IMAC SYSTEM INSTALLATION REQUIREMENTS

Integrated Monitoring and Control System

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This document will provide detailed diagrammatic explanations of the installation requirements of the iMAC System. Due to numerous possible installation types, showing a single complete system diagram is not practical. For this reason, it is important to read the entire document to gain a full understanding of the combined requirements for a given system type. This is of particular importance when constructing an Intrinsically Safe system.

NOTE

The information presented in this document applies to both the iMAC Controller and the iMAC2 Controller.

WARNING!

Failure to follow the requirements in this document can result in a system which may not operate optimally, and/or may undermine the overall integrity and safe operation of the system. **Always refer to the individual modules datasheets for other detailed installation and operating information.**

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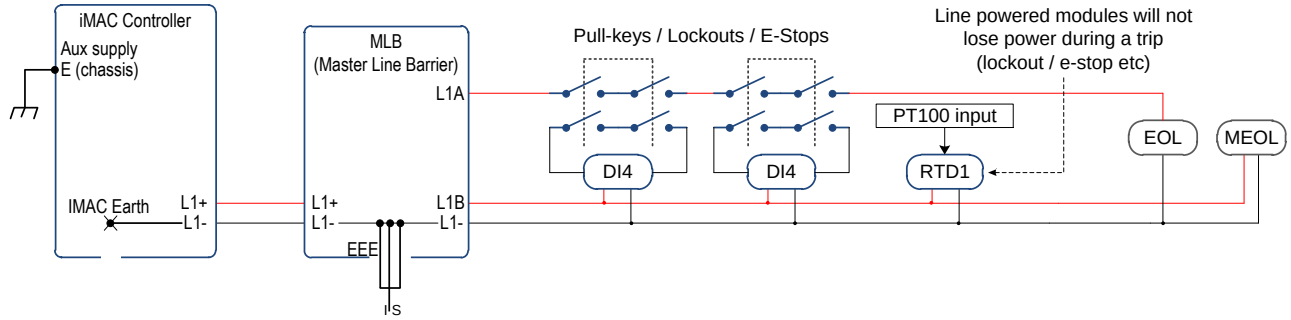
iMAC – Fieldbus - Line Connections - 3-Wire

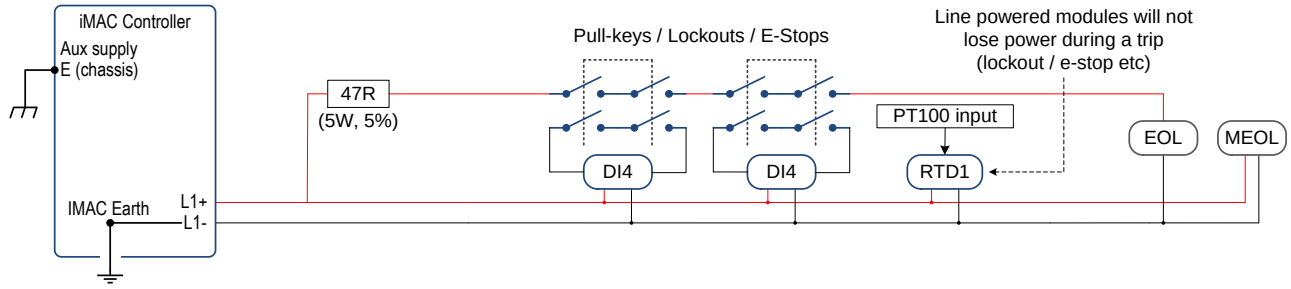
Installation Notes

- Use this system configuration when all modules are required to remain online regardless of a trip condition and/or for remote isolation systems.
- The 3 iMAC lines must be of the same wire gauge, for the entire system (this is typically between 0.75 - 2.5mm^2).

Intrinsically Safe (3-Wire)



Non-Intrinsically Safe (3-Wire)

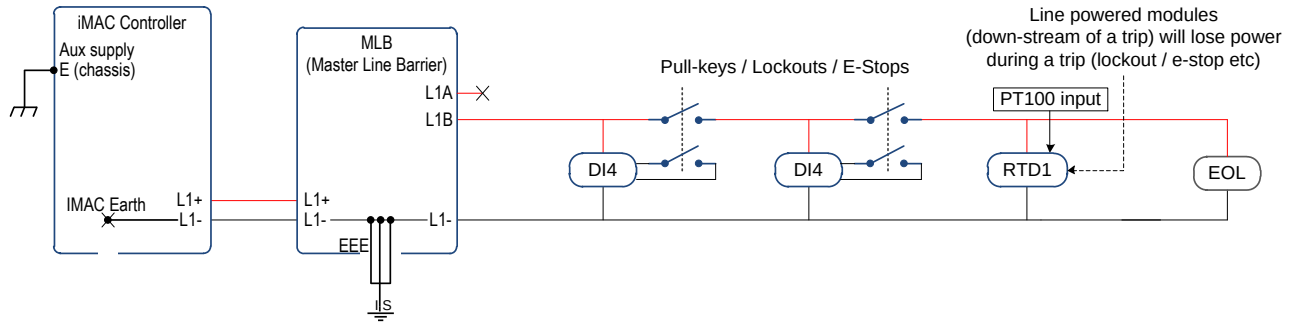


iMAC – Fieldbus - Line Connections - 2-Wire

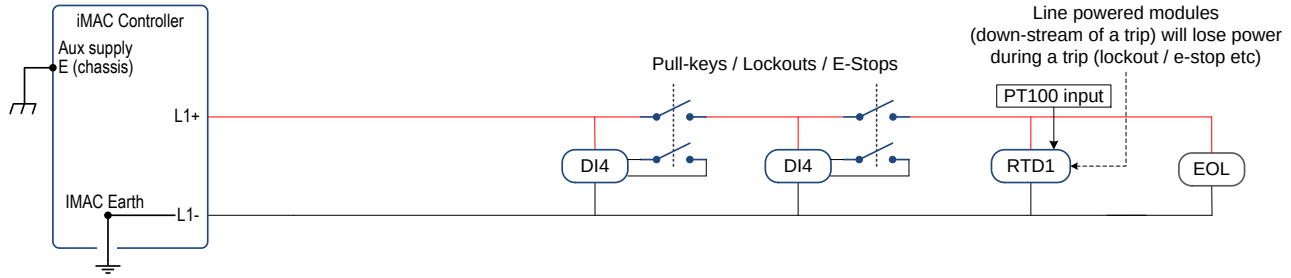
Installation Notes

- Low cost alternative to a 3 wire system, if the loss of communications to modules connected between the trip location and the EOL is acceptable, when a trip occurs.
- The 2 iMAC lines must be of the same wire gauge, for the entire system (this is typically between 0.75 - 2.5mm^2).

Intrinsically Safe (2-Wire)



Non-Intrinsically Safe (2-Wire)



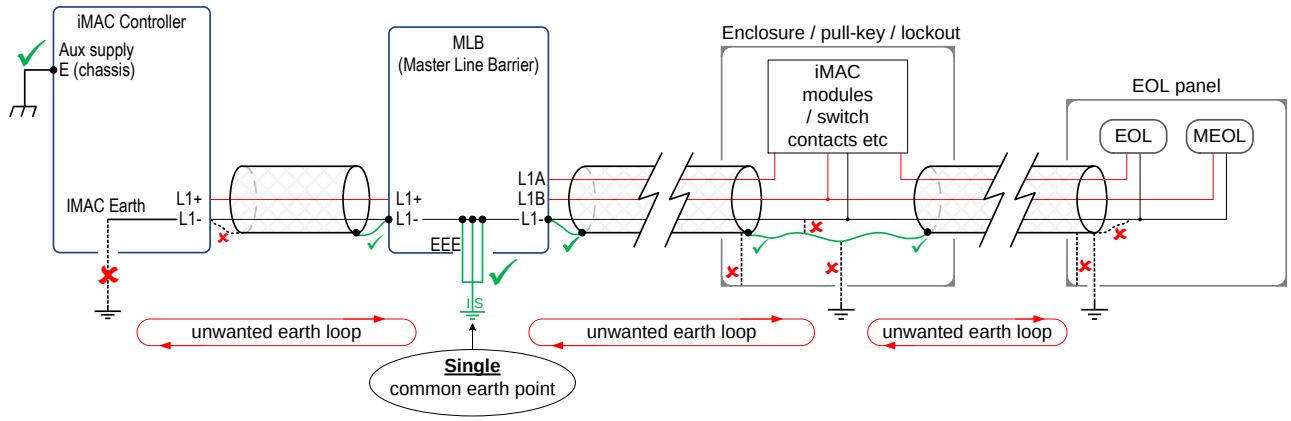
iMAC – Fieldbus - Earthing and Screening

Installation Notes

- Do NOT connect any of the iMAC cable screens to any enclosures / structures.

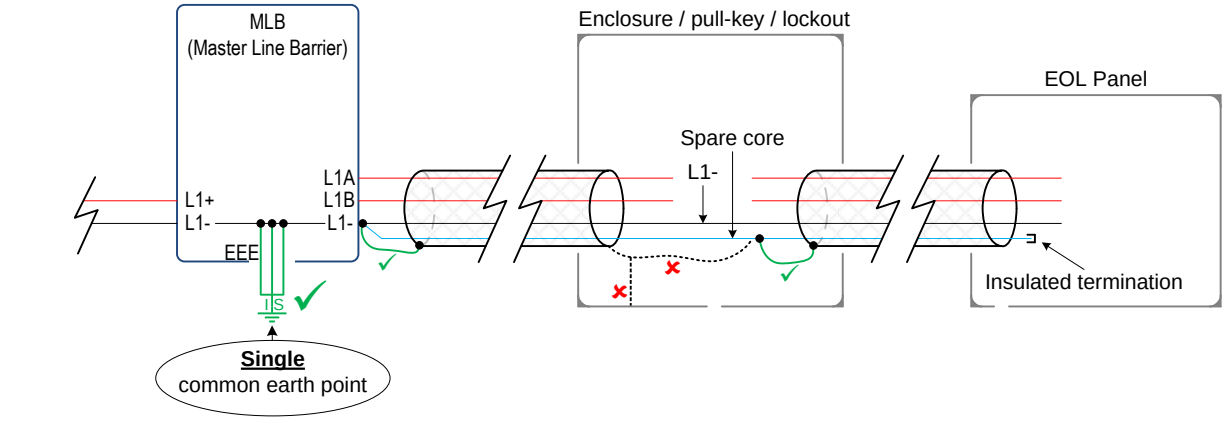
Intrinsically Safe – System

- Relevant for both 2 and 3 wire systems (3 wire system shown).
- As there are 3 earth connections required on the barrier, each earth wire need only be 1.5mm^2.
- Cable screens shall be connected to earth at a single common earth point only – I.S Earth.



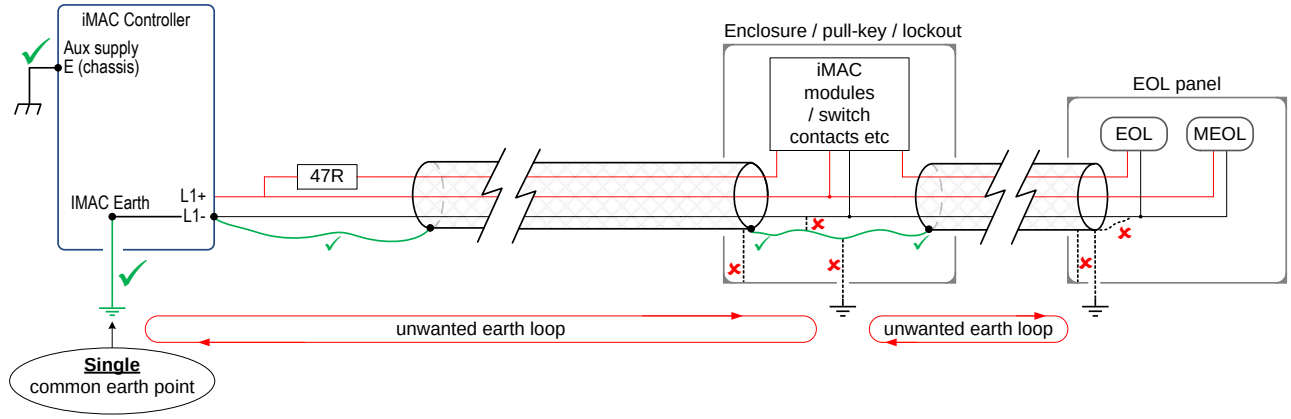
Intrinsically Safe – Handling of Spare Cable Cores

- The (first) spare core is used instead of L1-, to provide a single common earth point for the cable screens.
- The (first) spare core must provide a continuous electrical connection, and thus act as the earth backbone.
- This backbone may not connect to any enclosure or structure and may only terminate at the single common earth point.
- If you have more than 1 spare core, the additional spare cores must provide a continuous electrical connection, may not connect to any enclosure or structure, and may only terminate at the single common earth point.



Non-Intrinsically Safe

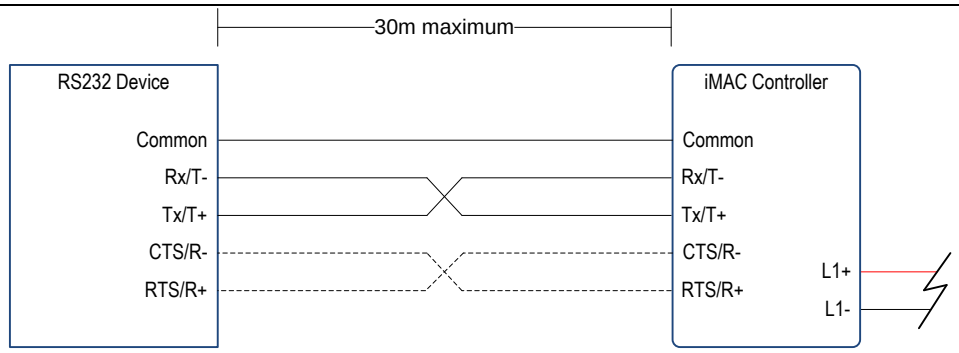
- Relevant for both 2 and 3 wire systems (3 wire system shown).



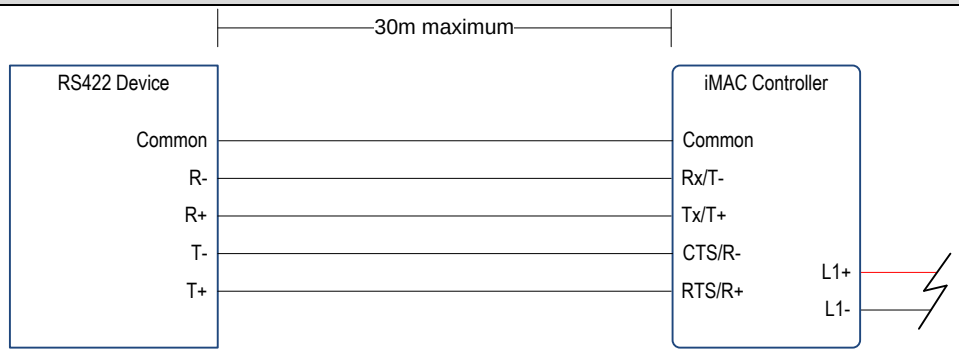
iMAC – Controller – Serial Communications

RS232 Serial Communications

- Although the iMAC Controller provides compatibility for the connection of 5-wire RS232 devices, the Controller does not require the CTS and RTS signals for data flow control (CTS and RTS connections are optional).

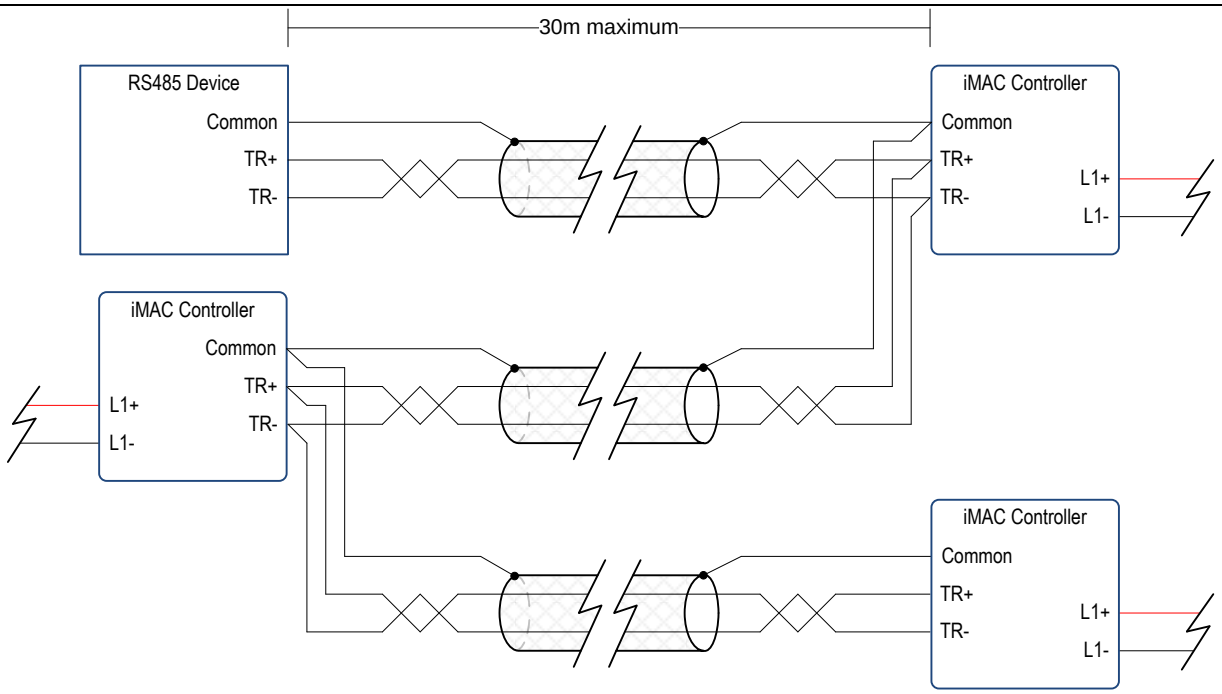


RS422 Serial Communications



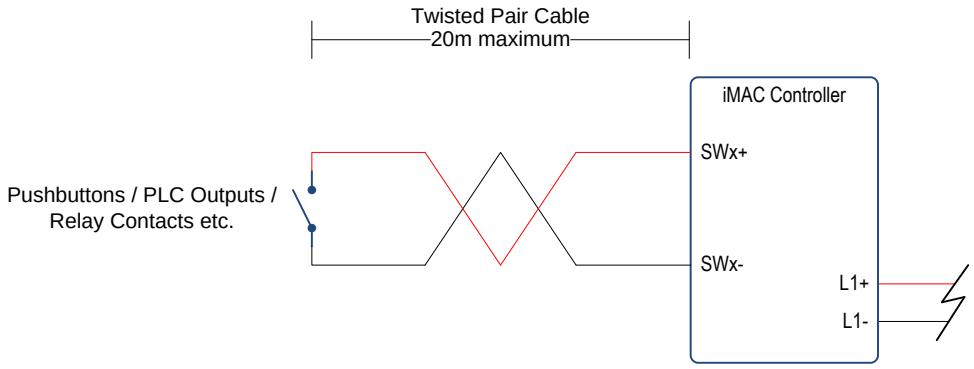
RS485 Serial Communications

- The TR+ connection on the iMAC Controller is made by bridging the Tx/T+ terminal and the RTS/R+ terminal.
- The TR- connection on the iMAC Controller is made by bridging the Rx/T- terminal and the CTS/R- terminal.



iMAC – Controller – Digital Inputs

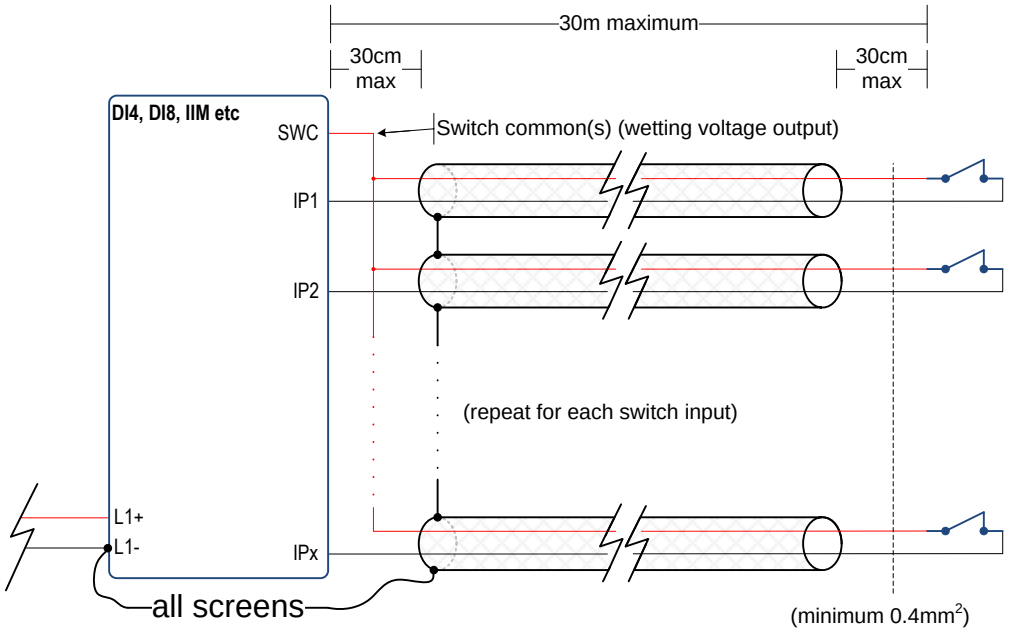
SW1, SW2, SW3 Inputs



iMAC – Modules – Digital Inputs

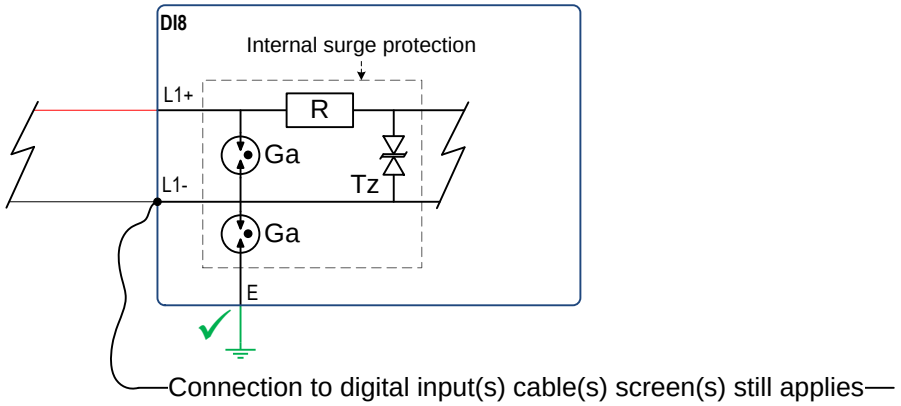
DI4, DI8, IIM Modules

- Do NOT use a multi-core (more than 2) cable and attempt to bundle inputs or other signals within a single cable.



DI8 Module Additional Requirements: Connection of the 'E' Terminal

- ONLY connect the E terminal to Earth if the system is a 2-wire NON-emergency stop system, where the iMAC fieldbus line is floating, and lightning poses a threat.

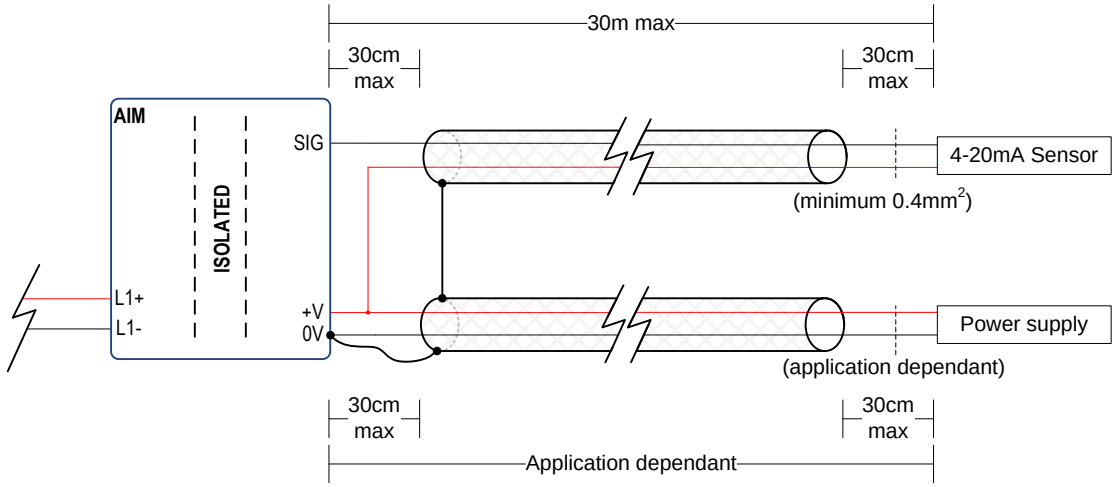


iMAC – Modules – Analogue Input

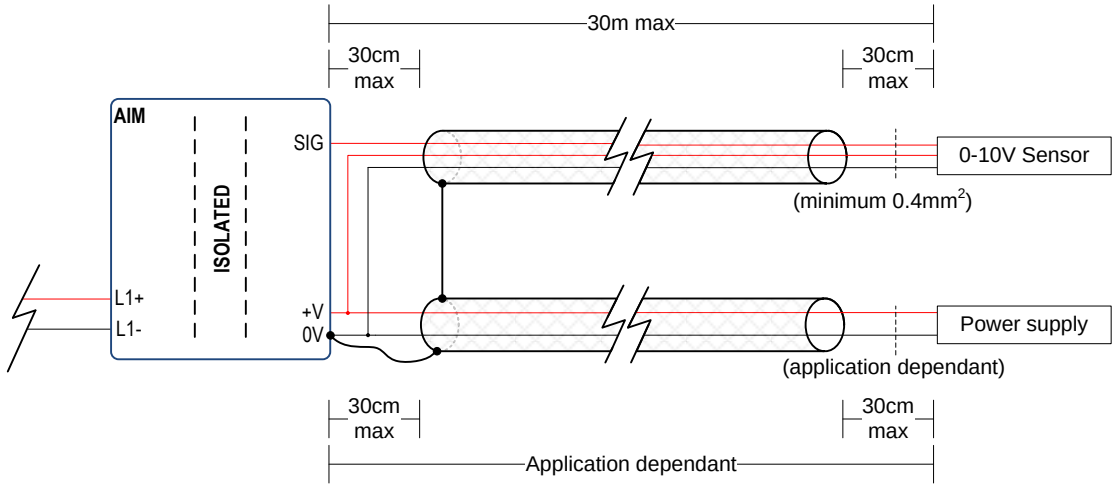
AIM (Analogue Input Module)

- Screening of the power supply input cable is optional, but highly recommended to reduce EMI interference.

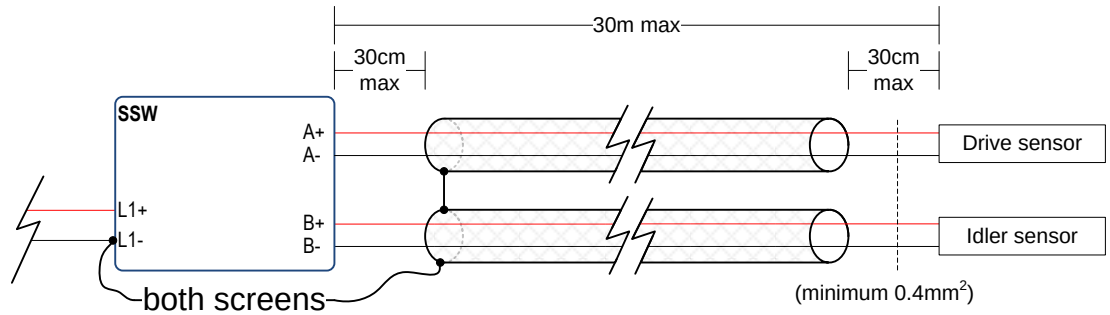
4-20mA Sensor



0-10V Sensor

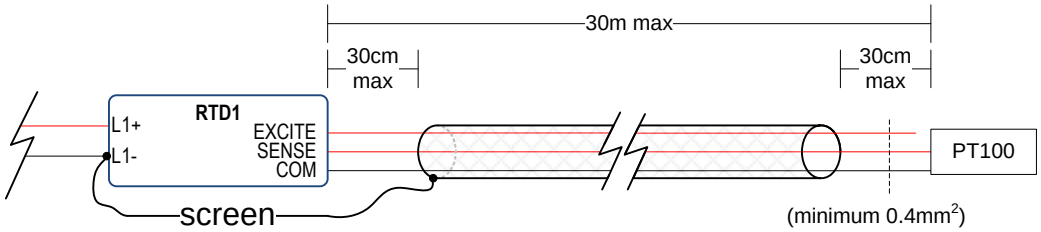


SSW (Speed Switch Module)



RTD1 (Resistive Temperature Device Module)

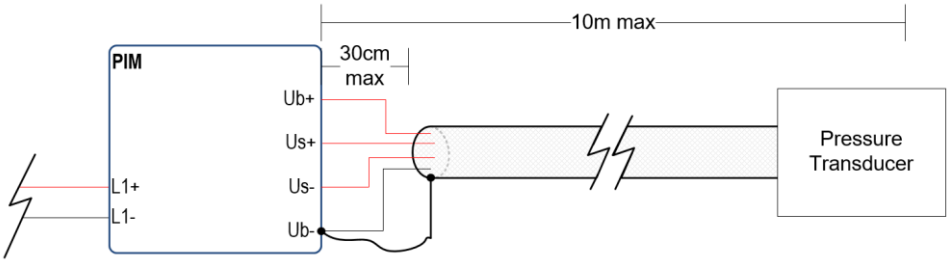
- Screen can alternatively connect to COM connection



iMAC – Modules – Analogue Input Cont'd

PIM (Pressure Input Module)

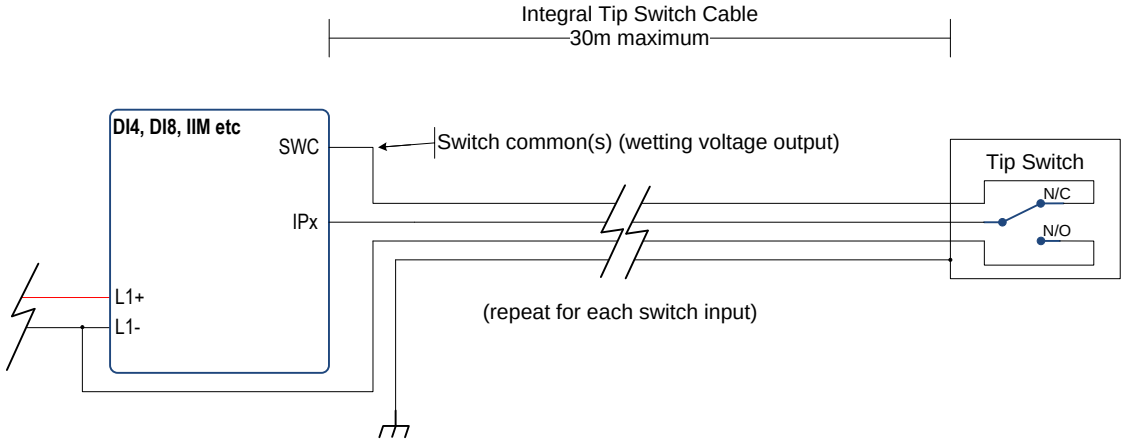
- Correct screening of the transducer cable is required to reduce EMI interference.
- Any unscreened transducer cabling (e.g. the tails out of the PIM module) should be kept short and as far away as practical from the iMAC fieldbus and other circuits.
- DO NOT increase the length of the transducer cable over what is supplied.
- A PIM Module shall only be connected to its corresponding Transducer (matched by serial number).
- Follow the guidelines in the PIM datasheet for the correct and safe connection of the pressure transducer.



iMAC – Modules – Tip Switch Connections

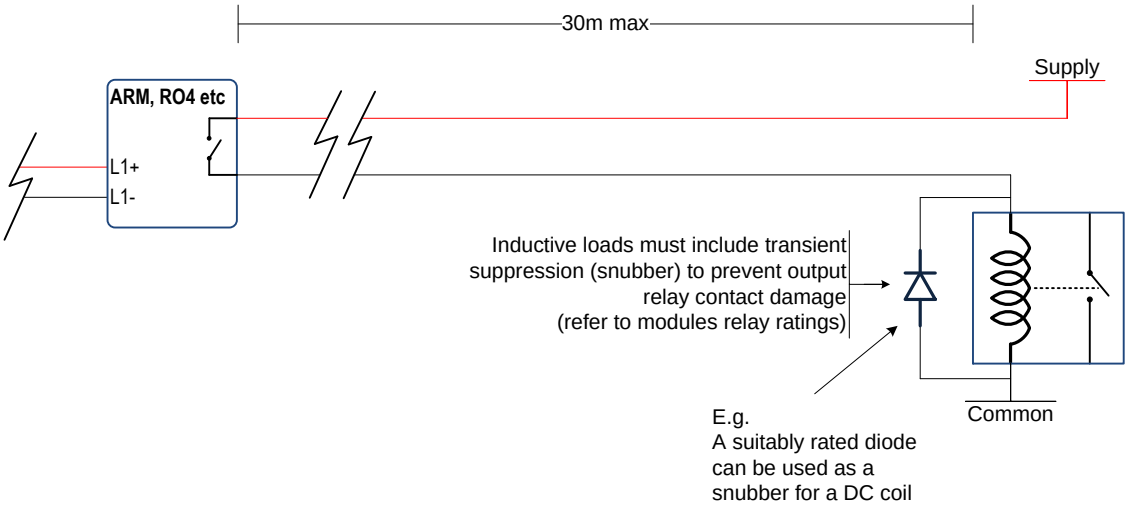
Tip Switch Connections

- Tip Switches that have an integral cable WITHOUT an overall screen shall be wired as shown to ensure reliable switch input operation. (If the integral cable DOES contain an overall screen that's open/insulated at the Tip Switch end, then this screen shall be additionally connected to the Input Module L1- terminal).



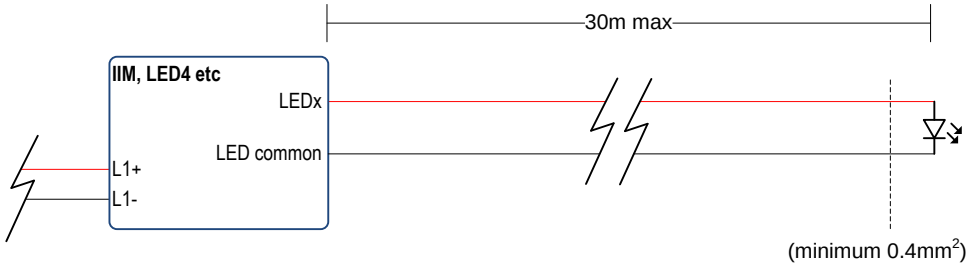
iMAC – Modules – Relay Output

ARM, CRM, DO4, DO4-4, EMM, GRM, RO4, SQM Modules



iMAC – Modules – LED Output

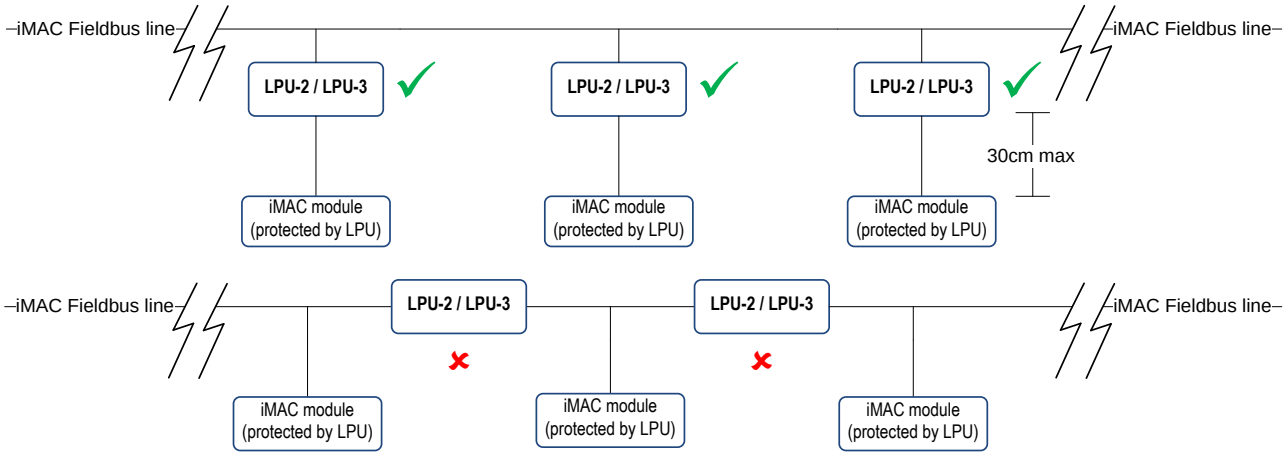
IIM, LED4 Modules



iMAC – Modules – Protection

LPU-2, LPU-3 (Lightening Protection Units)

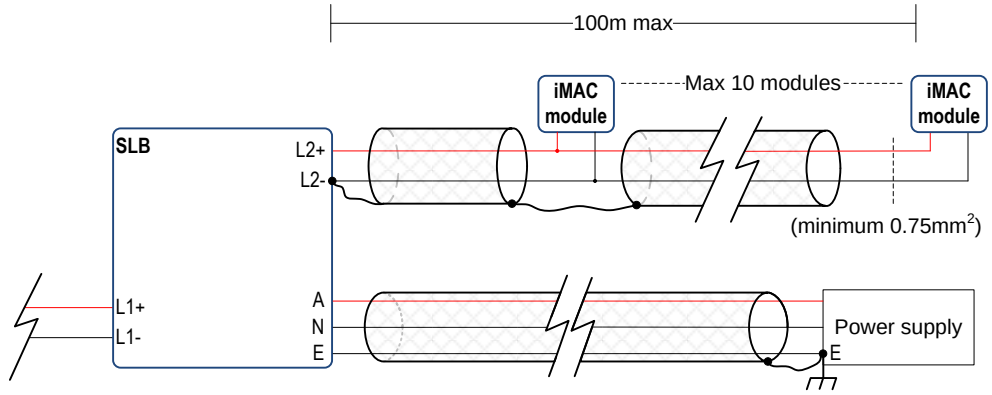
- NOT for use with Intrinsically Safe systems.
- Connect in a T-configuration, NOT inline.



iMAC – Modules – Interface

SLB (Slave Line Barrier)

- Can be connected to a 3-Wire system, however the L2 fieldbus interface is 2-Wire only (cannot create a 3-Wire T-off connection).
- Do NOT use a multi-core (more than 2) cable for the L2 interface.
- Screening of the power supply cable is highly recommended to reduce EMI interference.



SIM-T, SIM-G, SIM-G2, SIM-P (Serial Interface Modules)

- Shielded twisted pair cable must be used, with drain wire and or cable shield providing a solid common for the RS485 bus.
- Screening of the power supply cable is highly recommended to reduce EMI interference.