

MIR8035

Oriel[®] FTIR Scanner



Quick Start Guide



1 GENERAL INFORMATION

Thank you for your purchase of this FTIR scanner from Oriel Instruments.

Please carefully read all documents supplied for important safety precautions prior to setting up and operating this equipment. This Quick Start Guide describes how to optimize the signal going from the source, through the FTIR scanner and to the detector.

For software installation instructions and full operating instructions, please refer to the product's user manual. If there are any questions, please contact Newport Corporation or the representative through whom this equipment was purchased.

CAUTION: The FT-IR scanner contains a Class IIIA laser. The fully assembled FT-IR system functions as a protective housing for the laser. A safety interlock prevents the laser from operating with the cover off. Eye protection is required if operating this laser in such a manner as to be exposed to the beam or its reflection. It is strongly suggested that personnel who operate this instrument understand and utilize laser safety practices appropriate for a Class IIIA laser. The scanner should never be set up in such a manner that unprotected bystanders may be exposed to the laser's output beam.

CAUTION: The scanner may contain extremely hygroscopic materials, such as potassium bromide (KBr). The scanner, source and detector also contain delicate gold-coated optical parts. Therefore, the instrument must operate or be stored in a controlled laboratory environment where relative humidity does not exceed 30%.

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2 UNPACKING THE INSTRUMENT

Choose an installation location where the electrical requirements can be met for the system and the environment is suitable for the materials contained in the system.

The scanner contains extremely hygroscopic materials, such as potassium bromide (KBr). The scanner, source and detector also contain delicate gold-coated optical parts. Therefore, the instrument must operate or be stored in a controlled laboratory environment where relative humidity does not exceed 30%.

The shipping container and scanner contain desiccant, allowing the system to be transported without any negative effects due to humidity. It is the user's responsibility to ensure that the system is operated or stored in a low humidity environment. Note that damage caused by mishandling or placement in an inappropriate environment is not covered under warranty.

The system is carefully packaged to minimize the possibility of damage during shipment. Follow these steps to unpack the FT-IR system safely:

1. Wait 1 hour before opening the sealed plastic bag containing the scanner.
2. Put on powder-free nitrile or latex gloves. Remove the scanner from its bag.
3. Remove the desiccant, place it in the plastic bag, and seal it with a twist tie or cable tie.
4. Inspect the instrument to ensure that nothing is missing or damaged before proceeding with setting up the system. Ensure that power cords are provided for all instruments provided with the system.

2 SETTING UP THE SYSTEM

Place the scanner in its final location for operation. Remove the screws along the scanner's cover perimeter using a philips head screwdriver. Remove the cover and set aside.

CAUTION: The scanning mechanism is locked for transportation purposes.

Never operate the instrument without unlocking the scanning mechanism. Failure to remove the locking screw will result in catastrophic failure.

The locking screw for the scanning mechanism is shown below. Unscrew and remove the locking screw using a philips head screwdriver. Manually check to ensure mechanism can move freely.

Never slide, tilt or move the scanner after the mechanism has been unlocked. Keep the locking screw in a safe location for moving the instrument at a future date. Re-attach the cover using all screws provided.

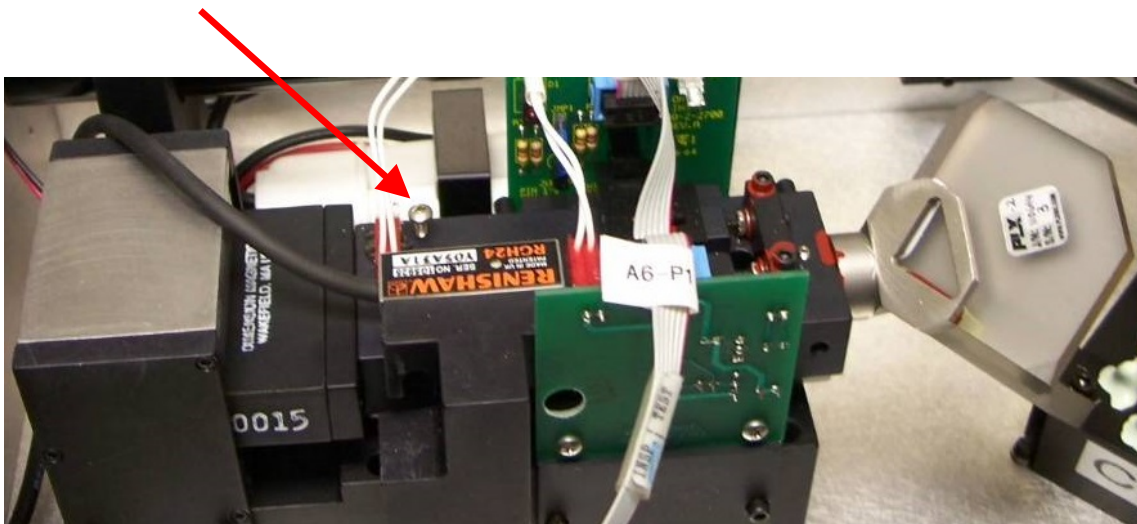


Figure 1: Unlocking Moving Mechanism

2 INITIAL CHECKS

Ensure that the scanning mechanism was unlocked prior to powering up the instrument. Apply power to the FT-IR scanner.

A liquid crystal display (LCD) is located on the top of the scanner, as shown below. "A" and "B" indicate the two signal levels after the beam splitter. The phase between the two signals is also displayed. The system must warm up for at least 30 minutes to stabilize the scanner's internal temperature in order to obtain accurate readings.

Specifications:

A and B 30% or greater, maximum 5% difference

Phase $90^\circ \pm 2^\circ$

If all readings meet the specifications shown here, the MIR8035 is ready to use.

If the A and B readings displayed are less than 30%, the beam splitter requires realignment. Refer to Section 4 for more information. If the phase is not within specification, proceed to Section 5 for instructions.

To adjust the beam splitter and the phase requires having the scanner open with the laser enabled. This requires disabling the laser interlock, which is discussed in Section 3. Observe all laser safety precautions when proceeding with Section 3.

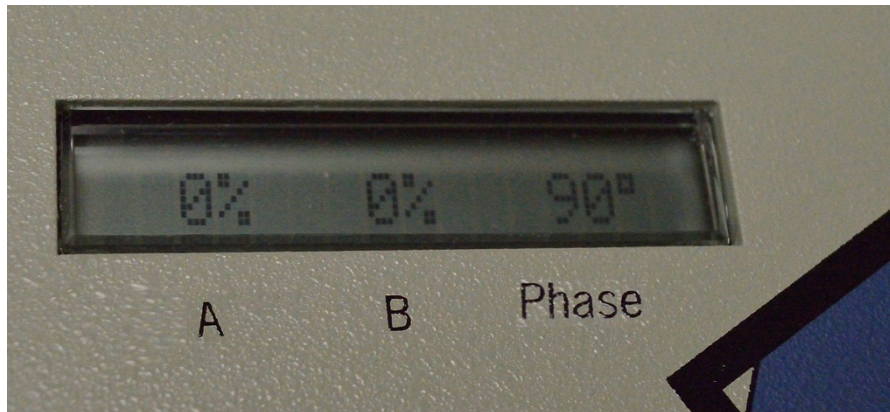


Figure 2: LCD Readings

3 LASER SAFETY INTERLOCK SWITCH

The laser interlock switch turns off the laser when the scanner cover is removed. The switch is designed to be defeated, allowing a qualified person to apply power to the laser. A qualified person must understand laser safety and take all necessary precautions when working with the FTIR cover open.

In order to disable the interlock, the switch needs to be pulled up.

The following illustrations and photos show the interlock switch with the FTIR scanner's cover removed. The illustration on the left shows the normal switch position with the Laser shut off when the cover is removed. The illustration on the right (with the plunger lifted up) would allow the power to be applied to the laser.

When the Laser is on with the interlock defeated, the LED mounted next to the switch will light. This is shown in the photographs on the following page.

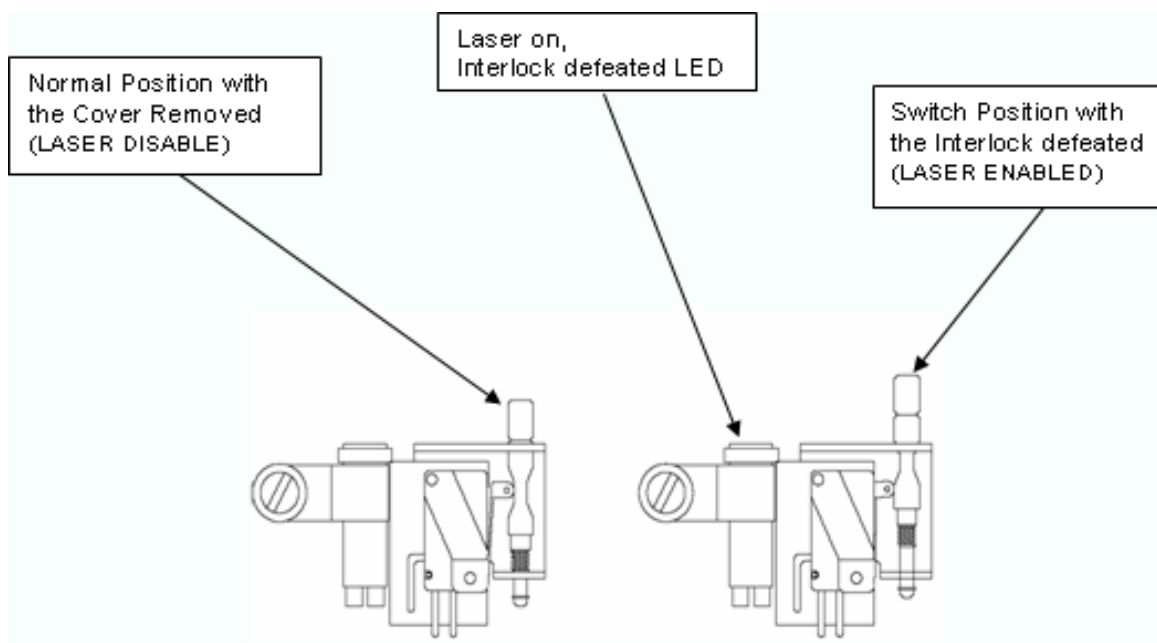


Figure 3: Safety Interlock Status Indication

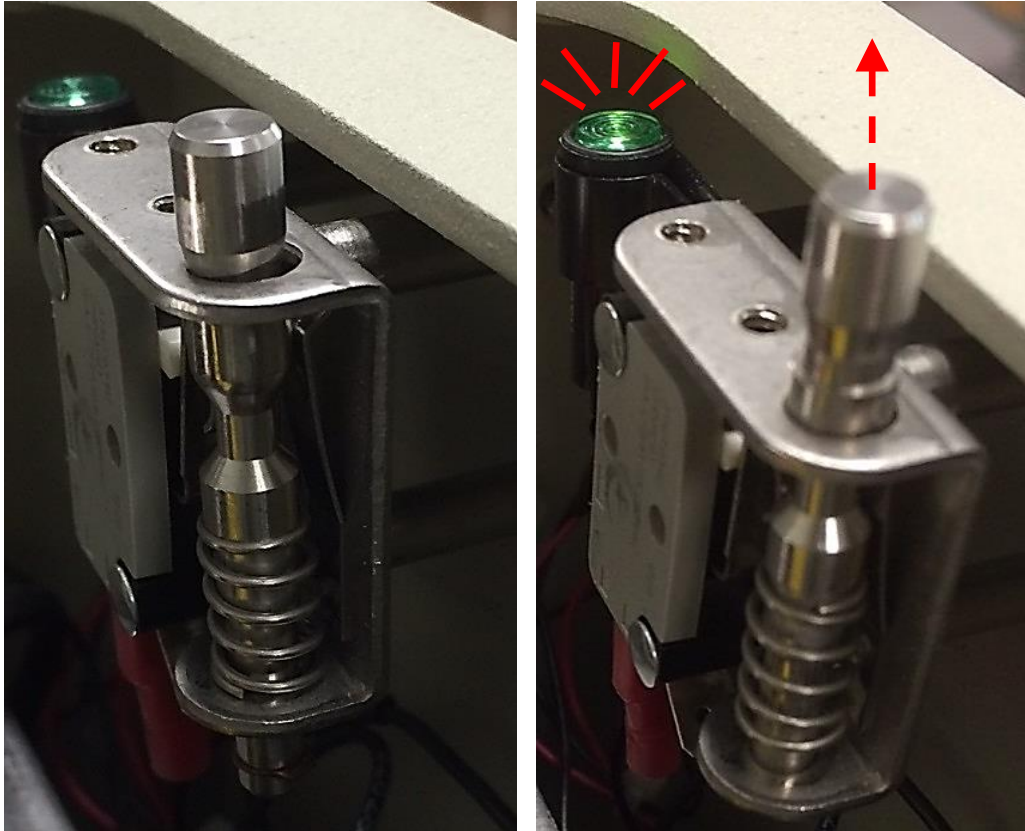


Figure 4: Safety Interlock Enabled (Left) and Disabled (Right)

CAUTION:

Direct eye exposure to the laser beam must be avoided. Laser safety glasses are strongly recommended any time the power is applied to the Laser and the instrument is open.

Protective eyewear worn must be appropriate for use with HeNe lasers. Newport includes one set of safety glasses with every instrument.

It is very strongly suggested that personnel who operate this instrument understand and utilize laser safety practices appropriate for a Class IIIA laser. The scanner should never be set up in such a manner that unprotected bystanders may be exposed to the laser's output beam.

4 BEAMSPLITTER ALIGNMENT

Beamsplitter alignment is achieved by inserting a flat blade screwdriver into the beamsplitter adjustment access ports. Once the screwdriver's slot is engaged, very slowly turn the screwdriver while observing the percentage values on the LCD.

A mark is located inside the instrument, as seen in Figure 6. The HeNe laser spot inside the FTIR scanner must line up with this factory index point. Turning the screwdriver when inserted into the top access port moves the laser output horizontally, while the bottom access port moves the laser vertically.

If the user is facing the scanner at the side of the instrument where the ON switch is located, turning the screwdriver at the top access port counterclockwise moves the laser spot away from the user. When the screwdriver is inserted into the bottom access port and turned counterclockwise, the laser spot moves vertically up.

It may sometimes be possible to see a second laser spot. If this is the case, align first one and then the other laser spot with the target to determine which one results in higher A and B readings on the LCD. Typically, this is achieved when aligning the less bright of the two spots with the target.

Never remove or otherwise disturb the laser or other optics unless specifically directed to do so by a qualified Newport service engineer.

Once the beam splitter alignment is complete, re-check the LCD readings for A and B. If they meet the required specification, continue to Section 4 to adjust the phase if necessary. If the phase is also within specification, the instrument is now ready to be utilized.

Once the readings for A, B and the phase are correct, the cover must be replaced on the instrument. All cover screws must be utilized. An additional 30 minutes of warmup time is suggested to stabilize the temperature within the instrument prior to taking data.

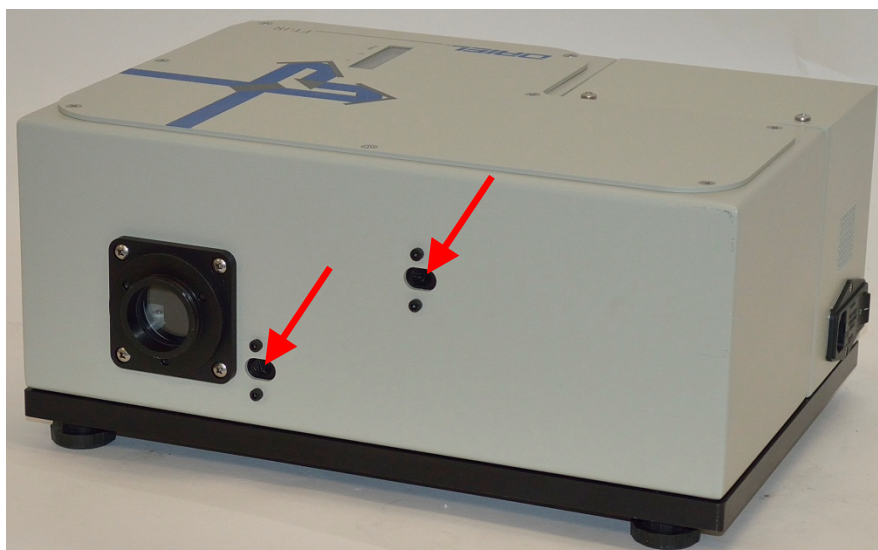


Figure 5: Beamsplitter Alignment Access Points

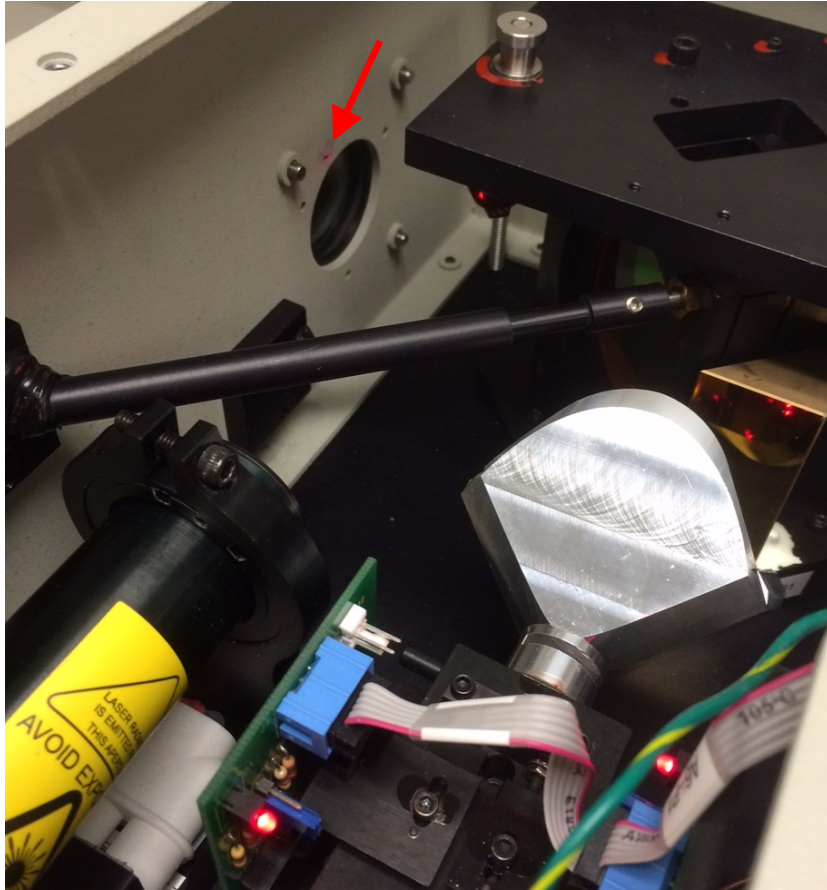


Figure 6: Laser Aligned with Factory Index Point



Figure 7: Laser Spot Aligned Out of Alignment

5 PHASE ADJUSTMENT

If the phase is not within specification, slowly turn the phase wheel (shown below) until the reading is correct.

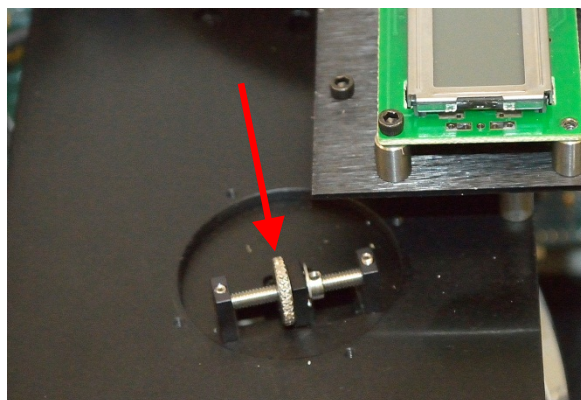


Figure 8: Laser Spot Aligned Out of Alignment

Once the readings for A, B and the phase are correct, the cover must be replaced on the instrument. All cover screws must be utilized. An additional 30 minutes of warmup time is suggested to stabilize the temperature within the instrument prior to taking data.