DHR/AR Rheometers

Optics Plate Accessory

Getting Started Guide

Revision A Issued January 2014

Notice

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Introduction

Important: TA Instruments Manual Supplement

Please click the TA Manual Supplement link to access the following important information supplemental to this Getting Started Guide:

- TA Instruments Trademarks
- TA Instruments Patents
- Other Trademarks
- TA Instruments End-User License Agreement
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Notes, Cautions, and Warnings

This manual uses NOTES, CAUTIONS, and WARNINGS to emphasize important and critical instructions. In the body of the manual these may be found in the shaded box on the outside of the page.

NOTE: A NOTE highlights important information about equipment or procedures.

CAUTION: A CAUTION emphasizes a procedure that may damage equipment or cause loss of data if not followed correctly.

A WARNING indicates a procedure that may be hazardous to the operator or to the environment if not followed correctly.

Regulatory Compliance

Safety Standards

For Canada

CAN/CSA-C22.2 No. 61010-1 Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1: General Requirements.

CAN/CSA-C22.2 No. 61010-2-010 Particular requirements for laboratory equipment for the heating of materials.

For European Economic Area

(In accordance with Council Directive 2006/95/EC of 12 December 2006 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.)

EN 61010-1:2001 Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1: General Requirements + Amendments.

EN 61010-2-010:2003 Particular requirements for laboratory equipment for the heating of materials + Amendments.

For United States

UL61010-1:2004 Electrical Equipment for Laboratory Use; Part 1: General Requirements.

Electromagnetic Compatibility Standards

For Australia and New Zealand

AS/NZS CISPR11:2004 Limits and methods of measurement of electronic disturbance characteristics of industrial, scientific and medical (ISM) radio frequency equipment.

For Canada

ICES-001 Issue 4 June 2006 Interference-Causing Equipment Standard: Industrial, Scientific, and Medical Radio Frequency Generators.

For the European Economic Area

(In accordance with Council Directive 2004/108/EC of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility.)

EN61326-1:2006 Electrical equipment for measurement, control, and laboratory use-EMC requirements-Part 1: General Requirements. Emissions: Meets Class A requirements per CISPR 11. Immunity: Per Table 1 - Basic immunity test requirements.

For the United States

CFR Title 47 Telecommunication Chapter I Federal Communications Commission, Part 15 Radio frequency devices (FCC regulation pertaining to radio frequency emissions).

Safety

WARNING: If this accessory is used in a manner not intended or specified in this manual, the protection provided by the instrument may be impaired.

For all detailed information regarding safety, please read this manual in its entirety.

Required Equipment

While operating this accessory, you must wear eye protection that either meets or exceeds ANSI Z87.1 standards. Additionally, wear protective clothing that has been approved for protection against the materials under test and the test temperatures.

Instrument Symbols

The following labels are displayed on the Optics Plate Accessory for your protection:

Symbol	Explanation
	This symbol indicates that you should read this Getting Started Guide for important safety information. This guide contains important warnings and cautions related to the installation, operation, and safety of the Optics Plate Accessory.

Please heed the warning labels and take the necessary precautions when dealing with these areas. The *Optics Plate Accessory Getting Started Guide* contains cautions and warnings that must be followed for your own safety.

Table of Contents

Chapter 1:

Introducing the Optics Plate Accessory

Overview

The Optics Plate Accessory (OPA) is available in two Smart Swap configurations: with and without microscope. The image below shows the OPA without microscope. This consists of a 1.1 mm thick borosilicate glass plate, which can accommodate up to a 60 mm upper plate, clamped in place with a nitrile 'O'-ring. This is supported on three legs from the base plate. The base plate has 8 M2 tapped holes in a 2x4 grid (20 mm spacing) that can be used to mount custom optics.

Figure 1 OPA without microscope.

The image below shows the OPA fitted with a microscope. In this configuration, x/z linear stages mounted to the base plate hold a microscope vertically beneath the top plate so that the sample can be viewed in situ during measurement. Video can be captured using the software supplied with the microscope, and images can be captured simultaneously with data points in TRIOS.

NOTE: The lighting is operated using the microscope software. This has to be started after the image view in TRIOS.

The microscope has a magnification range from 10 to 240x. However, within the limitations of the OPA dimensions and the Working Distance of the microscope there are effectively two optimum focal points at ~50x and ~240x.

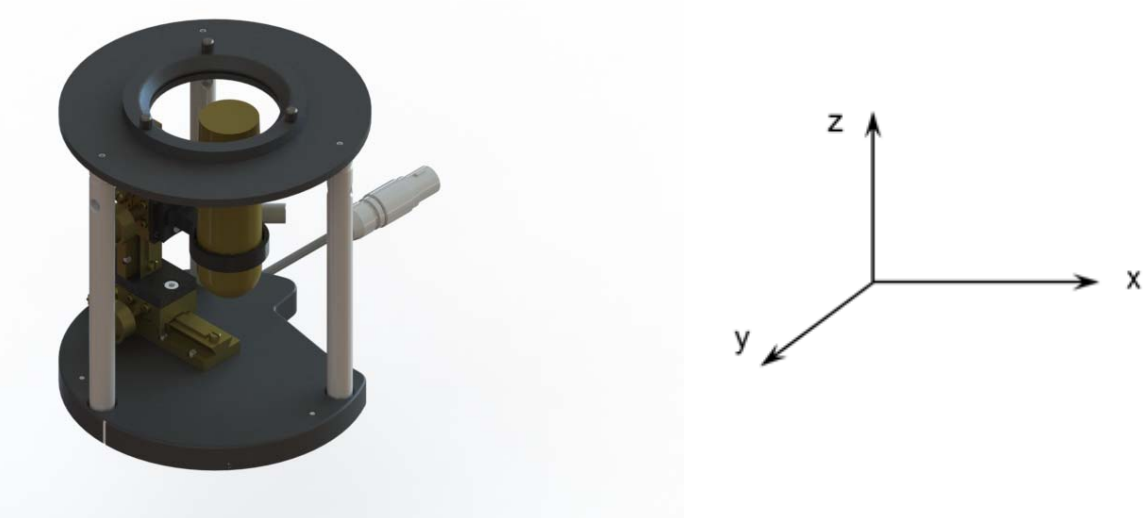

Figure 2 OPA with microscope.

If temperature control is required for either of the configurations, an Upper Heated Plate (UHP) accessory can be used up to a maximum of 100°C.

NOTE: Height constraints require the upper UHP geometry to be attached to the instrument prior to the OPA.

Getting the best image contrast is very sample-dependent and a range of upper plates are available for image optimization. For example: standard, roughened and mirror finish stainless steel, black anodised Aluminium, and transparent glass.

Chapter 2:

Installing the Optics Plate Accessory

OPA with Microscope

Fit the microscope to the bracket on the OPA and follow the manufacturer's installation instructions to load the software prior to plugging in the USB cable.

Installing the OPA using Smart Swap™

The following sections explain how to attach/detach the Optics Plate Accessory using Smart Swap™. Note that the installation and removal procedures are essentially the same for all modules.

Installing the Optics Plate Accessory

1 Press the **Release** button on the control panel, as seen in the figure below. A continuous green light indicates that the attachment can be fitted.

NOTE: The release state will only stay active for 10 seconds.

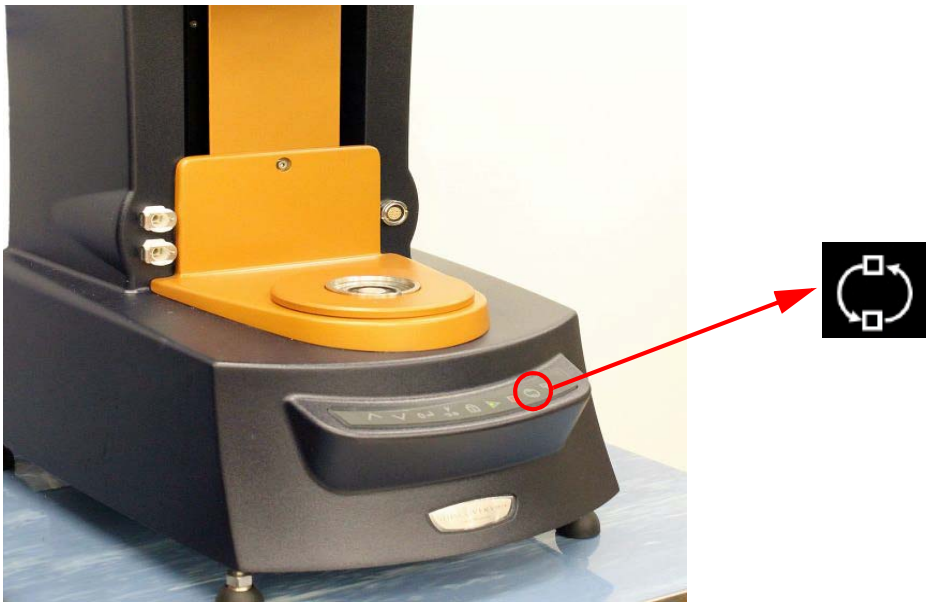

Figure 3 Release button (DHR Series shown).

2 Fit the OPA attachment, ensuring it is aligned correctly. The alignment lug on the bottom of the OPA should fit into the slot on the Smart Swap base.

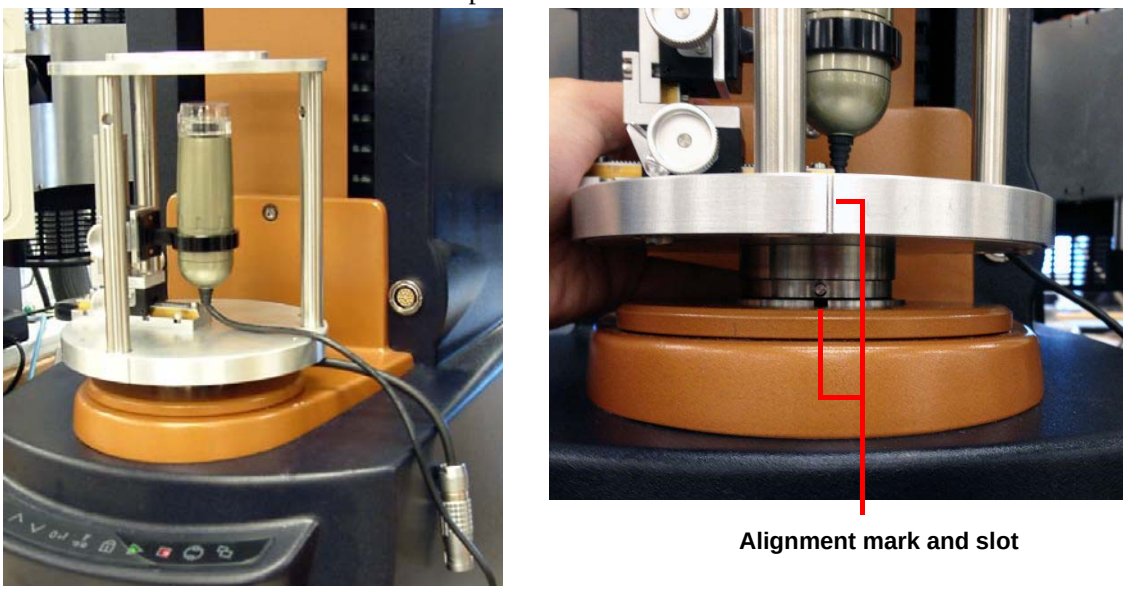

Figure 4 Fitting the attachment (DHR Series shown).

3 Connect the Smart Swap plug to the instrument and connect the USB cable into the PC.

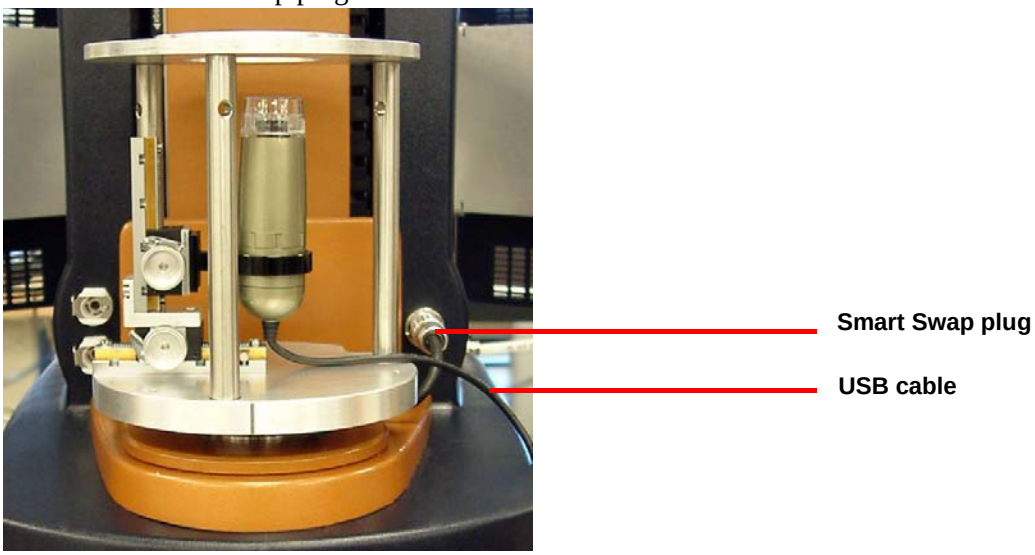

Figure 5 Connecting the Smart Swap plug and USB cable (DHR Series shown).

4 When the green status light turns off, the rheometer is ready for use.

Removing the Optics Plate Accessory

1 Press the **Release** button on the control panel. A flashing green light indicates that the attachment can be unplugged. Refer to step 1 in the previous section for **Release** button location.

2 Disconnect the USB cable from the PC, and the Smart Swap plug from the rheometer.

3 Press the **Release** button again. A continuous green light indicates that you can remove the attachment.

4 Remove the attachment from the rheometer.

NOTE: The release state will stay active for 10 seconds and then revert to locked.