Universal Fiber Coupler (Prototype)
Mirror Fiber Coupler adjustable for any FTIR spectrometer

user manual

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Introduction

The Universal Fiber Coupler (Prototype) is a product of art photonics company. It is intended to attach any fibre cable or fibre probe terminated with SMA905 connectors to the FTIR spectrometer. Coupler can be adjusted to any FTIR spectrometer using customized baseplates.

I.1 Safety Instructions

These units are not designed for use in hazardous areas. The units supplied should not be repaired by anyone other than art photonics engineers or technicians authorized by art photonics.

In case of operation trouble, please address to our Customer service department using the form for Confirmation on Decontamination [abbr.: Attachments].

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Conditions for operation!

To operate the fiber coupler with a spectrometry system, all specified conditions have to meet the requirements. Otherwise trouble or defects may occur.

Sensitive optical elements!

Please note the advice given below concerning the handling of sensitive optical elements.

Spare parts!

Only use original spare parts. If it is necessary to change parts not listed in the following chapters, please refer to art photonics customer service. Do not repair or change parts which are not explicitly mentioned in this manual.
Components designed to fit together!
Always use the spectrometer units which have been assembled for you at the original installation. Only use original spare parts. If it is necessary to change parts not listed in the following chapters, please refer to art photonics customer service. Do not repair or change parts which are not explicitly mentioned in this manual. Always contact art photonics Customer Services if you are considering an exchange.

Record the operating parameters of your spectrometer setup
The operating parameters of the system should be checked, defined and recorded each time a change is made to the measurement system (e.g. change of parabolic mirrors, precision sliders etc.). This can either be done by carrying out the measurements described in the following chapters or individually defined standard measurements.

I.2 Safety type and class
The modular spectrometer systems or accessories were constructed and tested according our test procedures and left our factory in perfect technical condition according to related safety regulations. If this condition is to be maintained and in order to guarantee safe operation, you must comply with all advice and warning notes in this manual.

I.3 Customer service and warranty
With the exception of o-rings and protective caps changes as well as the maintenance and service tasks mentioned in the following chapters, it is not allowed to service or repair components or accessories. In case of self service the guarantee by art photonics will be no longer valid.
Only the manufacturer and persons authorised by the manufacturer are permitted to carry out repairs.
Please contact Customer Services in case of problems with your system or individual components.

I.4 Operating conditions
Install your device with Fiber Coupler in easily accessible place.
Avoid contact of inside of the coupler with water or chemicals.
Protect optic elements against dirt.
Environmental temperature for the coupler (not for coupled equipment): + 0°C to + 50°C
Working temperature for the coupler (not for coupled equipment): 0°C to + 50°C

Do not use this Fiber Coupler in hazardous areas.
I.5 Storage and Transport

Before starting the accessory the specified temperature range has to be reached. Therefore allow the accessory to acclimatize for at least 0.5 hours to its new environment. Store the coupler in dry places only. No further safety measures are required. Although the components are robust, jolts and rough handling should be avoided.

I.6 Handling fiber couplers and cables

Handle parabolic mirrors with care.

- Do not touch optical surface of parabolic mirrors with fingers/napkin/any tool! The surface can be easily scratched resulting in reflection (transmission through the coupler) drop.
- Do not poke in the fiber ports with any tool!
- Do not rinse fiber coupler. Do not immerse fiber coupler into liquids. Ask the manufacturer for the advice if fiber coupler need cleaning.

Handle fiber cable with care.

- For optical reference cable in use: avoid tension, torsion and bending for radius less than 50mm. Hold the connector not cable protective tube when pulling it out of the adaptor. For handling with other optical cables and probes refer to handling rules for them.
- Store fiber coupler which is not in use in its protective storage cartons.
- Prevent impacts and drop of the coupler.

Be careful inserting the fiber cable into the coupler.
II Specifications

Universal Fiber Coupler (Prototype) is intended to attach any fibre cable or fibre probe terminated with SMA905 connectors to FTIR spectrometer. Coupler should be supplied with a baseplate to fit into defined device. To fit the coupler into Nicolet iS5 spectrometer no any baseplate is required.

II.1 Mechanical parts

Axis-to-axis: 48 mm (between fiber connectors)
Connectors: SMA905
Box material: Polymer
Weight: 2.26 kg

II.2 Optical parts

II.2.1 Parabolic mirrors
Light Diameter: Ø 25 mm
Effective Focus: 25 mm

II.2.2 Spherical mirrors
Diameter: 50mm
Focus: 100mm

II.2.3 Flat mirrors
Diameter: 20mm
III Content of Delivery

The Fiber Coupler FPC-2M package should include the following items:

1 x Fiber Coupler
1 x Reference fiber cable

Fiber Coupler is shown the coupler mounted in up-right position in the sample compartment of Nicolet iS5 spectrometer.
IV  Installation of the Coupler

This chapter describes which parts are needed to install the fibre coupler.

Holes for positioning pins are shown with red arrows, the groove for the electronic chip is shown with blue.

IV.1  Positioning of the coupler
Install the coupler into the sample compartment exactly onto positioning pins with fiber connectors faced to the operator. The coupler should not move or rock.

IV.2  Connecting the reference cable
Attach connectors of the reference cable into SMA adaptors of the coupler.

IV.3  Fiber Coupler alignment
The coupler is pre-aligned but all devices have slightly different optical properties. Therefore, align the SMA connectors as shown at the picture below:
Delete small plugs from the holes with tuning screws.

Start the alignment mode of the spectrometer.

Rotate slightly tuning screws one by one to get maximum signal. Continue the alignment until you have achieved the highest possible single beam or interferogram intensity. The typical throughput of the accessory is shown in the attached test report.

Put all the small plugs onto the place in the coupler case after the alignment.

The alignment window is shown at the picture below.
IV.4 Storage configuration

- Put the protective caps onto the SMA adapters when the coupler is not in work.
- Put the coupler into the box when it is not in use.

IV.5 How to store the Fiber Coupler safely

If not in use then the Fiber Coupler should be stored in a dry place. Protection against dust is recommended.

Store the reference cable with Fiber Coupler.

IV.6 Cleaning of mirrors

Clean the mirrors only with compressed air flow.

IV.7 Spare parts

Reference cables
PIR 400/500 0.5m long, SMA connectors AP10680
CIR 250/300 0.5m long, SMA connectors AP11124
NIR 200/220 0.5m long, SMA connectors AP11140

Trouble Shooting

Too low signal
  Check the system using reference cable with known signal
  Check fibre ends quality at both ends of the cable/ probe
  Check if the connectors are in good condition.

No signal
  Check position of the coupler in the spectrometer
Attachments

IV.8  New safety regulations for servicing laboratory equipment

IV.9  Confirmation on Decontamination

Form sheet for return

NEW SAFETY REGULATIONS FOR SERVICING LABORATORY EQUIPMENT

Dear Customer,

For instruments used in analytical laboratories (e.g. bio-, chemical- or pharmaceutical environment) it cannot be ruled out that service personnel could be exposed to health risks by coming into contact with residues of hazardous substances, especially when the instrument or accessories have been used for making measurements using radioactive, infectious or toxic substances.

The current regulations and laws, as well as the extended guidelines and norms, stipulate that we, as a manufacturer of measuring systems, observe more stringent safety regulations in order to ensure the safety of our employees. These regulations and laws include:

- The chemicals ordinance for protection from hazardous substances
- The hazardous substances ordinance, technical rules for hazardous substances
- The radiological protection ordinance
- The accident prevention regulations biotechnology, safety tests concerning biological safety according to UVV, VBG 102
- The guidelines of the professional associations, working in contaminated areas

Moreover, the environmental regulations issued by the environmental protection and industrial inspection board as well as the quality assurance system DIN/ISO 9001 which was awarded to art photonics, also have to be observed.

Therefore, prior to allowing any repair work in your laboratory or before returning the instrument to us we would ask you, either to carefully clean, disinfect or decontaminate the instrument or components to be serviced, or confirm that the instrument or components have not come into contact with any hazardous substances.

The enclosed “Confirmation on Decontamination” should be filled out and attached to the Shipping papers together with your repair order, or handed out directly to our service technicians in your laboratory.
We are unable to commence repair work without a declaration that the instrument has been decontaminated. Should the declaration not be received within three weeks we regret that we must for safety reasons return the instrument unrepaired, at your cost.

For further questions, please do not hesitate to contact us directly.

**Confirmation on Decontamination**

If you return an instrument or component (e.g. accessory) to AP for servicing purposes which is not properly decontaminated, there will be a health risk for AP employees. We therefore need your confirmation that the instrument or component was decontaminated and cleaned properly before shipping. If the form below is not filled in accordingly and completely, we will reject the instrument. This is needed to protect our employees. We kindly ask you for your understanding.

<table>
<thead>
<tr>
<th>Instrument / component</th>
<th>Serial no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>______________________</td>
<td>__________</td>
</tr>
</tbody>
</table>

Instrument or component has come into contact with:

[ ] radioactive substances

Isotope ______________________

___________________________

___________________________

How decontaminated / cleaned:

___________________________

___________________________

[ ] chemical reagents

R-and S-rules ______________________

___________________________

___________________________

How decontaminated / cleaned:

___________________________

___________________________

[ ] biological material

specify ______________________

___________________________

___________________________

How decontaminated / cleaned:

___________________________

___________________________

[ ] contagious agents

specify ______________________

___________________________

___________________________

How decontaminated / cleaned:

___________________________

___________________________
| [ ] I hereby confirm that the instrument or component specified above was not contaminated with any of the above mentioned substances / reagents / agents |
| [ ] I hereby confirm that the instrument or component specified above was decontaminated / cleansed using the appropriate method. |

| Date: __________________________ | signature: __________________________ |
| (please print) |
| name: __________________________ | address: __________________________ |
| title: __________________________ | phone: __________________________ |
| __________________________ | fax: __________________________ |