# Rewritable laser system SG
# SDK Interface Specification

# Version 1.2.10

Ricoh Co., Ltd.
IMS Business Group

# Important notes

1. The contents of this document are subject to change without notice in the future.

2. It is prohibited to copy, reproduce, modify, quote, reproduce, or distribute this document without permission.

3. Please note that we shall not be liable for any damages, lost profits, or claims by any third party arising out of the use of this document.

4. For trademarks
   A) Ethernet is a registered trademark of Fuji Xerox Co., Ltd.
   B) Windows is a registered trademark of Microsoft Corporation in the United States and other countries.
   C) Windows and Windows 10 are Microsoft products.
   D) Visual Studio 2015 and Visual Studio 2019 are Microsoft products.
   E) SDK stands for "Software Development Kit".
   F) Other product names and names are trademarks or registered trademarks of their respective companies.

## Change history

| Ver. | Date | Revised contents | In charge |
|---|---|---|---|
| 1.2.0 | 2020/11/26 | ・2.3.2 Only erase<br>　The flow diagram was modified.<br>　The wordings were corrected.<br><br>・2.3.3 Print only<br>　The flow diagram was modified.<br>　The wordings were corrected.<br><br>・2.3.4 Erase and print<br>　The flow diagram was modified.<br>　The wordings were corrected.<br>・4.2.3. ・4.2.3. API that controls the controller<br>　Added GetConfig<br>　SetConfig was added<br><br>・4.5.2 Error code list<br>　The following error codes were added.<br>　0x7120 specified key is invalid<br>　0x7121 The specified value is invalid.<br><br>・4.6. List of Acceptability of Acceptance for Controller Status of Each API<br>　SetConfig and GetConfig have been added | Nishiki-ori |
| 1.2.1 | 2020/12/11 | ・ History was corrected.<br><br>・2.3.2 Only erase<br>　The flow diagram was modified.<br><br>・2.3.3 Print only<br>　The flow diagram was modified.<br><br>・2.3.4 Erase and print<br>　The flow diagram was modified.<br><br>・4.2.3. ・4.2.3. API that controls the controller<br>　GetTemplate was added<br><br>・4.3.3. ・4.3.3. API that notifies the status of the media<br>Added TargetReadyXYZ<br><br>・4.5.2 Error code list<br>　The following error codes were added.<br>　0x7122 log file cannot be accessed<br>　0x7163 File compression failed<br>　Failed to decompress 0x7124 file<br><br>・4.6. List of Acceptability of Acceptance for Controller Status of Each API<br>　GetTemplate and TargetReady XYZ have been added | Nishiki-ori |
| 1.2.2 | 2020/12/24 | ・ 4.2.3.6 GetTemperature<br>The argument type was modified to SHORT* and the name of the argument was modified.<br><br>・ 4.2.3.8 SetConfig<br>　Ers_markSpeed_MediaType A-D was deleted<br>　Ers_markSpeed_CoffientA-C was added. | Nishiki-ori |

| 1.2.3 | 2020/01/14 | ・3.1.2. Controller state<br><br>  Addition of maintenance mode<br><br>・4.5.2 Error code list<br><br>  The following error codes were added.<br>0x7125  Version cannot be acquired.<br>0x7126  The update file cannot be opened.<br>0x7127  The configuration file cannot be updated.<br>0x7129  There is no executable file.<br>0x712A  Controller communication setting failed.<br>0x712B Since DHCP is used for the communication setting of the controller, no change was made.<br>0x712C No changes were made due to invalid communication settings.<br>0x71A8 Failed during software update.<br>0x8615  A function that cannot be executed during maintenance mode is called. | Nishiki-ori, Yoshikaw |
|---|---|---|---|
| 1.2.4 | 2021/01/28 | ・1.5. Component Overview<br><br>  The outline of the components was changed in accordance with the module separation response.<br><br>      ・ CoreSDK_w32.dll was added.<br>  Deleted description of unavailable modules<br>      ・ The description of LDTR_CMD_API_w32.dll was deleted.<br><br>・ 4.2.3.6 GetTemperature<br><br>  Corrected because the argument name was incorrect.<br><br>・4.3.3.1. ・4.3.3.1. TargetReadyXYZ<br><br>  Part of the argument type was modified to SHORT and the name of the argument was modified.<br><br>・4.2.3.4. ・4.2.3.4. ResetMaintenance Mode was added.<br><br>・4.5.1 Error Code Classification<br><br>  The flag for the classification of error codes was abolished, and the classification method was deleted.<br><br>・4.5.2 Error code list<br><br>  The following error codes were added.<br>0x712D The file to be restored is not found.<br>0x7644   Bitmap font file for drawing module cannot be found.<br><br>・4.6. List of Acceptability of Acceptance for Controller Status of Each API<br>  Maintenance mode was added.<br>  ResetMaintenance Mode was added. | Nishiki-ori, Suzuki, Tamura, Tezuka |
| 1.2.5 | 2021/02/09 | ・4.5.2 Error code list<br><br>  The following error codes are corrected for merging with other functions.<br>0x712D → 0x7134 The file to be restored is not found. | Suzuki |
| 1.2.6 | 2021/02/18 | ・4.3.2.1. ・4.3.2.1. IsMarkable<br><br>  Added the corresponding font.<br><br>・4.5.2 Error code list<br>  Change in SDK code value<br>0x7163 → 0x7123  File compression failed. | Tezuka, Suzuki |
| 1.2.7 | 2021/03/09 | ・4.2.2.2. ・4.2.2.2. ChangePassword<br><br>  Deleted the description that the initial password and the current password cannot be set as the password to be changed.<br><br>・5.1. ・5.1. SDK configuration file<br>  Addition of command timeout setting | Nishiki-ori, Tamura |

| | | | |
|---|---|---|---|
| | | ・4.5.2 Error code list<br>Full repair by reviewing errors | |
| 1.2.8 | 2021/03/16 | ・4.3.2. API specifying the print data in the job<br><br>・4.3.3. ・4.3.3. API that notifies the status of the media<br>The fact that "the Job is deleted and the device status becomes an error" was added depending on the status of the job specified by the argument at the time of execution of the API. | Tamura |
| 1.2.9 | 2021/04/05 | ・4.2.3.7. ・4.2.3.7. GetTemperature<br>The argument type for the Java interface and short[] were changed from int[]. Accordingly, the argument description was modified.<br>・4.2.3.8. ・4.2.3.8. GetConfig<br>The argument type for the Java interface was changed from WString[] to char[]. Accordingly, the argument description was modified.<br>Describe the approximate value to be specified in dwValueSize.<br>・4.2.3.9. ・4.2.3.9. SetConfig<br>"RequestEjectInError" was deleted from the keys that can be set.<br>・4.3.3.1. ・4.3.3.1. TargetReadyXYZ<br>Modified from the argument type for Java interface and int to short. | Sugita |
| 1.2.10 | 2021/04/23 | 4.5.1. 4.5.1. Error Code Classification<br>Classification of service call error and user response error was changed to control system and communication system. | Sugita |

# Table of contents

# 1. Introduction

## 1.1. Purpose

This interface specification describes the interface (hereinafter simply referred to as "SDK") of SDK (LDMarker Controller.dll and Java API) that implements the control functions of the rewritable laser system SG (hereinafter referred to as "SG").

## 1.2. Description of terms

The definitions of terms used in this document are as follows.

| Term | Meaning |
|---|---|
| SG | This section describes the laser marker equipment in the RICOH product "Reliable Laser System." |
| SDK | Indicate the SDK (LDMarker Controller.dll) that defines the specification in this document. |
| Log file | A file that records the execution result of the API function when SDK is executed. |
| Configuration file | A file that defines the control conditions and communication conditions to be controlled when using SDK to control SG. |
| I/F | Interface abbreviation |
| Controller | A unit that controls SG. This SDK gives control instructions to the SG controller in communication. |
| Memory handle | Start address of allocated memory It is used only in a C language environment and is synonymous with the void type pointer. |
| HostPC | A PC that runs an application that controls an SG using this SDK. |
| Java API | Indicate SDK for Java language that defines specification in this document. |

## 1.3. Development environment

The development environment or platform supported by SDK is as follows. Operation is not guaranteed if the device is used in any environment other than the following. The operation of the Java API has been confirmed only in the following environments.

| Programming language | Development platform | Remarks |
|---|---|---|
| C/C++ | Microsoft Visual Studio 2019 | |
| Java Standard Edition 8 (Java SE8) 32bit | Pleiades All in One Eclipse 2018-09 Windows 32bit full Edition Ultimate | Java SE8 and Eclipse must be Windows 32 bit versions. |

## 1.4. Operating Environment

The SDK supports operation in the following environments. The operation of the Java API has been confirmed only in the following environments.

| | OS | CPU | Memory (RAM) | HDD | Other conditions |
|---|---|---|---|---|---|
| Windows | Windows 10 (32bit/64bit) | 1.6GHz And above | 1.5GB And above | 10GB And above | |
| Other | ・ VisualC++2015-2019 Redistributable Package (Microsoft Visual C++ 2015-2019 Redistributable) must have been installed ・ (Only when using the Java API) Java SE Runtime Environment 8 must have been installed | | | | |

## 1.5. Component Overview

SDK provides programming language interface for each application. The application uses the SDK with an explicit link. Each library passes through an internal library configured as an SDK and controls the controller by a specified communication means. The library inside the SDK is changed to be used in the 32-bit or 64-bit platform.
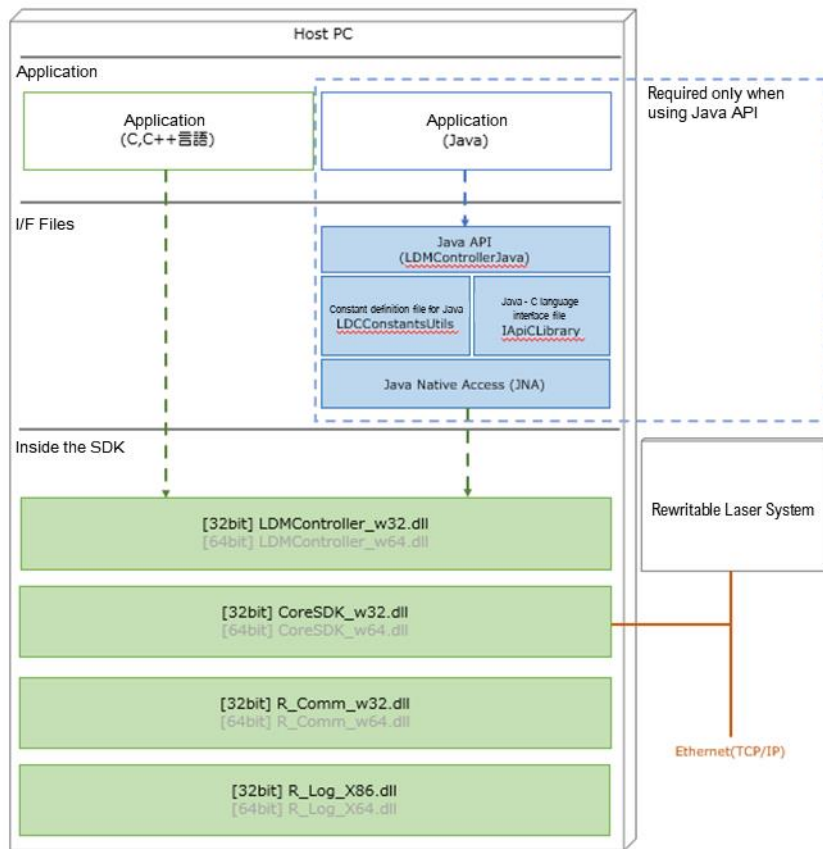


| No. | Module name | Description |
|---|---|---|
| 1 | LDMController_w32.dll | SDK Library (32-bit environment version). |
| 2 | CoreSDK_w32.dll | If LDMController_w32.dll is used, only a 32-bit version of all lower |
| 3 | R_Comm_w32.dll | libraries is available. |
| 4 | R_Log_X86.dll | The API disclosed by "LDMController_w32.dll" is used by the application using an explicit link. |
| 5 | LDMController_w64.dll | Not planned |
| 6 | CoreSDK_w64.dll | SDK Library (64-bit environment version). |
| 7 | R_Comm_w64.dll | If LDMController_w64.dll is used, all lower libraries can be used |
| 8 | R_Log_X64.dll | only for 64-bit versions. |
| 9 | Java API (LDMControllerJava) | Java API projects and sources (32-bit environmental version). |
| 10 | LDCConstantsUtils | A definition file (32-bit environment version) that includes Java API arguments and return values. |
| 11 | IApiCLibrary | The interface between Java API and SDK (C,C++) (32bit environment version). |
| 12 | Java Native Access (JNA) | Library (32-bit environment version) for accessing SDK (C, C++) from the Java program.<br><br>This package contains jna-4.5.0.jar and jna-platform-4.5.0.jar and is distributed in Apache License 2.0.<br>Apache 2.0 license : http://www.apache.org/licenses/LICENSE-2.0 |

# 2. Processing flow

## 2.1. Process overview

The SDK is divided into three blocks: Preparation Process, Irradiation Process, and End Process. The outline of each process is as follows.

1. Preparation processing.  Prepare for starting irradiation operation such as selection of SG, power control, and transition of controller state.
2. Radiation treatment.     Set the print data for the media and send a arrival notification to the specified position of the media to irradiate the laser.
3. Exit processing.    Processing at the end of SDK use, such as opening of internal memory

## 2.2. Preparation process

The following work is required as a preparation process.

1.    Select the controller
2.    Turn on the controller
3.    Connect to the controller
4.    Change the controller state

SDK is selected by specifying the ID corresponding to the controller to be used. After selection, when the controller is not powered on and the "Standby" state (the main power is turned on by the key switch only), the controller is switched on to the "Standby" state.

Turn on the power of the controller and connect to the controller that is in standby mode. When connecting the controller with the initial password, connection processing must be performed twice. This is because authentication/connection with the initial password responds to an error to prompt a password change when the first connection is made. When connecting for the second time, the authentication/connection processing is normal.

The password can be changed if it is connected. Changes from the initial password are recommended. If it is not the initial password, the error response does not return even in the first authentication/connection process.

In order to execute deletion and printing, it is necessary to change to the "irradiable" state.

For detailed specifications, see 4.2. See Preparation Process.4.2Preparation process
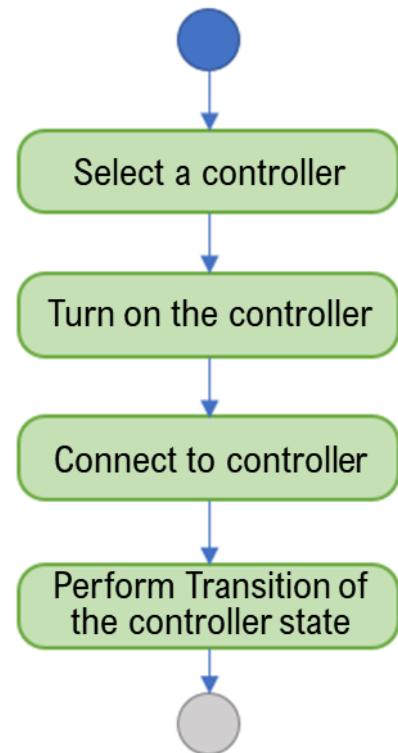
## 2.3. Irradiation treatment

Depending on the operation mode specified in the creation of the irradiation processing job, there are three cases of laser irradiation on the label: when only erasing is performed, when only printing is performed, and when erasing is performed and then printing is performed.

In addition, the layout to be used for laser irradiation shall be specified in the same manner when a job for irradiation processing is generated.

### 2.3.1. Basic flow

Delete/print to the media is performed by creating the job, setting the print data corresponding to the created job (printing only), and notifying that the corresponding media arrives at the specified position and can be irradiated.

The job can be generated in an irradiable or irradiated state or in a guide mode state.

One job is assigned for deletion and printing to one media. Jobs can be created simultaneously for up to two jobs. Accordingly, even when one job is executing deletion or printing, print data can be set for the other job.

Jobs are removed by deletion and printing completion, job deletion, and a transition to a state other than the irradiatable state of the controller, including errors. Once a job is removed, a new job can be created within the maximum number of jobs.

The job status including deletion and confirmation of completion of printing can be performed by a function that gets the job status. In each state, it can be acquired as the value defined by LDC_JOBSTAT_XXXX, which is written in blue in the flow diagram below. In addition, the currently created job can be checked by a function that gets the current job ID.

## 2.3.2. Erase only

Setting the print data in the basic flow is not necessary when only deletion is performed.

First, a job is created by specifying the following operation mode layout number, and the job ID is acquired.
・ Operation mode: Erase only
・ Layout number: Layout file number to be used for deletion

When the media arrives at the specified position and laser irradiation becomes possible, the "Media Ready" is notified. The controller starts the erase operation when the "Media ready completed" notification is received.

・ When media temperature notification is required

In parallel with the "Media ready completed" notification, the media temperature is notified.
The controller starts erasing when the "Media Temperature Notification Completed" and "Media Ready Completed" notices are received.

・ When using the terminal block, it is necessary to send a "Media Arrival Notice" from the PLC in parallel with the "Media Ready Completed" notification.
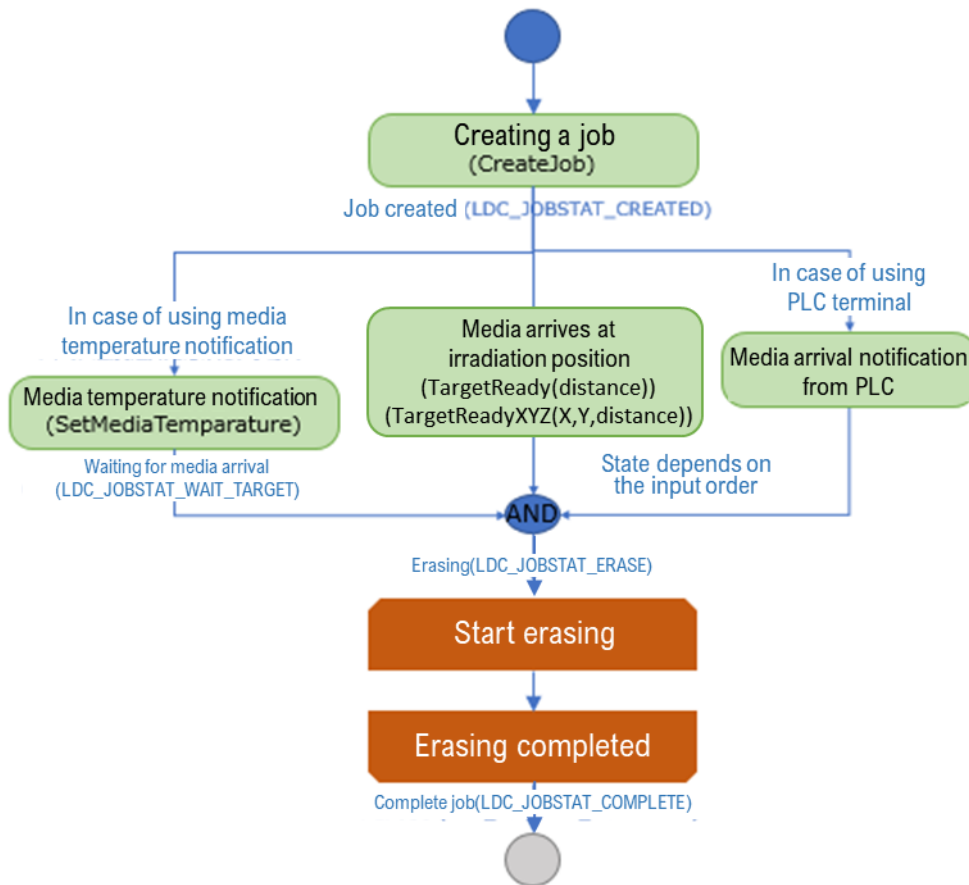
### 2.3.3. Print only

When only printing is performed, operation and notification are performed according to the basic flow.

First, a job is created by specifying the following operation mode layout number, and the job ID is acquired.

- ・ Operation mode: Print only

- ・ Layout number: Layout file number to be used for printing.

Then, according to the object number and specified position specified in the layout file, the data to be used for printing is specified in the job along with the object number. When the required print data designation is completed, "Data designation completion" is transmitted. When data is not specified for the object in the specified layout and "Data specification completed" is specified, the controller operates as "Printing as blank", i.e., the unspecified part is not printed.

When the media arrives at the specified position and laser irradiation becomes possible, the "Media Ready" is notified.
The controller starts printing when "Data specification completed" and "Media ready completed" are received.

・ Differences in the behavior when specifying the print data

When print data is specified in SetText, the specified print data is notified to the controller together with the "data designation completed" notification. Accordingly, an error occurs when the "Data designation completed" notification is sent to the following two points.

- ・ When the print data specification for a job that does not exist is a normal response

- ・ When printing data that cannot be specified for the object in the layout is specified

When print data is specified in SetBitmap, the controller is notified each time.

・ When media temperature notification is required

The media temperature is notified in parallel with the "Data designation completed" and "Media ready completed" notifications.
The controller starts the printing operation when the "Media Temperature Notification", "Data Selection Completed" and "Irradiatable" notices are received.

・ When using the terminal block, it is necessary to send a "Media Arrival Notice" from the PLC in parallel with the "Media Ready Completed" notification.
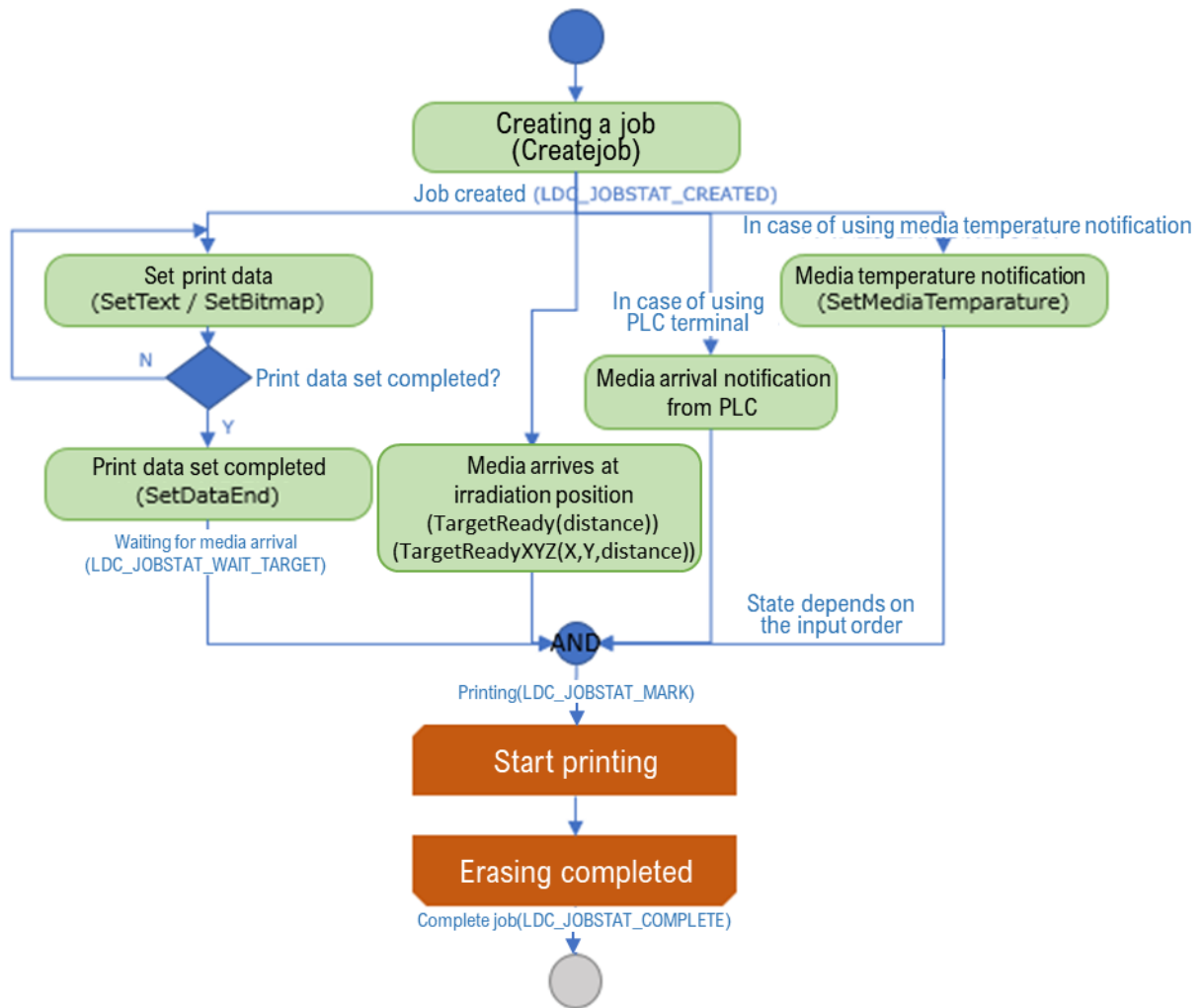
### 2.3.4. Erase and print

In the case of erase printing, operation and notification are performed according to the basic flow. However, when the controller accepts "Irradiatable", even if "Data designation completed" is not accepted, the deletion operation starts.

Thus, even during the erasing operation, it is possible to specify the print data.

First, a job is created by specifying the following operation mode layout, and the job ID is acquired.

- ・ Operation mode: Erase print

- ・ Layout number: Layout file number to be used for erase printing

Then, according to the object number and specified position specified in the layout file, the data to be used for printing is specified in the job along with the object number. When the required print data designation is completed, "Data designation completion" is transmitted. When data is not specified for the object in the specified layout and "Data specification completed" is specified, the controller operates as "Printing as blank", i.e., the unspecified part is not printed.

When the media arrives at the specified position and laser irradiation becomes possible, the "Media Ready" is notified. The controller starts printing when "Data specification completed" and "Media ready completed" are received.

・ Differences in the behavior when specifying the print data

When print data is specified in SetText, the specified print data is notified to the controller together with the "data designation completed" notification. Accordingly, an error occurs when the "Data designation completed" notification is sent to the following two points.

- ・ When the print data specification for a job that does not exist is a normal response

- ・ When printing data that cannot be specified for the object in the layout is specified

When print data is specified in SetBitmap, the controller is notified each time.

・ When media temperature notification is required

The media temperature is notified in parallel with the "Data designation completed" and "Media ready completed" notifications.

The controller starts erasing when the "Media Temperature Notification" and "Media Ready Completed" notices are received.

Printing operation starts when both deletion completion and data designation completion are received.

・ When using the terminal block, it is necessary to send a "Media Arrival Notice" from the PLC in parallel with the "Media Ready Completed" notification.
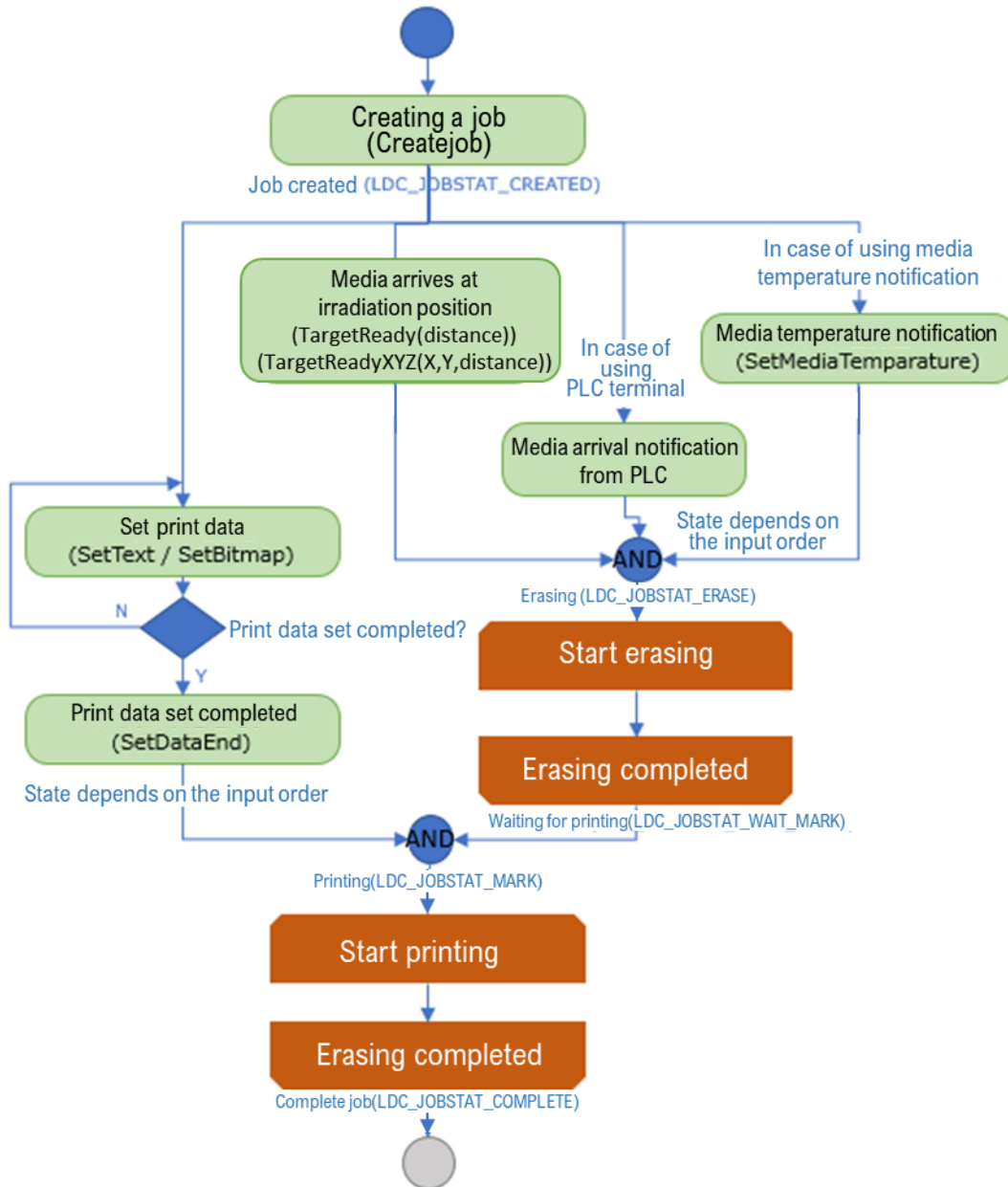
### 2.3.5. To cancel a job

The job can be cancelled if it is not "irradiated".

### 2.3.6. Processing when an error occurs

If an error occurs in the controller, all jobs generated at the time of the error will fail and be removed. Therefore, all failed jobs need to be reset.

After removing the error factor by the user, an attempt is made to cancel the error. In some cases, however, the error cannot be cleared because the cause cannot be removed depending on the error type.

If the error is cleared successfully, the controller enters the ready state and enters the standby state. It is necessary to shift to the irradiable state again, create a new job from the failed label, reset the data, and resume processing. ( 「2.2. See Preparation Process.

## 2.4. Termination processing

When completing irradiation processing, be sure to execute the termination processing after confirming that all jobs have been completed.
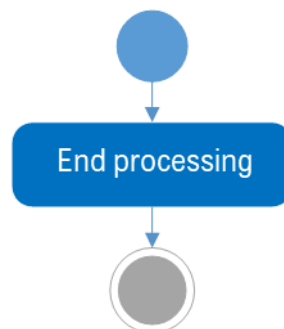
# 3. Data definition

## 3.1. Values indicating the status and mode

In SDK, values indicating a constant state and mode are not enumerated, but are treated as INT type.
The values and meanings that can be specified for each state and mode group are described in this chapter.

### 3.1.1. Running state of the job

| Associated API | GetJobStatus | | |
|---|---|---|---|
| Description | Indicates the execution status of the job.<br>Job failures include removing jobs due to controller transitions. | | |
| Definitions | Defined name (example) | Value | Meaning |
| | LDC_JOBSTAT_CREATED | 0 | The job has been created. Data can be specified |
| | LDC_JOBSTAT_WAIT_TARGET | 1 | Data designation completed. Wait for media to arrive |
| | LDC_JOBSTAT_ERASE | 2 | Erasing in progress |
| | LDC_JOBSTAT_WAIT_MARK | 3 | Wait for printing after deletion |
| | LDC_JOBSTAT_MARK | 4 | During printing |
| | LDC_JOBSTAT_COMPLETE | 100 | Job (deletion/printing) completed |
| | LDC_JOBSTAT_ERROR | 101 | Error occurrence/job failure |
| | LDC_JOBSTAT_DELETE | 102 | Job deletion |

### 3.1.2. Controller state

| Associated API | GetMachineState, SetMachineState |
|---|---|
| Description | Indicates controller status.<br>During error:<br>Error occurs in the controller. Error clearance is required after the error cause is cleared.<br>If the error is cleared successfully, the status changes to PREPARATION state.<br>When the error is reset, the guide mode is also OFF.<br>If a Job remains before this state transition, all Jobs are deleted.<br><br>Preparing:<br>The controller is operating the equipment for restart, reset, and warm-up.<br>When all preparations are completed, the state is automatically shifted to the standby state.<br>If a Job remains before this state transition, all Jobs are deleted.<br><br>Waiting:<br>The controller is waiting for control instructions.<br>It can be switched to the irradiable state or the guide mode ON state.<br>If a Job remains before this state transition, all Jobs are deleted.<br><br>Radiation is possible:<br>Prepared for laser irradiation for rewritable.<br>The status allows creating a job or setting data to a job.<br>When the controller determines that the conditions for starting irradiation are met, the status changes to the irradiated state.<br><br>During irradiation:<br>During laser irradiation. Upon completion of laser irradiation, the system enters an irradiable state. |

| | Guide mode ON:<br>The guide laser is irradiated.<br>The status allows creating a job or setting data to a job.<br>Start irradiation on the specified job when the data is set and the media is ready for arrival.<br><br>Maintenance mode:<br>Maintenance mode only.<br>To cancel the maintenance mode during operation, restart the controller. | | |
|---|---|---|---|
| Definitions | Defined name (example) | Value | Meaning |
| | LDC_MACHINE_STATE_ERROR | 0 | In error |
| | LDC_MACHINE_STATE_STARTUP | 1 | Preparation in progress |
| | LDC_MACHINE_STATE_WAITING | 2 | On standby |
| | LDC_MACHINE_STATE_LASER_READY | 3 | Irradiable |
| | LDC_MACHINE_STATE_LASER_MARKING | 4 | During irradiation |
| | LDC_MACHINE_STATE_GUIDE_ON | 5 | Guide mode ON |
| | LDC_MACHINE_STATE_MAINTENANCE | 6 | Maintenance mode |

### 3.1.3. Operation mode

| Associated API | CreateJob | | |
|---|---|---|---|
| Description | Indicates operation mode.<br>Specify the operation when laser irradiation is performed on the label. | | |
| Definitions | Defined name (example) | Value | Meaning |
| | LDC_MODE_ERASE | 0 | Delete only |
| | LDC_MODE_MARK | 1 | Print only |
| | LDC_MODE_ERASE_AND_MARK | 2 | Erase + Print |

# 4. Interface specification

## 4.1. For the use

SDK is developed in C, C++ languages and discloses the API in a C-language function format.

Detailed formats are provided in the "C,C++ Interface Reference" section of this chapter.

The SDK also contains a sample source for use in the Java language, which will implement the function via Java Native Access (JNA).

The format for use with the Java language described in the sample source is described in the column "Interface Reference for Java" in this chapter.

When using the SDK from any language, the application must explicitly link this SDK.

## ● Interface reference for C,C++

Call GetLDM Controller to obtain control handle for selected SG controller. When each API is executed, the acquired control handle is specified as an argument and executed in order to identify the SG controller to be controlled. The acquired control handle must be released by the Release LDM Controller after SDK termination processing.

## ● Interface reference for Java

Call getLDM Controller to obtain control handle for selected SG controller. Each Java language API specifies and executes the acquired control handle as an argument in order to identify the SG controller to be controlled. The acquired control handle must be released by the release LDM controller after SDK termination processing.

## 4.2. Preparation process

### 4.2.1. API specifying the controller

#### 4.2.1.1. GetLDMController

| Interface reference for C,C++ | | | Provided |
|---|---|---|---|
| Function name | GetLDMController | | |
| Type | HANDLE GetLDMController( BYTE ucMarkerNo); | | |
| Argument | UcMarkerNo    The device number [In] to be controlled | | |
| Return value | Control handle value. This steering wheel value is used to control subsequent events. | | |
| Function description | Obtains the control handle for controlling the controller. Designate the control handle acquired by this API as an argument of an API other than this API, and instruct control of the device specified by this API. Loads the setting file of the device number specified by ucMarker No. and gets the communication and control conditions. | | |
| Interface reference for Java | | | Provided |
| Method name | GetLDMController | Import | Com.ricoh.ldtr .LDMControllerJava Com.ricoh.ldtr.LDCConstantsUtils Com.sun.jna.Pointer |
| Type | Public static Pointer getLDMController(byte ucMarkerNo); | | |
| Argument | UcMarkerNo    The device number [In] to be controlled | | |
| Return value | Control handle value. This steering wheel value is used to control subsequent events. | | |
| Function description | Same as interface reference for C,C++ | | |

### 4.2.1. API that starts the controller

#### 4.2.1.1. PowerOn

| Interface reference for C,C++ | Provided |
|---|---|
| Function name | PowerOn |

| Type | WORD PowerOn (HANDLE hLDMCtrl); | | |
|---|---|---|---|
| Argument | hLDMCtrl            Control handle [In] acquired by GetLDM Controller | | |
| Return value | WORD<br>　　0        Normal completion<br>　　Other   Error termination (see "4.5 Error codes")4.5Error code | | |
| Function description | Start the controlled controller over the network.<br>After starting the controller, the status changes to the standby state after the initial check.<br>If it has already been started, nothing is done.<br>The Mac address and IP address in the SDK configuration file must be stated. | | |
| **Interface reference for Java** | | | **Provided** |
| Method name | PowerOn | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer |
| Type | Public static int powerOn(Pointer hLDMCtrl); | | |
| Argument | hLDMCtrl            Control handle [In] acquired by GetLDM Controller | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

### 4.2.2. API to connect to the controller

#### 4.2.2.1. Connect

| **Interface reference for C,C++** | | | **Provided** |
|---|---|---|---|
| Function name | Connect | | |
| Type | WORD Connect(<br>                        HANDLE hLDMCtrl,<br>                        WCHAR* szPassword); | | |
| Argument | hLDMCtrl            Control handle [In] acquired by GetLDM Controller<br>SzPassword          Password for connection authentication [In] | | |
| Return value | WORD<br>　　0        Normal completion<br>　　Other   Error termination (see "4.5 Error codes")4.5Error code | | |
| Function description | The communication connection with the controller is started.<br>Communication connection is made based on the setting file information loaded when GetLDMController is executed.<br><br>The szPassword authenticates the connected controller and password.<br>When authentication is performed with the initial password, an error response is returned for the first time.<br>This is to prompt you to change the initial password, and if you make a second connection,<br>Authentication and connection are possible.<br>            Initial password: 000000<br>            Password length: 6 to 64 characters<br>            Characters: Numbers (0-9), uppercase (a-z, A-Z), and symbols (-!#$%＆()*+.<br>/:;<=>?@^_`\|~)<br>If authentication fails three consecutive times, the account is locked for 10 seconds.<br>During account lock, password authentication and communication connection by this API are not possible.<br><br>Waits for the timeout set in the configuration file until the connection is established.<br>This API must be executed prior to other print control APIs. | | |
| **Interface reference for Java** | | | **Provided** |
| Method name | Connect | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer |

| | | | Com.sun.jna.WString |
|---|---|---|---|
| Type | Public static int connect( Pointer hLDMCtrl, WString szPassword); | | |
| Argument | hLDMCtrl         Control handle [In] acquired by GetLDM Controller | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

#### 4.2.2.2. ChangePassword

| Interface reference for C,C++ | | | Provided |
|---|---|---|---|
| Function name | ChangePassword | | |
| Type | WORD ChangePassword( HANDLE hLDMCtrl, WCHAR* szCurrentPassword, WCHAR* szTargetPassword); | | |
| Argument | hLDMCtrl                Control handle [In] acquired by GetLDM Controller<br>SzCurrentPasswordCurrent password [In]<br>SzTargetPassword  Password [In] to be changed | | |
| Return value | WORD<br>  0        Normal completion<br>  Other   Error termination (see "4.5 Error codes")4.5Error code | | |
| Function description | You change the password for connection authentication.<br>Only in the connected state can you change it.<br><br>Refer to "4.2.2.1 Connect" for the length and character type of the password to be changed.<br>The initial password or the current password cannot be specified for the password to be changed. | | |
| Interface reference for Java | | | Provided |
| Method name | ChangePassword | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer<br>Com.sun.jna.WString |
| Type | Public static int changepassword( Pointer hLDMCtrl, WString szCurrentPassword, WString szTargetPassword); | | |
| Argument | hLDMCtrl                Control handle [In] acquired by GetLDM Controller<br>SzCurrentPasswordCurrent password [In]<br>SzTargetPassword  Password [In] to be changed | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

### 4.2.3. API that controls the controller

#### 4.2.3.1. GetMachineState

| Interface reference for C,C++ | | | Provided |
|---|---|---|---|
| Function name | GetMachineState | | |
| Type | WORD GetMachineState ( HANDLE hLDMCtrl, INT* peOutMachineState); | | |
| Argument | hLDMCtrl                 Control handle [In] acquired by GetLDM Controller | | |

| | PeOutMachineStateController status [Out] |
|---|---|

| Return value | WORD<br>   0      Normal completion<br>   Other  Error termination (see "4.5 Error codes")4.5Error code |
|---|---|
| Function description | This property acquires the controller status.<br>See 3.1.2 "Controller status" for details of the available controller status and each status. |

| Interface reference for Java | | | Provided |
|---|---|---|---|
| Method name | GetMachineState | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer |
| Type | Public static int getMachineState(<br>      Pointer hLDMCtrl,<br>      Int[] peOutMachineState); | | |
| Argument | hLDMCtrl               Control handle [In] acquired by GetLDM Controller<br>PeOutMachineStateController status [Out]<br>               Specify the area of int[1]. | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

### 4.2.3.2. SetMachineState

| Interface reference for C,C++ | Provided |
|---|---|
| Function name | SetMachineState |
| Type | WORD SetMachineState (<br>      HANDLE hLDMCtrl,<br>      INT eInMachineState); |
| Argument | hLDMCtrl        Control handle [In] acquired by GetLDM Controller<br>eInMachineState: Controller state [Out] |
| Return value | WORD<br>   0      Normal completion<br>   Other  Error termination (see "4.5 Error codes")4.5Error code |
| Function description | Indicates the controller status change.<br>If the status described in the [Present status] below indicates a change to the [Transitional specifiable status].<br>Current Status<br>・ On standby<br>・ Irradiable<br>・ Guide mode ON<br><br>[Transition specifiable state]<br>・ On standby<br>・ Irradiable<br>・ Guide mode ON<br>・ Maintenance mode<br><br>For details of each state, see "3.1.2 Controller state". |

| Interface reference for Java | | | Provided |
|---|---|---|---|
| Method name | SetMachineState | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer |
| Type | Public static int setMachineState(<br>      Pointer hLDMCtrl, | | |

| Argument | hLDMCtrl          Control handle [In] acquired by GetLDM Controller<br>eInMachineState: Controller state [In] |
|---|---|
| Return value | Same as interface reference for C,C++ |
| Function description | Same as interface reference for C,C++ |

### 4.2.3.3. ResetMaintenanceMode

| Interface reference for C,C++ | | | Provided |
|---|---|---|---|
| Function name | ResetMaintenanceMode | | |
| Type | WORD ResetMaintenanceMode (<br>          HANDLE hLDMCtrl); | | |
| Argument | hLDMCtrl          Control handle [In] acquired by GetLDM Controller | | |
| Return value | WORD<br>     0     Normal completion<br>     Other   Error termination (see "4.5 Error codes")4.5Error code | | |
| Function description | It is recommended to use only during maintenance.<br>Restart the maintenance mode during operation by restarting the controller.<br><br>The maintenance mode is canceled when the controller state is in the maintenance mode.<br>After clearing, it enters the ready state and enters the standby state.<br><br>When controlling the controller after releasing the maintenance mode, make sure that the status has shifted to the standby mode before performing the control.<br><br>For details of each state, see "3.1.2 Controller state". | | |
| Interface reference for Java | | | Provided |
| Method name | ResetMaintenanceMode | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer |
| Type | Public static int resetMaintenanceMode (<br>          Pointer hLDMCtrl); | | |
| Argument | hLDMCtrl          Control handle [In] acquired by GetLDM Controller | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

### 4.2.3.4. GetErrorCode

| Interface reference for C,C++ | | Provided |
|---|---|---|
| Function name | GetErrorCode | |
| Type | WORD GetErrorCode(HANDLE hLDMCtrl, WORD* wErrorCode); | |
| Argument | hLDMCtrl                         Control handle [In] acquired by GetLDM Controller<br>wErrorCode                         Obtained error code [Out] | |
| Return value | WORD<br>     0     Normal completion<br>     Other   Error termination (see "4.5 Error codes")4.5Error code | |
| Function description | Obtains the error code of the controller.<br>The return value indicates the success or failure of this function as well as other functions, and the error code of the controller is obtained by using an argument.<br><br>GetMachineState can obtain details of errors occurring in the controller by using the controller in an | |

| | | | |
|---|---|---|---|
| | error condition. Refer to the error code list for the obtained error code.<br>Controller state can be executed even in a state other than error state. In this case, 0 is stored in the argument. | | |
| **Interface reference for Java** | | | **Provided** |
| Method name | GetErrorCode | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer |
| Type | Public static int getErrorCode(<br>　　　Pointer hLDMCtrl,<br>　　　Int[] wErrorCode); | | |
| Argument | hLDMCtrl　　　　　　　Control handle [In] acquired by GetLDM Controller<br>wErrorCode　　　　　　Obtained error code [Out]<br>　　　　　　　Specify the area of int[1]. | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

### 4.2.3.5. ResetError

| | | | |
|---|---|---|---|
| **Interface reference for C,C++** | | | **Provided** |
| Function name | ResetError | | |
| Type | WORD ResetError(HANDLE hLDMCtrl); | | |
| Argument | hLDMCtrl　　　　　　　Control handle [In] acquired by GetLDM Controller | | |
| Return value | WORD<br>　0　　　Normal completion<br>　Other　Error termination (see "4.5 Error codes")4.5Error code | | |
| Function description | Notifies the controller that an error factor has been removed.<br>The controller tries to cancel the error by removing the error factor. | | |
| **Interface reference for Java** | | | **Provided** |
| Method name | ResetError | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer |
| Type | Public static int resetError(Pointer hLDMCtrl); | | |
| Argument | hLDMCtrl　　　　　　　Control handle [In] acquired by GetLDM Controller | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

### 4.2.3.6. GetPartsInformation

| | | | |
|---|---|---|---|
| **Interface reference for C,C++** | | | **Provided** |
| Function name | GetPartsInformation | | |
| Type | WORD GetPartsInformation(<br>　　　HANDLE hLDMCtrl,<br>　　　DWORD* dwWarn,<br>　　　DWORD* dwOver); | | |
| Argument | hLDMCtrl　　　　Control handle [In] acquired by GetLDM Controller<br>DwWarn : Parts information [Out] that is being replaced<br>DwOver　　　　　: Parts information [Out] exceeding the usable quantity | | |
| Return value | WORD<br>　0　　　Normal completion<br>　Other　Error termination (see "4.5 Error codes")4.5Error code | | |
| Function | Obtains information about the timing of replacement of parts in the controller. | | |

| description | |
|---|---|
| | The value obtained by dwWarn indicates the part whose replacement is time. When the value is 0, there are no parts for replacement timing. Parts in excess of available capacity are not included. The value obtained by dwOver indicates a part in excess of the available amount. When the value is 0, there are no parts in excess of the usable amount. Parts at the time of replacement are not included in the scope. |

Both dwWarn and dwOver are determined by the bit flag.
Parts and bit flags that can be acquired are as follows.

| Value | Parts |
|---|---|
| 0x0001 | Fan for cooling LD light source |
| 0x0002 | LD light source cooling pump |

Example of Acquisition Results:
When dwWarn is 0x0001 and dwOver is 0x0002, the LD light source cooling fan is the replacement time and the LD light source cooling pump exceeds the available amount.

| Interface reference for Java | | | Provided |
|---|---|---|---|
| Method name | GetPartsInformation | Import | Com.ricoh.ldtr .LDMControllerJava Com.ricoh.ldtr.LDCConstantsUtils Com.sun.jna.Pointer |
| Type | Public static int getPartsInformation(        Pointer hLDMCtrl,        Int[] dwWarn,        Int[] dwOver); | | |
| Argument | hLDMCtrl      Control handle [In] acquired by GetLDM Controller DwWarn : Parts information [Out] that is being replaced          Specify the area of int[1]. DwOver      : Parts information [Out] exceeding the usable quantity          Specify the area of int[1]. | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

### 4.2.3.7. GetTemperature

| Interface reference for C,C++ | | Provided |
|---|---|---|
| Function name | GetTemperature | |
| Type | WORD GetTemperature(        HANDLE hLDMCtrl,        SHORT* nLdTemperature,        SHORT* nInnerTemperature,        SHORT* nThermistorTemperature); | |
| Argument | hLDMCtrl          Control handle [In] acquired by GetLDM Controller nLdTemperature    LD light source temperature [Out] nInnerTemperature Temperature in LD unit [Out] nThermistorTemperature: Outside thermistor temperature [Out] | |
| Return value | WORD   0      Normal completion   Other   Error termination (see "4.5 Error codes")4.5Error code | |
| Function description | This property acquires temperature information on the controller. For each value,-255 to 255 are allowed, but for-255 and 255,-255 are faults. Each temperature shall be in units of 1°C. | |
| Interface reference for Java | | Provided |
| Method | GetTemperature | Import   Com.ricoh.ldtr .LDMControllerJava |

| name | | | Com.ricoh.ldtr.LDCConstantsUtils |
| --- | --- | --- | --- |
| | | | Com.sun.jna.Pointer |
| Type | Public static int getTemperature( Pointer hLDMCtrl, Short[] nLdTemperature, Short[] nInnerTemperature, Short[] nThermistorTemperature); | | |
| Argument | hLDMCtrl          Control handle [In] acquired by GetLDM Controller nLdTemperature    LD light source temperature [Out]                         Specify an area for short[1]. nInnerTemperature Temperature in LD unit [Out]                         Specify an area for short [1]. nThermistorTemperature      : Outside thermistor temperature [Out]                         Specify an area for short [1]. | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

### 4.2.3.8. GetConfig

| Interface reference for C,C++ | | | Provided |
| --- | --- | --- | --- |
| Function name | GetConfig | | |
| Type | WORD GetConfig ( HANDLE hLDMCtrl, WCHAR* szKey, WCHAR* szValue, DWORD dwValueSize); | | |
| Argument | hLDMCtrl          Control handle [In] acquired by GetLDM Controller SzKey             : Key name to be retrieved [In] SzValue           : Buffer [Out] for returning the retrieved value DwValueSize       : Size of the buffer in which the retrieved value is returned | | |
| Return value | WORD 　0       Normal completion 　Other   Error termination (see "4.5 Error codes")4.5Error code | | |
| Function description | You acquire the controller settings. Gets the value associated with the key specified by szKey.  If dwValueSize is smaller than the value to be retrieved plus the end character, an error occurs and cannot be retrieved. If there is 260 dwValueSize, it can be retrieved for all normal operational parameters. | | |
| Interface reference for Java | | | Provided |
| Method name | GetConfig | Import | Com.ricoh.ldtr .LDMControllerJava Com.ricoh.ldtr.LDCConstantsUtils Com.sun.jna.Pointer Com.sun.jna.WString |
| Type | Public static int getConfig ( Pointer hLDMCtrl, WString szKey, Char[] szValue, Int dwValueSize); | | |
| Argument | hLDMCtrl          Control handle [In] acquired by GetLDM Controller SzKey             : Key name [In] to be obtained SzValue           : Buffer [Out] for returning the retrieved value                     Specify the area for char [dwValueSize]. DwValueSize       : Buffer size to return the retrieved value | | |

| | |
|---|---|
| | Specify the buffer size allocated when char[] is declared to be szValue. |
| Return value | Same as interface reference for C,C++ |
| Function description | Same as interface reference for C,C++ |

### 4.2.3.9. SetConfig

| Interface reference for C,C++ | | Provided |
|---|---|---|
| Function name | SetConfig | |
| Type | WORD SetConfig (         HANDLE hLDMCtrl,         WCHAR* szKey,         WCHAR* szValue); | |
| Argument | hLDMCtrl         Control handle [In] acquired by GetLDM Controller SzKey         : Key name to be set [In] SzValue         : Value to be set [In] | |
| Return value | WORD    0      Normal completion    Other   Error termination (see "4.5 Error codes")4.5Error code | |
| Function description | You change the controller settings. Sets the value specified by szValue to the key specified by szKey. Keys that do not appear in the configuration file and operate by default can also be changed. The keys that can be set are classified into laser and system settings. ・ **Laser setting** This is reflected when the device status changes to irradiable status when restarting or resetting an error. Usually, irradiate with the changed settings from the next Job. The following keys can be changed. | |

| Key name | Range of values (Minimum Unit) | Description |
|---|---|---|
| Ers_markSpeed_CofficientA | -10～10(1) | Coefficients of the second order term of the erased mark speed reference speed calculation formula |
| Ers_markSpeed_CofficientB | -1000～1000(1) | Coefficients in the first-order section of the erased mark speed reference speed calculation formula |
| Ers_markSpeed_CofficientC | -12000～12000(1) | Intercept of the erased mark speed reference speed calculation formula |
| Ers_PwmDuty | 0～100.0(0.1) | Erase Duty Ratio (%) |
| Mrk_markSpeed | 0～12000(1) | Mark speed (mm/sec) |
| Mrk_PwmDuty_MrkOnly | 0～100.0(0.1) | Print duty ratio (%) |
| Mrk_PwmDuty_EraseMark | 0～100.0(0.1) | Erase print duty ratio (%) |
| Mrk_laserOnDelay | 0～1000000(1) | Laser ON delay (us) |
| Mrk_laserOffDelay | 0～1000000(1) | Laser OFF delay (us) |
| Xoffset | -55～55(1) | X offset (mm) |

| Yoffset | -55～55(1) | Y offset (mm) |
| AngleOffset | 0～270(90) | Angle offset (degrees) |
| DefaultWorkDistance | 104～124(1) | Default value of work distance (mm) |

・ **System Settings**

It is reflected when restarting or resetting an error.

The following keys can be changed.

| Key name | Range of values (Minimum Unit) | Description |
| --- | --- | --- |
| PLCEmulatorMode | 0～1(1) | Use of input/output terminals<br>0: Take advantage<br>1: Do not use |
| TimingDelayTime_msec | 20～320(20) | Setting the response timing of the command to delay by a specified time (ms) |

| Interface reference for Java | | | Provided |
| --- | --- | --- | --- |
| Method name | SetConfig | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer<br>Com.sun.jna.WString |
| Type | Public static int setConfig (<br>　　　　Pointer hLDMCtrl,<br>　　　　WString szKey,<br>　　　　WString szValue); | | |
| Argument | hLDMCtrl　　　　Control handle [In] acquired by GetLDM Controller<br>SzKey　　　　　　: Key name [In] to be obtained<br>SzValue　　　　　: Value to be retrieved [In] | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

## 4.3. Irradiation treatment

### 4.3.1. APIs for creating and deleting jobs

#### 4.3.1.1. CreateJob

| Interface reference for C,C++ | | Provided |
| --- | --- | --- |
| Function name | CreateJob | |
| Type | WORD CreateJob(<br>　　　　HANDLE hLDMCtrl,<br>　　　　INT eMode,<br>　　　　DWORD dwLayoutFileNo,<br>　　　　DWORD* dwJobID); | |
| Input | hLDMCtrl　　　　Control handle [In] acquired by GetLDM Controller<br>eMode　　　　　　Operating mode [In]<br>DwLayoutFileNo　Layout No. [In]<br>DwJobIDJob ID [Out] | |
| Return value | WORD<br>　0　　　Normal completion<br>　Other　Error termination (see "4.5 Error codes")4.5Error code | |
| Function description | Requests that the controller generate a new job by specifying the operation mode layout number.<br>This API can be executed only when the controller state is "irradiable" or "irradiated" or "guide | |

| | mode".<br>The created Job ID is an integer from 1 to 9999 and becomes a unique Job ID when the job is executed.<br><br>DwLayoutFileNo is an integer from 1 to 99.<br>　　　　1〜99　　Specified layout number<br>If an unregistered layout number is set, an error is returned.<br><br>When a job is created, the operation mode layout number is retained as job information. The job information cannot be changed once it is set.<br>To change, discard the job and create the job again in CreateJob. | | |
|---|---|---|---|
| **Interface reference for Java** | | | **Provided** |
| Method name | CreateJob | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer |
| Type | Public static int createJob(<br>　　　　Pointer hLDMCtrl,<br>　　　　Int eMode,<br>　　　　Int dwLayoutFileNo,<br>　　　　Int[] dwJobID); | | |
| Argument | hLDMCtrl　　　　Control handle [In] acquired by GetLDM Controller<br>eMode　　　　Operating mode [In]<br>DwLayoutFileNo　Layout No. [In]<br>DwJobID　Job ID [Out]<br>　　　　　　　Specify the area of int[1]. | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

### 4.3.1.2. DeleteJob

| **Interface reference for C,C++** | | **Provided** |
|---|---|---|
| Function name | DeleteJob | |
| Type | WORD DeleteJob (<br>　　　　　　HANDLE hLDMCtrl,<br>　　　　　　DWORD dwJobID); | |
| Input | hLDMCtrl　　　　Control handle [In] acquired by GetLDM Controller<br>DwJobID　Job ID [In] | |
| Return value | WORD<br>　0　　　Normal completion<br>　Other　Error termination (see "4.5 Error codes")4.5Error code | |
| Function description | Instruct the controller to delete the job.<br>Deletion is not possible during irradiation. | |
| **Interface reference for Java** | | **Provided** |
| Method name | DeleteJob | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer |
| Type | Public static int deleteJob(<br>　　　　Pointer hLDMCtrl,<br>　　　　Int dwJobID); | | |
| Argument | hLDMCtrl　　　　Control handle [In] acquired by GetLDM Controller<br>DwJobID　Job ID [In] | | |
| Return value | Same as interface reference for C,C++ | | |

| Function description | Same as interface reference for C,C++ |
|---|---|

## 4.3.2. API specifying the print data in the job

### 4.3.2.1. IsMarkable

| Interface reference for C,C++ | | | Provided |
|---|---|---|---|
| Function name | IsMarkable | | |
| Type | WORD IsMarkable(<br>　　　HANDLE hLDMCtrl,<br>　　　WCHAR* szText); | | |
| Input | hLDMCtrl　　　　　　Control handle [In] acquired by GetLDM Controller<br>SzText　　　　　　　Character string [In] to print | | |
| Return value | WORD<br>　0　　Print-able<br>　Other　Printing impossible or error termination (see "4.5 Error code")4.5Error code | | |
| Function description | Check whether the character string can be printed.<br>SzText inputs a string (UTF-16) that terminates in a null character.<br>SzText cannot be a control string (line feed, tab character, etc.) other than a NULL character.<br><br>This API supports the standard and proportional fonts installed in the controller.<br>Bitmap fonts are not supported. | | |
| **Interface reference for Java** | | | **Provided** |
| Method name | IsMarkable | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer<br>Com.sun.jna.WString |
| Type | Public static int isMarkable(<br>　　　Pointer hLDMCtrl,<br>　　　WString szText); | | |
| Argument | hLDMCtrl　　　　　　Control handle [In] acquired by GetLDM Controller<br>SzText　　　　　　　Character string [In] to print | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

### 4.3.2.2. SetText

| Interface reference for C,C++ | | Provided |
|---|---|---|
| Function name | SetText | |
| Type | WORD SetText(<br>　　　HANDLE hLDMCtrl,<br>　　　DWORD dwJobID<br>　　　DWORD dwObjectNo,<br>　　　WCHAR* szText); | |
| Input | hLDMCtrl　　　　　　Control handle [In] acquired by GetLDM Controller<br>DwJobID　　　　Job ID [In]<br>DwObjectNo　　　　　Object number [In]<br>SzText　　　　　　　Character string [In] to print | |
| Return value | WORD<br>　0　　Normal completion<br>　Other　Error termination (see "4.5 Error codes")4.5Error code | |

| Function description | Specify text data for the specified job and object.<br>The dwObjectNo must be an integer from 1 to 99.<br>For szText,<br><br>・ Specify a string (UTF-16) that terminates with a null character.<br><br>・ When "\" or "" is specified, an escape character "\" should be given.<br><br>  Example: "\" to "\" and """ to "\"<br><br>・ Control strings (line feed, tab character, etc.) other than NULL characters cannot be specified.<br><br>・ Can specify empty characters<br><br><br>Whether the data specified by szText is a renderable string or not,<br>4.3.2.1IsMarkable<br>When this function is executed only for deletion, an error occurs.<br>The text data specified by this API is notified to the controller at the time of execution of SetDataEnd.<br>This API must be executed after creating a job in CreateJob.<br><br><br>If the layout used is inconsistent with the object number specified in this API,<br>When an argument such as "Job data status error" is set, the target Job may be deleted and the device status may be an error.<br>Release the error state of the equipment, review the layout to be used and the arguments specified in this API, and then re-create the job. | | |
|---|---|---|---|
| **Interface reference for Java** | | | **Provided** |
| Method name | SetText | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer<br>Com.sun.jna.WString |
| Type | Public static int setText(<br>        Pointer hLDMCtrl,<br>        Int dwJobID,<br>        Int dwObjectNo,<br>        WString szText); | | |
| Argument | hLDMCtrl                Control handle [In] acquired by GetLDM Controller<br>DwJobID          Job ID [In]<br>DwObjectNo                Object number [In]<br>SzText                Character string [In] to print | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

### 4.3.2.3. SetBitmap

| **Interface reference for C,C++** | | **Provided** |
|---|---|---|
| Function name | SetBitmap | |
| Type | WORD SetBitmap(<br>        HANDLE hLDMCtrl,<br>        DWORD dwJobID<br>        DWORD dwObjectNo,<br>        DWORD dwBufSize,<br>        BYTE* pucBuffer); | |
| Input | hLDMCtrl                Control handle [In] acquired by GetLDM Controller<br>DwJobID          Job ID [In]<br>DwObjectNo                Object number [In]<br>DwBufSize                :pucBuffer's memory buffer size (in bytes) [In]<br>PucBuffer                Memory Buffer [In] containing bitmap files | |
| Return | WORD | |

| value | 0      Normal completion<br>Other    Error termination (see "4.5 Error codes")4.5Error code |
|---|---|
| Function description | Specify bitmap data for object print data of specified job.<br>The dwObjectNo can be an integer from 1 to 99.<br>DwBufSize can be specified up to 200 Kbytes (1 Kbyte is 1,024 bytes).<br>The pucBuffer stores all bitmap file data (file header, information header, pallet data, image data).<br><br>Only a monochrome bit map (BitPerPixel 1) is supported.<br>Resolution of bitmap data is recommended to be 200 dpi.<br><br>When this function is used, the specified bit map can be output as a log.<br>The output availability can be set in BmpFileOutDirPath and BmpFileSaveMode of the SDK configuration file.<br>For details, refer to the SDK configuration file.<br><br>When this function is executed only for deletion, an error occurs.<br><br>If the layout used is inconsistent with the object number specified in this API,<br>When an argument such as "Job data status error" is set, the target Job may be deleted and the device status may be an error.<br>Release the error state of the equipment, review the layout to be used and the arguments specified in this API, and then re-create the job. |

| Interface reference for Java | | Provided |
|---|---|---|
| Method name | SetBitmap | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer |
| Type | Public static int setBitmap(<br>        Pointer hLDMCtrl,<br>        Int dwJobID,<br>        Int dwObjectNo,<br>        Int dwBufSize,<br>        Byte[] pucBuffer); | | |
| Argument | hLDMCtrl            Control handle [In] acquired by GetLDM Controller<br>DwJobID           Job ID [In]<br>DwObjectNo       Object number [In]<br>DwBufSize        :pucBuffer's memory buffer size (in bytes) [In]<br>PucBuffer         Memory Buffer [In] containing bitmap files | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

#### 4.3.2.4. SetBitmapFile

| Interface reference for C,C++ | Provided |
|---|---|
| Function name | SetBitmapFile |
| Type | WORD SetBitmapFile(<br>        HANDLE hLDMCtrl,<br>        DWORD dwJobID<br>        DWORD dwObjectNo,<br>        WCHAR* szFileName); |
| Input | hLDMCtrl            Control handle [In] acquired by GetLDM Controller<br>DwJobID        Job ID [In]<br>DwObjectNo       Object number [In]<br>SzFileName       Bitmap filename [In] |
| Return | WORD |

| value | 0 Normal completion |
| --- | --- |
| | Other Error termination (see "4.5 Error codes")4.5Error code |
| Function description | Specify the data read from the bitmap file in the object print data of the specified job. |
| | The dwObjectNo can be an integer from 1 to 99. |
| | SzFileName inputs a string (UTF-16) that terminates in a null character. |
| | The bitmap specified by szFileName must satisfy the following conditions. |
| | ・ Color: Monochrome Bit Map (2 colors) |
| | ・ Resolution: 200 [dpi] (recommended value) |
| | When this function is executed only for deletion, an error occurs. |
| | |
| | If the layout used is inconsistent with the object number specified in this API, |
| | When an argument such as "Job data status error" is set, the target Job may be deleted and the device status may be an error. |
| | Release the error state of the equipment, review the layout to be used and the arguments specified in this API, and then re-create the job. |

| Interface reference for Java | | | Provided |
| --- | --- | --- | --- |
| Method name | SetBitmapFile | Import | Com.ricoh.ldtr .LDMControllerJava |
| | | | Com.ricoh.ldtr.LDCConstantsUtils |
| | | | Com.sun.jna.Pointer |
| | | | Com.sun.jna. WString |
| Type | Public static int setBitmapFile( | | |
| |     Pointer hLDMCtrl, | | |
| |     Int dwJobID, | | |
| |     Int dwObjectNo, | | |
| |     WString szFileName); | | |
| Argument | hLDMCtrl         Control handle [In] acquired by GetLDM Controller | | |
| | DwJobID     Job ID [In] | | |
| | DwObjectNo     Object number [In] | | |
| | SzFileName     Bitmap filename [In] | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

### 4.3.2.5. SetBitmapText

| Interface reference for C,C++ | | Provided |
| --- | --- | --- |
| Function name | SetBitmapText | |
| Type | WORD SetBitmapText( | |
| |     HANDLE hLDMCtrl, | |
| |     DWORD dwJobID | |
| |     DWORD dwObjectNo, | |
| |     WCHAR* szText, | |
| |     WCHAR* szFontName, | |
| |     DWORD dwFontSize); | |
| Input | hLDMCtrl     Control handle [In] acquired by GetLDM Controller | |
| | DwJobID     Job ID [In] | |
| | DwObjectNo     Object number [In] | |
| | SzText     Character string [In] to print | |
| | SzFontName     Font name [In] | |
| | DwFontSize     Font Size [In] | |
| Return value | WORD | |
| | 0     Normal completion | |
| | Other   Error termination (see "4.5 Error codes")4.5Error code | |
| Function description | Creates the bitmap data of the character string from the specified font name and font size, and specifies it as an object. | |

The specified parameters for bit map data printing are as follows.

・ Maximum size of printing area: 30 mm high × 100 mm wide

・ Resolution: 200 dpi

・ Color: 2 colors

The dwObjectNo can be an integer from 1 to 99.
SzText and szFontName enter a character string (UTF-16) that terminates with a null character.
The szText and szFontName cannot be a control string (line feed, tab character, etc.) other than a NULL character.
For szText, check the renderable string in 4.3.2.1 IsMarkable.4.3.2.1IsMarkable
The szFontName must be a character string (UTF-16) for the Windows OS registered font name.
DwFontSize can be from 30 to 200 pixels.

The maximum number of printable characters varies with the value of dwFontSize. Designation shall be made with reference to the table below.
※ Assuming a width of 100 [mm]

| Font size [Pixel] | Maximum number of characters | Remarks (Method of calculation at the recommended maximum width of 100 [mm]) |
|---|---|---|
| 30 | 26 | 30 [Pixel]=3.81[mm] 100 With [mm]/3.81 [mm] = 26.24, the maximum value is 26. |
| 100 | 7 | 100 [Pixel]=12.7[mm] 100 The maximum value is 7 according to [mm]/12.7 [mm] = 7.86. |
| 200 | 3 | 200 [Pixel]=25.4[mm] 100 With [mm]/25.4 [mm] = 3.93, the maximum value is 3. |

When this function is used, the specified bit map can be output as a log.

If the layout used is inconsistent with the object number specified in this API,
When an argument such as "Job data status error" is set, the target Job may be deleted and the device status may be an error.
Release the error state of the equipment, review the layout to be used and the arguments specified in this API, and then re-create the job.

| Interface reference for Java | | | Provided |
|---|---|---|---|
| Method name | SetBitmapText | Import | Com.ricoh.ldtr .LDMControllerJava Com.ricoh.ldtr.LDCConstantsUtils Com.sun.jna.Pointer Com.sun.jna.WString |
| Type | Public static int setBitmapText(     Pointer hLDMCtrl,     Int dwJobID,     Int dwObjectNo,     WString szText,     WString szFontName,     Int dwFontSize); | | |
| Argument | hLDMCtrl     Control handle [In] acquired by GetLDM Controller DwJobID     Job ID [In] DwObjectNo     Object number [In] SzText     Character string [In] to print SzFontName     Font name [In] DwFontSize     Font Size [In] | | |
| Return value | Same as interface reference for C,C++ | | |

| Function description | Same as interface reference for C,C++ |
|---|---|

### 4.3.2.6. SetDataEnd

| Interface reference for C,C++ | | Provided |
|---|---|---|
| Function name | SetDataEnd | |
| Type | WORD SetDataEnd (<br>        HANDLE hLDMCtrl,<br>        DWORD dwJobID); | |
| Input | hLDMCtrl                    Control handle [In] acquired by GetLDM Controller<br>DwJobID            Job ID [In] | |
| Return value | WORD<br>    0        Normal completion<br>    Other   Error termination (see "4.5 Error codes")4.5Error code | |
| Function description | Transmits text data to the designated job of controller and notifies completion of data designation.<br>For the unspecified objects in the layout, the data is designated as "empty".<br>As a result, even if the job has no data to be printed, the job will be successful without printing at all.<br><br>This API can be specified when the controller is in the "Irradiable" state.<br>When this function is executed only for deletion, an error occurs.<br><br>If the layout to be used is inconsistent with the text data specified in the previously executed SetText,<br>When an argument such as "Job data status error" is set, the target Job may be deleted and the device status may be an error.<br>Release the error state of the equipment, review the layout to be used and the arguments specified in this API, and then re-create the job. | |
| Interface reference for Java | | Provided |
| Method name | SetDataEnd | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer |
| Type | Public static int setDataEnd(<br>        Pointer hLDMCtrl,<br>        Int dwJobID); | | |
| Argument | hLDMCtrl                    Control handle [In] acquired by GetLDM Controller<br>DwJobID            Job ID [In] | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

### 4.3.3. API that notifies the status of the media

### 4.3.3.1. TargetReady

| Interface reference for C,C++ | | Provided |
|---|---|---|
| Function name | TargetReady | |
| Type | WORD TargetReady(<br>        HANDLE hLDMCtrl,<br>        DWORD dwJobID,<br>        DWORD dwWorkDistance); | |
| Input | hLDMCtrl                    Control handle [In] acquired by GetLDM Controller<br>DwJobID            Job ID [In]<br>DwWorkDistance   Distance to media (mm) [In] | |
| Return value | WORD<br>    0          Normal completion | |

| | Other Error termination (see "4.5 Error codes")4.5Error code |
|---|---|
| Function description | Notifies the controller that the job and the corresponding target have been set to the specified position. When all laser irradiation conditions (*) are satisfied, the laser irradiation is started by executing this function.<br><br>If the laser irradiation condition is not met at the time of execution of this function, the execution of this function fails if LaserStop is Enable. Otherwise, the laser irradiation starts when the laser irradiation condition is met after execution of this function.<br><br>In addition, the distance to the media (dwWorkDistance) is used to compensate for the distance during laser irradiation.<br>If the specified value is "0", the distance to the media is treated as the default.<br>If the specified value is "Effective value (104 to 124)," a distance correction is performed and laser irradiation is performed if the laser irradiation conditions are satisfied.<br><br>This function can be performed with the controller "irradiable".<br><br>※ Laser irradiation conditions:<br>・ The target job has already been created (target API: CreateJob)<br>・ The media has already arrived at the irradiation position (target API: TargetReady).<br>・ Media temperature has been notified (Target API: SetMedia Temperature only when media temperature notification is mandatory)<br>・ Print data designation completed (Target API: SetDataEnd only for printing)<br>・ The controller must be in the "Irradiable" state (Target API: SetMachineState)<br>・ LaserStop must be disabled<br>・ TargetReady (TRDY_I) from the PLC interface must be asserted (ON) (only when the PLC interface is used).<br><br>When an argument such as "Job data status error" is set, the target Job may be deleted and the device status may be an error.<br>The error status of the equipment shall be cleared and the arguments specified in this API shall be reviewed before re-creating the job. |

| Interface reference for Java | | | Provided |
|---|---|---|---|
| Method name | TargetReady | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer |
| Type | Public static int targetReady(<br>　　　　Pointer hLDMCtrl,<br>　　　　Int dwJobID,<br>　　　　Int workDistance); | | |
| Argument | hLDMCtrl　　　　　　　　Control handle [In] acquired by GetLDM Controller<br>DwJobID　　　　Job ID [In]<br>DwWorkDistance　Distance to media (mm) [In] | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

### 4.3.3.1. TargetReadyXYZ

| Interface reference for C,C++ | Provided |
|---|---|
| Function name | TargetReadyXYZ |
| Type | WORD TargetReadyXYZ(<br>　　　　HANDLE hLDMCtrl, |

| | DWORD dwJobID,<br>SHORT nXoffset,<br>SHORT nYoffset,<br>DWORD dwWorkDistance); |
|---|---|
| Input | hLDMCtrl            Control handle [In] acquired by GetLDM Controller<br>DwJobID         Job ID [In]<br>nXoffset         Horizontal displacement of media (0.1 mm) [In]<br>nYoffset             Deviation in the vertical direction of the media (0.1 mm) [In]<br>DwWorkDistance   Distance to media (mm) [In] |
| Return value | WORD<br>    0        Normal completion<br>    Other   Error termination (see "4.5 Error codes")4.5Error code |
| Function description | Basic operation is the same as for TargetReady.<br><br>The amount of horizontal displacement of the media and the amount of vertical displacement are used for position correction during laser irradiation.<br>The specified value is in units of 0.1 mm and an effective value (-550 [-55 mm] ~ 550 [55 mm]) is specified.<br>The controller totals the other offsets and determines the position correction amount.<br><br>When an argument such as "Job data status error" is set, the target Job may be deleted and the device status may be an error.<br>The error status of the equipment shall be cleared and the arguments specified in this API shall be reviewed before re-creating the job. |

| **Interface reference for Java** | | | **Provided** |
|---|---|---|---|
| Method name | TargetReadyXYZ | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer |
| Type | Public static int targetReadyXYZ(<br>        Pointer hLDMCtrl,<br>        Int dwJobID,<br>        Short nXoffset,<br>        Short nYoffset,<br>        Int workDistance); | | |
| Argument | hLDMCtrl            Control handle [In] acquired by GetLDM Controller<br>DwJobID         Job ID [In]<br>nXoffset         Horizontal displacement of media (0.1 mm) [In]<br>nYoffset             Deviation in the vertical direction of the media (0.1 mm) [In]<br>DwWorkDistance   Distance to media (mm) [In] | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

### 4.3.3.2. SetMediaTemperature

| **Interface reference for C,C++** | | **Provided** |
|---|---|---|
| Function name | SetMediaTemperature | |
| Type | WORD SetMediaTemperature(<br>        HANDLE hLDMCtrl,<br>        DWORD dwJobID<br>        INT nMediaTemperature); | |
| Input | hLDMCtrl            Control handle [In] acquired by GetLDM Controller<br>DwJobID         Job ID [In]<br>nMedia Temperature: Media Temperature [In] | |
| Return | WORD | |

| value | 0      Normal completion | | |
|---|---|---|---|
| | Other   Error termination (see "4.5 Error codes")4.5Error code | | |
| Function description | Informs the controller of the temperature of the job and the corresponding media. Temperature is used to adjust the laser. <br><br> Requirements/permissible changes in the settings of the controller configuration file. <br>      If necessary: The irradiation process does not start unless the media temperature is transmitted. <br>      If allowable: Irradiation processing is started without media temperature transmission. <br>          However, before the media arrival notification, the transmission of the media temperature is permitted. <br>          The transmitted media temperature is used to adjust the laser. <br>          If the media temperature is not transmitted before the media arrival notice, <br>          The temperature of the instrument thermistor is used to adjust the laser. <br><br> The media temperature shall be input in units of $1°C$. <br><br> When an argument such as "Job data status error" is set, the target Job may be deleted and the device status may be an error. <br> The error status of the equipment shall be cleared and the arguments specified in this API shall be reviewed before re-creating the job. | | |

| Interface reference for Java | | | Provided |
|---|---|---|---|
| Method name | SetMediaTemperature | Import | Com.ricoh.ldtr .LDMControllerJava Com.ricoh.ldtr.LDCConstantsUtils Com.sun.jna.Pointer |
| Type | Public static int setMediaTemperature( <br>          Pointer    hLDMCtrl, <br>          Int        DwJobID, <br>          Int        nMediaTemperature); | | |
| Argument | hLDMCtrl                  Control handle [In] acquired by GetLDM Controller <br> DwJobID          Job ID [In] <br> nMedia Temperature: Media Temperature [In] | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

### 4.3.4. API that monitors the printing status

#### 4.3.4.1. GetJobStatus

| Interface reference for C,C++ | | Provided |
|---|---|---|
| Function name | GetJobStatus | |
| Type | WORD GetJobStatus( <br>          HANDLE hLDMCtrl, <br>          DWORD dwJobID, <br>          INT* eJobStatus); | |
| Input | hLDMCtrl                  Control handle [In] acquired by GetLDM Controller <br> DwJobID          Job ID [In] <br> eJobStatus            Job Status Out | |
| Return value | WORD <br>     0      Normal completion <br>     Other   Error termination (see "4.5 Error codes")4.5Error code | |
| Function description | Obtains the status of the specified job ID from the controller. <br> The completion of a job can be confirmed by obtaining the job status with this function. <br><br> Job status is "3.1.1." The status is defined in "Job Execution Status". <br> When a job is created, it can be acquired regardless of the job status. | |

| | It can be acquired after irradiation is complete or after the job has been removed due to a controller error. |  |  |
|---|---|---|---|
| **Interface reference for Java** |  |  | **Provided** |
| Method name | GetJobStatus | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer |
| Type | Public static int getJobStatus(<br>　　　　Pointer hLDMCtrl,<br>　　　　Int dwJobID,<br>　　　　Int[] eJobStatus); |  |  |
| Argument | hLDMCtrl　　　　　　　　　Control handle [In] acquired by GetLDM Controller<br>DwJobID　　　　Job ID [In]<br>eJobStatus　　　　　　　　Job Status Out<br>　　　　　　　　　Specify the area of int[1]. |  |  |
| Return value | Same as interface reference for C,C++ |  |  |
| Function description | Same as interface reference for C,C++ |  |  |

### 4.3.4.2. GetCurrentJobID

| **Interface reference for C,C++** |  | **Provided** |
|---|---|---|
| Function name | GetCurrentJobID |  |
| Type | WORD GetCurrentJobID(<br>　　　　HANDLE hLDMCtrl,<br>　　　　WORD wJobIDNum,<br>　　　　DWORD* pdwJobID); |  |
| Input | hLDMCtrl　　　　　　　　Control handle [In] acquired by GetLDM Controller<br>wJobIDNum　　　　　　　　Number of Allocated Elements of Array Storing Job ID [In]<br>PdwJobID　　　　　　　　Pointer to store Job ID [Out] |  |
| Return value | WORD<br>　0　　　　Normal completion<br>　Other　Error termination (see "4.5 Error codes")4.5Error code |  |
| Function description | Obtains the job ID group currently retained by the controller.<br>Specify the number of elements allocated for wJobIDNum as pdwJobID[].<br>Normally, specify 2 as the number of elements for pdwJob ID and allocate a memory area on the caller.<br>The job ID that can be retrieved is 1 to 9999, and if there is no job, 0 is stored in all elements of the pdwJob ID.<br><br>Example:<br>For a Job with one (Job ID 1)<br>PdwJob ID [0] •••1// Job ID<br>PdwJobID [1] ・・・ 0<br><br>For two Jobs (JobId 1 and 3)<br>PdwJob ID [0] •••1// Job ID<br>PdwJob ID [1]...3 // Job ID<br>※ When using this function, the array area given to the argument must be reserved by the caller. |  |
| **Interface reference for Java** |  | **Provided** |
| Method name | GetCurrentJobID | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer |
| Type | Public static int getCurrentJobID(<br>　　　　Pointer hLDMCtrl,<br>　　　　Int wJobIDNum,<br>　　　　Int[] dwJobID); |  |  |

| Argument | hLDMCtrl                      Control handle [In] acquired by GetLDM Controller<br>wJobIDNum               Number of Allocated Elements of Array Storing Job ID [In]<br>DwJobID          Array containing the job ID,<br>                              Specify the int [wJob IDNum] area [Out] |
| Return value | Same as interface reference for C,C++ |
| Function description | Same as interface reference for C,C++ |

## 4.4. Termination processing

### 4.4.1. API to be disconnected from the controller

#### 4.4.1.1. Disconnect

| Interface reference for C,C++ | | | Provided | |
|---|---|---|---|---|
| Function name | Disconnect | | | |
| Type | WORD Disconnect (HANDLE hLDMCtrl); | | | |
| Input | hLDMCtrl           Control handle [In] acquired by GetLDM Controller | | | |
| Return value | WORD<br>   0     Normal completion<br>   Other  Error termination (see "4.5 Error codes")4.5Error code | | | |
| Function description | Disconnects communication with the controller to be controlled. | | | |
| **Interface reference for Java** | | | **Provided** | |
| Method name | Disconnect | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer | |
| Type | Public static int disconnect(Pointer hLDMCtrl); | | | |
| Argument | hLDMCtrl           Control handle [In] acquired by GetLDM Controller | | | |
| Return value | Same as interface reference for C,C++ | | | |
| Function description | Same as interface reference for C,C++ | | | |

### 4.4.2. API to exit the controller

#### 4.4.2.1. PowerOff

| Interface reference for C,C++ | | | Provided | |
|---|---|---|---|---|
| Function name | PowerOff | | | |
| Type | WORD PowerOff (HANDLE hLDMCtrl); | | | |
| Argument | hLDMCtrl           Control handle [In] acquired by GetLDM Controller | | | |
| Return value | WORD<br>   0     Normal completion<br>   Other  Error termination (see "4.5 Error codes")4.5Error code | | | |
| Function description | Shut down the controller to be controlled.<br>Executed only when connect() has been executed.<br>This API also disconnects communication with the controller to be automatically connected after shutdown (Disconnect()). | | | |
| **Interface reference for Java** | | | **Provided** | |
| Method name | PowerOff | Import | Com.ricoh.ldtr .LDMControllerJava<br>Com.ricoh.ldtr.LDCConstantsUtils<br>Com.sun.jna.Pointer | |
| Type | Public static int powerOff(Pointer hLDMCtrl); | | | |
| Argument | hLDMCtrl           Control handle [In] acquired by GetLDM Controller | | | |

| | |
|---|---|
| Return value | Same as interface reference for C,C++ |
| Function description | Same as interface reference for C,C++ |

### 4.4.3. API that exits control of the controller

#### 4.4.3.1. ReleaseLDMController

| Interface reference for C,C++ | | | Provided |
|---|---|---|---|
| Function name | ReleaseLDMController | | |
| Type | Void ReleaseLDMController (HANDLE hLDMCtrl); | | |
| Argument | hLDMCtrl          Control handle [In] acquired by GetLDM Controller | | |
| Return value | None. | | |
| Function description | Releases the control handle acquired by GetLDM Controller in the interface. This API shall be executed to release the control handle at the end of control. | | |
| Interface reference for Java | | | Provided |
| Method name | ReleaseLDMController | Import | Com.ricoh.ldtr .LDMControllerJava Com.ricoh.ldtr.LDCConstantsUtils Com.sun.jna.Pointer |
| Type | Public static void releaseLDMController(Pointer hLDMCtrl); | | |
| Argument | hLDMCtrl          Control handle [In] acquired by GetLDM Controller | | |
| Return value | Same as interface reference for C,C++ | | |
| Function description | Same as interface reference for C,C++ | | |

## 4.5. Error code

### 4.5.1. Error Code Classification

Error codes are defined by 16-bit variable WORD type as the return values that SDK responds to in each API. Error codes are classified into the following two types of errors.

1. Error of control system... Indicates error classified into control system. When an error occurs, the host is notified of the error code. Error code is displayed on the front panel and error lamp lights. The controller moves to the error state and waits for error release. Restart is required for some errors.

2. Error in communication system... Indicates error classified in communication system. When an error occurs, the host is notified of the error code. No error code is displayed on the front panel and no error lamp is lit. Error cancellation is not necessary and irradiation operation can be continued (e.g. when CreateJob exceeds the maximum number of pending jobs or when characters that cannot be printed in SetText are specified).

The host application should create a recovery process flow according to the error code classification.

**4.5.2. Error code list**

List the values and names of the error codes, their causes, and actions taken. (The error codes in the table are displayed in hexadecimal).

| Error code | Cause | Measures to be taken |
| --- | --- | --- |
| 0x0041 | Emergency stop switch is pressed. | Reset the error with ResetError after eliminating the error cause. |
| 0x0042 | The interlock is released. | Reset the error with ResetError after eliminating the error cause. |
| 0x1042 | Head error 2 occurred. | Reset the error with ResetError after eliminating the error cause.<br>If you cannot reset the error, restart the system.<br>If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x1044 | Head error 1 (print stop) occurred. | Reset the error with ResetError after eliminating the error cause.<br>If you cannot reset the error, restart the system.<br>If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x1081 | Head error 1 occurred. | Contact the maintenance service contact person. |
| 0x1083 | Head does not start. | Contact the maintenance service contact person. |
| 0x1241 | The shutter of the head does not work properly. | Reset the error with ResetError after eliminating the error cause.<br>If you cannot reset the error, restart the system.<br>If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x1242 | LaserStop connector signal is released during printing. | Do not open the external shutter during laser irradiation.<br>Reset the error using ResetError.<br>Repeat printing from the beginning. |
| 0x2145 | Temperature of laser light source reaches alert value. | Since the temperature is high, leave it in an error condition for a while and execute ResettError.<br>If you cannot reset the error, restart the system.<br>If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x2181 | The temperature of the laser light source is too high. | Contact the maintenance service contact person. |
| 0x2182 | Laser source temperature is too low. | Contact the maintenance service contact person. |
| 0x2282 | The laser driver is abnormal. | Contact the maintenance service contact person. |
| 0x2342 | A self-diagnosis error occurred on the liquid cooling control PCB. | Reset the error with ResetError after eliminating the error cause.<br>If you cannot reset the error, restart the system.<br>If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x2345 | The cooling pump revolution is abnormal. | Restart the system.<br>If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x2348 | The temperature in the laser radiation unit is too high. | Check the filter.<br>Decrease the temperature inside the unit.<br>Reset the error with ResetError after eliminating the error cause. |

**RICOH**

| Error code | Cause | Measures to be taken |
|---|---|---|
| 0x2349 | The temperature in the laser radiation unit is too low. | The temperature in the unit is too low. Warm the unit. Reset the error with ResetError after eliminating the error cause. |
| 0x234B | The detection temperature of the ambient temperature sensor is too high | The ambient temperature is too high. Cool it. Reset the error with ResetError after eliminating the error cause. |
| 0x234C | Detection temperature of ambient temperature sensor is too low. | Warm the ambient temperature because it is too low. Reset the error with ResetError after eliminating the error cause. |
| 0x2381 | Communication with liquid cooling control PCB is impossible. | Contact the maintenance service contact person. |
| 0x2383 | Liquid cooling fan 1 does not rotate. | Contact the maintenance service contact person. |
| 0x2384 | Liquid cooling fan 2 is not rotating. | Contact the maintenance service contact person. |
| 0x2386 | Insufficient water is used in the cooling liquid. | Check the slope and liquid leakage. Contact the maintenance service contact person. |
| 0x2387 | The fluid level sensor is short-circuited. | Contact the maintenance service contact person. |
| 0x238D | Liquid cooling fan not in operation | Contact the maintenance service contact person. |
| 0x2441 | Laser source temperature sensor exceeds the detection temperature range (-50°C to 90°C) | Reset the error with ResetError after eliminating the error cause. If you cannot reset the error, restart the system. If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x2442 | Liquid cooling board upper temperature sensor exceeds the detection temperature range (-40°C to 90°C) | Reset the error with ResetError after eliminating the error cause. If you cannot reset the error, restart the system. If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x2443 | Ambient temperature sensor exceeds the detection temperature range (-40°C to 90°C) | Reset the error with ResetError after eliminating the error cause. If you cannot reset the error, restart the system. If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x2444 | The laser light source temperature sensor is out of order. | Contact the maintenance service contact person. |
| 0x2445 | The temperature sensor on the liquid cooling PCB is out of order. | Contact the maintenance service contact person. |
| 0x2446 | The ambient temperature sensor is out of order. | Contact the maintenance service contact person. |
| 0x2581 | An error occurred in the power supply for the laser light source. | Contact the maintenance service contact person. |
| 0x3082 | Failed to initialize the motherboard of the CTL unit. | Contact the maintenance service contact person. |
| 0x3083 | Failed to acquire the emergency stop switch status or interlock status. | Contact the maintenance service contact person. |
| 0x3141 | The main PCB is in error. | Restart the system. If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x3182 | Failed to initialize the main PCB. | Restart the system. If an error occurs after restart, stop the system and contact the maintenance service contact. |

| Error code | Cause | Measures to be taken |
|---|---|---|
| 0x3241 | A self-diagnosis error occurred on the front board. | Restart the system.<br>If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x3242 | Communication with the front board is impossible. | Reset the error with ResetError after eliminating the error cause.<br>If you cannot reset the error, restart the system.<br>If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x4043 | Failed to connect the PLC board.<br>Communication with the PLC board is impossible. | Reset the error with ResetError after eliminating the error cause.<br>If you cannot reset the error, restart the system.<br>If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x4081 | No loopback signal from PLC connected device | Contact the maintenance service contact person. |
| 0x4082 | An error occurred in the PLC PCB control. | Contact the maintenance service contact person. |
| 0x4084 | Communication with the PLC board is impossible. | Contact the maintenance service contact person. |
| 0x4085 | Self-diagnosis result error occurred on PLC board. | Contact the maintenance service contact person. |
| 0x7081 | Error occurred in software. | Reset the error using ResetError.<br>If you cannot reset the error, restart the system.<br>If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x7082 | Error occurred in software. | Reset the error using ResetError.<br>If you cannot reset the error, restart the system.<br>If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x7103 | Without password authentication | After password authentication, execute SDK IF or send command. |
| 0x7108 | An error occurred when reading a bitmap file in the controller. | Check the bitmap file. |
| 0x7111 | Since the job specified in the command is an erase job, print data cannot be set. | Check the set operation mode. |
| 0x7114 | The media temperature of the command is out of range. | Use the media within the specified temperature range. |
| 0x7115 | Media temperature is set in duplicate with the command. | Do not set the media temperature more than once for a job. |
| 0x7116 | Media temperature setting by command cannot be performed after the start of irradiation. | Call the function without irradiation. |
| 0x7117 | The variable data format of the command does not match the layout. | Confirm that the contents of the layout file match the format of the variable data sent from the host. |
| 0x7118 | The job status acquisition using the command failed. | Perform job status acquisition again. |
| 0x711A | There are too many data (strokes) irradiated for one piece of media. | Reduce the amount of information (characters, bar codes, etc. specified by the layout and SDK) to be irradiated on the media.<br>If this error occurs after a job is created, the target job is deleted.<br>After reviewing the information to be delivered to the media, re-create the job. |

**RICOH**

| Error code | Cause | Measures to be taken |
|---|---|---|
| 0x711C | The object is set outside the printable area in the specified layout. | Review the horizontal and vertical positions, including the offset specification.<br>If this error occurs after a job is created, the target job is deleted.<br>After reviewing the information to be delivered to the media, re-create the job. |
| 0x711D | Illegal values are set in the media information or object information in the layout file. | Make sure that the media size of the layout file is tied to the media type.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x711F | Variable data is invalid. | The specified variable data is invalid. Specify the variable data again. |
| 0x7120 | The specified key is invalid. | The specified key is invalid. Specify the key again. |
| 0x7121 | The specified setting is incorrect. | The specified set value is incorrect. Specify the set value again. |
| 0x7122 | You cannot access the log file. | Check that the log folder and log file are not opened. |
| 0x7123 | File compression failed. | Check if the log file exists. |
| 0x7124 | File decompression failed. | Check that the file is not corrupted. |
| 0x7125 | The acquisition of the file version failed. | Make sure that the application is installed. |
| 0x7126 | The update file is corrupted. | Check that the update file is correct. |
| 0x7127 | Failed to change the configuration file. | Check the set keys and parameters and reset them. |
| 0x7128 | The update process failed. | Re-update. |
| 0x7129 | The backup file does not exist. | The backup file is not available and cannot be executed. |
| 0x712A | Layout-related file list generation failed. | Read the list again.<br>If it recurs, restart.<br>Contact the maintenance service contact if it occurs after restart. |
| 0x712B | Preparation for transferring layout-related files failed. | Check that the specified file name is correct. |
| 0x712C | Backup of the layout folder failed. | Check that the specified file name is correct. |
| 0x712D | Failed to create a folder to save the upload file. | Restart upload.<br>If it recurs, restart the controller. |
| 0x712E | Failed to save the upload file. | Confirm the layout file to be uploaded and perform the upload again.<br>If it recurs, restart the controller. |
| 0x712F | Layout folder failed to be uploaded | Confirm the layout file to be uploaded and perform the upload again.<br>If it recurs, restart the controller. |
| 0x7130 | Failed to restore the layout folder. | Repeat the procedure.<br>If the operation fails after re-execution, the Layout folder cannot be restored because there is no backup folder. |
| 0x7131 | Failed to restore the configuration file. | Restore the file after checking the file size and file format for errors. |
| 0x7132 | Position coordinate or work-to-work distance is out of range at fixed-point irradiation. | Set to an appropriate range and repeat the procedure. |

**RICOH**

| Error code | Cause | Measures to be taken |
|---|---|---|
| 0x7133 | Speed setting for irradiation is out of the specified value. | Speed during irradiation is out of tolerance.<br>Correct the setting so that it is within the appropriate range. |
| 0x7134 | Power setting at irradiation is out of the specified value. | Set the power value within the specified range and execute the operation again.<br>When the correction function is enabled, set the value with margin. |
| 0x7135 | Run time for fixed-point irradiation is out of range. | Set the time within the specified range of run time and execute it again. |
| 0x7136 | The default equipment condition cannot be changed. | Restart the controller. |
| 0x7137 | Failed to verify laser unemitted light detection. | Repeat the procedure.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7141 | Failed to install the controller software. | Contact the maintenance service contact person. |
| 0x7142 | Failed to uninstall the controller software. | Contact the maintenance service contact person. |
| 0x7143 | The controller software failed to run. | Contact the maintenance service contact person. |
| 0x7147 | Loading of the layout file in the controller failed. | Check the layout table file and layout file.<br>Reset the error using ResetError.<br>If you cannot reset the error, restart the system.<br>If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x7149 | An error occurred when a file was opened in the controller. | Confirm that there is a file before restarting. |
| 0x714A | Failed to write the configuration file. | Confirm that there is a file before restarting. |
| 0x7153 | The distance between workpieces is out of the range. | Set the value within the compensatable range.<br>Adjust the media position and head unit position so that the value is within the set range after maintenance. |
| 0x7154 | Failed to initialize the laser radiation control section. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7155 | Laser radiation control stopped abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7156 | Initialization of the network setting control section failed. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7157 | Failed to change the equipment status. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7158 | Failed to monitor the equipment status. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7159 | The controller main control unit stops abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x715A | Error control section of the controller stops abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |

**RICOH**

| Error code | Cause | Measures to be taken |
|---|---|---|
| 0x715B | Failed to initialize the fixed-point radiation control section. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x715C | The fixed-point radiation control unit stops abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x715D | Failed to correct the distance between workpieces. | Check the created job and delete or reset it.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x715E | Media temperature forecasting failed. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x715F | Initialization of the laser radiation monitoring unit failed. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7160 | Failed to initialize the front panel control. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7161 | Front panel control stopped abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7162 | Front panel control stopped abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7163 | The switch control section on the front panel stopped abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7164 | Initialization of the head unit control unit failed. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7165 | Head unit control unit stopped abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7166 | Failed to initialize the monitoring and control section of the cooling system. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7167 | Supervisory control section of cooling system stopped abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7168 | Communication with the cooling system stopped abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7169 | Periodic status monitoring from the cooling system stops abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x716A | Transmission to the cooling system stopped abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x716B | Initialization of the job control failed. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x716C | The job controller stopped abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x716D | Job History Management Department stopped abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |

**RICOH**

| Error code | Cause | Measures to be taken |
|---|---|---|
| 0x716E | Setting file control section has stopped abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x716F | Layout control unit stopped abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7170 | The motherboard control unit stops abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7171 | Condition monitoring of the terminal block control unit stopped abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7172 | Acquisition of information from the main PCB control section stops abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7173 | The setting of the information to the main PCB control section stopped abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7185 | Failed to load the configuration file. | Contact the maintenance service contact person. |
| 0x7186 | An error was detected in the internal counter of the controller. | Contact the maintenance service contact person. |
| 0x7187 | The internal counter control section of the controller stops abnormally. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x719A | The reference correction file failed to be read. | Confirm that there is a reference correction file.<br>Then restart the system.<br>If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x719B | Creation of the correction file failed. | Restart the system.<br>If an error occurs after restart, stop the system and contact the maintenance service contact. |
| 0x7402 | The command does not match the authentication password. | Check the specified password. If you forget your password, please contact the maintenance service contact. |
| 0x7403 | The registered password has not changed from the initial password. | Change the password. To connect with the initial password, use the initial password again. |
| 0x7404 | The password length after the change is invalid or contains characters that cannot be used. | Check the password after the specified change. |
| 0x7405 | The new password contains the previous password. | Check the password after the specified change. |
| 0x7407 | Account lock is in progress due to authentication failure. | Wait for a while before reconnecting. If you forget your password, please contact the maintenance service contact. |
| 0x7408 | Layout file name is wrong. | Confirm the layout file to be uploaded and perform the upload again. |
| 0x7409 | The number of the layout file list obtained is wrong. | Confirm the layout file to be uploaded and perform the upload again. |
| 0x740A | Layout-related file size is wrong. | Confirm the layout file to be uploaded and perform the upload again. |
| 0x740B | Layout upload has not started. | The command sequence for uploading layouts is incorrect. Send the command in the order of the upload start command, upload command, and upload end command. |

**RICOH**

| Error code | Cause | Measures to be taken |
|---|---|---|
| 0x740C | The value specified in the data section of the command is mismatched. | Command data parameters are incorrect. |
| 0x740D | The value specified in the data section of the command is out of range. | Command data parameters are incorrect. |
| 0x740E | The size of the data section of the received command is incorrect. | Inappropriate command data size. |
| 0x740F | The size of the data part of the command you tried to reply to is incorrect. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7410 | Layout upload is in progress and cannot be executed. | Re-perform the procedure after completion of uploading the layout. |
| 0x7411 | The acquired device status is abnormal. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7412 | Already have the largest number of jobs | Delete the job or execute it again after completion of printing. |
| 0x7413 | The layout number is out of range. | Specify the layout number from 1 to 99. |
| 0x7414 | Job ID is out of range. | Job numbers range from 1 to 9999.<br>Confirm and specify the job number. |
| 0x7415 | Object number is out of range. | Object numbers range from 1 to 99.<br>Check the layout file and specify the object number. |
| 0x7416 | Variable data is empty. | Set the variable data. |
| 0x7417 | The specified horizontal and vertical positions are out of range. | Check the set range.<br>Check the job status and reset the settings. |
| 0x7418 | The specified work-to-work distance is out of range. | Check the set range.<br>Check the job status and reset the settings. |
| 0x7419 | There is no job with the specified ID. | Confirm and configure the job ID. |
| 0x741A | Failed to create a job | Repeat the procedure.<br>If it recurs, restart the controller. |
| 0x741B | Job Monitoring thread exclusion timed out | Restart.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x741C | Job deletion failed. | Repeat the procedure.<br>If it recurs, restart the controller. |
| 0x741D | The specified constant-point power is out of range. | Set the value within the range. |
| 0x741E | The specified fixed-point time is out of range | Set the value within the range. |
| 0x741F | I tried to re-establish SetDataEnd in a Job that has already set DataEnd. | Confirm the current job and perform it again. |
| 0x7420 | I attempted TargetReady again for a Job that has already been TargetReady. | Confirm the current job and perform it again. |
| 0x7421 | I tried to set the data in the Job already being printed. | Coping jobs cannot be set because they are being printed. |

| Error code | Cause | Measures to be taken |
|---|---|---|
| 0x7422 | The device status cannot be changed because the job is running. | Wait for the job to complete, or delete the job and execute it again. |
| 0x7423 | The data of the command does not match the command specification. | Check the command specifications. |
| 0x7424 | Cannot be received during Standby, Shutdown, or Start | Wait until the command is ready for reception. Check the list of acceptance/rejection for the controller status. |
| 0x7425 | Cannot be received due to error. | Reset the error and execute it again. |
| 0x7426 | Unable to receive radio signals due to preparation | Wait until it enters standby state, and then perform the procedure again. |
| 0x7427 | Cannot be received because the watch is waiting. | Change the state and perform the procedure again. |
| 0x7428 | Unable to receive radio signals due to irradiable condition | Change the state and perform the procedure again. |
| 0x7429 | Unable to receive radio signals due to irradiation | Change the state and perform the procedure again. |
| 0x742A | The watch is unable to receive radio signals due to guide mode. | Change the state and perform the procedure again. |
| 0x742B | Unable to receive radio signals due to maintenance mode | Change the state and perform the procedure again. |
| 0x742C | Unable to receive radio signals due to fixed-point irradiance | Change the state and perform the procedure again. |
| 0x742D | Unable to receive radio signals due to fixed-point irradiation | Change the state and perform the procedure again. |
| 0x742E | There is no download file. | Check the layout folder and execute it again. If the problem recurs, contact the maintenance service contact person. |
| 0x742F | Layout file size is 0. | Check the layout file and execute it again. If the problem recurs, contact the maintenance service contact person. |
| 0x7430 | Unable to receive radio signals due to software update | Wait until the software update is complete, and then do it again. |
| 0x7501 | The main command does not match. | The target command does not exist. |
| 0x7502 | The size of the data section is too large. | Reduce the command data size and execute the command again. |
| 0x7503 | The command version is wrong. | Update and execute the controller software again. |
| 0x7504 | The delimiter of the command is wrong. | Check the communication delimiter. |
| 0x7505 | The command is too short. | Check the command size and execute the correct command. |
| 0x7506 | Communication setting is wrong. | Incorrect setting range may occur. Check the setting parameters of the network setting command and execute it again. |
| 0x7507 | Command processing is already in progress. | Confirm that the command has been executed and execute it again. |
| 0x7508 | The command was shut down before the command was processed. | Restart the controller and execute it again. |
| 0x7509 | Failed to send command. | Repeat the procedure. If it recurs, restart the controller. |

**RICOH**

| Error code | Cause | Measures to be taken |
|---|---|---|
| 0x7541 | Initialization of the communication control section failed. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7542 | Exclusion of communication in the communication control section has timed out. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7543 | Exclusion of reception command in communication control section timed out. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7544 | Communication setting failed. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7545 | Communication setting failed due to DHCP. | Contact the maintenance service contact person. |
| 0x7546 | Communication setting failed. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7547 | The change to the online mode failed. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7601 | The font undefined character has been entered into the drawing module. | Change non-printable characters to printable substitute characters. |
| 0x7602 | An unwanted join occurred during drawing. | Restart the controller. If it recurs, call the service. |
| 0x7603 | The rendered object has been redrawn. | Restart the controller. If it recurs, call the service. |
| 0x7642 | An error occurred in the internal processing of the drawing module. | Restart the controller. If it recurs, call the service. |
| 0x7643 | The drawing module cannot allocate memory. | Restart the controller. If it recurs, call the service. |
| 0x7644 | Bitmap fonts cannot be found. | Contact the maintenance service contact person. |
| 0x7645 | Initialization process of drawing module failed. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7646 | The font name for the font is incorrect. | Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x7647 | The area specification in the drawing module is wrong. | The layout file is incorrect.<br>Recreate the layout file. |
| 0x7648 | The object type is invalid. | The layout file is incorrect.<br>Recreate the layout file. |
| 0x8081 | Error occurred in software. | Restart.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x8082 | Error occurred in software. | Restart.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x8511 | The main command does not match. | Restart.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x8512 | The size of the data section is too large. | Decrease the data to be sent. |
| 0x8513 | The command version is wrong. | Update the software version of the controller and SDK. |

| Error code | Cause | Measures to be taken |
|---|---|---|
| 0x8514 | The delimiter of the command is wrong. | Restart.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x8515 | The command is too short. | Restart.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x8601 | Out-of-range arguments are specified. | Review the value of the argument. |
| 0x8605 | The SDK configuration file is wrong. | Review the setting items and values in the SDK configuration file. |
| 0x8606 | Failed to read the bitmap file. | Check that there is a file. |
| 0x8607 | Failed to file bitmap data. | Check that there is a file. |
| 0x860A | SDK failed to connect to the controller. | Check the communication settings. |
| 0x860B | Reception failed. | Check the communication status. |
| 0x860C | Transmission failed. | Check the communication status. |
| 0x860D | Ethernet setting is incorrect. | Review the Ethernet setting items and values in the configuration file. |
| 0x8613 | The communication section failed to respond for a certain period of time. | Setting variable data for a job can be a load.<br>Review the job control sequence and check that the PC is not overloaded. |
| 0x8614 | The maximum number of jobs has already been created. | Since the maximum number of jobs has already been created, you cannot create a new job.<br>Check the job control sequence. |
| 0x8615 | Layout-related file name is wrong. | Rename the layout file. |
| 0x8616 | Layout-related file size is wrong. | Reduce the file size. |
| 0x8617 | Layout-related data processing failed. | Review the value of the argument and perform it again.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x8618 | Bitmap data processing failed. | Review the value of the argument and perform it again.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x8619 | The IP address is wrong. | Check the IP address setting and perform the procedure again. |
| 0x861A | MAC address is wrong. | Contact the maintenance service contact person. |
| 0x861B | The port number is incorrect. | Check the port number setting and execute the procedure again. |
| 0x861C | Data conversion failed. | Review the value of the argument and perform it again. |
| 0x861D | Bitmap data format is abnormal. | Bitmap file out of specification. |
| 0x861E | Bitmap file size too large | Bitmap file size is too large.<br>Reduce the size and perform the test again. |
| 0x861F | Failed to prepare before executing the low-level access command. | Repeat the procedure.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x8620 | Job ID out of range received | Job ID is out of range.<br>Confirm the job ID and execute it again. |
| 0x8621 | Incorrect received job status | Check the controller and SDK versions.<br>Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |

| Error code | Cause | Measures to be taken |
|---|---|---|
| 0x8622 | Incorrect received device status | Check the controller and SDK versions.<br>Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x8623 | Failed to disassemble the data | Check the controller and SDK versions.<br>Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x8624 | Error occurred during serial data holding. | Check the controller and SDK versions.<br>Restart the controller.<br>If the problem recurs, contact the maintenance service contact person. |
| 0x8625 | Communication is disconnected. | Connect again. |
| 0x8626 | The size of the returned argument is insufficient. | Increase the size of the area passed by argument. |
| 0x8627 | Communication setting failed. | Check the specified communication settings. |
| 0x8628 | Communication connection impossible | Contact the maintenance service contact person. |
| 0x8629 | Failed to update the SDK configuration file. | Review the setting items and values in the SDK configuration file. |
| 0xF800 | SDK unauthorized handle | Check that the value of the argument (handle) is valid. |

## 4.6. List of Acceptability of Acceptance for Controller Status of Each API

As shown in the table below.

| | State (the left priority) | Power OFF | Stand-by | shutdown in progress | startup in progress | Maintenance mode | In error | Preparation in progress | On standby | Guide mode | Irradiable | irradiation in progress |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SDK API  "Normal response" refers to the normal execution of processing and does not guarantee that the execution result is successful.  (Success or Error is returned depending on the argument or execution condition. See each API specification for details.) | | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response |
| | PowerOn | Normal response (The equipment won't start.) | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response |
| | Connect | Error | Error | Error | Error | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response |
| | ChangePassword | - | - | - | - | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response |
| | GetMachineState | - | - | - | - | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response |
| | SetMachineState | - | - | - | - | Error | Error | Error | Normal response | Normal response | Depend on the Job status ※1 | Error |
| | ResetMaintenanceMode | - | - | - | - | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response |
| | GetErrorCode | - | - | - | - | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response |
| | ResetError | - | - | - | - | Normal response | Depending on the reset result ※5 | Normal response | Normal response | Normal response | Normal response | Normal response |
| | GetPartsInformation | - | - | - | - | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response |
| | GetConfig | - | - | - | - | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response |
| | SetConfig | - | - | - | - | Normal response | Normal response | Normal response | Normal response | Error | Error | Error |
| | GetTemperature | - | - | - | - | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response |
| | CreateJob | - | - | - | - | Error | Error | Error | Error | Normal response | Normal response | Normal response |
| | DeleteJob | - | - | - | - | Error | Error | Error | Error | Normal response | Normal response | Depending on the specified job ※2, ※3 |
| | IsMarkable | - | - | - | - | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response |
| | SetText | - | - | - | - | Error | Error※4 | Error※4 | Error※4 | Normal response | Normal response | Depending on the specified job ※2, ※3 |
| | SetBitmap | - | - | - | - | Error | Error | Error | Error | Normal response | Normal response | Depending on the specified job ※2, ※3 |
| | SetBitmapFile | - | - | - | - | Error | Error | Error | Error | Normal response | Normal response | Depending on the specified job ※2, ※3 |
| | SetBitmapText | - | - | - | - | Error | Error | Error | Error | Normal response | Normal response | Depending on the specified job ※2, ※3 |
| | SetDataEnd | - | - | - | - | Error | Error | Error | Error | Normal response | Normal response | Depending on the specified job ※2, ※3 |
| | TargetReady | - | - | - | - | Error | Error | Error | Error | Normal response | Normal response | Error |
| | TargetReadyXYZ | - | - | - | - | Error | Error | Error | Error | Normal response | Normal response | Error |
| | SetMediaTemperature | - | - | - | - | Error | Error | Error | Error | Normal response | Normal response | Depending on the specified job ※2, ※3 |
| | GetJobStatus | - | - | - | - | Error | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response |
| | GetCurrentJobID | - | - | - | - | Error | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response |
| | Disconnect | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response |
| | PowerOff | - | - | - | - | Normal response | Normal response | Normal response | Normal response | Normal response | Normal response | Error |
| Detailed transition | State | Power OFF | Stand-by | shutdown in progress | startup in progress | Maintenance mode | In error | Preparation in progress | On standby | Guide mode | Irradiable | irradiation in progress |

・ "-" means "Connect" fails and the execution conditions of the applicable API are not satisfied (error).

・ By specified Job: In the target API, there is an error Job status.

※1 Currently active job,

    ・ Erase only: Normal response

    ・ Print only: Normal response

    ・ Delete print:
        └ erase not started: Normal response
        └ If deletion has started: Error

※2 When the maximum number of jobs (2) is being created,

    ・ Specify the currently irradiated job: Error

    ・ Specify a job that is not currently irradiated: Normal response

※ Even if the target of the API is "currently irradiated job," if "Delete" is completed and "Print" is not started, "Normal response" is returned.

※4 If the job on the controller side is discarded due to an error or a state transition, a normal response may occur. In this case, an error occurs at SetDataEnd.

※5 As a result of error cancellation,

    ・ Successful release: Normal response

    ・ Failure to release: error

# 5. Data file

## 5.1. SDK configuration file

Various settings required for SG control in SDK use the values described in the configuration file (LDMC_ProfileX.dat) located in the same directory as SDK (LDMarController.dll). The character code of the character string handled in this configuration file is UTF-8 (with BOM), and when the setting is changed, it is edited using a text editor.

The setting file consists of multiple lines separated by line feed codes. Each line is a separator with "= (equal)" as the format consisting of keywords and values. The line starting with # shall be ignored as a comment line, and the first line of the configuration file shall always be in the comment format.

One setup file can be used to set up one device information. When device number X is specified, the setting is associated with "LDMC_ProfileX.dat (where "X" is the device number)" and can be set to up to 10 units. (Equipment number "X" ranges from 0 to 9)

> Example: File name for device number 2 → LDMC_Profile2.dat

Device information in the configuration file is as follows.

| Parameter name | Valid value | Item Description |
|---|---|---|
| # SDK configuration file | | |
| [#Setting Connection Control] | | |
| ConnectTimeoutMsec | Integer greater than or equal to 0 | Sets the timeout before connection to the controller is completed. |
| CommandTimeoutMsec | Integer greater than or equal to 0 | Sets the timeout from the command transmission to the reception of the response command. |
| ConnectMode | Ethernet | Specifies the communication type of the controller to be controlled. Specify Ethernet. |
| EthIPAddress | - | Specifies the IPv4 address of the controller to be controlled and the controller to be controlled when communication is connected by Ethernet. Enter in dotted decimal notation. Example: When the IPv4 address is 0xC0A80002, Described as 192.168.0.2. |
| Subnetmask | - | Specifies the subnet mask of the controller to be controlled and the subnet mask of the controller to be controlled when communicating with Ethernet. Enter in dotted decimal notation. For example, when the subnet mask is 0xFFFFFF00, Write 255.255.255.0. |
| EthPortNo | Integer from 1 to 65535 | Specifies the port number of the controller to be controlled and the controller to be controlled when communication is connected by Ethernet. (1-1023 are reserved as well-known ports) |
| MACAddress | - | Specifies the MAC address of the controller to be controlled and the controller to be controlled when communication is connected by Ethernet. Indicate single-byte alphanumeric characters in hexadecimal characters separated by two digits by a "-". For example, if the MAC address is 0x1234567890AB, Describe 12-34-56-78-90-AB. |
| RecvThreadStackByteSize | Integer greater than or equal to 0 | Adjusted value of the thread the SDK internally starts up when communicating with the controller to be controlled. This parameter value must not be changed from the default value when SDK is provided. |
| [#BMP File Config] | | |
| BmpFileOutDirPath | - (Specify a valid path) | The path to the destination directory of the bitmap file specified by SetBitmap, SetBitmapText API. The maximum |

RICOH
imagine. change.

| Parameter name | Valid value | Item Description |
|---|---|---|
| | | length of a string that can be specified in the destination path is 127 bytes. When [BmpFileSaveMode] is set to [On], This parameter specifies the path for which the UAC is valid. Enter the end of the path in yen.　Example: When specifying the "Temp" folder under drive C　　BmpFileOutDirPath=C:\Temp\ When this parameter is not set, SDK does not output the bitmap file. (The behavior of BmpFileSaveMode is the same as that of Off.) |
| BmpFileSaveMode | On or Off | Specifies whether to save the bitmap file specified by SetBitmap and SetBitmapText API. If On is specified, the bitmap file is saved in the directory specified by "BmpFileOutDirPath". If Off is specified, it is not saved. |

An example of the SDK configuration file is described below.
　　Example) LDMC_Profile1.dat
　　　　　# SDK configuration file
　　　　　[#Setting Connection Control]
　　　　　ConnectTimeoutMsec=1000
　　　　　CommandTimeoutMsec =10000
　　　　　ConnectMode=Ethernet
　　　　　EthIPAddress=192.168.0.2
　　　　　EthPortNo=39403
　　　　　MACAddress=12-34-56-78-90-AB
　　　　　Subnetmask=255.255.255.0
　　　　　RecvThreadStackByteSize=1048576
　　　　　 [#BMP File Config]
　　　　　BmpFileOutDirPath= 。 \log\
　　　　　BmpFileSaveMode=Off

## 5.2. SDK log configuration file

　　Various settings required for the output of the SDK log shall be based on the values described in the log configuration file (log_sdk.ini, LDTRCmdSdk.ini) located in the same directory as the SDK (LDMarController.dll). Use a text editor to edit the settings.

## 5.3. Bitmap file

　　The SDK outputs and stores the transmitted data in the file when transmitting the bitmap data. The file name is LDM[Device number]_[Job ID]_[Date/minute/second]_[Serial number].bmp.

Example: device number "1", job ID "1234", transmit date and time "2016/11/01 12:34:56", serial number "1"
→ LDM1_1234_20161101123456_01.bmp

　　Bitmap files saved above are generated when bitmap data is specified by SetBitmap, SetBitmapFile, and SetBitmapText. The destination of the bitmap file can be changed in the configuration file (it is saved regardless of the transmission failure). For details, refer to "5.1 SDK configuration file".5.1SDK configuration file

# 6. Precautions

## 6.1. How to handle build errors caused by the definition type

Some data types used in SDK are Windows-dependent and are usually defined in the header file WinDef.h in Visual Studio. If the development project cannot refer to WinDef.h, the following type definitions can be avoided by including them in the header file.

```
Typedef unsigned char      BYTE;
Typedef unsigned short     WORD;
Typedef unsigned long      DWORD;
Typedef int                BOOL;


#define  TRUE    1
#define  FALSE   0
```
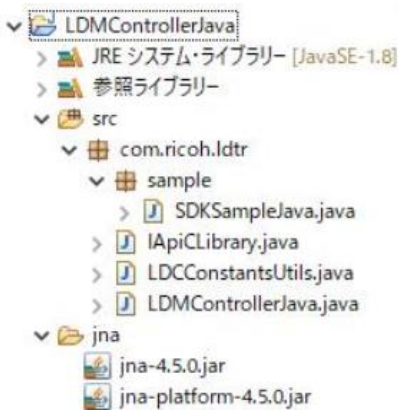
# 7. Special notes

## 7.1. About the Java API

The Java API is a SDK for Java languages and provides functionality through Java Native Access (JNA).

This SDK provides the source file for using the SDK from Java and the Java Native Access (JNA) library for use in the source file.

The package structure of the Java API to be provided is as follows.



Java API package overview

| No. | SDK Java configuration | Overview |
|-----|------------------------|----------|
| 1 | LDMControllerJava | Java API Properties are located. |
| 2 | Src | Position the Java API and sample source files. |
| 3 | Com.ricoh.ldtr | The Java API package. Position the Java API source file. |
| 4 | Com.ricoh.ldtr.sample | Package of Java language samples. Position the source file (SDKSampleJava.java) of the Java language sample. |
| 5 | Jna | The JNA JAR file used by the Java API is located. |

## 7.2. How to use the Java API

Describe the procedures for using the Java API.

Note that this procedure is based on the assumption that Eclipse is used as the development environment.

When using the product in a development environment other than Eclipse, the setting method must be replaced with one based on each development environment.

① Start the development environment as an administrator and implement the following procedures in the development environment.

※ The project using this SDK must have been imported into the development environment as appropriate.

② Import the LDM Controller Java project into the development environment.

③ The following folders and files can be referenced in the development environment.

   ・ Bin folder under the LDMController Java project

   ・ Following jar file in the jar folder under the LDMController Java project

      ・ Jna-4.5.0.jar

      ・ Jna-platform-4.5.0.jar

   ・ Folder to store SDK libraries (such as LDMController_w32.dll)

     Example 1

       In the Execution Configuration > Environment tab of the user class that invokes the Java API, register the environment variable as follows.

         Variable: PATH

         Value: The absolute path to the folder that stores the SDK library

     Example 2

       The reference library of the user class that calls the Java API specifies the absolute path of the folder in which the SDK library is stored.

④ Build the LDMController Java project and User Class.

## 7.3. Notes on Running the Java API

The following two cases are identified as problems that arise during the execution of the Java API.

① When an exception (java.lang.Error: Invalid memory access) occurs inside the Java API

     Since the stack size of the SDK execution thread is suspected to be insufficient, increase the stack size in the following manner.

     Since the value to be specified for stack size depends on the environment of the PC that starts Java API, specify it depending on the environment.

       Setting example: When 400 KB is specified for stack size

         In the startup parameter of the JVM that runs the program calling the Java API,

         Option-Xss400k is added.

② When an exception does not occur in the Java API, but processing is interrupted.

     Since the stack size of threads started inside the SDK is suspected to be insufficient, increase the stack size in the following manner.

     Since the value to be specified for stack size depends on the environment of the PC that starts Java API, specify it depending on the environment.

       Example of setting: When 2 MB is specified for stack size

         Add RecvThreadStackByteSize= 2097152 to the SDK configuration file to be connected.

This is all.