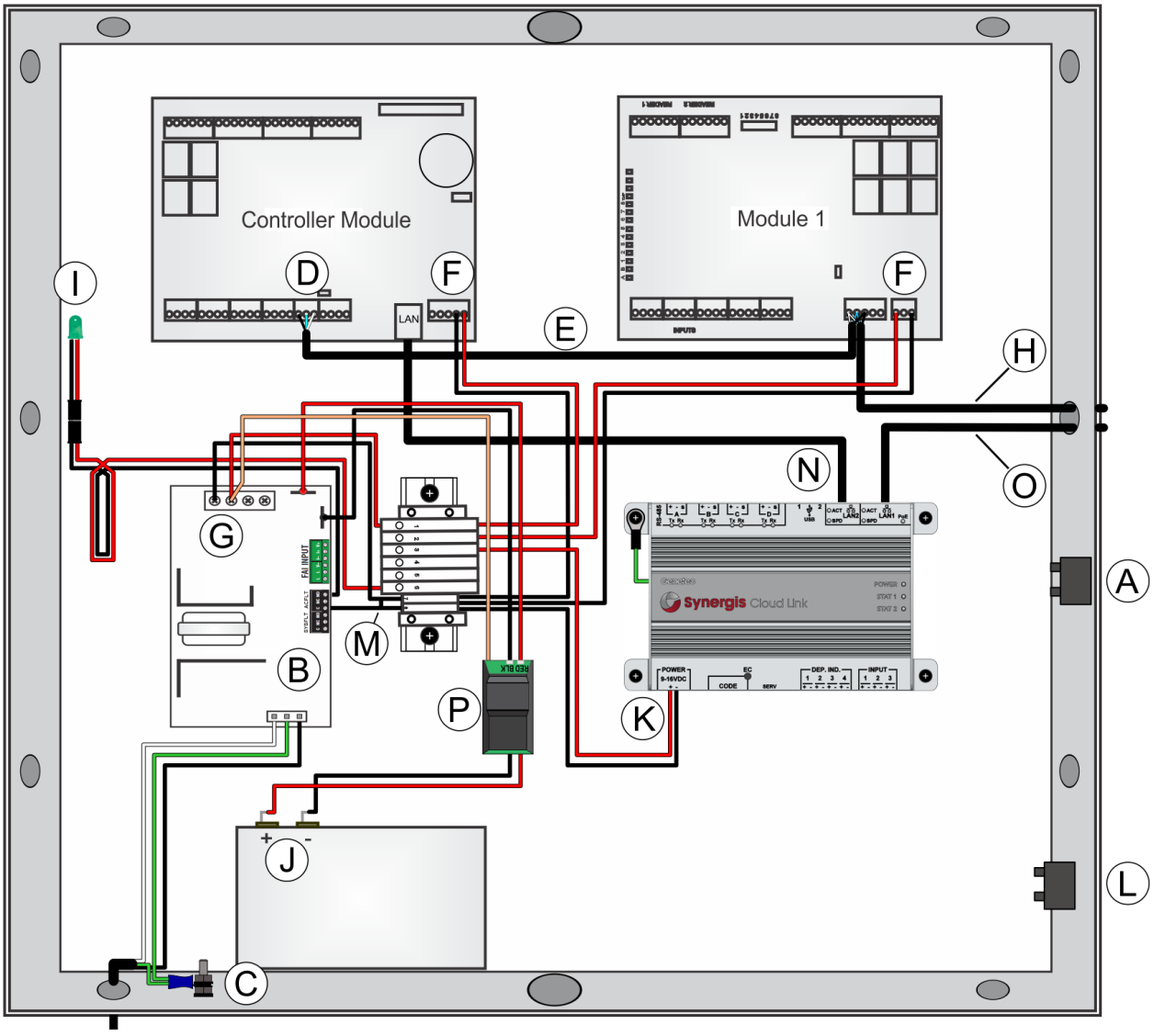
[e]Set the DIP switch for this RS-485 port to the ON position.

Related Topics

Component locations for small Synergis enclosures on page 26
Assembling components on the Synergis backplate on page 29
Wiring guidelines for Synergis enclosures on page 33

Synergis wiring diagram: 1 Mercury module with Mercury controller, Synergis™ Cloud Link, fuse assembly, and power supply

Before installing the Synergis enclosure and its components, familiarize yourself with how to wire one Mercury module with the Mercury controller module, Synergis™ Cloud Link, fuse assembly, and power supply in a small enclosure. Depending on the hardware installed, this configuration can support up to four readers: two on the controller module, and two on the reader module.



	Function	From location	To location	Wire information
A	Door tamper signal	Door tamper switch	Interface module tamper input	• Red to I1 • Black to I1

	Function	From location	To location	Wire information
B	AC power	External AC power	Power supply • AC input (J9)	• Green/yellow - Earth ground • Black - Hot • White - Neutral
C	Ground wire	Ground lug	Power supply	• Green/yellow to earth ground
D	Origin of RS-485 data[b]	Mercury EP1502 • TB3	Interface module 1 • TB6	• White to TR+ • Blue to TR- • Black (bare wire)[a]
E	RS-485 data daisy chain[b]	Mercury EP1502 • TB3	Interface module 1 • TB6	• White to TR+ • Blue to TR- • Black (bare wire)[a]
F	Interface modules to fuse assembly	Interface modules	Fuse assembly	• Red to open fuse block 1 to 2 • Black to ground block 7 or 8
G	Power supply to fuse assembly	12 VDC power supply	Fuse assembly	• Red to 1 • Black to 7 or 8
H	(Optional) Continue RS-485 data daisy chain to interface modules outside enclosure. NOTE Use the last module's RS-485 ground terminal to propagate the cable's shield for the rest of the chain.			
I	AC ON indicator	12 VDC power supply	Fuse assembly	• Red to 6 • Black to 7 or 8 via NO relay
J	Backup battery	Battery Disconnect Module	Backup battery (see Installing standby backup batteries for Synergis enclosures on page 69)	• Red to Battery (+) • Black to Battery (-)
K	Synergis Cloud Link to fuse assembly	Synergis™ Cloud Link	Fuse assembly (see Synergis™ Cloud Link connections on page 36)	• Red (+) to 5 • Black (-) to 7 or 8

	Function	From location	To location	Wire information
L	Wall tamper signal	Wall tamper switch	Interface module tamper input	• Red to I1 • Black to I1
M	Ground jumper wire	Fuse assembly	Fuse assembly	• Ground block 7 to 8
N	Synergis™ Cloud Link to EP1502 controller	Synergis™ Cloud Link LAN2 port	EP1502 LAN port	CAT5e LAN cable
O	LAN	Synergis™ Cloud Link LAN1 port	LAN[c, d]	CAT5e LAN cable
P	Battery Disconnect Module	Battery Disconnect Module	Power supply (see Installing standby backup batteries for Synergis enclosures on page 69).	• RED to BAT+ • BLK to BAT- • Orange to DC1+

[a] When running the RS-485 bus between enclosures, only ground one end of the cable. When running the RS-485 bus within the enclosure, you can ground one end, or both ends of the cable. For additional shielding information, see Wiring guidelines for Synergis enclosures on page 33.

[b] Install the terminating jumper on the controller module at the beginning of the RS-485 bus, and on the reader module at the end of the RS-485 bus.

[c]Communication with local network and other connected Mercury controller modules on Synergis Cloud Link LAN1 port.

[d]If the installation integrates Mercury modules and is required to be UL-294 or ULC-S319 compliant, it is forbidden to use the Synergis Cloud Link's LAN1 or LAN2 network interfaces (any LAN cable exiting the enclosure) to communicate with external Mercury EP controllers (for example, using the same network that is used for communication with Security Center). Use of a co-located (same enclosure) Synergis Cloud Link is required for every Mercury controller, as denoted in the Synergis wiring diagrams for Mercury modules (via LAN2 and short cable not leaving the enclosure).

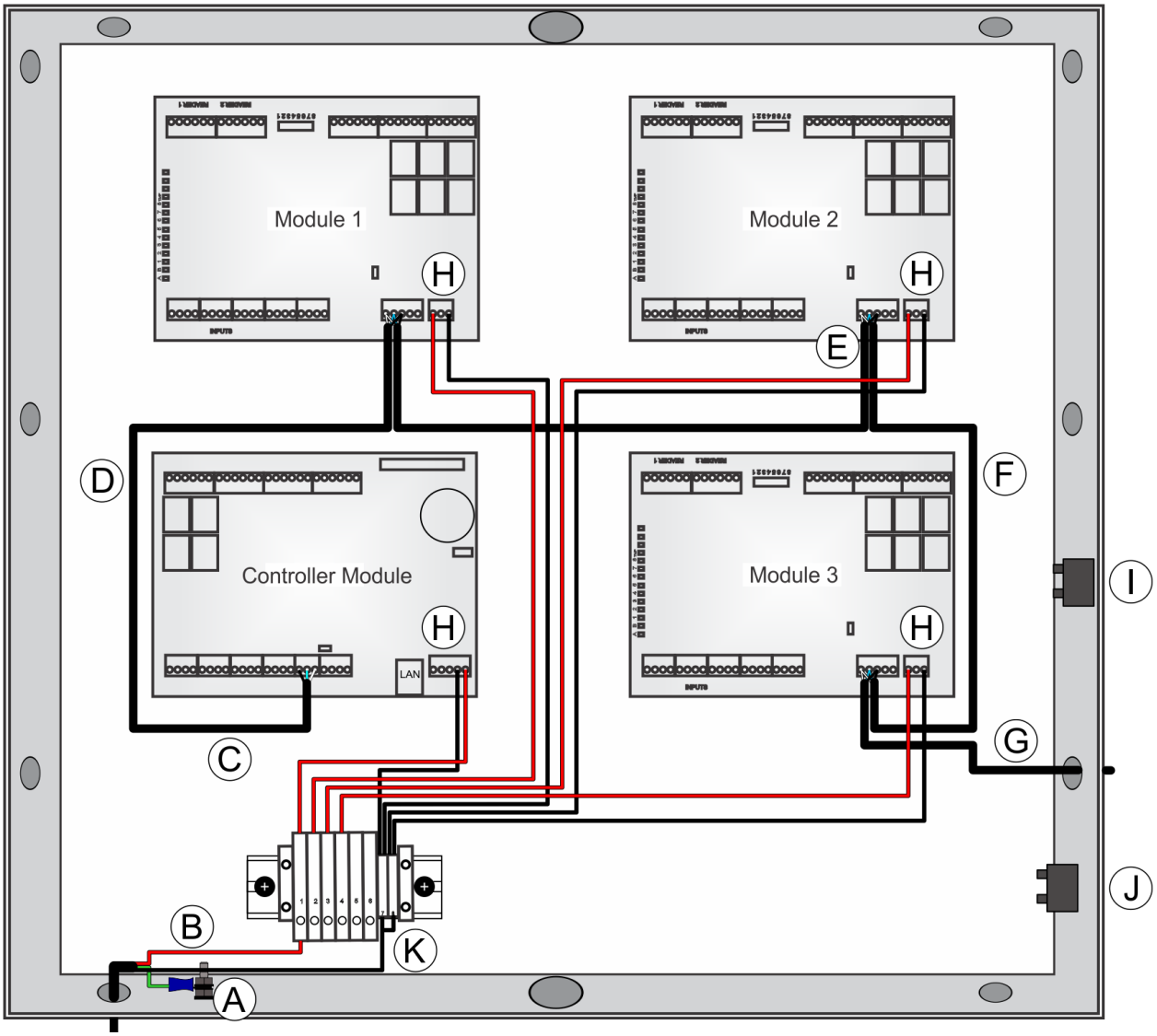
Related Topics

Component locations for small Synergis enclosures on page 26
Assembling components on the Synergis backplate on page 29
Wiring guidelines for Synergis enclosures on page 33

Synergis wiring diagram: 3 Mercury modules with Mercury controller and fuse assembly

Before installing the Synergis enclosure and its components, familiarize yourself with how to wire three Mercury modules and a Mercury controller module in a small enclosure.

NOTE: If the enclosure does not include a power supply unit, you must repurpose the AC ON indicator on the enclosure door. See How to repurpose the AC ON indicator for Synergis enclosures on page 76.



	Function	From location	To location	Wire information
A	Ground wire	Ground lug	External power supply	• Green/yellow to earth ground
B	External DC power to fuse assembly	External 12 VDC power supply	Fuse assembly	• Red to 1 • Black to 7 or 8

	Function	From location	To location	Wire information
C	Origin of RS-485 data[b]	Mercury EP1502 • TB3	Interface module 1 • TB6	• White to TR+ • Blue to TR- • Black (bare wire) block[a]
D	RS-485 data daisy chain	Mercury EP1502 • TB3	Interface module 1 • TB6	• White to TR+ • Blue to TR- • Black (bare wire) block[a]
E	RS-485 data daisy chain	Interface module 1 • TB6	Interface module 2 • TB6	• White to TR+ • Blue to TR- • Black (bare wire) block[a]
F	RS-485 data daisy chain (end of chain)[b]	Interface module 2 • TB6	Interface module 3 • TB6	• White to TR+ • Blue to TR- • Black (bare wire) block[a]
G	(Optional) Continue RS-485 data daisy chain to interface modules outside enclosure. NOTE Use the last module's RS-485 ground terminal to propagate the cable's shield for the rest of the chain.			
H	Interface modules to fuse assembly	Interface modules	Fuse assembly	• Red to open fuse block 1 to 4 • Black to ground block 7 or 8
I	Door tamper signal	Door tamper switch	Interface module tamper input	• Red to I1 • Black to I1
J	Wall tamper signal	Wall tamper switch	Interface module tamper input	• Red to I1 • Black to I1
K	Ground jumper wire	Fuse assembly	Fuse assembly	• Ground block 7 to 8

[a] When running the RS-485 bus between enclosures, only ground one end of the cable. When running the RS-485 bus within the enclosure, you can ground one end, or both ends of the cable. For additional shielding information, see Wiring guidelines for Synergis enclosures on page 33.

[b] Install the terminating jumper on the controller module at the beginning of the RS-485 bus, and on the reader module at the end of the RS-485 bus.

Related Topics

Component locations for small Synergis enclosures on page 26
Assembling components on the Synergis backplate on page 29
Wiring guidelines for Synergis enclosures on page 33

4

Cloud Link installation

This section contains general instructions for installing the components of a Synergis enclosure.

This section includes the following topics:

Installing Synergis enclosures

When the enclosure has been assembled, it can be mounted and connected to peripheral devices such as readers, to the IP network, and to the AC power source.

What you should know

- The enclosure and all components must be installed by certified professional installers according to local standards maintained by the Authority Having Jurisdiction in that locale.
- Installers must install the enclosure at a site that has been prepared to receive it. The site should include a branch circuit (protected by a circuit breaker appropriate for the wiring used) that is capable of providing the rated power to the installation:
  - North America: 120 VAC 60Hz 2.0A
  - Europe, Middle East, and Africa: 230 VAC 50/60Hz 1.1A
  - South America: 120 VAC or 230VAC depending on country
- Use a mounting surface that will allow you to mount the enclosure with screws, and that will accommodate the weight of the enclosure.
- Observe all standard safety precautions.

To install a Synergis enclosure:

1. After you have assembled the enclosure, mount the enclosure on the wall (see Mounting Synergis™ enclosures on page 66).
2. Adjust the height of the plunger screw for the wall tamper switch so it is properly detected if triggered. The tamper switch is located on the bottom-right of the large enclosure or small enclosure (see Component locations for large Synergis enclosures on page 24).
3. With the enclosure securely mounted, connect the peripheral devices to the interface modules inside the enclosure (see Connections for HID interface modules on page 86 or Connections for Mercury interface modules on page 96).
4. Install optional backup battery power (see Installing standby backup batteries for Synergis enclosures on page 69).

   NOTE: If the installation does not include a Battery Disconnect Module, connecting charged backup batteries will power up the hardware in the enclosure. You should keep the fuse blocks open until the AC power source is active.

5. Connect the AC ON indicator so that you can verify system power externally (see Connecting the AC ON indicator for Synergis enclosures on page 74).
6. Connect the power supply to the AC power source (see Connecting AC power on Synergis enclosures on page 77).
7. Power up the components of the enclosure (see Powering up Synergis™ Cloud Link and accessories on page 81).

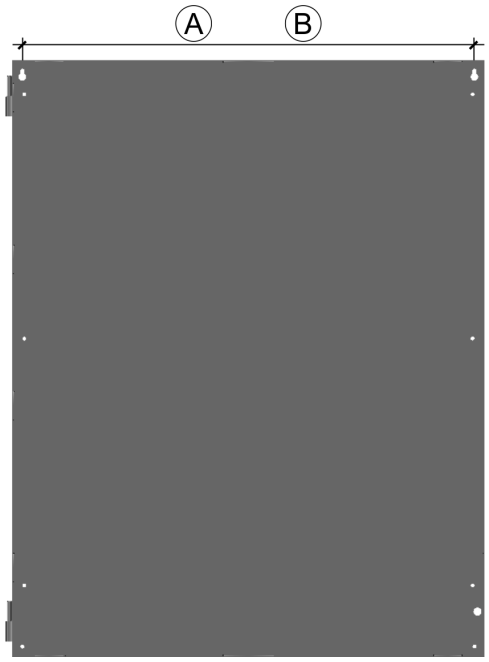
Mounting Synergis™ enclosures

After the enclosure has been assembled, you can mount it on the wall.

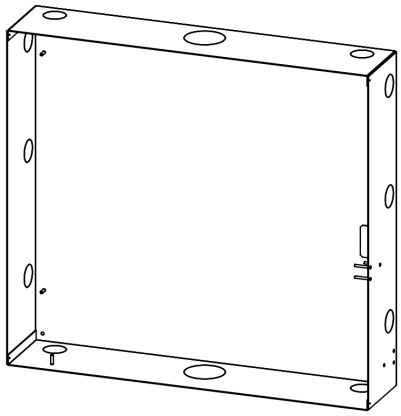
Before you begin

- Before handling any internal components, discharge static electricity by touching a grounded surface, and limit movement during installation to reduce static buildup.
- Wear a grounding wrist strap.

1 On the mounting site, install two #8 pan-head mounting screws (max. head diameter 9.1 mm/0.360 in.).



A	Small enclosure	55.9 cm (22 in.)
B	Large enclosure	55.9 cm (22 in.)



Both enclosures have trade size 2 knockouts centered on the top and bottom, plus trade size 1 knockouts at the corners and down the sides.

Trade Size	Knockout diameter
1	3.49 cm (1.375 in.)
2	6.27 cm (2.469 in.)

2 (Optional) Detach enclosure door and set aside.

It may be easier to mount the enclosure if you remove the door but it is not required. If you do remove the door, you must follow the correct procedure to avoid damage to the AC ON indicator (see Removing the door from Synergis enclosures on page 28.

3 Align enclosure's keyhole slots with two mounting screws and hook the enclosure into position.

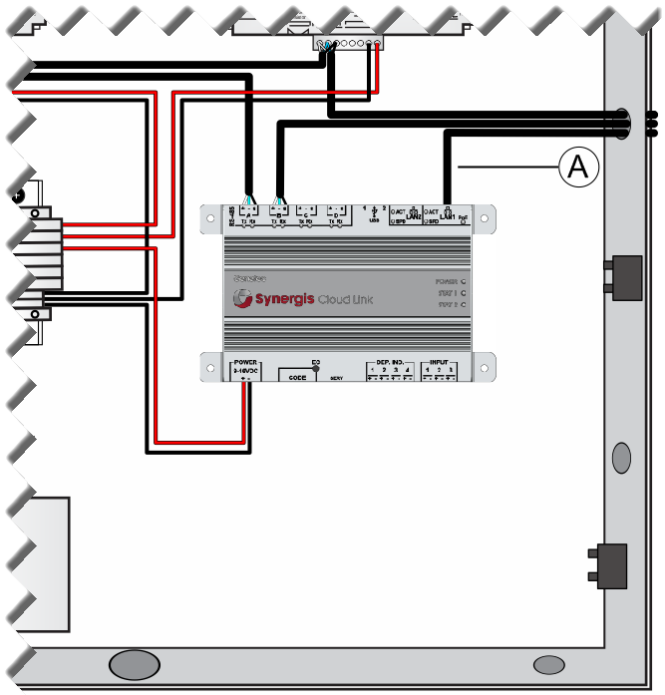
4 Place screws in the bottom two holes and secure the enclosure to its mounting surface.

5 Remove knockouts as needed to receive the peripheral devices, LAN cable, and AC wiring.

LAN network port connections for Synergis™ Cloud Link

The Synergis™ Cloud Link appliance features network ports labelled LAN 1 and LAN 2. This enables the controller's connection to the network.

The following diagram demonstrates how to connect the network cable to the Synergis™ Cloud Link appliance.



A	LAN 1, network connection

Installing standby backup batteries for Synergis enclosures

To ensure that system power is maintained in the event of an AC power outage, you can install one or two standby backup batteries in the Synergis enclosure.

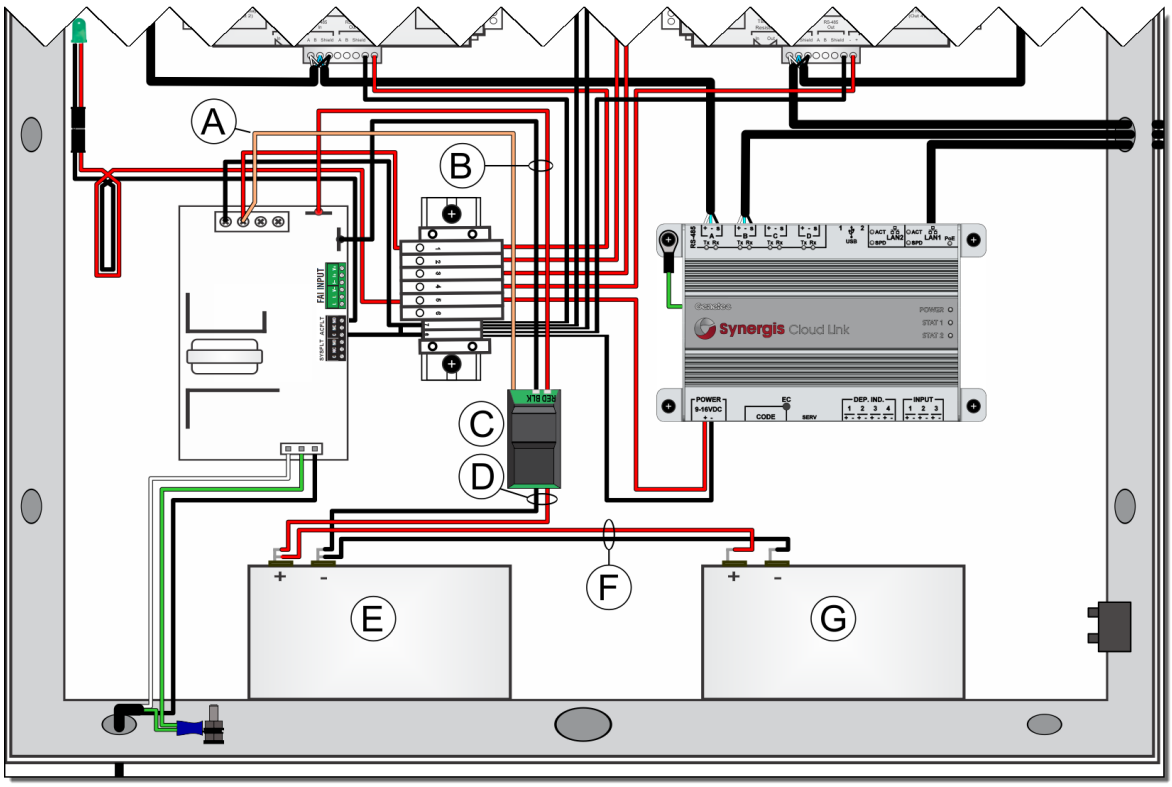
Before you begin

Before connecting batteries, open the fuse block to prevent current from reaching the other components in the enclosure.

What you should know

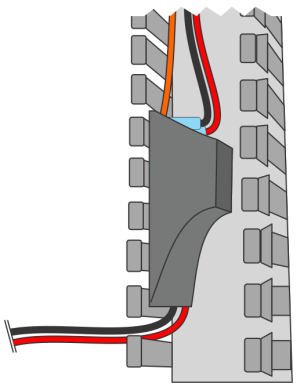
- The batteries must be 12V lead acid type, and must be connected in parallel, not in series.
- For UL installations, backup batteries must supply primary power for at least 30 minutes (Type: UL recognized (BAZR2), SLA 12V 7Ah or 12Ah).
- The enclosure can accommodate industry standard 12V batteries. Maximum battery size (H x W x D): 10.9 cm x 16.8 cm x 10.4 cm (4.3 in. x 6.6 in. x 4.1 in.)
- To protect backup batteries from a potentially damaging deep discharge in the event of an extended AC power outage, the Synergis enclosure must include a Battery Disconnect Module (BDM). The BDM provides the system with a safety low-voltage cut-off (hard shutdown) when the battery voltage reaches 8.5V.
- If the installation does not include a Battery Disconnect Module, connecting charged backup batteries will power up the hardware in the enclosure. You should keep the fuse blocks open until the AC power source is active.
- The BDM is only mandatory for ULC-S319 compliant installations. For information on connecting standby backup batteries to the power supply in Synergis enclosures that do not include a BDM, see Battery connections for Synergis enclosures that do not include a Battery Disconnect Module on page 71.
- For more information on connecting batteries, refer to the power supply's installation manual included with the enclosure.

To install backup batteries, refer to the illustration below, and the steps that follow:



1 Connect the BDM PSU cable assembly's red and black wires (B) to the corresponding RED and BLK terminals on the BDM (C).

2 Attach the BDM (C) to the lower part of the center cable duct's left wall using the provided double-sided adhesive tape. The BDM battery wires (D) must exit the duct through the last vertical slot of the cable duct.



3 Connect the orange reference wire (A) to the DC1+ contact on the power supply.

4 Connect the BDM-to-PSU cable assembly (B) to the power supply battery terminals (red to BAT+, black to BAT-).

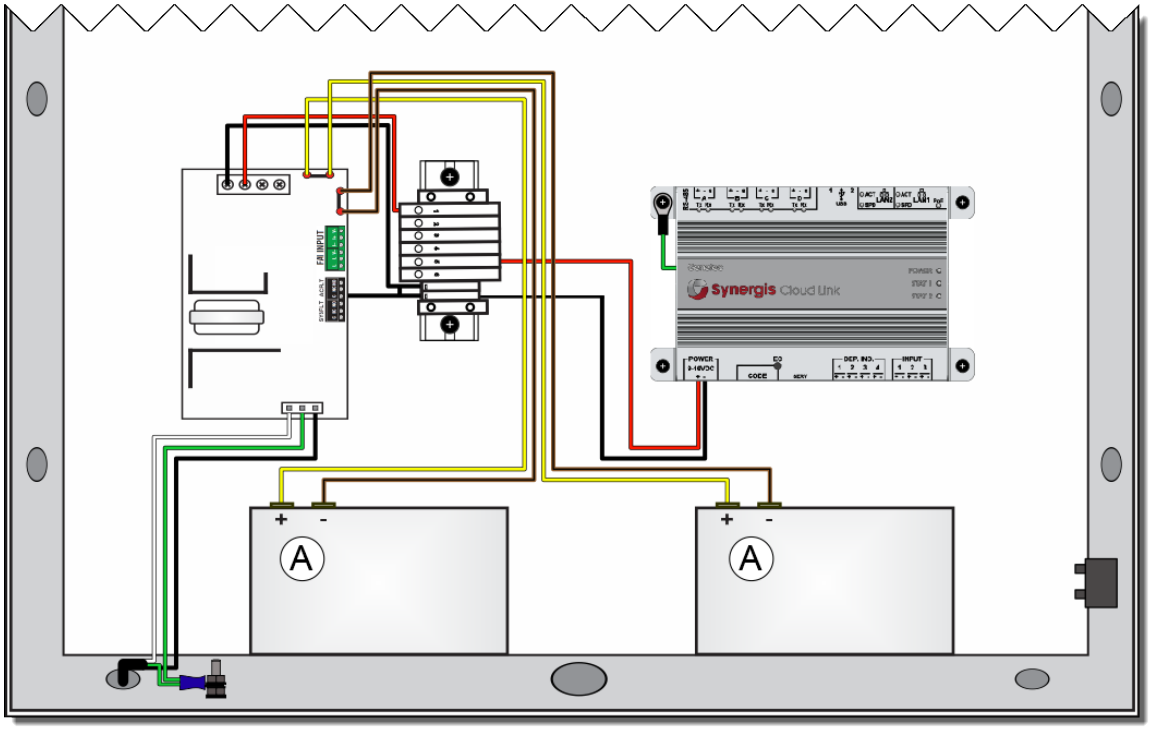
5 Connect the BDM battery wires to the batteries:

- If the Synergis enclosure includes only one battery, connect the BDM battery wires (D) directly to the battery, paying attention to polarity.
- If the Synergis enclosure includes two batteries, connect the bridge cable assembly (F) to the primary battery (E), and then connect the BDM battery wires (D) to the male blades of the bridges' stacked terminals. Connect the other bridge terminals to the secondary battery (G), paying attention to polarity.

Battery connections for Synergis enclosures that do not include a Battery Disconnect Module

Certain Synergis enclosures do not include the Battery Disconnect Module (BDM). The BDM is only mandatory for ULC-S319 compliant installations.

The following diagram demonstrates how to connect two standby backup batteries to the power supply in a Synergis enclosure that does not include a BDM.



	Component	From location	To location	Wire information
A	Standby backup battery	Standby backup battery	Power supply	• Yellow to (BAT+) • Black (shown as brown in the diagram) to (BAT-)

Adding a Battery Disconnect Module to an existing Synergis enclosure

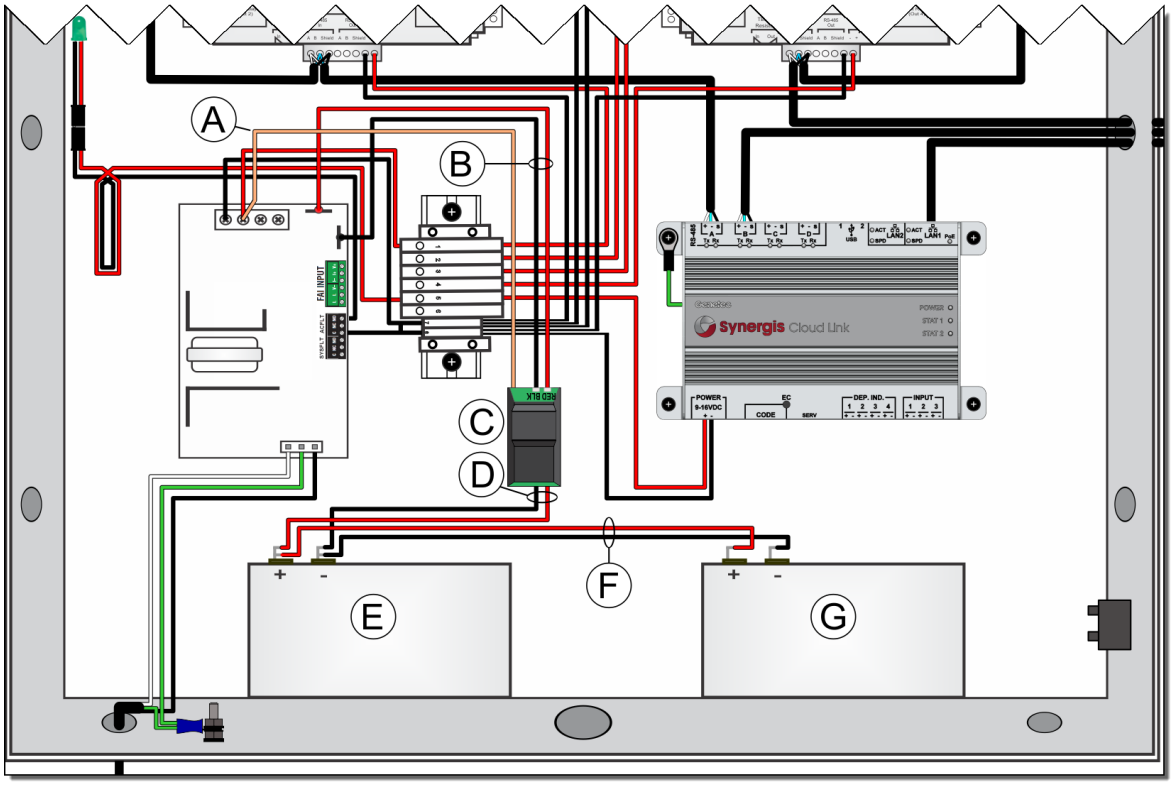
You can add a Battery Disconnect Module (BDM) to a Synergis enclosure to protect the standby backup batteries against damage from deep discharge in the event of an extended AC power outage.

What you should know

WARNING: This procedure requires opening the enclosure door and working in the presence of live voltage, which should only be performed by a registered electrician in your local jurisdiction. Do not attempt to install the BDM if you are not qualified to do so.

- The BDM provides the system with a safety low-voltage cut-off (hard shutdown) when the battery voltage reaches 8.5V.
- The BDM kit replaces the yellow/black cable assembly from the PSU's battery contacts to the batteries.
- The BDM is required for ULC-S319 compliance.
- You may need to remove the enclosure door to perform the following steps. When removing the door of the enclosure, be careful not to damage the AC ON indicator that is connected to the enclosure door. The AC ON indicator must be connected for all UL-listed installations.

To install the BDM, refer to the illustration below, and the steps that follow:



1 Remove the existing yellow/black battery cable assembly.

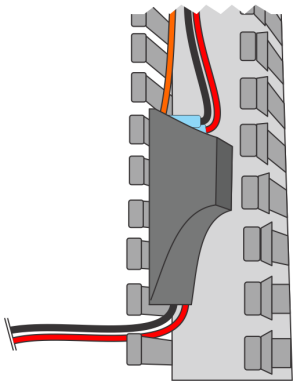
a) Remove the cable duct covers to expose the battery cable. The battery cable typically passes through the center vertical duct and the lower-left horizontal duct.

b) Disconnect and remove the yellow and black wires from the power supply and from the batteries. If two batteries are used, remove the splitters from the power supply.

IMPORTANT: Avoid short circuits between the battery wires.

2 Connect the BDM PSU cable assembly's red and black wires (B) to the corresponding RED and BLK terminals on the BDM (C).

3 Attach the BDM (C) to the lower part of the center cable duct's left wall using the provided double-sided adhesive tape. The BDM battery wires (D) must exit the duct through the last vertical slot of the cable duct.



4 Connect the orange reference wire (A) to the DC1+ contact on the power supply.

5 Connect the BDM-to-PSU cable assembly (B) to the power supply battery terminals (red to BAT+, black to BAT-).

6 Connect the BDM battery wires to the batteries:

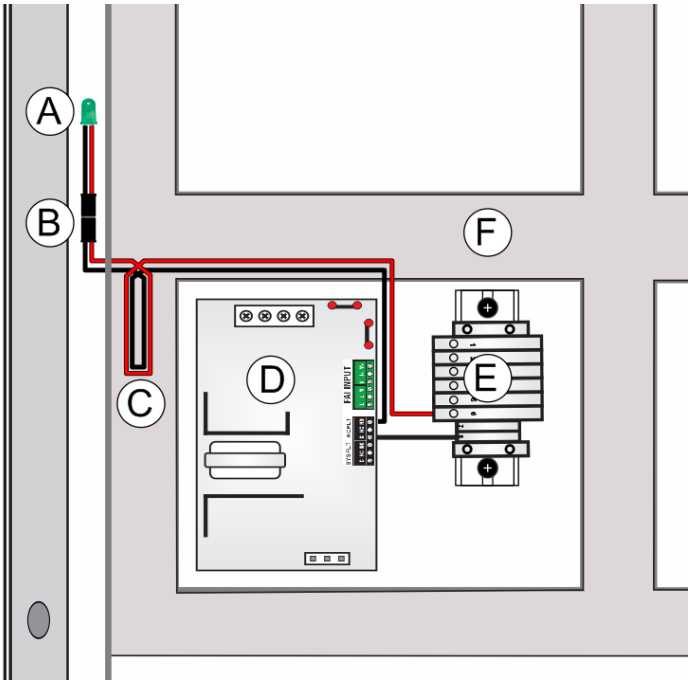
- If the Synergis enclosure includes only one battery, connect the BDM battery wires (D) directly to the battery, paying attention to polarity.
- If the Synergis enclosure includes two batteries, connect the bridge cable assembly (F) to the primary battery (E), and then connect the BDM battery wires (D) to the male blades of the bridges' stacked terminals. Connect the other bridge terminals to the secondary battery (G), paying attention to polarity.

Connecting the AC ON indicator for Synergis enclosures

The enclosure door is shipped with an attached AC ON indicator that allows you to verify system power externally. After the power supply and fuse assembly are installed, you can connect the AC ON indicator.

What you should know

- If the enclosure does not include a power supply, see How to repurpose the AC ON indicator for Synergis enclosures on page 76
- All Synergis enclosure kits (large and small) are shipped with the required cables, and connectors, to connect the external AC ON indicator.



A	AC ON indicator
B	AC ON indicator connector
C	Cable loop
D	Power supply
E	Fuse assembly
F	Cable ducts

To connect the AC ON indicator:

1 Connect the AC ON indicator supply cable (included).
   a) Connect the Red wire to an available input on the non-protected side of the fuse assembly (fuses are shorted by a bus bar).
   b) Connect the Black wire to the AC FLT Normally Open (NO) of the power supply.
2 Connect a Black wire from the AC FLT Common (C) of the power supply to the ground distribution block of the fuse assembly (labeled “8”).

3 Use the wiring duct to secure the AC ON indicator supply cable.

IMPORTANT: It is important to have slack in the AC ON indicator wire so that you can remove the enclosure door. Leave a loop of wire in the cable duct and leave the AC ON indicator connector outside of the duct so that the loop can be pulled outside without removing the duct cover. See Removing the door from Synergis enclosures on page 28.

4 Install the door on the metal enclosure (if not already installed).

5 Mate the AC ON indicator cable and AC ON indicator supply cable in-line connectors.

Related Topics

Removing the door from Synergis enclosures on page 28

How to repurpose the AC ON indicator for Synergis enclosures

If the Synergis enclosure does not include a power supply, the AC ON indicator cannot be connected. If this is the case, you must modify the AC ON indicator to avoid confusion.

If you do not want to repurpose the AC ON indicator, then leave the indicator unconnected and remove the AC ON label from the enclosure door to avoid confusion. Otherwise, you can repurpose the existing AC ON indicator in the enclosure door as you wish. For example, you could connect the indicator to a module relay to indicate an alarm, or use the indicator as a “POWER PRESENT” indicator, showing that 12V is supplied to the enclosure (from an external power box).

NOTE: If you repurpose the AC ON indicator, you should remove the AC ON label from the enclosure door and relabel the indicator according to its new function.

Light indicator specifications:

- 12V rated, LED based, green color, 20mcd.
- Red is positive, black is negative.
- Has internal bias resistor (only have to provide protected 12V); 20mA.
- UL496 recognized component.

Related Topics

Removing the door from Synergis enclosures on page 28

Connecting AC power on Synergis enclosures

You can power Synergis™ Cloud Link using a 12 VDC (nominal) power supply located inside the enclosure or in a separate enclosure.

Before you begin

- Before connecting AC power, make sure the circuit breaker is in the OFF position.
- Before connecting AC power, place all fuses in the fuse assembly in the open position to prevent current reaching the other components in the enclosure.

What you should know

- This procedure should only be performed by a registered electrician in your local jurisdiction. Do not attempt to connect AC power if you are not qualified to do so.
- The power supply provided by Genetec will correspond to the regional voltage. The wires used to connect the AC power in Genetec enclosures are white, black, and green/ yellow (120 VAC) or brown, blue, and green (230 VAC).

To connect the AC power:

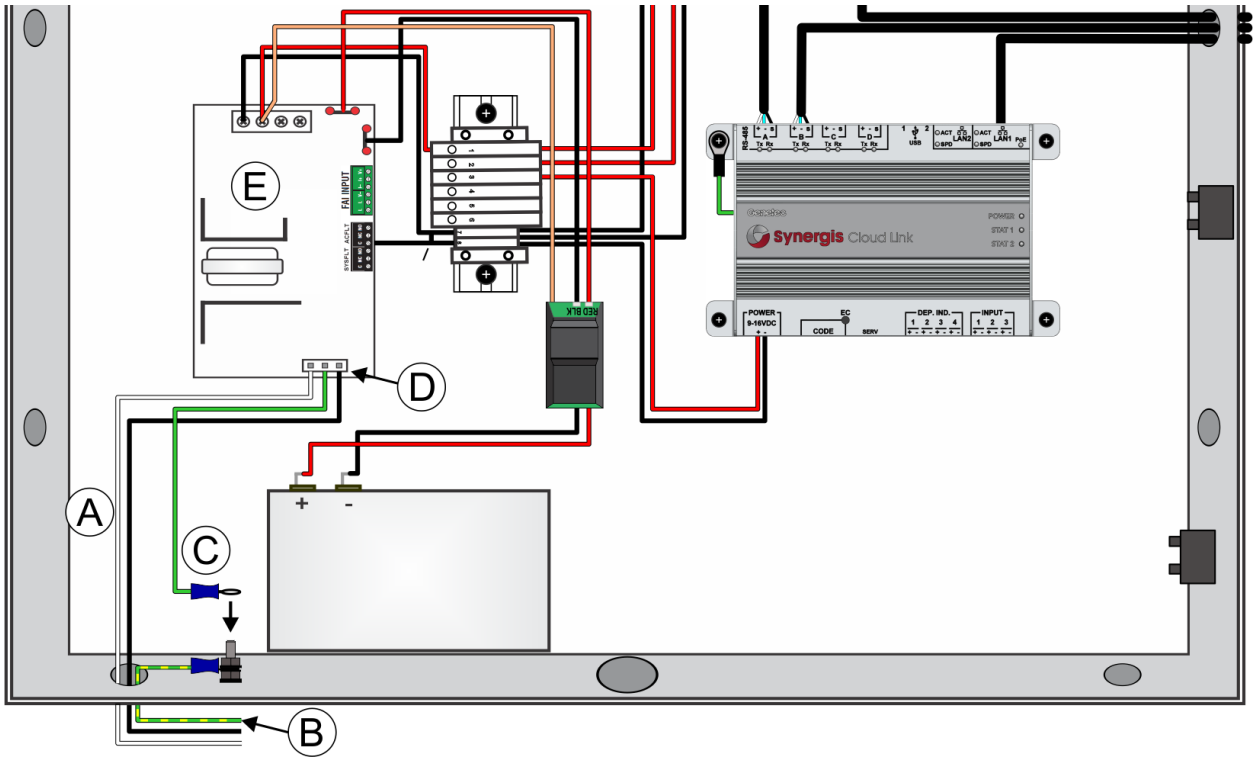
1 Connect the AC cable assembly to the AC input on the power supply. For more information on the connections to the AC input, refer to the product information that is shipped with the power supply.

2 Connect the ground wire of the AC cable assembly to the grounding lug.

3 Connect the installation's ground wire to the provided grounding pigtail (green/yellow) which is connected to the grounding lug.

4 Connect the installation's AC to the AC cable assembly.

5 After the AC cable has been connected, ensure that there is a minimum distance of 6.5mm (1/4 in.) between the AC wires and any low voltage wire inside the enclosure.



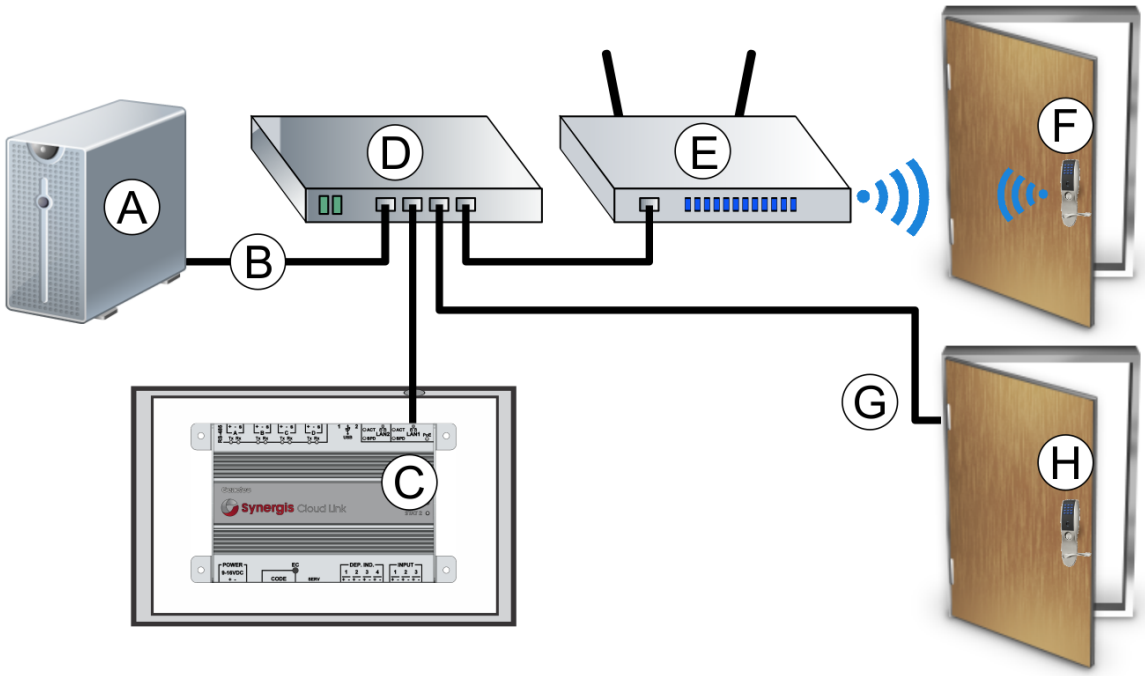
A	North America: 120 VAC Europe, Middle East, and Africa: 230 VAC **WARNING:** Before connecting the power supply, verify that the voltage is correct for the hardware. Never connect 230 V power to a 120 V power supply.
B	Grounding pigtail
C	AC cable assembly ground wire
D	AC cable assembly
E	Power supply

Powering Synergis™ Cloud Link using PoE

As an alternative to 12 VDC, you can supply power to the Synergis™ Cloud Link appliance using a Power over Ethernet connection (PoE).

To power Synergis™ Cloud Link using PoE, the Ethernet connection must qualify Class 0 or Class 3 and must be capable of supplying up to 12.94W (802.3af / 802.3at type 1).

IMPORTANT: UL has not evaluated the use of PoE to power system components. For UL and ULC listed systems, verify that the PoE LED on the Synergis Cloud Link is off when the LAN1 cable is connected to the Synergis™ Cloud Link.



A	Server running Security Center
B	Internal building network

C	Synergis™ Cloud Link. Power supplied on LAN 1 port. Green PoE LED is on. **NOTE:** For full European EMC compliance (CE), you must use shielded LAN cable (STP).
D	Power over Ethernet switch
E	Wireless network device
F	Wifi reader or lock
G	PoE-compatible Ethernet hinge
H	Door with PoE reader or lock

Supplying dual power

If both PoE and DC input (9-16V) are provided, PoE has priority over the DC input. In this case, Synergis™ Cloud Link will draw all of its current from PoE. If you disconnect the LAN1 cable, or if the PoE source (injector, Ethernet switch) has a failure or a power outage, the Synergis™ Cloud Link falls back automatically and transparently to the DC input if available. If PoE is restored, Synergis™ Cloud Link will use PoE (transparent switchover).

Connecting external 12 VDC power supply for Synergis™ Cloud Link

For Synergis™ Cloud Link enclosures that only contain interface modules, you must connect an external 12 VDC power supply.

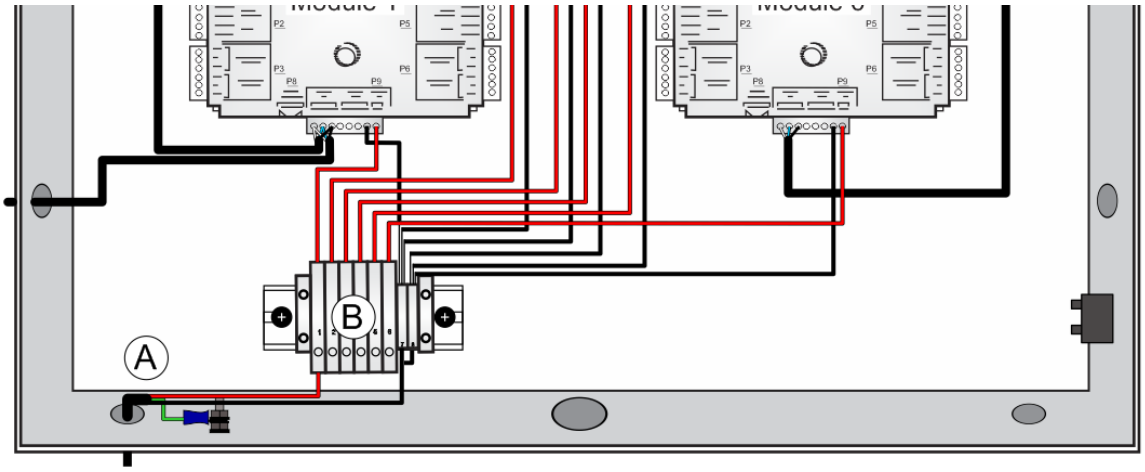
Before you begin

- Determine your power supply requirements. See Power supply requirements for Synergis enclosures on page 15.
- Before connecting DC power, place all fuses in the fuse assembly in the open position to prevent the current from reaching the other components in the enclosure.

To connect an external 12 VDC power supply:

1 Connect external 12 VDC power (red) to one of the inputs on the bus bar side of the fuse assembly (labeled "1" to "6").

2 Connect the negative (black) to the ground distribution block of the fuse assembly (labeled “7” and "8").



A	12 VDC in
B	Fuse assembly

Powering up Synergis™ Cloud Link and accessories

After you have installed all components, you can power up the Synergis™ Cloud Link appliance and accessories. Both Synergis™ Cloud Link and power supply have LEDs that can provide basic diagnostic information.

Before you begin

Make sure the power supply you have is the appropriate voltage for your country or region (120V or 230V).

To power up the Synergis™ Cloud Link:

1. Make sure the power supply's voltage jumper is set to 12 VDC (default) before powering the enclosure.
2. Make sure the fuses in the fuse block are in the open position to prevent current reaching the other components in the enclosure.
3. Place the circuit-breaker in the ON position. This provides current to the power supply.
4. Observe LEDs on the power supply to ensure proper functioning. For more information, see LifeSafety power supply LED feedback on page 83.
5. Close the fuses in the fuse block.
6. Observe LEDs on the Synergis Cloud Link appliance to verify proper functioning. For more information, see Synergis™ Cloud Link LED feedback on page 82.

Synergis™ Cloud Link LED feedback

LEDs are included on the Synergis™ Cloud Link appliance to provide visual feedback on system status.

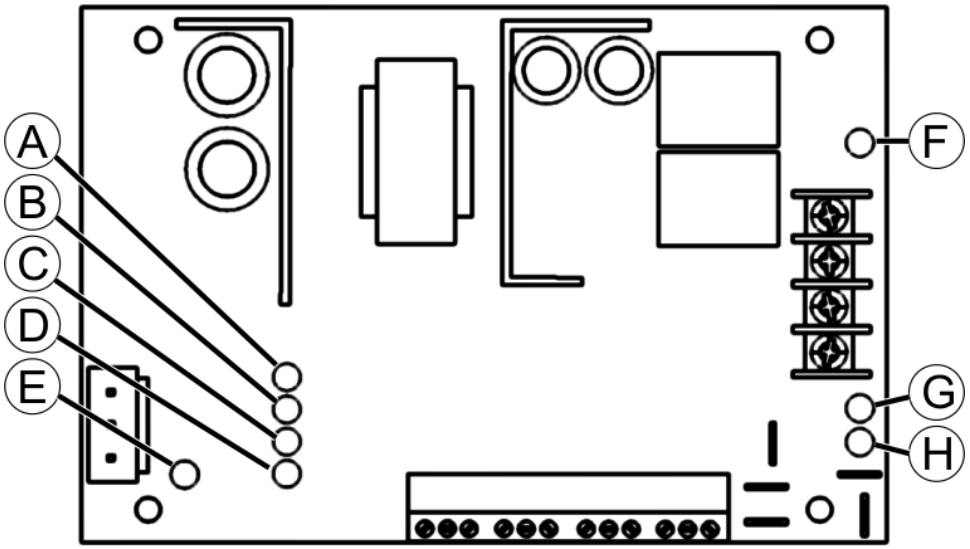
Group	LED name	LED color	Description
General	POWER	Blue	On when Synergis™ Cloud Link is receiving power (DC or PoE) and is running. If Synergis™ Cloud Link goes into shut-down (OS shut-down), the Power LED shuts-off (like a regular PC), even if DC or PoE power is still supplied.
	STAT1	Orange	Flashes when Synergis™ Cloud Link is starting up (Stat2 off).
	STAT1 and STAT2	Green	On when Synergis™ Cloud Link is running.
RS-485	RX	Red	Flashes when receiving data.
	TX	Green	Flashes when transmitting data.
LAN 1/LAN 2	ACT	Green	On if there is an Ethernet link established with other equipment. Flashes when transmitting/receiving Ethernet packets.
	SPD	Green	1000BT link established
		Yellow	100BT link established
		Off (while ACT is ON)	10BT link established
LAN 1	PoE	Green	On if Synergis™ Cloud Link is being powered from a Power over Ethernet (PoE) source connected to LAN 1. For more information, see Powering Synergis™ Cloud Link using PoE on page 78.

Related Topics

What is Synergis Cloud Link? on page 2

LifeSafety power supply LED feedback

LEDs are included on the LifeSafety power supply to provide visual feedback on the status of the power supply.



	LED	Description
A	FAI (D22) – Red	When using an FAI accessory module (for example, NL2 or NL4 LAN modules), this LED lights when a valid FAI signal is received on the FAI input terminals.
B	GND FLT (D42)	Not used. If this LED is ON, make sure the EARTH GND DETECT jumper is set to position 2, (OFF).
C	AC FLT (D43) – Yellow	This LED lights when the AC input voltage is low or missing.
D	SYS FLT (D33) – Yellow	This LED lights when a system trouble is detected by the FPO. Trouble conditions indicated by the SYS FLT LED include: • Missing Battery (If BAT DET jumper is ON) • Earth Ground Fault (If EARTH GND DET jumper is ON) • Battery voltage out of range • DC output voltage out of range • Ruptured fuse • Accessory board fault • Internal fault
E	AC ON (D34) – Green	This LED lights when any AC voltage is present on the AC input. It does not indicate that the voltage is sufficient for proper operation of the FPO power supply. See the yellow AC FLT LED for AC voltage out of range indication. **CAUTION**: Always confirm the absence of AC power with a meter before servicing to prevent electric shock.

	LED	Description
F	DC1 (D4) – Green	This LED lights when voltage is available on the DC1 output terminals.
G	DC2 (D5)	Not used.
H	REV BAT (D20) – Yellow	This LED lights if the backup battery set is connected in the reverse polarity. The lighting of this LED will also be accompanied by the rupture of the battery fuse (F4).

5

Connecting HID interface modules

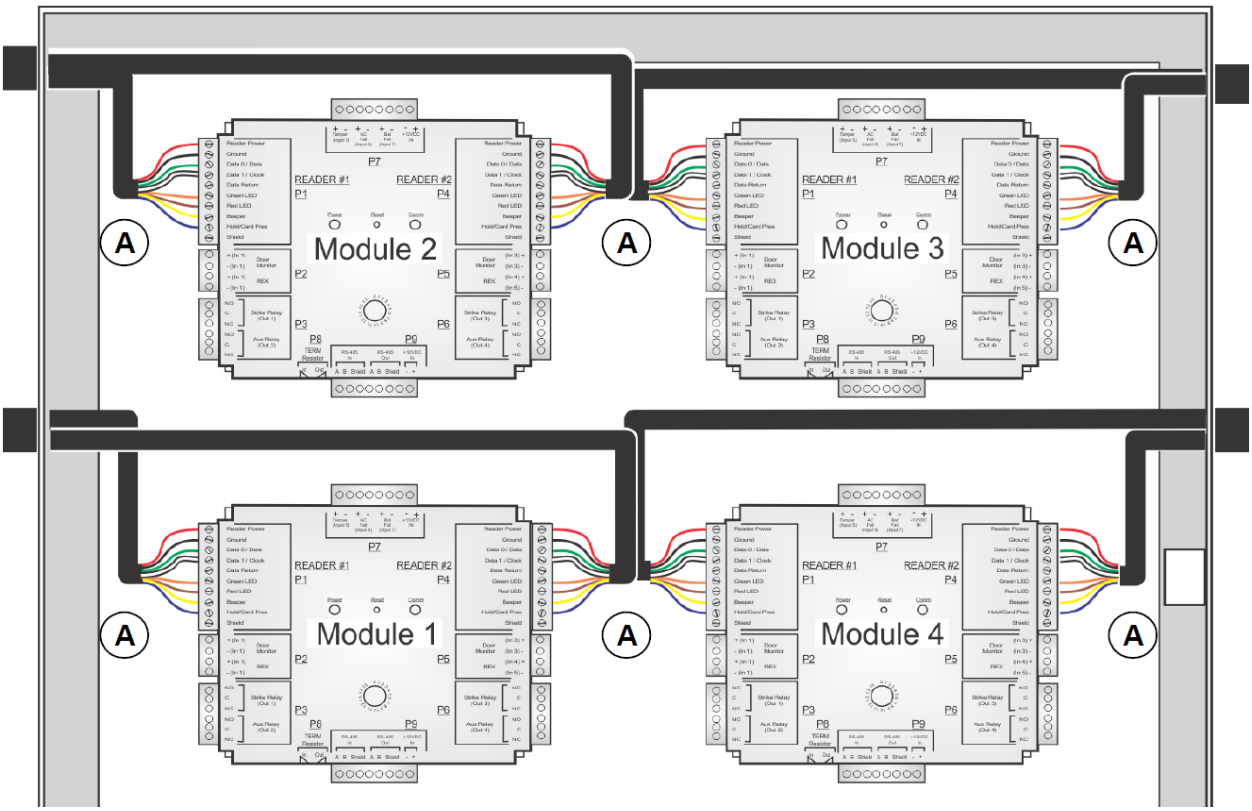
This section contains the procedures for connecting readers to the HID interface modules inside the enclosure. Note that readers can be from a number of manufacturers, but for the purposes of this documentation, connections for HID readers are shown.

This section includes the following topics:

Connections for HID interface modules

With the enclosure securely mounted, the peripheral devices, such as readers, the IP network, and AC power source can be connected to the HID interface modules inside the enclosure.

The following diagram is an example of how to connect HID interface modules to readers.



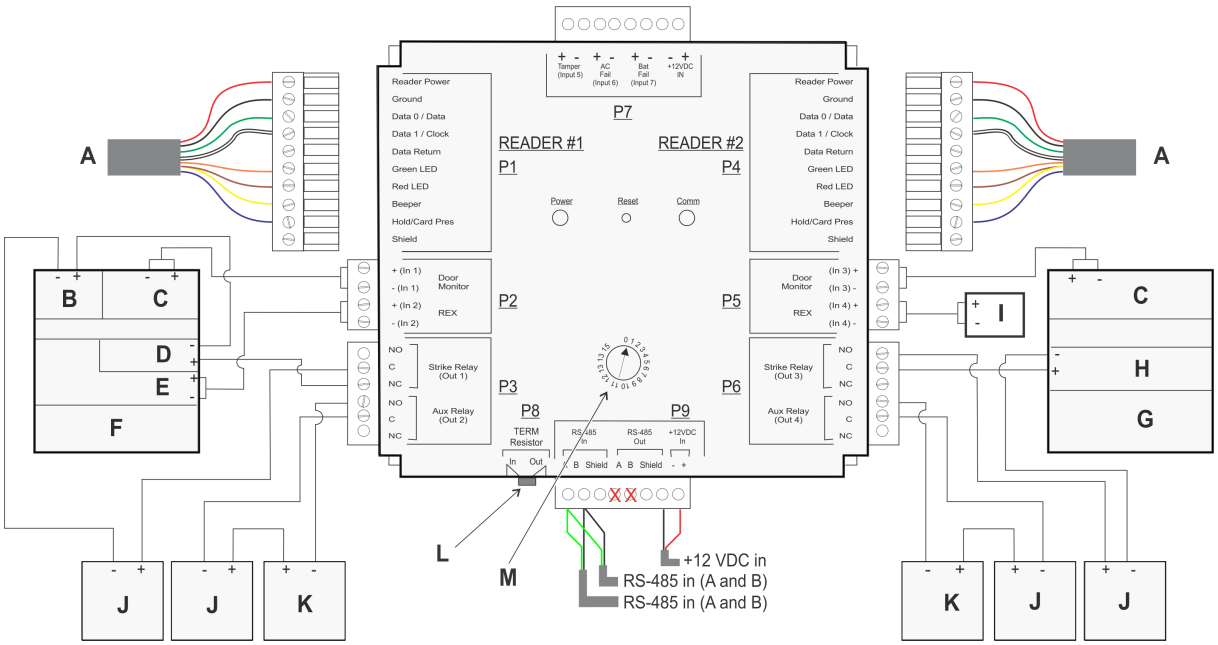
A	Reader connections to HID interface modules

HID interface module: Wiring diagram for a Card In/Free Out

You can wire HID interface modules for a "Card In / Free Out door" configuration.

The following diagram demonstrates how to connect HID interface modules (VertX V100 shown) for a “Card In / Free Out”.

IMPORTANT: The system must not be installed in the fail-secure mode unless permitted by the local authority having jurisdiction and must not interfere with the operation of Listed panic hardware.



A	Reader connections	See Reader connections for HID interface modules (P1 and P4) on page 88.
B	Standard MAG lock	See Door monitor and REX input connections for HID interface modules (P2 and P5) on page 89.
C	Door monitor switch N/C	See Door monitor and REX input connections for HID interface modules (P2 and P5) on page 89.
D	MAG lock switch	See Output connections for HID interface modules (P3 and P6) on page 88.
E	REX switch in Crash Bar	See Door monitor and REX input connections for HID interface modules (P2 and P5) on page 89.
F	Door #1	See Door monitor and REX input connections for HID interface modules (P2 and P5) on page 89.
G	Door #2	See Door monitor and REX input connections for HID interface modules (P2 and P5) on page 89.
H	Electric Door Strike (Lock)	See Output connections for HID interface modules (P3 and P6) on page 88.
I	PIR or REX	See Door monitor and REX input connections for HID interface modules (P2 and P5) on page 89.
J	12 or 24 VDC power supply	
K	Horn or Strobe	

L	Termination jumper	If the interface module will be attached to the end of the RS-485 bus, install a terminating jumper to the "In" position on the termination resistor pins.
M	Address dial	Use thumbnail to turn dial and set address.

Reader connections for HID interface modules (P1 and P4)

As part of the connecting the HID interface modules, you must connect the door reader wires to pins at locations P1 and P4.

For a visual representation of the HID interface module connections, see Connections for HID interface modules on page 86.

NOTE: You cannot unplug a connector from one side and plug it into the corresponding connector on the other side. Connectors on VertX devices are positioned to be mirror images and are not interchangeable.

The following connection information is for readers that come with a pig-tail cable. Note that the wire colors that are shown may not apply to readers with screw terminals.

P1 signal	Wire color	Pin	Pin	Wire color	P4 signal
Reader power	red	1	10	red	Reader power
Ground	black	2	9	black	Ground
Data 0 / Data	green	3	8	green	Data 0 / Data
Data 1 / Clock	white	4	7	white	Data 1 / Clock
Data Return	not used	5	6	not used	Data Return
Green LED	orange	6	5	orange	Green LED
Red LED	brown	7	4	brown	Red LED
Beeper	yellow	8	3	yellow	Beeper
Hold/Card Pres	blue	9	2	blue	Hold/Card Pres
Shield		10	1		Shield

Output connections for HID interface modules (P3 and P6)

As part of the connecting the HID interface modules, you must set up the HID output connections P3 and P6.

For a visual representation of the HID interface module connections, see Connections for HID interface modules on page 86.

IMPORTANT: The system must not be installed in the fail-secure mode unless permitted by the local authority having jurisdiction and must not interfere with the operation of Listed panic hardware.

NOTE: Relays are dry contact rated for 2A/30VDC resistive load, 1.2A/30VDC inductive load.

P3		State	Pin	Pin	State		P6
Strike Relay (Out 1)	Lock	Normally open	1	6	Normally open	Lock	Strike Relay (Out 3)
		Common	2	5	Common		
		Normally closed	3	4	Normally closed		
Aux Relay (Out 2)		Normally open	4	3	Normally open		Aux Relay (Out 4)
		Common	5	2	Common		
		Normally closed	6	1	Normally closed		

Door monitor and REX input connections for HID interface modules (P2 and P5)

As part of the connecting the HID interface modules, you must connect the door monitor and REX inputs to P2.

For a visual representation of the HID interface module connections, see Connections for HID interface modules on page 86.

NOTE:

- The default REX input configuration is normally open (NO) unsupervised (no EOL resistors).
- The default door switch (DS) configuration is Normally Closed (NC), unsupervised (no EOL resistors).
- The Door input monitor was not evaluated by UL.

P2	Label	Pin	Pin	Label	P5
Door monitor	+(In 1)	1	4	(In 3)+	Door monitor
	-(In 1)	2	3	(In 3)-	
REX	+(In 2)	3	2	(In 4)+	REX
	-(In 2)	4	1	(In 4)-	

Remaining inputs for HID interface modules (P7)

As part of the connecting the HID interface modules, you must connect the remaining inputs.

For a visual representation of the HID interface module connections, see Connections for HID interface modules on page 86.

Connect remaining inputs. All other input points (except for the 12 VDC) are defaulted for NO switches and are unsupervised. They can be configured for end-of-line resistors of 1 to 6k Ohms. Use the Synergis™ Cloud Link application to configure supervised inputs.

NOTE: Input monitoring was not evaluated by UL.

	Tamper (Input 5)		AC Fail (Input 6)		Batt Fail (Input 7)		12VDC IN	
Label	+	-	+	-	+	-	-	+
Pin#	8	7	6	5	4	3	2	1

pivCLASS Authentication Module (PAM) installation

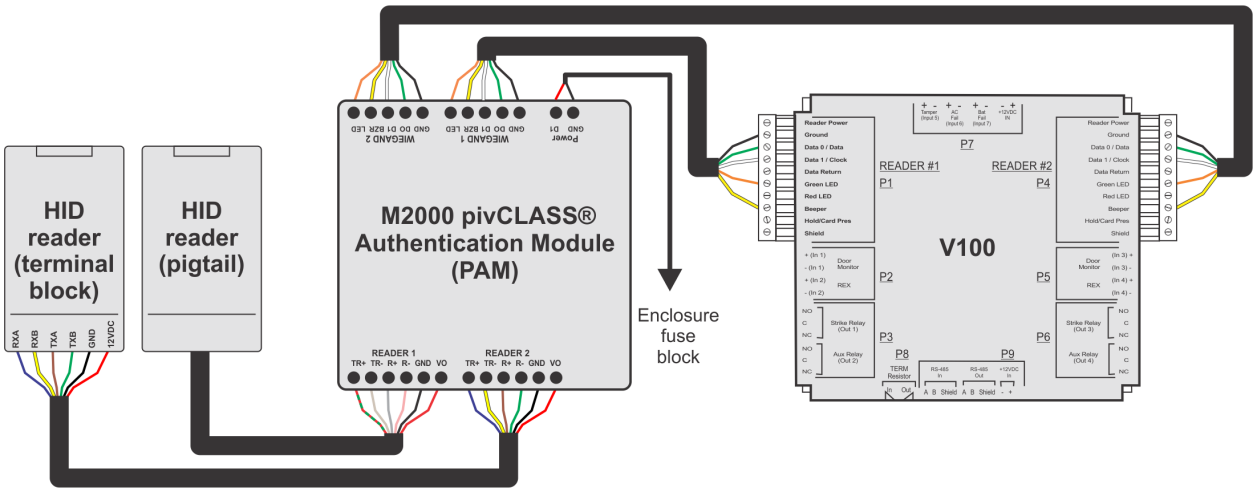
If the system requires the installation of an M2000 pivCLASS Authentication Module (PAM), the module can be installed in the Synergis™ Cloud Link enclosure.

You can install the M2000 in the Synergis™ Cloud Link enclosure using the "H" mounting holes. For more information, see Component locations for large Synergis enclosures on page 24.

IMPORTANT: The M2000 module and the connected V100 must be installed in the same enclosure as communication is not encrypted between the two devices.

NOTE: The M2000 cannot be used if CAN/ULC-S319 compliance is needed.

The following diagram shows how to connect an M2000 module:



NOTE:

- Wire colors shown for the HID terminal block reader are for example only.
- Power must be supplied directly from the fuse block. For more information, see Adding high-power readers to Synergis™ Cloud Link installations on page 35.
- A maximum length of 500 ft (150 m) is recommended by the manufacturer for the 4-wire RS-485 link between the M2000 and the reader.

Wire colors for pigtail HID readers

Reader cable wire color	M2000 connection
Red/green	TR+
Tan	TR-
Gray	R+
Pink	R-
Black	GND
Red	VO (voltage out - reader power)

Connections for terminal block HID readers

Reader pinout	Terminal	M2000 connection
RXA	P2-7	TR+
RXB	P2-6	TR-
TXA	P2-1	R+
TXB	P2-2	R-
GND	P1-3	GND
+12 VDC in	P1-4	VO (voltage out - reader power)

NOTE: For RS-485 links longer than 30 ft (10 m), place the correspondent line termination jumpers on the M2000, as well as 120 ohm resistors between terminals RXA-RXB and TXA-TXB on the reader. On this last one, the terminal block's screw clamps shall be used to connect the resistors along with the wires.

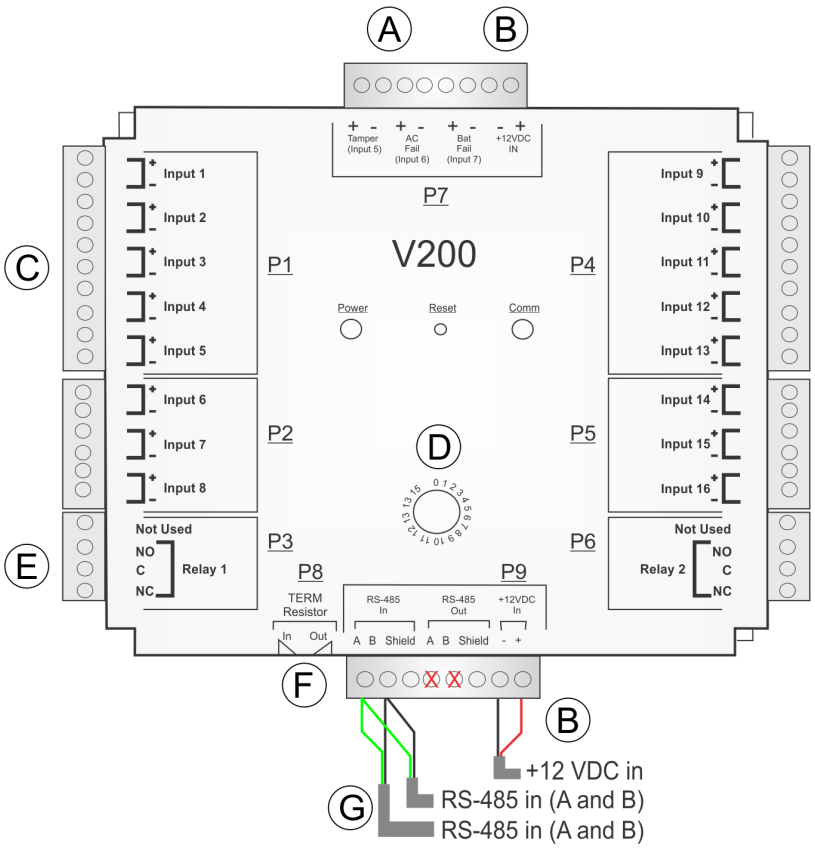
Related Topics

Types of Synergis enclosure assemblies on page 9
Component locations for large Synergis enclosures on page 24
Component locations for small Synergis enclosures on page 26
Adding high-power readers to Synergis Cloud Link installations on page 35

HID V200 connections

As part of a Synergis installation, you may need to include a HID V200 Input Monitor Interface.

The following diagram shows the connections for a V200 Input Monitor Interface.



A	Inputs	Tamper and power monitor.
B	Power In	Connect + to red (observe polarity). Connect - to black. Use 20 AWG wires minimum.
C	Inputs	16 general-purpose, programmable-circuit type.
D	Address switches	Rotary address switch (0–15).
E	Relay outputs	2A @ 30 VDC
F	Line termination	Install a terminating jumper on the “In” position of the interface module at the end of the RS-485 bus.
G	RS-485	RS-485 bus connection to other modules.

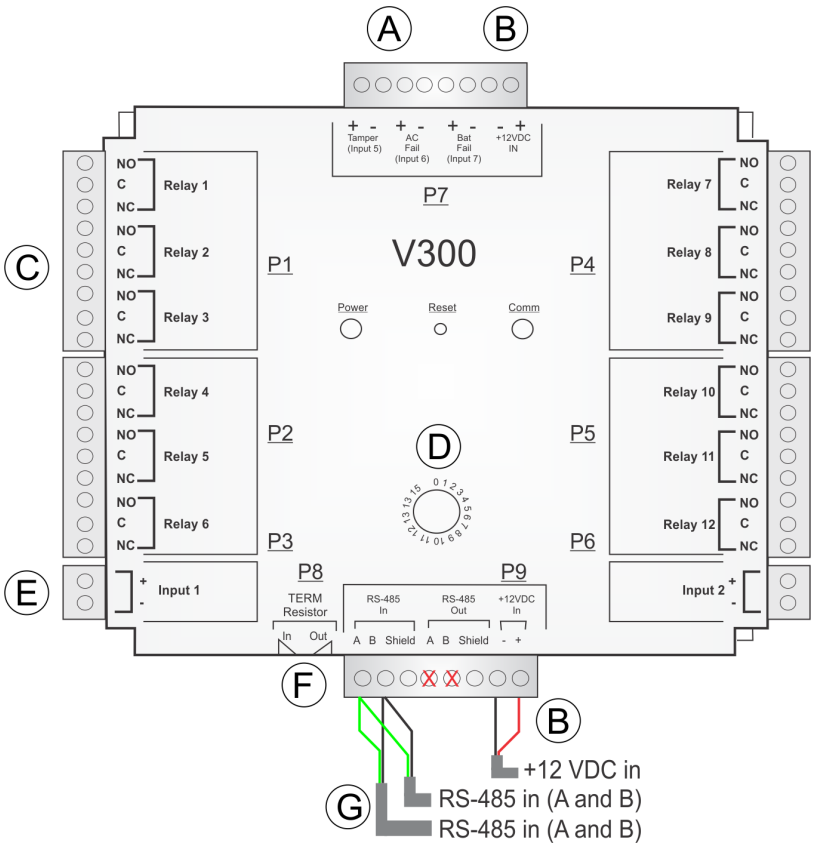
Related Topics

Types of Synergis enclosure assemblies on page 9
Component locations for large Synergis enclosures on page 24
Component locations for small Synergis enclosures on page 26

HID V300 connections

As part of a Synergis installation, you may need to include a HID V300 Output Control Interface.

The following diagram shows the connections for a V300 Output Control Interface.



A	Inputs	Tamper and power monitor.
B	Power In	Connect + to red (observe polarity). Connect - to black. Use 20 AWG wires minimum.
C	Relays	12 latching Form-C relays, contacts rated at 2A at 30 VDC
D	Address switches	Rotary address switch (0–15).
E	Inputs	2A @ 30 VDC
F	Line termination	Install a terminating jumper on the “In” position of the interface module at the end of the RS-485 bus.
G	RS-485	RS-485 bus connection to other modules.

Related Topics

Types of Synergis enclosure assemblies on page 9
Component locations for large Synergis enclosures on page 24
Component locations for small Synergis enclosures on page 26

6

Connecting Mercury interface modules

This section contains the procedures for connecting readers to the Mercury interface modules inside the enclosure. Note that readers can be from a number of manufacturers, but for the purposes of this documentation, connections for HID and Mercury readers are shown.

This section includes the following topics:

Connections for Mercury interface modules

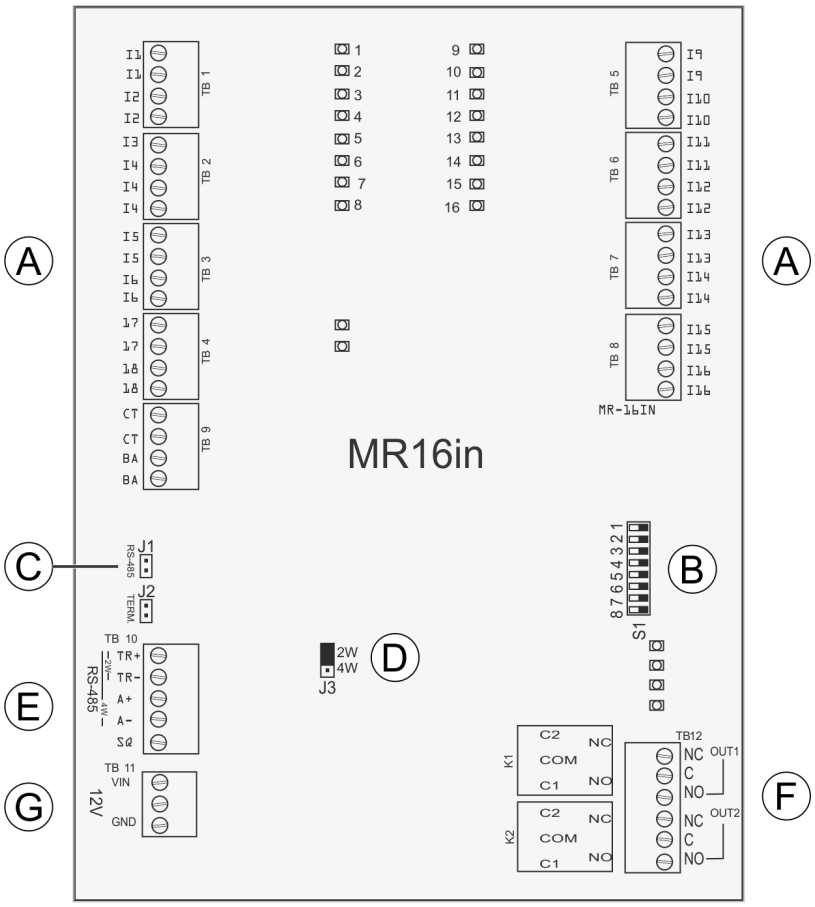
With the enclosure securely mounted, the peripheral devices, such as readers, the IP network, and AC power source can be connected to the Mercury interface modules inside the enclosure.

For how to connect Mercury interface modules, refer to the diagram about your particular interface module.

Mercury MR16in connections

As part of a Synergis installation, you may need to include Mercury MR16in interface module.

The following diagram demonstrates how to connect an MR16in interface module.



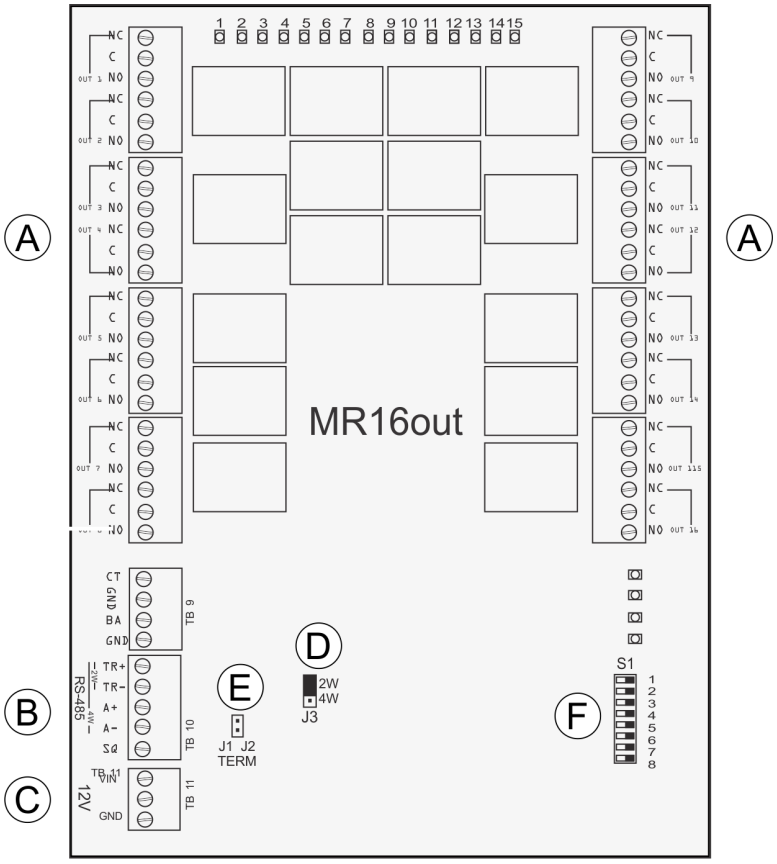
A	Inputs	16 general-purpose, programmable-circuit type.
B	Address switches	Used to set the device address. For more information on address settings on the Mercury module, refer to the manufacturer's instructions.
C	Line termination	For modules at end of line, install Jumper J1 for 120 Ohm line termination (J2 is not used).
D	2W/4W Select	Install jumper in 2W position (4W is not supported).
E	RS-485	RS-485 bus connection to other Mercury modules.

F	Relay outputs	Form C, 5A/28VDC resistive load, 3A/28VDC inductive load.
G	Power In	Connect + to VIN (observe polarity). Connect - to GND. Use 20 AWG wires minimum.

Mercury MR16out connections

As part of a Synergis installation, you may need to include Mercury MR16out interface module.

The following diagram demonstrates how to connect an MR16out interface module.

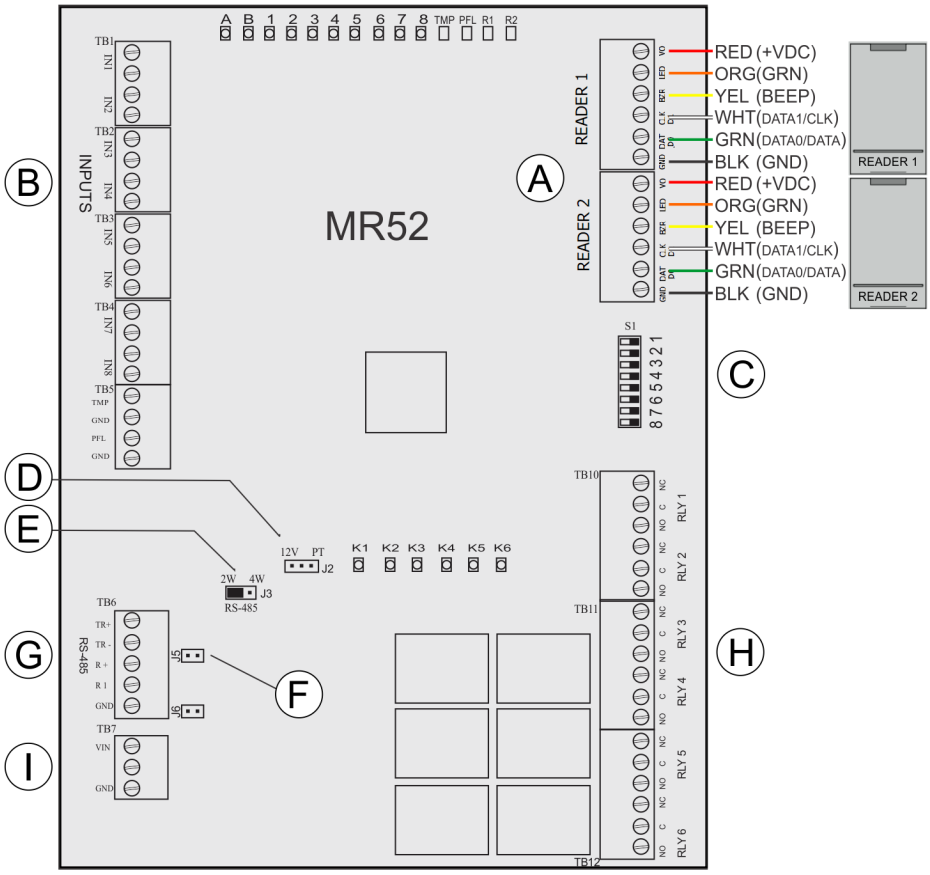


A	Outputs	Relay outputs x16. Form-C, 5A/28VDC resistive load, 3A/28VDC inductive load.
B	RS-485	RS-485 bus connection to other Mercury modules.
C	Power in	Connect + to VIN (observe polarity). Connect - to GND. Use 20 AWG wires minimum.
D	2W/4W Select	Install jumper in 2W position (4W is not supported)
E	Line termination	For interface modules at end of line, install Jumper J2 for 120 Ohm line termination.
F	Address switches	Used to set the device address. For more information on address settings on the Mercury module, refer to the manufacturer's instructions.

Mercury MR52 connections

As part of a Synergis installation, you may need to include Mercury MR52 interface modules.

The following diagram demonstrates how to connect a MR52 interface module.



A	Reader connections	TB8: Door 1 Reader 1, TB9: Door 1 Reader 2 **NOTE:** The wire colors in the illustration refer to "pigtail" HID readers; the information in parentheses refers to "terminal block" HID readers.
B	Inputs	Inputs 1 to 8 can be configured to use End-Of-Line (EOL) resistors, and for normally open or normally closed contacts.
C	Address switches	Used to set the device address. For more information on address settings on the Mercury module, refer to the manufacturer's instructions.
D	Reader power	12V = 12VDC at readers, PT = voltage “passed through” to readers.
E	2W/4W Select	Install jumper in 2W position (4W is not supported).
F	Line termination	For end-of-line interface modules, install Jumper J5 for 120 Ohm line termination (J6 is not used).
G	RS-485	RS-485 bus connection to other Mercury modules.

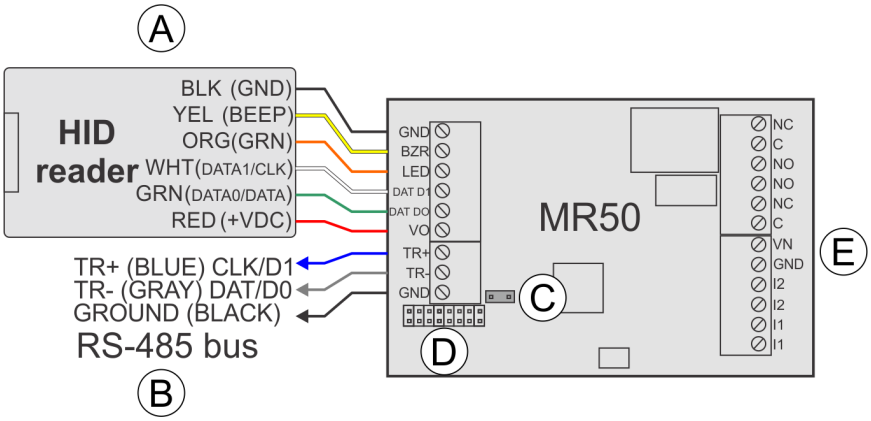
H	Relay outputs	6 Form-C, 5A/28VDC resistive load, 3A/28VDC inductive load.
I	Power In	Connect + to VIN (observe polarity). Connect - to GND. Use 20 AWG wires minimum.

Mercury MR50 connections

As part of a Synergis installation, you may need to include Mercury MR50 interface modules.

NOTE: For UL certified installations, the output from the MR50's K2 relay must not leave the room of installation and must be shorter than 30.5 m (100 ft.).

The following diagram demonstrates how to connect a MR50 interface module.

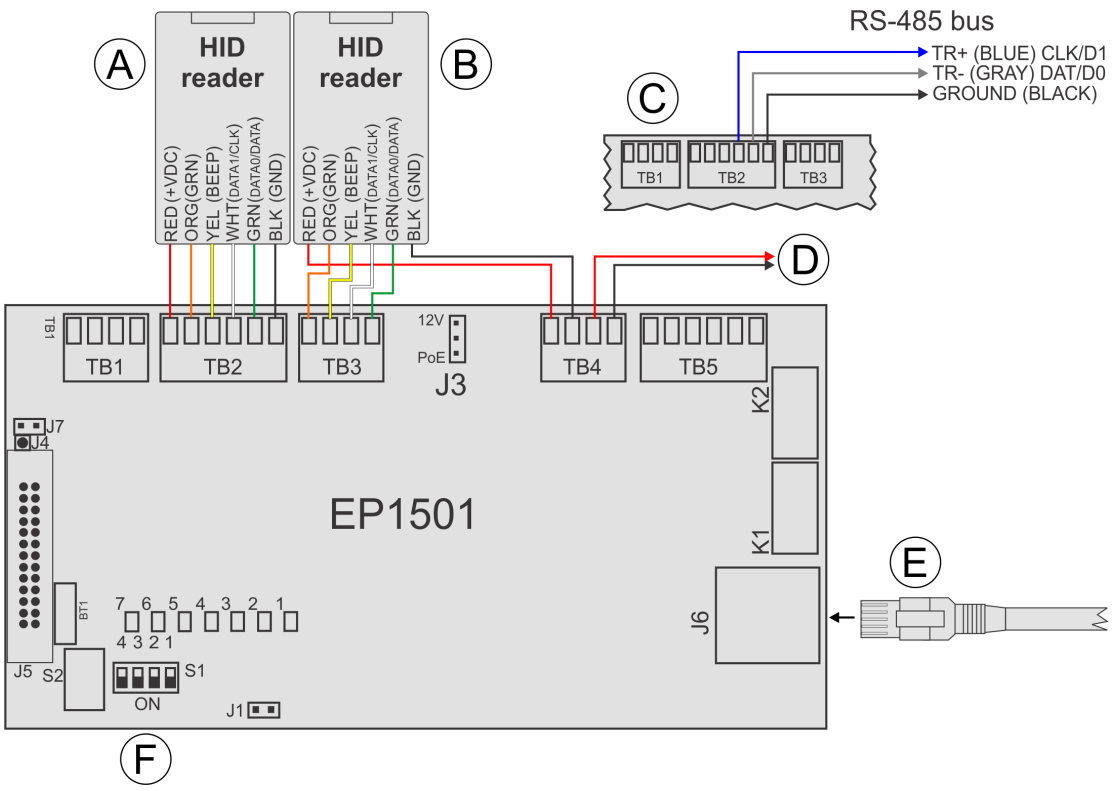


A	Reader connections	Connect one reader. **NOTE:** The wire colors in the illustration refer to "pigtail" HID readers; the information in parentheses refers to "terminal block" HID readers.
B	RS-485	RS-485 bus connection to other Mercury modules.
C	Line termination	For modules at end of line, install jumper J4 for 120 Ohm line termination.
D	Address jumpers	Used to set the device address. For more information on address settings on the Mercury module, refer to the manufacturer's instructions.
E	Power In	Connect + to VIN (observe polarity). Connect - to GND. Use 20 AWG wires minimum.

EP1501 connections

As part of a Synergis installation, you may need to include an EP1501 Intelligent Controller.

The following diagram demonstrates how to connect an EP1501 Intelligent Controller.



A	Reader connections	TB2: Reader 1 **NOTE:** The wire colors in the illustration refer to "pigtail" HID readers; the information in parentheses refers to "terminal block" HID readers.
B	Reader connections	TB3: Reader 2 **NOTE:** The wire colors in the illustration refer to "pigtail" HID readers; the information in parentheses refers to "terminal block" HID readers.
C	RS-485 bus	RS-485 bus connection to other Mercury modules. **NOTE:** When using the TB2 port for RS-485, the controller can only support only one reader (TB3).
D	Power In	Connect + to VIN (observe polarity). Connect - to GND. Use 20 AWG wires minimum. **NOTE:** Set jumper J3 to 12V.
E	Ethernet cable	Connect to Synergis™ Cloud Link (LAN2).
F	Address switches	Used to set the device address. For more information on address settings on the Mercury controller, refer to the manufacturer's instructions.

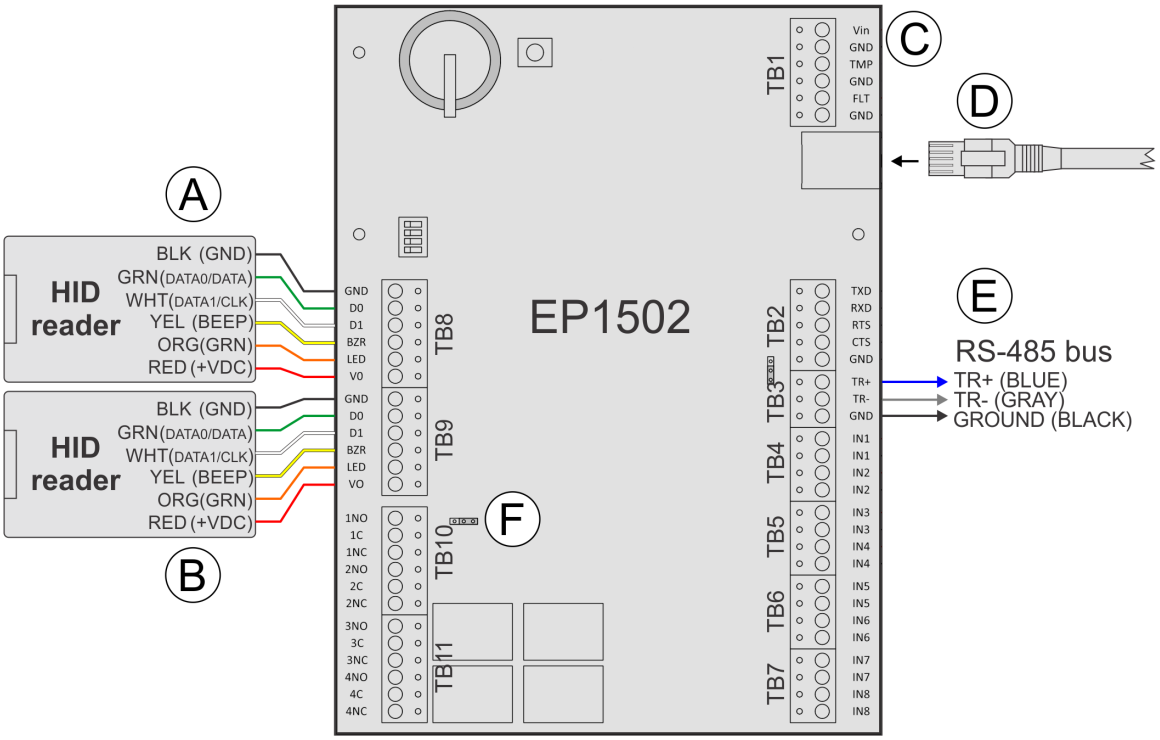
Related Topics

Types of Synergis enclosure assemblies on page 9
Component locations for large Synergis enclosures on page 24
Component locations for small Synergis enclosures on page 26

EP1502 connections

As part of a Synergis installation, you may need to include an EP1502 Intelligent Controller.

The following diagram demonstrates how to connect an EP1502 Intelligent Controller.



A	Reader connections	TB8: Door 1 Reader **NOTE:** The wire colors in the illustration refer to "pigtail" HID readers; the information in parentheses refers to "terminal block" HID readers.
B	Reader connections	TB9: Door 2 Reader **NOTE:** The wire colors in the illustration refer to "pigtail" HID readers; the information in parentheses refers to "terminal block" HID readers.
C	Power In	Connect + to VIN (observe polarity). Connect - to GND. Use 20 AWG wires minimum.
D	Ethernet cable	Connect to Synergis™ Cloud Link (LAN2).
E	RS-485 bus	RS-485 bus connection to other Mercury modules.
F	Reader power	12V = 12VDC at readers, PASS = voltage “passed through” to readers.

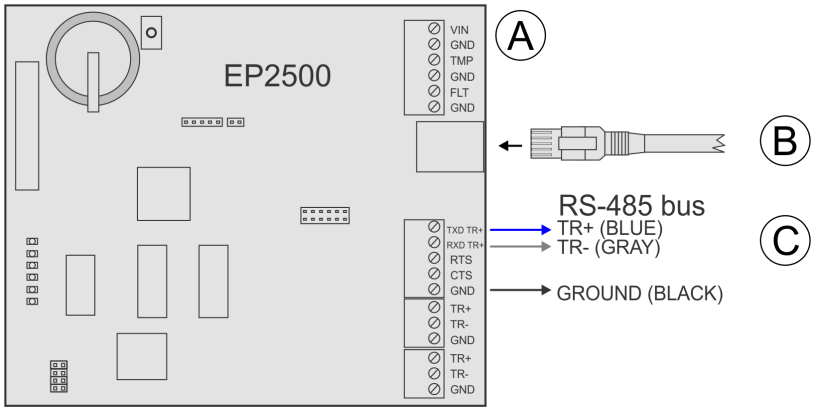
Related Topics

Types of Synergis enclosure assemblies on page 9
Component locations for large Synergis enclosures on page 24
Component locations for small Synergis enclosures on page 26

EP2500 connections

As part of a Synergis installation, you may need to include an EP2500 Intelligent Controller.

The following diagram demonstrates how to connect an EP1502 Intelligent Controller.



A	Power In	Connect + to VIN (observe polarity). Connect - to GND. Use 20 AWG wires minimum.
B	Ethernet cable	Connect to Synergis™ Cloud Link (LAN2).
C	RS-485 bus	RS-485 bus connection to other Mercury modules.

Related Topics

Types of Synergis enclosure assemblies on page 9
Component locations for large Synergis enclosures on page 24
Component locations for small Synergis enclosures on page 26

Appendices

Additional resources

This section includes the following topics:

A

Post-installation checklist

This section includes the following topics:

Verifying the Synergis™ Cloud Link installation

After completing a Synergis™ Cloud Link installation, there are several steps you must perform to verify that the system is functioning correctly.

Post-installation checklist:

1 Apply 12 VDC power and verify that the Synergis™ Cloud Link status LEDs indicate that the unit is powered and online (see Synergis™ Cloud Link LED feedback on page 82).

2 Remove AC power and verify that the backup battery powers the system.

3 For UL installations, verify that the PoE LED is off when the LAN1 cable is connected to the Synergis™ Cloud Link. For more information, see Powering Synergis™ Cloud Link using PoE on page 78.

4 In the Synergis Appliance Portal, perform the following steps. For more information on the Synergis Appliance Portal, refer to the *Synergis Appliance Configuration Guide*.

   a) Verify that Synergis™ Cloud Link has the latest firmware version.

   b) Verify that the default password has been changed.

   c) Verify that Synergis™ Cloud Link is in *Secure mode*.

   d) Verify that all connected interface modules are online.

   e) Present a card to the readers and verify the state change in the Synergis Appliance Portal.

   f) If you connected the enclosure tamper switch to the input of an interface module, verify that the input state changes in the Synergis Appliance Portal when the input is activated.

B

Replacement instructions

This section includes the following topics:

Replacing a Synergis Master Controller with Synergis™ Cloud Link

You can replace a Synergis Master Controller with Synergis™ Cloud Link inside a legacy enclosure.

Before you begin

- Before handling any internal components, discharge static electricity by touching a grounded surface, and limit movement during installation to reduce static buildup.
- Wear a grounding wrist strap.

To replace a Synergis Master Controller with Synergis™ Cloud Link:

1 Cut off the main power to the Synergis Master Controller enclosure.
2 Disconnect the power cable from the Synergis Master Controller.

TIP: Leave the power cable attached to the fuse assembly. You will be able to cut off the existing connector, shorten the cable, and attach the new Synergis™ Cloud Link power port connector.

3 Disconnect the LAN cable from the Synergis Master Controller.
4 Disconnect the RS-485 cables from the RS-485 module ports.
5 Remove the USB cable that connects the RS-485 module to the Synergis Master Controller.
6 Remove the RS-485 module mounting screws.
7 Remove the RS-485 module from the enclosure.
8 Remove the RS-485 module standoffs from the backplate.
9 Remove the Synergis Master Controller mounting screws.
10 Remove the Synergis Master Controller from the enclosure.
11 Remove the Synergis Master Controller standoffs from the backplate.
12 Position the Synergis™ Cloud Link in the space that was previously occupied by the Synergis Master Controller and RS-485 module. Refer to the examples at the end of this section showing the optimal positioning of Synergis™ Cloud Link in a large or small Synergis Master Controller enclosure.

NOTE:

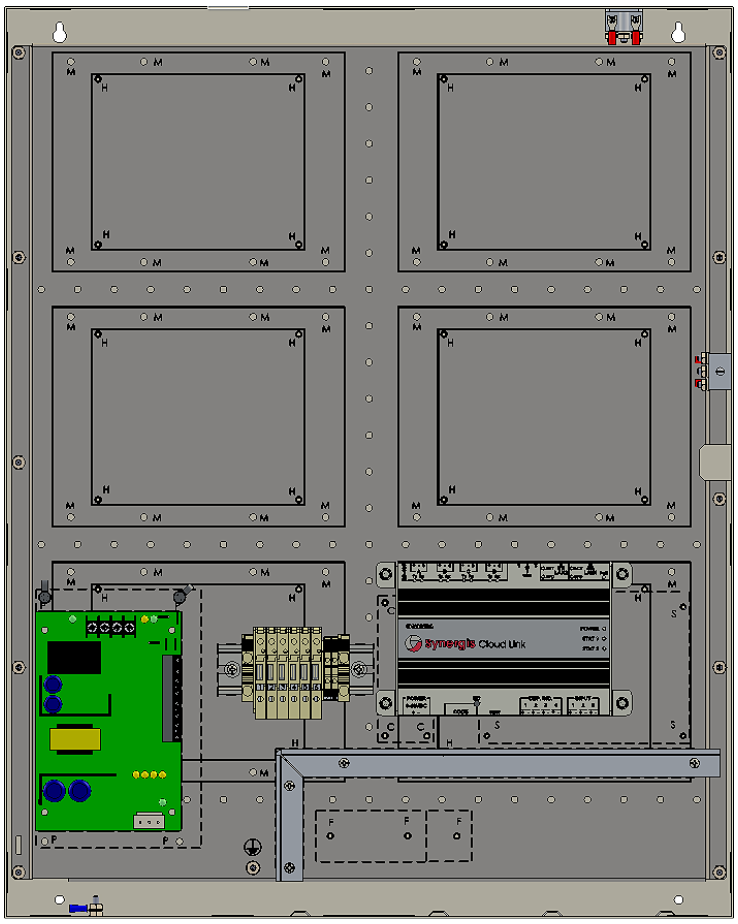
- Depending on the installation, there may not be enough space to access the ports on the bottom of Synergis™ Cloud Link (currently unused), however, you must make sure that the power port is accessible.
- When positioning Synergis™ Cloud Link, take into account the length of the existing RS-485 and LAN cables if you want to reuse them.

13 Mount Synergis™ Cloud Link using the provided self-drilling screws.

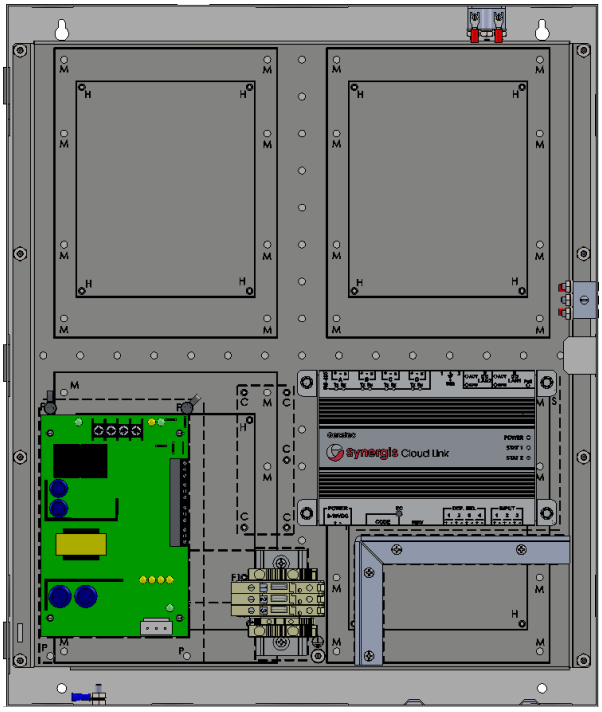
NOTE: You will not be able to use the existing mounting holes in the enclosure backplate.

14 Connect Synergis™ Cloud Link as indicated in Synergis™ Cloud Link connections on page 36.
15 Reconnect the power supplied to the enclosure.

Large Synergis Master Controller enclosure



Small Synergis Master Controller enclosure



Replacing the Synergis™ Cloud Link time/date battery

You can change the time/date battery of the Synergis™ Cloud Link. It is a standard button cell battery (BR2032) located on the bottom of the unit.

What you should know

- When used with Synergis™ Cloud Link, the Panasonic BR2032 has a 5-year expected battery life.

CAUTION:

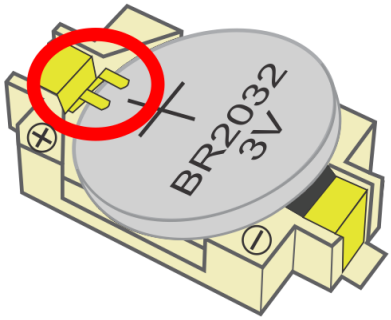
- Replace battery with Panasonic, part No. BR2032 only. Use of another battery may present a risk of fire or explosion.
- Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire. Do not heat above 100°C (212°F).
- Keep battery out of reach of children and in original package until ready to use. Dispose of used battery promptly.

To replace the Synergis™ Cloud Link time/date battery:

1 Locate the button cell battery (BR2032) on the bottom of the Synergis™ Cloud Link.

2 Insert a small flat-head screwdriver (5-7mm) under the negative (-) battery clip contact and carefully pry out the battery.

3 With the new battery in the correct orientation (label facing up), insert the battery under the positive (+) battery clip contact as shown in the illustration and press the battery into place.



About the standby backup batteries

To ensure proper performance of the Synergis IP access control system, you must properly test and maintain the standby backup batteries located in the enclosure.

To ensure the minimum standby power capacity of the system in case of an AC power failure, the standby backup batteries should be checked at least once a year. It is highly recommended to change the batteries every 2 – 3 years (preventive replacement), even if there are no evident signs of problems.

You can detect a defective battery by monitoring the backup power time during an AC power outage. If the batteries supply power for less than 30 minutes, or if the system immediately powers off, the batteries should be replaced. In addition, periodic checks are highly recommended to prevent and solve degradation of the backup power.

Maintaining the standby backup battery

There are several steps that must be performed as part of the regular maintenance of the standby backup batteries of a Synergis IP access control system.

What you should know

The following steps will allow an Electrician to detect problems with the backup batteries and to provide the minimum required battery maintenance.

WARNING: The procedures described in this section require opening the enclosure door and working in presence of live voltages. Backup battery maintenance should only be performed by a registered Electrician in your local jurisdiction. Do not attempt to provide maintenance, test, or replace the batteries if you are not qualified to do so.

WARNING: To avoid possible injuries to eyes and hands from battery acid, always use the necessary protective gear.

IMPORTANT: If you decide to remove the enclosure door, follow the recommended steps as described in the section: Removing the door from Synergis enclosures on page 28.

To maintain the standby backup batteries:

1 Visually check for the following problems. Any of these signs mean that the batteries must be replaced.

- The LifeSafety power supply's yellow SYSFLT LED should not be ON. This could indicate that there is a problem with the battery (see LifeSafety power supply LED feedback on page 83).
- Any mechanical deformation on the battery body caused by internal plates/poles growth.
- Signs of corrosion on the battery's electrical contacts.
- Signs of leakage.

2 Measure the DC float voltage.

a) Verify that the system is running on AC voltage. This will ensure that the system will not go offline when testing the batteries.

b) Disconnect the battery. If two batteries are used within the enclosure, disconnect and test one at a time.

NOTE: For systems that include two batteries, the battery on the right has a standard terminal connector, while the one on the left has a stacked (piggyback) connector. When testing the left battery, make sure to disconnect the whole stacked connector from the battery terminal before measuring its voltage.

c) Take a DC float voltage measurement of each battery by disconnecting one of the two battery cables. The normal open battery voltage when fully charged should be 12.5 VDC or higher.

NOTE: There can be a small difference between this value and the measured voltage, but if no other symptoms are present (for example, short backup time, SYSFLT LED is ON) the battery may not be defective.

3 Clean the batteries.

4 Confirm that the cable connectors are securely attached to the battery terminals. If the connectors can be easily unplugged from the battery terminals, use a pair of pliers to tighten them, or replace the whole cable assembly if required.

Replacing the standby backup battery

As part of the regular maintenance of a Synergis IP access control system, you may need to replace the backup batteries in the enclosure.

What you should know

The following procedure is applicable for the replacement of a defective battery or for preventive replacement.

WARNING: The procedures described in this section require opening the enclosure door and working in presence of live voltages. Backup battery maintenance should only be performed by a registered Electrician in your local jurisdiction. Do not attempt to provide maintenance, test, or replace the batteries if you are not qualified to do so.

WARNING: To avoid possible injuries to eyes and hands from battery acid, always use the necessary protective gear.

IMPORTANT: If you decide to remove the enclosure door, follow the recommended steps as described in the section: Removing the door from Synergis enclosures on page 28.

NOTE: If the system has two batteries, it is highly recommended to keep the same replacement cycle for both batteries, even if only one is found to be defective.

To replace the standby backup batteries:

1 Verify that the system is running on AC voltage. This will ensure that the system will not go offline when replacing the batteries.

2 Disconnect the battery to be replaced. Pay special attention to avoid a short circuit between the positive and negative cable connectors. As an added precaution, cover each connector with an electrical isolating tape after disconnecting it.

3 Remove the battery from the enclosure and place it in a safe place until the procedure is finished.

NOTE:

SLA batteries are a hazardous waste. Dispose of the replaced batteries according to the specific regulations in your local jurisdiction.

4 Place the new battery in its designated place in the enclosure and connect the cables to the battery, paying attention to polarity. Ensure that the cable connectors are firmly attached to the battery terminals.

C

Hardware compliance information

This section includes the following topics:

Hardware compliance information for Synergis™ Cloud Link

Synergis™ Cloud Link hardware products are certified based on the power supplies provided or recommended by Genetec. If you use a different power supply, you do so at your own risk, and you are responsible for the EMC compliance of the new system formed by the Synergis™ Cloud Link hardware and the new power supply.

Synergis™ Cloud Link hardware

This device complies with Part 15 of the FCC rules.

Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

This equipment has been tested and found to comply with the limits of a Class A digital device, pursuant to Part 15 of the FCC rules and CISPR32 / EN55032. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area might cause harmful interference in which case the user will be required to correct the interference at his own expense. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase separation between the equipment and receiver.
- Connect the equipment into an output on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To maintain electromagnetic compliance in an end-user installation, follow these conditions:

- Ensure that the enclosure is properly grounded to the building earth/ground system.
- All reader and RS-485 cables extending outside the enclosure (including installations where the Synergis™ Cloud Link kit is in a third-party enclosure) must be shielded and must have their drain wire grounded using the appropriate terminal for this usage.
- Any changes or modifications to the product or installation practice not expressly approved by Genetec, may result in interference to radio or television reception, and could void the user's right to operate the equipment.
- Ensure that you use only recommended cable types as described in the Genetec documentation, especially for the RS-485 cables and reader cables, which are both shielded cables.

Where to find product information

You can find our product documentation in the following locations:

- **Genetec™ Technical Information Site:** The latest documentation is available on the Technical Information Site. To access the Technical Information Site, log on to Genetec™ Portal and click Technical Information. Can't find what you're looking for? Contact documentation@genetec.com.
- **Installation package:** The Installation Guide and Release Notes are available in the Documentation folder of the installation package. These documents also have a direct download link to the latest version of the document.
- **Help:** Security Center client and web-based applications include help, which explain how the product works and provide instructions on how to use the product features. Genetec Patroller™ and the Sharp Portal also include context-sensitive help for each screen. To access the help, click **Help**, press F1, or tap the **?** (question mark) in the different client applications.

Technical support

Genetec™ Technical Assistance Center (GTAC) is committed to providing its worldwide clientele with the best technical support services available. As a customer of Genetec Inc., you have access to the Genetec™ Technical Information Site, where you can find information and search for answers to your product questions.

- **Genetec™ Technical Information Site:** Find articles, manuals, and videos that answer your questions or help you solve technical issues.

  Before contacting GTAC or opening a support case, it is recommended to search the Technical Information Site for potential fixes, workarounds, or known issues.

  To access the Technical Information Site, log on to Genetec™ Portal and click Technical Information. Can't find what you're looking for? Contact documentation@genetec.com.

- **Genetec™ Technical Assistance Center (GTAC):** Contacting GTAC is described in the Genetec™ Lifecycle Management (GLM) documents: EN_GLM_ASSURANCE and EN_GLM_ADVANTAGE.

Additional resources

If you require additional resources other than the Genetec™ Technical Assistance Center, the following is available to you:

- **Forum:** The Forum is an easy-to-use message board that allows clients and employees of Genetec Inc. to communicate with each other and discuss many topics, ranging from technical questions to technology tips. You can log in or sign up at https://gtapforum.genetec.com.
- **Technical training:** In a professional classroom environment or from the convenience of your own office, our qualified trainers can guide you through system design, installation, operation, and troubleshooting. Technical training services are offered for all products and for customers with a varied level of technical experience, and can be customized to meet your specific needs and objectives. For more information, go to http://www.genetec.com/support/training/training-calendar.

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- If you require a demo license or have questions regarding pricing, please contact Genetec™ Sales at sales@genetec.com, or call 1-866-684-8006 (option #2).

Hardware product issues and defects

Please contact GTAC at https://gtap.genetec.com to address any issue regarding Genetec™ appliances or any hardware purchased through Genetec Inc.