Connecting the External Interlock

Your Raman instrument is a laser class 3B device that has the potential to cause harm or injury to those using the system or others in the vicinity of the system.

Please read and understand the general safety precautions described in the manual supplied with your instrument. If you do not understand any of the details regarding general safety precautions, please contact PerkinElmer before proceeding.

In accordance with IEC laser safety regulations the instrument has an external interlock connector. Your laser safety officer should assess the installation site and intended application to determine if (a) an external interlock is required, (b) the supplied external interlock is suitable to use in your facility, or (c) a third-party external interlock should be used.

If your laser safety officer has determined that the supplied external interlock (L1320820) is suitable to use in your facility, follow the information in *Installing the External Interlock*. If your laser safety officer has determined that a third-party external interlock should be used, see *Requirements of the External Interlock*.

The supplied external interlock consists of:

- 1 × Magnetic Proximity Switch (MPS) (25 × 13 × 88 mm) with cable and DIN connector
- 1 × Magnetic Actuator (MA) (25 × 13 × 88 mm).

PerkinElmer Ltd, Chalfont Road, Seer Green,
Beaconsfield, BUCKS, HP9 2FX, United Kingdom.

Produced in the UK.

Installing the External Interlock

1. Attach the MPS (with cable and DIN connector attached) to the doorframe on the entrance to the laboratory as shown in Figure 1.

2. Attach the MA to the door so that it lines up with the MPS on the doorframe when the door is fully closed.

   Additional brackets may be required to attach the MPS and MA to the doorframe and door, respectively.

   The MPS and MA should now be separated by about 3 to 4 mm (no more than 8 mm).

NOTE: The MPS and MA should line up when the door is fully closed in order for them to operate the interlock safely and effectively. The contact between the MPS and MA is made at a distance of 8 mm. The contact is broken at a distance of 20 mm.

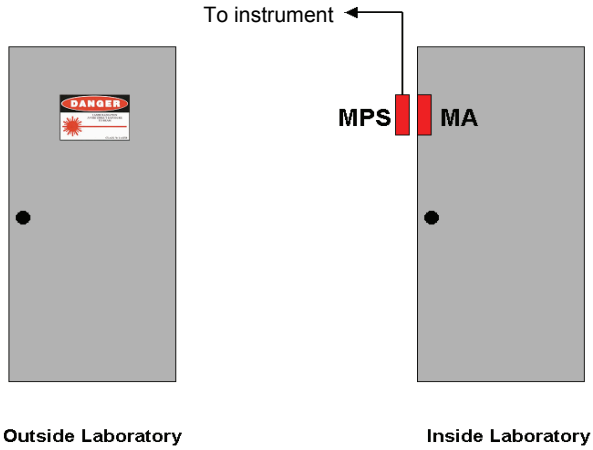


Figure 1 Positioning the external interlock

3. Attach the DIN connector on the MPS cable to the 7 way DIN connector that is labeled **INTERLOCK** or **EXT INTERLOCK** on the rear of the spectrometer module (above the fiber optic probe attachment couplers).

When the external interlock has been installed the instrument will not function unless the laboratory door is fully closed. Please note that the interlock switches cannot be over-ridden by using simple magnets.

Requirements of the External Interlock

The external interlock (L1320820) is a three-circuit switch that has multiple circuits so that if the switch fails, the interlock switch is removed, or the interlock cable is cut, the system will be laser safe.

If your facility requires the use of a different interlock switch or if you would like to attach to an existing interlock switch system, note that only three-circuit (NC/NC/NO) and two-circuit (NC/NO) switch types are compatible with your Raman instrument.

To operate the Raman instrument with a three-circuit switch, attach the switch as in Figure 2(a). To attach the Raman instrument to a two-circuit switch, join pins A/C and separately join B/D as shown in Figure 2(b). We recommend that you use a three-circuit switch.

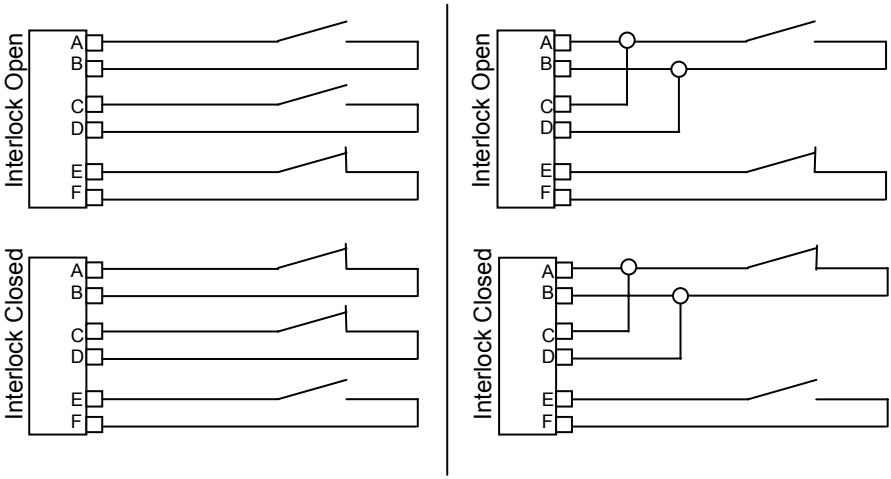
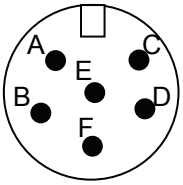


Figure 2 (a) Three-circuit switch NC/NC/NO, and (b) two-circuit switch NC/NO

The external interlock circuit requires dual redundant interlock switches to be used, which can be magnetic proximity switches or contact (plunger) switches.

Figure 3 Interlock switch types (a) magnetic proximity switch, (b) contact (plunger switch)

You must use an interlock switch with three or two internal switch circuits, that is if the interlock is a magnetic proximity switch or a contact plunger type, the internal circuitry must have a minimum of 1NC/1NO circuits. However 2NC/1NO is recommended. Do **NOT** short connections in a manner other than is shown, as this may result in unsafe operation of the Raman instrument interlock system.



Interlock Switch Connector

3 Circuit Switch

Switch 1 Closed (NC)
A Out
B Return

Switch 2 Closed (NC)
C Out
D Return

Switch 3 Open (NO)
E Out
F Return

2 Circuit Switch

Switch 1 Closed (NC)
A&C Out
B&D Return

Switch 32 Open (NO)
E Out
F Return

DO NOT Short E or F to ANY other Pins

Figure 4 Wiring set-up for the Raman instrument external interlock connector