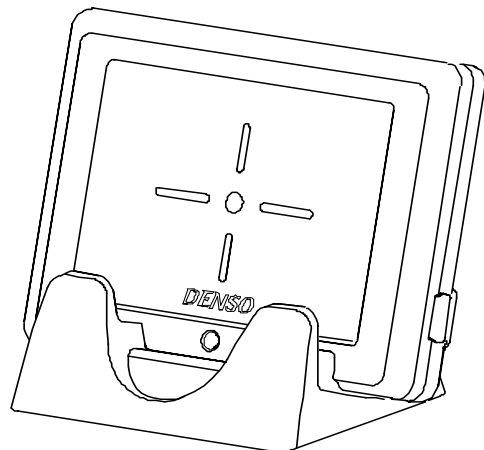


DENSO

PR-450UDM

Contactless IC Card Reader/Writer

User's Manual



- * Microsoft® and Windows® are trademarks or registered trademarks of Microsoft Corporation in the U.S.A. and other countries.
- * FeliCa is a registered trademark of Sony Corporation.
FeliCa is a contactless IC card technology developed by Sony Corporation.
- * MIFARE® is a registered trademark of NXP Semiconductors.

Federal Communication Commission Interference

NOTICE:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- * Reorient or relocate the receiving antenna.
- * Increase the separation between the equipment and receiver.
- * Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- * Consult the dealer or an experienced radio/TV technician for help.

Properly shielded grounded cables and connectors with ferrite core must be used for connection to host computer and / or peripherals in order to meet FCC emission limits.

Cables with ferrite core must be used for RF interference suppression.

FCC WARNING:

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC CAUTION:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Declaration of Conformity (For European Union)

English: Here by, DENSO WAVE INCORPORATED declare that this equipment (Contactless IC Card Reader / Writer), model PR-450UDM is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Česky: DENSO WAVE INCORPORATED tímto prohlašuje, že tento PR-450UDM je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.

Dansk: Undertegnede DENSO WAVE INCORPORATED erklærer herved, at følgende udstyr PR-450UDM overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.

Deutsch: Hiermit erklärt DENSO WAVE INCORPORATED, dass sich das Gerät PR-450UDM in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.

Eesti: Käesolevaga kinnitab DENSO WAVE INCORPORATED seadme PR-450UDM vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.

Español: Por medio de la presente DENSO WAVE INCORPORATED declara que el PR-450UDM cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.

Ελληνική: ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ DENSO WAVE INCORPORATED ΔΗΛΩΝΕΙ ΟΤΙ PR-450UDM ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.

Français: Par la présente DENSO WAVE INCORPORATED déclare que l'appareil PR-450UDM est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.

Italiano: Con la presente DENSO WAVE INCORPORATED dichiara che questo PR-450UDM è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.

Latviski: Ar šo DENSO WAVE INCORPORATED deklarē, ka PR-450UDM atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.

Lietuvių: Šiuo DENSO WAVE INCORPORATED deklaruoja, kad šis PR-450UDM atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.

Nederlands: Hierbij verklaart DENSO WAVE INCORPORATED dat het toestel PR-450UDM in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.

Malti : Hawnhekk, DENSO WAVE INCORPORATED, jiddikjara li dan PR-450UDM jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.

Magyar: Alulírott, DENSO WAVE INCORPORATED nyilatkozom, hogy a PR-450UDM megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.

Polski: Niniejszym DENSO WAVE INCORPORATED oświadcza, że PR-450UDM jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.

Português: DENSO WAVE INCORPORATED declara que este PR-450UDM está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.

Slovensko: DENSO WAVE INCORPORATED izjavlja, da je ta PR-450UDM v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.

Slovensky: DENSO WAVE INCORPORATED týmto vyhlasuje, že PR-450UDM spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.

Suomi: DENSO WAVE INCORPORATED vakuuttaa täten että PR-450UDM tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.

Svenska: Härmed intygar DENSO WAVE INCORPORATED att denna PR-450UDM står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

Íslenska: Hér með lýsir DENSO WAVE INCORPORATED yfir því að PR-450UDM er í samræmi við grunnkröfur og aðrar kröfur, sem gerðar eru í tilskipun 1999/5/EC.

Norsk: DENSO WAVE INCORPORATED erklærer herved at utstyret PR-450UDM er i samsvar med de grunnleggende krav og øvrige relevante krav i direktiv 1999/5/EF.

CE marking





SAFETY PRECAUTIONS

Be sure to observe all these safety precautions.



- Please READ through these instructions carefully. They will enable you to use the PR-450UDM correctly.
- Always keep this manual handy for easy reference.

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

Level of Precautions

 WARNING	Alert you to those conditions which could cause serious bodily injury or death if the instructions are not followed correctly.
 CAUTION	Alert you to those conditions which could cause minor bodily injury or substantial property damage if the instructions are not followed correctly.

Meaning of Symbols

	A diagonal line through a circle alerts you to something you should not do; it may have a picture inside to show the specific acts or practices you should not do.
	A black circle with an exclamation mark inside alerts you to something you MUST do; it may have a picture inside to show the specific acts or practices you must do.



Alerts you the conditions which could cause serious bodily injury or death if you do not follow the instruction.

To System Designers:

When introducing the PR-450UDM IC card reader/writer in those systems that could affect human lives (e.g., medicines management system), develop applications carefully through redundancy and safety design which avoid the feasibility of affecting human lives even if a data error occurs.

Operating Environments:

	<p>Do not use the PR-450UDM in places where the use of radio frequency is restricted, such as in an airplane or hospital. Doing so may cause failures or malfunctions in electronic or medical equipment.</p>
	<p>Do not use the PR-450UDM in places where any inflammable gases may be emitted. Doing so could cause fire.</p>
	<p>Do not use the PR-450UDM in places where it is subject to strong vibration or shock. Doing so could cause the device to break or burn.</p>

Power Supply:


	<p>Never use the PR-450UDM on the line voltage other than the specified level. Doing so could cause the device to break or burn.</p>
--	---

Setting Up:


	<p>Never bring any metals into contact with connector terminals. Doing so could produce a large current through the PR-450UDM, resulting in heat or fire, as well as damage to the device.</p>
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Handling:

	<p>Do not scratch, modify, heat, bend, twist, or pull the PR-450UDM and cables. Do not allow them to get pressed under heavy or sharp materials. Doing so could cause the PR-450UDM and cables to break down, resulting in fire.</p>
	<p>The PR-450UDM is a precision device. Do not drop it or apply a strong shock or force to it. Doing so could cause the device to break.</p>
	<p>Do not use the PR-450UDM in places where it is subject to a sharp temperature change, dewing or steam. Failure to do so could cause fire or electrical shock.</p>

	<p>Replace the cable with a new one if it gets damaged (exposed or broken lead wires, etc.).</p> <p>Failure to do so could cause fire or electrical shock.</p>
	<p>If foreign material or water gets into the PR-450UDM, immediately turn off the power and unplug the cable from the device.</p> <p>Failure to do so could cause fire or electrical shock.</p>
	<p>If smoke, abnormal orders or noises come from the PR-450UDM, immediately turn off the power, unplug the cable from the device, and contact your nearest dealer.</p> <p>Failure to do so could cause fire or electrical shock.</p>

Implantable Medical Equipment:

	<p>A patient with implantable medical equipment (cardiac pacemaker, etc.) is strongly advised to operate the PR-450UDM away from at least 12 cm from the said medical equipment.</p> <p>A survey conducted on the wireless card systems has reported the possibility of their affecting or giving unfavorable impact on implantable medical equipment. This is a general characteristic of those systems using radio waves, and not the unique feature of DENSO WAVE's products or the PR-450UDM itself. More information is available from the website by Ministry of Internal Affairs and Communications at: http://www.soumu.go.jp/s-news/2003/030620_1.html.</p>
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Alerts you the conditions which could cause minor bodily injury or substantial property damage if you do not follow the instruction.

Operating Environments:

	<p>Do not put the PR-450UDM in places where there are excessively high temperatures, such as inside closed-up automobiles, or in places exposed to direct sunlight. Doing so could affect the housing or parts, resulting in fire.</p>
	<p>Avoid using the PR-450UDM in extremely humid or dusty areas, or where there are drastic temperature changes. Moisture or dust will get into the PR-450UDM, resulting in malfunction, fire or electrical shock.</p>

Handling:

	<p>Never disassemble or modify the PR-450UDM. Doing so could cause fire or electrical shock.</p>
	<p>Do not touch the PR-450UDM with wet hands. Doing so could cause electrical shock.</p>
	<p>Use the PR-450UDM away from electrical or electronic equipment, e.g., a cell phone, PHS, TV or radio. This will introduce noise in the sound or display due to electromagnetic waves generated by the device.</p>
	<p>Make sure to hold the plug when connecting and disconnecting the cable. This may cause the PR-450UDM or the cable to break, or result in burn, fire or electrical shock.</p>

Preface

The PR-450UDM reader/writer, which is easy to plug in to your host computer with a USB cable, is an IC card reader/writer capable of reading contactless IC cards.

This user's manual sets forth the procedures for handling, setting and operating this product. You should study it carefully to make sure that you use this product both correctly and effectively before starting the operation.

About This Document

- All rights in this document are reserved by DENSO WAVE INCORPORATED. No part of this publication may be reproduced in any form or by any means without permission in writing from the publisher.
- The information in this manual are subject to change without prior notice.
- Please contact us if you have lost this document.

Related Documents

You need the following manuals for the development of applications for IC cards.

- **PR-450UDM Command Manual**

A manual describing how to create the programs for controlling IC cards.

- **FeliCa Card Control Command Manual**

A guideline on the commands exclusively used to control FeliCa cards.
You should read this manual in line with the PR-450UDM Command Manual.

- **Mifare Card Control Command Manual**

A guideline on the commands exclusively used to control Mifare cards.
You should read this manual in line with the PR-450UDM Command Manual.

- **Communication Security Manual**

A guideline on the commands used to create application programs that need high security, for example, two-way authentication.

You should read this manual in line with the PR-450UDM Command Manual and the FeliCa Card Control Command Manual or Mifare Card Control Command Manual.

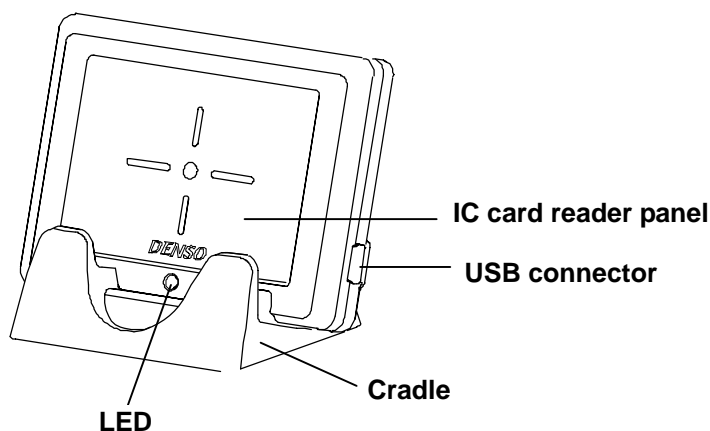
Applicable Standards & Laws

- This product is classified as inductive reader/writer communications equipment under the High Frequency Equipment section of Japan's Radio Law. It has a built-in reader/writer unit certified by the Ministry of Internal Affairs and Communications as the AC-06104 model type unit.
- This product, when not using radio frequencies, is classified as Class B information technology equipment in accordance with the Voluntary Control Council for Interference Technology Equipment (VCCI). Though originally designed to accommodate home environments, it may generate some interference while receiving data if it is used in close proximity of a radio or TV unit. You are required to strictly follow this instruction manual for successful operation.
- This product is intended for use only within Japan and therefore shall not be used outside the country. Any products that include this product are regarded as controlled items subject to the Foreign Exchange and Foreign Trade Control Law of Japan, and the export license specified by this law is required from the government of Japan when exporting such products to outside Japan for the purpose of their production.

Limited Liability

- In no event will DENSO WAVE be liable for direct, indirect, special, incidental, or consequential damages (including imaginary profits or damages resulting from interruption of operation or loss of business information) resulting from any defect in the software or its documentation or resulting from inability to apply the software or its documentation.
- DENSO WAVE takes reasonable precautions to ensure its products do not infringe upon any patent of other intellectual property rights of others, but DENSO WAVE cannot be responsible for any patent or other intellectual right infringements or violations which could arise from:
 - (1) The use of DENSO WAVE's products in connection or in combination with other components, products, equipment or data processing systems or software not supplied from DENSO WAVE,
 - (2) The use of DENSO WAVE's products in a manner for which the same were not intended nor designed,
 - (3) Modifications or changes made to DENSO WAVE's products by individuals or parties others than DENSO WAVE, or
 - (4) The use of DENSO WAVE's products in the region or country other than Japan.
- The following acts and practices on the reader/writer unit built in this product are regarded as violations of laws and DENSO WAVE will not take any responsibility for any of such acts and practices. You are strongly required not to:
 - Disassemble, modify, change or alter the reader/writer unit,
 - Apply for a change of the model type of reader/writer unit, or
 - Modify or change the reader/writer unit and reapply for a new model type.
- If it is judged by DENSO WAVE that malfunction of this product is caused by its having been dropped or subjected to shock or impact, repairs will be made at a reasonable charge even within the warranty period.

Part Names



LED indicator	State
Light ON	Communication standby
Fast blinking	Communication underway
Slow blinking	Malfunction or abnormality detected
Light OFF	Main unit powered off

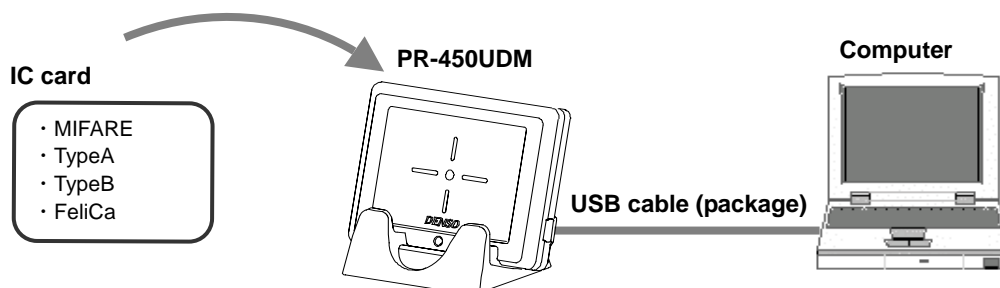
:* The LED is normally configured in this factory default setting. If not so, the LED condition may have been possibly changed by the application software. Consult your system administrator.

System Configuration

The PR-450UDM is a contactless IC card reader/writer designed to operate on the host computer.

Supported contactless IC cards include MIFARE, FeliCa and ISO/IEC 14443 Type A and Type B.

You can use this device on the computer equipped with WindowsXP or Windows 2000.



Before Starting the PR-450UDM

Preparation

You should first go through the following procedure before starting the PR-450UDM setup.

1 Cancel the computer's power supply control setting.

This reader/writer does not support such power supply control functions as "standby", "sleep", "resume" and "hibernation".

You need to turn off these functions before starting the setup procedure.

2 Login the computer with the administrator's right.

In Windows XP/2000, installing the driver requires the administrator's right.

Start your computer at the right of administrator before moving to the setup procedure.

3 Prepare a driver.

Using the PR-450UDM requires you to install the dedicated USB driver provided by DENSO WAVE. You need to download this driver from our website at <http://www.denso-wave.com> before starting the setup procedure.

The file downloaded is a self-extracting file, containing a driver and an uninstaller in compressed form. Double-click the file icon and the file is decompressed by itself. At this time, you are recommended to write down the destination of the file to save, as you need it when installing the driver later on.

NOTE	If the old version of PR-400 driver is already installed in your computer, you need to remove it with the uninstaller "Pcd_SeRemover" before installing the driver.
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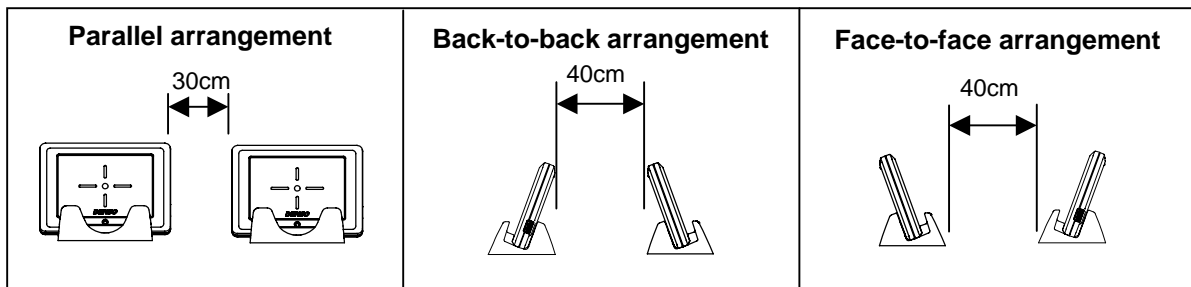
Notes for placing the PR-450UDM

Do not place the PR-450UDM on a metal plate

Do not place the PR-450UDM on a steel desk or computer with a metal housing. It will generate harmful interference due to the effects of metal, which may block wireless networking with IC cards.

Leave enough space between the PR-450UDMs

When operating more than one PR-450UDM, be sure to place them apart from each other as shown in the figures below. This is to avoid radio frequency interference between the PR-450UDMs.



Avoid effects of noise

The PR-450UDM may not be able to function normally or encounter difficulties in transmitting data in the presence of noise.

You should take the following measures in the vicinity of noise source.

Noise source	Solutions
Switching power source, power cable, etc.	Move the PR-450UDM away from the noise source or shield the noise source.
Inverter (air conditioner, refrigerator, fluorescent light, etc.)	Move the PR-450UDM away from the noise source until transmission is established.
Equipment operating in the same frequency band (13.56MHz)	<ul style="list-style-type: none"> • Move the PR-450UDM away from the noise source until transmission is established. • Use another USB port having a power source different from the equipment generating the noise.
Another type of IC card reader/writer	
Electrical equipment generating noise	

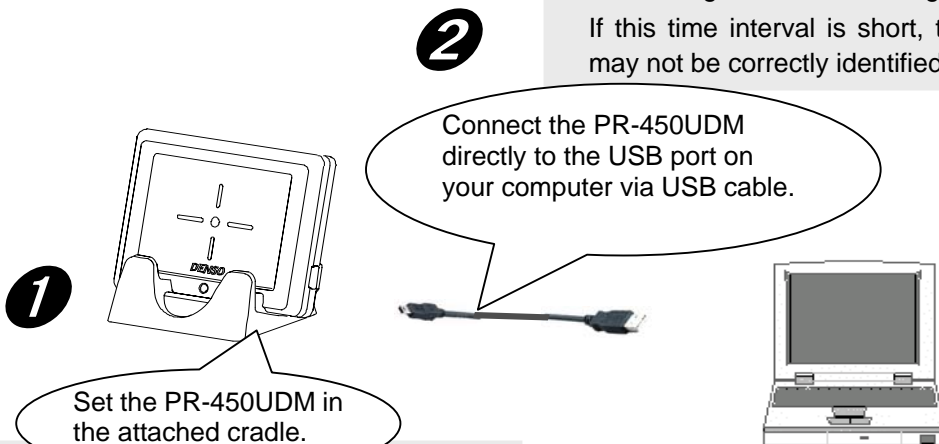
Setting Up the PR-450UDM

1. Connecting to your computer

Connect the PR-450UDM to the USB port on your computer or to the USB powered hub through the USB cable provided in the package.

Important!

Leave at least 10 msec intervals when connecting and disconnecting the USB cable. If this time interval is short, the USB device may not be correctly identified.

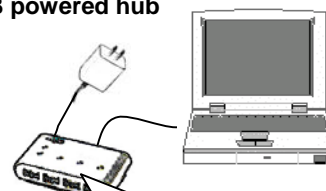


Important!

1. Do not place the PR-450UDM on a steel desk or computer with a metal housing. It will generate harmful interference due to the effects of metal and wireless networking with IC cards may be blocked.
2. Do not use the PR-450UDM under the following conditions:
 - Humid or dust
 - Extremely high or low temperature
 - Sharp temperature changes
 - Direct sunlight
 - Water, oil, chemical or steam
 - Strong vibration or shock

Or

USB powered hub



Use the USB powered hub if you cannot directly connect to your computer. You should be reminded that the operation may become unstable depending on the hub you use.

Important!

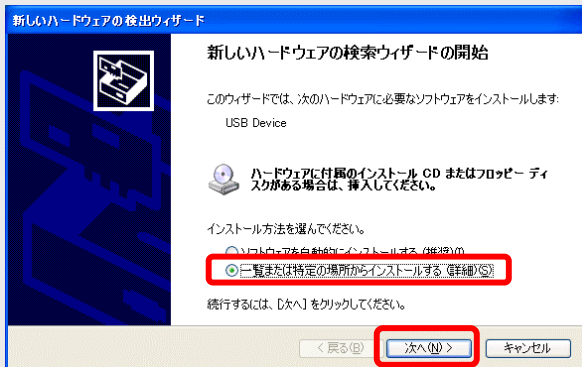
Make sure that the USB hub has been turned on before connecting it to the PR-450UDM. Do not turn off the USB hub unless you unplug it from the PR-450UDM.

2. Installing the driver

Soon after the PR-450UDM is connected to the host computer, **Found New Hardware Wizard** starts. Install the driver in the following steps.

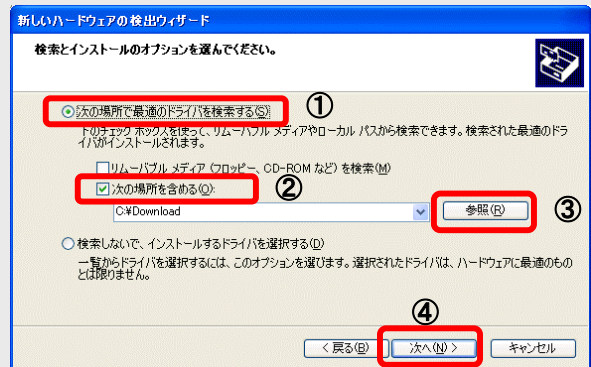
Installing on WindowsXP

1



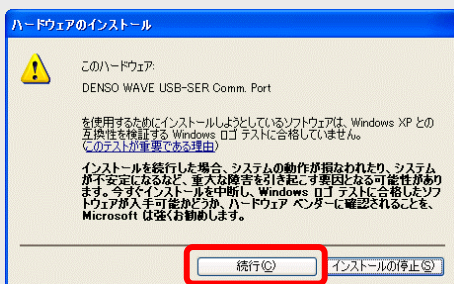
Select **Install from a list or specific location (S)**, then click **Next**.

2



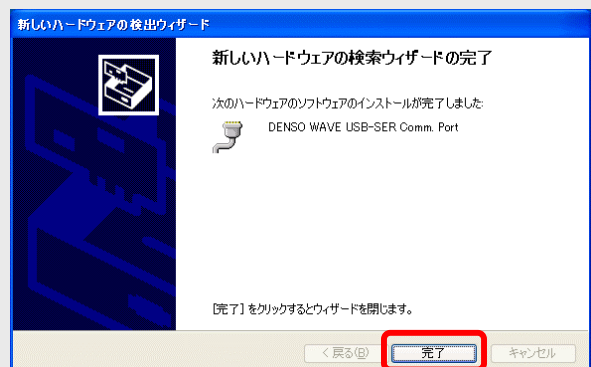
Select ① **Search for the new driver in these locations (S)** and the ② **Include this location in the search (O)** check box. Click ③ **Reference (R)** and select the folder of the driver you have downloaded in "Before Starting the PR-450UDM" in page 4. Then click ④ **Next**.

3



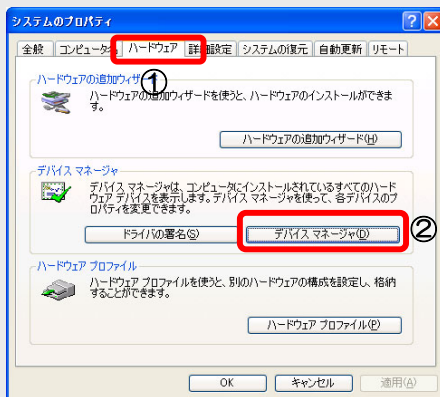
Even if the caution about Windows Logo testing (WHQL) appears, you must continue this installation. Click **Continue Anyway**.

4



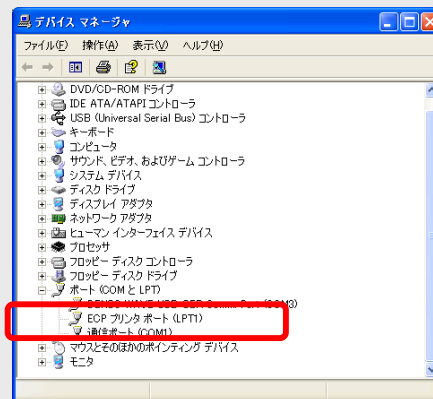
If the Completion screen appears at the end of driver installation, click **Finish**.

5 Check that the driver is now properly installed.



On the control panel, click **System** -> **System Properties** -> ① **Hardware** tab -> ② **Device Manager** tab. The Device Manager screen is displayed.

6



If **DENSO WAVE USB-SER Comm.Port** is added to the sub-tree of **Ports (COM & LPT)** as shown above, the driver is successfully installed.

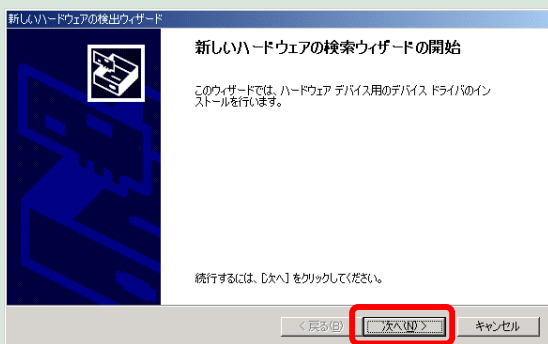
If **DENSO WAVE USB-SER Comm.Port** is not added or marked with "!" or "X", remove the driver, reboot the computer, and then reinstall the driver according to the procedure specified in "Uninstalling the driver" in page 11.

Notes on COM Port Number:

1. To access to the DENSO WAVE USB-SER Comm.Port from the application software, you need the COM port number identified by the device manager.
2. The COM port number may be changed if another port is connected the PR-450UDM.

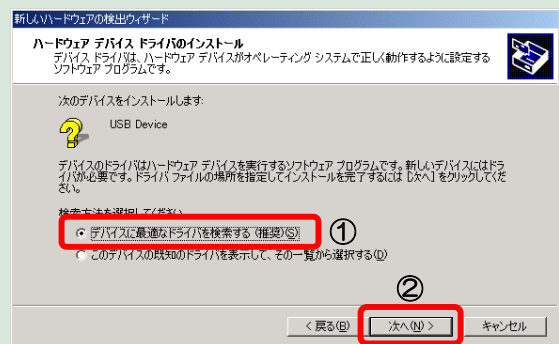
Installing on Windows2000

1



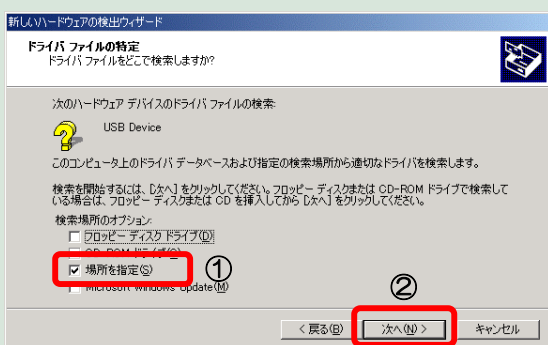
Click **Next**.

2



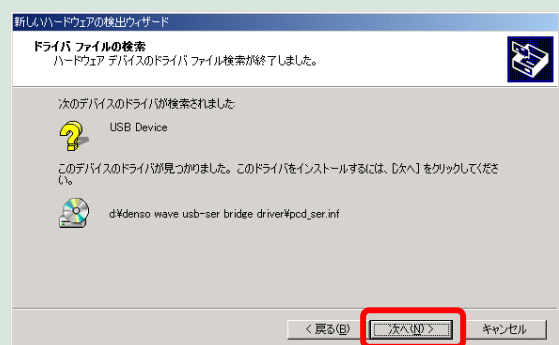
Select ① **Search for the best driver for your device (Recommended) (S)**, then click ② **Next**.

3



Check ① **Specify a location (S)** check box and select the folder of the driver you have downloaded in "Before Starting the PR-450UDM" in page 4. Then click ② **Next**.

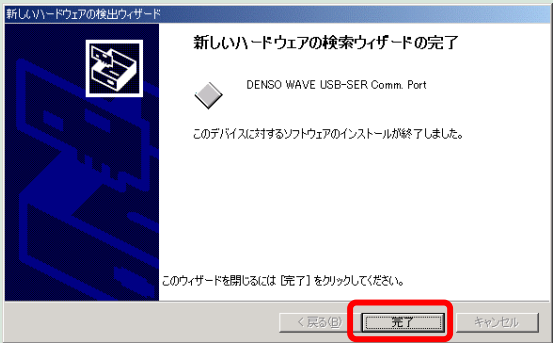
4



When "New hardware device driver found" messages appear, click **Next**.

Windows2000

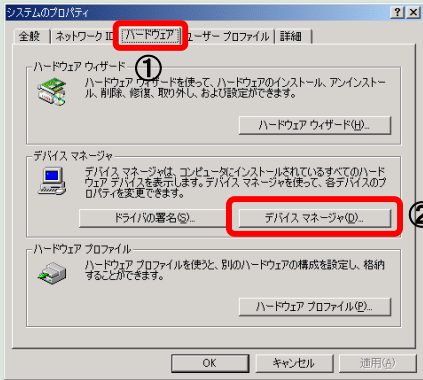
5



If the Completion screen appears at the end of driver installation, click **Finish**.

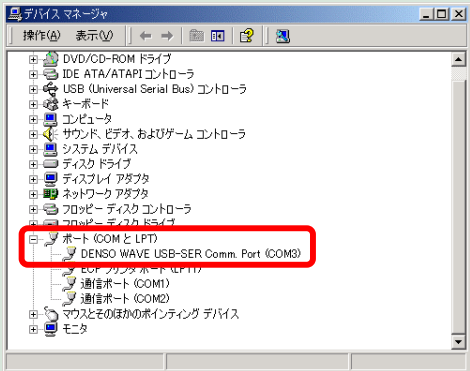
6

Make sure that the driver is correctly installed.



On the control panel, click **System** -> **System Properties** -> **1 Hardware** tab -> **2 Device Manager** tab. The Device Manager screen is displayed.

7



If **DENSIO WAVE USB-SER Comm.Port** is added to the sub-tree of **Ports (COM & LPT)** as shown above, the driver is successfully installed.

If **DENSIO WAVE USB-SER Comm.Port** is not added or marked with "!" or "X", remove the driver, reboot the computer, and then reinstall the driver according to the procedure specified in "Uninstalling the driver" in page 11.

Notes on COM Port Number:

1. To access to the DENSIO WAVE USB-SER Comm.Port from the application software, you need the COM port number identified by the device manager.
2. The COM port number may be changed if another port is connected the PR-450UDM.

Uninstalling the driver

Preparation

1 Login your computer with the administrator's right.

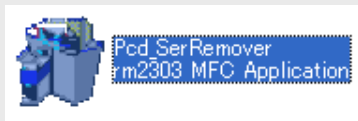
In WindowsXP/2000, removing the driver requires the administrator's right.

2 Release the PR-450UDM from your computer.

How to remove

You can remove the driver with the dedicated uninstaller **Pcd_SerRemover** in the steps below. This example shows the display screens for WindowsXP.

1



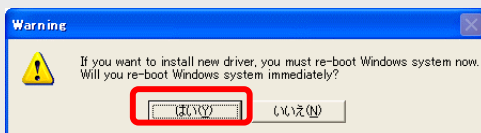
Double-click the uninstaller's **Pcd_SerRemover** icon.

2



The USB-SER Driver Remover screen appears. Click **OK**.

3



The caution tells you that you need to reboot the system if you want to install a new driver. Click **Yes**.

4



The USB-SER Driver Remover completion screen appears. Click **Exit**.

Updating the driver

Preparation

1 Login the computer with the administrator's right.

In Windows XP/2000, removing the driver requires the administrator's right.

2 Download the latest version of the USB driver.

The latest version of the USB driver is available from our website at <http://www.denso-wave.com>. Download the driver following the steps below.

The file downloaded is a self-extracting file, containing a driver and an uninstaller in compressed form. Double-click the file icon and the file is decompressed by itself. At this time, you are recommended to write down the destination of the file to save, as you need it when installing the driver later on.

How to update

1 Release the PR-450UDM from your computer.

2 Remove the old driver with the dedicated uninstaller.

For how to remove the driver, refer to "Uninstalling the driver" in page 11.

NOTE	Be sure to remove the old driver before updating the driver. Successful updating cannot be expected if the old driver still remains in the host computer.
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3 Reboot the host computer.

4 Connect the PR-450UDM to the computer.

5 Install a new driver.

When you connect the PR-450UDM to the host computer, the new hardware wizard will automatically run. Follow the wizard and install a new driver.

Handling of Card

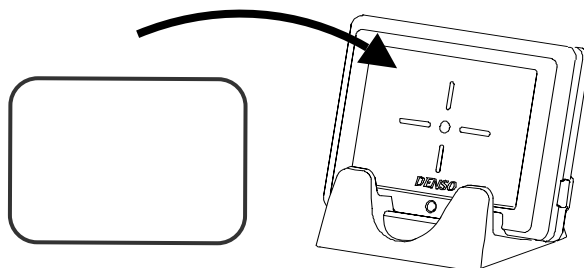
Notes to users

Do not unplug the USB cable from the PR-450UDM while the application is still running. This may cause the host computer to become unstable or the data stored in the PR-450UDM will be lost or broken.

Proper card position

You **MUST** place the card sideways as shown in the figure below.

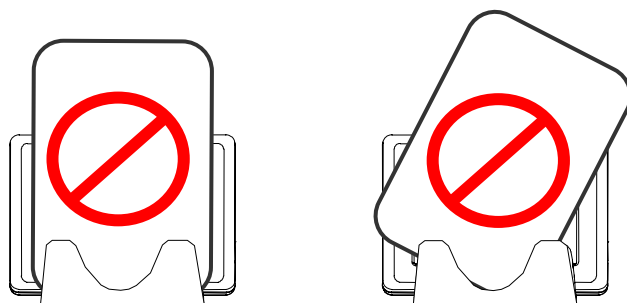
Be sure to place only one card in the cradle. The PR-450UDM cannot read more than one card at a time.



Improper card position

These are bad examples: The card placed lengthwise or on a skew as shown below may not be read correctly.

Be sure to place the card in the right position.



Specifications

● Standard

Item	Specification
Operating environment	Office environment
Supported card type	MIFARE (Standard 1k, 4k) ISO/IEC 14443 Type A (Incl. MIFARE DESFire) ISO/IEC 14443 Type B FeliCa
Interface	Complying with USB 1.1 (Power is supplied via USB interface)
Supported OS	WindowsXP, Windows2000
Power voltage & source	5 VDC/500 mA max.
Outer dimensions	75 (width) X 54 (height) X 10 (depth) mm (Excl. projected part)
Operating temperature & humidity	0 - 40°C, 20 - 90%RH
Storage temperature & humidity	-20 - 60°C, 20 - 90%RH

● Communication protocol with upper unit (USB virtual COM)

Item	Specification
Synchronous system	Half-duplex synchronous system
Transmission speed	9600/19200/28800/38400/57600/115200/230400/ 460800/614400 bps (9600 bps at default)
Transmission	LSB first
Character format	Start bit: 1 bit Data bit: 8 bits Parity bit: Odd Stop bit: 1 bit

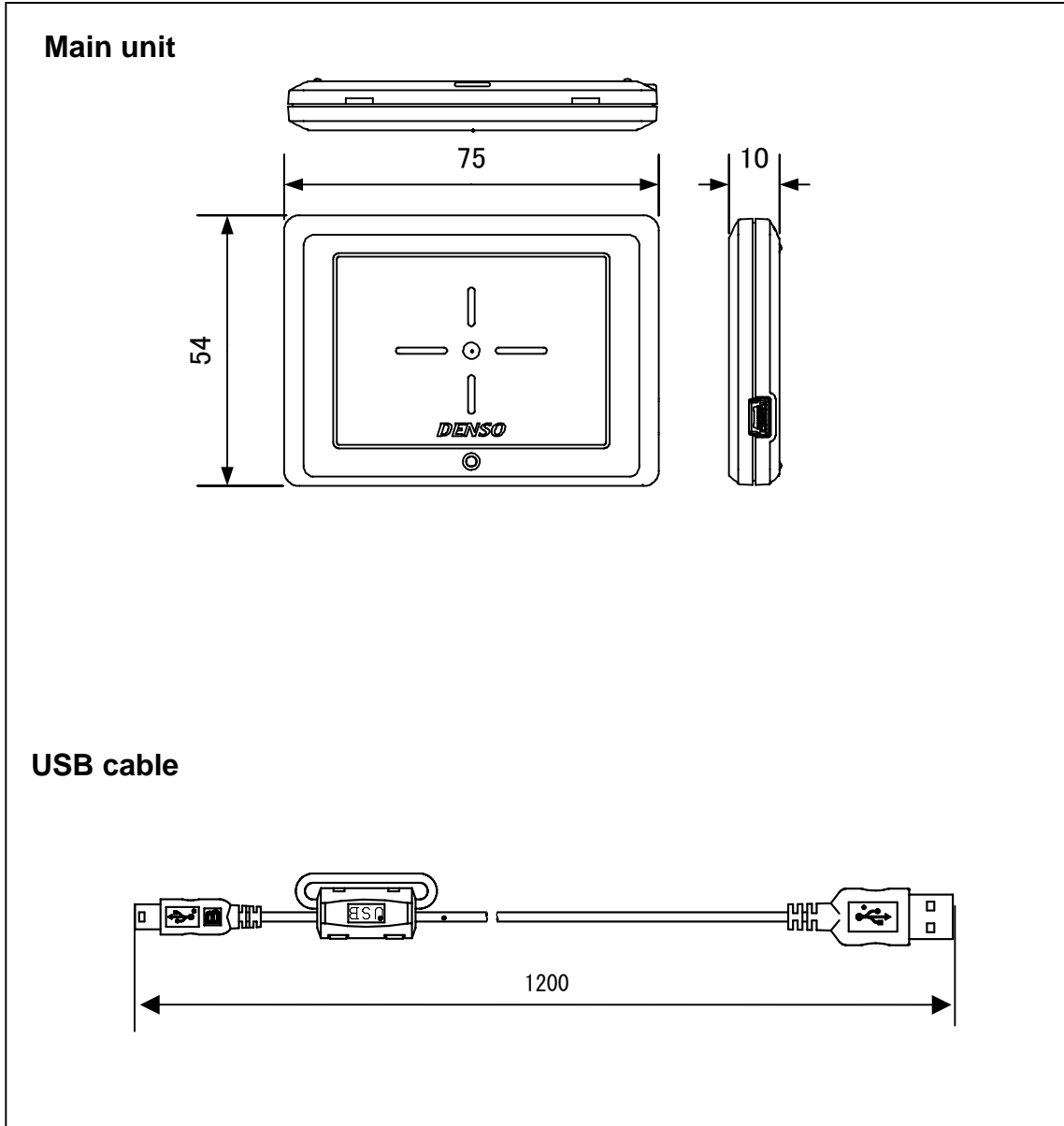
● Radio frequency

Item	Specifications	
Carrier frequency	13.56 MHz	
Output power	Low	0.4 W or less
	High	None (Normal output only)

Outer dimensions

All the measurements given in the figures are provided as referential values.

Unit: mm



Troubleshooting

If there is a problem in IC card reading, you are advised to take the following troubleshooting measures before consulting your dealer.

Problem **The LED does not light up.**

- Make sure that the USB cable is properly connected to the PR-450UDM.
- Remove the USB cable, then reconnect it to the PR-450UDM again.
- Replace the USB cable with a new one.

The PR-450UDM is assumed to be broken if the problem cannot be solved even with these measures. If such is a case, contact your dealer.

Problem **The LED blinks slowly.**

- Remove the USB cable, then reconnect it to the PR-450UDM again.
Contact your dealer if the problem cannot be solved with this measure.

Problem **The PR-450UDM cannot be recognized by the application.**

Check the DENSO WAVE USB-SER Comm.Port (COM*) as to the following points with the device manager.

- If the DENSO WAVE USB-SER Comm.Port (COM*) is not found, remove the USB cable from the PR-450UDM and then reconnect it when 10 sec have elapsed.
- Make sure that the right COM number is assigned to the DENSO WAVE USB-SER Comm in your application.
- If the DENSO WAVE USB-SER Comm.Port (COM*) is marked with “!” or “X”, remove the driver according to the “Uninstalling the driver” in page 11, reboot your computer and then reinstall the driver.

Problem **The PR-450UDM gets unstable during the operation.**

- If any other USB cable than the one provided by DENSO WAVE is used, you need to change it to the cable attached to this product. Connect the attached cable directly to the USB port on your computer and check the operation after that.
- Remove the USB cable, then reconnect it to the PR-450UDM again.
- Replace the USB cable with a new one if it gets damaged.
- The PR-450UDM is not designed to support power supply control functions such as “standby”, “sleep”, “resume” and “hibernation. You need to cancel these functions if they are set to the ON position.
- Check that the PR-450UDM is free from any noise source that may adversely affect its operation. If required, you should take some appropriate noise pretension measures. (Refer to “Notes for placing the PR-450UDM” in page 5.)
- Do not place the PR-450UDM near metal objects, for example, on a steal desk or computer with a metal housing. You shall move the device away from such metal objects. (Refer to “Notes for placing the PR-450UDM” in page 5.)

Problem**Communication with IC card is blocked.**

- Check that the card is correctly placed in the cradle. (Refer to “Handling of Card” in page 13.)
- Make sure that the card you are using is supported as a readable card. (Refer to “Specifications” in page 14.)
- Check that the PR-450UDM is free from any noise source that may adversely affect its operation. If required, you should take some appropriate noise prevention measures. (Refer to “Notes for placing the PR-450UDM” in page 5.)
- If the PR-450UDM is placed near a metal object, such as on a steel desk or computer with a metal housing, move the device away from that metal object. (Refer to “Notes for placing the PR-450UDM” in page 5.)

If the wireless networking with IC card cannot be regained even if you have tried all the above solutions, there may be an error in the application running on the PR-450UDM. Make sure that:

- The right method and protocol are selected for the transmission.
- The communication protocol with the upper unit has been successfully processed.
- The carrier is set to the ON position.
- The communication with IC cards has been successfully processed.

Contactless IC Card Reader/Writer PR-450UDM User's Manual
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