The Embedded-based Teach Pendant optimized for industrial robots.

DTP10-D User's Manual

DAINCUBE Corp. Display type

FORM 140108F - 2018.01.11

DAIN CUBE

DTP10-D User's manual Form 140108F-171206— January, 2018

DAINCUBE Corp. Web: <u>www.daincube.com</u> E-mail: sales@daincube.com Tel: 82-32-329-9783~4 Fax: 82-32-329-9785

#401-701, Bucheon TechnoPark 4-Danji, 655 Pyeongcheon-ro, Wonmi-gu, Bucheon-Si, Gyeonggi-Do, Republic of Korea

Copyright © 2005–2018 Daincube All rights reserved. Printed in the Republic of Korea

Preface

Copyright notice

Copyright © 2005–2018 Daincube. All rights reserved.

Copying of this document, and giving it to others and the use or communication of the Contents thereof, is forbidden without express authority. Offenders are liable to the payment of damages.

All rights are reserved in the event of the grant of a patent or the registration of a utility model or design.

Important information

This documentation is intended for qualified audience only. The product described herein is not an end user product. It was developed and manufactured for further processing by trained personnel.

Disclaimer

Although this document has been generated with the utmost care no warranty or liability for correctness or suitability for any particular purpose is implied. The information in this document is provided "as is" and is subject to change without notice.

Trademarks

All used product names, logos or trademarks are property of their respective owners.

Product support

DAINCUBE Corp. Web: www.daincube.com E - MAIL: sales@daincube.com

Safety precautions

Be sure to observe all of the following safety precautions.

Strict observance of these warning and caution indications are a MUST for preventing accidents, which could result in bodily injury and substantial property damage. Make sure you fully understand all definitions of these terms and related symbols given below, before you proceed to the manual.

Safety precautions

The following symbols may be used in this specification:

\land Warning:

Warnings indicate conditions that, if not observed, can cause personal injury.

A Caution :

Cautions warn the user about how to prevent damage to hardware or loss of data.

Solution → Note:

Notes call attention to important information that should be observed.

Revision history

Revision	Data	Comment
Version 0.1 (Preliminary)	2018.01.11	Preliminary version
Version 0.2 (Preliminary)	2018.01.16	Change OSD key mapping
Version 0.3	2018.05.10	Change Touch method (Serial -> USB HID)
		A
		*

Contents

1.	Introduction	5
1.1	. Host PC to target (DTP10-D) connection	5
2.	Virtual Com Port driver	6
2.1 2.2 2.3	 Install Virtual COM Port driver Universal Pointer Device Driver install Touch Calibration 	6 9 11
3.	Set the Host PC resolution	14
3.1 3.2	. Supported resolution . Resolution setting to 1280 x 800	14 14
4.	How to use Keypad, LED, Buzzer	20
4.1	. Execute Serial daemon application.	20
5.	OSD function description	24
5.1 5	. How to enter OSD	24 .25
6.	FAQ	26
6.1 6	. Solution of error	26 .26
7.	General care and maintenance	28
7.1	. Cleaning	28
8.	EC directives and standards	28
8.1 8.2	EC directives	28 28
9.	Reference list	29

1. Introduction

This document is a manual document that describes how to set up the DTP10-D Host PC environment for Daincube. The DTP10-D is equipped with a 1280 x 800 LCD. Touch controller are configured USB HID and keypad, LED, and Buzzer are configured as RS-232 type. (Virtual Com Port)

To use DTP10-D, you need the following configuration procedure.

- A. Host PC to target (DTP10-D) connection.
- B. Install Virtual COM Port driver.
- C. Touch driver installation & calibration.
- D. Host PC resolution setting.
- E. How to test Keypad, LED and buzzer.
- * This document is based on Windows 7 32bit, 64bit environment.

1.1. Host PC to target (DTP10-D) connection

As a connection method between Host PC and DTP10-D, Host PC is based on Windows7 32bit, 64bit.



2. Virtual Com Port driver

2.1. Install Virtual COM Port driver

DTP10-D uses Virtual COM Port when controlling Touch, Key, LED and buzzer using USB Mini-AB type. Therefore, you need to install Virtual COM Port driver on your Host PC.

Execute .exe files when 02_Driver₩01_VCP_Driver folder. If your Host PC is 32bit, excute

"VCP_V1.3.1_Setup.exe". If your Host PC is 64bit, excute "VCP_V1.3.1_Setup_x64.exe"

When you execute .exe files, following screen appear. Click to "Next".

InstallShield Wizard		x	
	Welcome to the InstallShield Wizard for Virtual COM Port Driver V1.3.1		
	The InstallShield® Wizard will install Virtual COM Port Driver on your computer.		
	To continue, click Next		
	< Back Next > Cance		

If the installation wizard for the device driver appears during the installation process, click "Next".



If driver installation is completed, power on DTP10-D and driver installation will proceed.

If it completed, the following appears in "Control panel" -> "Device manager" -> "Port".



Also, if the connection is success, the right LED of DTP10-D will blue. (If the connection is fail, the right LED of DTP10-D will red. If this happens, reinstall the driver and unplug the USB Mini-AB and plug it back in.



2.2. Universal Pointer Device Driver install

In order to control the Host PC in DTP10-D, driver and UPDD application are installed through Universal Pointer Device Driver (UPDD) install as a necessary procedure. The UPDD install file is located in the folder 02_DTP10-D_SW >> 02_Driver >> 02_Win8Win7XPUPDD" in the provided SDK, and can be installed on the Host PC by executing "setup32.exe" or "setup64.exe" file depending on the OS environment.

When the installation program is executed, select "Microchip, AR1100, USB", and click the "Install" button.

	UPDD Install	
This program will install the Universal Pointer Device Driver software on your computer. USB controllers will be detected	Software version: 05:00:02 Supported controllers Microchip, TSHARC-12/10, USB	<u> </u>
automatically by the install process and do not need to be selected. Serial controllers need to be selected now or after the software has been installed.	 Microchip, TSHARC-12/10, PS/2 Microchip, TSHARC-12/10, Serial Microchip, AR1000, Serial Microchip, AR1100, Serial 	
Click "Install" to proceed, or "Cancel" if you do not wish to install the software at this time.	Microchip, AR1100, USB	•
	▶ <u>I</u> nstall	

When the following window appears, click "Install" button continuously.

Windows Security
Would you like to install this device software? Name: Touch-Base Ltd Mice and other pointing d Publisher: Touch-Base Ltd
Always trust software from "Touch-Base Ltd".
You should only install driver software from publishers you trust. <u>How can I</u> <u>decide which device software is safe to install?</u>

When the following window appears, click "Install" button continuously.



When the following window appears, click the "Close" button to complete the installation.

UPDD Install	
Install successful	
The Universal Pointer Device Driver software has been successfully installed on your computer.	
Use the Pointer Devices option in the Windows Control Panel to add further devices or make changes to settings.	
If your touch device does not operate correctly then please reboot your computer.	

After installation is complete, check that the "UPDD" icon has been created in the notification area to the right of the taskbar.



"Start" -> "All Program	s" -> "UPDD"	folder is	created.	
Vindows Media Player	Documents			
 Windows Update XPS Viewer 	Pictures			
Accessories	Music			
Maintenance	Games			
UPDD	Computer			
Settings	Control Panel			
Test	Devices and Printers			
	Default Programs			
1 Back	Help and Support			
Search programs and files	Shut down			
 (a) (b) (c) (c)				
R Touch Calibration				
Click "Start" -> "All P	rograms" -> "	UPDD" ->	"Settings".	

Documents

Pictures

Music

Games

Computer

Control Panel

Devices and Printers

Default Programs

Shut down 🕨

ρ

0

Windows Media Player
Windows Update

🛹 XPS Viewer]] Accessories

📙 Games]] Maintenance

Startup

Calibrate

Search programs and files

E

page 1

1

Test

Back

Click the "Monitor icon" t	o select a monitor.	
R UPDD Console		
Microchip, AR1100	0	
Wardware		
Click Mode	Handling Whole desktop	
Properties	Connected to USB port	
Calibration		
<u>Status</u>		🕂 Add a new de <u>v</u> ice
		<u>Remove this device</u>
Calibrate	🖌 Cļose 🍞	H <u>e</u> lp (j) A <u>b</u> out

Press the down arrow to select the monitor to which DTP7H-D is connected. If only the connected monitor is DTP7H-D, you can select "All". After making your selection, click "OK".

North Desktop Area		×
Microchip, AR1100		
Select a monitor or desktop area from	n the list below	
Whole	🙆 🔲 Configure All	
A calibration may be required if this	setting is changed	
VN 🚽	The Lancel I Help	

This is "Settings" execution screen. "Connected to USB port" is output when normal. Click the "Monitor icon" to select a monitor.

"Not required" is output when normal.

VPDD Console		
Microchip, AR1100	0	
_H ardware	Controller type: Microchip, AR1100, USB	
Click Mode	State: Enabled	
Properties		
Calibration	Macro result: 🖌 Not required	
<u>Status</u>	<u>Replay</u> initialization macro	🖋 Sho <u>w</u> test screen
	Reset error counts	∰ Show test grid
	Z Rel <u>o</u> ad driver settings	dump settings
Calibrate	√ C <u>l</u> ose	i About

On the bottom left, click the "Calibrate" button.

Microchip, AR1100	٢	
Hardware	Controller type: Microchip, AR1100, USB	
Click Mode	State: Enabled	
Properties		
Calibration	Macro result: Vot required	
ETT: Status	<u>Replay initialization macro</u> Show test screened	en
	Reset error counts	
	Reload driver settings 🗧 Dump settings	
Cal <u>i</u> brate	✓ Close ③ Help	:

X

Touch the center of the cross. Touching the upper left, lower left, center, upper right, lower right 5times to complete the calibation.



Microchip, AR1100 on Whole Desktop

Please touch the center of each cross as it appears

0

3. Set the Host PC resolution

The resolution setting of this manual is based on Windows7 32bit and 64bit environment, and may differ depending on the user's PC and graphic environment.

The DTP100-D supports multiple resolutions, but in Windows 7 32bit and 64bit environments, it is confirmed that the resolution is supported, and the optimal resolution value is confirm to be 1280 x 800 resolution. Therefore, this manual also describes the setting method based on the resolution of 1280 x 800 and recommends using 1280 x 800 resolution.

For the resolution setting, the cable must be connected as shown in "1.1 DTP10-D Connection".

3.1. Supported resolution

DTP10-D supports VESA standard resolution. However, optimized resolution is 1280 x 800 60Hz, so we recommend 1280 x 800 60Hz.

3.2. Resolution setting to 1280 x 800

Right-click on the desktop and click "Screen resolution".

0	새 폴더(N) 보기(V) 정렬 기준(O) 새로 고침(E)	F F
♦	붙여넣기(A) 바로 가기 붙여넣기(S) Git GUI Here Git Bash Here 삭제 취소(U)	Ctrl+Z
2 2 1 2 2	인텔® 그래픽 설정 Git Clone Git Create repository here TortoiseGit 새로 만들기(W)	Þ
	화면 해상도(U)	
	가젯(G) 개인 설정(E)	

On the resolution tab, select a resolution of 1280 x 800.

디스플레이 모양 변경



After selecting the resolution, click "advanced settings".

디스플레이 모양	· 변경	
3		감지(C) 확인(I)
디스플레이(S):	1. 일반 비 PnP 모니터 ▼	
해상도(R):	1280 × 800 -	
방향(0):	7)로 🔹	
다중 디스플레이(M):	바탕 화면을 이 디스플레이에 확장 ▼	
🖻 이 디스플레이를 주	도니터로 만들기(K)	고급 설정
텍스트 및 기타 항목 :	크거나 작게 만들기	
나에게 맞는 디스플레	이 설정 방법 보기	
		Language and the second s

취소

적용(A)

확인

In the properties of the graphics card, click "Show all modes".

일반 비 PnP 모니터 및 Intel(R) HD Graphics 530	속성 🏼 🗠
어댑터 모니터 문제 해결 색 관리	
│ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │	
Intel(R) HD Graphics 530	
	😚 속성(P)
- 어댑터 정보	
칩 종류: Intel(R) HD Graphics F	amily
DAC 종류: Internal	
어댑터 문자열: Intel(R) HD Graphics 5	30
BIOS 정보: Intel Video BIOS	
사용 가능한 총 그래픽 메모리: 18	24MB
전용비디오메모리: 19	2MB
시스템 비디오 메모리: 아	1B
공유 시스템 메모리: 16	32MB
모든 모드 표시(1)	
확인	취소 적용(A)

Select "1280 x 800, True color (32bit), 60Hz" and press OK and then "OK" in the graphics card properties.

모드 목록 표시	
사용할 수 있는 모드 목록(L) 1280×768, 트루 컬러(32비트), 85Hz 1280×768, 트루 컬러(32비트), 120Hz 1280×800, 256색, 60Hz 1280×800, 256색, 75Hz 1280×800, 35HI 컬러(16비트), 60Hz 1280×800, 하미 컬러(16비트), 75Hz 1280×800, 하미 컬러(16비트), 75Hz 1280×800, 히미 컬러(16비트), 60Hz 1280×800, 히미 컬러(16비트), 60Hz 1280×800, 히미 컬러(16비트), 60Hz 1280×800, 히미 컬러(16비트), 60Hz 1280×800, 히미 컬러(16비트), 60Hz	
이바 HI DoD DI I FI U Total(P) HD Granhics 530 소서	X
어댑터 모니터 문제 해결 색 관리 어댑터 종류 Intel(R) HD Graphics 530 ● 이댑터 정보 칩 종류: Intel(R) HD Graphics Family DAC 종류: Internal 어댑터 문자열: Intel(R) HD Graphics 530 BIOS 정보: Intel(R) HD Graphics 530 BIOS 정보: Intel Video BIOS 사용 가능한 총 그래픽 메모리: 1824MB 전용 비디오 메모리: 192MB 시스템 비디오 메모리: 0MB 공유 시스템 메모리: 1632MB 모든 모드 표시(L) 확인	<u>속성(P)</u> 적용(A)

After all settings are completed, press "OK" on the screen resolution screen.

디스플레이 모양 변경 감지(C) 확인(I) 1. 일반 비 PnP 모니터 ▼ 디스플레이(S): 1280 × 800 해상도(R): + 방향(0): 가로 • 다중 디스플레이(M): 바탕 화면을 이 디스플레이에 확장 ▼ 이 디스플레이를 주 모니터로 만들기(K) 고급 설정 텍스트 및 기타 항목 크거나 작게 만들기 나에게 맞는 디스플레이 설정 방법 보기 적용(A) 확인 취소

4. How to use Keypad, LED, Buzzer

4.1. Execute Serial daemon application.

Execute the file "serial.exe" in the folder "O2_DTP10-D_SW >> O3_Example >> O1_DTP10-D_SerialDaemon_V1.0 >> Release" in the provided SDK.

When the following message box is displayed, click "OK" button.



Serial Daemon application execution screen. The following icon appears on the right task bar and click "Daemon show".



After setting COM port for Key, LED and Buzzer, set Baud rate to 115200 and press "OPEN" button.

Serial Connection	Daemon
COM Port COM1	➡ Baud rate 115200
 Auto Manual 	OPEN SAVE
ETC	
LED1	LED2 LED3
LED ALL	BUZZER
Touch Keypad Enable /	/ Disable
Touch	Enable
🔲 Keypad	Disable

DAINCUBE Serial Daemon	ou can check the LED and Buzzer controls by	/ pressing the button.
Serial Connection COM Port ON19 Baudrate IS200 COSE SAVE FC IED LED2 ED3 ED LED2 ED3 ED ALL BUZZER FUL	DAINCUBE Serial Daemon 🗖 🖻 💌	J
COM Port COM19 Baud rate 115200	Serial Connection	1
Auto Manual ETC EDD EDD EDD EDD EDD EDD EDD EDD EDD Cuch Keypad Enable / Disable Touch Enable Disable	COM Port COM19 Baud rate 115200	
Manual LUGE SATE	O Auto	
ETC	O Manual	
LED L EDZ LED3	ETC	
LED ALL BUZZER	LED1 LED2 LED3	
ouch Keypad Enable / Disable Crouch Inable Reypad Disable	LED ALL BUZZER	
ouch Keypad Enable / Disable Couch Couch Ceypad Disable Disable Disable		
ouch Keypad Enable / Disable Touch Reypad Disable		
ouch Keypad Enable / Disable I Touch Enable Keypad Disable		
ouch Keypad Enable / Disable Keypad Disable		
ouch Keypad Enable C Touch Enable Keypad Disable		
Touch Keypad Disable	i ouch Keypad Enable / Disable	
Keypad	Touch Enable	
	Kevpad Disable	

If you press the key, it will be output to the edit window. Since the function key and the motor switch are function keys, the corresponding action is performed. Key value are refer to API manual.

🔮 DAINCUBE Serial Daemon 💷 💷 💌	
Serial Connection	1
COM Port COM19 v Baud rate 115200 v	
O Auto	
Manual CLOSE SAVE	
FIC	
LED1 LED2 LED3	
LED ALL BUZZER	
Touch Keypad Enable / Disable	
Touch Enable	
Disable	
$\langle \rangle$	

If you check "Check" in "Touch" or "Keypad" and press the "Enable" or "Disable" button, you can check the Enable, disable function of "Touch" and "Keypad" of "DTP10-D".

🛫 DAINCUBE Serial Daemon 💷 💷 💌	
Serial Connection	
COM Port COM19 Baud rate 115200	
O Auto	
O Manual	
LED1 LED2 LED3	
LED ALL BUZZER	
Touch Enable	
Keypad Disable	
-	

5. OSD function description

5.1. How to enter OSD

OSD is an on-screen display that allows you to adjust the display options. Brightness, contrast, horizontal or vertical position setting and many other features are supported.

When using OSD function, you must stop the robot or device before proceeding.

The keys to enter and use the OSD are shown below.

<i>i</i> Ù	Кеу	Function	Others
F2	F1,F2	Enter to OSD	Press F1 and F2 keys simultaneously and wait for about 3 seconds.
+1	F1	Move down	
+2	F2	Move up	
	-8	OK	
١	+8	Back	
Ì	<u> </u>		1
- ·			

Press F1 and F2 simultaneously and the OSD menu will appear as shown below for about 3 seconds.



Move to the desired menu in the menu and use the OK button to change the setting.

5.1.1. Support function description

Menu	Function	
Contrast	Contrast function	
Brightness	Brightness function	
Color adjust	Red, Green, Blue ratio control	
Color Temp	Use of preset values	
Sharpness	Sharpness function	
H.Position	Move to screen that horizontal position function	
V.Position	Move to screen that vertical position function	
OSD H.Pos	Move to OSD screen that horizontal position function	
OSD V.Pos	Move to OSD screen that vertical position function	
OSD Timer	OSD Timer function	
Language	Language function (Support to English, French, German, Spanish)	

In addition to the support functions, access to menus is possible, but changes are not recommended.

6. FAQ

6.1. Solution of error

6.1.1. Fail to execute serial daemon

When the following error occurs, execute "10_vcredist_x86.exe" file in "02_DTP10-D_SW >> 02_Driver" folder.

C:\Users	×
C:#Users#daincube#Desktop#serial_v1.1.exe	
응용 프로그램의 side-by-side 구성이 잘못되어 응용 프로그램을 시작하지 못했습니다 한 내용은 응용 프로그램 이벤트 로그를 참조하거나 명령줄 sxstrace.exe 도구를 사용 오.	나. 자세 하십시
	확인
Click the "Next" button to start the installation.	,
🕞 Microsoft Visual C++ 2008 Redistributable Setup	
Welcome to Microsoft Visual C++ 2008 Redistributable Setup	
This wizard will guide you through the installation process.	
Next > Cancel	

License agreement. Check "accept" and click the "install" button.
License Terms
Be sure to carefully read and understand all the rights and restrictions described in the license terms. You must accept the license terms before you can install the software. MICROSOFT SOFTWARE LICENSE TERMS MICROSOFT VISUAL C++ 2008 RUNTIME LIBRARIES (X86, IA64 AND X64), SERVICE PACK 1 These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. Please read them. They apply to the software named above, which includes the media on which you received it, if any. The terms also apply to any Microsoft • updates, <u>Print</u>
Press the Page Down key to see more text.
Then the installation is complete, click the "Finish" button.
Setup Complete
Microsoft Visual C++ 2008 Redistributable has been successfully installed.
It is highly recommended that you download and install the latest service packs and security updates for this product.
For more information, visit the following Web site:
Product Support Center
Einish

Once installation is complete, execute the Serial.exe program again.

7. General care and maintenance

Your device is a product of superior design and craftsmanship and should be treated with care.



The following suggestions will help you.

- Keep the device dry. Precipitation, humidity, and all types of liquids or moisture can contain minerals that will corrode electronic circuits. If your device does get wet, allow it to dry completely.
- Do not use or store the device in dusty, dirty areas. Its moving parts and electronic components can be damaged.
- Do not store the device in hot areas. High temperatures can shorten the life of electronic devices, damage cable, and warp or melt certain plastics.
- Do not store the device in cold areas. When the device returns to its normal temperature, moisture can form inside the device and damage electronic circuit boards.
- Do not attempt to open the device.
- Do not drop, knock, or shake the device. Rough handling can break internal circuit boards and fine mechanics.
- Do not paint the device. Paint can clog the moving parts and prevent proper operation.
- Unauthorized modifications or attachments could damage the device and may violate regulations governing radio devices.

7.1. Cleaning

To clean the pendant, use a soft cloth dampened with a small amount of water or a mild cleaning agent.

8. EC directives and standards

The list of safety standards on the robot. This section does not cover the safety design methods and safety equipment installation.

8.1. EC directives

2006/42/EC Directive for the safety of machinery with the application MD 2006/42/EC 2004/108/EC EMC directive 2011/65/EC RoHS directive

8.2. Standards

EN ISO 12100: Safety of machinery - General principles for design – Risk assessment and risk reduction EN ISO 13849-1: Safety of machinery, safety related parts of control systems

-Part 1: General principles for design

EN ISO 13850: Safety of machinery - Emergency stop - Principles for design

EN ISO 10218-1: Robots for industrial environments - Safety requirements -Part1 Robot

EN ISO 9787: Robots and robotic devices -- Coordinate systems and motion nomenclatures

EN ISO 9283: Manipulating industrial robots, performance criteria, and related test methods

EN ISO 13732-1: Ergonomics of the thermal environment - Part 1

EN 61000-6-4(2007+A1:2011): Terminal disturbance voltage, Radiated disturbance EN 61000-3-2:2014: Harmonic Distortion EN 61000-3-2:2013: Voltage fluctuations & flicker EN 61000-6-2:2005: Include below test types EN 61000-4-2:2009: Electrostatic discharge EN 61000-4-3:2006 +A1:2008+A2:2010: Radiated, radio-frequency, electromagnetic field EN 61000-4-4:2004 +A1:2010: Electrical fast transient / burst EN 61000-4-5:2006: Surge EN 61000-4-6:2009: Conducted disturbances, induced by radio-frequency fields EN 61000-4-8:2010: Power frequency magnetic field EN 61000-4-11:2004: Voltage dips, short interruptions and voltage variations

Korea Standard KN 61000-6-3 : Conducted tests (mains port), electromagnetic conduction test (communication ports) KN 14-1 : Discontinuous disturbance test KN 61000-6-3 : Electromagnetic radiation test KN 61000-6-1, KN 61000-4-2: Electrostatic discharge immunity test KN 61000-6-1, KN 61000-4-3: Radiated RF electromagnetic field immunity test KN 61000-6-1, KN 61000-4-4: EFT/_Burst immunity test KN 61000-6-1, KN 61000-4-5: Surge immunity test KN 61000-6-1, KN 61000-4-6: Conducted immunity test KN 61000-6-1, KN 61000-4-8: Power frequency magnetic field immunity test KN 61000-6-1, KN 61000-4-11: Voltage drop and momentary power failure immunity test

9. Reference list

A list of installation related reference materials.

Please refer to the documents below for more details.

■ Mitsubishi -EMC Installation Guidelines for General-Purpose AC Servo.

Check the local regulations for disposal of electronic products.

- YASKAWA: AC Servo Drive Technical Manual
- LS Industrial Systems: AC Servo Drive user's Manual
- Control Techniques: Motor Drives Installer's Guide.
- DELTA: EMC Standard Installation Guide for AC Motor Drives.
- Electrical design method considering EMC
- Rockwell Automation : Servo Drive Installation



This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste.

Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment.

The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

We hereby declare that the product is in compliance with the essential requirements and other relevant provisions of European Directive 2014/30/EC(The Electromagnetic Compatibility Directive).



We hereby declare that the product is in compliance with the essential requirements and other relevant provisions of Korea Directive (EMC standards) Standard: Information Communication equipment such notice with regard to the

assignment and management of the laboratory