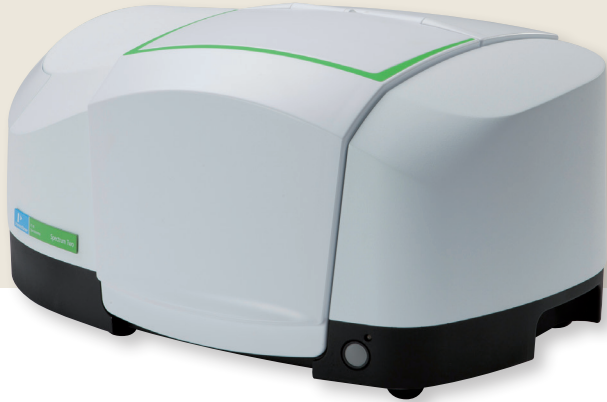


Spectrum Two FT-IR and Spectrum Two N FT-NIR Systems



FT-IR and FT-NIR Spectroscopy

Preparation Checklist

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System Overview

The Spectrum Two™ instrument can operate as a standalone FT-IR transmission system and can support the use of various sampling accessories (including the UATR pictured above).

The Spectrum Two model can come in several variants which include different detector types, an optional internal Filter Wheel and can also be connected to a Spotlight® 150i or Spotlight 200i microscope if an internal flipper mirror is installed.

An entry level Spectrum Two can be upgraded in the field at any time to add a filter wheel or flipper mirror to allow use with a microscope.

The Spectrum Two N™ is available with pyroelectric or InGaAs photodiode detectors with a filter wheel as standard. It can also be used in transmission mode and supports the use of various sampling modes (including the popular Near Infrared Reflectance Module or NIRM).

The Spectrum Two and Spectrum Two N can be customer installed, but PerkinElmer offers installation by a service engineer, if required.

Order Overview

Upon receipt of the system, please review the order. Record any discrepancies between the PerkinElmer order and your Purchase Order, along with any agreements or commitments made by your PerkinElmer Sales Representative that are NOT listed on the order.

Let your Customer Care Representative know about any discrepancies and/or commitments when you submit your Site Readiness confirmation.

Site Requirements

The Spectrum Two and Two N systems must be installed on a flat and level bench. The bench must be strong enough to support the weight specified below in addition to any ancillary equipment without warping, wobbling or swaying.

Make sure that there are no overhanging shelves, and no water pipes or faucets that could leak onto the system.

Bench Space/Instrument Weights

Table 1. Bench Space/Instrument Weights.

Instrument	Dimensions*			
	Width	Depth	Height	Weight
Spectrum Two	46 cm	30 cm	23 cm	13 kg (29 lbs)
Spectrum Two with UATR Fitted	46 cm	30 cm	32 cm	16 kg (35.5 lbs)
Spectrum Two N	46 cm	30 cm	21 cm	13 kg (29 lbs)
Spectrum Two N with NIRM Fitted	46 cm	30 cm	25 cm	16 kg (35.5 lbs)

*The dimensions and weights listed above do not include the PC/Monitor.

The workbench where the Spectrum Two and Two N systems and PC are to be located should be at a suitable height to allow the user to work comfortably and must be strong and vibration free. The bench space required should be slightly larger than the above dimensions to allow the user to work safely and comfortably when analyzing samples.

Specifically, there must be at least 10 cm clear room above the instrument to allow the sample compartment lid to open.

Note: Floor vibrations or noise from heavy manufacturing equipment can affect the performance of the system. Avoid proximity to intense magnetic fields.

Electrical Requirements

Power Consumption

Max power consumption is 65 VA (approximately 40 W).

Maximum power consumption is experienced when the Spectrum Two is powering the (optional) wireless router.

In power save mode the mains power consumption is <10 VA (approximately 6 W) and the DC power consumption is 0.2 W.

Power Specifications

Any fluctuation in the line supply must not exceed $\pm 10\%$ of the nominal voltage.

The Spectrum Two and Two N Systems:

100 V to 230 V, 50 Hz or 60 Hz

Power Outlets:

3 (1 for the the Spectrum Two and Two N, 2 for the PC/Monitor)

- If the electricity supply does not conform to the above specifications, please consult PerkinElmer prior to installation. If the supply of power is erratic please use an uninterruptible power supply (UPS). Incorrect shutdown, power fluctuations or brown-outs may damage the spectrometer or system.
- If possible, do not use photocopiers, discharge lamps, radio transmitters or other equipment with large or frequent transient loads on the same supply circuit as this may affect the performance of the system.
- Make sure that the power outlets at the electrical supply sockets to the system are not obstructed.

Gas Requirements

The Spectrum Two and Two N instruments are sealed and desiccated so atmospheric absorption from water vapor and carbon dioxide does not typically pose a problem. However, if the ambient temperature and humidity are particularly high, or if you intend to work at high resolution with gas samples, for example, you may find it useful to purge the sample compartment.

Dry, oil-free nitrogen or air can be used as the purge gas; full details are given in the *FT-IR Instrument User's Guide*.

The internal instrument compartment can be purged if necessary (see the user's guide for more information). If using a compressor, desiccators must be used to reduce the water content of the supplied gas.

Environmental Requirements

Laboratory Environment

Operating Temperature Range:

0 °C to 50 °C*

Storage Temperature Range:

-20 °C to 60 °C

Maximum Relative Humidity:

80% non-condensing with KBr windows, 90% non-condensing with ZnSe windows, 90% non-condensing with CaF₂ windows

*If you intend to operate the instrument regularly at temperatures of 40 °C or higher, for optimum performance, it is recommended that you repeat the Wavelength Calibration at the appropriate operating temperature. Refer to the on-screen software help for more information.

- The laboratory should be relatively free of dust, corrosive fumes and vibrations.
- The laboratory bench should be free from vibration and, if possible, isolated from other equipment that may induce vibration.
- Do not leave the instruments in direct sunlight.
- Make sure that there are no overhanging shelves, and no water pipes or faucets that could leak onto the instrument.
- Ensure there is sufficient clearance underneath the instrument to allow an adequate flow of cooling air.
- Major changes in temperature should be avoided – if the instrument is moved to a different environment which has a temperature difference, it should be left to stabilize before data collection can begin.

Safety Requirements

Electrical Safety

Connect the instrument power supply to a power outlet that includes a switch or other means of disconnection from the electricity supply.

Only plug the instrument power supply into a power outlet that is provided with a protective earth connection.

Do not operate the instrument with any covers or parts removed.

Servicing should be carried out only by a PerkinElmer service representative or similarly authorized and trained person.

Disconnect the instrument from all voltage sources before opening it for any adjustment, replacement, maintenance, or repair. If afterwards, the opened instrument must be operated for further adjustment, maintenance, or repair, this must only be done by a skilled person who is aware of the hazard involved.

Use only fuses with the required current rating and of the specified type for replacement. Do not use makeshift fuses or short-circuit the fuse holders.

Whenever it is likely that the instrument is no longer electrically safe for use, make the instrument inoperative and secure it against any unauthorized or unintentional operation.



Do not use a flammable gas to purge the Spectrum Two or Spectrum Two N. The FT-IR instrument contains a hot source, and a fire or explosion will result. Only use clean, dry, oil-free nitrogen or air to purge the instruments.

The instrument is likely to be electrically unsafe when it:

- Shows visible damage
- Fails to perform the intended measurement
- Has been subjected to prolonged storage under unfavorable conditions

PC Configuration

A pre-configured PC, which meets the system requirements, can be provided as part of the Spectrum Two or Spectrum Two N order, in which case, the system can be installed as normal.

If a customer-supplied PC is to be used, it must meet the following minimum specifications and hardware requirements:

Component	Requirement
Operating System	Windows® 7 or 10 (32 or 64 bit can be used)
Processor	2.5 GHz Dual Core (Quad Core recommended)
RAM	4 GB (8 GB recommended)
Hard Disk Space	500 GB
USB Ports	3 ports (this is the maximum required for the system if the Spectrum Two is connected over USB)
Ethernet Port	1 (not required if the Spectrum Two is connected over USB)

Any extra time taken for the installation that is caused by issues encountered from trying to install the system on a PC which does not meet these requirements (or is otherwise unsuitable) will be billable at the current service rate.

PerkinElmer may not provide maintenance service on customer-supplied items.

Software Requirements

The Spectrum Two and Two N instruments are operated with the Spectrum 10™ software.

NOTE: It is important to note that you must be logged on at Administrator level before installing the software.

The latest Microsoft Service Packs can be downloaded from: www.microsoft.com/msdownload/default.htm.

Installation Overview

The customer is recommended to remove the Spectrum Two and Spectrum Two N instruments from the shipping box. **The instrument must be left sealed in the foil bag to prevent moisture damage to the hygroscopic components.**

The instrument (still sealed in the foil bag) should be placed on the bench along with associated components.

The instrument must be allowed to reach room temperature before it is removed from the bag. This will mean leaving it overnight if it was moved from a cold area, and at least 4 hours after removal from the shipping container.

Only once the instrument is at room temperature can it be removed from the foil bag and installed.

Customer to Hold Packing Material for CSE

When PerkinElmer is installing the instrument, the packing material must be retained until the installation is fully signed off (recommend to retain for the warranty period).

Physical Installation (Instrument Only)

The Spectrum Two instrument is small enough to be handled by a single person using the two handholds underneath on the ends of the instrument.

Physical Installation (Accessories)

As required.

Installation Test Standards

When PerkinElmer installs the instrument, the Service Engineer will test the instrument in order to ensure that its performance meets PerkinElmer's installation specifications.

Customer Orientation

When PerkinElmer installs the instrument, the service engineer will familiarize you with the basic instrument and software operation. If further training is required, please contact your local Sales representative.

Ensure that a staff member, who will have ultimate responsibility for the Spectrum Two System, is available during the installation.

Related Documents

The *Spectrum Two instrument User's Guide* informs you how to use the FT-IR instrument. On-screen HTML Help Systems are supplied with all software applications.

Manuals for the PC and for the operating system of the PC are supplied with the PC (if purchased from PerkinElmer).

Documents are supplied to describe the use of any accessories you choose to buy, for example, the Universal Attenuated Total Reflectance (UATR) accessory.