# SAS® Drug Development

## SAS Macro API 1.4
## User's Guide

**SAS® Drug Development API release 1.7.1: SAS® Macro API 1.4 User's Guide**

Copyright © 2014, SAS Institute Inc., Cary, NC, USA

All rights reserved. Produced in the United States of America.

**For a hard-copy book**: No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior written permission of the publisher, SAS Institute Inc.

**For a Web download or e-book:** Your use of this publication shall be governed by the terms established by the vendor at the time you acquire this publication.

**U.S. Government Restricted Rights** Notice: Use, duplication, or disclosure of this software and related documentation by the U.S. government is subject to the Agreement with SAS Institute and the restrictions set forth in FAR 52.227-19, Commercial Computer Software-Restricted Rights (June 1987).

SAS Institute Inc., SAS Campus Drive, Cary, North Carolina 27513.

SAS® Publishing provides a complete selection of books and electronic products to help customers use SAS software to its fullest potential. For more information about our e-books, e-learning products, CDs, and hard-copy books, visit the SAS Publishing Web site at support.sas.com/publishing or call 1-800-727-3228.

SAS® and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries. ® indicates USA registration.

Other brand and product names are registered trademarks or trademarks of their respective companies.

# Contents

**Chapter 1 Introduction ..... 1**

Audience ..... 1

Typographic and Syntax Conventions Used in This Guide ..... 1

**Chapter 2 Installing the Macros ..... 3**

Overview ..... 3

Requirements ..... 3

Installation Instructions for Microsoft Windows ..... 3

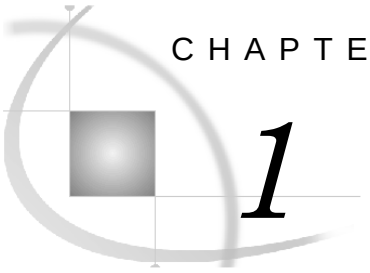
Verifying the Installation ..... 5

**Chapter 3 SAS® Drug Development Macros ..... 7**

Introduction ..... 7

Macro Return Codes ..... 7

Using the Macros ..... 8



CHAPTER

# 1 Introduction

*Audience* ..... *1*
*Typographic Conventions Used In This Guide* ..... *1*

## Audience

This guide is intended for users who want to develop applications with the SAS Drug Development macros.

You must be familiar with SAS Drug Development functionality, such as type definitions, containers, files and access permissions. For reference information on SAS Drug Development functionality, see the SAS Drug Development online help and User's Guide.

## Typographic Conventions Used In This Guide

Throughout this document you'll see the following typographic conventions:

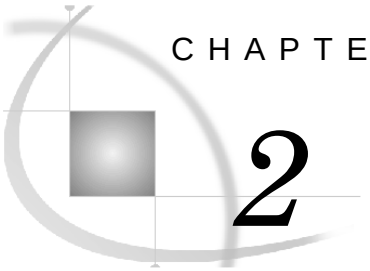
| Convention | Description |
|---|---|
| `monospace` font | denotes code, such as a code example |
| **`monospace bold`** font | denotes text that you type, such as an object name |
| ***`monospace bold italics`*** font | denotes a value that you specify, such as your name |

The following graphic explains the syntax for SAS code used in this document:

## Syntax Conventions

**PROC DATASETS** <LIBRARY=*libref*> <MEMTYPE=(*mtype-list*)>
<DETAILS | NODETAILS> <*other-options*>;
**RENAME** *variable-1*=*new-name-1* <. . . *variable-n*=*new-name-n*>;

1. SAS keywords, such as statement or procedure names, appear in bold type.
2. Values that you must spell as they are given in the syntax appear in uppercase type.
3. Optional arguments appear inside angle brackets(<>).
4. Mutually exclusive choices are joined with a vertical bar(|).
5. Values that you must supply appear in italic type.
6. Argument groups that you can repeat are indicated by an ellipsis (. . .).



CHAPTER 2

# Installing the Macros

*Overview* ..... 3
*Requirements* ..... 3
*Installation Instructions for Microsoft Windows* ..... 3
*Verifying the Installation* ..... 5

## Overview

This document describes how to install the SAS Drug Development Macro API, which are distributed in the sdd-sas-macro-1.4.zip.

## Requirements

The following software is required by the SAS Drug Development Macros:

- SAS 9.4 M1
- Java Runtime Environment Version 1.6
- SAS Drug Development Java API client version 1.7.1

## Installation Instructions for Microsoft Windows

1. Follow the instructions in the *Getting Started with the SAS Drug Development Java API* document to install the Java API client. Be sure to note the location of the lib directory. Typically this would be:

   ```
   C:\sdd-java-api-client-1.7.1\lib
   ```

2. Unzip the contents of sdd-sas-macro-1.4.zip to C:\.

   This creates the following files and folders in C:\:

   - sdd-sas-macro-1.4\conf

     This folder contains example configuration files.
   - sdd-sas-macro-1.4\docs

     This folder contains the documentation for the SAS Drug Development Macro API including the detailed documentation describing all of the macros delivered with this distribution.

- sdd-sas-macro-1.4\lib

  This folder contains the sas.hls.drug.api.macro.jar.
- sdd-sas-macro-1.4\sasmacros

  This folder contains the SAS Drug Development macros as .sas files.

3 Determine where you have SAS installed and where the config file is. In a typical Windows Unicode Support installation, **!sasroot** would point to:

```
C:\Program Files\SASHome\SASFoundation\9.4\nls\u8
```

You need to edit the file **!sasroot\sasv9.cfg** and add the following lines near the top, right before the comment box with the "WARNING:" label in it:

```
/* define the location of the SAS Drug Development Macro API */
-insert sasautos "C:\sdd-sas-macro-1.4\sasmacros"

/* put both the macro and java api client jars on the classpath */
-JREOPTIONS (-Dsas.app.class.dirs=C:\sdd-sas-macro-1.4\lib;C:\sdd-java-api-
client-1.7.1\lib)
```

***Caution:*** Back up this file before you edit it. Use extreme care when editing this file and modify only these options. Ensure that you do not insert any carriage returns in the **sas.app.class.dirs** option. If you have any questions, concerns, or problems, please contact SAS Technical Support.

4 Once you have made these changes to the sasv9.cfg file, save the file and start a new SAS session.

# Verifying the Installation

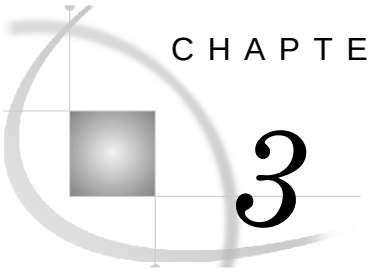
The following SAS code displays the settings for the JREOPTIONS and verifies that the JRE is configured properly. It also verifies that the SAS Drug Development macros are installed and functioning as expected. Replace ***sdd-instance***, ***sdd-user-ID***, and ***sdd-password*** with values that reflect your instance of SAS Drug Development.

```
/* verify the JRE settings */
options mprint;
proc javainfo;
run;

/* initiate a connection to SAS Drug Development */
%sasdrugdev_login(sdd_url=%str(https://sdd-instance), sdd_userid=%str(sdd-user-ID),
sdd_password=%str(sdd-password));

/* print configuration information including version information */
%sasdrugdev_getconfiguration();

/* List the contents of the root folder in the SAS Drug Development repository */
%sasdrugdev_getchildren(sdd_path=%str(/SAS/Files));
proc print;
  title "List of Objects in /SAS/Files";
run;

/* terminate the connection to SAS Drug Development */
%sasdrugdev_logout();
```

The code should generate a list of the contents of the root folder in the SAS Drug Development repository.

***Note:*** By default, the root folder in the SAS Drug Development repository is **/SAS**. If the root of your SAS Drug Development repository is different, change **/SAS** in the code above.

The SAS log will contain information that might be useful for debugging the installation of the SAS Drug Development macros.



CHAPTER

# 3 SAS® Drug Development Macros

*Introduction* ..... 7
*Macro Return Codes* ..... 7
*Using the Macros* ..... 8
*Using the Ampersand Character (&) in URLs* ..... 8
*The Proper Case for Parameter Values* ..... 8
*Quoting Parameter Values* ..... 8

## Introduction

The SAS Drug Development SAS Macro API enables you to use familiar SAS macro syntax to perform operations against SAS Drug Development.

## Macro Return Codes

After you execute a macro, the global macro variable _SDDRC_ will contain a return code reflecting the success or failure of the operation; the global macro variable _SDDMSG_ will contain text information regarding the success or the cause of the failure

Here are the specific values that can be returned by a macro:

| _SDDRC_ Value | Explanation |
|---|---|
| 0 | The macro executed without error. |
| -1 | The macro executed with error, see return message for details. |
| -100 | SAS Drug Development Java API did not initialize correctly. |
| -101 | SAS Drug Development server URL is malformed. |
| -102 | SAS Drug Development server returned an HTTP error code. |
| -103 | SAS Drug Development proxy server returned an error code. |
| -104 | SAS Drug Development proxy port specification caused an error. |
| -200 | The session does not exist. |
| -201 | The session already exists. |
| -202 | The session does not support the macro being executed.<br>Examples of this are running the login, logout, create file or download file macros during an active SAS Drug Development session. |
| -300 | The user account could not be authenticated. |
| -301 | The user account does not have appropriate authorization. |

| _SDDRC_ Value | Explanation |
|---|---|
| -400 | Macro parameter is required. |
| -401 | Macro parameter is invalid. |
| -500 | The object was not found. |
| -501 | The object already exists. |
| -502 | The object type is invalid for the operation. |
| -503 | The source path equals the target path. |
| -504 | The target path is within the source path. |
| -600 | Principal is not a member. |
| -601 | Role is not assigned at parent. |
| -602 | Roles defined at context cannot be unassigned. |
| -603 | SAS Drug Development repository item is closed and cannot be updated. This applicable only to projects and analyses. |
| -605 | The job parameter type provided for a job submission is invalid. |
| -606 | The value specified for a numeric object property is invalid. |
| -607 | The value specified for a boolean object property is invalid. |
| -900 | An unexpected error occurred. |
| -999 | There is no return code. |

***Note:*** A macro always returns a code, but any single macro will not return all of these codes.

# Using the Macros

## Using the Ampersand Character (&) in URLs

For a macro with a parameter that specifies a URL, such as a macro that sets properties, you cannot embed the ampersand character (&) in the URL. The ampersand character is a special character in SAS. If you embed an ampersand character, SAS will attempt to resolve the subsequent text as a macro variable.

## The Proper Case for Parameter Values

Although SAS is case insensitive, the parameter values passed to SAS Drug Development may be case sensitive.

## Quoting Parameter Values

In order to ensure consistent results, it is recommended that the parameters of type String be wrapped using one of the string functions, e.g. %str(), %nrbquote(). Using double quotes will result in a SAS system syntax error.