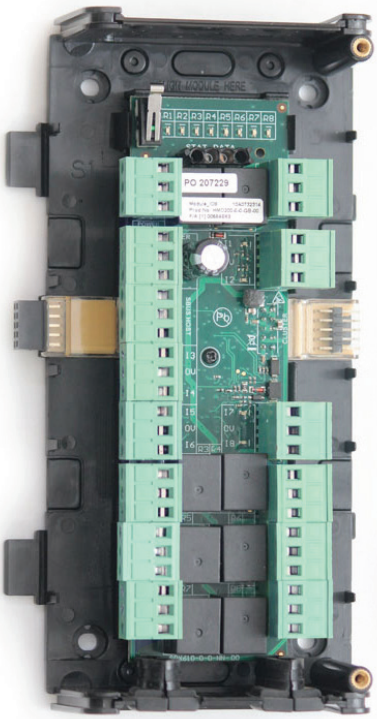
impro technologies®

COMPONENT CODES:

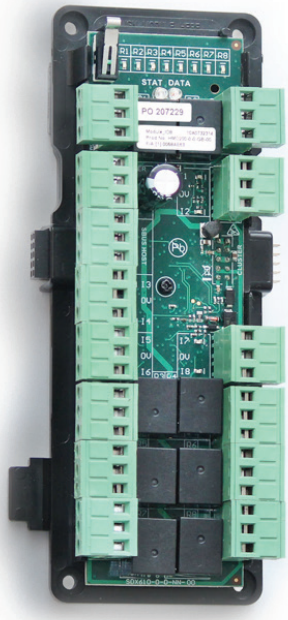
HMO900-0-0-NN-XX HMO901-0-0-NN-XX

IO8 Module

INSTALLATION MANUAL



Cluster Module Version
HMO900-0-0-GB-XX



IPS Module Version
HMO901-0-0-GB-XX

Specifications

The IO8 is a Cluster Expansion Module that works in conjunction with an Impro (CCM) Cluster Controller Module; offering eight digital inputs and eight output relays.

Working Environment

Cluster Module	Designed to work in an indoor (dry) environment similar to IP20, the Module is not sealed against water.
IPS Module	Designed to work in an indoor (dry) environment similar to IP20, the IPS Module is not sealed against water.

Power

Input Voltage	12 V DC to 15 V DC, polarity protected.	
Power Requirements	**Current (mA)**	**Power (W)**
Input Voltage 12 V DC, Relays all off	40	0.48
Input Voltage 12 V DC with all 8 relays holding on	240	2.88

Communication with the Cluster Controller Module

Direct Communications	When clustered (plugged side-by-side) into the Cluster Controller Module, or into an existing Cluster, or installed in an IPS enclosure.
Electrical Interface	Propriety Cluster-Bus
Baud Rate	115 200
Encryption	AES Encryption

S-Bus Device Port

Electrical Interface	Propriety S-Bus
Baud Rate	9600
Encryption	AES Encryption

Digital Inputs

Type	8 Dry-contact inputs with End-of-line (EOL) Sensing.
Detection Resistance Range	< 2 kΩ.
Protection Range.....	+15 V continuous.

Relays

Relay Output	8 Independent, single-pole, double-throw (SPDT) Relays, each with NO, COM and NC contacts.
Relay Contact Ratings.....	10 A at 28 V DC, 5 A at 220 V AC, 12 A at 120 V AC.
Operations.....	100 000 Minimum.

LED Status and Diagnostic Indicators

Status LED (RED)	**Indication**
Supply Voltage Status.....	Off when supply voltage is too high, or too low
Upgrade Mode	Flashing at a steady rate during upgrade
Communications Failure	Two brief flashes, repeating
Data LED (GREEN)	Flashing Green during communication
Digital Inputs (I1-I8)	Continuous Green on detected contact closure
Relays (R1-R8)	Continuous Red on activation of the Relay

INSTALLATION INFORMATION

Accessories

CAUTION: DO NOT use the Metal-oxide Varistors (25 Vrms, 500 A, 77 V max clamping) with mains power applications.

Find the following when unpacking the IO8:

Cluster Module Housing (HMO900)

An Impro (IO8) Module is supplied in a customisable Black, ABS plastic housing with the following features/components:

- Housing, consisting of a base, a cover and a selection of end plates, including cable entry gland plates.
- The housing base has:
  - Two slots to hold the user-selectable end plates
  - Six knock-out cable entry points
  - Four drill-out cable entry points
- The housing cover and base are held together with two Allen head screws (M3 x 10 mm) through the cover of the housing.
- Five Ziploc bags, containing the following:
  - Four stand-offs (for spacing the IO8 away from the mounting surface) and two cluster connector covers (for closing off the cluster connectors when not in use.)
  - Eight Metal-Oxide Varistors 25 Vrms, 500 A, 77 V max clamping.
  - A 2mm Allen key and a spare hex head screw
  - Two extra gland plates
  - An extra Fixed address label, for installation site mapping

NOTE: The installer needs to obtain fasteners (< 5 mm Diameter to fit through the supplied stand-offs) that are suitable for securing the module to the mounting surface – these are NOT supplied in the kit.

IPS Module (HMO901)

Included in the packaging is:

- Impro IO8 PCB on a base plate.
- An extra fixed address label, for installation site mapping
- Eight Metal-Oxide Varistors 25 Vrms, 500 A max clamping

Remember the following when installing the IO8 Module:

Clustering

Clustering allows for the easy addition or replacement of modules, it saves on wiring and requires only one DC Power Supply connection for the Cluster.

The following applies:

- The IO8 may be plugged directly into its associated Cluster Controller Module, or into an existing cluster consisting of a Cluster Controller Module and other expansion modules.
- The IO8 is powered and controlled via its cluster connector.
- No more than eight IO8 modules can be clustered with their associated Cluster Controller Module.

EARTH Connection

This is only necessary when mounting the IO8 Module remotely from the cluster

Connect the Impro IO8 (“ETH” Terminal) to a good EARTH point. Mains EARTH can be used, but electrical noise may exist.

I/O Cable lengths

It is recommended that cables used between the relays and their loads, and between the digital inputs and their push buttons / magnetic switches, are no longer than 50 m (164 ft.).

The use of thicker, multi-stranded cable for relay outputs will reduce excessive volt drops over long cable runs, preventing unreliable operation.

Blank Space

CAUTION: Make certain that you mount the IO8 on a vibration-free surface.

NOTE: The HMO900 can be mounted onto virtually any surface including metal.

Clustering

Provided there are less than eight other expansion modules already clustered with the Cluster Controller Module, you may add the IO8 to an existing Cluster:

- Remove the housing cover from the IO8 and plug the IO8 into the cluster socket on the right hand side of the Cluster Controller – or that of the outermost expansion module in the cluster.
- Holding the IO8 square against its neighbouring Module, mark the mounting hole locations through the mounting holes in the back of the Housing Base.
- Remove the IO8, drill the mounting holes.
- Use the plastic Stand-Offs to provide space for cables behind the cluster, or if the other modules in the Cluster are already mounted with stand-offs.
- Mount the IO8 Housing Base firmly to the mounting surface using fasteners (not included) appropriate for the mounting surface material.
- Select the gland plates that best suit the installation and/or knock out the cable entry points as needed.
- Connect the digital inputs and the relay terminals as necessary for the installation
- Commission the IO8 via the menu options on Access Portal.
- Replace the IO8 housing cover and fasten closed with the two Allen head screws provided.

Blank Space

Remote Mounting (Controlled via S-Bus)

When it is advantageous to mount an IO8 (HMO900) some distance from the Cluster Controller Module, the IO8 may be connected to the Cluster Controller Module using a 2-core S-Bus cable up to a maximum of 150 m (490 ft.) long.

Referring to Figure 4 on page 10, the procedure is as follows:

- Check to see how many other device addresses are already connected to the S-Bus Host “D” terminal of the Cluster Controller Module. No more than eight device addresses should be connected to an S-Bus.
- Obtain a suitable isolated DC power supply to power the IO8 and any magnetic locks, gate motors, etc., that may be connected to the IO8.
- Remove the housing cover from the IO8 and try the IO8 against the proposed mounting surface, considering accessibility, routing of cables, the visibility of the LEDs and the possibility of adding further hardware in any future expansion of the system.
- Secure the IO8 housing base to the mounting surface, using suitable screws and wall plugs, nuts and bolts or rivets. Use the stand-offs if rear clearance will assist for cable entry or coping with an uneven mounting surface.
- Select the gland plates and Quick Click glands that best suit the installation and/or knock out the cable entry points as needed.
- Connect the digital inputs and relay terminals as necessary for the installation.
- Power up the IO8 and its peripherals
- Replace the IO8 Housing Cover and fasten closed with the two Allen head screws provided.

NOTE: *Remote, S-Bus connected modules may not be clustered, but a maximum total eight IO8 Modules may be connected to the S-Bus Host terminals of the Cluster Controller Module (Provided nothing else is also connected). The remote IO8 modules may be in different locations in the building.*

See the Cluster Controller installation manual for full S-Bus wiring instructions

Mounting the IPS IO8 Module (HMO901)

IPS IO8 modules have no housing and are only intended for mounting inside an IPS (Integrated Power Supply) housing. An IPS IO8 Combo that has any spare space may be expanded by adding more IPS IO8 modules. Additional modules are plugged into the available space and secured with four 6 mm M4 cheese head screws.

ELECTRICAL CONNECTIONS

Key Component Positions

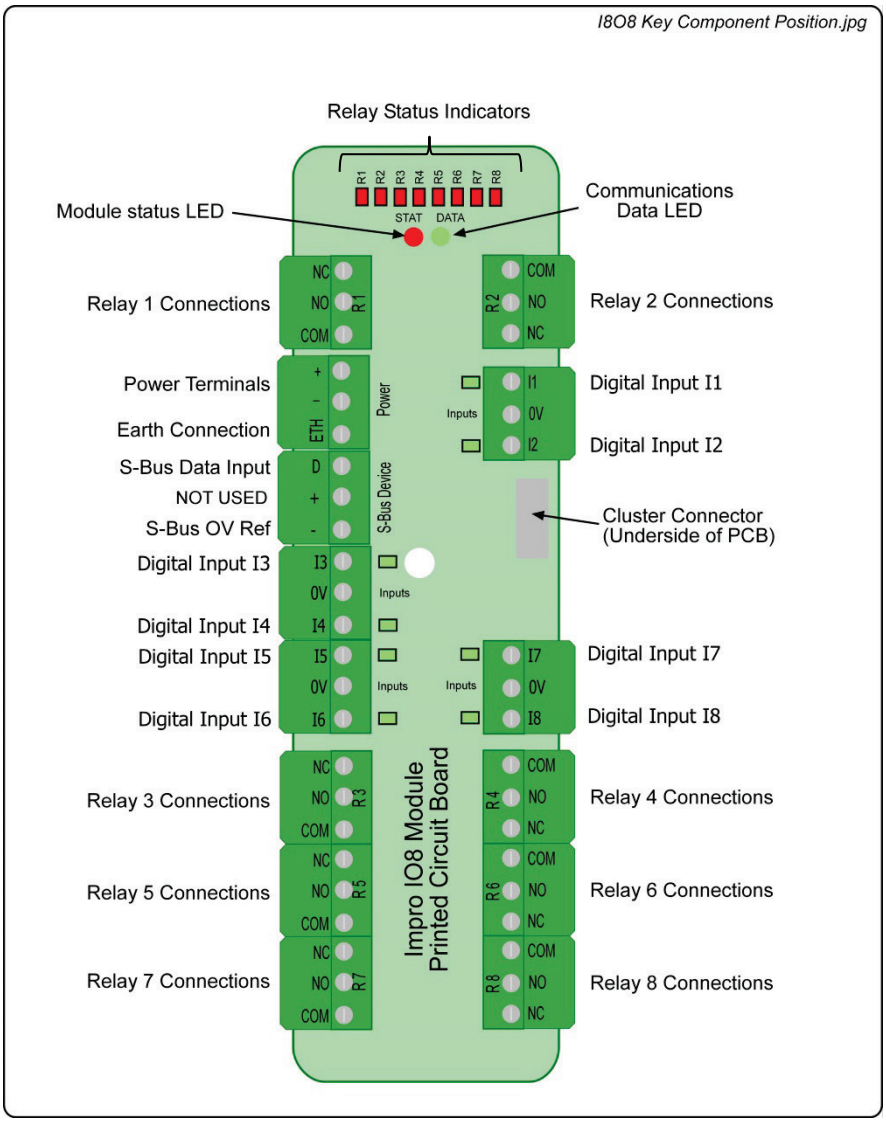


Figure 1: Key Component Positions

Wiring of digital inputs

The eight inputs on the IO8 PCB are arranged in pairs, each pair has a shared ground terminal between them. The eight digital inputs have internal pullups and each input can detect the opening/closing of a pair of dry contacts. Each input is independently configurable via Access Portal. (Normally Open/Normally Closed, and the option of end-of-line tamper detection)

End-of-line tamper detection will register a “Door Forced” event, should the wires to the contacts be cut or shorted together. This tamper detection feature requires the correct installation of a 1 kΩ end-of-line resistors – see the figure below:

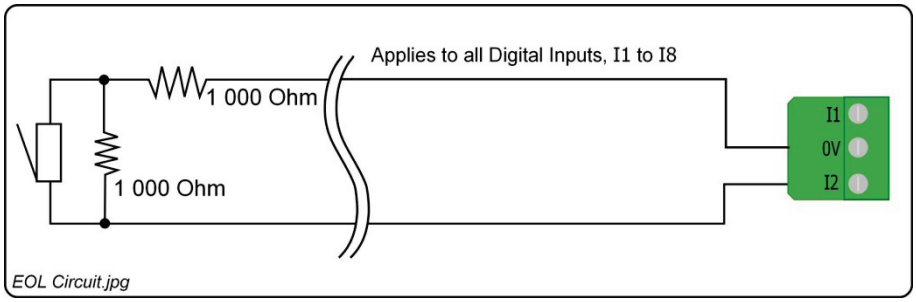


Figure 2: End-of-Line (EOL) Sensing Circuit

Wiring of the relays

Snubber devices are recommended for EMF Flyback and Arc Suppression when driving an inductive load with the Relay, see Figure 3.

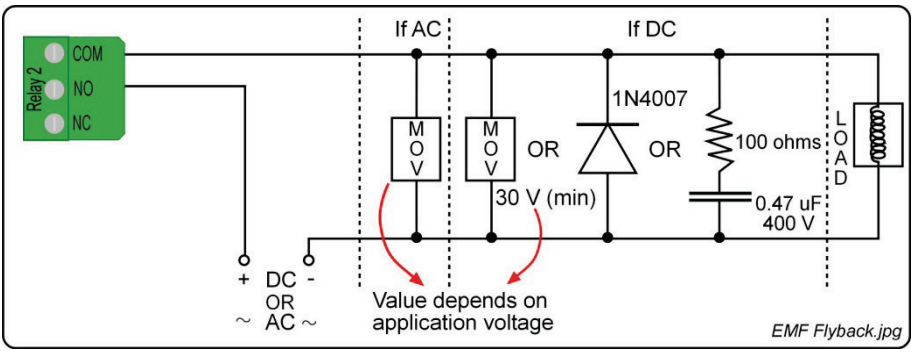


Figure 3: Back-EMF and Arc Suppression

Wiring the remotely mounted IO8 (HMO900)

When the IO8 is remotely mounted, data communications is handled via the dual-core S-Bus cable, and the IO8 will need to be powered up from an isolated 12V DC power supply. This power supply can be the same that is used to power other 12V DC devices (see Figure 4), as long as its power rating is sufficient for the total load.

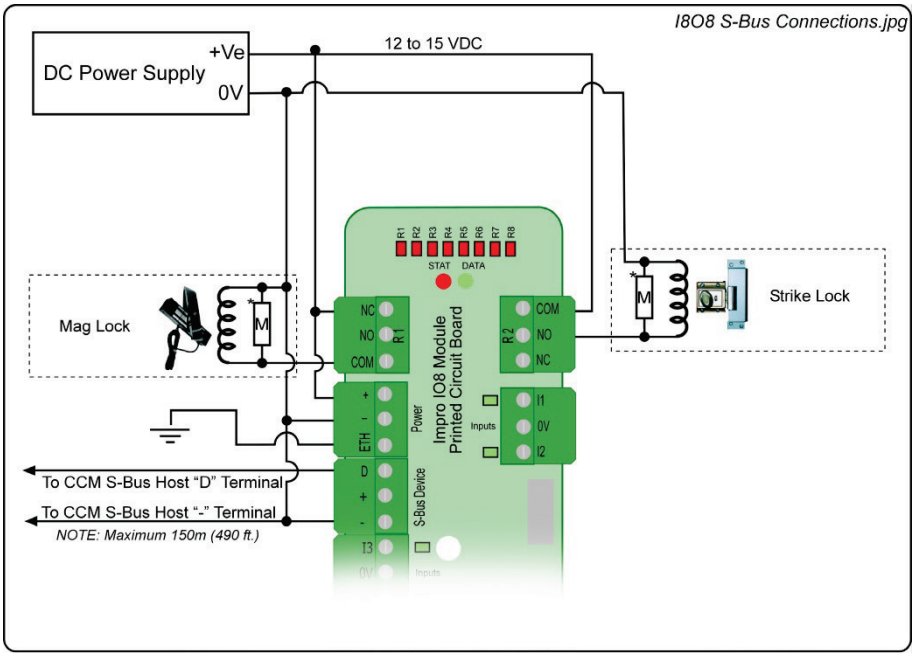


Figure 4: Typical Remotely Mounted IO8 Electrical Connections

*NOTE: * Refer to Figure 3 on the previous page for suitable relay contact arc prevention methods.*

Site plan documentation

- If you do not have one already, sketch a rough site plan.
- Attach the loose additional Fixed Address Label, packaged with the IO8, in the position of the IO8 on the sketched site plan.
- When the system installation is complete and all the modules are represented on the site plan by their Fixed Address Labels, file the site plan for future reference.

USER NOTES

GUARANTEE OR WARRANTY

CAUTION: We reserve the right to nullify the products guarantee or warranty where you have not properly installed the Metal-oxide Varistors.

This product conforms to our Guarantee or Warranty details placed on our Web Site, to read further please go to www.impro.net.

This manual is applicable to the Impro IO8 Module, Product Order Codes: HMO900-0-0-GB-XX, HMO901-0-0-GB-XX (The last two digits of the Impro stock code indicate the issue status of the product).			
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