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INSTRUCTION MANUAL

892-9903-007 Ver.8 March 2020

Hitachi Chromaster / Chromaster Rs driver for Empower3 (INSTALLATION)

Hitachi High-Tech Science Corporation

This product is intended for research use only.　It is not to be used for reporting patient diagnostic or therapeutic results.

- Before using the instrument, read the safety instructions and precautions carefully.
- Be sure to observe the safety instructions in this manual and the WARNING/CAUTION labels on the instrument.
- Keep this manual in a safe place nearby so it can be referred to whenever needed.

NOTICE:

1. The Information contained in this document is subject to change without notice for improvement.
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3. Hitachi High-Tech Science Corporation assumes no liability for any direct, indirect, or consequential damages arising from use not described in this manual.
   Utmost care must be exercised when using the instrument.
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PREFACE

Thank you very much for purchasing Hitachi Chromaster / ChromasterUltra Rs Driver for Empower3.
The Hitachi Chromaster / ChromasterUltra R_S Driver for Empower3 is the driver software for controlling the Hitachi high performance liquid chromatographs (HPLC) on Empower™ 3.

This software is intended for use by persons having a basic knowledge of chemical analysis.
Remember that improper use of analytical instruments, chemicals or samples would result not only in wrong analytical data but also in consequences adverse to safety. Note that it is allowed only for persons having a basic knowledge of chemical analysis procedures to use this instrument.

Carefully read this instruction manual before attempting operation. For proper use of the software, please acquaint yourself with it.

ABOUT THIS MANUAL

This instruction manual describe how to install and use the Hitachi Chromaster / ChromasterUltra Rs Driver for Empower3 for customer.

- The manual of the Hitachi Chromaster Driver for Empower is consists of:
  - INSTRUCTION MANUAL FOR HITACHI CHROMASTER / CHROMASTERULTRA RS DRIVER FOR EMPOWER3 (INSTALLATION)
  - INSTRUCTION MANUAL FOR HITACHI CHROMASTER DRIVER FOR EMPOWER3 (OPERATION)
  - INSTRUCTION MANUAL FOR HITACHI CHROMASTER DRIVER FOR EMPOWER3 (MAINTENANCE SOFTWARE)
  - INSTRUCTION MANUAL FOR HITACHI CHROMASTERULTRA RS DRIVER FOR EMPOWER3 (OPERATION)
  - INSTRUCTION MANUAL FOR HITACHI CHROMASTERULTRA RS DRIVER FOR EMPOWER3 (MAINTENANCE SOFTWARE)

  ※ Manuals of OPERATION and MAINTENANCE SOFTWARE have been saved to the Installation CD as PDF files.

  The operating procedures and matters that should be especially noted for the software are contained in this manual.

INSTALLATION	This includes how to install the Hitachi Chromaster / ChromasterUltra R_S Driver for Empower3.
OPERATION	This includes how to control the Chromaster / ChromasterUltra R_S series and set the analysis method.
MAINTENANCE SOFTWARE	This includes how to operate the Maintenance Software to maintain each modules of Chromaster / ChromasterUltra R_S series.

- **First of all, read "IMPORTANT" and "SAFETY SUMMARY" at the beginning of this manual for ensuring safety in operation of Hitachi Chromaster / ChromasterUltra R_S Driver for Empower3.**

ABOUT THE MARK IN THIS TEXT

There is the symbol mark in this text. The symbol mark help you understand the contents of information. The meaning of symbol mark is as shown below.

Mark	Name	Meaning
✍	Supplementary Mark	Provides detailed/complementary information to expand operational application for the left column contents.
☞	Reference Mark	Provides detailed/complementary information, and indicated in other chapters or other manuals.
☝	Attention Mark	Provides notes for reading instruction manuals, and precautions for operating modules. This is different from the information indicated in **NOTE**. The information which doesn't cause slight damage of module is indicated as attention.
[END]	End Mark	This is a mark to show the end of the operation.

IMPORTANT

This section describes Warranty, Installation and After-sale Technical Service.
Before using the Hitachi Chromaster / ChromasterUltra R_S Driver for Empower3, read this section carefully.

Warranty on Product..... IMPORTANT-1
Installation, Relocation and
After-sale Technical Service..... IMPORTANT-3
Technical Seminars and
Training Courses for Users..... IMPORTANT-3
Other Precautions IMPORTANT-3

IMPORTANT

Warranty on Product

Limited Warranty

The Hitachi Chromaster / ChromasterUltra R_S Driver for Empower3 is warranted to be free from defects in material or workmanship under normal use within the product specifications indicated in this manual and under conditions given below. This warranty is void if the software is not used according to the instruction manual.

The manufacturer makes no warranties, either express or implied, except as provided herein, including without limitation thereof, warranties as to marketability, merchantability, for a particular purpose or use, or against infringement of any patent.

No oral or written information or advice given by the manufacturer, its dealers, distributors, agents or employees shall create a warranty or in any way increase the scope of this warranty.

Scope of Warranty

Any parts which prove to be defective in design or workmanship during the warranty period will be repaired, adjusted or replaced without charge. A substitute part may be used for repair, or replacement with an equivalent product may be made instead of repair. Such system components as a personal computer and printer to be updated frequently for improvement may not be available in original versions at the time of replacement.

Note that this warranty does not apply to the instrument after it is discarded, or if modified by the user or resold without permission from the manufacturer, consumable parts, and any failure of lifetime-expired parts.

The manufacturer assumes no liability for any damage to data or application software due to any possible fault or failure of this instrument.

Warranty Period

One year from the date of initial installation.

(In case a separate warranty document has been issued, the warranty period indicated in it takes precedence over the above period.)

Warranty Limitations and Exclusions

Disclaimer of Warranty

THE MANUFACTURER MAKES NO WARRANTIES, EITHER EXPRESS OR IMPLIED, EXCEPT AS PROVIDED HEREIN, INCLUDING WITHOUT LIMITATION THEREOF, WARRANTIES AS TO MARKETABILITY, MERCHANTABILITY, FOR A PARTICULAR PURPOSE OR USE, OR AGAINST INFRINGEMENT OF ANY PATENT. IN NO EVENT SHALL THE MANUFACTURER BE LIABLE FOR ANY DIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE, OR LOSSES OR EXPENSES RESULTING FROM ANY DEFECTIVE PRODUCT OR THE USE OF ANY PRODUCT.

NO ORAL OR WRITTEN INFORMATION OR ADVICE GIVEN BY THE MANUFACTURER, ITS DEALERS, DISTRIBUTORS, AGENTS OR EMPLOYEES SHALL CREATE A WARRANTY OR IN ANY WAY INCREASE THE SCOPE OF THIS WARRANTY.

Note that the following cases are excluded from the scope of this warranty, i.e., these cases are beyond the coverage of free-of-charge repair even during the warranty period indicated above.

(a) Failure due to operation at a place not meeting the installation requirements specified by the manufacturer.

(b) Failure due to power supply voltage/frequency other than specified by the manufacturer or due to abnormality in power supply.

(c) Corrosion or deterioration of the tubing due to impurities contained in reagent, gas, air or cooling water supplied by the user.

(d) Corrosion of the electric circuits or deterioration of the optical elements due to highly corrosive atmospheric gas.

(e) Failure due to use of software, hardware or spare parts not supplied by the manufacturer.

(f) Failure due to use not described in the manual or improper repair not approved by the manufacturer.

(g) Failure due to maintenance or repair by other than service personnel qualified by the manufacturer.

(h) Failure due to relocation or transport conducted not under the supervision of the manufacturer after the initial installation of the instrument.

(i) Failure due to disassembly, modification or relocation not approved by the manufacturer.

(j) Failure due to acts of God, including fire, earthquake, storm, flood, lightning, social disturbance, riot, crime, insurrection, terrorism, war (declared or undeclared), radioactive pollution, contamination with harmful substance, etc.

(k) Failure of the hardware, or damage to the system software, application software, data or hard disk due to computer virus infection.

(l) After disposal of this instrument, after its resale without prior approval from the manufacturer, consumable parts, and failure of any part that have reached the end of its service life.

(m) Failure due to a life-limited part that has exceeded the end of its useful lifetime.

Installation, Relocation and After-sale Technical Service

Installation and Relocation

(a) Installation at delivery shall not be carried out by the user. It shall be carried out by our sales representative or the engineers who have been trained and qualified for this purpose by us in order to use the instrument safely and accurately.

(b) Before installation, the user shall make preparations for satisfying the installation requirements in accordance with this instruction manual.

(c) If relocation becomes necessary after initial installation (delivery), please contact the dealer from whom you purchased the instrument or our sales representative.

After-sales Service

(a) For after-sales service, contact our sales representative or service office of our sales representative.

(b) For service after the warranty period, consult us with regard to a maintenance and inspection service contract.

Technical Seminars and Training Courses for Users

We offer technical seminars and training courses at either our or user's facilities to ensure proper and safe operation of the analytical instrument to its full performance. For further information, contact our sales representative. (Applicants will be charged.)

Other Precautions

Handling of Chemicals and Samples

(1) The user is responsible for following relevant laws and regulations in handling, storage and disposal of chemicals and samples used in analytical operation with this instrument.

(2) Reagents, standard solutions and accuracy-control samples shall be handled, stored and discarded as instructed by the respective suppliers.

Trademark Acknowledgments

Microsoft, MS and Windows are a registered trademark or a trademark of Microsoft Corporation (USA) in the United State and/or the other countries.

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Waters, Empower and LAC/E is a registered trademark or a trademark of Waters Corporation in the United State and/or the other countries.

All other trademarks are the property of their respective holders and are hereby acknowledged.

⚠ SAFETY SUMMARY

Before using the Hitachi Chromaster / ChromasterUltra R_S Driver for Empower3, be sure to read the following safety instructions carefully.

⚠ Definitions of Safety Alert Symbol and Direction Word SAFETY-1
⚠ CAUTION Precautions in the Manual SAFETY-2
NOTICE Precaution SAFETY-3
Accuracy and Precision of Measured Values SAFETY-3
Data Backup SAFETY-3
Protection against Computer Viruses SAFETY-3
Power Interruption SAFETY-4
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SAFETY SUMMARY

⚠ Definitions of Safety Alert Symbol and Direction Word

The hazard warnings which appear on the warning labels on the product or in the manual have one of the following alert headings consisting of a safety alert symbol ⚠ and signal word WARNING or CAUTION.

	:	The alert symbol shown at left precedes every signal word for hazard warnings, and appears in safety-related descriptions in the manual. To prevent possible hazards or injury, be sure to follow the safety precautions preceded by this symbol.
⚠**WARNING**	:	Indicates a potentially hazardous situation which, if not avoided, will or can result in death or serious injury.
⚠**CAUTION**	:	Indicates a potentially hazardous situation which, if not avoided, will or can result in minor or moderate injury.

The following signal word *NOTICE* or NOTE is used to indicate precautionary instructions concerning possible property damage.

NOTICE	:	Used to indicate a potentially hazardous situation which, if not avoided, will or can result in damage to user's property, serious damage to the instrument, damage to data, or environmental pollution, though personal injury may not be incurred.
NOTE	:	Used to indicate explanatory information for ensuring proper instrument operation and accurate measurement while preventing any possible damage to the instrument.

- Be sure to observe the precautionary instructions in the manuals accompanying the instrument.
- Do not perform any operation or action other than described in these manuals.
- On occurrence of any trouble in the instrument, notify the nearest sales service representative of Hitachi High-Technologies.
- Keep in mind that the hazard warnings in the manuals or on the product cannot cover every possible case, as it is impossible to predict and evaluate all circumstances beforehand. Always be alert and use your common sense.

⚠ CAUTION Precautions in the Manual

Notes described in this manual and the description locations are shown as follows.

⚠ CAUTION

- Fatigue due to Long-Hour Operation

  If you keep working with the display monitor and keyboard for long hours, your eyes and body will be fatigued to jeopardize your health. When working with the display monitor for a long time, take a break for 10 to 15 minutes per hour for health of your eyes and body.

  (Chapter 1)

NOTICE Precaution

Accuracy and Precision of Measured Values

■ Carry out periodic inspection and check whether the system is operating normally.
If necessary, conduct measurement on a control sample.

Data Backup

■ Data on the hard disk may become unusable due to a system failure, wrong operation, computer virus infection, etc.
To ensure data integrity in case of accidental damage to the hard disk, periodically make backup copies of hard disk files onto removable disks. Be sure to carry out this data backup procedure periodically.

Protection against Computer Viruses

■ If any program/data is damaged suddenly or an unexpected operation/screen is encountered, the personal computer may be infected by a computer virus. Computer viruses are malicious programs that sneak into personal computers to cause misbehavior or damage to data. And, a program designed to offer protection against computer viruses is called a vaccine program.

Possible causes of virus infection are:

(1) Downloading a virus-laden program through communication.
(2) Using a floppy disk or other storage medium infected by a virus.

Note also that once a virus infects any personal computer, it may spread to other computers via communication or storage medium.

Never use a program or storage medium that is suspected of containing a virus.

If there is a possibility of virus infection, check for a virus using a vaccine program. Note, however, that some kinds of vaccine programs cannot eradicate particular viruses.
In such a case, be sure to make a backup of hard disk files.
The user is requested to prepare a vaccine program and carry out virus removal on his or her responsibility.

NOTICE Precaution (Continued)

Power Interruption

- On occurrence of momentary power voltage drop due to power interruption or lightning, the personal computer may become faulty or the basic software, application software or data may be damaged.
  For protection against momentary power voltage drop, it is advisable to use an AC uninterruptible power supply unit (stated according to the Japanese Electronic Industry Development Association guidelines for protection against momentary power voltage drop in personal computers).

About Personal Computer

- About handling of the personal computer, read the manual that is standard-furnished for personal computer and use as directed.
  When using this product, be sure to observe the warnings and cautions shown by the personal computer manufacturer.

- Do not turn off the personal computer main circuit while the hard disk or removable disk drive is active. If power to the personal computer is turned off while the hard disk or removable disk is being accessed, the personal computer may become faulty or data/software stored in it may be damaged. Before turning off power to the personal computer, quit the Empower3 and then take the shutdown sequence of the operating system of the personal computer.

- Do not locate the personal computer on an unstable place or a narrow place. Failure to do so could result in personal injury or damage to the personal computer.

- Do not spill the solvent on the personal computer because there is a possibility that the personal computer fails. Should you spill the solvent on the personal computer, wipe it off immediately.
  If you use as it is, it cause an electric shock, release of fume and ignition.

- Do not use the volatile liquid near the personal computer because of the possibility of ignition hazard.

PREFACE

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TERMINOLOGY

1

OVERVIEW

This section shows the overview of Hitachi Chromaster / ChromasterUltra R_S Driver for Empower3, system configuration and PC requirement.

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⚠ CAUTION

Fatigue due to Long-Hour Operation

If you keep working with the display monitor and keyboard for long hours, your eyes and body will be fatigued to jeopardize your health. When working with the display monitor for a long time, take a break for 10 to 15 minutes per hour for health of your eyes and body.

1.1 Overview

This manual describes the procedure for installing the Hitachi Chromaster / ChromasterUltra R_S driver for Empower3, and the USB driver for Interface Control Board (IFC) onto a personal computer (PC). Please read this manual when installing the Hitachi Chromaster / ChromasterUltra R_S driver for Empower3 and the USB driver for IFC.

For installation and operation of the Empower™3 Software, read the instruction manual of Empower™3 Software.

In each of the instruction manuals, including this document, the Empower™3 Software is referred to as “Empower” and the Microsoft® Windows® operating system as “Windows”, unless otherwise specified.

The Hitachi Chromaster / ChromasterUltra R_S driver for Empower3 is an application software product designed to run on Windows. In each instruction manual for the Hitachi Chromaster / ChromasterUltra R_S driver for Empower3, such basic operations of Windows as menu opening, command selection, dialog box setting, and file copying are not explained. If you are using Windows for the first time, please acquaint yourself with its basic operations and functions through use of the manuals accompanying Windows.

The descriptions contained in this manual are given on the premise that the Windows character input system tool and printer driver software have already been set up properly. For details on how to set up these software facilities, refer to the manuals accompanying Windows.

1.2 System Configuration

This section describes the PC requirement and the system configuration supported by the Hitachi Chromaster / ChromasterUltra R_S driver for Empower3.

<Hitachi Chromaster / ChromasterUltra R_S driver for Empower3>

◆ Empower™ 3 Software Requirement

Please refer to the Release Notes supplied with your product.

◆ Empower3 System Configuration

The Hitachi Chromaster / ChromasterUltra Rs driver for Empower3 supports Empower Personal, Empower Workgroup, or Empower Enterprise system.

◆ Supporting Module

The Hitachi Chromaster driver for Empower3 supports Chromaster modules below:

- Chromaster 5110 Pump
  [Program Number 892-8110-02 or later]
- Chromaster 5160 Pump
  [Program Number 892-8116-01 or later]
  Low-pressure gradient unit, dynamic mixer, degassing unit, plunger washing pump and auto purge valve are supported.
- Chromaster 5210 Autosampler
  [Program Number 892-8120-01 or later]
- Chromaster 5260 Autosampler
  [Program Number 892-8126-00 or later]
  Thermostat, option rack, degassing unit and option syringe are supported.
- Chromaster 5280 Autosampler
  [Program Number 892-8125-00 or later]
  Thermo unit, option rack and option syringe are supported.
- Chromaster 5310 Column Oven
  [Program Number 892-8130-00 or later]
  Option valve and column management system are supported.

✍ The number of connectable pumps per system is three.

- ChromasterUltra R_S 6310 Column Oven
  [Program Number 892-8130-00 or later]
  Option valve and column management system are supported.
- Chromaster 5410 UV Detector
  [Program Number 892-8140-00 or later]
  Thermo cell is supported.
- Chromaster 5420 UV-VIS Detector
  [Program Number 892-8142-00 or later]
  Thermo cell is supported.
- Chromaster 5430 DAD
  [Program Number 892-8145-01 or later]
  Thermo cell and analog signal output device are supported.
- Chromaster 5440 FL Detector
  [Program Number 892-8148-00 or later]
  Thermo cell is supported.
- Chromaster 5450 RI Detector
  [Program Number 2.00 or later]
- Chromaster Analog Input Device
  [Program Number 892-8165-00 or later]
- Interface control Board (IFC)
  [Program Number 892-8214-04 or later]

✍ The number of connectable detectors and AID per system is two.

✍ The number of connectable DAD per system is one.

The Hitachi ChromasterUltra R_S driver for Empower3 supports ChromasterUltra R_S modules below:

- ChromasterUltra R_S 6170 Pump
  [Program Number 889-8110-01 or later]
- ChromasterUltra R_S 6270 Autosampler
  [Program Number 889-8120-01 or later]
  Option rack and option syringe are supported.
- ChromasterUltra R_S 6310 Column Oven
  [Program Number 889-8130-00 or later]
  Option valve, column management system are supported.
- ChromasterUltra R_S 6420 UV-VIS Detector
  [Program Number 889-8142-00 or later]

✍ The number of connectable detectors and AID per system is two.

- ChromasterUltra R_S 6430 DAD
  [Program Number 889-8145-00 or later]
  High sensitivity flow cell is supported.
- ChromasterUltra R_S 6440 FL Detector
  [Program Number 889-8148-00 or later]
- Chromaster Analog Input Device
  [Program Number 892-8165-00 or later]
- Interface control Board (IFC)
  [Program Number 889-8214-02 or later]

✍ The number of connectable DAD per system is one.

◆ Maximum number of connected system

The Hitachi Chromaster / ChromasterUltra R_S driver for Empower3 can have a maximum of four systems connected to one PC.

☝ The maximum number of ChromasterUltra R_S instruments that can be connected is two.

NOTE: If connecting the instrument including DAD, the supported configuration is as follows:

Number of connected DAD	Maximum number of connectable instrument
1	Four instruments
2	Two instruments
3 or more	Connection disabled

◆ PC Requirements

OS: < for Personal >
Windows 7 Professional with Service Pack 1 64bit
Windows 10 Professional 64bit
< for Client and LAC/E^{32} >
Windows 7 Professional with Service Pack 1 64bit
Windows 10 Professional 64bit

CPU: Please refer to the Empower™ 3 Feature Release 4 installation manual.

RAM: Please refer to the Empower™ 3 Feature

Release 4 installation manual.

Hard Disk Space: Please refer to the Empower™ 3 Feature Release 4 installation manual.

Optical Drive: One CD drive for software installation

USB: One USB port (HiSpeed USB) per one Chromaster series system

Internet Explorer: Version 8.0 or 11.0
（However, Windows 10 is only IE 11.0.）

Network: Microsoft Network with TCP/IP for Empower Enterprise Systems or Empower Workgroup

Acrobat: Adobe Acrobat Reader for browsing the online manual

2

INSTALLING SOFTWARE

This section shows the preparation and procedure for installation of the Hitachi Chromaster / ChromasterUltra R_S Driver for Empower3.

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2

2.1 Before Installation

Please make sure the connection between PC and peripherals before installation of the Hitachi Chromaster / ChromasterUltra R_S Driver for Empower3 and USB driver for Interface Control Board (IFC). And you need to check and set some configuration to install the Hitachi Chromaster / ChromasterUltra R_S Driver for Empower3. Please logon to PC as an Administrator and make sure the configuration below and configure to suit requirement of this software.

2.1.1 Setting of Windows 7

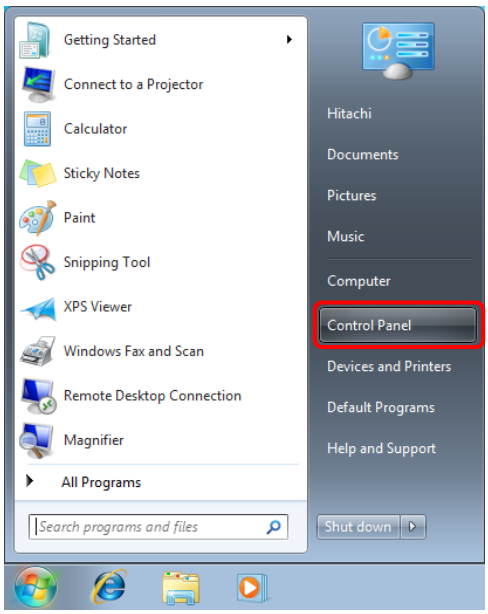
Please set the following configurations before installation. About undesignated settings (include BIOS), use these settings in default configuration.

☝ Please set the following configurations for each user that use the Hitachi Chromaster / ChromasterUltra R_S Driver for Empower3.

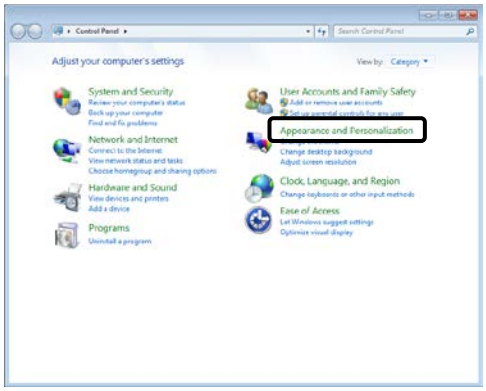
◆ Setting up Screen Saver

Set screen saver to [None] in accordance with the following process.

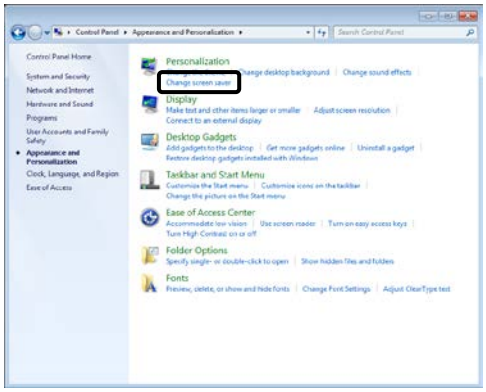
(1) Click [Control Panel] from Start menu.



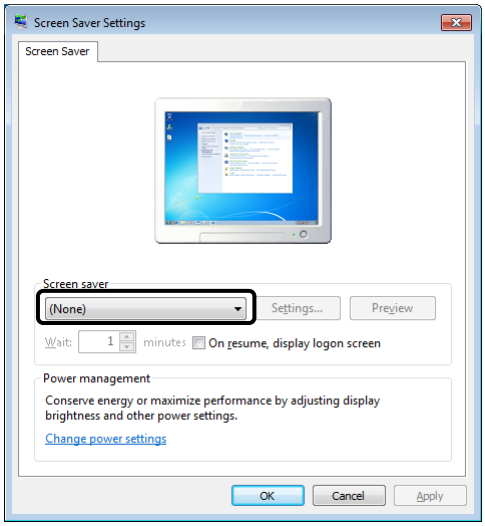
(2) Click [Appearance and Personalization].



(3) Click [Change screen saver].



(4) Select [None] from the drop-down menu of [Screen saver] and then click [OK] button.

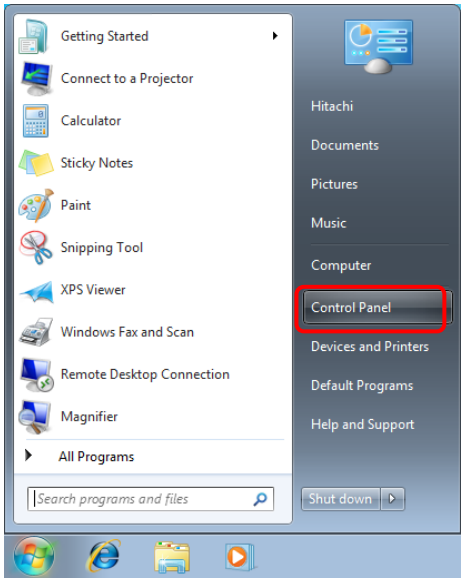


[END]

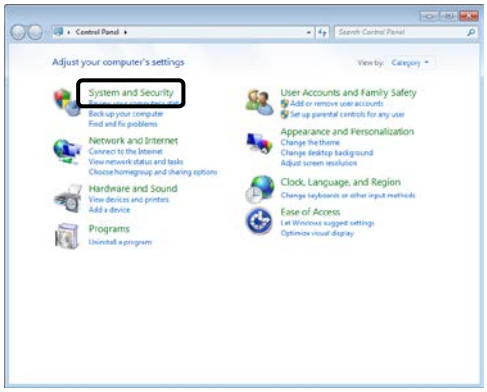
◆ Setting up Power Options

Set a power plan to [High performance] in accordance with the following process.

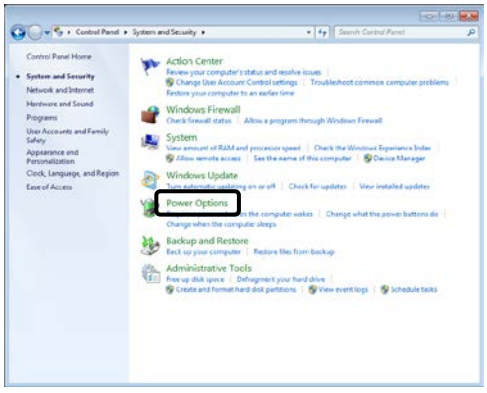
(1) Click [Control Panel] from Start menu.



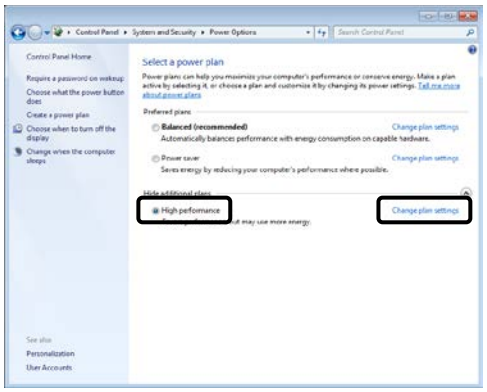
(2) Click [System and Security].



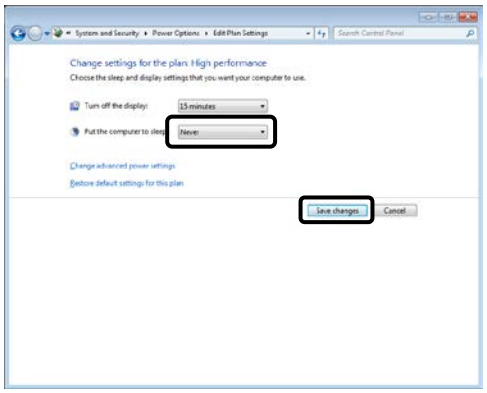
(3) Click [Power Options].



(4) Select [High performance] and then click [Change plan settings]. (When "high performers" are not displayed, click "Hide Additional plans")



(5) Select [Never] from the drop-down menu of [Put the computer to sleep] and click [Save Changes].

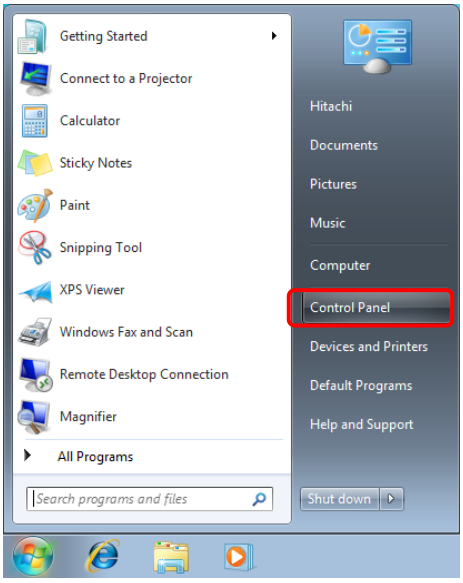


[END]

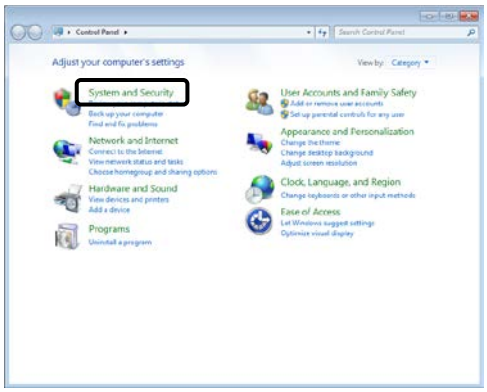
◆ Setting up Virtual Memory

Set Virtual Memory in accordance with the following process.

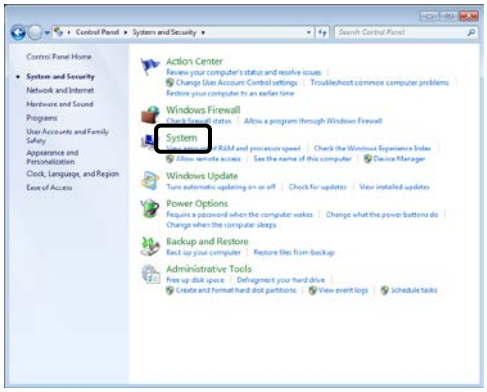
(1) Click [Control Panel] from Start menu.



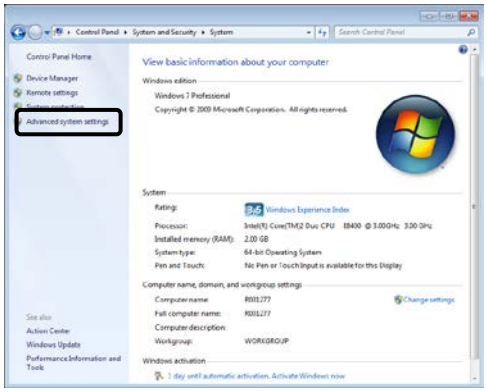
(2) Click [System and Security].



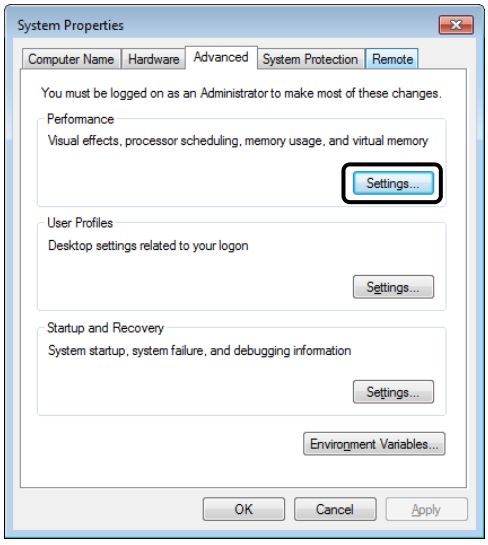
(3) Click [System].



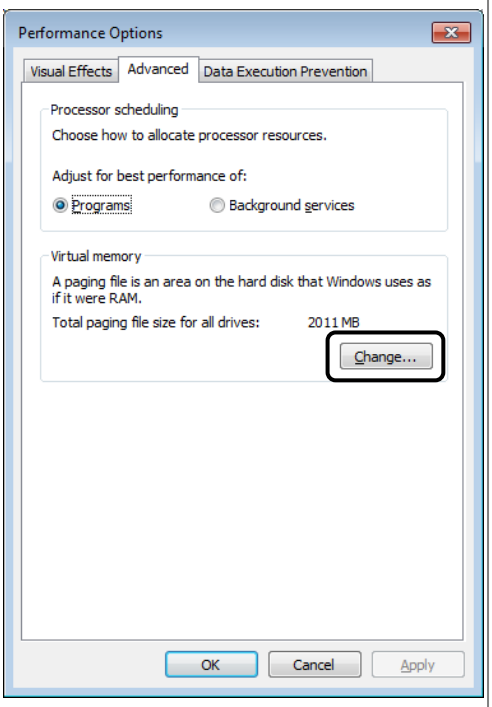
(4) Click [Advanced system settings].



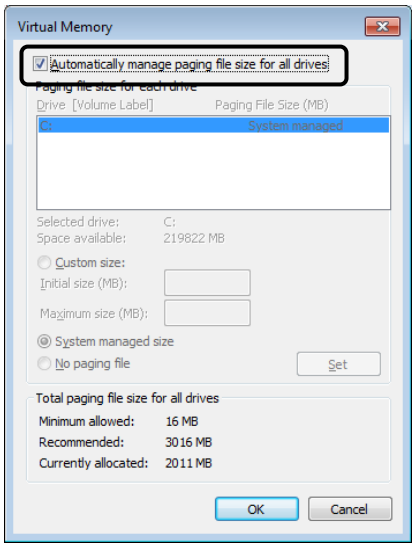
(5) Open [Advanced] tab and then click [Settings] button on [Performance] area.



(6) Open [Advanced] tab and then click [Change] button.



(7) Check the check box for [Automatically manage paging file size for all drives] and then click [OK] button. The message for reboot appears after setting up. Restart the PC in accordance with the message.

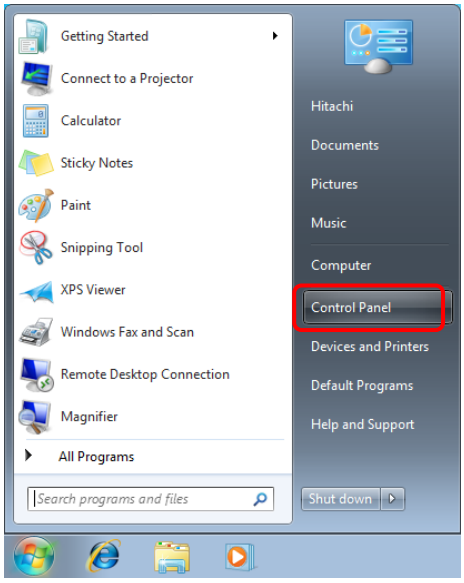


[END]

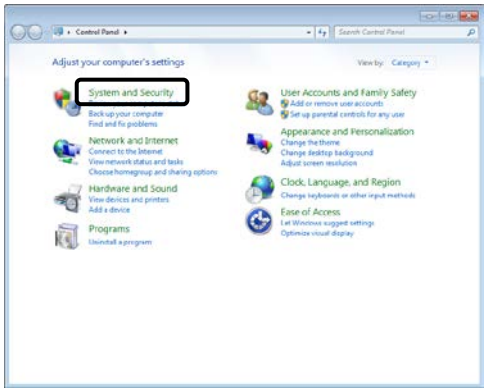
◆ Setting up Windows Update

Set Automatic Updates to [Never check] in accordance with the following process.

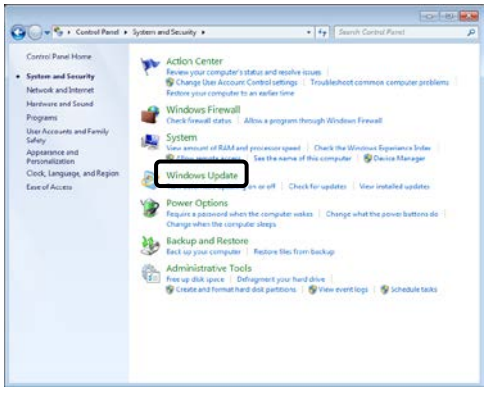
(1) Click [Control Panel] from Start menu.



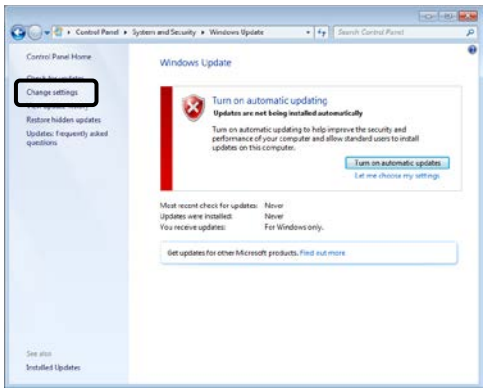
(2) Click [System and Security].



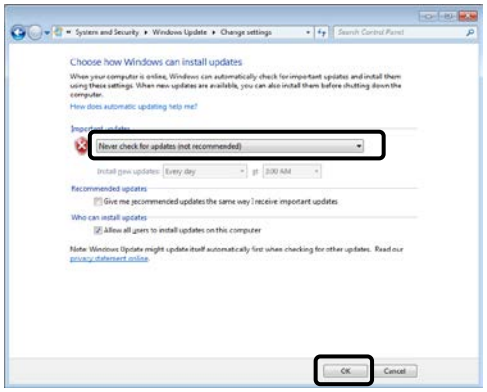
(3) Click [Windows Update].



(4) Click [Change settings].



(5) Select [Never check for updates (not recommended)] and then click [OK] button.

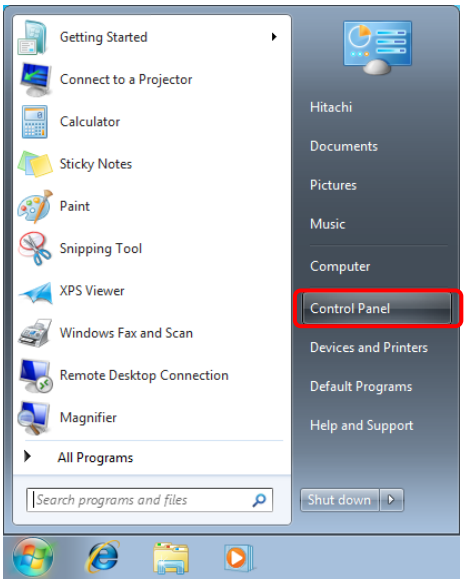


[END]

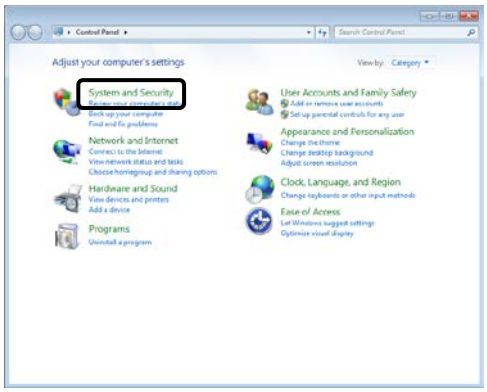
◆ Setting up Disk Defragment

Set the schedule of Disk Defragment to [Off] in accordance with the following process.

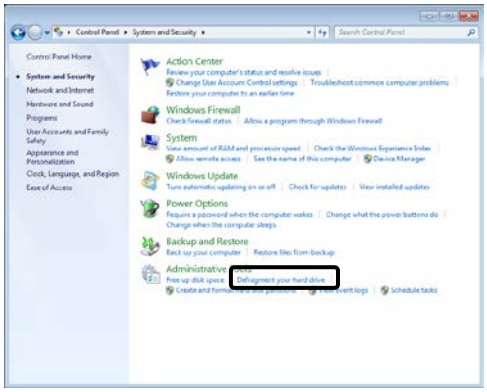
(1) Click [Control Panel] from Start menu.



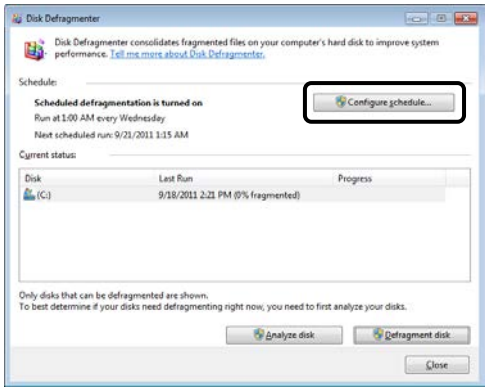
(2) Click [System and Security].



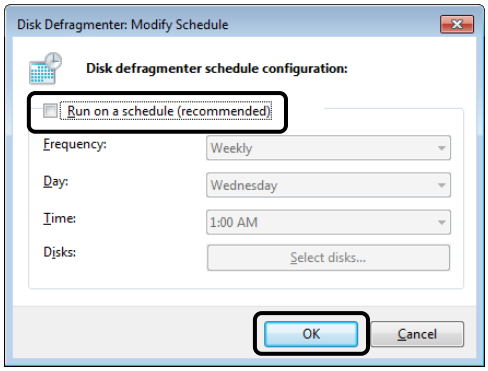
(3) Click [Defragment your hard drive].



(4) Click [Configure schedule].



(5) Clear the check box for [Run on a schedule (recommended)] and then click [OK] button.

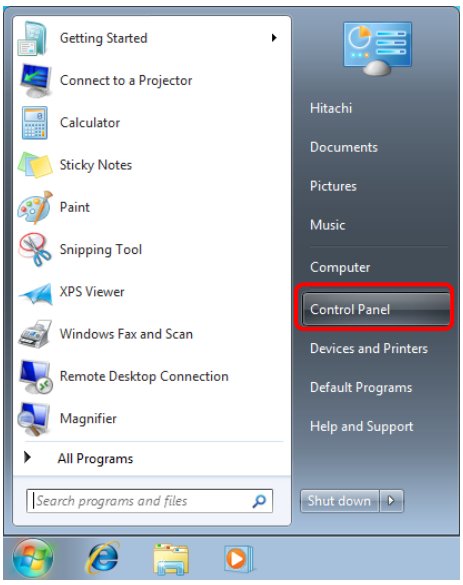


[END]

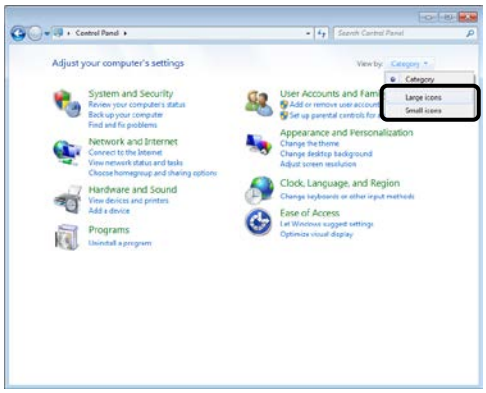
◆ Setting up Windows Defender

Set Windows Defender to [Turn off] in accordance with the following process.

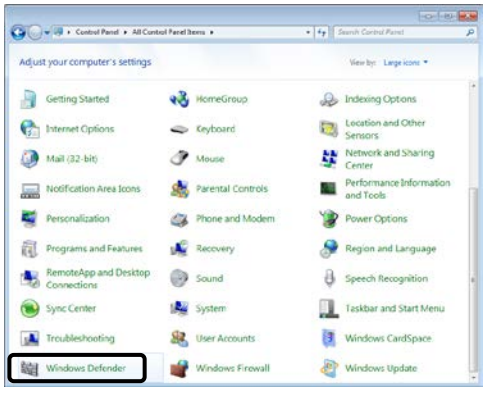
(1) Click [Control Panel] from Start menu.



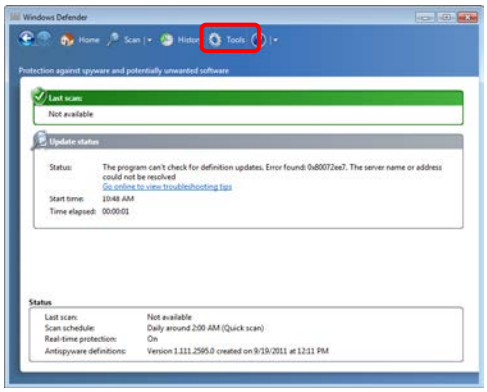
(2) Choose <Large icon> or <Small icon> among menu <category>.



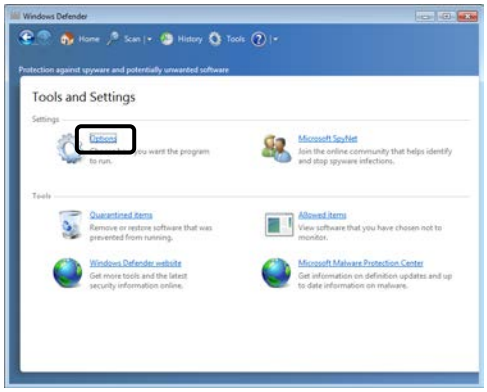
(3) Click [Windows Defender].



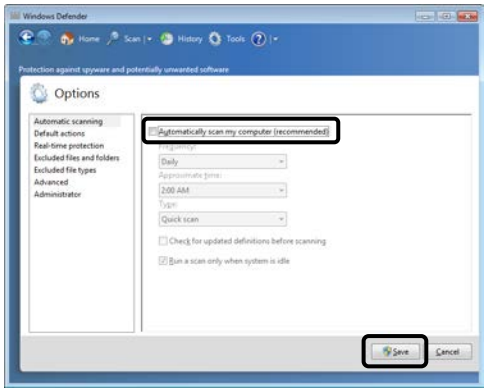
(4) Click [Tools]. (When the definition of the anti-spyware measure is unclear, the setting is unnecessary.)



(5) Click [Options].



(6) Clear the check box for [Automatically scan my computer (recommended)] and then click [Save] button.



[END]

◆ Setting up Gadget

Delete the Gadget (Feed Headlines, stocks, Currency, Weather, etc) with web services from Windows Side Bar. Please refer to the Help or the manual attached Windows for deletion method of Gadget.

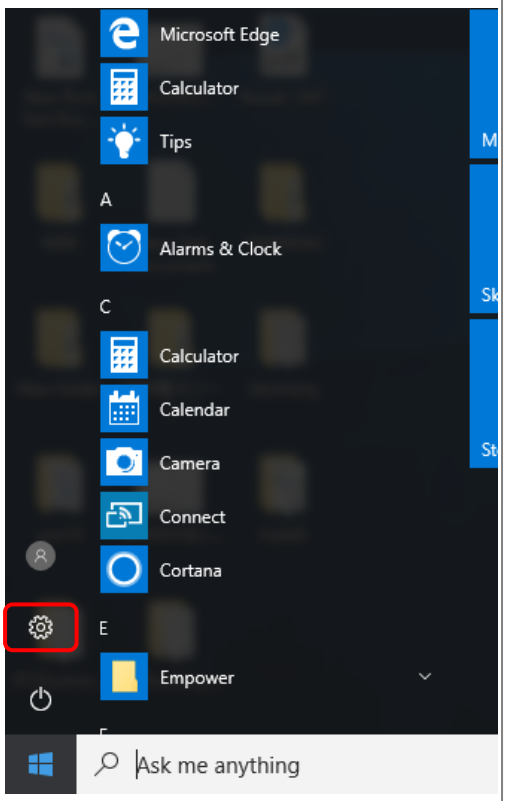
2.1.2 Setting of Windows 10

Please set the following configurations before installation. About undesignated settings (include BIOS), use these settings in default configuration.

◆ Setting up Screen Saver

Set screen saver to [None] in accordance with the following process.

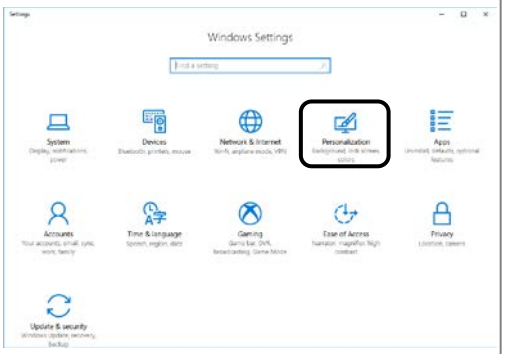
(1) Click [Setting] button from Start menu.



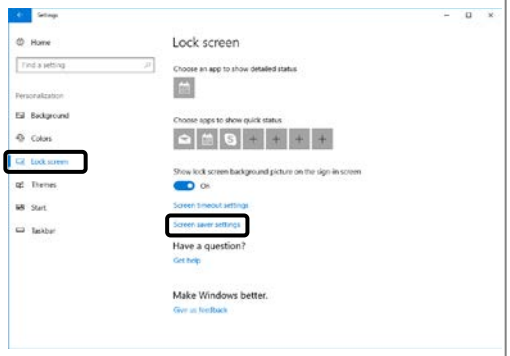
☝ Please set the following configurations for each user that use the Hitachi Chromaster / ChromasterUltra R_S Driver for Empower3.

☝ The operating procedure of Windows in this manual is based on Windows 10 Version 1703 (OS Build 15063.0).
If the version number is different, the operation procedure may be different.

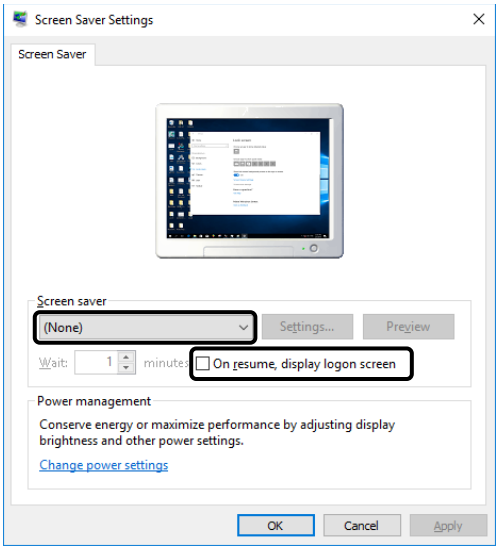
(2) Click [Personalization].



(3) Select [Lock Screen] from the left pane, and click [Screen saver settings].



(4) Select [None] from the drop-down menu and Uncheck of the [On resume, display logon screen] of [Screen saver]. After that click [OK] button.

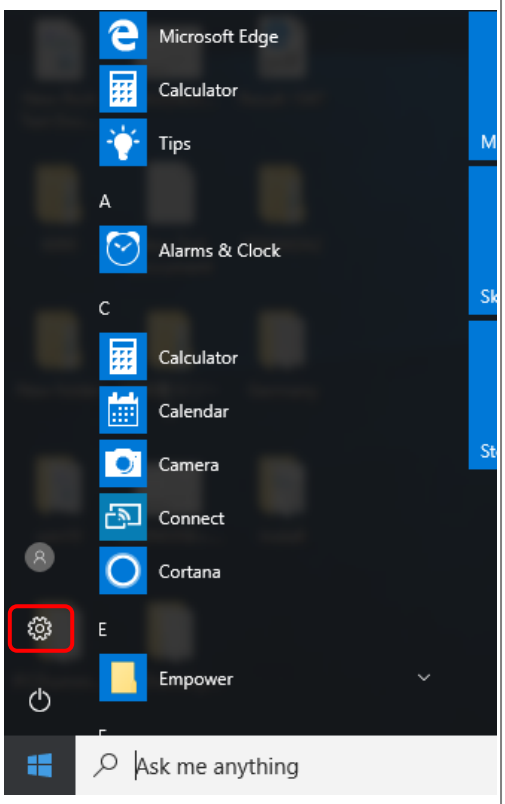


[END]

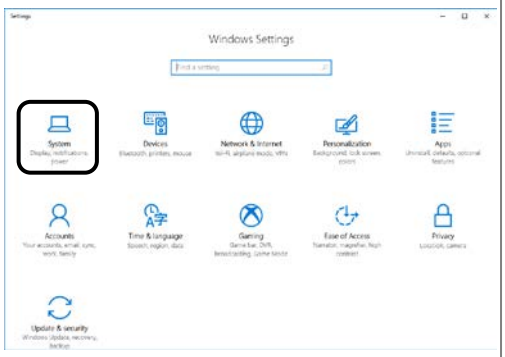
◆ Setting up Power Options

Set a power plan to [High performance] in accordance with the following process.

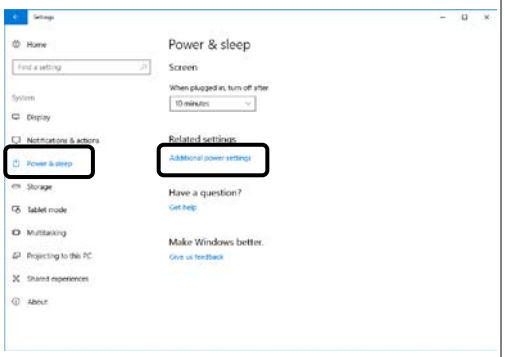
(1) Click [Setting] button from the Start menu.



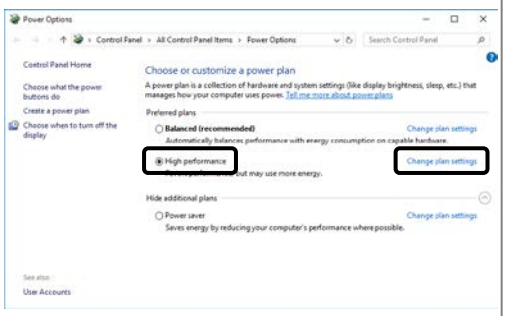
(2) Click [System].



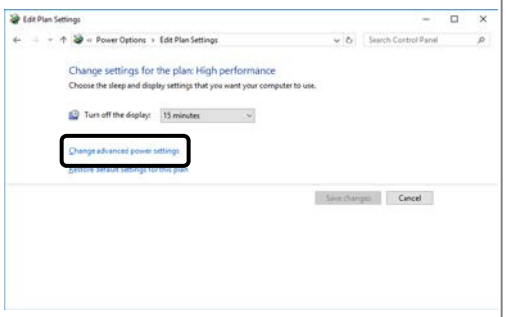
(3) Select [Power & sleep] from the left pane, and click [Additional power settings].



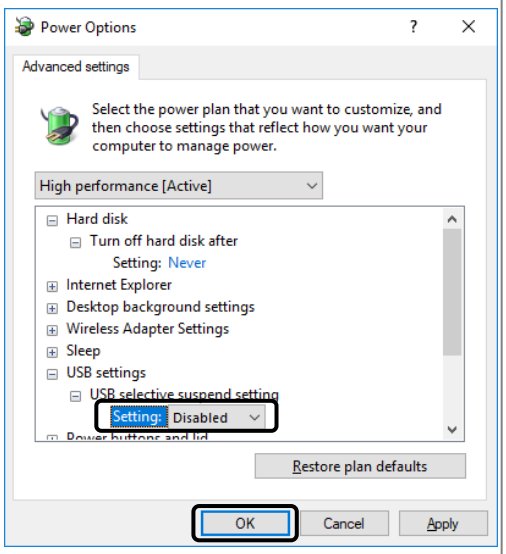
(4) Select [High performance] and then click [Change plan settings]. (When "high performers" are not displayed, click "Show Additional plans")



(5) Click [Change advanced power settings].



(6) [Hard disk / Turn off hard disk after] set to [Never], and [USB settings / USB selective suspend setting] set to [Disabled]. Then click [OK] button.

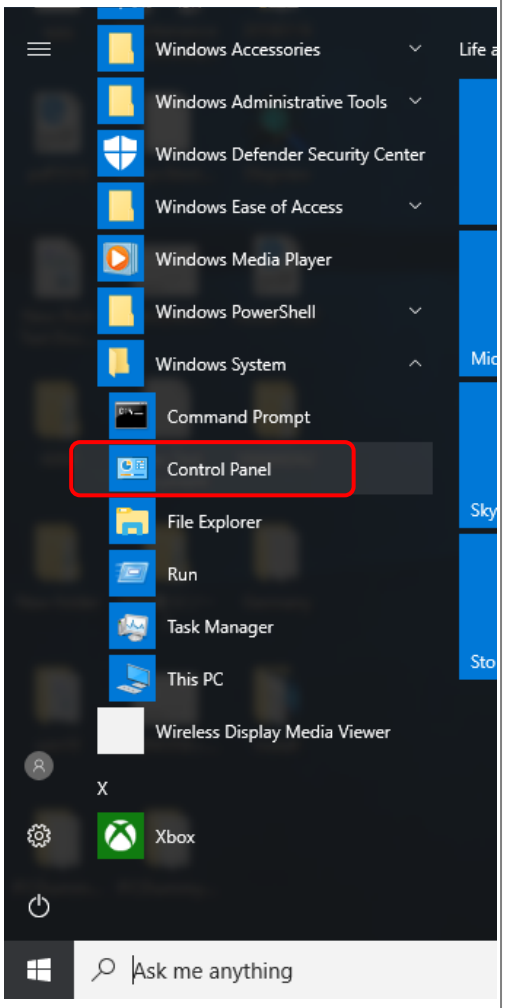


[END]

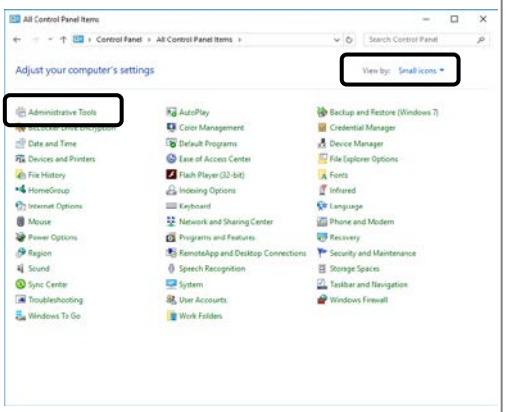
◆ Setting up Disk Defragment

Set the schedule of Disk Defragment to [Off] in accordance with the following process.

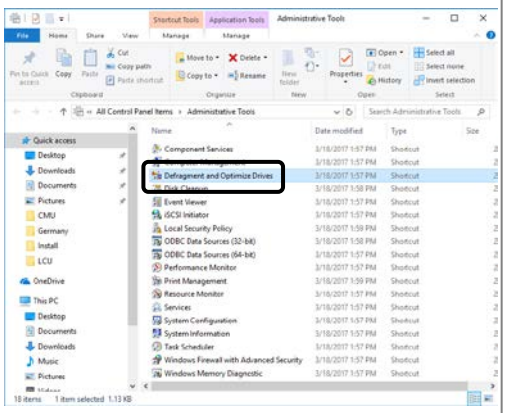
(1) Select [Windows System / Control Panel] from the Start menu.



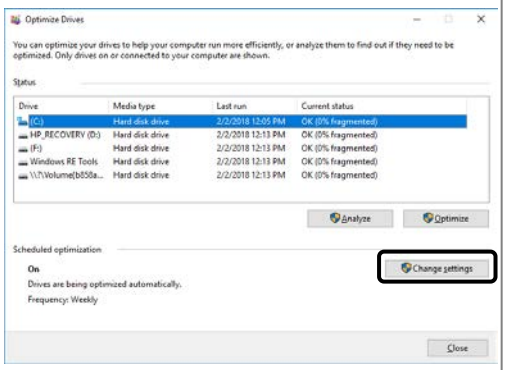
(2) Change [View by] to [Small icons] and choose [Administrative Tools].



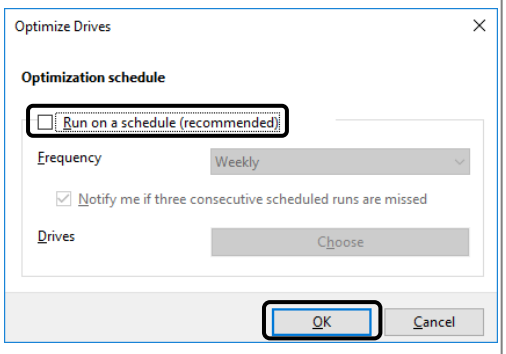
(3) Double click [Defragment and Optimize Drives].



(4) Click [Change settings] button.



(5) Clear the check box for [Run on a schedule (recommended)] and then click [OK] button.



[END]

2.2 Installation Procedure

NOTICE: The customer must not attempt installation, uninstallation, or upgrade of the software. To insure safe and correct use of the instrument, its installation must be carried out by, or under the supervision of, service personnel qualified by our authorized service agent or us.

Please install the Hitachi Chromaster / ChromasterUltra R_S Driver for Empower3 and USB driver for IFC according to the following step.

(1) Installation of Empower3 (Refer to chapter 2.2.1)
(2) Installation of Hitachi Chromaster Driver for Empower3 (Refer to chapter 2.2.2)
(3) Installation of Hitachi ChromasterUltra R_S Driver for Empower3 (Refer to chapter 2.2.3)
(4) Installation of USB driver (Refer to chapter 3.1)

2.2.1 Installation of Empower™ 3

Install Empower™ 3 before installation of the Hitachi Chromaster / ChromasterUltra R_S driver for Empower3. Please refer to the manual supplied with your Empower™ 3 for the installation procedure of it.

2.2.2 Installation of Hitachi Chromaster Driver for Empower3

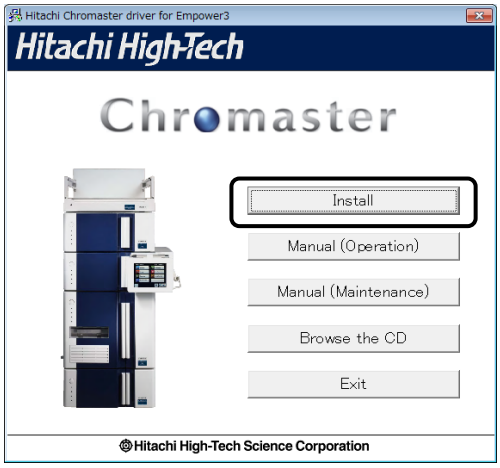
For installing the Hitachi Chromaster Driver for Empower3, start up the Windows and logon to PC as an Administrator account. If the Windows cannot be started up normally or if a log-on operation cannot be accomplished, refer to the manual accompanying the Windows. Install the software following the process below.

☝ Install it on LAC/E server and Client PC when the usage environment of Empower is Workgroup or Enterprise system.

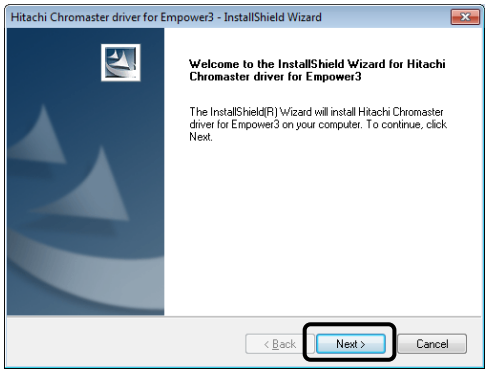
☝ Don't install the driver other than Hitachi driver.

(1) Close all running application software and insert the install CD of Hitachi Chromaster Driver for Empower3 into the CD drive.

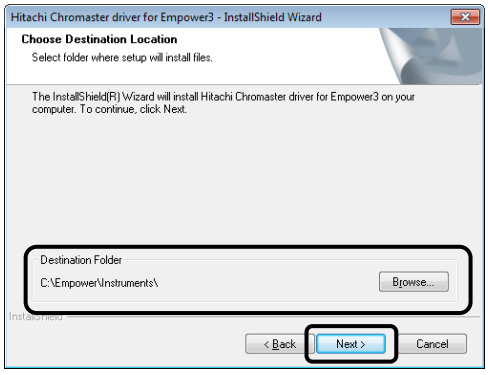
(2) The dialog shown right is displayed. Click [Install]. If this screen does not appear automatically, browse the CD and run the StartSelector.exe program.



(3) The InstallShield Wizard dialog box is displayed. Click [Next] to continue the installation.

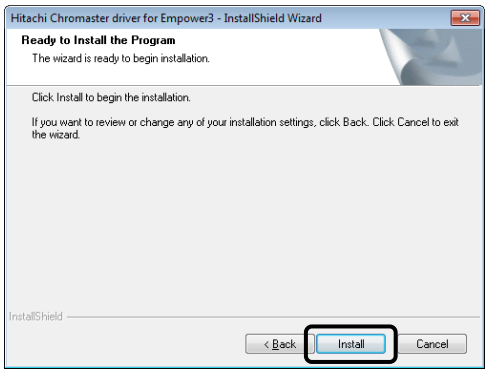


(4) At the "Choose Destination Location" page, confirm that the Destination Folder is [C:¥Empower¥Instruments¥] and then click <Next>. ([C] is the drive with Empower 3 installed.)



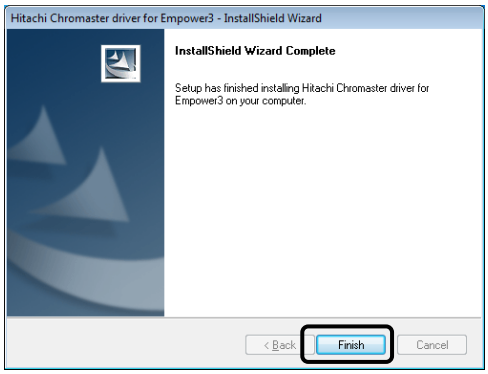
NOTE: If you select a folder other than [C:¥Empower¥Instruments¥] as the Destination Folder, this software might not work properly. Be sure to select [C:¥Empower¥Instruments¥] as the Destination Folder.

(5) At the "Ready to Install the Program" page, click [Install] to start the installation.



(6) After the "Setup Status" page is closed, the File Verification Utility starts and opens the Checksum.txt file of the File Verification Results log in a WordPad window. Please close this file.

(7) Upon completion of installation, the InstallShield Wizard Complete dialog box is displayed. Click [Finish] to finish the wizard.



(8) Remove the install CD from the CD drive and reboot the PC.

[END]

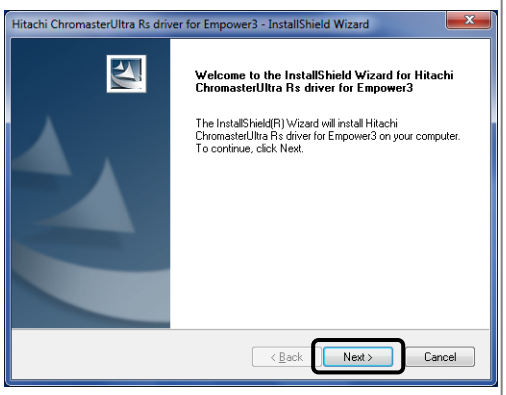
2.2.3 Installation of Hitachi ChromasterUltra R_S Driver for Empower3

For installing the Hitachi ChromasterUltra R_S Driver for Empower3, start up the Windows and logon to PC as an Administrator account. If the Windows cannot be started up normally or if a log-on operation cannot be accomplished, refer to the manual accompanying the Windows. Install the software following the process below.

(1) Close all running application software and insert the install CD of Hitachi ChromasterUltra R_S Driver for Empower3 into the CD drive.

(2) The dialog shown right is displayed. Click [Install]. If this screen does not appear automatically, browse the CD and run the StartSelector.exe program.

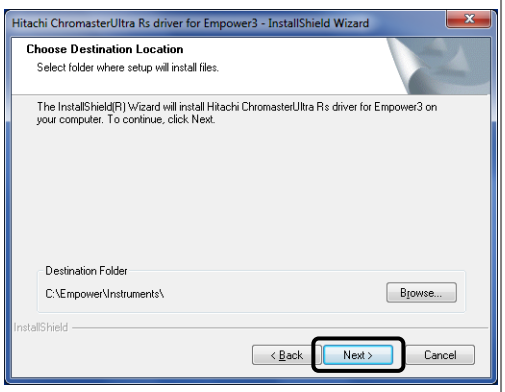
(3) The InstallShield Wizard dialog box is displayed. Click [Next] to continue the installation.



☝ Install it on LAC/E server and Client PC when the usage environment of Empower is Workgroup or Enterprise system.

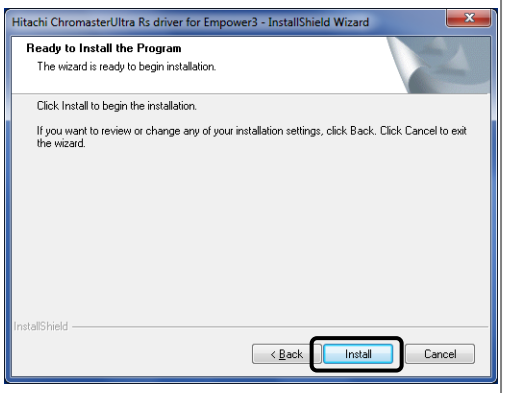
☝ Don't install the driver other than Hitachi driver.

(4) At the "Choose Destination Location" page, confirm that the Destination Folder is [C:¥Empower¥Instruments¥] and then click <Next>. ([C] is the drive with Empower 3 installed.)



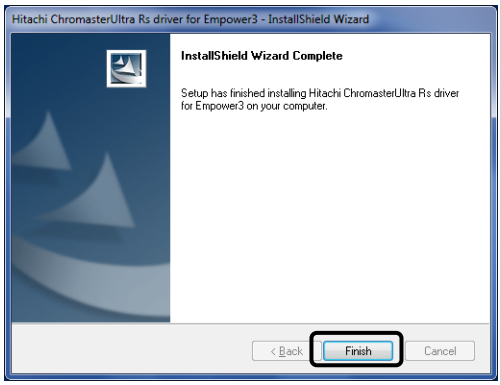
NOTE: If you select a folder other than [C:¥Empower¥Instruments¥] as the Destination Folder, this software might not work properly. Be sure to select [C:¥Empower¥Instruments¥] as the Destination Folder.

(5) At the "Ready to Install the Program" page, click [Install] to start the installation.



(6) After the "Setup Status" page is closed, the File Verification Utility starts and opens the Checksum.txt file of the File Verification Results log in a WordPad window. Please close this file.

(7) Upon completion of installation, the InstallShield Wizard Complete dialog box is displayed. Click [Finish] to finish the wizard.



(8) Remove the install CD from the CD drive and reboot the PC.

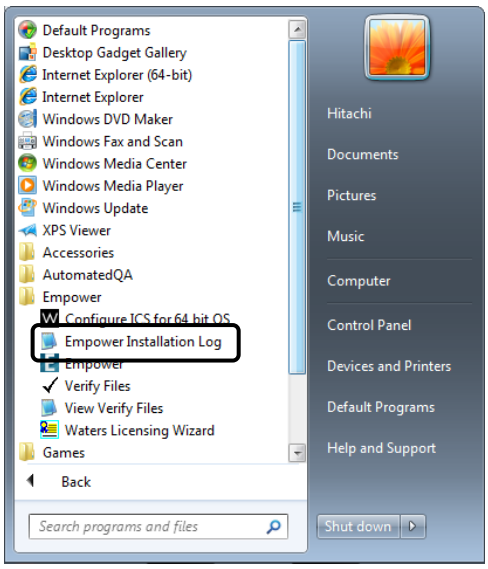
[END]

2.3 Verification of Installed Files

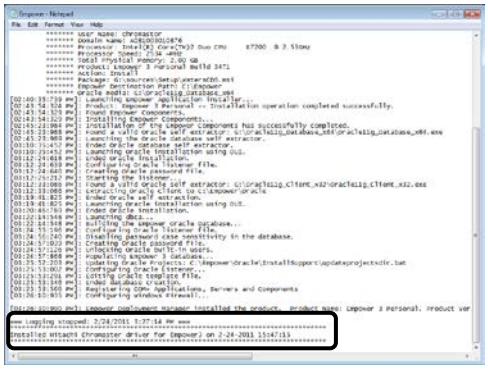
2.3.1 Confirmation of the Install Log Text

Using the Installation Log, confirm that the installation has been completed properly.
The Installation Log contains information about your Empower installations. You can read the log file to review your installation choices. If the installation has been partial or unsuccessful, you can review the Installation Log to check for errors.
To confirm the Installation Log:

(1) From the Start menu, click [All Programs] – [Empower] – [Empower Installation Log]. The program displays the Empower log file in Notepad.



(2) Review the contents of the Installation Log file. The most recent installation is at the end of the file. Confirm that the installation log has recorded the installation of this driver at the bottom of the log.

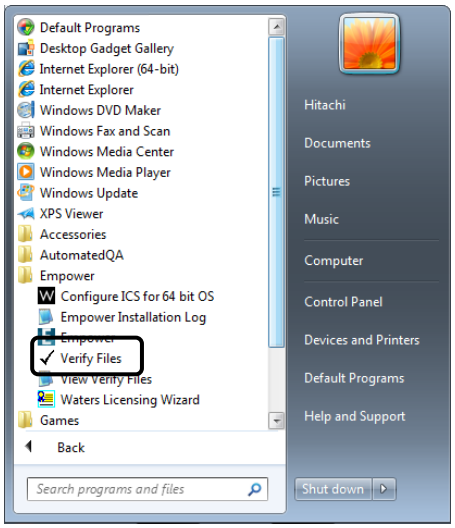


[END]

2.3.2 File Verification Utility

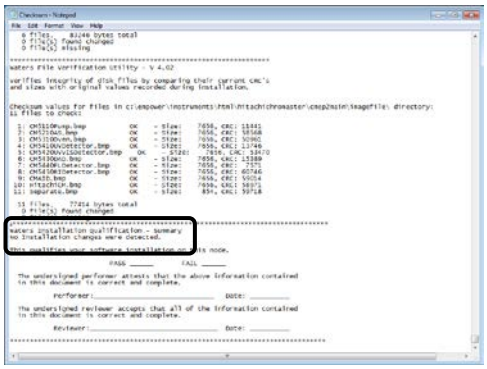
Using the File Verification Utility, confirm the integrity of the installed Empower program.
The File Verification Utility checks the integrity of the installed Empower program, data files, and database files.
After installation, use the File Verification Utility to verify the Empower program and data files only (not the database files).
To confirm the integrity of the installed Empower program:

(1) From the Start menu, click [All Programs] – [Empower] – [Verify Files].



(2) The File Verification Utility compares the installed Empower files checksum with a previously stored checksum number, creates a File Verification Results log, and opens the Checksum.txt file in a WordPad window.

(3) Review the contents of the file. Confirm that the result log has not recorded the file name in "Waters Installation Qualification – Summary" in the closing content. If you store the results, you can print or save a copy.



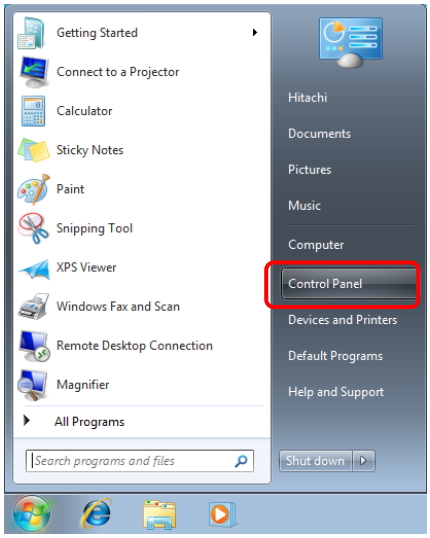
[END]

☝ If installation changes is detected, please restart the PC and reinstall in accordance with Chapter 2.5.

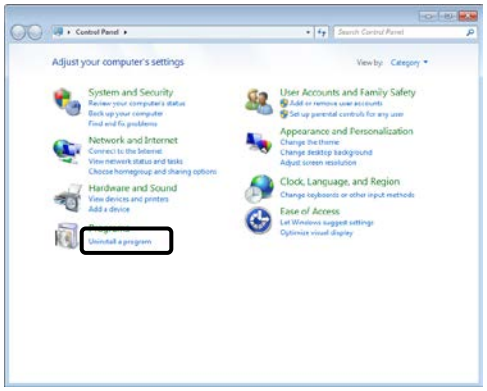
2.4 Uninstalling Procedure

For uninstallation of the Hitachi Chromaster / ChromasterUltra R_S driver for Empower3, turn on the PC and log on to Windows as a user with Administrator privileges. If Windows doesn't start or you don't log on to Windows, please refer to the manuals accompanying Windows.
Uninstall the software following the process below.

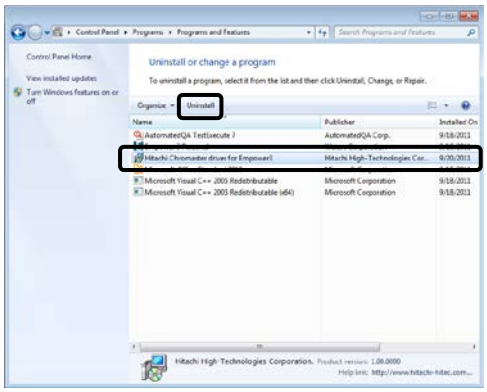
(1) Select [Control Panel] from Start menu.



(2) Click [Uninstall a program].

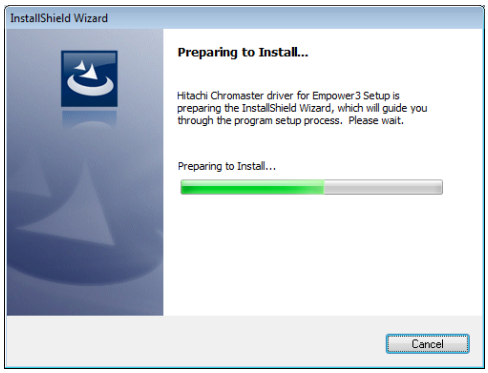


(3) Select the [Hitachi Chromaster driver for Empower3] or [Hitachi ChromasterUltra Rs driver for Empower3], and click the [Uninstall].

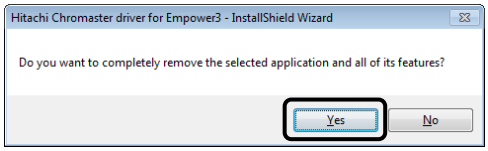


* X is version of Empower.

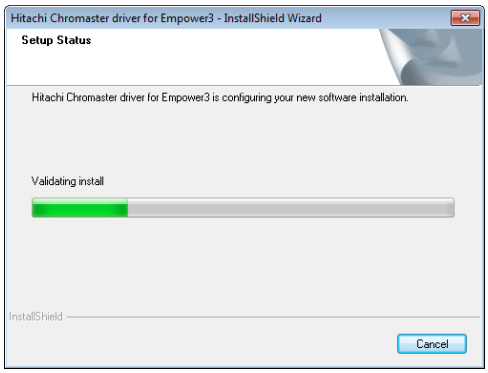
(4) The dialog box for preparing for uninstallation is displayed.



(5) Click the [Yes] button.



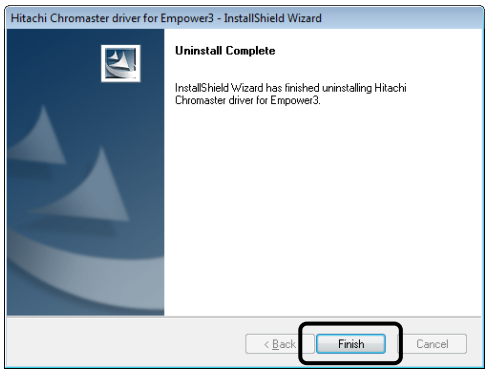
(6) The dialog box shown below is displayed during uninstallation.



(7) After the Setup Status page was closed, the File Verification Utility starts and opens the Checksum.txt file of a File Verification Results log in a WordPad window. Please close this file.

NOTE: Although changed parts are detected during file verification, uninstallation is performed normally. These are the parts changed by uninstallation of the Hitachi Chromaster / ChromasterUltra R_S driver for Empower3.

(8) On completion of uninstallation, the dialog box shown at the right comes up. In this dialog box, click the [Finish] button.



[END]

2.5 Upgrading Procedure

When upgrading the existing Hitachi Chromaster / ChromasterUltra R_S driver for Empower3, uninstall it in accordance with Chapter 2.4 and then perform installation as instructed in Section 2.2.

3

INSTALLATION OF USB DRIVER

This section shows the procedure of installing USB driver for Interface Control Board (IFC).

3.1 Installation of USB driver for IFC 3-1

3

3.1 Installation of USB driver for IFC

Before installing the USB driver, please complete installation of Empower and Hitachi Chromaster / ChromasterUltra R_S Driver for Empower3.
Please do not install the USB driver for IFC, before installing Hitachi Chromaster / ChromasterUltra R_S Driver for Empower3.
For installing the USB driver for IFC, startup the Windows and logon to PC as an Administrator. If the Windows cannot be started up normally or if a logon operation cannot be accomplished, please refer to the manual accompanying the Windows.

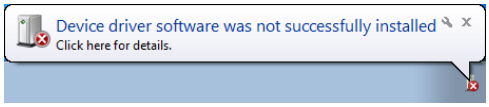
Install the USB driver for IFC following the process below.

3.1.1 Install on Windows® 7

(1) Turn on power to the PC and then turn on the power of IFC. To turn on the power to the IFC, please follow the procedure below.

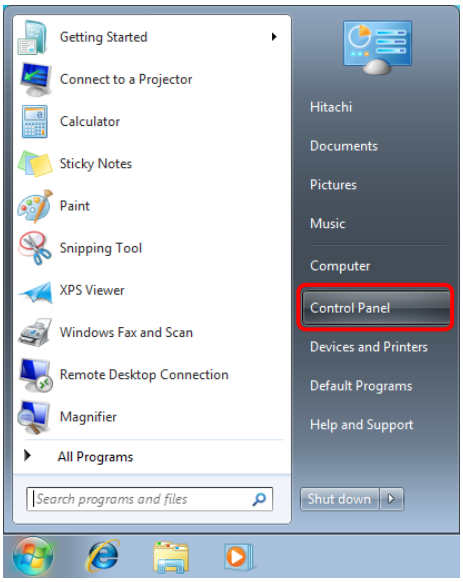
- If the power is from organizer,
  please turn on the power of organizer.
- If the power is from the AC adapter,
  please connect the AC adapter and the IFC.
- If the IFC is mounted in the Interface Box,
  please turn on the power of the Interface Box.

(2) Because a driver prepared for by default cannot discover a USB driver for IFC, the “device driver software was not installed in the screen lower right definitely. It is displayed with ".

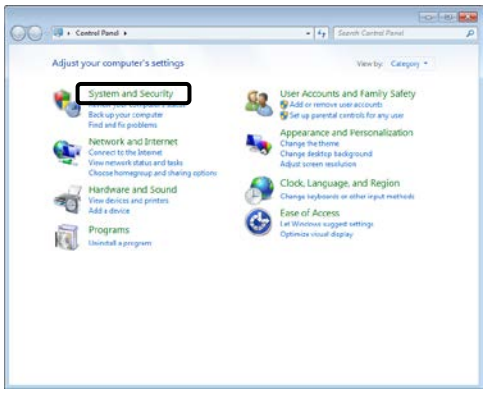


☝ The installation of the USB driver for IFC on Windows® 7 does the following procedures from Control Panel.

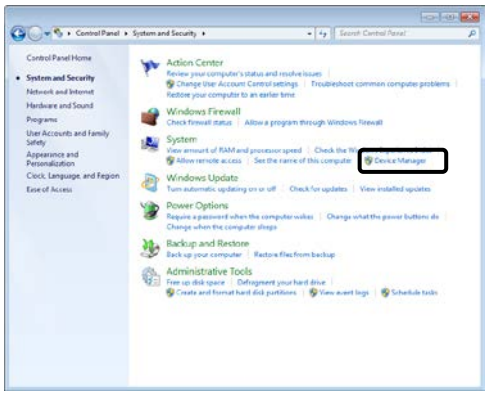
(3) Click [Control Panel] from Start menu to open the Control Panel.



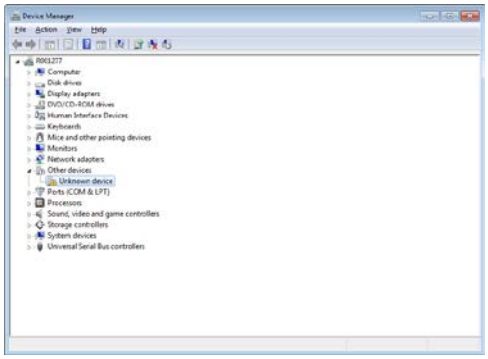
(4) Click [System and Security].



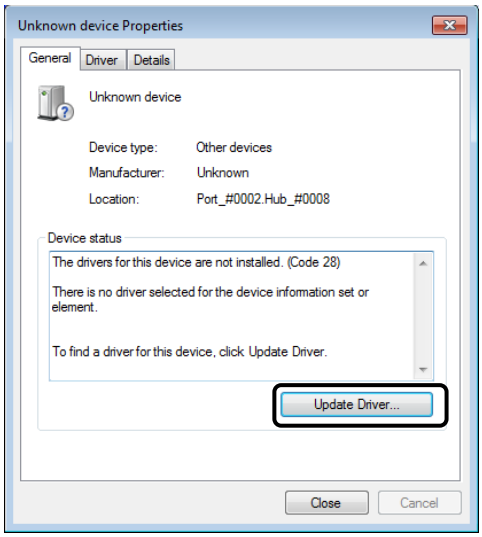
(5) Click [Device Manager].



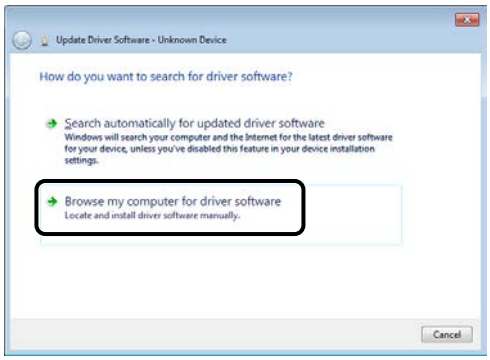
(6) Double-click [Unkown device] under Other devices to open the Unkonwn device Properties dialog.



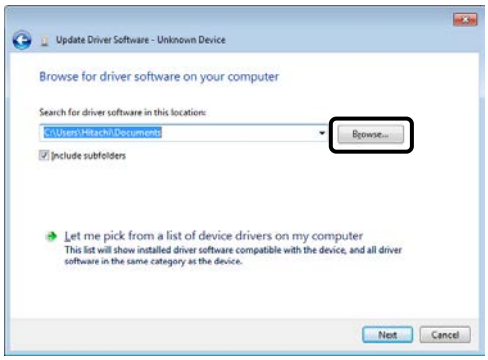
(7) Open [General] tab and then click the [Update Driver...] button.



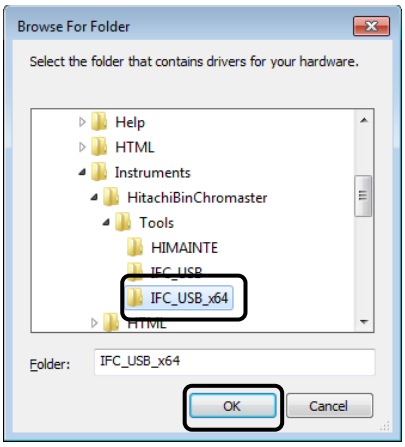
(8) Click the [Browse my computer for driver software].



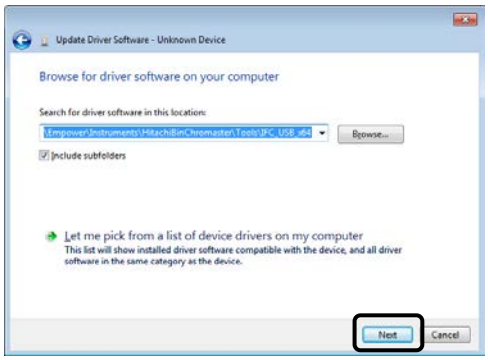
(9) Click the [Browse…] button.



(10) Select the folder, [X:¥Empower ¥Instruments ¥HitachiBinChromaster ¥Tools¥IFC_USB_x64] or [X:¥Empower ¥Instruments¥Hitachi BinChromasterUltra ¥Tools¥IFC_USB_x64], and then click [OK]. ([X] is the drive where Empower is installed.)

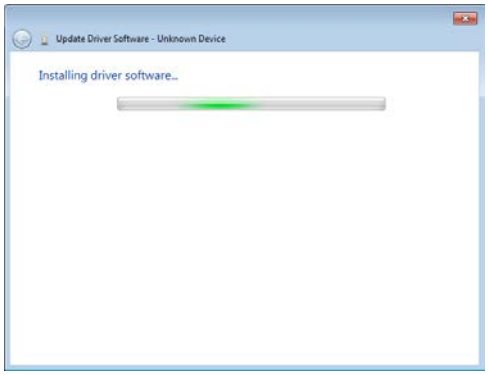


(11) With the driver software location displayed in the dialog. Click the [Next] button.

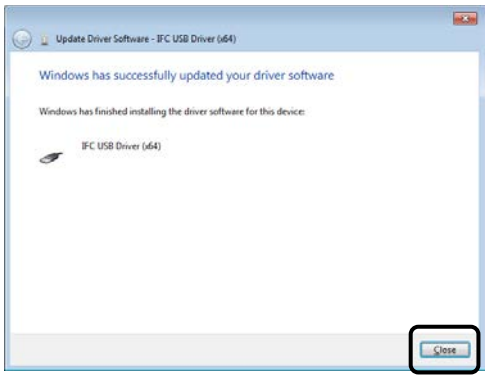


(12) The dialog shown right appears on the screen. Click the [Install] button.

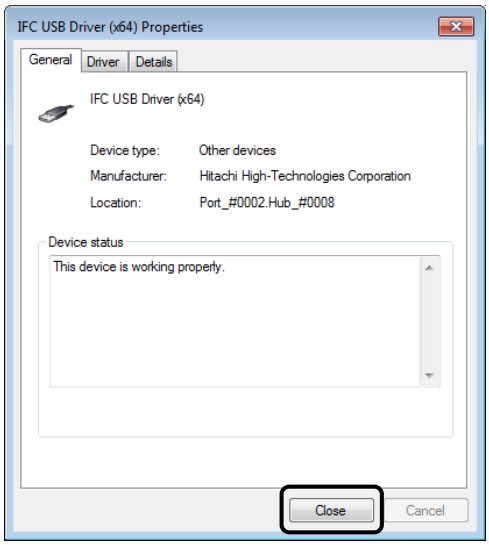
(13) The installation is started. Please wait.



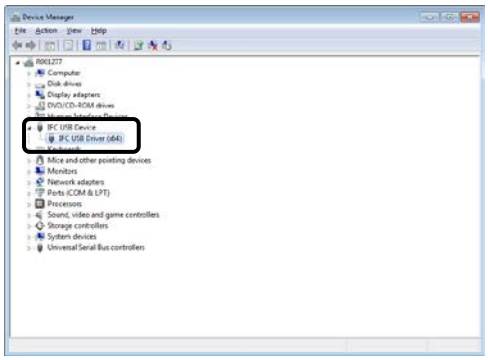
(14) The dialog shown right appears after completing the installation. Click the [Close] button.



(15) The IFC USB Driver (x64) Properties screen is displayed, and then clicks the [Close] button.



(16) Make sure that "IFC USB Driver (x64)" is indicated in the Device Manager screen.



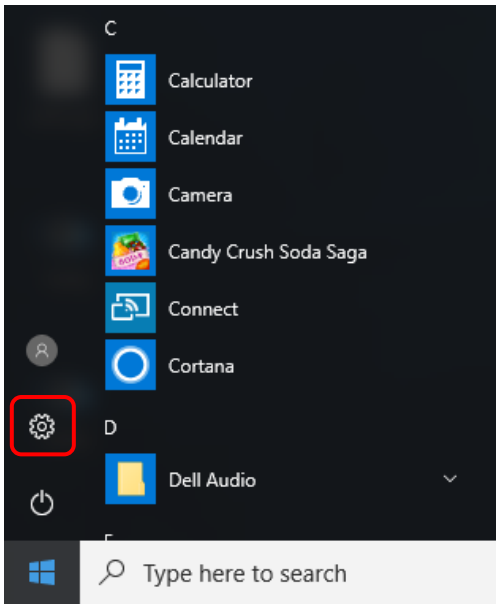
[END]

3.1.2 Install on Windows® 10

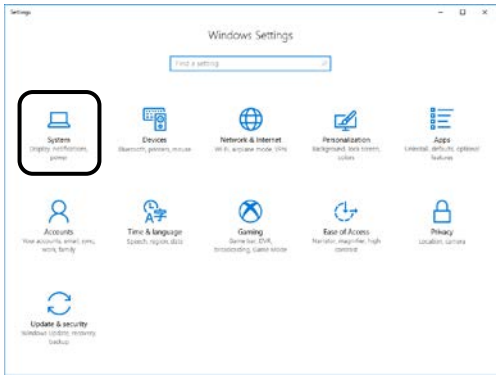
(1) Turn on power to the PC and then turn on the power of IFC. To turn on the power to the IFC, please follow the procedure below.

- If the power is from organizer, please turn on the power of organizer.
- If the power is from the AC adapter, please connect the AC adapter and the IFC.
- If the IFC is mounted in the Interface Box, please turn on the power of the Interface Box.

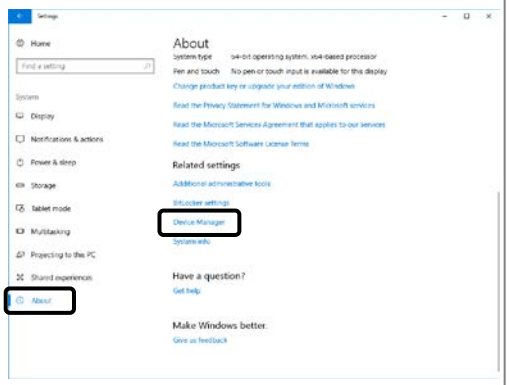
(2) Click [Settings] from Start menu.



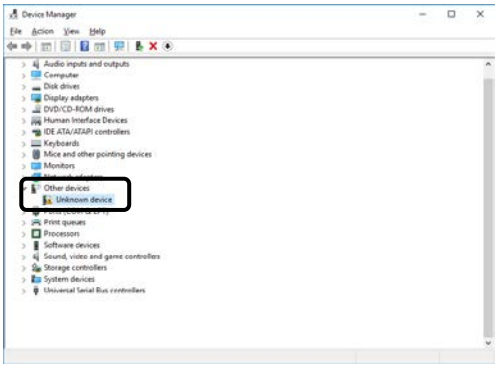
(3) Click [System].



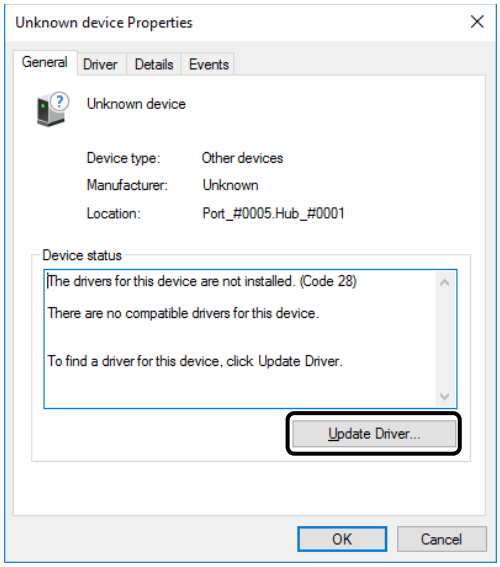
(4) On the System page, switch to the About tab and click [Device Manager].



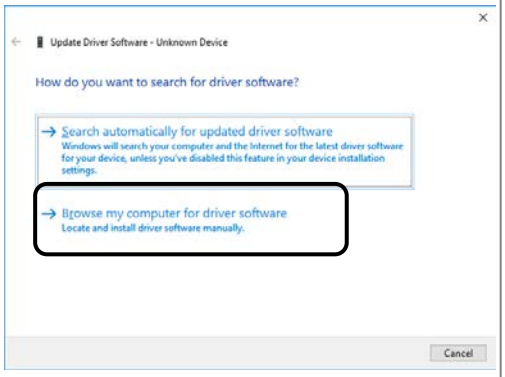
(5) Double-click [Unkown device] under Other devices to open the Unkonwn device Properties dialog.



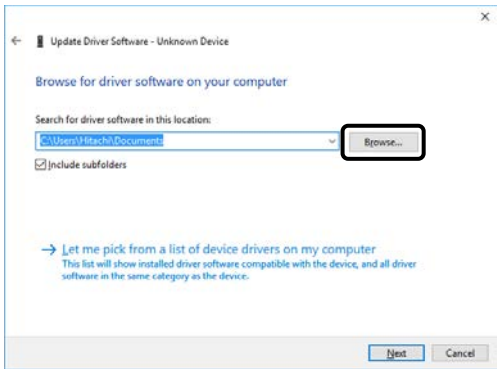
(6) Open [General] tab and then click the [Update Driver...] button.



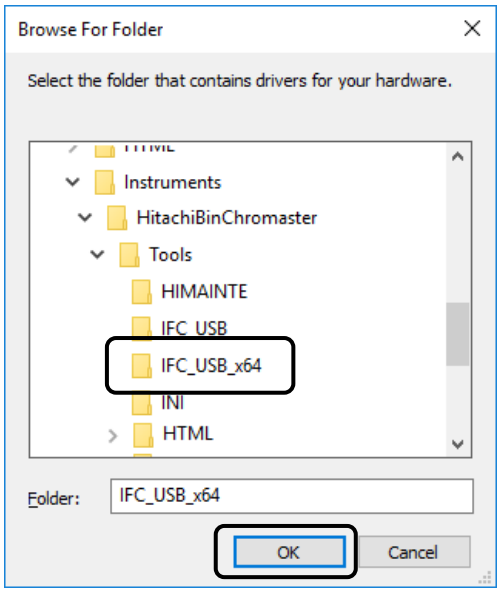
(7) Click the [Browse my computer for driver software].



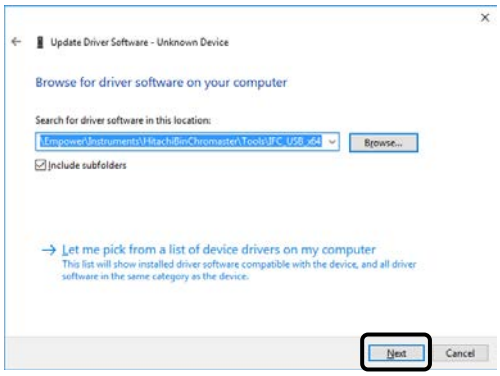
(8) Click the [Browse…] button.



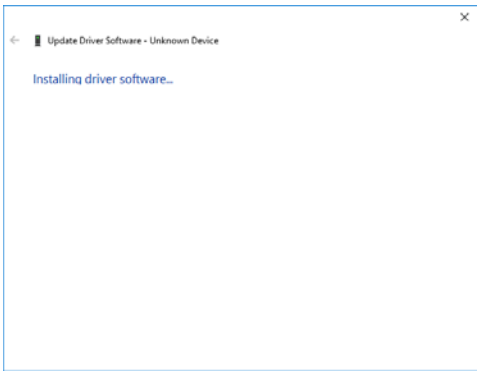
(9) Select the folder, [X:¥Empower ¥Instruments ¥HitachiBinChromaster ¥Tools¥IFC_USB_x64] or [X:¥Empower ¥Instruments¥HitachiBinChromasterUltra ¥Tools¥IFC_USB_x64], and then click [OK].
([X] is the drive where Empower is installed.)



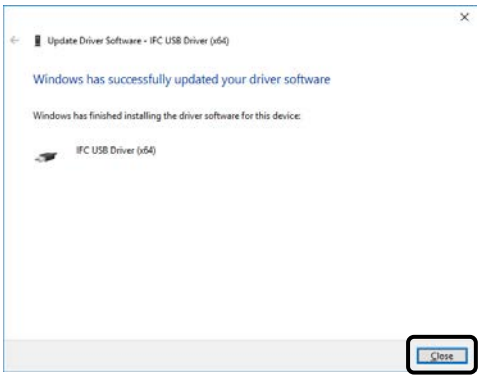
(10) With the driver software location displayed in the dialog. Click the [Next] button.



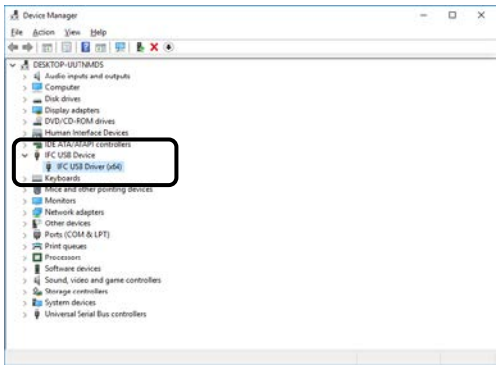
(11) The installation is started. Please wait.



(12) The dialog shown right appears after completing the installation. Click the [Close] button.



(13) Make sure that "IFC USB Driver (x64)" is indicated in the Device Manager screen.



[END]

4

REGISTERING THE SYSTEM CONFIGURATION

This section describes how to register the Chromatographic system configuration of the Chromaster Series models and ChromasterUltra R_S Series models.

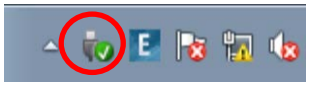
4.1 Registering the system configuration of Chromaster series....4-1
4.2 Registering the system configuration of ChromasterUltra R_S series....4-5
4.3 Register tool....4-9
4.4 Changing the system configuration....4-10

4

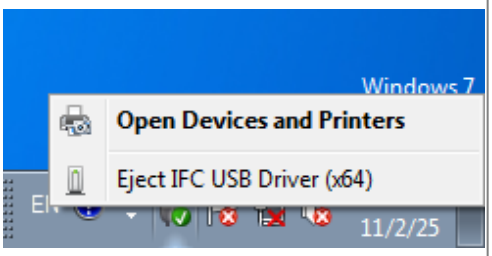
4.1 Registering the system configuration of Chromaster series

(1) Turn on the power supply of all the Chromaster Series modules. Then check that no error occurs after initialization of each module.

(2) Double-click the Safely Remove Hardware icon on the task tray.



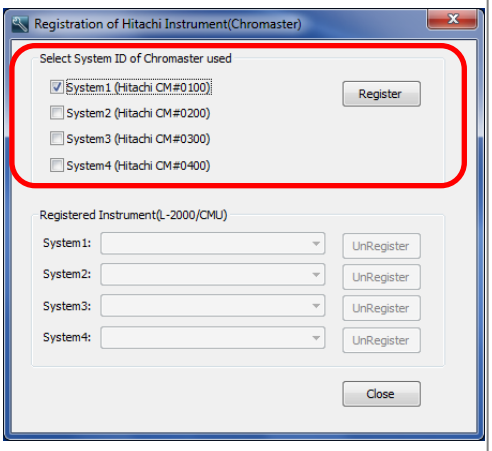
(3) The Safely Remove Hardware dialog box is displayed. Check that the IFC USB Driver is displayed in the dialog box.



(4) On the <Start> menu, Select <All Programs>
→ <Hitachi Chromaster driver for Empower3>
→ <Register Tool for Chromaster>.

(5) The Register Tool is launched.

(6) Select the System ID of the connected system and then click <Register>.

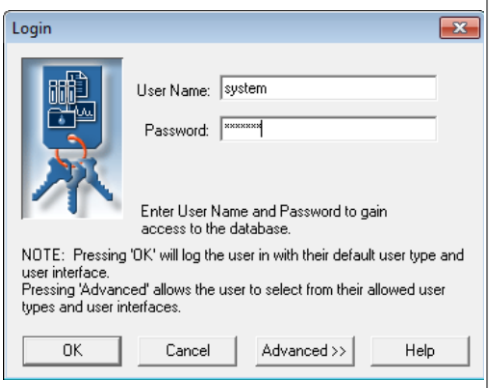


(7) Click <Close> to close the Register Tool.

☞ Regarding the Register Tool, refer to 4.3 section.

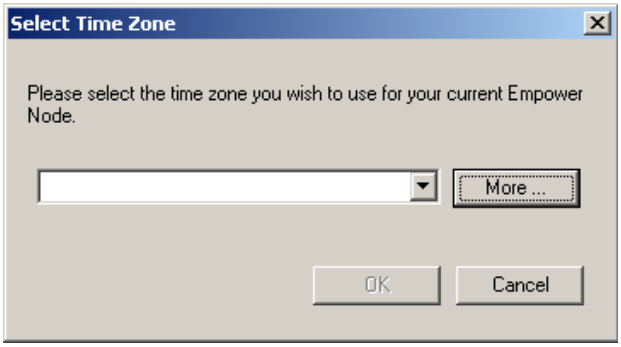
✍ System configuration of the registered system ID will be registered automatically to match the configuration of the system that is currently connected when you start Empower.

(8) On the <Start> menu, select <All Program> → <Empower> → <Empower>. The Empower Login dialog is displayed. Enter User Name and Password as follows, then click <Advanced>.

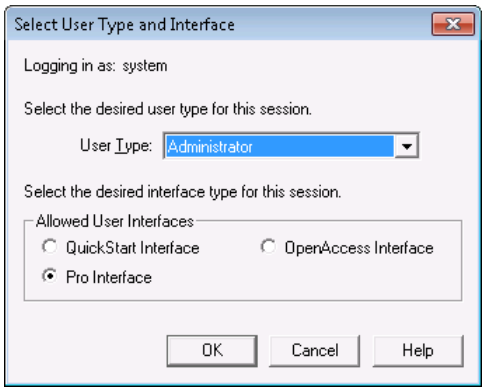


User Name : system
Password : manager

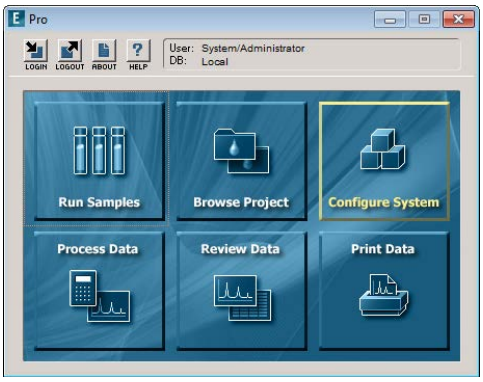
NOTE: If you have never launched Empower, the Select Time Zone dialog box will be displayed. Select the time zone, then click <OK>.



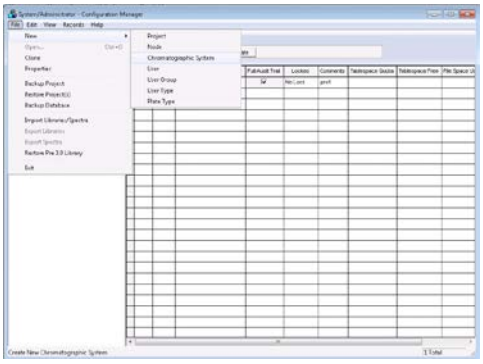
(9) Select <Pro Interface> in the Allowed User Interfaces group box, then click <OK>.



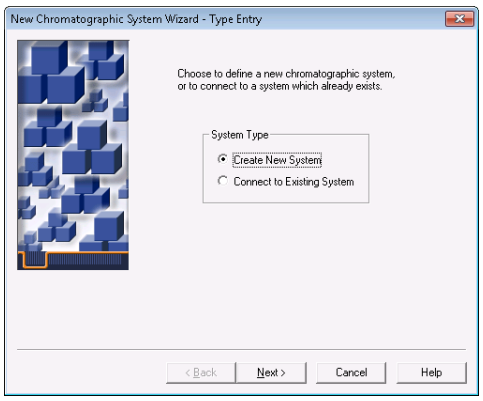
(10) Click <Configure System>.



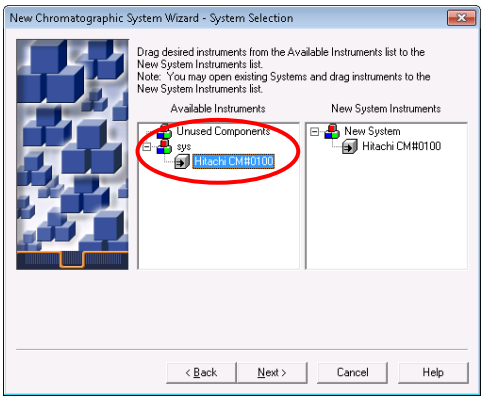
(11) Select <File> → <New> → <Chromatographic System>.



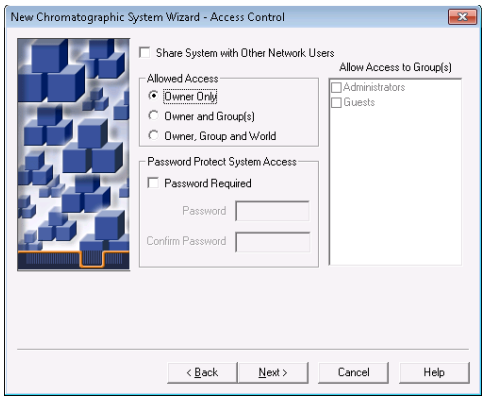
(12) Select <Create New System> in the System Type group box, then click <Next>.



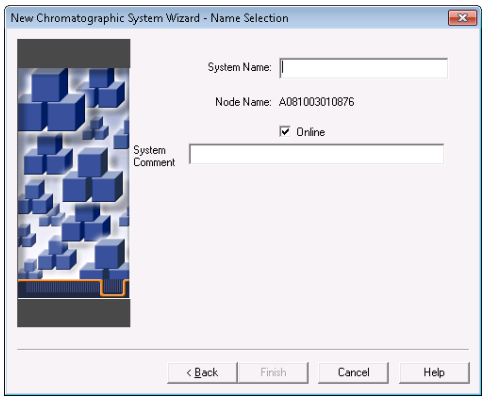
(13) Select the instrument icon that you want to use from the Available Instruments list, then double-click the icon. Check that the icon moves to the New System Instruments list, then click <Next>.



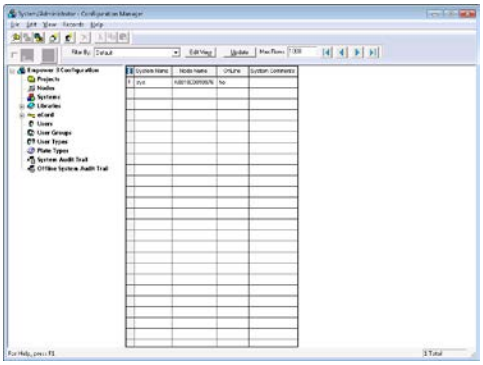
(14) Setup the access control, then click <Next>.



(15) Enter the system name, then click <Finish>.



(16) Check that the system name is displayed in the Systems list.



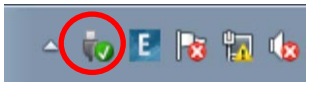
NOTE: The registration of plural systems that are neither used nor connected to instrument will cause failure or delay (up to 1 hour) of the program startup process.
Maintain the maximum registration number of the system as 4 or less.

[END]

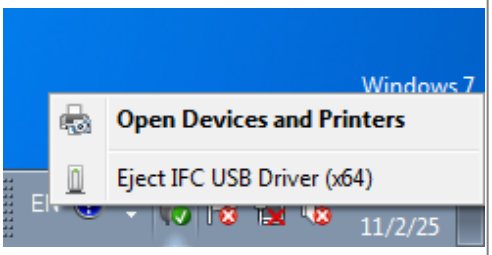
4.2 Registering the system configuration of ChromasterUltra Rs series

(1) Turn on the power supply of all the ChromasterUltra Rs Series modules. Then check that no error occurs after initialization of each module.

(2) Start the PC that a module is connected. Double-click the Safely Remove Hardware icon on the task tray.



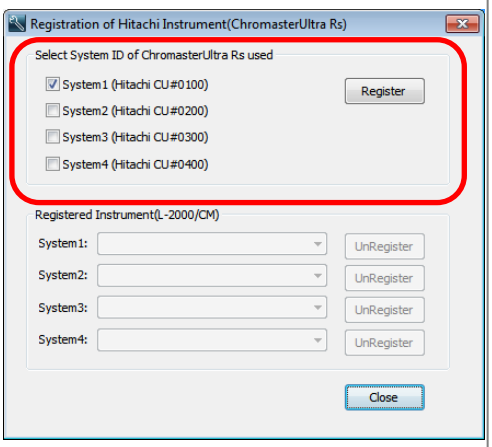
(3) The Safely Remove Hardware dialog box is displayed. Check that the IFC USB Driver is displayed in the dialog box.



(4) On the <Start> menu, Select <All Programs>
→ <Hitachi ChromasterUltra Rs driver for Empower3>
→ < Register Tool for ChromasterUltra Rs >.

(5) The Register Tool is launched.

(6) Select the System ID of the connected system and then click <Register>.

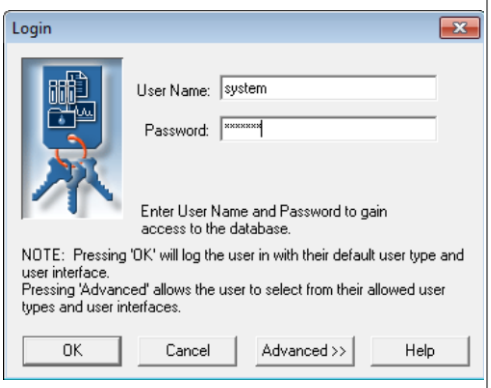


(7) Click <Close> to close the Register Tool.

☞ Regarding the Register Tool, refer to 4.3 section.

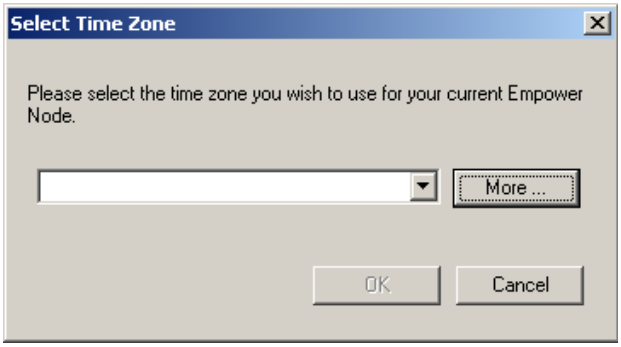
✍ System configuration of the registered system ID will be registered automatically to match the configuration of the system that is currently connected when you start Empower.

(8) On the <Start> menu, select <All Program> → <Empower> → <Empower>. The Empower Login dialog is displayed. Enter User Name and Password as follows, then click <Advanced>.

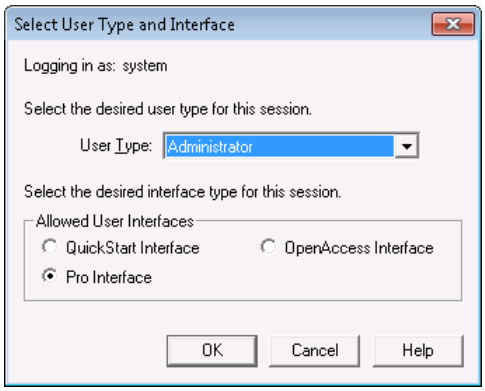


User Name : system
Password : manager

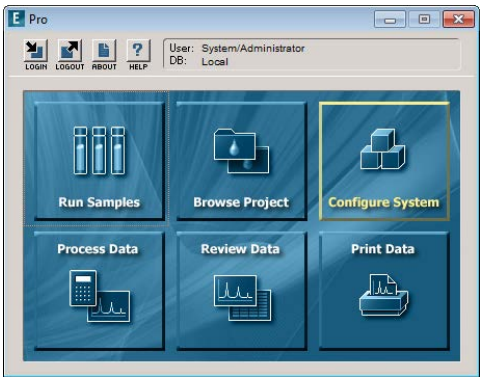
NOTE: If you have never launched Empower, the Select Time Zone dialog box will be displayed. Select the time zone, then click <OK>.



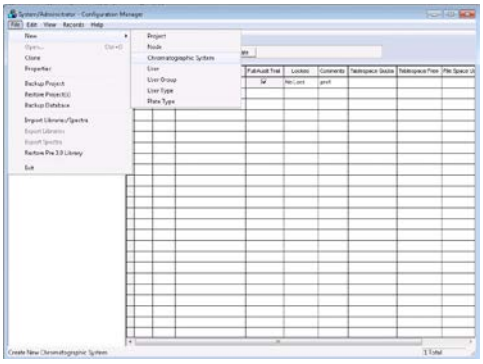
(9) Select <Pro Interface> in the Allowed User Interfaces group box, then click <OK>.



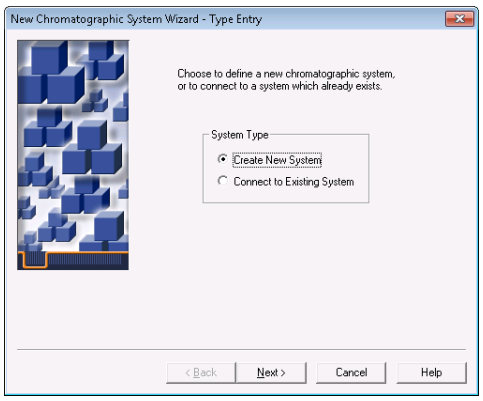
(10) Click <Configure System>.



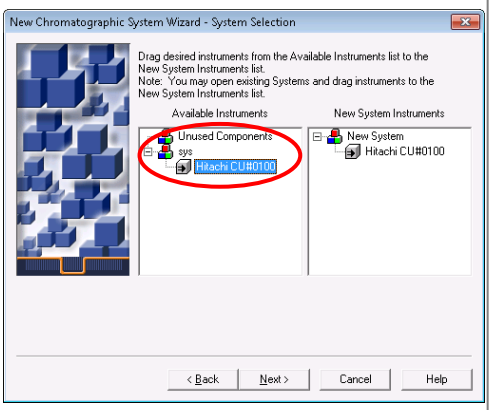
(11) Select <File> → <New> → <Chromatographic System>.



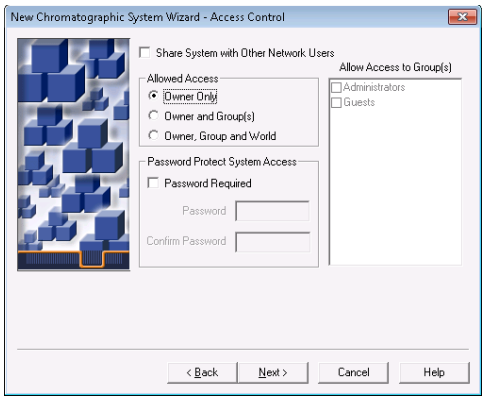
(12) Select <Create New System> in the System Type group box, then click <Next>.



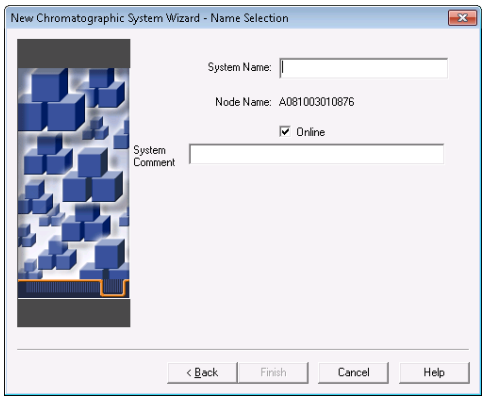
(13) Select the instrument icon that you want to use from the Available Instruments list, then double-click the icon. Check that the icon moves to the New System Instruments list, then click <Next>.



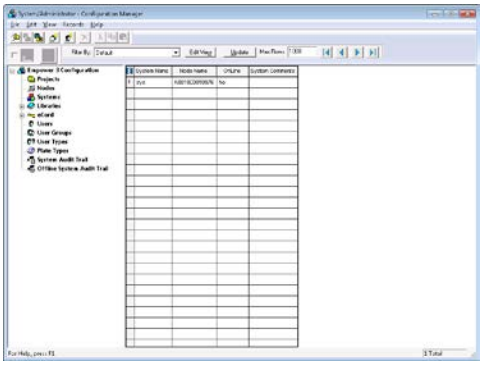
(14) Setup the access control, then click <Next>.



(15) Enter the system name, then click <Finish>.



(16) Check that the system name is displayed in the Systems list.

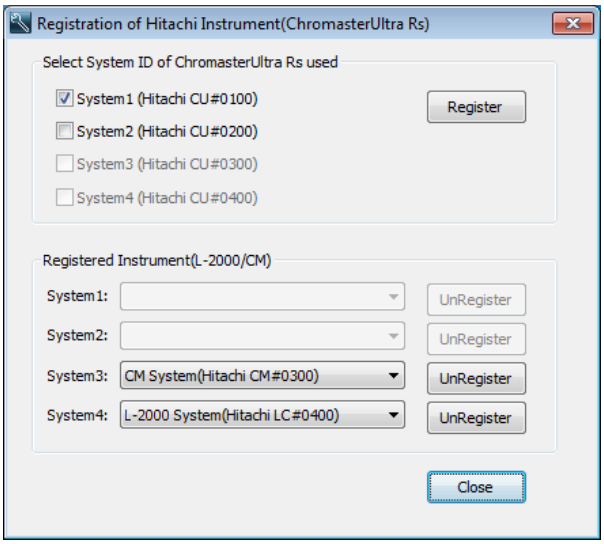


NOTE: The registration of plural systems that are neither used nor connected to instrument will cause failure or delay (up to 1 hour) of the program startup process.
Maintain the maximum registration number of the system as 4 or less.

[END]

4.3 Register tool

Register Tool is a tool to register the chromatographic system configurations of Chromaster series and ChromasterUltra R_S series (On Chromaster driver, only the driver for Empower3 have it). This tool can also cancel the registration of the other system configuration (Chromaster series, ChromasterUltra R_S series and L-2000 series).



Select System ID of XXX Used
(XXX is Chromaster or ChromasterUltra R_S)

System 1-4

Select the system ID of the LC system be registered in the chromatographic system of Empower.

✍ System ID that is already registered other series cannot be selected.

Register

Press this button to register the selected system on the chromatographic system of Empower.

Registered Instrument

System 1-4

Display the system of other series that has already been registered.

UnRegister

Press this button to cancel the registration of the analysis system of other series.

4.4 Changing the system configuration

This section describes how to change the analysis system configuration.

(1) Close the Run Samples windows or QuickStart window of the analysis system which changes the system configuration.

(2) Turn off the power of all modules of the analysis system which changes the system configuration.

(3) Turn on the power of the modules used. Make sure that no error occurs from the modules after finishing the initialization of the modules.

(4) Wait a little time (about 30 seconds) and open the Run Samples windows or QuickStart window of the analysis system which changed the system configuration.
The Run Samples windows or QuickStart window will be opened in the system configuration that has been changed.

☝ It takes time a little until system configuration is changed.

☝ When the system configuration is the configuration before the change, wait a little time and then try to open the window.

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APPENDIX

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APPENDIX

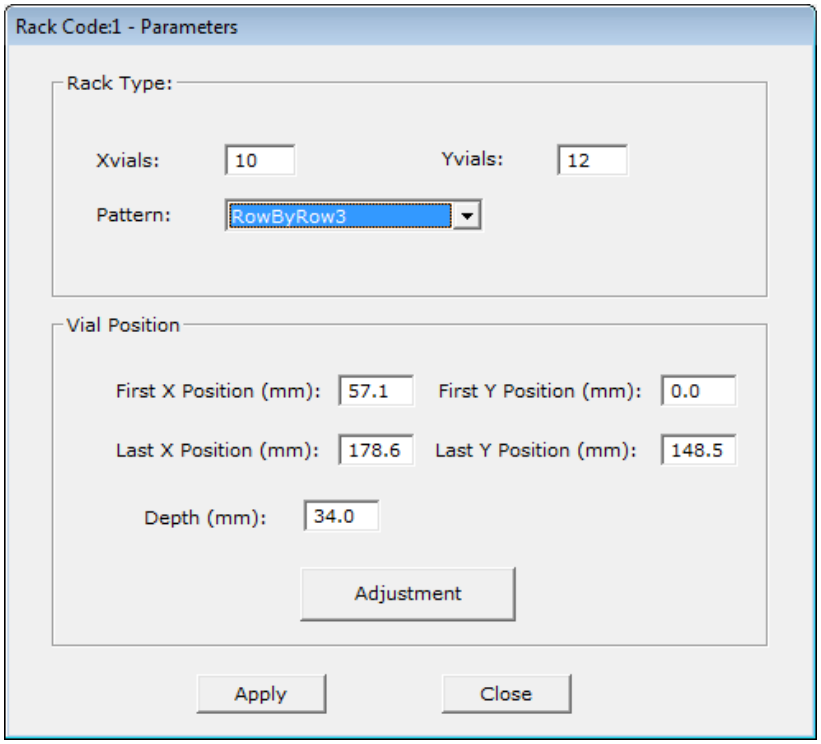
Appendix 1 Setup of the option rack for Autosampler

NOTE: The customer must not attempt setup of the option rack. When the change in the setting of the option rack is necessary, please notify your local Hitachi High-Technologies Corporation sales representative or service office of Hitachi High-Technologies Corporation sales representative.

1.1 Setting of Rack Parameters

Please set the rack parameters of the Autosampler with the Maintenance Software.
Refer to the instruction manual of optional rack for the Autosampler, enter rack parameters appropriate for the option rack to be used.

☞ Refer to the Instruction Manual or Help of Maintenance Software for setup procedures.

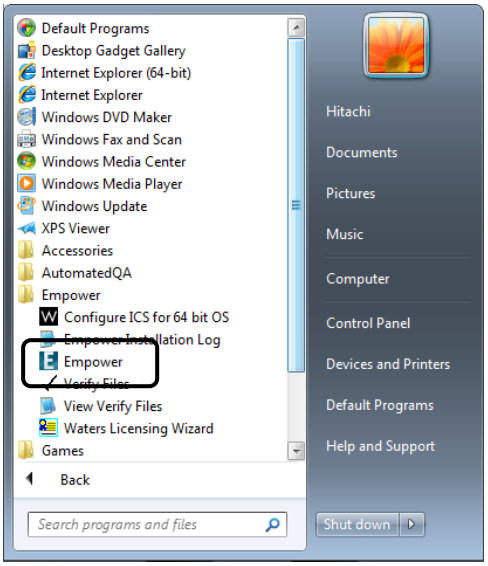


1.2 Registration of Plate Information on Empower3

1.2.1 Create New Plate Type

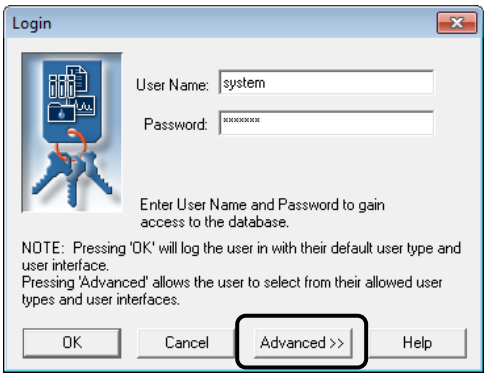
Please create the New Plate Type with Configuration Manager.

(1) From the Start menu, click [All Programs]
– [Empower]
– [Empower].

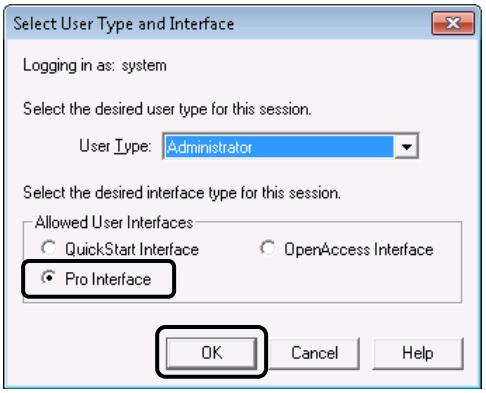


(2) Launch “Empower Login” dialog, enter “User Name” and “Password” as follows, and then click <Advanced> button.

User Name : system
Password : manager



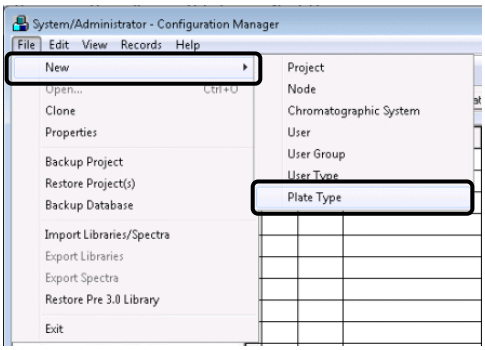
(3) Select [Pro Interface] in "Allowed User Interfaces" group box, and then click [OK] button.



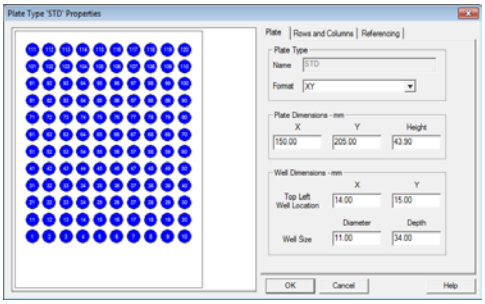
✍ You can start Empower from the following shortcut icon for Empower to start if you create the shortcut on the desktop.

(4) Click [Configure System] in the Empower Pro screen.

(5) Select [File] – [New] – [Plate Type]



(6) New Plate Type dialog is displayed. Please set the parameters with reference to section 1.2.2 in this manual. Enter plate parameters appropriate for the option rack to be used.



[END]

1.2.2 Setting of Plate

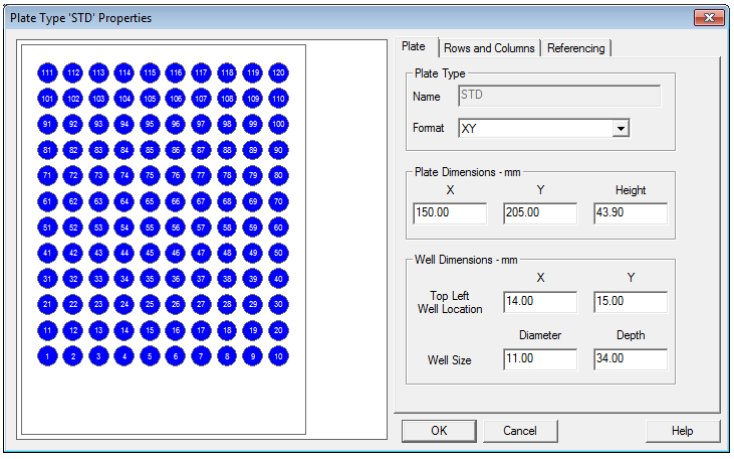
Please set the parameters of the plate as follows according to the used rack.

【For Chromaster 5210 / Chromaster 5260
/ ChromasterUltra RS 6270】

(1) Standard Option Rack: Sample rack for 120 vials of 1.5 mL each (Part No.892-0230)
Thermostat Rack: Sample rack for 120 vials of 1.5 mL each (Part No.892-0240)

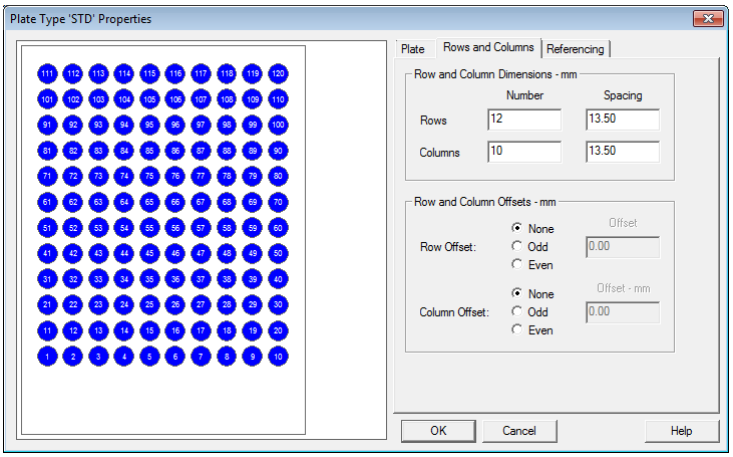
< Plate tab >

Category	Parameter		Value
Plate Type	Name		STD
	Format		XY
Plate Dimensions (mm)	X		150.00
	Y		205.00
	Height		43.90
Well Dimensions (mm)	Top Left Well Location	X	14.00
		Y	15.00
	Well Size	Diameter	11.00
		Depth	34.00



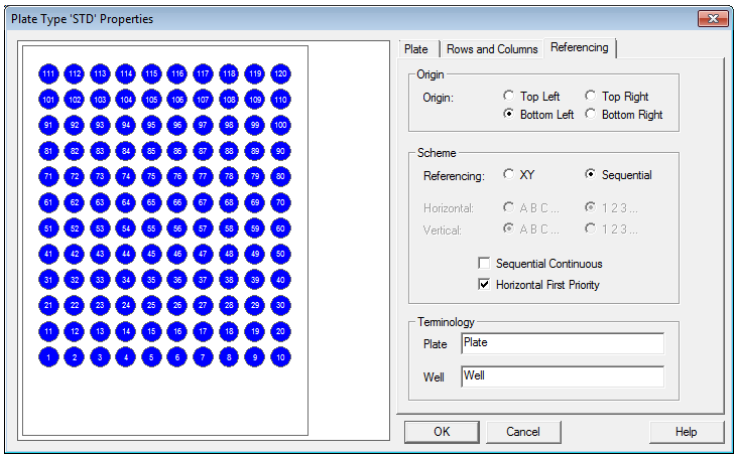
< Rows and Columns tab >

Category	Parameter		Value
Row and Column Dimensions (mm)	Rows	Number	12
		Spacing	13.50
	Columns	Number	10
		Spacing	13.50
Row and Column Offset (mm)	Row Offset		None
	Column Offset		None



< Referencing tab >

Category	Parameter	Value
Origin	Origin	Bottom Left
Scheme	Referencing	Sequential
	Sequential Continuous	Not Checked
	Horizontal First Priority	Checked
Terminology	Plate	Plate
	Well	Well

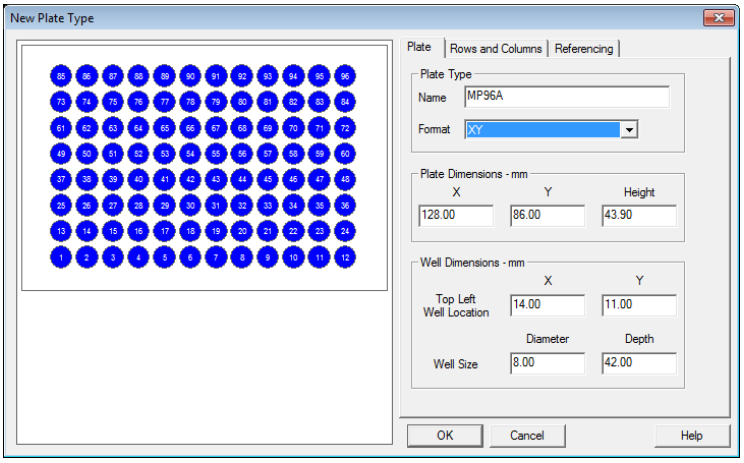


(2) Standard Option Rack: Sample rack for micro plate (×2)
(Part No.892-0236)
Thermostat Rack: Sample rack for micro plate (×2)
(Part No.892-0246)

(a) 96-hole micro-plate

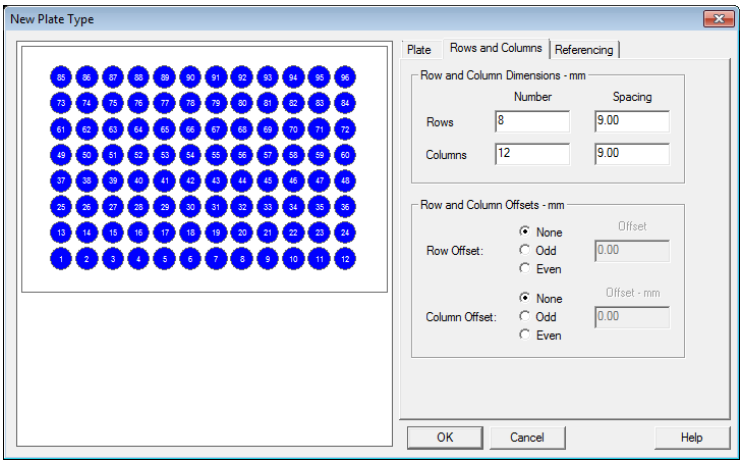
< Plate tab >

Category	Parameter		Value	
Plate Type	Name		MP96A	MP96B
	Format		XY	XY
Plate Dimensions (mm)	X		128.00	128.00
	Y		86.00	86.00
	Height		43.90	43.90
Well Dimensions (mm)	Top Left Well Location	X	14.00	14.00
		Y	11.00	11.00
	Well Size	Diameter	8.00	8.00
		Depth	42.00	42.00



< Rows and Columns tab >

Category	Parameter		Value
Row and Column Dimensions (mm)	Rows	Number	8
		Spacing	9.00
	Columns	Number	12
		Spacing	9.00
Row and Column Offset (mm)	Row Offset		None
	Column Offset		None



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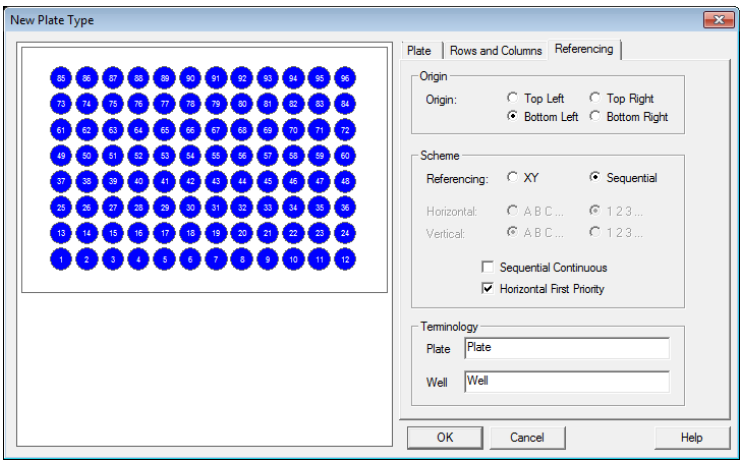
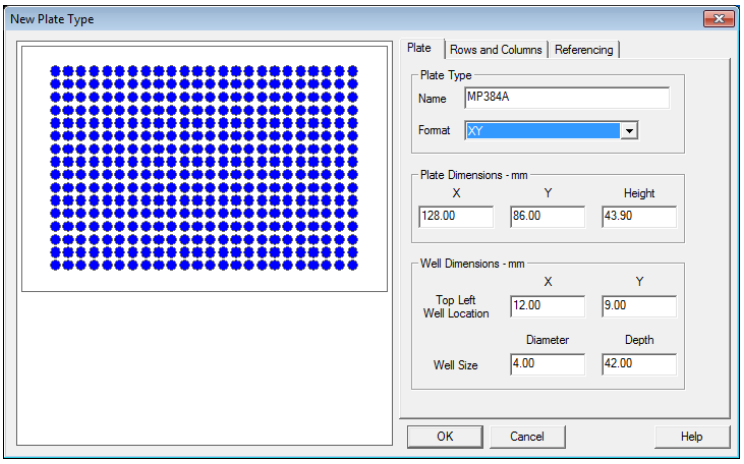
Category	Parameter	Value
Origin	Origin	Bottom Left
Scheme	Referencing	Sequential
	Sequential Continuous	Not Checked
	Horizontal First Priority	Checked
Terminology	Plate	Plate
	Well	Well



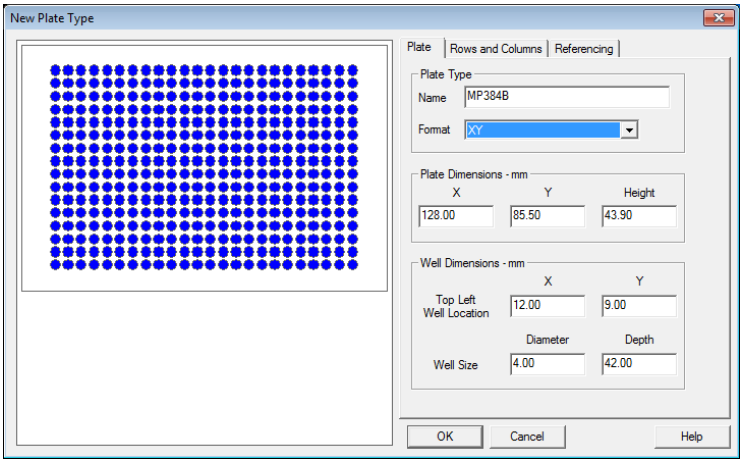
(b) 384-hole micro-plate

< Plate tab >

Category	Parameter		Value	
Plate Type	Name		MP384A	MP384B
	Format		XY	XY
Plate Dimensions (mm)	X		128.00	128.00
	Y		86.00	85.50
	Height		43.90	43.90
Well Dimensions (mm)	Top Left Well Location	X	12.00	12.00
		Y	9.00	9.00
	Well Size	Diameter	4.00	4.00
		Depth	42.00	42.00



MP384A



MP384B

< Rows and Columns tab >

Category	Parameter		Value
Row and Column Dimensions (mm)	Rows	Number	16
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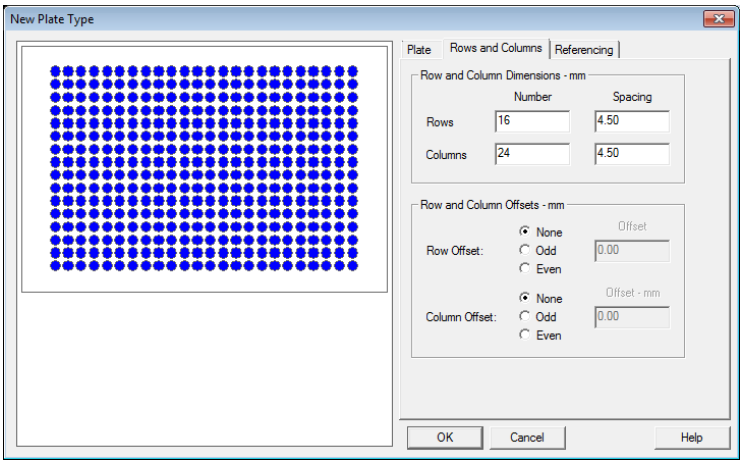
	Columns	Number	24
		Spacing	4.50
Row and Column Offset (mm)	Row Offset		None
	Column Offset		None



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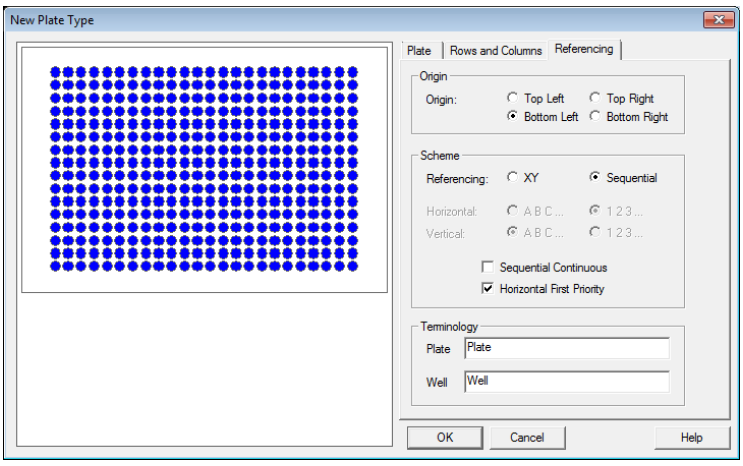
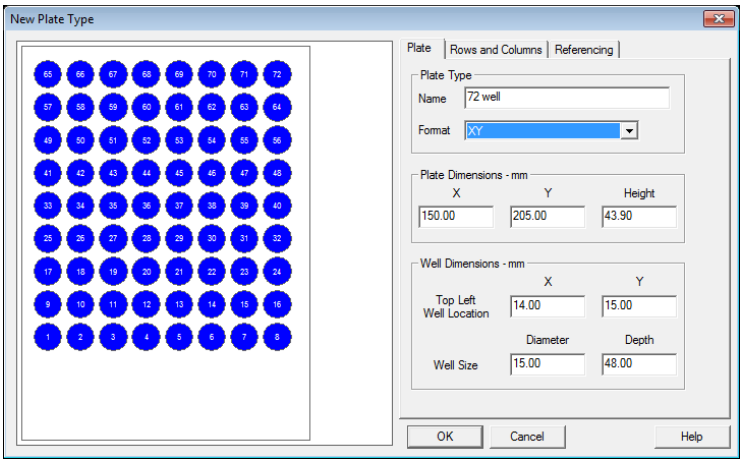
Category	Parameter	Value
Origin	Origin	Bottom Left
Scheme	Referencing	Sequential
	Sequential Continuous	Not Checked
	Horizontal First Priority	Checked
Terminology	Plate	Plate
	Well	Well



(3) Standard Option Rack: Sample rack for 4 mL vial (×72)
(Part No.892-0232)
Thermostat Rack: Sample rack for 4 mL vial (×72)
(Part No.892-0242)

< Plate tab >

Category	Parameter		Value
Plate Type	Name		72 well
	Format		XY
Plate Dimensions (mm)	X		150.00
	Y		205.00
	Height		43.90
Well Dimensions (mm)	Top Left Well Location	X	14.00
		Y	15.00
	Well Size	Diameter	15.00
		Depth	48.00



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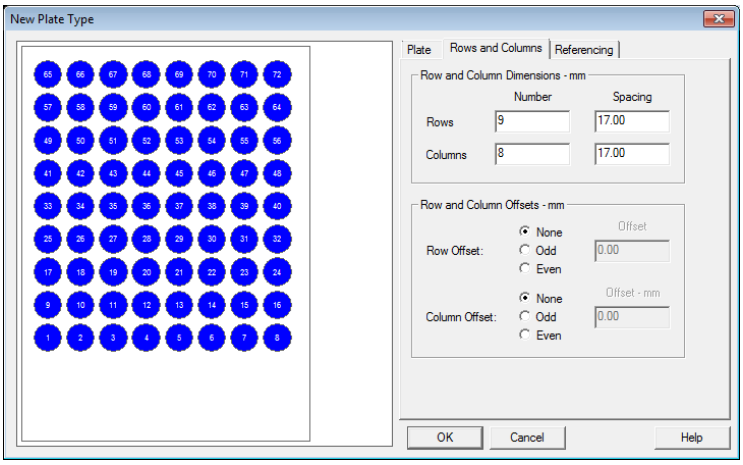

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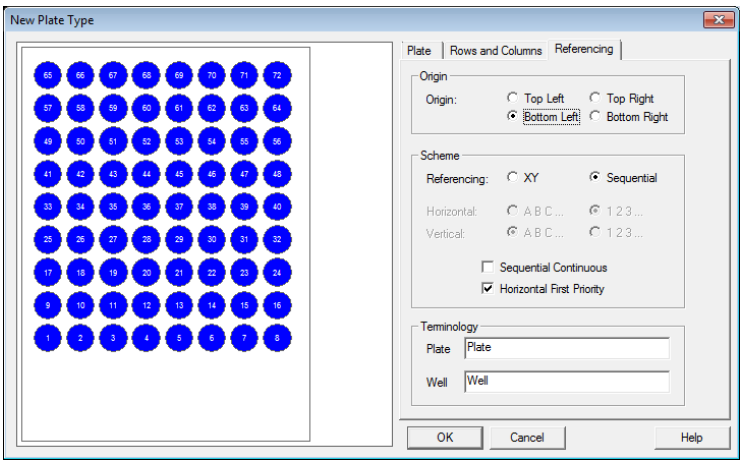
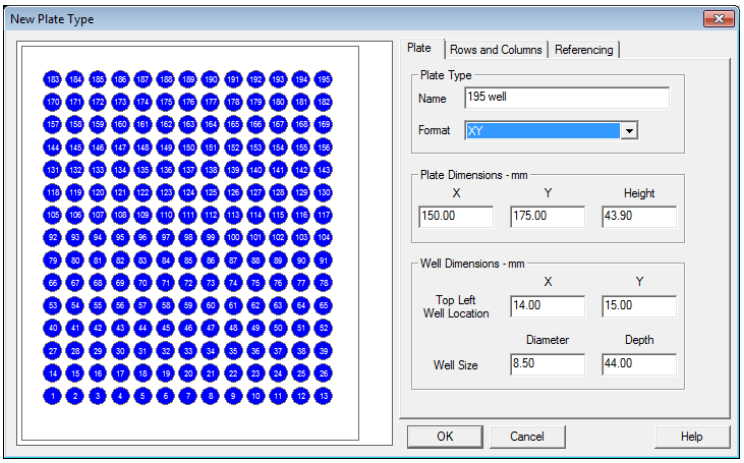
Category	Parameter	Value
Origin	Origin	Bottom Left
Scheme	Referencing	Sequential
	Sequential Continuous	Not Checked
	Horizontal First Priority	Checked
Terminology	Plate	Plate
	Well	Well



(4) Standard Option Rack: Sample rack for 1 mL vial (×195)
(Part No. 892-0234)
Thermostat Rack: Sample rack for 1 mL vial (×195)
(Part No. 892-0244)

< Plate tab >

Category	Parameter		Value
Plate Type	Name		195 well
	Format		XY
Plate Dimensions (mm)	X		150.00
	Y		175.00
	Height		43.90
Well Dimensions (mm)	Top Left Well Location	X	14.00
		Y	15.00
	Well Size	Diameter	8.50
		Depth	44.00



< Rows and Columns tab >

Category	Parameter		Value
Row and Column Dimensions (mm)	Rows	Number	15
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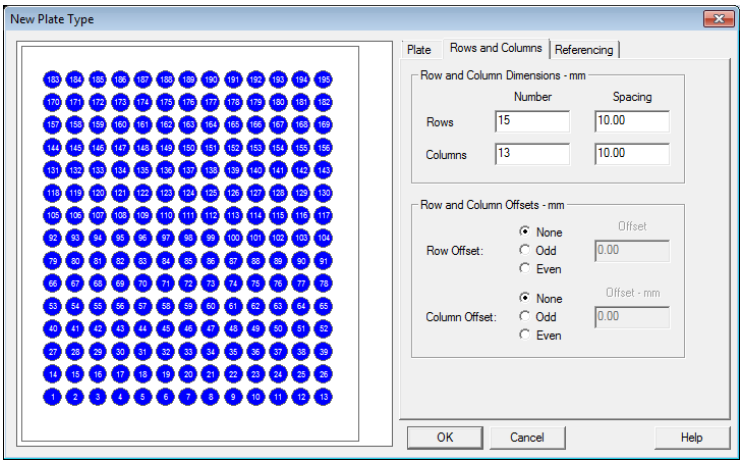
	Columns	Number	13
		Spacing	10.00
Row and Column Offset (mm)	Row Offset		None
	Column Offset		None



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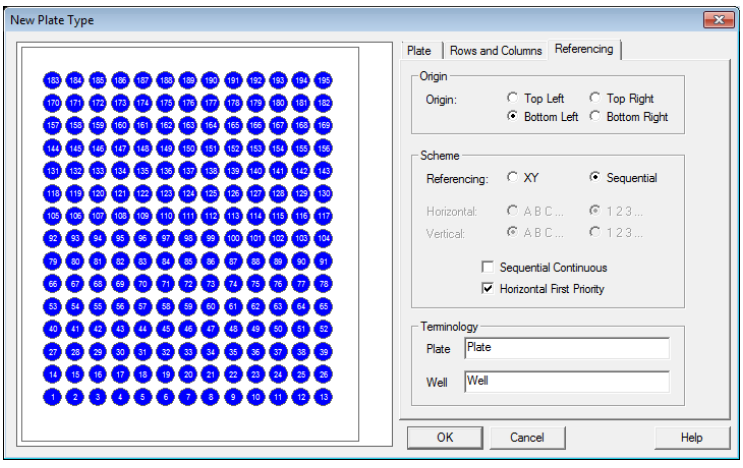
Category	Parameter	Value
Origin	Origin	Bottom Left
Scheme	Referencing	Sequential
	Sequential Continuous	Not Checked
	Horizontal First Priority	Checked
Terminology	Plate	Plate
	Well	Well



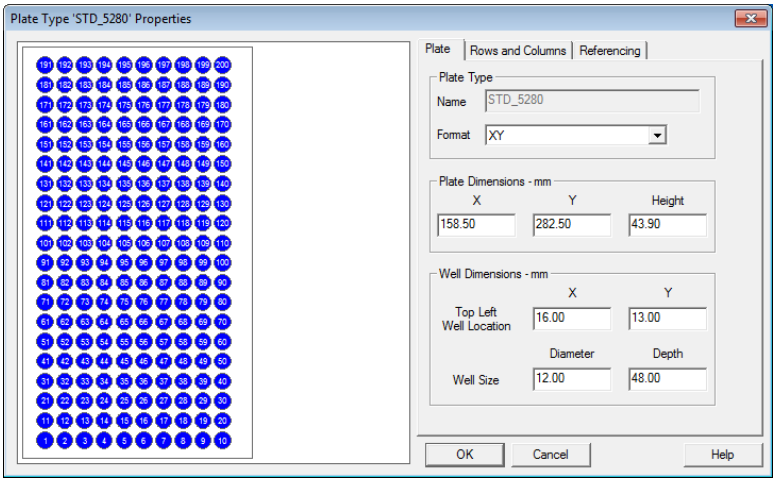
【For Chromaster 5280】

(1) Standard Option Rack: Sample rack for 200 vials of 1.5 mL each

Thermo Unit Rack: Sample rack for 200 vials of 1.5 mL each

< Plate tab >

Category	Parameter		Value
Plate Type	Name		STD_5280
	Format		XY
Plate Dimensions (mm)	X		153.50
	Y		282.50
	Height		43.90
Well Dimensions (mm)	Top Left Well Location	X	16.00
		Y	13.00
	Well Size	Diameter	12.00
		Depth	48.00



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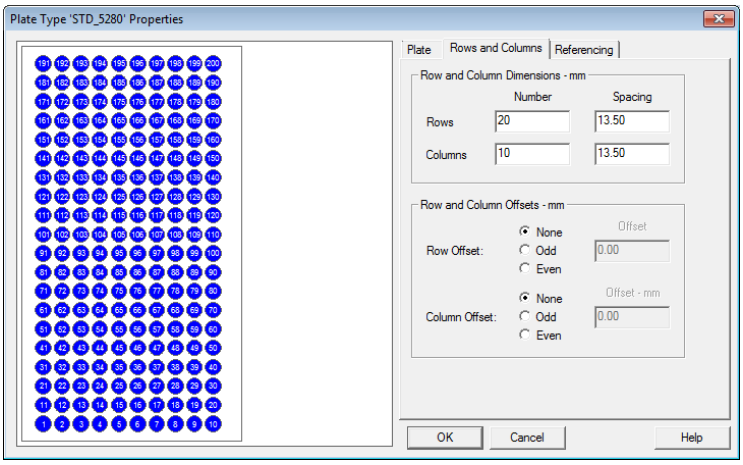

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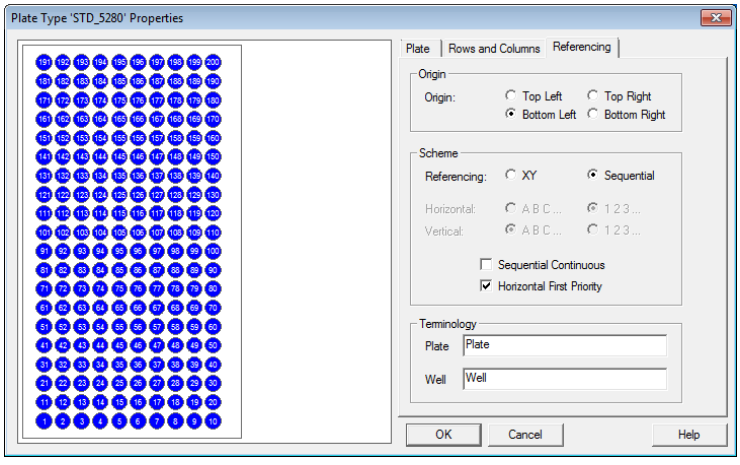
Category	Parameter	Value
Origin	Origin	Bottom Left
Scheme	Referencing	Sequential
	Sequential Continuous	Not Checked
	Horizontal First Priority	Checked
Terminology	Plate	Plate
	Well	Well



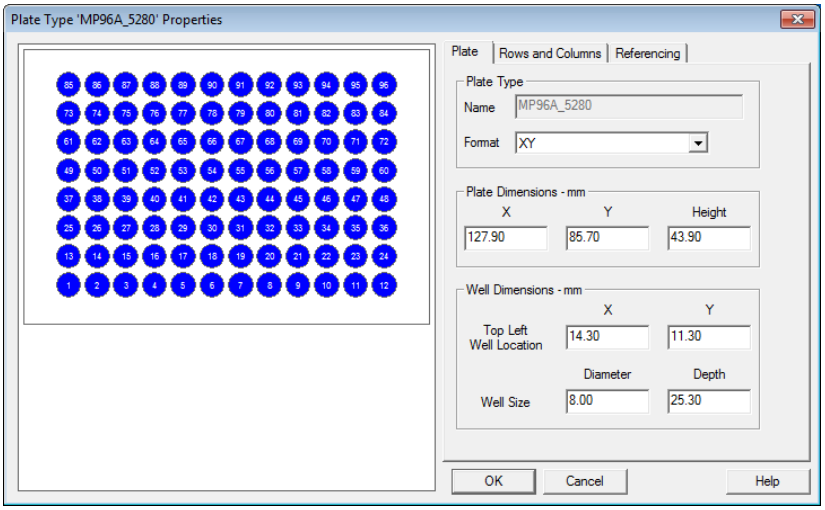
(2) Standard Option Rack: Sample rack for micro plate (×3)
Thermo Unit Rack: Sample rack for micro plate (×3)

(a) 96-hole micro-plate

< Plate tab >

Category	Parameter		Value		
Plate Type	Name		MP96A_5280	MP96B_5280	MP96C_5280
	Format		XY		
Plate Dimensions (mm)	X		127.90		
	Y		85.70		
	Height		43.90		
Well Dimensions (mm)	Top Left Well Location	X	14.30		
		Y	11.30		
	Well Size	Diameter	8.00		
		Depth	25.30*1		

*1 When you use Thermo Unit Rack, please set "42.00"



< Rows and Columns tab >

Category	Parameter		Value
Row and Column Dimensions (mm)	Rows	Number	8
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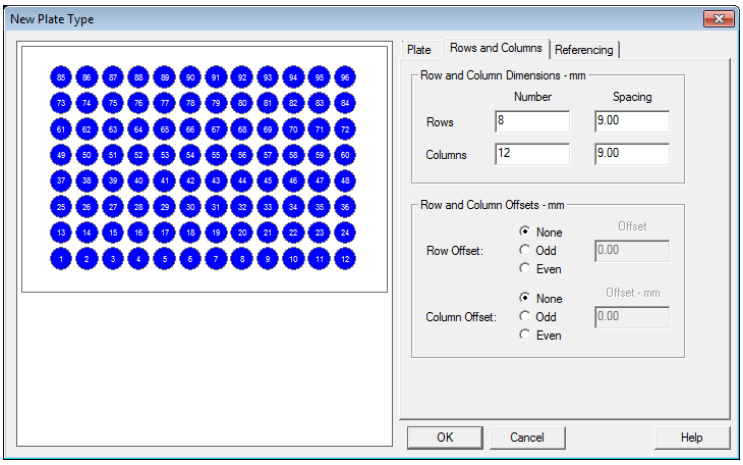
		Spacing	9.00
Row and Column Offset (mm)	Row Offset		None
	Column Offset		None



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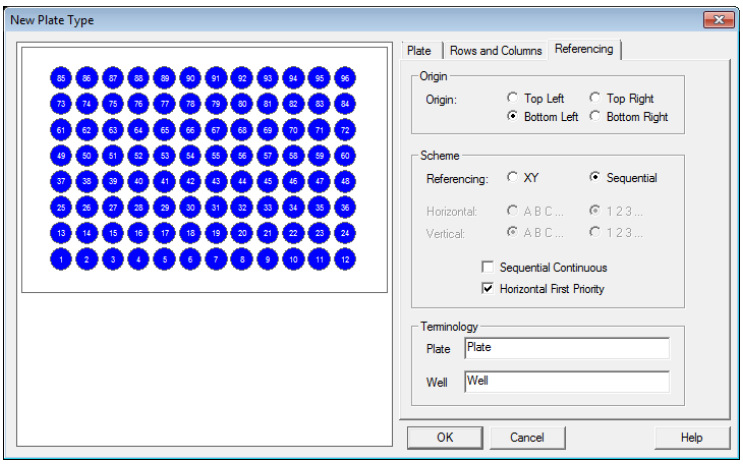
Category	Parameter	Value
Origin	Origin	Bottom Left
Scheme	Referencing	Sequential
	Sequential Continuous	Not Checked
	Horizontal First Priority	Checked
Terminology	Plate	Plate
	Well	Well

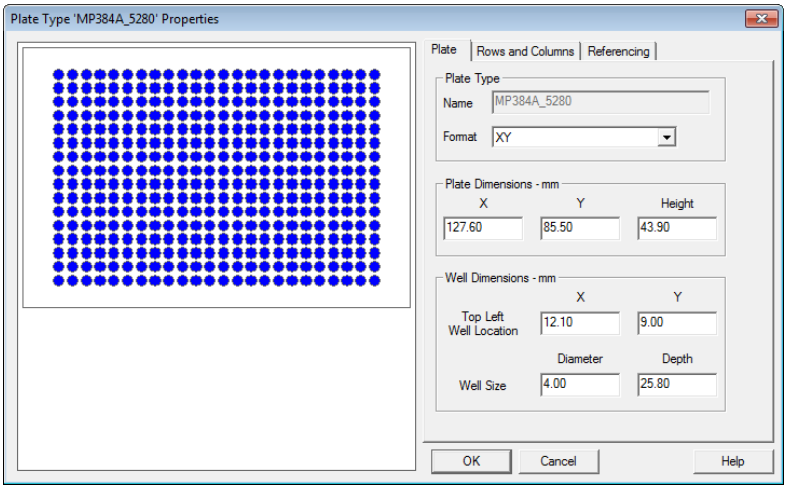


(b) 384-hole micro-plate

< Plate tab >

Category	Parameter		Value		
Plate Type	Name		MP384 A_5280	MP384 B_5280	MP384 C_5280
	Format		XY		
Plate Dimensions (mm)	X		127.60		
	Y		85.50		
	Height		43.90		
Well Dimensions (mm)	Top Left Well Location	X	12.10		
		Y	9.00		
	Well Size	Diameter	4.00		
		Depth	25.80*1		

*1 When you use Thermo Unit Rack, please set "42.00"



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Category	Parameter		Value
Row and Column Dimensions (mm)	Rows	Number	16
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	Columns	Number	24
		Spacing	4.50
Row and Column Offset (mm)	Row Offset		None
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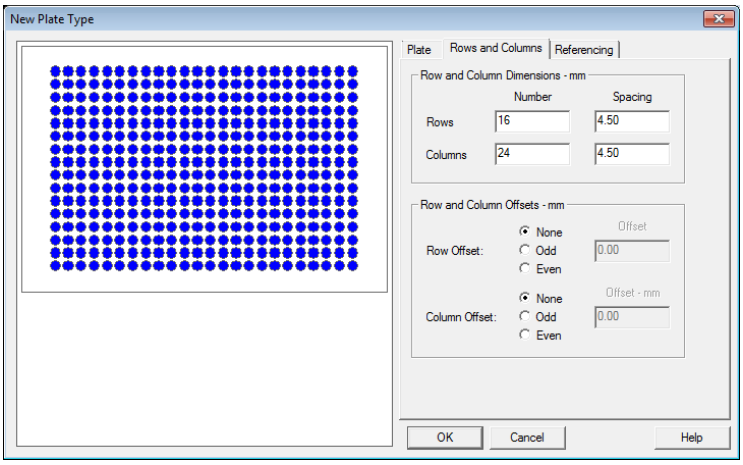

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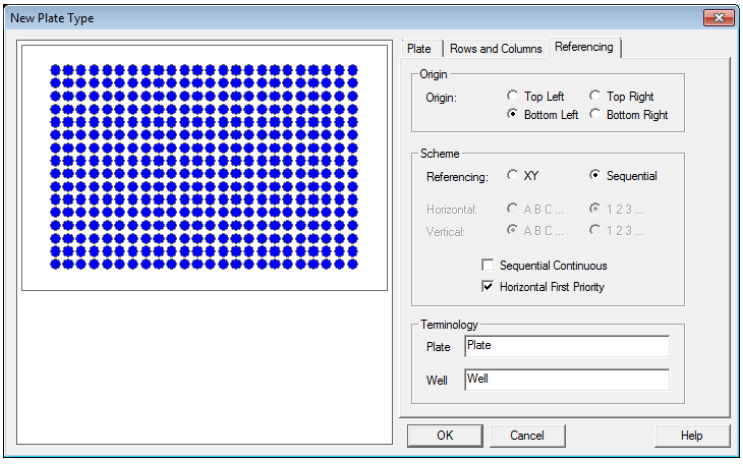
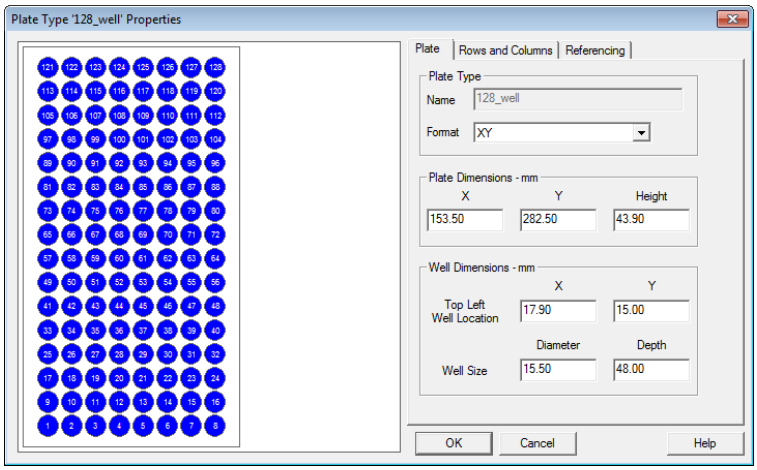
Category	Parameter	Value
Origin	Origin	Bottom Left
Scheme	Referencing	Sequential
	Sequential Continuous	Not Checked
	Horizontal First Priority	Checked
Terminology	Plate	Plate
	Well	Well



(3) Standard Option Rack: Sample rack for 4 mL (15 x 46) vial (×128)
Thermo Unit Rack: Sample rack for 4 mL (15 x 46) vial (×128)

< Plate tab >

Category	Parameter		Value
Plate Type	Name		128 well
	Format		XY
Plate Dimensions (mm)	X		153.50
	Y		282.50
	Height		43.90
Well Dimensions (mm)	Top Left Well Location	X	17.90
		Y	15.00
	Well Size	Diameter	15.50
		Depth	48.00



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Category	Parameter		Value
Row and Column Dimensions (mm)	Rows	Number	16
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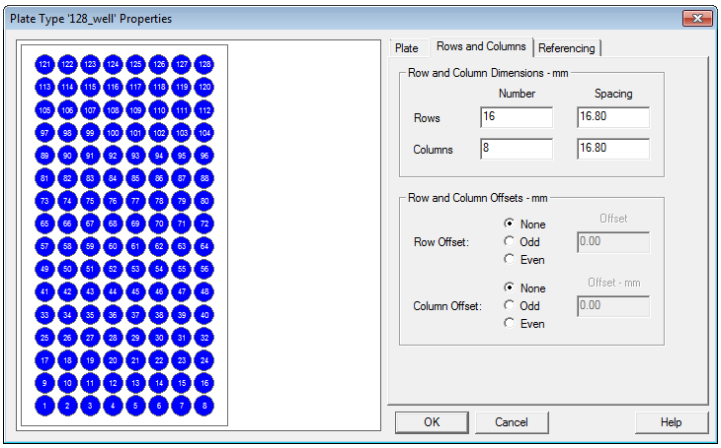
		Spacing	16.80
Row and Column Offset (mm)	Row Offset		None
	Column Offset		None



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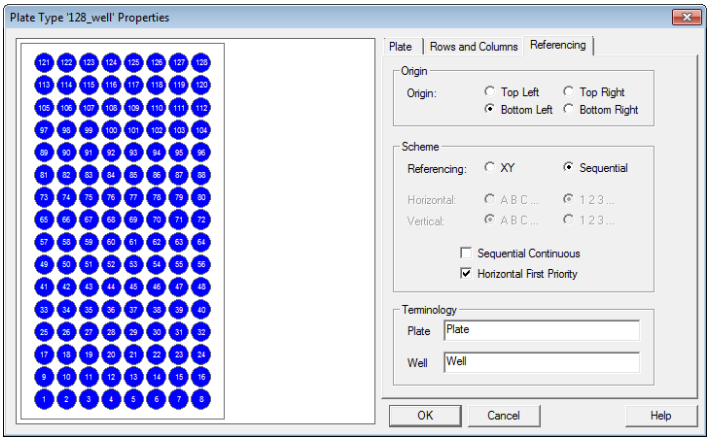
Category	Parameter	Value
Origin	Origin	Bottom Left
Scheme	Referencing	Sequential
	Sequential Continuous	Not Checked
	Horizontal First Priority	Checked
Terminology	Plate	Plate
	Well	Well



1.3 Setting of Plate on Empower3

Refer to the Instruction Manual (Operation) or Help of each driver for setup procedures.

TERMINOLOGY

TERMINOLOGY

C

Chromaster series	A general name for the Hitachi High-Performance Liquid Chromatograph.
ChromasterUltra Rs series	A general name for the Hitachi Ultra High-Performance Liquid Chromatograph.

E

e-line cable	A digital network used exclusively for analysis.

I

IFC	IFC, which is short for Interface Control Board, is an interface board required for controlling the HPLC system from a PC.

L

Low pressure gradient	Using one pump, a mixing ratio of two to four solvents is varied with time for analytical operation.

P

PC	The abbreviation of personal computer.

U

USB	USB, which is short for Universal Serial Bus, is a standard type of connection for many different kinds of devices.