THORLABS

Spectrometer

CCS Series Spectrometer Quick Start Manual

2018

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Contents

We aim to develop and produce the best solution for your application in the field of optical measurement technique. To help us to live up to your expectations and improve our products permanently we need your ideas and suggestions. Therefore, please let us know about possible criticism or ideas. We and our international partners are looking forward to hearing from you.

Thorlabs GmbH

Warning

Sections marked by this symbol explain dangers that might result in personal injury or death. Always read the associated information carefully, before performing the indicated procedure.

Attention

Paragraphs preceded by this symbol explain hazards that could damage the instrument and the connected equipment or may cause loss of data.

Note

This manual also contains "NOTES" and "HINTS" written in this form.

Please read these advices carefully!

1 General Information

The CCS Series Spectrometer is designed for general laboratory use. Integrated routines allow averaging, smoothing, peak indexing, as well as saving and recalling data sets.

Attention

Do not connect the CCS Series Spectrometer to a PC prior to installingh the OSA-SW Application! The installation package includes CCS Series Spectrometer specific drivers and software that must be installed before the CCS Series Spectrometer is connected to the PC for the first time.

A troubleshooting section and detailed specifications of the various components are provided in this manual. The description of the instrument driver commands can be found in the VXIpnp VISA instrument driver package.

Application software OSA-SW

OSA-SW is an acronym for "**O**ptical **S**pectrum **A**nalyzer **S**oftw**a**re". This software can be used for acquiring direct, transmittance and absorbance measurements in conjunction with Thorlabs' optical spectrum analyzers and CCD spectrometers.

After the installation, the software is able to communicate with all Thorlabs CCD based CCS Series Spectrometers and OSA20x Optical Spectrum Analyzers. Additionally, a number of virtual devices are included to demonstrate the functionality of OSA-SW: five for OSA20x Analyzers and one for CCS spectrometers.

1.1 Safety

Attention

The safety of any system incorporating the equipment is the responsibility of the assembler of the system.

All statements regarding safety of operation and technical data in this instruction manual will only apply when the unit is operated correctly as it was designed for.

The CCS Series Spectrometer must not be operated in explosion endangered environments!

Do not obstruct the air ventilation slots in the housing!

Do not remove covers!

Do not open the cabinet. There are no parts serviceable by the operator inside!

This precision device is only serviceable if properly packed into the complete original packaging including the plastic foam sleeves. If necessary, ask for replacement packaging.

Refer servicing to qualified personnel!

Only with written consent from Thorlabs may changes to single components be made or components not supplied by Thorlabs be used.

Attention

The following statement applies to the products covered in this manual, unless otherwise specified herein. The statement for other products will appear in the accompanying documentation.

Note This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Users that change or modify the product described in this manual in a way not expressly approved by Thorlabs (party responsible for compliance) could void the user's authority to operate the equipment.

Thorlabs is not responsible for any radio television interference caused by modifications of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by Thorlabs. The correction of interference caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.

The use of shielded I/O cables is required when connecting this equipment to any and all optional peripheral or host devices. Failure to do so may violate FCC and ICES rules.

Attention

Mobile telephones, cellular phones or other radio transmitters are not to be used within the range of three meters of this unit since the electromagnetic field intensity may then exceed the maximum allowed disturbance values according to IEC 61326-1.

This product has been tested and found to comply with the limits according to IEC 61326-1 for using connection cables shorter than 3 meters (9.8 feet).

1.2 Ordering Codes and Accessories

Ordering code	Short description
CCS100(/M) [1]	CCS spectrometer, 350 - 700 nm
CCS175(/M) [1]	CCS spectrometer, 500 - 1000 nm
CCS200(/M) [1]	CCS spectrometer, 200 - 1000nm
M14L01	1 m SMA MMF Patch Cable, 50µm / 0.22 NA (to CCS100 and CCS175)
FG200UCC	1 m SMA MMF Patch cable, 200µm / 0.22 NA, High OH (to CCS200)
CVH100; CVH100/M	Cuvette holder (imperial and metric versions)

[1]   CCSxxx = imperial version, mounting holes 1/4-20;
        CCSxxx/M = metric version, mounting holes M6x1

Attention

Make sure to use your CCS spectrometer only with the included fiber (see above table). If using a different fiber, the Amplitude Correction Calibration will be affected!

1.3 Requirements

These are the requirements to the PC intended to be used for remote operation of the CCS Series Spectrometer.

Minimum Hardware and Software Requirements

- Operating System: Windows Vista or Windows 7 (32 or 64 bit)
- Free USB 2.0 high speed port (Notice that a USB 1.1 port cannot be used)
- Processor: Intel Pentium 4 or AMD Athlon 64 3000+
- 2.0 GB RAM
- .NET framework 4.0 or higher

Recommended Hardware and Software Requirement

- Operating System: Windows 7, 64 bit
- Free USB 2.0 high speed port (Notice that a USB 1.1 port cannot be used)
- Processor: Intel Core i5 or AMD Athlon II
- 6.0 GB RAM
- .NET framework 4.0 or higher

Note

Please be aware that the OSA software requires a number of third party software installed on your system. The installer checks for these software components and, if necessary, will install them automatically. You will be notified accordingly.

2   Installation

Attention

Do not connect the CCS Series Spectrometer to a PC prior to install the OSA-SW Application! The installation package includes CCS Series Spectrometer specific drivers and software that must be installed before the CCS Series Spectrometer is connected to the PC for the first time.

2.1   Parts List

Inspect the shipping container for damage. If the shipping container seems to be damaged, keep it until you have inspected the contents and you have inspected the CCS Series Spectrometer mechanically and electrically.

Verify that you have received the following items within the package:

- 1x   CCS Series Spectrometer

- 1x   This CCS Series Spectrometer Quick Reference

- 1x   CD-ROM with application software OSA-SW, drivers and PDF User Manual

- 1x   USB 2.0 A-B mini cable, 1.5 meters

- 1x   Optical Fiber, SMA to SMA, 50µm / 0.22 NA, 1 meter (CCS100, CCS175)
  Quartz Fiber, SMA to SMA, 200µm / 0.22 NA, 1 meter (CCS200)

- 1x   Trigger Input cable SMB to BNC

Attention

Make sure to use your CCS spectrometer only with the included fiber (see above table). If using a different fiber, the Amplitude Correction Calibration will be affected.

CCS Spectrometer - Ports and Signal LEDs

- (1)   USB port
- (2)   Fiber input (SMA connector)
- (3)   Status LED
- (4)   Trigger Input (SMB connector)

2.2 Installing Software

Before installing OSA Software, please make sure that no CCS Series Spectrometer is connected. After you insert the OSA Software installation CD an autorun menu will appear (see figure below). If autorun is disabled on your system, you will have to browse the installation CD and run

"[CD-Drive]:\Autorun\Autorun.exe":

Click to "Install Software":

Note

Please be aware that the OSA software requires a number of third party software installed on your system. The installer checks for these software components and, if necessary, will install them automatically. You will be notified accordingly.

Administrator privileges are required for installation. Please contact your system administrator if you get an error message.

Installation steps are shown below in detail for an installation on a Windows $7^{©}$ operating system. After selecting "Install Software", the installer checks your system and determines the software components that need to be installed.
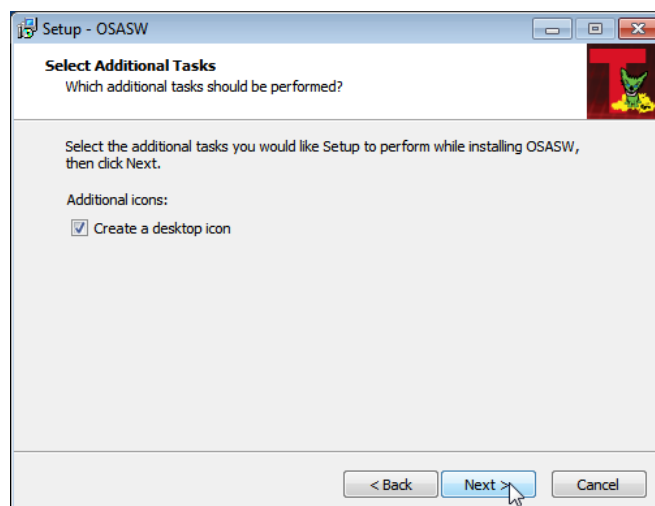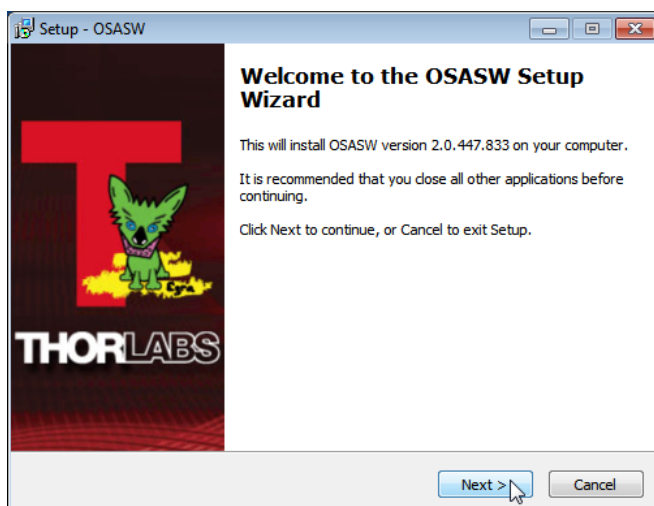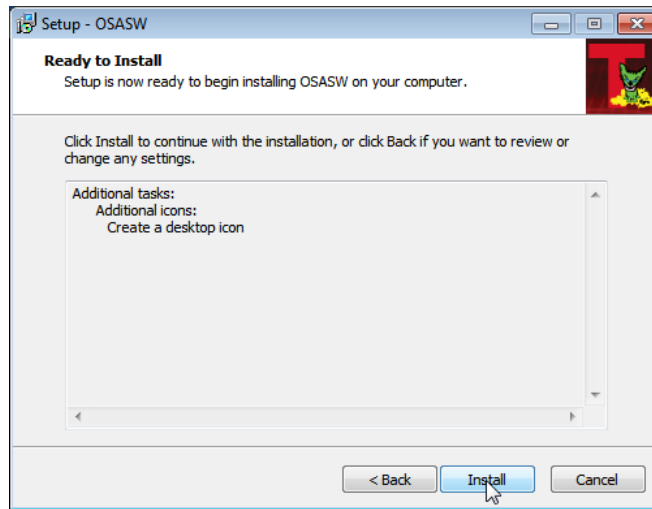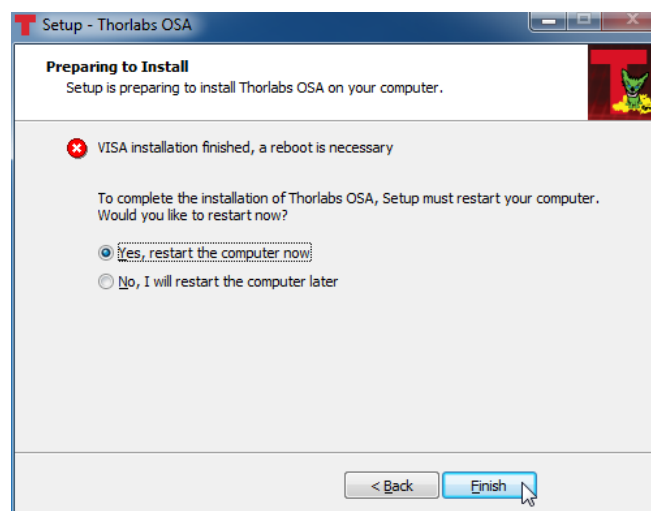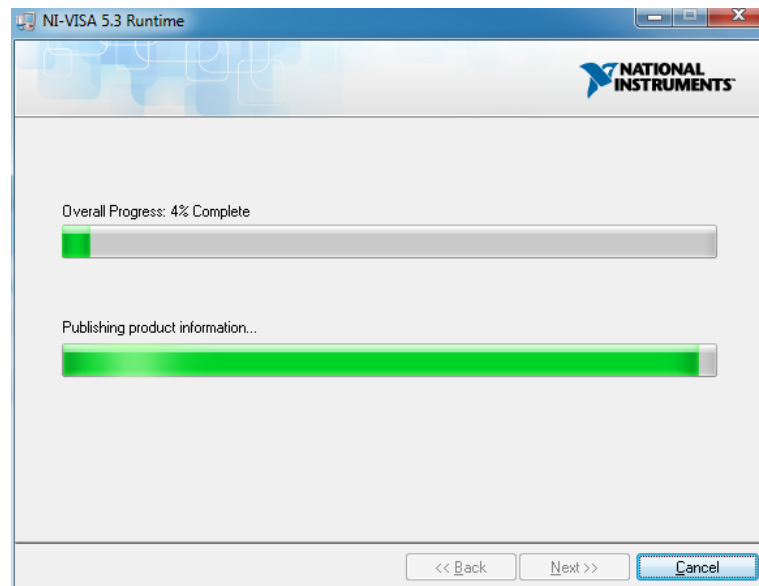
Click "Install" to continue. The necessary software components are being installed, followed by installation of device driver software. The installation of all components is described below.
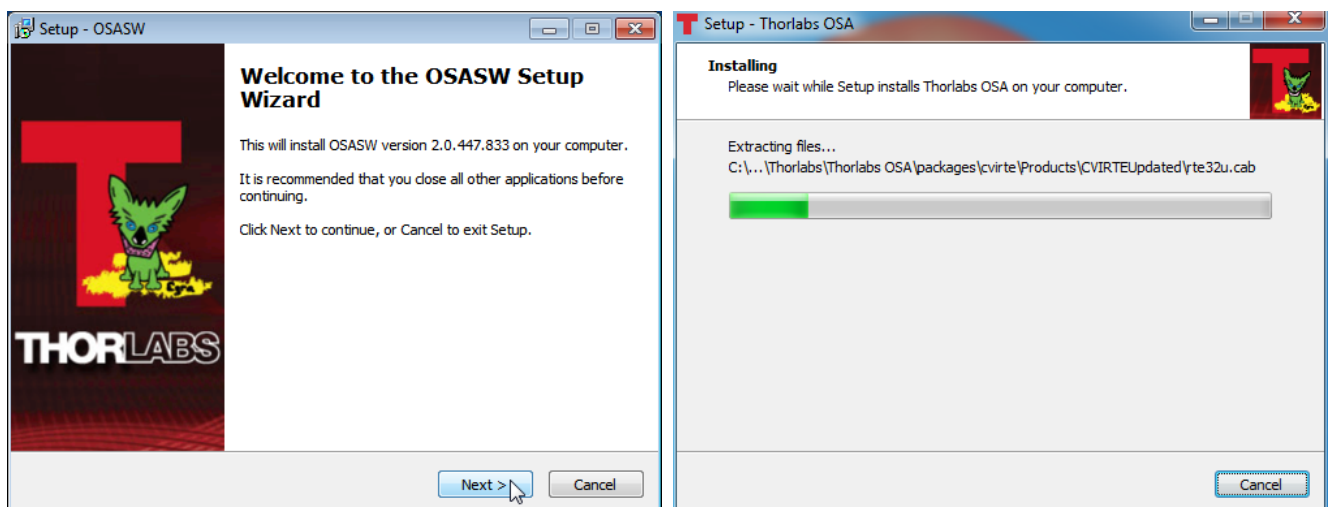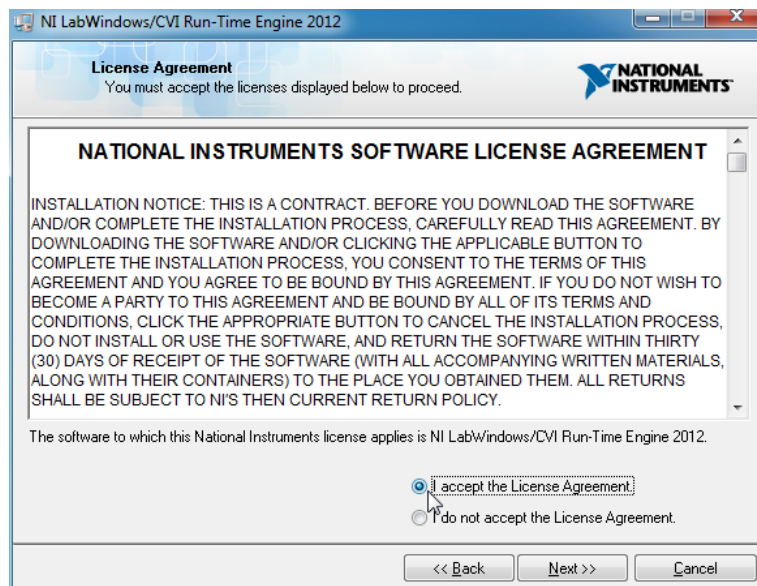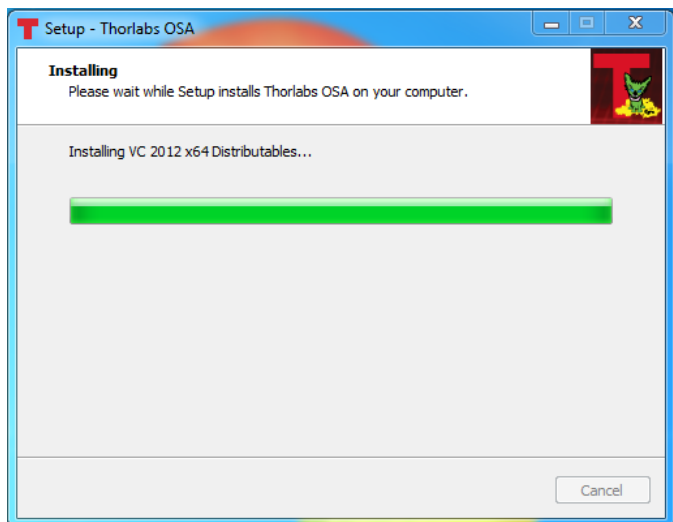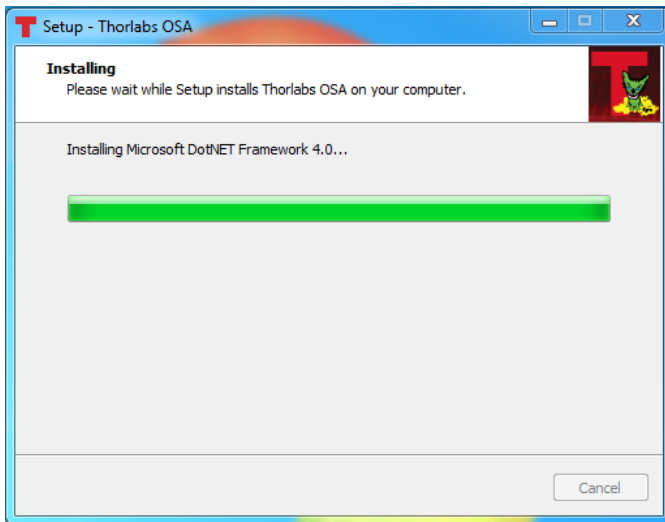
NI VISA installation
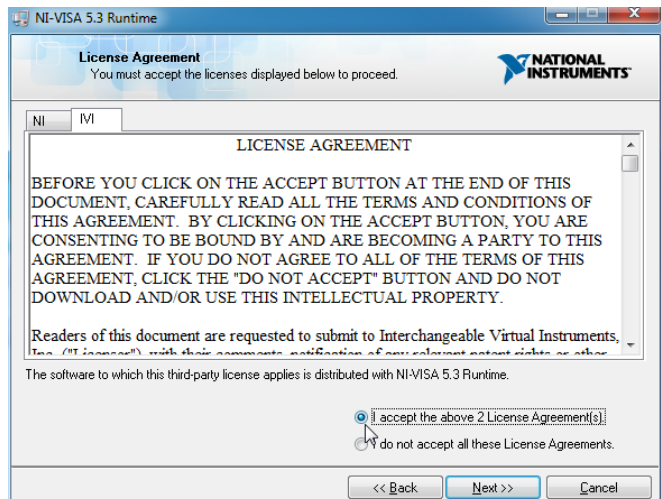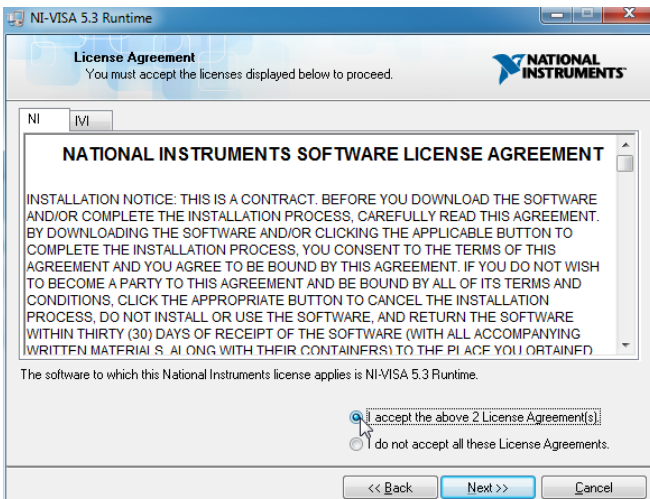
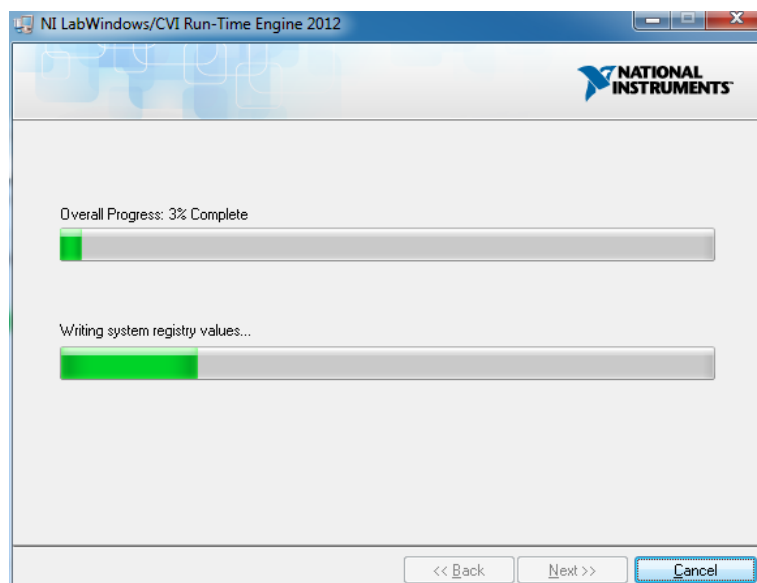Click "I accept...", then "Next>>" to continue:

After NI-VISA Installation, the computer must be restarted. After reboot, the setup wizard restarts automatically and continues to install further software components:
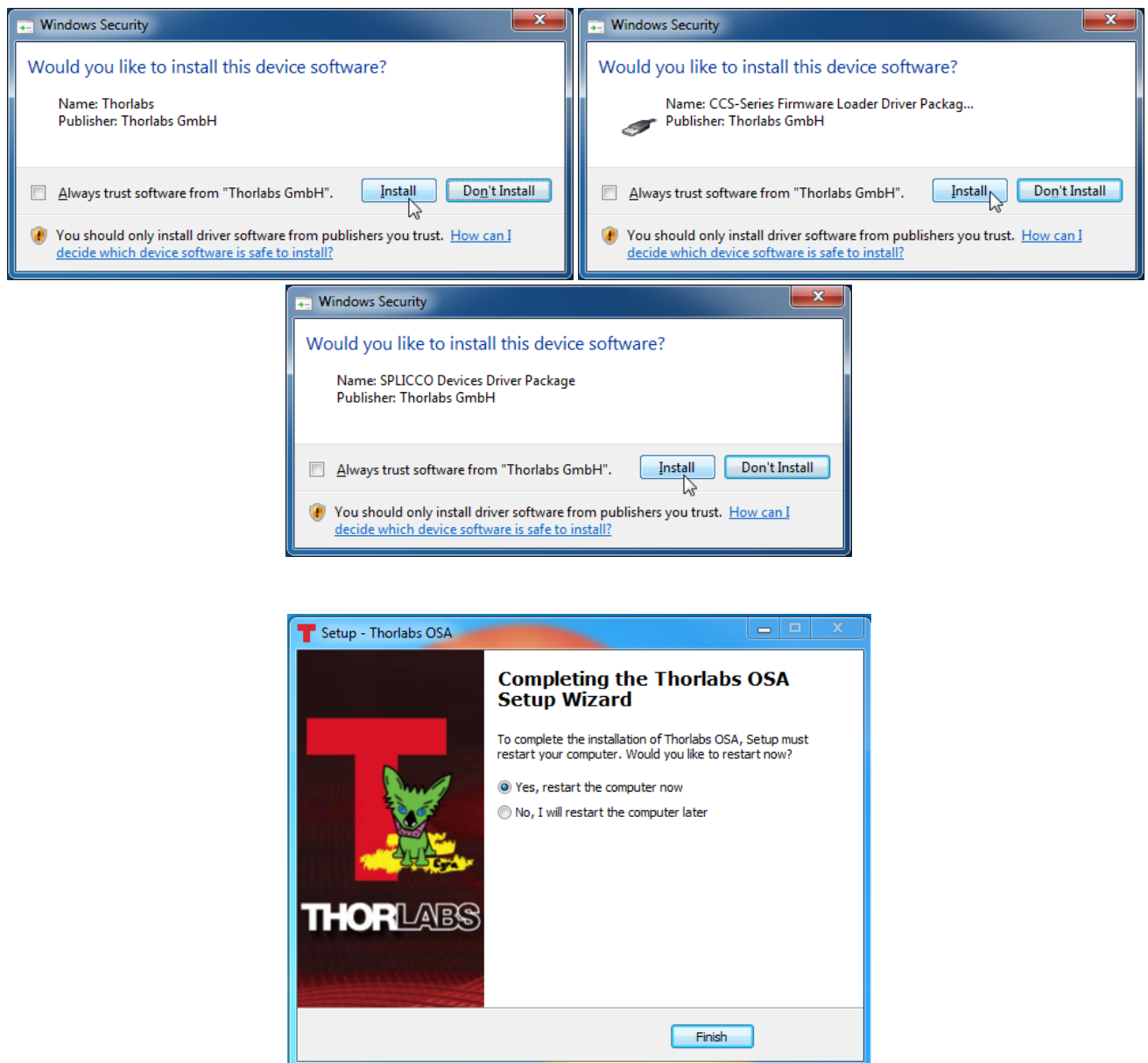
Click "I accept...", then "Next>>" to continue:

Depending on the set up security level, the Installation Wizard might ask to allow to install the driver software:


To finalize the OSA Software installation, the computer must be restarted. Click "Finish" to restart and complete installation.

3 Getting Started

Attention

Do not connect the CCS Series Spectrometer to a PC prior to installing the OSA-SW Application! The installation package includes CCS Series Spectrometer specific drivers and software that must be installed before the CCS Series Spectrometer is connected the first time to the PC.

The initial setup is simple to complete. Following installation of the software, connect the CCS Series Spectrometer to a USB 2.0 port. The operating system recognizes the new hardware and installs the firmware loader and the driver:
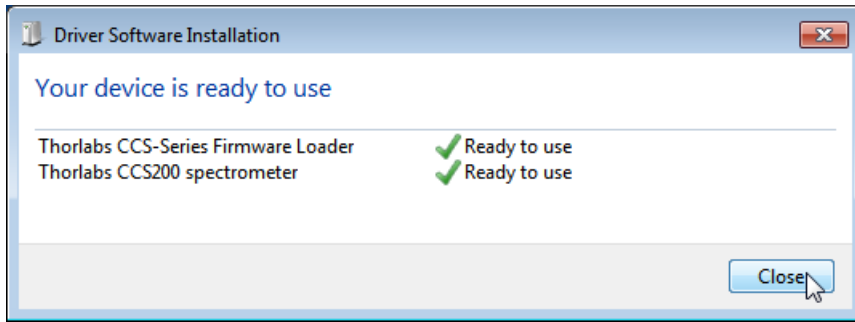
Then run the application software OSA-SW either from the desktop icon
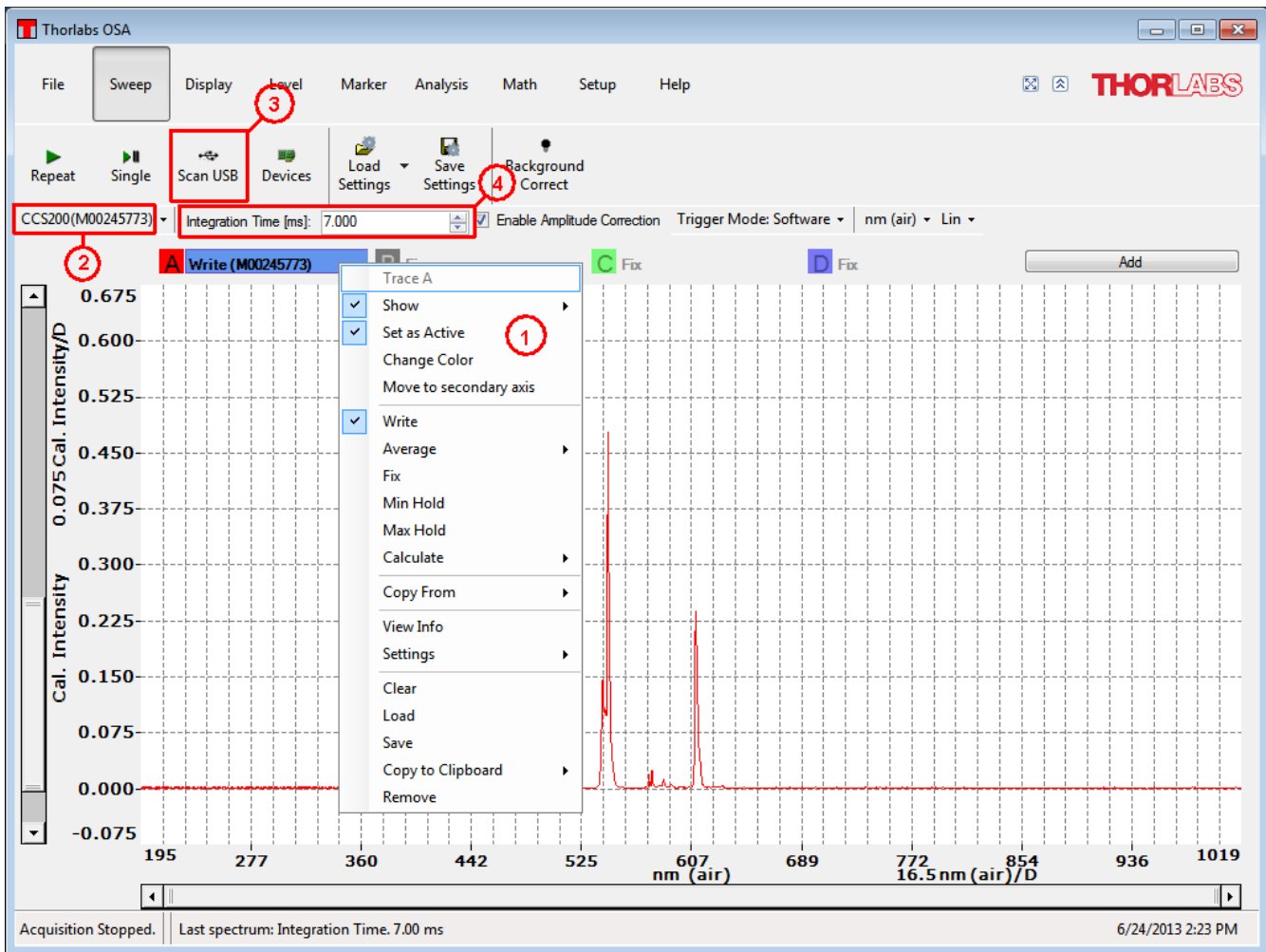
1. Click to trace A and make sure that the topics below are checked.
   - Show

- Set as Active
- Write

2. Check that the connected spectrometer is recognized. If not, click to
   "Scan USB"

3. Apply an optical input signal to the fiber input. Increase the integration time until the spectrum is displayed. A right click into the data display area zooms in the intensity axis to it's best fit to the spectrum.

Note

If you are using a CCS200 broadband spectrometer and a continuous spectrum (e.g. of a white light lamp) shall be measured, please note the following recommendation:
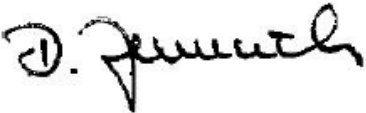
Due to the eccentricity between the fiber core and the ferrule of the delivered FG200UCC MMF and the geometry of the input slit of the spectrometer, the displayed spectral intensity may vary when the SMA connector of the fiber is rotated within the input receptacle of the CCS200. Please find the maximum intensity by rotation and then fix the fiber connector with the lock bush. This ensures best measurement results.

Please see details about the OSA software features, handling and CCS Series Spectrometer settings in the advanced user manual, provided with the data carrier. After the software has been installed, it can be found as well in the folder

"All Programs - Thorlabs - Thorlabs OSA - CCS".

4 Appendix

4.1 Certifications and Compliances

EU Declaration of Conformity

in accordance with EN ISO 17050-1:2010

We: Thorlabs GmbH

Of: Hans-Boeckler-Str. 6, 85221 Dachau/München, Deutschland

in accordance with the following Directive(s):

2014/30/EU	Electromagnetic Compatibility (EMC) Directive
2011/65/EU	Restriction of Use of Certain Hazardous Substances (RoHS)

hereby declare that:

Model: **CCSxxx(/M)**

Equipment: **CCS Spectrometer Series**

is in conformity with the applicable requirements of the following documents:

EN 61326-1	Electrical Equipment for Measurement, Control and Laboratory Use - EMC Requirements	2013
EN 61010	Safety requirements for electrical equipment for measurement, control and laboratory use	2010

and which, issued under the sole responsibility of Thorlabs, is in conformity with Directive 2011/65/EU of the European Parliament and of the Council of 8th June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, for the reason stated below:

does not contain substances in excess of the maximum concentration values tolerated by weight in homogenous materials as listed in Annex II of the Directive

I hereby declare that the equipment named has been designed to comply with the relevant sections of the above referenced specifications, and complies with all applicable Essential Requirements of the Directives.

Signed:

On: 20 March 2017

Name: Dorothee Jennrich

Position: General Manager

EDC - CCSxxx(/M) -2017-03-20

CE

4.2 Warranty

Thorlabs warrants material and production of the CCS Series Spectrometer for a period of 24 months starting with the date of shipment. During this warranty period Thorlabs will see to defaults by repair or by exchange if these are entitled to warranty.

For warranty repairs or service the unit must be sent back to Thorlabs. The customer will carry the shipping costs to Thorlabs, in case of warranty repairs Thorlabs will carry the shipping costs back to the customer.

If no warranty repair is applicable the customer also has to carry the costs for back shipment.

In case of shipment from outside EU duties, taxes etc. which should arise have to be carried by the customer.

Thorlabs warrants the hard- and/or software determined by Thorlabs for this unit to operate fault-free provided that they are handled according to our requirements. However, Thorlabs does not warrant a fault free and uninterrupted operation of the unit, of the software or firmware for special applications nor this instruction manual to be error free. Thorlabs is not liable for consequential damages.

Restriction of Warranty

The warranty mentioned before does not cover errors and defects being the result of improper treatment, software or interface not supplied by us, modification, misuse or operation outside the defined ambient stated by us or unauthorized maintenance.

Further claims will not be consented to and will not be acknowledged. Thorlabs does explicitly not warrant the usability or the economical use for certain cases of application.

Thorlabs reserves the right to change this instruction manual or the technical data of the described unit at any time.

4.3   Copyright and Exclusion of Reliability

Thorlabs has taken every possible care in preparing this document. We however assume no liability for the content, completeness or quality of the information contained therein. The content of this document is regularly updated and adapted to reflect the current status of the hardware and/or software. We furthermore do not guarantee that this product will function without errors, even if the stated specifications are adhered to.

Under no circumstances can we guarantee that a particular objective can be achieved with the purchase of this product.

Insofar as permitted under statutory regulations, we assume no liability for direct damage, indirect damage or damages suffered by third parties resulting from the purchase of this product. In no event shall any liability exceed the purchase price of the product.

Please note that the content of this document is neither part of any previous or existing agreement, promise, representation or legal relationship, nor an alteration or amendment thereof. All obligations of *Thorlabs* result from the respective contract of sale, which also includes the complete and exclusively applicable warranty regulations. These contractual warranty regulations are neither extended nor limited by the information contained in this document. Should you require further information on this product, or encounter specific problems that are not discussed in sufficient detail in the document, please contact your local *Thorlabs* dealer or system installer.

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4.4 Thorlabs 'End of Life' Policy (WEEE)

As required by the WEEE (Waste Electrical and Electronic Equipment Directive) of the European Community and the corresponding national laws, Thorlabs offers all end users in the EC the possibility to return "end of life" units without incurring disposal charges.

This offer is valid for Thorlabs electrical and electronic equipment

- sold after August 13th 2005
- marked correspondingly with the crossed out "wheelie bin" logo (see figure below)
- sold to a company or institute within the EC
- currently owned by a company or institute within the EC
- still complete, not disassembled and not contaminated

As the WEEE directive applies to self contained operational electrical and electronic products, this "end of life" take back service does not refer to other Thorlabs products, such as

- pure OEM products, that means assemblies to be built into a unit by the user (e. g. OEM laser driver cards)
- components
- mechanics and optics
- left over parts of units disassembled by the user (PCB's, housings etc.).

Waste treatment on your own responsibility

If you do not return an "end of life" unit to Thorlabs, you must hand it to a company specialized in waste recovery. Do not dispose of the unit in a litter bin or at a public waste disposal site.

WEEE Number (Germany) : DE97581288

Ecological background

It is well known that waste treatment pollutes the environment by releasing toxic products during decomposition. The aim of the European RoHS Directive is to reduce the content of toxic substances in electronic products in the future.

The intent of the WEEE Directive is to enforce the recycling of WEEE. A controlled recycling of end-of-life products will thereby avoid negative impacts on the environment.

Crossed out
"Wheelie Bin" symbol

4.5   Thorlabs Worldwide Contacts

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